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Investigation Report for Upper Mortandad Canyon Aggregate Area

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Prepared by the Environmental Programs Directorate

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EXECUTIVE SUMMARY

This investigation report presents the investigation activities at 63 solid waste management units (SWMUs) and areas of concern (AOCs) in the Upper Mortandad Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The SWMUs and AOCs are located in Technical Area 03 (TA-03), former TA-42 (within the current TA-55), TA-48, TA-50, and TA-55. Two additional sites at TA-35 were omitted from the Middle Mortandad/Ten Site Canyon Aggregate Area investigation work plan and are included in this report. Of the 65 sites, 20 are proposed for delayed characterization and investigation pending the decommissioning and demolition of certain buildings and structures within the Upper Mortandad Canyon Aggregate Area.

The objective of this investigation is to define the nature and extent of contamination and, if defined, to determine whether the sites pose a potential unacceptable risk to human health or the environment. This report presents the results of site characterization activities conducted during the 2009 investigation, as directed by the approved investigation work plan for Upper Mortandad Canyon Aggregate Area, submitted to the New Mexico Environment Department (NMED) in November 2007. The revised work plan was submitted to NMED in February 2008 and approved by NMED in March 2008.

The 2009 investigation activities included collecting 800 surface and shallow subsurface soil, sediment, and rock samples from 306 locations, from the surface to a maximum depth of 101.5 ft below ground surface. Data from the samples collected during the 2009 investigation were combined with data collected before 2009 that meet current Laboratory data-quality requirements.

The sampling data presented in this report indicate the extent of contamination has been defined at 11 of the sites investigated. Of the 11 sites for which nature and extent of contamination have been defined, 10 sites have been determined to pose no potential unacceptable risk or dose to human health or the environment under the current or reasonably foreseeable future land use. No further investigation or remediation activities are warranted at the 10 sites. The eleventh site was not evaluated for risk or dose as only swipe samples were collected and analyzed. Additional sampling will be necessary when the site is decommissioned to determine whether contaminants are present beneath the concrete sump structure.

The extent of contamination has not been completely defined at 31 of the sites investigated. Additional sampling is needed to define the vertical and/or lateral extent of one or more contaminants at each of these sites. The Laboratory will provide a Phase II investigation work plan to address the additional sampling required to define extent at the sites identified in this report. This Phase II work plan will also identify specific sampling locations, sampling depths, and analytical suites required to confirm the effectiveness of all remediation activities. 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 a potential unacceptable risk to human health or the environment.

CONTENTS

1.0 INTRODUCTION 1
1.1 General Site Information 1
1.2 Purpose of Investigation 1
1.3 Document Organization 2
1.4 Scope of Activities 2
1.4.1 Site Access and Premobilization Activities 2
1.4.2 Field Activities 2
1.4.3 Chemical and Radiological Sample Analyses 5
1.4.4 Health and Safety Measures 5
1.4.5 Investigation-Derived Waste Storage and Disposal 5
1.4.6 Deviations 5
1.5 Aggregate Area Site Conditions 6
1.5.1 Surface Conditions 6
1.5.2 Subsurface Conditions 7
1.6 Regulatory Criteria 11
1.6.1 Screening Levels 12
1.6.2 Ecological Screening Levels 12
1.6.3 Cleanup Standards 12
2.0 TA-03 BACKGROUND AND FIELD-INVESTIGATION RESULTS 12
2.1 Background of TA-03 12
2.1.1 Operational History 14
2.1.2 Summary of Releases 14
2.1.3 Current Site Usage and Status 14
2.2 AOC 03-003(e)—Storage Area (Transformers) 15
2.2.1 Site Description and Operational History 15
2.2.2 Relationship to Other SWMUs and AOCs 15
2.2.3 Summary of Previous Investigations for AOC 03-003(e) 15
2.2.4 Delayed Site Investigation Rationale 15
2.3 AOC 03-003(i)—Storage Area (Transformers) 15
2.3.1 Site Description and Operational History 15
2.3.2 Relationship to Other SWMUs and AOCs 16
2.3.3 Summary of Previous Investigations for AOC 03-003(i) 16
2.3.4 Delayed Site Investigation Rationale 16
2.4 AOC 03-004(c)—Storage Area, CMR Building Loading Dock 16
2.4.1 Site Description and Operational History 16
2.4.2 Relationship to Other SWMUs and AOCs 17
2.4.3 Summary of Previous Investigations for AOC 03-004(c) 17
2.4.4 Site Contamination 17
2.4.5 Summary of Human Health Risk Screening 18
2.4.6 Summary of Ecological Risk Screening 18
2.5 AOC 03-004(d)—Former Storage Area at CMR Building 18
2.5.1 Site Description and Operational History 18
2.5.2 Relationship to Other SWMUs and AOCs 19
2.5.3 Summary of Previous Investigations for AOC 03-004(d) 19
2.5.4 Site Contamination 19

2.5.5 Summary of Human Health Risk Screening 20
2.5.6 Summary of Ecological Risk Screening 20
2.6 AOC 03-007—Decommissioned Firing Site 21
2.6.1 Site Description and Operational History 21
2.6.2 Relationship to Other SWMUs and AOCs 21
2.6.3 Summary of Previous Investigations for AOC 03-007 21
2.6.4 Site Contamination 21
2.6.5 Summary of Human Health Risk Screening 23
2.6.6 Summary of Ecological Risk Screening 23
2.7 AOC 03-014(w)—Floor Drain in CMR Building 23
2.7.1 Site Description and Operational History 23
2.7.2 Relationship to Other SWMUs and AOCs 23
2.7.3 Summary of Previous Investigations for AOC 03-014(w) 24
2.7.4 Delayed Site Investigation Rationale 24
2.8 AOC 03-014(x)—Floor Drain in Sigma Building 24
2.8.1 Site Description and Operational History 24
2.8.2 Relationship to Other SWMUs and AOCs 24
2.8.3 Summary of Previous Investigations for AOC 03-014(x) 25
2.8.4 Delayed Site Investigation Rationale 25
2.9 AOC 03-026(a)—Sump 25
2.9.1 Site Description and Operational History 25
2.9.2 Relationship to Other SWMUs and AOCs 25
2.9.3 Summary of Previous Investigations for AOC 03-026(a) 26
2.9.4 Delayed Site Investigation Rationale 26
2.10 SWMU 03-026(c)—Aboveground Holding Tanks 26
2.10.1 Site Description and Operational History 26
2.10.2 Relationship to Other SWMUs and AOCs 26
2.10.3 Summary of Previous Investigations for SWMU 03-026(c) 27
2.10.4 Delayed Site Investigation Rationale 27
2.11 SWMU 03-031—Radioactive Liquid Waste System in CMR Building 27
2.11.1 Site Description and Operational History 27
2.11.2 Relationship to Other SWMUs and AOCs 28
2.11.3 Summary of Previous Investigations for SWMU 03-031 28
2.11.4 Delayed Site Investigation Rationale 28
2.12 SWMU 03-034(a)—Radioactive Liquid Waste Tanks 29
2.12.1 Site Description and Operational History 29
2.12.2 Relationship to Other SWMUs and AOCs 29
2.12.3 Summary of Previous Investigations for SWMU 03-034(a) 30
2.12.4 Site Contamination 30
2.12.5 Summary of Human Health Risk Screening 31
2.12.6 Summary of Ecological Risk Screening 32
2.12.7 Delayed Site Investigation Rationale 32
2.13 SWMU 03-034(b)—Active Industrial Waste Sump 32
2.13.1 Site Description and Operational History 32
2.13.2 Relationship to Other SWMUs and AOCs 32
2.13.3 Summary of Previous Investigations for SWMU 03-034(b) 32
2.13.4 Delayed Site Investigation Rationale 33

2.14 AOC 03-041—Underground Tank 33
2.14.1 Site Description and Operational History 33
2.14.2 Relationship to Other SWMUs and AOCs 33
2.14.3 Summary of Previous Investigations for AOC 03-041 33
2.14.4 Site Contamination 33
2.14.5 Summary of Human Health Risk Screening 35
2.14.6 Summary of Ecological Risk Screening 35
2.15 SWMU 03-045(h)—Former NPDES-Permitted Outfall from Cooling Tower 35
2.15.1 Site Description and Operational History 35
2.15.2 Relationship to Other SWMUs and AOCs 36
2.15.3 Summary of Previous Investigations for SWMU 03-045(h) 36
2.15.4 Site Contamination 36
2.15.5 Summary of Human Health Risk Screening 38
2.15.6 Summary of Ecological Risk Screening 38
2.16 SWMU 03-049(a)—NPDES-Permitted Outfall from Cooling Tower 38
2.16.1 Site Description and Operational History 38
2.16.2 Relationship to Other SWMUs and AOCs 38
2.16.3 Summary of Previous Investigations for SWMU 03-049(a) 38
2.16.4 Site Contamination 39
2.16.5 Summary of Human Health Risk Screening 40
2.16.6 Summary of Ecological Risk Screening 40
2.17 Consolidated Unit 03-049(b)-00—Soil Contamination 41
2.17.1 Site Description and Operational History 41
2.17.2 Relationship to Other SWMUs and AOCs 41
2.17.3 Summary of Previous Investigations for Consolidated Unit 03-049(b)-00 41
2.17.4 Site Contamination 41
2.17.5 Summary of Human Health Risk Screening 43
2.17.6 Summary of Ecological Risk Screening 43
2.18 SWMU 03-049(e)—Outfall from Sigma Building Roof Drains 43
2.18.1 Site Description and Operational History 43
2.18.2 Relationship to Other SWMUs and AOCs 43
2.18.3 Summary of Previous Investigations for SWMU 03-049(e) 43
2.18.4 Site Contamination 44
2.18.5 Summary of Human Health Risk Screening 45
2.18.6 Summary of Ecological Risk Screening 45
2.19 SWMU 03-054(e)—Outfall 45
2.19.1 Site Description and Operational History 45
2.19.2 Relationship to Other SWMUs and AOCs 46
2.19.3 Summary of Previous Investigations for SWMU 03-054(e) 46
2.19.4 Site Contamination 46
2.19.5 Summary of Human Health Risk Screening 48
2.19.6 Summary of Ecological Risk Screening 48
2.20 AOC C-03-006—One-Time Spill from Industrial Waste Line Manhole 48
2.20.1 Site Description and Operational History 48
2.20.2 Relationship to Other SWMUs and AOCs 48
2.20.3 Summary of Previous Investigations for AOC C-03-006 48
2.20.4 Site Contamination 49

2.20.5 Summary of Human Health Risk Screening 50
2.20.6 Summary of Ecological Risk Screening 50

3.0 TA-35 BACKGROUND AND FIELD-INVESTIGATION RESULTS 50
3.1 Background of TA-35 50
3.1.1 Operational History 50
3.1.2 Summary of Releases 51
3.1.3 Current Site Usage and Status 51
3.2 SWMU 35-016(g)—Drain and Outfall from Building 35-213 51
3.2.1 Site Description and Operational History 51
3.2.2 Relationship to Other SWMUs and AOCs 51
3.2.3 Summary of Previous Investigations for SWMU 35-016(g) 51
3.2.4 Site Contamination 52
3.2.5 Summary of Human Health Risk Screening 53
3.2.6 Summary of Ecological Risk Screening 53
3.3 SWMU 35-016(h)—Storm Drains and Outfalls Associated with Building 35-213 53
3.3.1 Site Description and Operational History 53
3.3.2 Relationship to Other SWMUs and AOCs 53
3.3.3 Summary of Previous Investigations for AOC 35-016(h) 53
3.3.4 Site Contamination 54
3.3.5 Summary of Human Health Risk Screening 55
3.3.6 Summary of Ecological Risk Screening 55

4.0 FORMER TA-42 BACKGROUND AND FIELD-INVESTIGATION RESULTS 55
4.1 Background of Former TA-42 55
4.1.1 Operational History 55
4.1.2 Summary of Releases 55
4.1.3 Current Site Usage and Status 55
4.2 Consolidated Unit 42-001(a)-99—Former TA-42 Incinerator Complex 56
4.2.1 Site Description and Operational History 56
4.2.2 Relationship to Other SWMUs and AOCs 57
4.2.3 Summary of Previous Investigations for Consolidated Unit 42-001(a)-99 57
4.2.4 Site Contamination 57
4.2.5 Summary of Human Health Risk Screening 59
4.2.6 Summary of Ecological Risk Screening 59

5.0 TA-48 BACKGROUND AND FIELD-INVESTIGATION RESULTS 59
5.1 Background of TA-48 59
5.1.1 Operational History 60
5.1.2 Summary of Releases 60
5.1.3 Current Site Usage and Status 60
5.2 AOC 48-001—Air Exhaust System 61
5.2.1 Site Description and Operational History 61
5.2.2 Relationship to Other SWMUs and AOCs 61
5.2.3 Summary of Previous Investigations for AOC 48-001 61
5.2.4 Site Contamination 62
5.2.5 Summary of Human Health Risk Screening 63
5.2.6 Summary of Ecological Risk Screening 63

5.3 SWMU 48-002(a)—Container Storage Area 63
5.3.1 Site Description and Operational History 63
5.3.2 Relationship to Other SWMUs and AOCs 64
5.3.3 Summary of Previous Investigations for SWMUs 48-002(a) and 48-002(b) 64
5.3.4 Site Contamination 64
5.3.5 Summary of Human Health Risk Screening 66
5.3.6 Summary of Ecological Risk Screening 66
5.4 SWMU 48-002(b)—Container Storage Area 66
5.4.1 Site Description and Operational History 66
5.4.2 Relationship to Other SWMUs and AOCs 66
5.4.3 Summary of Previous Investigations for SWMUs 48-002(a and b) 66
5.4.4 Site Contamination 66
5.4.5 Summary of Human Health Risk Screening 66
5.4.6 Summary of Ecological Risk Screening 66
5.5 AOC 48-002(e)—Container Storage Area 67
5.5.1 Site Description and Operational History 67
5.5.2 Relationship to Other SWMUs and AOCs 67
5.5.3 Summary of Previous Investigations for AOC 48-002(e) 67
5.5.4 Site Contamination 67
5.5.5 Summary of Human Health Risk Screening 68
5.5.6 Summary of Ecological Risk Screening 69
5.6 SWMU 48-003—Septic System 69
5.6.1 Site Description and Operational History 69
5.6.2 Relationship to Other SWMUs and AOCs 69
5.6.3 Summary of Previous Investigations for SWMU 48-003 69
5.6.4 Site Contamination 70
5.6.5 Summary of Human Health Risk Screening 71
5.6.6 Summary of Ecological Risk Screening 71
5.7 Consolidated Unit 48-004(a)-99—Sumps and Tanks 71
5.7.1 Site Description and Operational History 71
5.7.2 Relationship to Other SWMUs and AOCs 72
5.7.3 Summary of Previous Investigations for Consolidated Unit 48-004(a)-99 72
5.7.4 Delayed Site Investigation Rationale 72
5.8 SWMU 48-005—Waste Lines 75
5.8.1 Site Description and Operational History 75
5.8.2 Relationship to Other SWMUs and AOCs 75
5.8.3 Summary of Previous Investigations for SWMU 48-005 75
5.8.4 Site Contamination 75
5.8.5 Summary of Human Health Risk Screening 77
5.8.6 Summary of Ecological Risk Screening 77
5.8.7 Delayed Site Investigation Rationale 77
5.9 Consolidated Unit 48-007(a)-00—Drainlines and Outfalls 79
5.9.1 Site Description and Operational History 79
5.9.2 Relationship to Other SWMUs and AOCs 79
5.9.3 Summary of Previous Investigations for Consolidated Unit 48-007(a)-00 80
5.9.4 Site Contamination 80
5.9.5 Summary of Human Health Risk Screening 82
5.9.6 Summary of Ecological Risk Screening 82

5.10 SWMU 48-007(b)—Cooling Tower Outfall from Building 48-1 82
5.10.1 Site Description and Operational History 82
5.10.2 Relationship to Other SWMUs and AOCs 83
5.10.3 Summary of Previous Investigations for SWMU 48-007(b) 83
5.10.4 Site Contamination 83
5.10.5 Summary of Human Health Risk Screening 85
5.10.6 Summary of Ecological Risk Screening 85
5.11 SWMU 48-007(c)—Floor Drain Outfall from Building 48-1 85
5.11.1 Site Description and Operational History 85
5.11.2 Relationship to Other SWMUs and AOCs 85
5.11.3 Summary of Previous Investigations for SWMU 48-007(c) 85
5.11.4 Site Contamination 86
5.11.5 Summary of Human Health Risk Screening 87
5.11.6 Summary of Ecological Risk Screening 87
5.12 SWMU 48-007(f)—Outfall from Building 48-46 87
5.12.1 Site Description and Operational History 87
5.12.2 Relationship to Other SWMUs and AOCs 88
5.12.3 Summary of Previous Investigations for SWMU 48-007(f) 88
5.12.4 Site Contamination 88
5.12.5 Summary of Human Health Risk Screening 89
5.12.6 Summary of Ecological Risk Screening 89
5.13 AOC 48-011—Radiation Detector Disposal Shaft 90
5.13.1 Site Description and Operational History 90
5.13.2 Relationship to Other SWMUs and AOCs 90
5.13.3 Summary of Previous Investigations for AOC 48-011 90
5.13.4 Site Contamination 90
5.13.5 Summary of Human Health Risk Screening 91
5.13.6 Summary of Ecological Risk Screening 91
5.14 AOC 48-012—Soil Contamination 92
5.14.1 Site Description and Operational History 92
5.14.2 Relationship to Other SWMUs and AOCs 92
5.14.3 Summary of Previous Investigations for AOC 48-012 92
5.14.4 Site Contamination 92
5.14.5 Summary of Human Health Risk Screening 93
5.14.6 Summary of Ecological Risk Screening 93

6.0 TA-50 BACKGROUND AND FIELD-INVESTIGATION RESULTS 94
6.1 Background of TA-50 94
6.1.1 Operational History 95
6.1.2 Summary of Releases 95
6.1.3 Current Site Usage and Status 95
6.2 SWMU 50-001(a)—Wastewater Treatment Facility 95
6.2.1 Site Description and Operational History 95
6.2.2 Relationship to Other SWMUs and AOCs 96
6.2.3 Summary of Previous Investigations for SWMU 50-001(a) 96
6.2.4 Delayed Site Investigation Rationale 96
6.3 AOC 50-001(b)—Waste Lines and Manholes 96
6.3.1 Site Description and Operational History 96

6.3.2 Relationship to Other SWMUs and AOCs 97
6.3.3 Summary of Previous Investigations for AOC 50-001(b) 98
6.3.4 Delayed Site Investigation Rationale 98
6.4 SWMU 50-002(a)—Underground Tanks 99
6.4.1 Site Description and Operational History 99
6.4.2 Relationship to Other SWMUs and AOCs 99
6.4.3 Summary of Previous Investigations for SWMU 50-002(a) 99
6.4.4 Delayed Site Investigation Rationale 100
6.5 Consolidated Unit 50-002(b)-00—Vaulted Underground Tanks for TA-55 Waste 100
6.5.1 Site Description and Operational History 100
6.5.2 Relationship to Other SWMUs and AOCs 100
6.5.3 Summary of Previous Investigations for Consolidated Unit 50-002(b)-00 100
6.5.4 Delayed Site Investigation Rationale 101
6.6 AOC 50-002(d)—Aboveground Storage Tank 101
6.6.1 Site Description and Operational History 101
6.6.2 Relationship to Other SWMUs and AOCs 101
6.6.3 Summary of Previous Investigations for AOC 50-002(d) 101
6.6.4 Site Contamination 101
6.6.5 Summary of Human Health Risk Screening 102
6.6.6 Summary of Ecological Risk Screening 102
6.6.7 Delayed Site Investigation Rationale 103
6.7 AOC 50-003(a)—Container Storage Area 103
6.7.1 Site Description and Operational History 103
6.7.2 Relationship to Other SWMUs and AOCs 103
6.7.3 Summary of Previous Investigations for AOC 50-003(a) 103
6.7.4 Current Site Status 103
6.8 Consolidated Unit 50-004(a)-00—Historical Waste Lines and Underground Vault 104
6.8.1 Site Description and Operational History 104
6.8.2 Relationship to Other SWMUs and AOCs 104
6.8.3 Summary of Previous Investigations for Consolidated Unit 50-004(a)-00 104
6.8.4 Site Contamination 105
6.8.5 Summary of Human Health Risk Screening 106
6.8.6 Summary of Ecological Risk Screening 107
6.9 SWMU 50-006(a)—Operational Releases from Sump 107
6.9.1 Site Description and Operational History 107
6.9.2 Relationship to Other SWMUs and AOCs 107
6.9.3 Summary of Previous Investigations for SWMU 50-006(a) 107
6.9.4 Site Contamination 108
6.9.5 Summary of Human Health Risk Screening 109
6.9.6 Summary of Ecological Risk Screening 109
6.10 SWMU 50-006(c)—Operational Release 109
6.10.1 Site Description and Operational History 109
6.10.2 Relationship to Other SWMUs and AOCs 109
6.10.3 Summary of Previous Investigations for SWMU 50-006(c) 110
6.10.4 Site Contamination 110
6.10.5 Summary of Human Health Risk Screening 111
6.10.6 Summary of Ecological Risk Screening 112

6.11 SWMU 50-006(d)—Drainline and Associated NPDES-Permitted Outfall 112
6.11.1 Site Description and Operational History 112
6.11.2 Relationship to Other SWMUs and AOCs 112
6.11.3 Summary of Previous Investigations for SWMU 50-006(d) 112
6.11.4 Site Contamination 113
6.11.5 Summary of Human Health Risk Screening 114
6.11.6 Summary of Ecological Risk Screening 114
6.12 AOC 50-007—Incinerator 115
6.12.1 Site Description and Operational History 115
6.12.2 Relationship to Other SWMUs and AOCs 115
6.12.3 Summary of Previous Investigations for AOC 50-007 115
6.12.4 Current Site Status 115
6.13 AOC 50-008—Reduction Site 115
6.13.1 Site Description and Operational History 115
6.13.2 Relationship to Other SWMUs and AOCs 116
6.13.3 Summary of Previous Investigations for AOC 50-008 116
6.13.4 Current Site Status 116
6.14 SWMU 50-009—Material Disposal Area (MDA C) 116
6.14.1 Site Description and Operational History 116
6.14.2 Relationship to Other SWMUs and AOCs 116
6.14.3 Summary of Previous Investigations for SWMU 50-009 116
6.14.4 Current Site Status 116
6.15 AOC 50-010—Decontamination Facility 117
6.15.1 Site Description and Operational History 117
6.15.2 Relationship to Other SWMUs and AOCs 117
6.15.3 Summary of Previous Investigations for AOC 50-010 117
6.15.4 Delayed Site Investigation Rationale 117
6.16 SWMU 50-011(a)—Septic System 118
6.16.1 Site Description and Operational History 118
6.16.2 Relationship to Other SWMUs and AOCs 118
6.16.3 Summary of Previous Investigations for SWMU 50-011(a) 118
6.16.4 Current Site Status 119
6.16.5 Site Contamination 120
6.16.6 Summary of Human Health Risk Screening 121
6.16.7 Summary of Ecological Risk Screening 121
6.17 SWMU 50-011(b)—Lift Station 121
6.17.1 Site Description and Operational History 121
6.17.2 Relationship to Other SWMUs and AOCs 122
6.17.3 Summary of Previous Investigations for AOC 50-011(b) 122
6.17.4 Delayed Site Investigation Rationale 122

7.0 TA-55 BACKGROUND AND FIELD-INVESTIGATION RESULTS 122
7.1 Background of TA-55 122
7.1.1 Operational History 123
7.1.2 Summary of Releases 123
7.1.3 Current Site Usage and Status 123
7.2 SWMU 55-008—Sumps and Tanks 123
7.2.1 Site Description and Operational History 123

7.2.2 Relationship to Other SWMUs and AOCs 123
7.2.3 Summary of Previous Investigations for SWMU 55-008 124
7.2.4 Delayed Site Investigation Rationale 124

8.0 CONCLUSIONS 125
8.1 Nature and Extent of Contamination 125
8.1.1 TA-03 125
8.1.2 TA-35 126
8.1.3 Former TA-42 126
8.1.4 TA-48 126
8.1.5 TA-50 126
8.1.6 TA-55 127
8.2 Summary of Risk-Screening Assessments 127
8.2.1 Human Health Risk Screening Assessment 127
8.2.2 Ecological Risk Screening Assessment 128

9.0 RECOMMENDATIONS 128
9.1 Additional Field Characterization Activities 128
9.2 Request for Certificates of Completion 129
9.3 Schedule for Recommended Activities 130

10.0 REFERENCES AND MAP DATA SOURCES 131
10.1 References 131
10.2 Map Data Sources 139

Figures

Figure 1.1-1 Location of Upper Mortandad Canyon Aggregate Area with respect to Laboratory technical areas 141
Figure 1.5-1 Surface water drainage to the Rio Grande 142
Figure 1.5-2 Location of Upper Mortandad Canyon Aggregate Area and its surrounding land holdings 143
Figure 1.5-3 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau 144
Figure 1.5-4 Existing groundwater monitoring wells in the vicinity of Upper Mortandad Canyon Aggregate Area 145
Figure 2.1-1 TA-03 site map 146
Figure 2.2-1 Site map of AOC 03-003(e), AOC 03-014(w), SWMU 03-026(c), and SWMU 03-031 147
Figure 2.3-1 Site map of AOC 03-003(i) 148
Figure 2.4-1 Site map and sampling locations at AOC 03-004(c) 149
Figure 2.4-2 Inorganic COPCs detected or detected above BVs at AOC 03-004(c) 150
Figure 2.4-3 Organic COPCs detected at AOC 03-004(c) 151
Figure 2.4-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-004(c) 152
Figure 2.5-1 Site map and sampling locations at AOC 03-004(d) 153
Figure 2.5-2 Inorganic COPCs detected or detected above BVs at AOC 03-004(d) 154
Figure 2.5-3 Organic COPCs detected at AOC 03-004(d) 155
Figure 2.5-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-004(d) 156

Figure 2.6-1 Site map and sampling locations at AOC 03-007 157
Figure 2.6-2 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-007 158
Figure 2.8-1 Site map of AOC 03-014(x), AOC 03-026(a), and SWMU 03-034(b) 159
Figure 2.12-1 Site map and sampling locations at SWMU 03-034(a) 160
Figure 2.12-2 Inorganic COPCs detected or detected above BVs at SWMU 03-034(a) 161
Figure 2.12-3 Organic COPCs detected at SWMU 03-034(a) 162
Figure 2.12-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-034(a) 163
Figure 2.14-1 Site map and sampling locations at AOC 03-041 164
Figure 2.14-2 Inorganic COPCs detected or detected above BVs at AOC 03-041 165
Figure 2.14-3 Organic COPCs detected at AOC 03-041 166
Figure 2.14-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-041 167
Figure 2.15-1 Site map and sampling locations at SWMUs 03-045(h) and 03-049(a) [Consolidated Unit 03-045(h)-00] 168
Figure 2.15-2 Inorganic COPCs detected or detected above BVs at SWMU 03-045(h) 169
Figure 2.15-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-045(h) 170
Figure 2.16-1 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-049(a) 171
Figure 2.17-1 Site map and sampling locations at Consolidated Unit 03-049(b)-00 172
Figure 2.17-2 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 03-049(b)-00 173
Figure 2.18-1 Site map and sampling locations at SWMU 03-049(e) 174
Figure 2.18-2 Inorganic COPCs detected or detected above BVs at SWMU 03-049(e) 175
Figure 2.18-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-049(e) 176
Figure 2.19-1 Site map and sampling locations at SWMU 03-054(e) and AOC C-03-006 177
Figure 2.19-2 Inorganic COPCs detected or detected above BVs at SWMU 03-054(e) 178
Figure 2.19-3 Organic COPCs detected at SWMU 03-054(e) 179
Figure 2.19-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-054(e) 180
Figure 2.20-1 Inorganic COPCs detected or detected above BVs at AOC C 03-006 181
Figure 2.20-2 Organic COPCs detected at AOC C-03-006 182
Figure 2.20-3 Radionuclides COPCs detected or detected above BVs/FVs at AOC C-03-006 183
Figure 3.1-1 Site map and sampling locations at SWMUs 35-016(g) and 35-016(h) 184
Figure 3.2-1 Inorganic COPCs detected or detected above BVs at SWMU 35-016(g) 185
Figure 3.2-2 Organic COPCs detected at SWMU 35-016(g) 186
Figure 3.2-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 35-016(g) 187
Figure 3.3-1 Inorganic COPCs detected or detected above BVs at SWMU 35-016(h) 188
Figure 3.3-2 Organic COPCs detected at SWMU 35-016(h) 189
Figure 3.3-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 35-016(h) 190
Figure 4.1-1 TA-42 site map and sampling locations at Consolidated Unit 42-001(a)-99 191
Figure 5.1-1 TA-48 site map and sampling locations 192
Figure 5.2-1 Site map and sampling locations at AOC 48-001 193
Figure 5.3-1 Site map and sampling locations at SWMUs 48-002(a) and 48-002(b) 194

Figure 5.3-2 Inorganic COPCs detected or detected above BVs at SWMUs 48-002(a) and 48-002(b) 195
Figure 5.3-3 Organic COPCs detected at SWMUs 48-002(a) and 48-002(b) 196
Figure 5.3-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMUs 48-002(a) and 48-002(b) 197
Figure 5.5-1 Site map and sampling locations at AOC 48-002(e) 198
Figure 5.5-2 Inorganic COPCs detected or detected above BVs at AOC 48-002(e) 199
Figure 5.5-3 Organic COPCs detected at AOC 48-002(e) 200
Figure 5.6-1 Site map and sampling locations at SWMU 48-003 201
Figure 5.6-2 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-003 202
Figure 5.7-1 Site map of Consolidated Unit 48-004(a)-99 203
Figure 5.8-1 Site map and sampling locations at SWMU 48-005 204
Figure 5.8-2 Inorganic COPCs detected or detected above BVs at SWMU 48-005 205
Figure 5.8-3 Organic COPCs detected at SWMU 48-005 206
Figure 5.8-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-005 207
Figure 5.9-1 Site map and sampling locations at Consolidated Unit 48-007(a)-00 208
Figure 5.9-2 Inorganic COPCs detected or detected above BVs at Consolidated Unit 48 007(a)-00 209
Figure 5.9-3 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 48-007(a)-00 210
Figure 5.10-1 Site map and sampling locations at SWMU 48-007(b) 211
Figure 5.10-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(b) 212
Figure 5.10-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(b) 213
Figure 5.11-1 Site map and sampling locations at SWMU 48-007(c) 214
Figure 5.11-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(c) 215
Figure 5.11-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(c) 216
Figure 5.12-1 Site map and sampling locations at SWMU 48-007(f) 217
Figure 5.12-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(f) 218
Figure 5.12-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(f) 219
Figure 5.13-1 Site map and sampling locations at AOC 48-011 220
Figure 5.13-2 Inorganic COPCs detected or detected above BVs at AOC 48-011 221
Figure 5.13-3 Organic COPCs detected at AOC 48-011 222
Figure 5.14-1 Site map and sampling locations at AOC 48-012 223
Figure 5.14-2 Organic COPCs detected at AOC 48-012 224
Figure 6.2-1 Site map of SWMU 50-001(a), SWMU 50-002(a), SWMU 50-002(d), AOC 50-003(a), and AOC 50-010 225
Figure 6.3-1 Site map of AOC 50-001(b), Consolidated Unit 50-002(b)-00, and SWMU 50-011(b) 226
Figure 6.6-1 Site map and sampling locations at AOC 50-002(d) 227
Figure 6.6-2 Inorganic COPCs detected or detected above BVs at AOC 50-002(d) 228
Figure 6.6-3 Organic COPCs detected at AOC 50-002(d) 229
Figure 6.8-1 Site map and sampling locations at Consolidated Unit 50-004(a)-00 230

Figure 6.9-1 Site map and sampling locations at SWMU 50-006(a) 231
Figure 6.9-2 Inorganic COPCs detected or detected above BVs at SWMU 50-006(a) 232
Figure 6.10-1 Site map and sampling locations at SWMU 50-006(c) 233
Figure 6.11-1 Site map and sampling locations at SWMU 50-006(d) 234
Figure 6.12-1 Site map of AOC 50-007 and AOC 50-008 235
Figure 6.16-1 Site map and sampling locations at SWMU 50-011(a) 236
Figure 6.16-2 Inorganic COPCs detected or detected above BVs at SWMU 50-011(a) 237
Figure 6.16-3 Organic COPCs detected at SWMU 50-011(a) 238
Figure 6.16-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 50-011(a) 239
Figure 7.1-1 Site map of TA-55 and SWMU 55-008 240

Tables

Table 1.1-1 Sites Under Investigation in Upper Mortandad Canyon Aggregate Area 241
Table 1.4-1 Surveyed Coordinates for Locations Sampled in 2009 247
Table 1.4-2 Field Screening Results for Samples Collected in 2009 257
Table 1.4-3 Crosswalk of Proposed and Sampled Locations 279
Table 1.6-1 Soil Screening Levels and Screening Action Levels for COPCs in Upper Mortandad Canyon Aggregate Area 287
Table 2.4-1 Samples Collected and Analyses Requested at AOC 03-004(c) 289
Table 2.4-2 Inorganic Chemicals above BVs at AOC 03-004(c) 290
Table 2.4-3 Organic Chemicals Detected at AOC 03-004(c) 291
Table 2.4-4 Radionuclides Detected or Detected above BVs/FVs at AOC 03-004(c) 293
Table 2.5-1 Samples Collected and Analyses Requested at AOC 03-004(d) 294
Table 2.5-2 Inorganic Chemicals above BVs at AOC 03-004(d) 296
Table 2.5-3 Organic Chemicals Detected at AOC 03-004(d) 297
Table 2.5-4 Radionuclides Detected or Detected above BVs/FVs at AOC 03-004(d) 299
Table 2.6-1 Samples Collected and Analyses Requested at AOC 03-007 300
Table 2.6-2 Inorganic Chemicals above BVs at AOC 03-007 302
Table 2.6-3 Organic Chemicals Detected at AOC 03-007 304
Table 2.6-4 Radionuclides Detected or Detected above BVs/FVs at AOC 03-007 312
Table 2.12-1 Samples Collected and Analyses Requested at SWMU 03-034(a) 313
Table 2.12-2 Inorganic Chemicals above BVs at SWMU 03-034(a) 314
Table 2.12-3 Organic Chemicals Detected at SWMU 03-034(a) 315
Table 2.12-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 03-034(a) 315
Table 2.14-1 Samples Collected and Analyses Requested at AOC 03-041 316
Table 2.14-2 Inorganic Chemicals above BVs at AOC 03-041 317
Table 4.14-3 Organic Chemicals Detected at AOC 03-041 318
Table 2.14-4 Radionuclides Detected or Detected above BVs/FVs at AOC 03-041 320
Table 2.15-1 Samples Collected and Analyses Requested at SWMU 03-045(h) 321
Table 2.15-2 Inorganic Chemicals above BVs at SWMU 03-045(h) 322

Table 2.15-3 Organic Chemicals Detected at SWMU 03-045(h) 323
Table 2.15-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 03-045(h) 326
Table 2.16-1 Samples Collected and Analyses Requested at SWMU 03-049(a) 327
Table 2.16-2 Inorganic Chemicals above BVs at SWMU 03-049(a) 328
Table 2.16-3 Organic Chemicals Detected at SWMU 03-049(a) 330
Table 2.16-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 03-049(a) 334
Table 2.17-1 Samples Collected and Analyses Requested at Consolidated Unit 03-049(b)-00 335
Table 2.17-2 Inorganic Chemicals above BVs at Consolidated Unit 03-049(b)-00 337
Table 2.17-3 Organic Chemicals Detected at Consolidated Unit 03-049(b)-00 341
Table 2.17-4 Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 03-049(b)-00 349
Table 2.18-1 Samples Collected and Analyses Requested at SWMU 03-049(e) 350
Table 2.18-2 Inorganic Chemicals above BVs at SWMU 03-049(e) 351
Table 2.18-3 Organic Chemicals Detected at SWMU 03-049(e) 353
Table 2.18-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 03-049(e) 357
Table 2.19-1 Samples Collected and Analyses Requested at SWMU 03-054(e) 358
Table 2.19-2 Inorganic Chemicals above BVs at SWMU 03-054(e) 359
Table 2.19-3 Organic Chemicals Detected at SWMU 03-054(e) 360
Table 2.19-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 03-054(e) 362
Table 2.20-1 Samples Collected and Analyses Requested at AOC C-03-006 363
Table 2.20-2 Inorganic Chemicals above BVs at AOC C-03-006 364
Table 2.20-3 Organic Chemicals Detected at AOC C-03-006 365
Table 2.20-4 Radionuclides Detected or Detected above BVs/FVs at AOC C-03-006 367
Table 3.2-1 Samples Collected and Analyses Requested at SWMU 35-016(g) 368
Table 3.2-2 Inorganic Chemicals above BVs at SWMU 35-016(g) 369
Table 3.2-3 Organic Chemicals Detected at SWMU 35-016(g) 370
Table 3.2-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 35-016(g) 371
Table 3.3-1 Samples Collected and Analyses Requested at SWMU 35-016(h) 372
Table 3.3-2 Inorganic Chemicals above BVs at SWMU 35-016(h) 373
Table 3.3-3 Organic Chemicals Detected at SWMU 35-016(h) 374
Table 3.3-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 35-016(h) 375
Table 4.2-1 Samples Collected and Analyses Requested at Consolidated Unit 42-001(a)-99 376
Table 4.2-2 Inorganic Chemicals above BVs at Consolidated Unit 42-001(a)-99 381
Table 4.2-3 Organic Chemicals Detected at Consolidated Unit 42-001(a)-99 386
Table 4.2-4 Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 42-001(a)-99 402
Table 5.2-1 Samples Collected and Analyses Requested at AOC 48-001 405
Table 5.2-2 Inorganic Chemicals above BVs at AOC 48-001 411
Table 5.2-3 Organic Chemicals Detected at AOC 48-001 418
Table 5.2-4 Radionuclides Detected or Detected above BVs/FVs at AOC 48-001 433
Table 5.3-1 Samples Collected and Analyses Requested at SWMUs 48-002(a) and 48-002(b) 435

Table 5.3-2 Inorganic Chemicals above BVs at SWMUs 48-002(a) and 48-002(b) 437
Table 5.3-3 Organic Chemicals Detected at SWMUs 48-002(a) and 48-002(b) 439
Table 5.3-4 Radionuclides Detected or Detected above BVs/FVs at SWMUs 48-002(a) and 48-002(b) 442
Table 5.5-1 Samples Collected and Analyses Requested at AOC 48-002(e) 443
Table 5.5-2 Inorganic Chemicals above BVs at AOC 48-002(e) 444
Table 5.5-3 Organic Chemicals Detected at AOC 48-002(e) 445
Table 5.5-4 Radionuclides Detected or Detected above BVs/FVs at AOC48-002(e) 446
Table 5.6-1 Samples Collected and Analyses Requested at SWMU 48-003 447
Table 5.6-2 Inorganic Chemicals above BVs at SWMU 48-003 451
Table 5.6-3 Organic Chemicals Detected at SWMU 48-003 455
Table 5.6-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 48-003 459
Table 5.8-1 Samples Collected and Analyses Requested at SWMU 48-005 461
Table 5.8-2 Inorganic Chemicals above BVs at SWMU 48-005 463
Table 5.8-3 Organic Chemicals Detected at SWMU 48-005 464
Table 5.8-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 48-005 468
Table 5.9-1 Samples Collected and Analyses Requested at Consolidated Unit 48-007(a)-00 469
Table 5.9-2 Inorganic Chemicals above BVs at Consolidated Unit 48-007(a)-00 471
Table 5.9-3 Organic Chemicals Detected at Consolidated Unit 48-007(a)-00 475
Table 5.9-4 Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 48-007(a)-00 480
Table 5.10-1 Samples Collected and Analyses Requested at SWMU 48-007(b) 481
Table 5.10-2 Inorganic Chemicals above BVs at SWMU 48-007(b) 482
Table 5.10-3 Organic Chemicals Detected at SWMU 48-007(b) 483
Table 5.10-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(b) 487
Table 5.11-1 Samples Collected and Analyses Requested at SWMU 48-007(c) 488
Table 5.11-2 Inorganic Chemicals above BVs at SWMU 48-007(c) 489
Table 5.11-3 Organic Chemicals Detected at SWMU 48-007(c) 490
Table 5.11-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(c) 494
Table 5.12-1 Samples Collected and Analyses Requested at SWMU 48-007(f) 495
Table 5.12-2 Inorganic Chemicals above BVs at SWMU 48-007(f) 496
Table 5.12-3 Organic Chemicals Detected at SWMU 48-007(f) 497
Table 5.12-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(f) 501
Table 5.13-1 Samples Collected and Analyses Requested at AOC 48-011 501
Table 5.13-2 Inorganic Chemicals above BVs at AOC 48-011 502
Table 5.13-3 Organic Chemicals Detected at AOC 48-011 502
Table 5.14-1 Samples Collected and Analyses Requested at AOC 48-012 503
Table 5.14-2 Organic Chemicals Detected at AOC 48-012 504
Table 6.6-1 Samples Collected and Analyses Requested at AOC 50-002(d) 504
Table 6.6-2 Inorganic Chemicals above BVs at AOC 50-002(d) 505
Table 6.6-3 Organic Chemicals Detected at AOC 50-002(d) 505

Table 6.8-1 Samples Collected and Analyses Requested at Consolidated Unit 50-004(a)-00 506
Table 6.8-2 Inorganic Chemicals above BVs at Consolidated Unit 50-004(a)-00 511
Table 6.8-3 Organic Chemicals Detected at Consolidated Unit 50-004(a)-00 521
Table 6.8-4 Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 50-004(a)-00 533
Table 6.9-1 Samples Collected and Analyses Requested at SWMU 50-006(a) 537
Table 6.9-2 Inorganic Chemicals above BVs at SWMU 50-006(a) 541
Table 6.9-3 Organic Chemicals Detected at SWMU 50-006(a) 544
Table 6.9-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(a) 556
Table 6.10-1 Samples Collected and Analyses Requested at SWMU 50-006(c) 561
Table 6.10-2 Inorganic Chemicals above BVs at SWMU 50-006(c) 563
Table 6.10-3 Organic Chemicals Detected at SWMU 50-006(c) 564
Table 6.10-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(c) 567
Table 6.11-1 Samples Collected and Analyses Requested at SWMU 50-006(d) 569
Table 6.11-2 Inorganic Chemicals above BVs at SWMU 50-006(d) 572
Table 6.11-3 Organic Chemicals Detected at SWMU 50-006(d) 574
Table 6.11-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(d) 580
Table 6.16-1 Samples Collected and Analyses Requested at SWMU 50-011(a) 583
Table 6.16-2 Inorganic Chemicals above BVs at SWMU 50-011(a) 584
Table 6.16-3 Organic Chemicals Detected at SWMU 50-011(a) 584
Table 6.16-4 Radionuclides Detected or Detected above BVs/FVs at SWMU 50-011(a) 585
Table 9.0-1 Summary of Investigation Results and Recommendations 587

Appendixes

Appendix A Acronyms and Abbreviations, Metric Conversion Table, and Data Qualifier Definitions
Appendix B Field Methods
Appendix C Supporting Information for Delaying Site Investigations (on DVD included with this document)
Appendix D Borehole Logs (on DVD included with this document)
Appendix E Investigation-Derived Waste Storage and Disposal
Appendix F Sample Collection Logs (on DVD included with this document)
Appendix G Analytical Program
Appendix H Analytical Suites and Results and Analytical Reports (on DVDs included with this document)
Appendix I Data Review and Assessment
Appendix J Risk Assessments

Plates

Plate 2.6-1 Inorganic COPCs detected or detected above BVs at AOC 03-007

Plate 2.6-2 Organic COPCs detected at AOC 03-007

Plate 2.15-1 Organic COPCs detected at SWMU 03-045(h)

Plate 2.16-1 Inorganic COPCs detected or detected above BVs at SWMU 03-049(a)

Plate 2.16-2 Organic COPCs detected at SWMU 03-049(a)

Plate 2.17-1 Inorganic COPCs detected or detected above BVs at Consolidated Unit 03-049(b)-00

Plate 2.17-2 Organic COPCs detected at Consolidated Unit 03-049(b)-00

Plate 2.18-1 Organic COPCs detected at SWMU 03-049(e)

Plate 4.2-1 Inorganic COPCs detected or detected above BVs at Consolidated Unit 42-001(a)-99

Plate 4.2-2 Organic COPCs detected at Consolidated Unit 42-001(a)-99

Plate 4.2-3 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 42-001(a)-99

Plate 5.2-1 Inorganic COPCs detected or detected above BVs at AOC 48-001

Plate 5.2-2 Organic COPCs detected at AOC 48-001

Plate 5.2-3 Radionuclides COPCs detected or detected above BVs/FVs at AOC 48-001

Plate 5.6-1 Inorganic COPCs detected or detected above BVs at SWMU 48-003

Plate 5.6-2 Organic COPCs detected at SWMU 48-003

Plate 5.9-1 Organic COPCs detected at Consolidated Unit 48-007(a)-00

Plate 5.10-1 Organic COPCs detected at SWMU 48-007(b)

Plate 5.11-1 Organic COPCs detected at SWMU 48-007(c)

Plate 5.12-1 Organic COPCs detected at SWMU 48-007(f)

Plate 6.1-1 TA-50 site map and sampling locations

Plate 6.8-1 Inorganic COPCs detected or detected above BVs at Consolidated Unit 50-004(a)-00

Plate 6.8-2 Organic COPCs detected at Consolidated Unit 50-004(a)-00

Plate 6.8-3 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 50-004(a)-00

Plate 6.9-1 Organic COPCs detected at SWMU 50-006(a)

Plate 6.9-2 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 50-006(a)

Plate 6.10-1 Inorganic COPCs detected or detected above BVs at SWMU 50-006(c)

Plate 6.10-2 Organic COPCs detected at SWMU 50-006(c)

Plate 6.10-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 50-006(c)

Plate 6.11-1 Inorganic COPCs detected or detected above BVs at SWMU 50-006(d)

Plate 6.11-2 Organic COPCs detected at SWMU 50-006(d)

Plate 6.11-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 50-006(d)

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.

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

This investigation report addresses SWMUs and AOCs within the Upper Mortandad Canyon Aggregate Area at the Laboratory. These sites are potentially contaminated with hazardous chemicals and radionuclides. Corrective actions at the Laboratory are subject to the March 1, 2005, Compliance Order on Consent (the Consent Order). Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to the New Mexico Environment Department (NMED) in accordance with DOE policy.

1.1 General Site Information

The Upper Mortandad Canyon Aggregate Area is located in Technical Area 03 (TA-03), former TA-42, TA-48, TA-50, and TA-55 at the Laboratory (Figure 1.1-1) and consists of 119 sites, 56 of which have been previously investigated and/or remediated and have been approved for no further action. Historical details of previous investigations and data for all 119 sites are provided in the historical investigation report (HIR) for the Upper Mortandad Canyon Aggregate Area (LANL 2003, 098995). The remaining 63 SWMUs and AOCs were evaluated in the approved investigation work plan (LANL 2008, 100750). Two additional sites at TA-35 were included in this investigation because they were omitted from the Middle Mortandad/Ten Site Canyon Aggregate Area investigation work plan and report. This investigation report describes the investigation status or results from sampling activities conducted in 2009 for all 65 sites investigated. Table 1.1-1 lists the 65 sites, with a brief description, summary of previous investigations, and investigation activities conducted in 2009 for each site.

1.2 Purpose of Investigation

The objective of the investigation was to collect samples to define the nature and the lateral and vertical extent of contamination for the sampled SWMUs, AOCs, and consolidated units located at TA-03, TA-35, former TA-42, TA-48, and TA-50. Another objective was to determine whether contamination at any of the sites poses a potential unacceptable risk to human health or the environment. This report presents details and results of the 2009 investigation activities conducted within the Upper Mortandad Canyon Aggregate Area and the two TA-35 sites and presents recommendations for each site.

1.3 Document Organization

This report is organized in 10 sections, including this introduction, with multiple supporting appendixes. Sections 2 through 7 present an overview of the site operational history, historical releases, summaries of previous investigations, results of the field activities performed during this investigation, site contamination, summaries of the nature and extent of contamination, and summaries of human health risk-screening and ecological risk-screening assessments for TA-03, TA-35, former TA-42, TA-48, TA-50, and TA-55, respectively. Section 8 presents the conclusions of the nature and extent of contamination and risk assessments for each technical area. Section 9 discusses recommendations based on applicable data and the risk-screening assessments. Section 10 includes a list of references cited and the map data sources used in all figures and plates.

Appendices include acronyms, a metric conversion table, and definitions of the data qualifiers used in this report (Appendix A); field methods (Appendix B); supporting information for delayed investigations (Appendix C), borehole logs (Appendix D); investigation-derived waste storage and disposal documentation (Appendix E); sample collection logs (SCLs) (Appendix F); analytical program descriptions and summaries of data quality (Appendix G); analytical suites and results and analytical reports (Appendix H); data review (Appendix I); and risk-screening assessments (Appendix J).

1.4 Scope of Activities

This section presents an overview of preliminary activities and the field activities performed during the implementation of the Upper Mortandad Canyon Aggregate Area investigation work plan; the field investigation results and observations obtained are presented in detail in sections 5 through 9 and in the appendixes. The scope of activities for the 2009 Upper Mortandad Canyon Aggregate Area investigation included site access and premobilization activities; geodetic, geophysical, and radiological surveys; surface and shallow subsurface sampling; borehole drilling, sampling, and abandonment; health and safety monitoring; and waste management activities.

1.4.1 Site Access and Premobilization Activities

The area encompassing the Upper Mortandad Canyon Aggregate Area is currently open to the public for recreational activities such as hiking. Before field mobilization, the issue of public access was reviewed, and efforts were made to provide a secure and safe work area and to reduce impacts to recreational users.

1.4.2 Field Activities

The following subsections describe the field activities conducted during the 2009 investigation, including surface surveys, field screening, surface and shallow subsurface sampling, and borehole drilling, sampling and abandonment. Details regarding the field methods and procedures used to perform these field activities are presented in Appendix B.

1.4.2.1 Geodetic Survey

A geodetic survey was conducted during the Upper Mortandad Canyon Aggregate Area investigation to identify surface and subsurface sampling locations. The planned sampling locations for the 2009 investigation were determined based on the location and results of the historical borehole samples. An

initial geodetic survey was performed to establish and mark the planned locations in the field. Geodetic surveys were conducted at the completion of the sampling campaign to establish the spatial coordinates for all sampling locations. Geodetic surveys were conducted in accordance with Standard Operating Procedure (SOP) 5028, Coordinating and Evaluating Geodetic Surveys, using a Trimble 5700 differential global positioning system. The surveyed coordinates for all sampling locations are presented in Table 1.4-1. All coordinates are expressed as State Plane Coordinate System 83, New Mexico Central, U.S.

1.4.2.2 Field Screening

Core samples, cuttings, and excavated material were screened for gross-alpha and gross-beta radiation. Screening was performed by Laboratory radiological control technicians (RCTs) using an Eberline E600 with either a 380AB or SHP360 probe (or equivalent) and an ESP-1 rate meter with a 210 probe (or equivalent) in accordance with SOP-10.07, Field Monitoring for Surface and Volume Radioactivity Levels. The probe was held less than 1 in. away from the medium. Measurements were made by conducting a quick scan to find the location with the highest initial reading and then collecting a 1-min reading at that location to determine gross-alpha and gross-beta radiation levels. Soil and core material was sampled and logged only after radiological field-screening measurements were established so appropriate precautions could be taken before the sample was collected. Field personnel collected and recorded background measurements for gross-alpha and gross-beta radiation daily.

Before samples were removed from the site for shipping, they were screened for radioactivity by an RCT. All samples were submitted to the American Radiation Services, Inc. laboratory in White Rock, New Mexico, for gross-alpha, gross-beta, and gross-gamma analyses before shipment by the Laboratory's Sample Management Office (SMO) to ensure compliance with U.S. Department of Transportation (DOT) requirements.

Immediately after sample retrieval organic vapor monitoring of surface and subsurface samples was performed using a MiniRae 2000, Model PGM-7600 photoionization detector (PID) with an 11.7-electron-volt (eV) bulb. In addition, headspace vapor screening for VOCs was performed on recovered surface and subsurface media in accordance with SOP-06.33, Headspace Vapor Screening with a Photoionization Detector. Samples were placed in a glass container and covered with aluminum foil. The container was sealed, shaken gently, and allowed to equilibrate for 5 min. The sample was screened by inserting the PID probe into the container and measuring and recording any detected vapors. The workers' breathing zone was also monitored using the MiniRae 2000.

Field-screening results were recorded on the borehole logs and/or corresponding sample collection logs (see Appendix F for SCLs), in the site safety officer field notebook, and in the RCT field notes (see Appendix D for boring logs). Field radiation and PID screening results are presented in Table 1.4-2.

1.4.2.3 Surface and Shallow Subsurface Soil Investigation

Samples were collected according to the approved investigation work plan (LANL 2008, 100750) and NMED's approval with modifications letter (NMED 2008, 101110). Table 1.4-3 lists the proposed sampling locations, crosswalked to actual location identifiers.

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 using stainless-steel shovels or spoons and homogenized in stainless-steel bowls.

Shallow subsurface samples were collected using the hand auger method in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. The material was placed in stainless-steel bowls and handled in the same manner as the surface samples.

All surface and shallow subsurface samples were placed in appropriate sample containers and submitted for the laboratory analyses specified by the work plan. Standard quality assurance/quality control (QA/QC) samples (field duplicates, field trip blanks, and rinsate blanks) were also collected in accordance with SOP-01.05, Field Quality Control Samples.

All sample collection activities were coordinated with the SMO. Upon collection, samples remained in the controlled custody of the field team at all times until delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to a preapproved off-site analytical laboratory (SCL/chain of custody [COC] forms on DVD in Appendix F).

1.4.2.4 Borehole Drilling and Subsurface Sampling

At locations where the required sample depths could not be reached by hand augers, a drill rig with hollow-stem auger (HSA) was used to collect subsurface samples. Samples were collected using stainless-steel core barrel samplers. The samples were extracted from the core barrels and collected using stainless-steel spoons and homogenized in stainless-steel bowls.

Samples were collected at depth intervals based on criteria established in the approved work plan (LANL 2008, 100750). All sampled core material was placed in the appropriate sampling containers, labeled, documented, and preserved (as appropriate) for transport to the SMO. Samples were submitted for laboratory analyses as specified by the work plan.

1.4.2.5 Borehole Abandonment

Boreholes were abandoned in accordance with SOP-5034, Monitoring Well and Borehole Abandonment. All boreholes were abandoned within 24 h of completion with bentonite grout by filling upward from the bottom via tremie pipe to within 2 ft of the surface. After 24 to 48 h, the backfilled level was checked for settling, and additional grout was added as necessary. The remainder of each boring was filled with Portland type I/II cement to surface grade.

1.4.2.6 Equipment Decontamination

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

1.4.3 Chemical and Radiological Sample Analyses

All investigation samples were shipped by the SMO to off-site contract analytical laboratories for the requested analyses. The analyses requested were as specified by the approved work plan (LANL 2008, 100750). The samples were analyzed for all or a subset of the following: target analyte list (TAL) metals, total cyanide, anions, perchlorate, chromium hexavalent ion, total phosphorus, explosive compounds, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH) diesel range organics (DRO), volatile organic compounds (VOCs), dioxins and furans, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, isotopic thorium, strontium-90, tritium, and pH.

1.4.4 Health and Safety Measures

All 2009 investigation activities were conducted in accordance with a site-specific health and safety plan, an integrated work document, and two radiological work permits 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 (PPE) in areas where elevated radiation was expected and field monitoring for VOCs, gross-alpha and gross-beta radiation, and dust-particulate matter using both portable and personnel air monitoring systems.

1.4.5 Investigation-Derived Waste Storage and Disposal

All investigation-derived waste (IDW) generated during the Upper Mortandad Canyon Aggregate Area investigation was managed in accordance with the IDW management plan in the approved work plan (LANL 2008, 100750) and the approved project waste characterization strategy form (WCSF), which is included in Appendix E. These SOPs incorporate the requirements of all applicable EPA and NMED regulations and DOE orders. The SOP applicable to the characterization and management of IDW is EP-ERSS-SOP-5022, Characterization and Management of Environmental Project (ER) Project Waste.

The waste streams associated with the investigation included drill cuttings, contact waste, returned samples, concrete and asphalt debris, returned samples, and municipal solid waste. Each waste stream was containerized and managed in storage areas appropriate to the type of waste. Management of IDW is discussed in greater detail in Appendix E.

1.4.6 Deviations

Deviations from the scope of activities, as defined in the approved work plan (LANL 2008, 100750), occurred during the implementation of the work. The deviations did not adversely affect the completion or results of the investigation. Specific deviations are described in Appendix B, section B-8.0.

In the approval with modifications letter (NMED 2008, 101110), NMED requested that pressure testing be performed at several sites proposed for delayed investigation in the work plan (LANL 2008, 100750). Because pressure testing at these sites has been determined not to be feasible, it was not performed during this investigation. The rationale for this decision is provided in the sections specific to these sites.

1.5 Aggregate Area Site Conditions

1.5.1 Surface Conditions

1.5.1.1 Soil

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

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

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

1.5.1.2 Surface Water

The Rio Grande is the primary river in north-central New Mexico. All surface-water drainage and groundwater discharge from the plateau ultimately arrive at the Rio Grande (Figure 1.5-1). Most surface water in the Los Alamos area occurs as ephemeral, intermittent, or interrupted streams in canyons cut into the Pajarito Plateau. Springs on the flanks of the Jemez Mountains, west of the Laboratory's western boundary, supply flow to the upper reaches of Cañon de Valle and to Guaje, Los Alamos, Pajarito, and Water Canyons (Purtymun 1975, 011787; Stoker 1993, 056021). These springs discharge water perched in the Bandelier Tuff and Tschicoma Formation at rates from 2 to 135 gal./min (Abeele et al. 1981, 006273). The volume of flow from the springs maintains natural perennial reaches of varying lengths in each of the canyons.

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

1.5.1.3 Land Use

Currently, land use of the Upper Mortandad Canyon Aggregate Area is industrial. The TAs comprise the core operational and administrative complex of the Laboratory. The area is highly developed with

numerous office and Laboratory buildings, utilities, parking facilities, roads, and other paved areas. Most of TA-03 is located on the mesa top west of Mortandad Canyon (Figure 1.5-2). Most of TA-42, TA-48,TA-50, and TA-55 are located on the mesa top south of Mortandad Canyon (Figure 1.5-2).

1.5.2 Subsurface Conditions

1.5.2.1 Stratigraphic Units of the Bandelier Tuff

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

The bedrock at or near the surface of the mesa top is the Bandelier Tuff. There are approximately 1250 ft of volcanic and sedimentary materials between any potential contaminant-bearing units at the mesa surface and the regional aquifer. The descriptions begin with the oldest (deepest) and proceed to the youngest (topmost). The stratigraphic units that encountered during investigation of the Upper Mortandad Canyon Aggregate Area are described briefly in the following sections and are shown in Figure 1.5-3.

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

Otowi Member

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

The Guaje Pumice Bed

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

Tephras and Volcaniclastic Sediment of the Cerro Toledo Interval

The Cerro Toledo interval is an informal name given to a sequence of volcaniclastic sediment and tephra of mixed provenance that separates the Otowi and Tshirege Members of the Bandelier Tuff (Broxton et al.

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

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

Tshirege Member

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

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

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

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

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

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

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

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

1.5.2.2 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. Intermediate perched groundwater has been found at certain locations on the plateau at depths ranging between 100 and 400 ft. The regional aquifer is found at depths of about 600 to 1200 ft.

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

Groundwater

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

investigate the presence of groundwater in these zones and to monitor groundwater quality. The locations of the existing wells within the vicinity of the Upper Mortandad Canyon Aggregate Area are shown in Figure 1.5-4.

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

Alluvial Groundwater

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

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

Regional Aquifer

The regional aquifer of the Los Alamos area is the only aquifer capable of large-scale municipal water supply (Purtymun 1984, 006513). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western part of the Pajarito Plateau. The depths to groundwater below the mesa tops range between about 1200 ft along the western margin of the plateau and about 600 ft at the eastern margin. The location of wells and generalized water-level contours on top of the regional aquifer are described in the 2009 General Facility Information report (LANL 2007, 095364). The regional aquifer is typically separated from the alluvial groundwater and intermediate-perched zone groundwater by 350 to 620 ft of tuff, basalt, and sediments (LANL 1993, 023249).

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

Vadose Zone

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

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

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

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

1.6 Regulatory Criteria

This section describes the criteria used for evaluating potential risk to ecological and human receptors. Regulatory criteria identified by medium in the Consent Order include cleanup standards, risk-based screening levels, and risk-based cleanup goals. Table 1.6-1 summarized the applicable soil screening levels (SSLs) for inorganic and organic chemicals of potential concern (COPCs) and screening action levels (SALs) for radionuclide COPCs at Upper Mortandad Canyon Aggregate Area sites.

The objective of the current investigation is to complete the characterization of the nature and extent of contamination from historical operations, to perform human health and ecological risk-screening assessments, and to identify any further actions needed at each site. For each consolidated unit, SWMU, and AOC, the regulatory criteria and the data gathered during the investigation are used to identify COPCs and their distribution in the environment (Appendix I), and the resulting potential human and ecological risks (Appendix J). The results of the data assessment and the screening-level risk evaluations help to confirm the physical location and extent of specific sites, the nature and extent of contamination, and the need for additional corrective actions at the site(s).

All analytical results from samples collected during the 2009 investigation as well as relevant historical investigations are reviewed for quality (Appendix G), and all data found to be validated to current standards for data usability are regarded as “qualified data.” Only qualified data are included in the final data set used to characterize the nature and extent and evaluate potential risk associated with the Upper Mortandad Canyon Aggregate consolidated units, SWMUs, or AOCs. Risk-screening evaluations are based on applicable exposure scenarios, as discussed below; thus, only qualified data obtained from samples collected from 0–1 ft, 0–5 ft, and 0–10 ft bgs are used in the human health or ecological risk-screening evaluations.

Human health risk-screening evaluations were conducted for the Upper Mortandad Canyon Aggregate Area using NMED guidance (NMED 2008, 101110). Ecological screening assessments were performed using the Laboratory’s ecological screening methods (LANL 2004, 087630).

1.6.1 Screening Levels

Human health and ecological risk-screening evaluations were conducted for the solid media at the Upper Mortandad Canyon Aggregate Area. The human health screening assessment (Appendix J) was performed on inorganic and organic COPCs using NMED SSLs (NMED 2008, 101110) for the construction worker and residential scenarios. Radionuclides were assessed using the Laboratory SALs (LANL 2005, 088493). When an NMED SSL was not available for a COPC for the construction worker and residential scenarios, EPA regional screening levels (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) were used (adjusted to a risk level of 10^{-5} for carcinogens. If an SSL is not available and if sufficient toxicity information was available, a SSL was calculated. A surrogate SSL is used for some COPCs based on structural similarity or breakdown products. Table 1.6-1 summarizes the applicable SSLs for inorganic and organic COPCs and SALs for radionuclide COPCs at Upper Mortandad Canyon Aggregate Area.

The Laboratory's ecological screening guidance (LANL 2004, 087630) and ecological screening levels (ESLs) from the ECORISK Database, Version 2.3 (LANL 2008, 103352) were used to evaluate ecological receptors. Ecological risks are assessed in Appendix J.

1.6.2 Ecological Screening Levels

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

1.6.3 Cleanup Standards

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

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

2.0 TA-03 BACKGROUND AND FIELD-INVESTIGATION RESULTS

2.1 Background of TA-03

TA-03 is located on the western end of South Mesa and is almost completely developed. The core operational facilities for the Laboratory are located at TA-03, including the principal administration buildings, library, the Chemistry and Metallurgy Research (CMR) Building, Beryllium Technology Facility,

a gas-fired electrical generating plant, and a former sanitary wastewater treatment plant (WWTP) and supporting structures. Figure 2.1-1 shows the site features of TA-03.

Eleven AOCs and nine SWMUs located in TA-03 are addressed in this investigation report.

- AOC 03-003(e) is a former transformer site located in the basement of the CMR Building (03-29).
- AOC 03-003(i) is a former transformer site located in a vault beneath the Cryogenics Building (03-32).
- AOC 03-004(c) is a storage area at the main loading dock of the CMR Building (03-29).
- AOC 03-004(d) is the former location of a dumpster at the west end of Wing 9 of the CMR Building (03-29).
- AOC 03-007 is a decommissioned firing site located southwest of the Beryllium Technology Facility (03-141).
- AOC 03-014(w) is a floor drain in the CMR Building (03-29).
- AOC 03-014(x) is a floor drain in the Sigma Building (03-66).
- AOC 03-026(a) is a sump located in the southeast corner of an open pump pit directly adjacent to and west of the SWMU 03-037 holding tanks.
- SWMU 03-026(c) is the site of aboveground holding tanks for returning chilled water in the basement of the CMR Building (03-29).
- SWMU 03-031 is a radioactive liquid waste system in the CMR Building (03-29).
- SWMU 03-034(a) a pumphouse (structure 03-154) and associated radioactive liquid waste tanks.
- SWMU 03-034(b) is the active industrial waste sump and tank located on the west side of the Beryllium Technology Facility (03-014).
- AOC 03-041 is an unloading station (structure 03-1264) designed as a holding tank for industrial low-level radioactive wastewater, located approximately 140 ft southwest of the Sigma Building (03-66).
- Consolidated Unit 03-045(h)-00 consists of SWMUs 03-045(h) and 03-049(a).
    - ❖ SWMU 03-045(h) is a former National Pollutant Discharge Elimination System–(NPDES-) permitted outfall at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (03-187); ultimately, SWMU 03-045(h) drains into Sandia Canyon.
    - ❖ SWMU 03-049(a) is a NPDES-permitted outfall south of the Sigma Building (03-66) that discharges treated cooling water from a cooling tower (03-127) and roof-drain runoff to Mortandad Canyon.
- Consolidated Unit 03-049(b)-00 consists of SWMU 03-049(b) and AOC C-03-014.
    - ❖ SWMU 03-049(b) is a discharge area from a former vacuum pump at the south wall of the press building (03-35).
    - ❖ AOC C-03-014 is an equipment storage area located southwest of the press building (03-35).
- SWMU 03-049(e) is an outfall from a single pipe that connects three roof drains, located south of the Sigma Building (03-66).

- SWMU 03-054(e) is an outfall located in upper Mortandad Canyon that receives roof drain and stormwater runoff at the CMR Building (03-29); it received an unintentional, one-time release from an industrial waste manhole (AOC C-03-006) in 1974.
- AOC C-03-006 is an unintentional overflow at an industrial waste line manhole in 1974 that discharged to an outfall [SWMU 03-054(e)].

2.1.1 Operational History

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

In 1950, construction began on the major buildings at TA-03 to replace operational facilities in the Los Alamos townsite. The Van de Graaf accelerator was built on the rim of Twomile Canyon. The CMR Building (03-29), constructed in 1952, is a large laboratory facility that houses diverse chemical and metallurgical operations involving plutonium, uranium, other radionuclides, metals, inorganic and organic chemicals, acids, and solvents.

The Administration Building was completed in 1956. In addition to offices, it housed laboratory and shop facilities and extensive photographic operations. In 1959, the Sigma Building (03-66) was completed at the eastern end of the site. The building houses a complex array of equipment and activities concerned with metallurgical and ceramics research and fabrication. Construction of new facilities continued through the 1960s and 1970s. Office buildings, shops, storage areas, an addition to the wastewater treatment plant, a cement batch plant, and numerous transportable buildings filled the areas between the initial buildings. More recent constructions include the Oppenheimer Study Center in 1977, the Otowi Building, an annex to the Administration Building, in 1981, a computer facility, and several national centers for various scientific activities in the 1990s. A parking structure was completed in 2006.

The Upper Mortandad Canyon Aggregate Area includes only part of TA-03. The SWMUs and AOCs that drain to Los Alamos Canyon are discussed in the work plan for Upper Los Alamos Canyon Aggregate Area (LANL 2006, 091916). The SWMUs and AOCs that drain to Sandia Canyon are discussed in the work plan for Upper Sandia Canyon Aggregate Area (LANL 2008, 100692).

2.1.2 Summary of Releases

Potential contaminants at TA-03 may have been released into the environment through drainages, outfalls, firing sites, liquid spills, leaks, or operational releases.

2.1.3 Current Site Usage and Status

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

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

2.2.1 Site Description and Operational History

AOC 03-003(e) is an area in the basement of the CMR Building (03-29) where 13 PCB-containing transformers were formerly located (Figure 2.2-1). The transformers, which had PCB ID numbers 85.5567 through 85.5579, contained PCB concentrations greater than 500,000 ppm. Therefore, the transformers were regulated under the Toxic Substances Control Act (TSCA). The PCB transformers were removed in 1989 and 1990 in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (DOE 1991, 065656; LANL 1995, 057590). Under this plan, any evidence of a release was sampled and cleaned up in accordance with TSCA requirements (40 Code of Federal Regulations [CFR] 761). Because no stains were visible on the concrete basement floor after the transformers were removed, the area was considered free of contamination (LANL 1995, 057590).

2.2.2 Relationship to Other SWMUs and AOCs

AOC 03-003(e) is located in a confined space in the basement of building 03-29. It is not associated or near any other SWMU or AOC within building 03-29.

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

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

2.2.4 Delayed Site Investigation Rationale

AOC 03-003(e) is located within a basement of a building that is currently active. The investigation work plan (LANL 2008, 100750) proposed that site characterization and investigation be delayed until future decontamination and decommissioning (D&D) of the building has been completed. NMED approved this proposal (NMED 2008, 101110).

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

2.3.1 Site Description and Operational History

AOC 03-003(i) is an area in a vault beneath the Cryogenics Building (03-32) where a transformer was formerly located (Figure 2.3-1). The transformer contained dielectric fluid with PCB concentrations greater than 500 ppm (LANL 1995, 057590). The transformer, which had PCB ID number 85.5551, was removed and replaced with a non-PCB transformer in September 1992 (Appendix C, C-1a) in accordance with the DOE/Albuquerque Operations Office Environmental Restoration and Waste Management Five-Year Plan (DOE 1991, 065656; LANL 1995, 057590). Under this plan, any evidence of a release was sampled and cleaned up in accordance with TSCA requirements (Appendix C, C-1b).

During the removal efforts, drops of PCB-containing dielectric fluid were spilled in the vault and in the parking lot outside building 03-32 (Heskett 1994, 065828) (Appendix C, C-1c). The vault and parking lot areas were cleaned up and postcleanup sampling was done to verify the completion of clean-up as required by TSCA PCB spill cleanup requirements (Appendix C, C-1b). During the cleanup efforts, three large concrete slabs and three 55-gal. drums of soil and debris were removed from the vault and parking

lot areas (Heskett 1994, 065828; Appendix C, C-1c). The waste was taken to the Laboratory's waste disposal site at TA-54, Area G (Appendix C, C-1d).

After the sampling and cleanup activities were completed, the non-PCB transformer was installed and the concrete replaced. Currently, the vault contains only non-PCB electrical equipment (Appendix C, C-1a).

2.3.2 Relationship to Other SWMUs and AOCs

AOC 03-003(i), located in the vault beneath building 03-32, is the only site under investigation in building 03-32.

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

No RFI activities have been conducted at this AOC.

During the cleanup efforts, swipes of the concrete collected by the Laboratory's Environmental Management Division revealed PCB concentrations up to 94 µg/100 cm^2 (Heskett 1994, 065828; Appendix C, C-1c and C-1e). This concrete was removed and disposed off at TA-54 (Appendix C, C-1d). After the concrete was removed, soil samples collected below the concrete slabs contained PCBs at a concentration of 0.27 ppm, which is below the TSCA cleanup standard of 10 ppm (Heskett 1994, 065828; Appendix C, C-1c and C-1e).

2.3.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 03-003(i) because this site is located inside a vault beneath an active laboratory and facility (Appendix C, C-1f). The vault area is confined and currently contains active electrical equipment that is needed for ongoing operations within building 03-32 (Appendix C, C-1a). Available information provided in section 2.3.3, indicates a very low likelihood of releases to the environment. Even if a release had occurred, any residual contamination would be located beneath the concrete floor of the vault in building 03-32, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants. Available sampling data indicate residual PCB contamination remaining in the soil beneath the concrete is less than the 1 mg/kg default cleanup level contained in the Consent Order. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-32 has been completed.

2.4 AOC 03-004(c)—Storage Area, CMR Building Loading Dock

2.4.1 Site Description and Operational History

AOC 03-004(c) is an active 85-ft × 50-ft dumpster storage area at the main loading dock of the CMR Building (03-29) (Figure 2.4-1). The area is level and paved with asphalt. Two dumpsters occupying the area are used to stage boxed low-level waste (LLW) before disposal. The waste is generated from offices and material-handling areas in the CMR Building. One dumpster receives compactable waste, and the other receives noncompactable waste. Waste consists of gloves, paper products, glass, plastic, and metal. Runoff from the dumpster storage area flows to a storm drain inlet grate about 50 ft southwest of the area. The storm drain eventually discharges at an outfall [SWMU 03-054(e)] in Mortandad Canyon (LANL 1995, 057590).

2.4.2 Relationship to Other SWMUs and AOCs

AOC 03-004(c) is an active dumpster storage area that is level and paved with asphalt. Runoff from the storage area flows to a storm drain inlet grate about 50 ft southwest of the area. The storm drain eventually discharges at an outfall, SWMU 03-054(e), which is evaluated in section 2.19 of this report.

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

An RFI was conducted at this site in July 1997. Samples were collected and field screened for organic chemicals and radioactivity. Screening results did not indicate the presence of organic chemicals, and radioactivity was at or below background. Samples were analyzed for TAL metals, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report, which included the results of five asphalt samples analyzed for isotopic plutonium and isotopic uranium (LANL 1997, 056660.289). These asphalt samples were collected from the asphalt pavement and were all surface samples (0–0.42 ft bgs). The results of the asphalt samples are screening-level data because the samples are engineered material, the results have no applicable background values (BVs), and the results are not directly comparable to results from soil, fill, or tuff samples. Section 2.3.1 of the HIR provides additional details of previous investigations (LANL 2007, 098955).

2.4.4 Site Contamination

2.4.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 03-004(c) are shown in Figure 2.4-1. Table 2.4-1 provides the sampling locations and depths for samples collected and the analyses requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 03-004(c) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

2.4.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.4.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.4-2 lists the inorganic chemicals above BVs at AOC 03-004(c). The identification of inorganic COPCs is presented in Appendix I, section I-2.3.1. The inorganic chemicals identified as COPCs at

AOC 03-004(c) are antimony, barium, calcium, chromium, copper, iron, magnesium, manganese, nickel, nitrate, perchlorate, selenium, silver, and vanadium. The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.4-2.

Organic Chemicals

Table 2.4-3 lists the organic chemicals detected at AOC 03-004(c). The identification of organic COPCs is presented in Appendix I, section I-2.3.2. The organic chemicals identified as COPCs at AOC 03-004(c) are acetone; benzo(b)fluoranthene; benzo(k)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofuran; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; toluene; and trichloroethene. Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.4-3.

Radionuclides

Table 2.4-4 lists the radionuclides detected or detected above BVs/fallout values (FVs). The identification of radionuclide COPCs is presented in Appendix I, section I-2.3.3. The only radionuclide identified as a COPC at AOC 03-004(c) is tritium. The sampling locations and detected concentrations of tritium above FVs or in samples with no applicable FV are shown in Figure 2.4-4.

2.4.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 03-004(c) are discussed in Appendix I, section I-2.3.5.

The lateral extent of barium, chromium, copper, and manganese and the vertical extent of chromium at location MO-605048 are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at AOC 03-004(c).

2.4.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-004(c), no human health risk-screening assessment was performed.

2.4.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-004(c), no ecological risk-screening assessment was performed.

2.5 AOC 03-004(d)—Former Storage Area at CMR Building

2.5.1 Site Description and Operational History

AOC 03-004(d) is a former 75-ft × 20-ft dumpster storage area located on a level, asphalt-covered surface south of the steps at the west end of Wing 9 at the CMR Building (03-29) (Figure 2.5-1). Runoff from this AOC flows to a storm drain inlet grate located approximately 100 ft west of the area. The storm drain discharges at an outfall [SWMU 03-054(e)] into Mortandad Canyon. The dumpster located at

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

2.5.2 Relationship to Other SWMUs and AOCs

Runoff from AOC 03-004(d) flows toward the west, passing by the pump house (building 03-154) where four underground storage tanks [SWMU 03-034(a)] are located partially beneath the building.

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

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

2.5.4 Site Contamination

2.5.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 03-004(d) are shown in Figure 2.5-1. Table 2.5-1 provides the sampling locations, depths, and the requested analyses. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 03-004(d) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

2.5.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.5-2 lists the inorganic chemicals above BVs at AOC 03-004(d). The identification of inorganic COPCs is presented in Appendix I, section I-2.4.1. The inorganic chemicals identified as COPCs at AOC 03-004(d) are antimony, chromium, lead, nitrate, selenium, silver, thallium, and zinc. The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.5-2.

Organic Chemicals

Table 2.5-3 lists the organic chemicals detected at AOC 03-004(d). The identification of organic COPCs is presented in Appendix I, section I-2.4.2. The organic chemicals identified as COPCs at AOC 03-004(d) are anthracene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; carbazole; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans. Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.5-3.

Radionuclides

Table 2.5-4 lists the radionuclides detected or detected above BVs/FVs or detected in samples with no applicable BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.4.3. The radionuclides identified as COPCs at AOC 03-004(d) are cesium-137, plutonium-238, plutonium-239/240, and tritium. The sampling locations and detected concentrations of radionuclides detected or detected above BVs/FVs are shown in Figure 2.5-4.

2.5.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 03-004(d) are discussed in Appendix I, section I-2.4.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at AOC 03-004(d), except for the lateral extent of chromium.

2.5.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-004(d), no human health risk-screening assessment was performed.

2.5.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-004(d), no ecological risk-screening assessment was performed.

2.6 AOC 03-007—Decommissioned Firing Site

2.6.1 Site Description and Operational History

AOC 03-007 is a decommissioned firing site located southwest of the Beryllium Technology Facility (building 03-141) within the security fence at the Sigma Complex (Figure 2.6-1). This AOC includes a containment building for explosives experiments (building 03-159) and a personnel safety barrier (structure 03-160). Building 03-159 sits on an 8 × 8 ft concrete slab and has 6-in.-thick × 8-ft high walls. An opening on one side serves as an entrance. Structure 03-160 sits on a concrete slab and has two 8-ft-high × 4-ft-wide × 6-in.-thick walls. From 1970 to 1975, approximately 50 to 75 explosive shot experiments were detonated within building 03-159. The building was rinsed with water after each shot. Washdown water from within building 03-159 was released to the environment (soil immediately surrounding the building) from engineered gaps between the concrete floor and structure walls. The rinse water drained into small drainages and catchment areas and eventually flowed into Mortandad Canyon. The site was remediated in the late 1970s, and no explosives compounds were detected (LANL 1995, 057590). In the mid-1980s, building 03-159 was modified to serve as a storage building for thoria (oxide) and thorium (metal), which were stored in containers within the building (LANL 1995, 057590).

2.6.2 Relationship to Other SWMUs and AOCs

SWMU 03-049(a) is located approximately 120 ft downgradient of AOC 03-007. However, runoff from AOC 03-007 flows to the east of the site following a drainage that leads to the east, then south to Mortandad Canyon.

2.6.3 Summary of Previous Investigations for AOC 03-007

An RFI was conducted at this site in July 1997. Samples were collected on the north, east, and south sides of building 03-159 and were field screened for organic chemicals and radioactivity. Screening results indicated that organic chemicals were not detected, and radioactivity was at or below local background. Samples were analyzed for TAL metals, gamma-emitting radionuclides, isotopic thorium, explosive compounds, SVOCs, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Section 2.5.1 of the HIR provides the details of previous investigations (LANL 2007, 098955). Decision-level data from the 1997 investigation are included in this report.

2.6.4 Site Contamination

2.6.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 03-007 are shown in Figure 2.6-1. Table 2.6-1 provides the sampling locations, depths, and the analytical suites. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 03-007 consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, explosive compounds, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, tritium, and pH.

2.6.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.6.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.6-2 lists the inorganic chemicals above BVs at AOC 03-007. The identification of inorganic COPCs is presented in Appendix I, section I-2.5.1.

The inorganic chemicals identified as COPCs at AOC 03-007 are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 2.6-1.

Organic Chemicals

Table 2.6-3 lists the organic chemicals detected at AOC 03-007. The identification of organic COPCs is presented in Appendix I, section I-2.5.2.

The organic chemicals identified as COPCs at AOC 03-007 are acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; 4-chloro-3-methylphenol; 2-chloronaphthalene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; tetrachloroethene; toluene; and 1,2,4-trimethylbenzene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 2.6-2.

Radionuclides

Table 2.6-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.5.3.

The radionuclides identified as COPCs at AOC 03-007 are cesium-137, plutonium-239/240, and tritium.

The sampling locations and concentrations of radionuclide COPCs detected or detected above BVs/FVs or in samples with no applicable FV are shown in Figure 2.6-2.

2.6.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 03-007 are discussed in Appendix I, section I-2.5.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at AOC 03-007, except for the lateral and vertical extent of chromium.

2.6.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-007, no human health risk-screening assessment was performed.

2.6.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 03-007, no ecological risk-screening assessment was performed.

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

2.7.1 Site Description and Operational History

AOC 03-014(w) is a floor drain in a darkroom in the CMR Building (03-29) (Figure 2.2-1). The drain was installed in 1953 and became inactive in 1991 when it was plugged (Appendix C, C-2a, C-2b, and C-2c). Between 1953 and 1991, the drain was connected to the sanitary sewer system which went to the former TA-03 WWTP (Appendix C, C-2c). Effluent from the CMR Building darkroom operations, including spent photographic solutions, may have been discharged to this floor drain (LANL 1993, 020947). Currently, the floor drain remains plugged (Appendix C, C-2a and C-2b).

2.7.2 Relationship to Other SWMUs and AOCs

The floor drains and associated drainlines of AOC 03-014(w) originated within the darkroom in the CMR Building. The drainlines were connected to the sanitary sewer lines that went to the former WWTP (Appendix C, C-2d). The sites associated with the former WWTP include SWMUs 03-014(a–p and u) and 03-056(d) and AOCs 03-14(b2 and c2). The WWTP treated sanitary wastes from 1951 to 1992, when the Laboratory's Sanitary Wastewater Systems Consolidation (SWSC) Plant came online at TA-46. The sites associated with WWTP will be investigated under the Upper Sandia Aggregate Area investigation work plan.

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

An RFI was conducted at the former WWTP in 1994. Sites most likely to have received and retained any potential contaminants from discharges from the sanitary sewer system, including AOC 03-014(w), were included in that investigation. SWMUs 03-014(a and e), which are Imhoff tanks, were sampled because treated sludge was directly applied to the soil around the tanks. AOCs 03-014(b2 and c2) were sampled because they were the outfalls for the WWTP. AOC 03-014(w) was considered in conjunction with the investigation activities at SWMUs 03-014(a and e) and AOCs 03-014(b2 and c2) because it was connected to the sanitary sewer system. Surface and subsurface samples were collected and submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1996, 052930).

2.7.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 03-014(w) because characterizing a site in an active nuclear facility is not feasible. Previous investigations conducted at other related SWMUs and AOCs (see section 2.7.3), while not sufficient to determine nature and extent of contamination, provide data indicating it is unlikely releases occurred from the drainlines while they were in operation.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing at AOC 03-014(w) to determine if there were any leaks. Pressure testing is not feasible at this site since the system was not designed or constructed to be pressure tested. The sanitary drainline system within the CMR building relies on gravity flow and was not designed to be pressurized. The wastewater stream characterization report for building 03-29 identified 93 drains that were connected to the sanitary sewer drainline including AOC 03-014(w). Sealing all the drains to pressure test AOC 03-014(W) is not feasible.

In addition, the drain associated with AOC 03-014(w) is plugged so no opportunity exists for future releases. Any residual contamination is located beneath asphalt paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-32 has been completed.

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

2.8.1 Site Description and Operational History

AOC 03-014(x) consists of a floor drain and associated drainline (Figure 2.8-1) in the Sigma Building (03-66). The floor drain was installed in the darkroom in the Sigma Building in 1959. Effluent may have included spent photoprocessing solutions from darkroom operations. From 1959 to 1992, the drain was connected to the sanitary sewer and former TA-03 WWTP (Appendix C, C-3a and C-3b). The TA-03 WWTP was taken offline in 1992 when the TA-46 SWSC plant came online (LANL 1996, 052930). In 1996, the floor drain was plugged (Appendix C, C-3c).

2.8.2 Relationship to Other SWMUs and AOCs

The floor drain and associated drainline originated within the darkroom in the Sigma Building. The drainline was connected to the sanitary sewer line that flowed to the former WWTP (Appendix C, C-3a). The sites associated with the former WWTP include SWMUs 03-014(a–p and u) and 03-056(d) and

AOCs 03-14(b2 and c2). The WWTP treated sanitary wastes from 1951 to 1992, when the Laboratory's SWSC Plant came online at TA-46. The sites associated with the WWTP will be investigated under the Upper Sandia Aggregate Area investigation work plan.

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

An RFI was conducted at the former WWTP in 1994. SWMUs most likely to have received and retained any potential contaminants from discharges from the sanitary sewer system, including AOC 03-014(x). SWMUs 03-014(a and e), which are Imhoff tanks, were sampled because treated sludge was directly applied to the soil around the tanks. AOCs 03-014(b2 and c2) were sampled because they were the outfalls for the WWTP. Surface and subsurface samples were collected and submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1996, 052930).

2.8.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 03-014(x) because the site is located inside an active facility. Previous investigations conducted at other related SWMUs and AOCs (see section 2.8.3), while not sufficient to determine nature and extent of contamination, provide data indicating it is unlikely releases occurred from the drainlines while they were in operation. The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing at AOC 03-014(x) to determine if there were any leaks. Pressure testing is not feasible at this site since the system was not designed or constructed to be pressure tested. In addition, AOC 03-014(x) is currently plugged. Any potential contamination from past releases would be located beneath the building and surrounding asphalt paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-66 has been completed.

2.9 AOC 03-026(a)—Sump

2.9.1 Site Description and Operational History

AOC 03-026(a) is an active sump (Figure 2.8-1) located in the Sigma Building on the southeast corner of an open pump pit next to and west of the SWMU 03-037 holding tanks (Appendix C, C-4a and C-4b). The sump was installed to contain any liquid accumulated in the pump pit. Any liquid in the sump is pumped to the acid waste line (Appendix C, C-4c and C-4d). The pump pit contains two electrically driven pumps that are used to evacuate waste fluids from the holding tanks. The pump pit measures 12-ft long × 10.7-ft wide × 8.5-ft deep, with 8-in.-thick concrete walls (Appendix C, C-4a and C-4b). The west edge of the pump pit is about 3 ft from the west wall of the Sigma Building (03-66). No releases from the sump have been reported (LANL 1993, 020947).

2.9.2 Relationship to Other SWMUs and AOCs

AOC 03-026(a) is located immediately adjacent to SWMU 03-037. Both are components of the active acid waste system within the Sigma Building before the waste enters the acid waste line system (Appendix C, C-4c).

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

There have been no previous investigations at or associated with AOC 03-026(a).

2.9.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 03-026(a) because this site is located in the basement of an active nuclear facility. The sump comprises part of the containment system for the Sigma Building, which is a nuclear facility. Breaching of this containment system to collect samples is not allowed under the nuclear safety requirements for operating the facility.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the pipes associated with the sump. The sump is not completely enclosed and was not designed to be pressurized. The lines associated with the sump were also not designed to be pressure tested but rely on a double containment system for leak detection (see section 6.3). The waste-stream characterization report for building 03-66 identifies the discharge line connected to the radioactive liquid waste (RLW) collection system that goes to TA-50 (Appendix C, C-4d). For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-66 has been completed.

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

2.10.1 Site Description and Operational History

SWMU 03-026(c) is incorrectly identified in the 1990 SWMU report as 11 sumps located at the base of cooling towers in the CMR Building (03-29) that receive blowdown from the cooling tower (LANL 1990, 007511). However, SWMU 03-026(c) is actually composed of 25 active aboveground holding tanks in the basement of the CMR Building (LANL 1995, 057590) (Figure 2.2-1). There are five holding tanks in each wing, each approximately 16 ft long and 4 ft in diameter, in Wings 2, 3, 4, 5, and 7. The holding tanks are associated with chilled water systems in these wings. The water chillers are located on the first floor. Over 10 yr ago the chilled water system was upgraded and tanks are no longer in use. When the chilled water system was used, the chilled water was piped to each laboratory for circulation in equipment. Returning water was piped to the basement where it emptied into aboveground tanks. Next to each holding tank were two pumps that recirculated the water to the chillers (Appendix C, C-5a and C-5b). If both the tanks recirculating pumps failed, each tank was designed to discharge to the CMR RLW line system (SWMU 03-031) via basement floor sink drains 1 through 24, shown in Figures 2 and 3 in the Wastewater Stream Characterization Report.

2.10.2 Relationship to Other SWMUs and AOCs

The aboveground holding tanks, SWMU 03-026(c), are all contained within the basement of the CMR Building. The cooling tower system was designed to be a closed-loop system, except if the recirculating pumps fail and the tanks had to discharge to the CMR RLW line system (SWMU 03-031) via floor drains. In the event the tanks discharged to the floor drains, the discharge went through SWMU 03-031 and entered the acid waste line system for treatment at the TA-50 RLWTF (Appendix C, C-5c, C-5d, and Figures 2 and 3 in C-5e).

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

No RFI activities have been conducted at this SWMU.

2.10.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for the SWMU 03-026(c) because this site is located in the basement of an active nuclear facility. Samples cannot be collected from beneath the tanks because the concrete floor is part of the containment system for the CMR Building, which is a nuclear facility. Breaching of this containment system to collect samples is not allowed under the nuclear safety requirements for operating the facility.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the pipes and tanks associated with SWMU 03-026(c). This system was not constructed or designed to be pressurized. Because the tanks are aboveground, pressure testing is not necessary for integrity assessment and inspections are used to identify potential leakage. In addition, the Wastewater Stream Characterization Report for building 03-29 identifies the discharge line connected to the CMR RLW collection system, SWMU 03-031, and the acid waste line system that goes to TA-50 (Appendix C, C-5e). This system is not designed to be pressure tested but relies instead on a double-containment system to detect leaks (see section 6.3).

The SWMU 03-026(c) tanks were part of the system that provides chilled water for various ongoing laboratory operations with the CMR Building. Per the Laboratory's maintenance procedures, the chilled water-system units were tested at a minimum once per week, and all components of the loop system were inspected at a minimum once per year (Appendix C, C-5f). Any maintenance or repairs were addressed immediately because the chilled water system was essential to many CMR operations. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-29 has been completed.

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

2.11.1 Site Description and Operational History

SWMU 03-031 is the RLW collection system in the CMR Building (03-29) (Figure 2.2-1). The system consists of double-encased stainless-steel vaults, tanks, and drainlines that discharge to the RLW line for treatment at TA-50 (LANL 1995, 057590). Operations at the CMR Building drained RLW through sumps and tanks to the RLW line. Two 10,800-gal. concrete tanks and associated sumps are located in the basement of each of five wings, a total of 10 tanks (Appendix C, C-6a). The tanks in each wing are next to each other and are made of 6-in.-thick concrete walls. The tanks are 10 ft long × 6 ft wide × 6 ft high (Appendix C, C-6b through C-6l). Although the concrete tanks were engineered to meet specifications for a water pressure of approximately 5000 gal. per tank, the tanks were primarily used as a pass-through system. The valve at the bottom of each tank was always in the open position to allow all liquids to drain directly to the RLW line. The tanks serve as holding tanks if the inflow to the tank was greater than the rate of the outflow (LANL 1997, 056848). From 1953 to 1982, the RLW system in the CMR Building discharged to the acid waste lines to pumping station 03-700, which then pumped to the RLWTF at TA-50. Pumping station 03-700 was removed in the early 1980s (LANL 1995, 057590) when the TA-50 RLWTF came online.

In the early 1980s, upgrades were completed on the CMR RLW collection system, including the concrete tanks, because the tank's piping needed to be replaced to work with the new double-containment pipe and manhole system associated with the TA-50 RLWTF. The scope of the TA-50 RLWTF double-containment system mandated bypassing the concrete retention tanks and installing a manifold outside the tanks to allow the tanks to be brought online in an emergency situation. Because all the new pipes leading to the TA-50 RLWTF were double-contained and all the manholes were built to certain specifications, the TA-50 RLWTF engineers required the CMR tanks to meet the same specifications as the manholes to ensure that no leaking would occur. The tank interiors were sealed and epoxied, and all valves were replaced to meet the same specifications as the manholes. In addition, liquid-sensing devices were added to the tanks that relay information directly to the TA-50 RLWTF for continual monitoring of these units. Since the upgrade, the holding tanks still primarily serve as a pass-through system and no liquid has gone into the tanks (LANL 1997, 056848). Presently, operations at the CMR Building are still active, and the RLW is routed directly to the TA-50 RLWTF (Appendix C, C-6a).

2.11.2 Relationship to Other SWMUs and AOCs

SWMU 03-031 collects all discharges from drains within the CMR building that are routed to the acid waste system. SWMU 03-026(c), which are tanks associated with the cooling water system, may discharge to SWMU 03-031 if cooling water system's recirculating pumps fail. SWMU 03-031 discharges to the acid waste line system for treatment at the TA-50 RLWTF (Appendix C, C-6a and C-6b).

2.11.3 Summary of Previous Investigations for SWMU 03-031

No RFI activities have been conducted at this SWMU.

2.11.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for SWMU 03-031 because this site is located inside an active nuclear facility. The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the entire system associated with SWMU 03-031 and ancillary equipment. This system was not constructed or designed to be pressurized. Available information, including the design features of the site and upgrades in the early 1980s, indicates a very low likelihood of past releases to the environment. Even if such a release had occurred, any residual contamination would be located beneath the floor of the CMR Building, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

During the upgrades in the early 1980s, the CMR RLW piping and the tanks were inspected and upgraded to meet the same specifications as the double-containment pipe and manhole system associated with the TA-50 RLWTF. Personnel at TA-50 RLTWF entered and inspected the interior tank walls for cracks and other structural defects. No defects were noted. The tanks were sandblasted and visually inspected a second time. Again, no structural defects were noted. The tanks were then sealed and epoxied, and all valves were replaced to meet the same specifications as manholes associated with the TA-50 RLWTF (LANL 1997, 056848).

Also, as described in section 6.3.1, all of the drainline segments are double-containment lines, and the underground vaults provide double containment at all joints and connections. The double-containment design allows for continuous monitoring for leaks from the inner pipes that transport the wastewater. Leak detection monitoring has been performed since the system was placed in service in 1982. No releases from the waste conveyance system to the environment have been detected. For these reasons, it is

proposed that site characterization and investigation be delayed until future D&D of building 03-29 has been completed.

2.12 SWMU 03-034(a)—Radioactive Liquid Waste Tanks

2.12.1 Site Description and Operational History

SWMU 03-034(a) consists of four underground RLW storage tanks (two stainless-steel tanks and two concrete tanks) located partially beneath the pump house (building 03-154) (Figure 2.12-1; Appendix C, C-7a through C-7e). Building 03-154 was constructed in 1961 to house operating equipment of the four storage tanks that received radioactive waste from Wing 9 of the CMR Building (03-29) (LANL 1995, 057590). The tanks associated with SWMU 03-034(a) is located approximately 65 ft west of Wing 9.

From 1961 to 1983, the underground storage tanks (USTs) received RLW (fission products from the destructive testing of reactor fuel rods) from the hot cell of Wing 9 at the CMR Building. The RLW originally was routed to the stainless-steel tanks and stored to allow decay of short-lived radionuclides. The RLW was pumped through a series of stainless-steel transfer lines into the concrete storage tanks. The liquid was processed through ion-exchange columns, which resulted in lower-activity RLW. The two cylindrical stainless-steel storage tanks located belowgrade beneath the north part of building 03-154 are accessible from individual manholes outside the building. Each tank is 7 ft long and 5 ft in diameter, with a maximum capacity of approximately 1000 gal. and is located inside a concrete vault. The concrete vaults share a common wall, and each concrete vault contains pumps and stainless-steel piping associated with the tanks. Each concrete tank is approximately 17 ft long × 9 ft wide × 6 ft high, with a maximum capacity of 4900 gal. A single gravity-outflow sump pit, which served both concrete tanks, is located on the south side of the tanks and was used to drain liquid waste to the RLW line that was pumped to TA-50 (LANL 1995, 057590).

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

In 2003 and 2004, contaminated water remaining after the tanks were taken offline in the four USTs was removed, treated, and disposed of. The work consisted of pumping the water in the two south tanks, the lower north vault, the upper north vault, plus removing additional water from triple rinsing the two south tanks. During the 2003 and 2004 activities, the tanks were also inspected to ensure they were stabilized and preserved in a near-dry state until the tanks were addressed through D&D and remediation activities (Appendix C, C-7f).

2.12.2 Relationship to Other SWMUs and AOCs

SWMU 03-034(a) consists of the tanks located in building 03-154. Before the tanks were taken offline, the waste from the tanks entered the acid waste line system for treatment at the TA-50 RLWTF (Appendix C, C-7g). The system is currently inactive and stand-alone, not associated with any other SWMU or AOC.

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

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

A summary of decision-level data for SWMU 03-034(a) is presented below. Section 2.11.2 of the Upper Mortandad Canyon Aggregate Area HIR provides the details of data evaluation (LANL 2007, 098955).

- Samples from two locations were analyzed for TAL metals. Analytical results indicated antimony, cadmium, and thallium had detection limits above the BVs in at least one sample.
- Samples from three locations were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Analytical results indicated that cesium-137, plutonium-238, and plutonium-239/240 were detected at depths where FVs do not apply.
- Samples from two locations were analyzed for SVOCs. Analytical results indicated that pyrene was detected at both locations.

2.12.4 Site Contamination

Delayed investigation is proposed for the tanks until D&D of the CMR Building and building 03-154. Delayed investigation is proposed because fully characterizing this site, which is located next to the CMR Building, an active nuclear facility, is not feasible. The rationale for not investigating that portion of the site is presented in section 2.12.7. The investigation activities for the remainder of the site are discussed in the following sections.

2.12.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 03-034(a) are shown in Figure 2.12-1. Table 2.12-1 provides the sampling locations, depths, and the analytical suites requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 03-034(a) consisted of the following activities in 2009:

- Tuff samples were collected at four sampling locations from three depth intervals: the interval adjacent to the bottom of the concrete tanks, the interval beginning 5 ft below the bottom of the tanks, and the interval beginning 10 ft below the bottom of the tanks.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic uranium, isotopic plutonium, tritium, and pH.

2.12.4.2 Soil, Rock, and Sediment Field-Screening Results

Elevated organic vapors were not detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.12.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.12-2 lists the inorganic chemicals above BVs at SWMU 03-034(a). The identification of inorganic COPCs is presented in Appendix I, section I-2.11.1. The inorganic chemicals identified as COPCs at SWMU 03-034(a) are antimony, chromium, and selenium. The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.12-2.

Organic Chemicals

Table 2.12-3 lists the organic chemicals detected at SWMU 03-034(a). The identification of organic COPCs is presented in Appendix I, section I-2.11.2. The organic chemicals identified as COPCs at SWMU 03-034(a) are benzoic acid, total heptachlorodibenzodioxins, and methylene chloride. Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.12-3.

Radionuclides

Table 2.12-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.11.3.

The radionuclide identified as a COPC at SWMU 03-034(a) is tritium.

The sampling locations and detected concentrations of radionuclide COPCs detected or detected above BVs/FVs are shown in Figure 2.12-4.

2.12.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 03-034(a) are discussed in Appendix I, section I-2.11.5. The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 03-034(a), except for the inactive and stand-alone tanks.

2.12.5 Summary of Human Health Risk Screening

The samples and the potential contamination associated with the storage tanks are at 16 ft bgs or deeper. A risk-screening assessment was conducted using maximum detected concentrations of the COPCs from the sampled depths. The human health risk-screening assessment for SWMU 03-034(a) is discussed in Appendix J, sections J-4.2.1 and J-4.4.

The total excess cancer risk for the residential scenario is 3×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.000001, which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for the residential scenario is 0.0009 mrem/yr, which is below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-8}, based on a comparison with EPA's residential preliminary remediation goals (PRGs) for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the preliminary risk-screening assessment results, there are no potential unacceptable risks or doses from COPCs for the residential scenario.

2.12.6 Summary of Ecological Risk Screening

The samples and the potential contamination associated with the waste tanks are at 16 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted at SWMU 03-034(a).

2.12.7 Delayed Site Investigation Rationale

Delayed investigation is proposed for SWMU 03-034(a) because the tanks are located immediately next to the CMR Building, an active nuclear facility. Previous investigations conducted at SWMU 03-034(a),while not sufficient to fully determine nature and extent of contamination, provide data indicating it is unlikely releases occurred while the tanks were in operation.

Collecting samples from beneath the tanks and from the concrete of building 03-154 is also not feasible. Although the tanks are no longer used to collect waste, the concrete floor still comprises part of the containment system for building 03-154.

Indirect characterization methods, such as pressure testing, are also not feasible. Available information, including the design features of the site and the report from the removal of the water in the tanks, indicates a very low likelihood of past releases to the environment. Even if such a release had occurred, any residual contamination would be located beneath the floor of building 03-154, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants. In addition, the tanks and waste lines are inactive so no opportunity exists for future releases. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of buildings 03-29 and 03-154 has been completed.

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

2.13.1 Site Description and Operational History

SWMU 03-034(b) is a 10-ft-long × 10-ft-wide × 11-ft-deep active industrial waste sump located on the west side of the Beryllium Technology Facility (building 03-141) (Figure 2.8-1). The concrete sump is an underground pit that provides secondary containment for a 50-gal. tank that processes water and liquid waste (Appendix C, C-8a). The tank and the sump were installed in the 1960s and are active. The liquids may contain small quantities of radionuclides and acid wastes pumped into the RLW line from the tank for treatment at the TA-50 RLWTF (LANL 1995, 057590).

2.13.2 Relationship to Other SWMUs and AOCs

The liquid waste from SWMU 03-034(b) enters the acid waste line system for treatment at the TA-50 RLWTF (Appendix C, C-8b).

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

There have been no previous investigations at or associated with SWMU 03-034(b).

2.13.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for SWMU 03-034(b) because the sump is still in use and is located immediately adjacent to the active Beryllium Technology Facility. The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the sump and ancillary line. SWMU 03-034(b) was not designed or constructed to be pressurized. The sump is not completely enclosed and was not designed to maintain pressure. The ancillary line is also not designed to be pressure tested and relies on a double-containment system for leak detection (see section 6.3). The waste stream characterization report for building 03-141 identifies the discharge line connected to the RLW collection system that goes to TA-50 (Appendix C, C-8a). The site is also an active sump designed to provide secondary containment. Breaching the sump to collect samples from beneath it would eliminate the ability to provide secondary containment. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 03-141 has been completed.

2.14 AOC 03-041—Underground Tank

2.14.1 Site Description and Operational History

AOC 03-041 is an unloading station designed as a holding tank for industrial low-level radioactive wastewater (Figure 2.14-1). It is located in a belowgrade concrete-lined vault (building 03-1264), approximately 140 ft southwest of the Sigma Building (03-66). The tank is 15 ft long × 20 ft wide × 15 ft high, is constructed of double-walled fiberglass, and has a capacity of 2000 gal. The base of the vault is approximately 15 ft bgs. It is corrosion-proof and has a leak-detection system. The holding tank connects to the industrial waste line. The tank was installed in 1982 to serve as a holding chamber for liquid waste collected from sites not connected to the industrial waste line. Although the unloading station is currently on active status, it has never been used. If used, the unloading station, building 03-1264, would act as an introduction point for waste into the industrial waste line (LANL 1995, 057590).

2.14.2 Relationship to Other SWMUs and AOCs

AOC 03-041 is located to the west of the drainage of SWMU 03-045(h).

2.14.3 Summary of Previous Investigations for AOC 03-041

No previous investigation activities have been conducted at this AOC.

2.14.4 Site Contamination

2.14.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 03-041 are shown in Figure 2.14-1. Table 2.14-1 provides the sampling location, depths, and the analyses requested for each sample. Sampling at AOC 03-041 consisted of the following activities in 2009:

- Soil and tuff samples were collected at three locations from four depth intervals: the surface interval, at the soil/tuff interface, the interval beginning 15 ft bgs, and the interval beginning 25 ft bgs. The sampling locations are on the three downslope sides of the holding tank.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

2.14.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of subsurface cores. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.14.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.14-2 lists the inorganic chemicals above BVs at AOC 03-041. The identification of inorganic COPCs is presented in Appendix I, section I-2.13.1. The inorganic chemicals identified as COPCs at AOC 03-041 are antimony, calcium, iron, lead, nitrate, perchlorate, and selenium. The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.14-2.

Organic Chemicals

Table 2.14-3 lists the organic chemicals detected at AOC 03-041. The identification of organic COPCs is presented in Appendix I, section I-2.13.2. The organic chemicals identified as COPCs at AOC 03-041 are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans. Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.14-3.

Radionuclides

Table 2.14-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.13.3. The radionuclide identified as a COPC at AOC 03-041 is tritium. The sampling locations and detected concentrations of tritium above the FV or in samples with no applicable FV are shown in Figure 2.14-4.

2.14.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 03-041 are discussed in Appendix I, section I-2.13.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

2.14.5 Summary of Human Health Risk Screening

The human health risk-screening assessment for AOC 03-041 is discussed in Appendix J, sections J-4.2.2 and J-4.4.

The total excess cancer risks for the industrial and residential scenarios are 2×10^{-7} and 7×10^{-7}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.05 and 0.4, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.002 mrem/yr for the residential scenario, which is below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 3×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). No radionuclide COPCs were identified for the industrial scenario.

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

2.14.6 Summary of Ecological Risk Screening

The ecological risk-screening assessment is presented in Appendix J, section J-5.4. No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous canyon studies.

2.15 SWMU 03-045(h)—Former NPDES-Permitted Outfall from Cooling Tower

2.15.1 Site Description and Operational History

SWMU 03-045(h) consists of a cooling tower outlet pipe that discharged to a storm drain at the north perimeter of the TA-03 Sigma Complex security fence (Figure 2.15-1), approximately 50 ft north of a cooling tower (structure 03-187). The cooling tower outlet pipe is a former NPDES-permitted outfall (03A024) that was removed from the NPDES permit on August 1, 2007 (EPA 2007, 099009). This outlet pipe discharged treated cooling water onto a small area of ground surface, which drained into a buried corrugated metal storm drain that trended northeast of structure 03-187, where it eventually combined with stormwater runoff from surrounding areas. The drainage continued northeast and joined a channel north of Eniwetok Drive, which ultimately drained into Sandia Canyon (LANL 1995, 057590). The cooling tower outlet pipe was active from 1953 to the late 1980s. The pipe was reactivated in early 1995 and remained active until it was plugged in February 1997.

Routine cooling water treatment began in 1968. Treatment included biocides and fungicides to reduce algae growth and chelating agents [such as ethylenediaminetetraacetic acid (EDTA)] to inhibit corrosion. The potential contamination resulting from the northward flow of the discharge from the cooling water outlet pipe into Sandia Canyon will be investigated as part of the Upper Sandia Canyon Aggregate Area work plan (LANL 2008, 100692).

In addition, it is possible that the buried corrugated storm drain into which the cooling tower outlet pipe drained may not have been able to handle the large flow of stormwater that results during sporadic and heavy storm events. Should this have occurred, the overflow would have drained due south across

asphalt pavement to a drainage located to the southwest of building 03-66. This drainage discharges into upper Mortandad Canyon.

2.15.2 Relationship to Other SWMUs and AOCs

SWMU 03-045(h) and SWMU 03-049(a) constitute Consolidated Unit 03-045(h)-00. Both are associated with cooling towers; however, their locations are separate, and their operations are independent from each other.

The potential stormwater overflow area associated with SWMU 03-045(h) is located approximately 70 ft east of building 03-35, while Consolidated Unit 03-049(b)-00 is located to the south and southwest of the building.

AOC 03-041, a holding tank housed in a belowgrade concrete-lined vault (structure 03-1264), is located west of the drainage of SWMU 03-045(h).

2.15.3 Summary of Previous Investigations for SWMU 03-045(h)

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

2.15.4 Site Contamination

2.15.4.1 Soil, Rock, and Sediment Sampling

The sampling locations for SWMU 03-045(h) are shown in Figure 2.15-1. Table 2.15-1 provides the sampling location, depths, and the analyses requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 03-045(h) consisted of the following activities in 2009:

- Sediment samples were collected at 10 locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface. The sampling locations were in the drainage below SWMU 03-045(h).
- Samples were collected from two depth intervals (surface and soil/tuff interface) at one location at the discharge point north of the cooling tower.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic uranium, tritium, and pH.

2.15.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.15.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.15-2 lists the inorganic chemicals above BVs at SWMU 03-045(h). The identification of inorganic COPCs is presented in Appendix I, section I-2.14.1.

The inorganic chemicals identified as COPCs at SWMU 03-045(h) are aluminum, antimony, arsenic, barium, cadmium, calcium, chromium, hexavalent chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.15-2.

Organic Chemicals

Table 2.15-3 lists the organic chemicals detected at SWMU 03-045(h). The identification of organic COPCs is presented in Appendix I, section I-2.14.2.

The organic chemicals identified as COPCs at SWMU 03-045(h) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-Pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 2.15-1.

Radionuclides

Table 2.15-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.14.3.

The radionuclides identified as COPCs at SWMU 03-045(h) are cesium-137 and tritium.

The sampling locations and concentrations of cesium-137 and tritium detected or detected above FVs are shown in Figure 2.15-3.

2.15.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 03-045(h) are discussed in Appendix I, section I-2.14.5.

The lateral and vertical extent of barium and the lateral extent of antimony are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at SWMU 03-045(h).

2.15.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-045(h), no human health risk-screening assessment was performed.

2.15.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-045(h), no ecological risk-screening assessment was performed.

2.16 SWMU 03-049(a)—NPDES-Permitted Outfall from Cooling Tower

2.16.1 Site Description and Operational History

SWMU 03-049(a) is a currently permitted NPDES outfall (03A022) located south of the Sigma Building (03-66) (Figure 2.15-1). The outfall discharges treated cooling water from a cooling tower (structure 03-127), which serves the Sigma Building (03-66), and runoff from six roof drains on the Sigma Building. The cooling tower has operated since 1960. From 1984 to 1990, the outfall also received discharge from rinse tanks associated with the electroplating operation in the Sigma Building. The tanks contained the final rinse from electroplating and surface-finishing experimental components. Although the rinse tanks were flushed continually with tap water to reduce contaminant buildup, trace amounts of metals, acids, cyanide, and depleted uranium were introduced into the rinse water. The NPDES permit allowed discharge of 4680 gal./d of treated cooling water and 24,000 gal./d of electroplating rinse water. Since 1990, the outfall has received only treated cooling water and roof-drain runoff. The outfall discharges to upper Mortandad Canyon (LANL 1995, 057590).

2.16.2 Relationship to Other SWMUs and AOCs

SWMUs 03-045(h) and 03-049(a) comprise Consolidated Unit 03-045(h)-00. Both are associated with cooling towers, but their locations are separate, and their operations are independent of each other.

SWMU 03-049(a) is located approximately 120 ft downgradient of AOC 03-007. They do not share drainages because runoff from AOC 03-007 flows east and then south into Mortandad Canyon.

SWMU 03-049(e) is located approximately 170 ft to the west of the Outfall 03A022 of SWMU 03-049(a). The drainages of SWMUs 03-049(a) and 03-049(e) run almost parallel to Mortandad Canyon.

2.16.3 Summary of Previous Investigations for SWMU 03-049(a)

In July 1997, an RFI was conducted at SWMU 03-049(a). The investigation evaluated the point of discharge for the outfall and four associated sediment catchment basins through which the discharge flows before draining into Mortandad Canyon. Field activities included a site survey, geodetic survey, field screening, and sample collection. Sediment samples were collected from each of the sediment basins. Two water samples were collected: one at the NPDES outfall pipe before it entered the sediment

catchment basin, and the other from flowing water exiting the last sediment catchment basin before it entered Mortandad Canyon. Screening results did not indicate the presence of organic chemicals, and radioactivity was at or below background. The sediment samples were analyzed for hexavalent chromium, TAL metals, cyanide, isotopic uranium, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Decision-level data from the 1997 investigation are included in this report.

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

2.16.4 Site Contamination

2.16.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 03-049(a) are shown in Figure 2.15-1. Table 2.16-1 provides the sampling locations, depths, and the analyses requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 03-049(a) consisted of the following activities in 2009:

- Sediment samples were collected at 11 locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface. The sampling locations were downgradient of the outfall.
- Sediment samples were collected at one location below Outfall 03A022 from two depth intervals: the surface sediment interval and the soil/tuff interface.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic uranium, tritium, and pH.

2.16.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.16.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.16-2 lists the inorganic chemicals above BVs at SWMU 03-049(a). The identification of inorganic COPCs is presented in Appendix I, section I-2.15.1.

The inorganic chemicals identified as COPCs at SWMU 03-049(a) are antimony, cadmium, chromium, hexavalent chromium, copper, lead, nickel, nitrate, perchlorate, selenium, silver, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 2.16-1.

Organic Chemicals

Table 2.16-3 lists the organic chemicals detected at SWMU 03-049(a). The identification of organic COPCs is presented in Appendix I, section I-2.15.2.

The organic chemicals identified as COPCs at SWMU 03-049(a) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 2.16-2.

Radionuclides

Table 2.16-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.15.3.

The radionuclides identified as COPCs at SWMU 03-049(a) are cesium-137, tritium, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 2.16-1.

2.16.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 03-049(a) are discussed in Appendix I, section I-2.15.5.

The vertical extent of chromium at location MO-604985 and the lateral extent of dioxins/furans are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at SWMU 03-049(a).

2.16.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-049(a), no human health risk-screening assessment was performed.

2.16.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-049(a), no ecological risk-screening assessment was performed.

2.17 Consolidated Unit 03-049(b)-00—Soil Contamination

2.17.1 Site Description and Operational History

Consolidated Unit 03-049(b)-00 consists of SWMU 03-049(b) and AOC C-03-014 (Figure 2.17-1). These units were consolidated because surface-water drainage from both sites collects in the same locations, and regrading and paving operations may have distributed contamination from one site to the other.

SWMU 03-049(b) is a 50 ft long × 20 ft wide discharge area at the south wall of the press building (03-35). It is associated with an inactive vacuum pump that served furnaces in building 03-35. The press building was built in 1953. The vacuum pump evacuated oil from furnaces used for experiments in building 03-35. Experiments included fabricating enriched uranium-loaded graphite and carbide fuel elements. Enriched uranium was processed in the press building. The outlet is located about 8 ft above the ground on the south wall of the press building. The vacuum pump was deactivated in the late 1980s. At about the same time, a 10 ft × 8 ft area under the exhaust pipe outlet was paved with asphalt. Runoff from this area drains southwest toward low-lying areas. Use of the press building ceased in November 1991 but was reactivated in 1995 (LANL 1995, 057590).

AOC C-03-014 is a 125 ft × 100 ft equipment-storage area located southwest of the press building (03-35). The area is bounded by security fences to the north, south, and west and by building 03-35 to the east. Most of the area is paved, except for a 15-ft-wide strip of grass along the southern security fence that widens to 30 ft southwest of building 03-35. Various equipment and molds from building 03-35 were stored at AOC C-03-014 for salvage or because of the building's space limitations. Equipment is no longer stored outside the building (LANL 1995, 057590).

2.17.2 Relationship to Other SWMUs and AOCs

Consolidated Unit 03-049(b)-00 is located to the south and southwest of the press building (03-35). A potential stormwater overflow area associated with SWMU 03-045(h) is located approximately 70 ft east of building 03-35.

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

An RFI was conducted in July 1997 for Consolidated Unit 03-049(b)-00. Field activities included a site survey, geodetic survey, field screening, and sample collection. Screening results indicated that organic chemicals were not detected, and radioactivity was at or below background. Samples were collected and analyzed for TAL metals, isotopic uranium, PCBs, TPH-DRO, and VOCs. The RFI activities and results were presented in the RFI report (LANL 1997, 056660.289). Decision-level data from the 1997 investigation are included in this report.

2.17.4 Site Contamination

2.17.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at Consolidated Unit 03-049(b)-00 are shown in Figure 2.17-1. Table 2.17-1 provides the sampling locations, depths, the objectives, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at Consolidated Unit 03-049(b)-00 consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, PCBs, TPH-DRO, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), gamma-emitting radionuclides, isotopic uranium, and pH.

2.17.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.17.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.17-2 lists the inorganic chemicals above BVs at Consolidated Unit 03-049(b)-00. The identification of inorganic COPCs is presented in Appendix I, section I-2.16.1.

The inorganic chemicals identified as COPCs at Consolidated Unit 03-049(b)-00 are aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, iron, lead, magnesium, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 2.17-1.

Organic Chemicals

Table 2.17-3 lists the organic chemicals detected at Consolidated Unit 03-049(b)-00. The identification of organic COPCs is presented in Appendix I, section I-2.16.2.

The organic chemicals identified as COPCs at Consolidated Unit 03-049(b)-00 are acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and TPH-DRO.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 2.17-2.

Radionuclides

Table 2.17-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.16.3.

The radionuclides identified as COPCs at Consolidated Unit 03-049(b)-00 are tritium, uranium-234, uranium-235/236, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 2.17-2.

2.17.4.4 Nature and Extent of Contamination

The nature and extent of contamination at Consolidated Unit 03-049(b)-00 are discussed in Appendix I, section I-2.16.5.

The lateral extent of aluminum, chromium, total cyanide, lead, and perchlorate are not defined on the south side of the site. The vertical extent of PCBs is not defined at one location on the south (downslope) side of the site. The lateral and vertical extent of tritium are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

2.17.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 03-049(b)-00, no human health risk-screening assessment was performed.

2.17.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 03-049(b)-00, no ecological risk-screening assessment was performed.

2.18 SWMU 03-049(e)—Outfall from Sigma Building Roof Drains

2.18.1 Site Description and Operational History

SWMU 03-049(e) is identified in the 1990 SWMU report (LANL 1990, 007511) as an area located south of the Sigma Building (03-66) that is potentially contaminated by an outfall pipe of unknown origin (Figure 2.18-1). The 1990 SWMU report also states that the outfall discharged to Mortandad Canyon (LANL 1990, 007511). Subsequent investigation at the Sigma Building determined that three of the building's roof drains connect to a single pipe and discharge to the outfall area of SWMU 03-049(e) (LANL 1995, 057590).

2.18.2 Relationship to Other SWMUs and AOCs

SWMU 03-049(e) is located approximately 170 ft to the west of the Outfall 03A022 of SWMU 03-049(a). The drainages of SWMUs 03-049(a) and 03-049(e) run almost parallel to Mortandad Canyon.

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

In 2001, RFI samples were collected from the outfall and analyzed for anions and TAL metals. The results of those samples are included in this report.

2.18.4 Site Contamination

2.18.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 03-049(e) are shown in Figure 2.18-1. Table 2.18-1 provides the sampling location, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 03-049(e) consisted of the following activities in 2009:

- Sediment samples were collected at six locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface interval. Four of the sampling locations were located near the previous 2001 sampling locations, two were downslope of both the previous and new sampling locations, and one was below the outfall.
- Sediment samples were collected at one location from the outfall of the discharge pipe from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface interval.
- Sediment samples were collected from five locations from two depth intervals: the surface sediment interval and the soil/tuff interface every 50-ft from the top of the slope to the toe of the colluvium in the drainage downslope of the outfall.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, tritium, and pH.

2.18.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.18.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.18-2 lists the inorganic chemicals above BVs at SWMU 03-049(e). The identification of inorganic COPCs is presented in Appendix I, section I-2.17.1.

The inorganic chemicals identified as COPCs at SWMU 03-049(e) are antimony, arsenic, cadmium, copper, chromium, hexavalent chromium, iron, lead, nickel, nitrate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.18-2.

Organic Chemicals

Table 2.18-3 lists the organic chemicals detected at SWMU 03-049(e). The identification of organic COPCs is presented in Appendix I, section I-2.17.2.

The organic chemicals identified as COPCs at SWMU 03-049(e) are acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran;

fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 2.18-1.

Radionuclides

Table 2.18-4 lists the radionuclides detected above BVs/FVs or detected in samples with no applicable BVs/FVs at SWMU 03-049(e). The identification of radionuclide COPCs is presented in Appendix I, section I-2.17.3.

The radionuclide identified as a COPC at SWMU 03-049(e) is cesium-137.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 2.18-3.

2.18.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 03-049(e) are discussed in Appendix I, section I-2.17.5.

The vertical extent of antimony, chromium, hexavalent chromium, selenium, and zinc are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

2.18.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-049(e), no human health risk-screening assessment was performed.

2.18.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-049(e), no ecological risk-screening assessment was performed.

2.19 SWMU 03-054(e)—Outfall

2.19.1 Site Description and Operational History

SWMU 03-054(e) is an outfall located in upper Mortandad Canyon (Figure 2.19-1). The outfall typically discharges a steady, low-volume flow of effluent that originates from several sources at the CMR Building (03-29). These sources include drainage from roofs over the west wing, where towers vent filtered exhaust, and surface water runoff from the asphalt area around the building.

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

2.19.2 Relationship to Other SWMUs and AOCs

SWMU 03-054(e) received effluent from an unintentional one-time release in 1974 from an industrial waste manhole (AOC C-03-006). Currently, SWMU 03-054(e) continues to receive surface-water runoff from the area surrounding building 03-29.

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

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

2.19.4 Site Contamination

2.19.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 03-054(e) are shown in Figure 2.19-1. Table 2.19-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 03-054(e) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, PCBs, SVOCs, and VOCs (in samples deeper than 0.5 ft bgs), gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

2.19.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.19.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.19-2 lists the inorganic chemicals above BVs at SWMU 03-054(e). The identification of inorganic COPCs is presented in Appendix I, section I-2.18.1.

The inorganic chemicals identified as COPCs at SWMU 03-054(e) are antimony, cadmium, calcium, chromium, copper, total cyanide, mercury, nitrate, selenium, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.19-2.

Organic Chemicals

Table 2.19-3 lists the organic chemicals detected at SWMU 03-054(e). The identification of organic COPCs is presented in Appendix I, section I-2.18.2.

The organic chemicals identified as COPCs at SWMU 03-054(e) are acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; diethylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.19-3.

Radionuclides

Table 2.19-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.18.3.

The radionuclides identified as COPCs at SWMU 03-054(e) are europium-152, plutonium-238, plutonium-239/240, and sodium-22.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 2.19-4.

2.19.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 03-054(e) are discussed in Appendix I, section I-2.18.5.

The vertical extent of chromium and zinc are not defined. The lateral and vertical extent of phthalates and dioxins/furans are not defined, and the lateral extent of polycyclic aromatic hydrocarbons (PAHs) is not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

2.19.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-054(e), no human health risk-screening assessment was performed.

2.19.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 03-054(e), no ecological risk-screening assessment was performed.

2.20 AOC C-03-006—One-Time Spill from Industrial Waste Line Manhole

2.20.1 Site Description and Operational History

AOC C-03-006 is the site of an unintentional release from a manhole connected to the industrial waste line. The manhole is located near the corner of Diamond Drive and Pajarito Road (Figure 2.19-1) and is part of the liquid industrial waste collection system that runs from TA-03 to the RLWTF at TA-50. In 1974, the manhole overflowed to a storm sewer in TA-03 [discussed in section 2.19, SWMU 03-054(e), Outfall] and discharged to upper Mortandad Canyon. The overflow resulted from a plug in the industrial waste line and was estimated to be between 500 and 1000 gal. of RLW. The overflow spilled to the surrounding paved area, traveled north along Diamond Drive, flowed into the storm sewer via a storm-drain grate, and ultimately discharged into upper Mortandad Canyon through the outfall at SWMU 03-054(e). A cleanup of the overflow-impacted area began the day after the release. A collection and pumping system was used to flush the contaminated storm drain. Approximately 176 m^3 of pavement was cut to the depth of the base course, excavated, and disposed of at Area G at TA-54. Newly exposed surfaces were monitored, and one section of curbing with radioactivity levels exceeding background levels was removed. Additional surveys and subsequent confirmation sampling determined that no radioactivity exceeding the decontamination criteria (25 pCi/g) was present in the base-course material. The area was restored by repaving and replacing the curb along Diamond Drive and around the manhole, removing the dam built in the stream bed at the base of the canyon, and installing engineering controls (LANL 1995, 057590). The area was further excavated in 1984 when the manhole and the industrial waste line were removed.

2.20.2 Relationship to Other SWMUs and AOCs

The unintentional one-time release at AOC C-03-006 in 1974 eventually discharged through the outfall of SWMU 03-054(e) into upper Mortandad Canyon.

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

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

2.20.4 Site Contamination

2.20.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC C-03-006 are shown in Figure 2.19-1. Table 2.20-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC C-03-006 consisted of the following activities in 2009:

- Soil samples were collected at five locations from two depth intervals: the surface sediment interval and the soil/tuff interface interval.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, PCBs, SVOCs, and VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

2.20.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

2.20.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 2.20-2 lists the inorganic chemicals above BVs at AOC C-03-006. The identification of inorganic COPCs is presented in Appendix I, section I-2.19.1.

The inorganic chemicals identified as COPCs at AOC C-03-006 are antimony, barium, chromium, copper, cyanide (total), mercury, nitrate, selenium, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 2.20-1.

Organic Chemicals

Table 2.20-3 lists the organic chemicals detected at AOC C-03-006. The identification of organic COPCs is presented in Appendix I, section I-2.19.2.

The organic chemicals identified as COPCs at AOC C-03-006 are Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; diethylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 2.20-2.

Radionuclides

Table 2.20-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-2.19.3.

The radionuclides identified as COPCs at AOC C-03-006 are europium-152, plutonium-238, plutonium-239/240, sodium-22, and tritium.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 2.20-3.

2.20.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC C-03-006 are discussed in Appendix I, section I-2.19.5.

The lateral and vertical extent of chromium are not defined at AOC C-03-006. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

2.20.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC C-03-006, no human health risk-screening assessment was performed.

2.20.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC C-03-006, no ecological risk-screening assessment was performed.

3.0 TA-35 BACKGROUND AND FIELD-INVESTIGATION RESULTS

3.1 Background of TA-35

TA-35 is located northeast of the intersection of Pajarito Road and Pecos Drive. TA-35 structures are located on a finger mesa between Mortandad Canyon on the north and Ten Site Canyon, which is a branch of Mortandad Canyon, on the south.

Two SWMUs located in TA-35 are addressed in this investigation report.

- SWMU 35-016(g) is a drain and outfall from building 35-213.
- SWMU 35-016(h) are storm drains and outfalls associated with building 35-213.

The site features of SWMUs 35-016(g and h) are shown in Figure 3.1-1.

3.1.1 Operational History

The first laboratories and offices at TA-35 were completed in 1951. Initial operations involved the preparation of kilocurie sources of radioactive lanthanum. Experimentation with several radionuclides, mainly plutonium and tritium, was conducted at TA-35 in the 1950s and 1960s. Three experimental fission reactors were developed and operated for short periods between 1956 and 1964.

By the 1970s, most of the work with radioactive materials was phased out, and attention was focused on laser operations. In addition, research on optics, robotics, and nuclear safeguards are being conducted at TA-35.

3.1.2 Summary of Releases

Section 3.3.2 of the Operable Unit (OU) 1129 work plan (LANL 1992, 007666) provides a summary of releases for TA-35. This report includes only the investigation at SWMUs 35-016(g and h).
SWMU 35-016(g) is an active outfall that historically handled reverse osmosis discharge and now handles cooling tower blowdown. The drainline is suspected to contain tritium and chemicals added to the cooling water to prevent corrosion, scaling, and algal growth (LANL 1992, 007666, p. 3-57). SWMU 35-016(h) includes several active storm drains to handle rainwater run-off and brine from a water deionizer. The drainline is also suspected to contain tritium (LANL 1992, 007666, p. 3-57). The discharge points of both SWMUs are on the south rim of Mortandad Canyon.

3.1.3 Current Site Usage and Status

Facilities at TA-35 are used for nuclear-safeguards research and development (primarily in the areas of lasers, physics, fusion work, materials development, and biochemistry); physical chemistry research and development; research in reactor safety; optical science; and pulsed-power systems. Metallurgy, ceramic technology, and chemical plating also occur at this site.

3.2 SWMU 35-016(g)—Drain and Outfall from Building 35-213

3.2.1 Site Description and Operational History

SWMU 35-016(g) is a former NPDES outfall (Permit No. 04A127) that was established in 1979 to handle reverse osmosis discharge and cooling tower blowdown from room 29 in building 35-213, the Target Fabrication Facility (Figure 3.1-1). This former outfall now handles cooling tower blowdown from the same room. The drainage ran approximately 100 ft north to its point of discharge on the south rim of Mortandad Canyon.

3.2.2 Relationship to Other SWMUs and AOCs

The drainage from the SWMU 35-016(g) outfall runs almost parallel to that of SWMU 35-016(h).

3.2.3 Summary of Previous Investigations for SWMU 35-016(g)

An RFI was conducted for SWMU 35-016(g) outfall in March 1995. Samples were submitted for analysis of inorganic chemicals, organic chemicals, and radionuclides. The sampling results are screening-level results based on current data quality standards but were reported in a 1996 RFI report (LANL 1996, 054422).

In 1997, additional sampling was conducted at SWMU 35-016(g). Eleven samples from six locations were collected and submitted for analysis of inorganic chemicals, organic chemicals, and radionuclides. Those sampling results are discussed together with the 2009 sampling results. Decision-level data from the 1997 investigation are included in this report.

3.2.4 Site Contamination

3.2.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 35-016(g) are shown in Figure 3.1-1. Table 3.2-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 35-016(g) consisted of the following activities in 2009:

- Soil samples were collected at five locations from two depth intervals: the surface sediment interval and the soil/tuff interface interval.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, SVOCs, gamma-emitting radionuclides, and tritium.

3.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

3.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 3.2-2 lists the inorganic chemicals above BVs at SWMU 35-016(g). The identification of inorganic COPCs is presented in Appendix I, section I-3.1.1.

The inorganic chemicals identified as COPCs at SWMU 35-016(g) are antimony, cadmium, chromium, hexavalent chromium, mercury, nickel, selenium, silver, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 3.2-1.

Organic Chemicals

Table 3.2-3 lists the organic chemicals detected at SWMU 35-016(g). The identification of organic COPCs is presented in Appendix I, section I-3.1.2.

The organic chemicals identified as COPCs at SWMU 35-016(g) are benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; and pyrene.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 3.2-2.

Radionuclides

Table 3.2-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-3.1.3.

The radionuclides identified as COPCs at SWMU 35-016(g) are cesium-137 and tritium.

The sampling locations and detected concentrations of radionuclide detected or detected above FVs are shown in Figure 3.2-3.

3.2.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 35-016(g) are discussed in Appendix I, section I-3.1.5.

The lateral and vertical extent of cesium-137 are not defined at SWMU 35-016(g) in the drainage at location MO-605136. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

3.2.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 35-016(g), no human health risk-screening assessment was performed.

3.2.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 35-016(g), no ecological risk-screening assessment was performed.

3.3 SWMU 35-016(h)—Storm Drains and Outfalls Associated with Building 35-213

3.3.1 Site Description and Operational History

AOC 35-016(h) consists of three storm drains located north of building 35-213 (Figure 3.1-1). The storm drains were installed in 1979 to handle stormwater runoff from roof drains of building 35-213, the nearby parking lot, and discharge from a water deionizer in building 35-213. The drain from the water deionizer was rerouted to the RLW drain system in the mid-1990s and no longer discharges to the stormwater system.

The storm drain that handles the runoff from roof drains is located on the north side of building 35-213. The storm drain that used to handle discharge from the water deionizer is located on the northeast side of building 35-213. This storm drain currently only handles stormwater runoff from the area around building 35-213. The third storm drain that handles stormwater from the nearby parking lot is located northwest of building 35-213. All three storm drains discharge into Mortandad Canyon.

3.3.2 Relationship to Other SWMUs and AOCs

The drainages of AOC 35-016(h) run almost parallel to the drainage from the AOC 35-016(g) outfall; however, they do not share a drainage.

3.3.3 Summary of Previous Investigations for AOC 35-016(h)

An RFI was conducted at AOC 35-016(h) in March 1995. Samples were submitted for analysis of inorganic chemicals, organic chemicals, and radionuclides. The sampling results are screening-level data based on the current data quality standard but were reported in a 1996 RFI report (LANL 1996, 054422).

In 1997, additional sampling was conducted at AOC 35-016(h). Three samples were collected from one location and submitted for analysis of inorganic chemicals, organic chemicals, and radionuclides. Those sampling results are discussed together with the 2009 sampling results below. Decision-level data from the 1997 investigation are included in this report.

3.3.4 Site Contamination

3.3.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 35-016(h) are shown in Figure 3.1-1. Table 3.3-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 35-016(h) consisted of the following activities in 2009:

- Soil samples were collected at 10 locations from two depth intervals: the surface sediment interval and the soil/tuff interface interval.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, SVOCs, gamma-emitting radionuclides, and tritium.

3.3.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

3.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 3.3-2 lists the inorganic chemicals above BVs at AOC 35-016(h). The identification of inorganic COPCs is presented in Appendix I, section I-3.2.1.

The inorganic chemicals identified as COPCs at AOC 35-016(h) are antimony, cadmium, chromium, hexavalent chromium, copper, nickel, and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 3.3-1.

Organic Chemicals

Table 3.3-3 lists the organic chemicals detected at AOC 35-016(h). The identification of organic COPCs is presented in Appendix I, section I-3.2.2.

The organic chemicals identified as COPCs at AOC 35-016(h) are anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 3.3-2.

Radionuclides

Table 3.3-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-3.2.3.

The radionuclides identified as COPCs at AOC 35-016(h) are americium-241, tritium, and uranium-235.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 3.3-3.

3.3.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 35-016(h) are discussed in Appendix I, section I-3.2.5.

The lateral and vertical extent of chromium and the lateral extent of PAHs downslope from locations MO-605515 and MO-605516 are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at AOC 35-016(h).

3.3.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 35-016(h), no human health risk-screening assessment was performed.

3.3.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 35-016(h), no ecological risk-screening assessment was performed.

4.0 FORMER TA-42 BACKGROUND AND FIELD-INVESTIGATION RESULTS

4.1 Background of Former TA-42

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

4.1.1 Operational History

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

4.1.2 Summary of Releases

No documented accidental releases have occurred at former TA-42 because of the inefficiency of the incinerator and problems with the off-gas cleanup system, radionuclides and possibly other contaminants were likely released through airborne emissions.

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

4.1.3 Current Site Usage and Status

Former TA-42 is now part of TA-55 (see section 7.1).

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

4.2.1 Site Description and Operational History

Consolidated Unit 42-001(a)-99 consists of SWMUs 42-001(a), 42-001(b), 42-001(c), 42-002(b), and 42-003 and AOC 42-002(a) (Figure 4.1-1). These sites are associated with the former TA-42 radioactive waste incinerator that operated in 1951 and 1952. From 1957 to 1969, this incinerator facility was used to store and decontaminate radioactively contaminated equipment. In 1969, an unsuccessful attempt was made to reactivate the incinerator to burn uncontaminated classified wastes. By 1970, all operations were discontinued, and all combustibles were removed from the building. The facility was decommissioned in 1977, and the site was decontaminated in 1978 (LANL 1990, 007513).

SWMU 42-001(a) is the historical location of building 42-1 that housed the incinerator. Building 42-1 was a 2000-ft^2, steel-frame structure covered with corrugated metal. The building contained the incinerator, a cyclone dust collector, a spray cooler, a Venturi scrubber, a filter bank, and an ash separator. Combustion products passed through an off-gas cleanup system before they were released through an exhaust stack. The off-gas system consisted of a Venturi scrubber, a filter bank, and an ash separator. Ash trapped in the off-gas system and incinerator was transported by underground drainlines to two holding tanks [SWMUs 42-001(b and c)] located immediately north of the incinerator (LANL 1992, 007666).

SWMUs 42-001(b) and 42-001(c) are the historical locations of two former aboveground ash-holding tanks (structures 42-2 and 42-3) associated with the incinerator complex. Each tank was 22 ft in diameter and approximately 13 ft high, with a volume of 37,000 gal. The tanks were built in 1951 and removed in 1978. When the tanks were decommissioned in 1978, the contents were assayed and measured for plutonium. Contaminated sludge was removed, mixed with cement, and taken to Material Disposal Area (MDA) G for storage. The tanks were excavated and disposed of at Area G at TA-54. The tank drainlines were filled with hot asphalt to contain radioactive contamination. It is not known if the drainlines were removed (LANL 1992, 007666).

AOC 42-002(a) is the historical location of an indoor storage (building 42-1) and decontamination area. SWMU 42-002(b) is the location of a historical outdoor decontamination area. Between 1956 and 1969, the main floor of building 42-1 was used to store and decontaminate equipment. During D&D, a vacublaster removed radionuclides and other contaminants from various pieces of equipment. The process generated wastes, some of which are believed to have been discharged to the building's septic system (structure 42-3). It is believed that wastes in the form of fine solid residues were bagged and disposed of at an MDA. Objects (such as vehicles) that were too large to take inside the building were decontaminated at the end of the asphalt driveway located west and north of building 42-1. Wash water from this activity flowed down an embankment on the northwest side of the parking lot. Potentially contaminated soil in that area was not addressed during the 1978 D&D activities (LANL 1992, 007666).

SWMU 42-003 is the historical location of a septic system that served the incinerator building 42-1. The septic system was installed in 1951 and consisted of a 565-gal. septic tank (structure 42-4), a drainline from building 42-1 to the tank, a filter trench, a tile leach field, and an outfall to Mortandad Canyon. The septic tank received RLW from building 42-1. According to the OU 1129 work plan, the system probably also received solvents, acids, and grease (LANL 1992, 007666). Radioactively contaminated liquids were removed periodically from the septic tank and disposed of in pit 4 at MDA L. Samples collected in Mortandad Canyon in 1952 downstream of former TA-42 showed radioactive contamination in the canyon. In 1973, the septic tank was observed to contain water and possibly may have overflowed (LANL 1992, 007666). Also in 1973, the tank slurry was sampled and was found to be radioactively contaminated. The septic system and associated contaminated soil were removed as part of 1978 D&D activities (Harper and Garde 1981, 006286). Before the tank was removed, liquid in the tank was pumped

and treated at the TA-50 RLWTF [SWMU 50-001(a)]. Tank sludge was solidified by adding cement, and the tank and sludge were disposed of at Area G at TA-54, and the excavated area was backfilled. In addition, contaminated soil in the drain field was excavated (LANL 1992, 007666).

4.2.2 Relationship to Other SWMUs and AOCs

Former TA-42 is designated as Consolidated Unit 42-001(a)-99 and remains undeveloped since all structures were removed in 1978. It is currently part of TA-55, which was constructed immediately south of TA-42 in 1973.

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

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

In 1991, the Environmental Protection Group performed a reconnaissance study and collected soil samples. Samples were analyzed for radionuclides, PCBs, SVOCs, VOCs, and metals. These results are screening-level data based on current data-quality validation standards.

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

4.2.4 Site Contamination

4.2.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at Consolidated Unit 42-001(a)-99 are shown in Figure 4.1-1. Table 4.2-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at Consolidated Unit 42-001(a)-99 consisted of the following activities in 2009:

- Soil and tuff samples were collected at 18 locations from 6 depth intervals: the surface interval, the soil/tuff interface interval, and the intervals beginning 5 ft, 10 ft, 20 ft, and 30 ft below the soil/tuff interface.
- In the backfilled area in the southeast corner of the site, soil and tuff samples were collected at two locations from four depth intervals: the fill/tuff interface interval and the intervals beginning 10 ft, 20 ft, and 30 ft below the soil/tuff interface.
- Sediment samples were collected at seven locations from two depth intervals: the surface sediment interval within the drainage and the soil/tuff interface interval.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, PCBs, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), explosives compounds, dioxins and furans, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

4.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

4.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 4.2-2 lists the inorganic chemicals above BVs at Consolidated Unit 42-001(a)-99. The identification of inorganic COPCs is presented in Appendix I, section I-4.1.1.

The inorganic chemicals identified as COPCs at Consolidated Unit 42-001(a)-99 antimony, cadmium, chromium, copper, mercury, nitrate, perchlorate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 4.2-1.

Organic Chemicals

Table 4.2-3 lists the organic chemicals detected at Consolidated Unit 42-001(a)-99. The identification of organic COPCs is presented in Appendix I, section I-4.1.2.

The organic chemicals identified as COPCs at Consolidated Unit 42-001(a)-99 are acenaphthene; acetone; anthracene; aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 4.2-2.

Radionuclides

Table 4.2-4 lists the radionuclides detected or detected above BVs/FVs or detected in samples with no applicable BVs/FVs at Consolidated Unit 42-001(a)-99. The identification of radionuclide COPCs is presented in Appendix I, section I-4.1.3.

The radionuclides identified as COPCs at Consolidated Unit 42-001(a)-99 are americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 4.2-3.

4.2.4.4 Nature and Extent of Contamination

The nature and extent of contamination at Consolidated Unit 42-001(a)-99 are discussed in Appendix I, section I-4.1.5.

The vertical extent of tritium in the mesa-top portion of the site is not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

4.2.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 42-001(a)-99, no human health risk-screening assessment was performed.

4.2.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 42-001(a)-99, no ecological risk-screening assessment was performed.

5.0 TA-48 BACKGROUND AND FIELD-INVESTIGATION RESULTS

5.1 Background of TA-48

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

Four AOCs and 13 SWMUs located in TA-48 are addressed in this investigation report.

- AOC 48-001 is the air exhaust system of building 48-1.
- SWMU 48-002(a) is a former container storage area located at the southwest corner of building 48-1.
- SWMU 48-002(b) is a former container storage area located at a loading dock on the south side of building 48-1.
- AOC 48-002(e) is a former container storage area located on the east side of building 48-1.
- SWMU 48-003 is a former septic system that served TA-48 from 1957 to 1986.
- Consolidated Unit 48-004(a)-99 consists of SWMUs 48-004(a,b,c):
    - ❖ SWMU 48-004(a) is the site of two sumps located below the floor of the shop (room 50) of building 48-1.

  - ❖ SWMU 48-004(b) is the site of three sets of tanks located in the south basement of building 48-1.
  - ❖ SWMU 48-004(c) is the site of two tanks located in the north basement of building 48-1.
- SWMU 48-005 consists of segments of inactive radioactive liquid waste lines at TA-48 and an associated outfall.
- Consolidated Unit 48-007(a)-00 consists of SWMUs 48-007(a), 48-007(d), and 48-010:
  - ❖ SWMUs 48-007(a,d) are former NPDES-permitted outfalls located east of building 48-1; they currently discharge stormwater to SWMU 48-010.
  - ❖ SWMU 48-010 is a surface impoundment located approximately 300 ft east of building 48-1 and 150 ft south of building 48-45; it discharges into a tributary to Mortandad Canyon.
- SWMU 48-007(b) is a former NPDES-permitted outfall located north of building 48-1; currently discharges stormwater into Mortandad Canyon.
- SWMU 48-007(c) is another former NPDES-permitted outfall located north of building 48-1; it currently discharges stormwater into Mortandad Canyon.
- SWMU 48-007(f) is a third former NPDES-permitted outfall located north of building 48-1 that received discharges from two sink drains in building 48-46 and discharged into Mortandad Canyon.
- AOC 48-011 is a 3-ft diameter by 65-ft deep shaft that was drilled into tuff on the east side of building 48-1; inside the shaft is a 2-ft-diameter by 3-ft-long stainless-steel cylinder that contains a sodium iodide radiation detector.
- AOC 48-012 is a soil contamination discovered in August 2002 during trenching east of building 48-1.

5.1.1 Operational History

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

5.1.2 Summary of Releases

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

5.1.3 Current Site Usage and Status

TA-48 is almost completely developed. Roads and large paved parking areas surround the buildings. Several building complexes are fenced for controlled access. A hiking trail accessible to Laboratory employees runs along the east and north side of TA-48.

5.2 AOC 48-001—Air Exhaust System

5.2.1 Site Description and Operational History

AOC 48-001 consists of the air exhaust system at the main radiochemistry laboratory in building 48-1 and surface and near surface soil potentially impacted by deposition from the stack emissions (Figure 5.2-1). The radiochemistry laboratory in building 48-1 was constructed in 1957 to analyze samples collected from nuclear weapons tests. Currently, radiochemical analyses are conducted there to support a variety of programs. The building 48-1 exhaust system consists of nine stacks. Three stacks exhaust unfiltered discharges from chemical hoods, three stacks are associated with combustion boilers, one stack exhausts individually filtered glove boxes, one stack exhausts filtered air from hot cell laboratories, and one stack exhausts air from a welding and degreasing booth. Discharges from the chemical hoods are not filtered because the chemicals used in the hoods (e.g., perchloric acid) degrade filters. However, these hoods are equipped with wet scrubbers. The glove box stack (stack FE54) is permitted and monitored under the National Emissions Standards for Hazardous Air Pollutants Program of the Clean Air Act. According to the RFI work plan, monitoring data are available for stack FE54 beginning in 1967 for plutonium and beginning in 1974 for uranium and fission products (LANL 1992, 007666). These data indicate releases of plutonium, uranium, and fission products, principally cesium-137, cerium-144, and strontium-90.

5.2.2 Relationship to Other SWMUs and AOCs

Building 48-1 is the main laboratory at TA-48, and its air exhaust system consists of nine stacks. AOC 48-001 includes the air exhaust system as well as air deposition from the stack emissions, which could potentially cover the surface and near-surface soil throughout TA-48.

5.2.3 Summary of Previous Investigations for AOC 48-001

In 1991, samples were collected east and northwest of building 48-1. These samples contained elevated levels of alpha radioactivity, with surface samples slightly exceeding DOE guideline levels. Organic chemicals were detected at low concentrations.

In 1993, a Phase I RFI was conducted at AOC 48-001 to determine the presence of soil contamination associated with discharges from the air exhaust system. The EPA computer model, AIRDOS, was used to estimate the areal extent of potential contamination based on historical stack release data. This area was surveyed for radioactivity and organic vapors. Radiation levels were at background levels, and organic vapors were not detected. Samples were collected to the north and east of building 48-1. All samples were field screened for radioactivity and organic chemicals and were submitted for analysis of inorganic chemicals, radionuclides, and organic chemicals using a combination of fixed and mobile laboratories. The RFI activities and results were presented in the RFI report (LANL 1995, 050289). Additional samples were collected in a 1997 RFI. Decision-level data from the 1993 and 1997 investigations are included in this report.

5.2.4 Site Contamination

5.2.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 48-001 are shown in Figure 5.2-1. Table 5.2-1 provides the sampling locations, depths, and the analytical suites. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 48-001 consisted of the following activities in 2009:

- Soil samples were collected at nine locations from the surface soil interval (0–0.5 ft bgs).

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, PCBs, SVOCs, dioxin and furans, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, tritium, and pH.

5.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.2-2 lists the inorganic chemicals above BVs at AOC 48-001. The identification of inorganic COPCs is presented in Appendix I, section I-5.1.1.

The inorganic chemicals identified as COPCs at AOC 48-001 are antimony, arsenic, barium, cadmium, calcium, chromium, hexavalent chromium, cobalt, copper, cyanide (total), manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, vanadium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 5.2-1.

Organic Chemicals

Table 5.2-3 lists the organic chemicals detected at AOC 48-001. The identification of organic COPCs is presented in Appendix I, section I-5.1.2.

The organic chemicals identified as COPCs at AOC 48-001 are acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;

1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.2-2.

Radionuclides

Table 5.2-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.1.3.

The radionuclides identified as COPCs at AOC 48-001 are americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, thorium-227, thorium-230, tritium, uranium-234, uranium-235/236, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 5.2-3.

5.2.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 48-001 are discussed in Appendix I, section I-5.1.5.

The lateral extent of total cyanide at location MO-604942 is not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at AOC 48-001.

5.2.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no human health risk-screening assessment was performed.

5.2.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no ecological risk-screening assessment was performed.

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

5.3.1 Site Description and Operational History

SWMU 48-002(a) consists of a former container storage area located at the southwest corner of the main radiochemistry laboratory in building 48-1 (Figure 5.3-1). The storage area was located against the south wall of building 48-1 on an area of soil between the building and an asphalt roadway. An inspection of SWMU 48-002(a) in 1986 noted the presence of approximately 200 rusty flasks in decayed and broken wooden-frame holders (Perkins 1986, 000808). Each of the flasks reportedly held about 2 qt of high-purity mercury. The flasks are estimated to have been present at SWMU 48-002(a) since about 1976. The flasks were removed from the site in 1989 (LANL 1990, 007513). The RFI work plan reports that available documentation contained no indication of any spills or leaks associated with this site (LANL 1992, 007666).

5.3.2 Relationship to Other SWMUs and AOCs

SWMU 48-002(a) is located approximately 50 ft west of SWMU 48-002(b), another former storage area associated with building 48-1. The SWMUs are located on the south side of building 48-1 and are not close to any other SWMUs or AOCs.

SWMUs 48-002(a) and 48-002(b) were investigated together previously and during this investigation. Therefore, they are discussed together.

5.3.3 Summary of Previous Investigations for SWMUs 48-002(a) and 48-002(b)

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

In 1995, an EC was implemented at SWMUs 48-002(a and b). The EC involved developing of soil cleanup levels for mercury and PAHs; soil sampling and analysis to delineate the area exceeding cleanup levels; excavation of soil contaminated above cleanup levels; confirmation sampling; and site restoration (backfilling, grading, and revegetation). The area of soil excavated during the cleanup was to the east of SWMU 48-002(a) (LANL 1995, 050289).

Decision-level data from the 1993 investigation and the 1995 EC are included in this report.

5.3.4 Site Contamination

5.3.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMUs 48-002(a and b) are shown in Figure 5.3-1. Table 5.3-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at 48-002(a) and SWMU 48-002(b) consisted of the following activities:

- Soil and tuff samples were collected at 13 locations from 3 or 4 depth intervals: the surface interval, soil/tuff interface interval, the interval beginning 5 ft below the soil/tuff interface, and the interval beginning 10 ft below the soil/tuff interface.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

5.3.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.3.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.3-2 lists the inorganic chemicals above BVs at SWMUs 48-002(a and b). The identification of inorganic COPCs is presented in Appendix I, section I-5.2.1.

The inorganic chemicals identified as COPCs at SWMUs 48-002(a and b) are antimony, barium, copper, mercury, nitrate, perchlorate, and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.3-2.

Organic Chemicals

Table 5.3-3 lists the organic chemicals detected at SWMUs 48-002(a and b). The identification of organic COPCs is presented in Appendix I, section I-5.2.2.

The organic chemicals identified as COPCs at SWMUs 48-002(a and b) are acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; carbon disulfide; 4-chloro-3-methylphenol; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; isopropylbenzene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 5.3-3.

Radionuclides

Table 5.3-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.2.3.

The radionuclides identified as COPCs at SWMUs 48-002(a and b) are plutonium-239/240, thorium-230, tritium, and uranium-235/236.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.3-4.

5.3.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMUs 48-002(a and b) are discussed in Appendix I, section I-5.2.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined, except for the vertical extent of perchlorate.

5.3.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMUs 48-002(a and b), no human health risk-screening assessment was performed.

5.3.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMUs 48-002(a and b), no ecological risk-screening assessment was performed.

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

5.4.1 Site Description and Operational History

SWMU 48-002(b) consists of a former container storage area located at a loading dock on the south side of the main radiochemistry laboratory in building 48-1 at TA-48 (Figure 5.3-1). The storage area was located against the south wall of building 48-1, near the southeast corner of the building. An inspection of SMWU 48-002(b) in 1986 noted the presence of labeled and unlabeled drums and evidence of spills and leaks (Perkins 1986, 000808). Spills from leaky drums were also observed at the site during a November 1988 field survey (LANL 1990, 007513). The date that materials began to be stored at this site is not known, and no evidence was found that the site was managed as a formal container storage area. All materials were removed from the site by July 1991 (LANL 1992, 007666).

5.4.2 Relationship to Other SWMUs and AOCs

SWMUs 48-002(a and b) are situated on the south side of building 48-1, with SWMU 48-002(a) located to the west of SWMU 48-002(b). Both storage areas are associated with the functions within building 48-1 and are not close to other SWMUs or AOCs.

5.4.3 Summary of Previous Investigations for SWMUs 48-002(a and b)

The summary of previous investigations for SWMU 48-002(b) is discussed in section 5.3.3.

5.4.4 Site Contamination

Site contamination for SWMU 48-002(b) is discussed in section 5.3.4.

5.4.5 Summary of Human Health Risk Screening

The human health risk-screening results are discussed in section 5.3.5.

5.4.6 Summary of Ecological Risk Screening

The ecological risk-screening results are discussed in section 5.3.6.

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

5.5.1 Site Description and Operational History

AOC 48-002(e) consists of a storage area located on the east side of the main radiochemistry laboratory in building 48-1 (Figure 5.5.1). This storage area was located against the east wall of building 48-1, just north of building 48-17. The storage area is almost entirely paved with asphalt, except for one small section (several square feet) of soil left unpaved to allow access to underground utilities. The RFI work plan states that AOC 48-002(e) was used for many years to store solvents (LANL 1992, 007666). The 1990 SWMU report states this area operated as a satellite accumulation area from the late 1980s (LANL 1990, 007513). Solvents were not stored in the area after about 1989 or 1990 (LANL 1992, 007666). Since 1992, the area has been used to store a tank containing liquid nitrogen and cylinders of compressed gas.

5.5.2 Relationship to Other SWMUs and AOCs

AOC 48-002(e) is a storage area located on the east side of building 48-1, just north of building 48-17. AOC 48-012 is located approximately 70 ft to the east of AOC 48-002(e).

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

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

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

5.5.4 Site Contamination

5.5.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 48-002(e) are shown in Figure 5.5-1. Table 5.5-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 48-002(e) consisted of the following activities in 2009:

- Soil and tuff samples were collected at five locations from three depth intervals: the surface interval (1–2.5 ft bgs), soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. Two locations were near the previous sampling locations, and the other three locations were downgradient of the storage area.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, PCBs, dioxins and furans, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, tritium, and pH.

5.5.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.5.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.5-2 lists the inorganic chemicals above BVs at AOC 48-002(e). The identification of inorganic COPCs is presented in Appendix I, section I-5.3.1.

The inorganic chemicals identified as COPCs at AOC 48-002(e) are antimony, barium, chromium, cyanide (total), nitrate, perchlorate, and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.5-2.

Organic Chemicals

Table 5.5-3 lists the organic chemicals detected at AOC 48-002(e). The identification of organic COPCs is presented in Appendix I, section I-5.3.2.

The organic chemicals identified as COPCs at AOC 48-002(e) are 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 5.5-3.

Radionuclides

Table 5.5-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.3.3.

No radionuclides are identified as COPCs at AOC 48-002(e).

5.5.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 48-002(e) are discussed in Appendix I, section I-5.3.5.

The lateral and vertical extent of all inorganic and organic COPCs are defined at AOC 48-002(e), and no radionuclide COPCs are identified at the site.

5.5.5 Summary of Human Health Risk Screening

At AOC 48-002(e), no samples were collected from 0–1 ft because the site is covered with asphalt. All surface samples were collected below the asphalt, which was approximately 1 ft thick. The human health risk-screening assessment for AOC 48-002(e) is discussed in Appendix J, sections J-4.2.3 and J-4.4.

The total excess cancer risk for the residential scenario is 3×10^{-8}. This risk is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.01, which is below the NMED target HI of 1.0 (NMED 2009, 106420).

Based on the risk-screening assessment results, no potential unacceptable risks from COPCs exist for the residential scenario at AOC 48-002(e).

5.5.6 Summary of Ecological Risk Screening

The ecological risk-screening assessment is presented in Appendix J, section J-5.4. No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous canyon studies.

5.6 SWMU 48-003—Septic System

5.6.1 Site Description and Operational History

SWMU 48-003 consists of a former septic system that served TA-48 from 1957 to 1986. This septic system consisted of a septic tank (structure 48-5), a dosing chamber, a filter bed (structure 48-6), and an outfall that discharged into Mortandad Canyon (Figure 5.6-1). The septic tank and dosing chamber were 21 ft 7 in. long and the filter bed measured 81 ft 2 in. long × 40 ft 7 in. wide. The septic system operated until 1986, at which time the septic tank and filter bed were decommissioned and removed (LANL 1990, 007513). A laboratory and diagnostics facility (building 48-45) was constructed over the site of the septic tank and filter bed. After the septic system was decommissioned, sanitary wastewater from TA-48 was sent to the sanitary lagoons at TA-35 and later to the consolidated treatment plant at TA-46. Although this septic system primarily received sanitary wastewater from TA-48 facilities, the system reportedly received hazardous and radioactive materials through accidental discharges (LANL 1992, 007666).

5.6.2 Relationship to Other SWMUs and AOCs

SWMU 48-003 is located to the east of building 48-45 and is not near any other SWMUs or AOCs.

5.6.3 Summary of Previous Investigations for SWMU 48-003

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

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

5.6.4 Site Contamination

5.6.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 48-003 are shown in Figure 5.6-1. Table 5.6-1 provides the sampling locations, depths, objectives, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 48-003 consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, americium-241, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, tritium, and pH.

5.6.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.6.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.6-2 lists the inorganic chemicals above BVs at SWMU 48-003. The identification of inorganic COPCs is presented in Appendix I, section I-5.4.1.

The inorganic chemicals identified as COPCs at SWMU 48-003 are antimony, beryllium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, nitrate, perchlorate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 5.6-1.

Organic Chemicals

Table 5.6-3 lists the organic chemicals detected at SWMU 48-003. The identification of organic COPCs is presented in Appendix I, section I-5.4.2.

The organic chemicals identified as COPCs at SWMU 48-003 are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;

2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; and toluene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.6-2.

Radionuclides

Table 5.6-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.4.3.

The radionuclides identified as COPCs at SWMU 48-003 are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, tritium, uranium-234, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.6-2.

5.6.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 48-003 are discussed in Appendix I, section I-5.4.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 48-003, except the vertical extent of strontium-90.

5.6.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no human health risk-screening assessment was performed.

5.6.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no ecological risk-screening assessment was performed.

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

5.7.1 Site Description and Operational History

Consolidated Unit 48-004(a)-99 consists of SWMUs 48-004(a, b, and c). These SWMUs include inactive sumps and tanks located in the basement of the main radiochemistry laboratory (building 48-1) that were formerly used to treat RLW generated in the building (Figure 5.7-1). A layout of the building 48-1 basement showing the locations of these sites, which are in rooms 50, 80, and 246, is presented in Appendix C (C-9a). These sumps and tanks were part of the waste-neutralization process at building 48-1. Caustic (sodium hydroxide) solution was automatically added to the sumps or tanks to neutralize acidic wastewaters, which were pumped from the sumps or tanks to the RLW lines for subsequent treatment at TA-45 or TA-50. The neutralization process caused sludge to precipitate in the sumps or tanks. This sludge was removed and disposed of as radioactive waste. The sumps and tanks were equipped with automatic level controls to prevent overfilling (Appendix C, C-9b). The tanks and sumps operated from the late 1950s until the 1970s. Some of the tanks were subsequently removed. The RFI work plan states no documentation exists of past releases or spills from these sumps and tanks but some residual contamination may remain (LANL 1992, 007666).

SWMU 48-004(a) consists of two sumps located below the floor of the shop in building 48-1, room 50. One of these sumps is approximately 4 ft × 3 ft × 2 ft deep and the other is approximately 6 ft × 6 ft × 5 ft deep. The sumps comprising SWMU 48-004(a) were inspected during preparation of the RFI work plan (LANL 1992, 007666). The inspection revealed no physical evidence of releases or external contamination.

SWMU 48-004(b) consists of three sets of tanks located in the south basement of building 48-1 in room 80. The numbers and size of the tanks in each set were not reported in the RFI work plan (LANL 1992, 007666). One set of these tanks is located in a pit area where a sump is also present. Precipitates containing radioactive contamination were reportedly removed from the second set of tanks. The tanks comprising SWMU 48-004(b) were inspected during preparation of the RFI work plan (LANL 1992, 007666), and no physical evidence of releases or external contamination was found.

SWMU 48-004(c) consists of two tanks that contained caustic (sodium hydroxide) solution from the caustic tanks. These tanks and sumps are located in the north basement of building 48-1 in room 246. The tanks comprising SWMU 48-004(c) were inspected during preparation of the RFI work plan (LANL 1992, 007666). The inspection revealed no physical evidence of releases or external contamination.

5.7.2 Relationship to Other SWMUs and AOCs

Consolidated Unit 48-004(a)-99 consists of sumps, tanks, and connecting pipelines located in the basement of building 48-1. The system is inactive and stand-alone and not associated with any other SWMUs or AOCs.

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

No previous investigation activities have been conducted at this consolidated unit.

5.7.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for the SWMUs comprising Consolidated Unit 48-004(a)-99 until D&D of building 48-1. The rationale for delayed investigation of each of these SWMUs is presented below.

5.7.4.1 SWMU 48-004(a)

Delayed investigation is proposed for SWMU 48-004(a) because characterizing this site, which is located inside an active nuclear facility, is not feasible. Available information, including the design features of the site, indicates a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath the floor of building 48-1, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contamination.

Radioactive liquid waste was discharged into the SWMU 48-004(a) sumps from two collection lines connected to floor drains and sink drains in the basement of building 48-1 (Appendix C, C-9c). Three collection lines connected to sink drains and cup drains in laboratories on the first floor of building 48-1 also discharged to SWMU 48-004(a) (Appendix C, C-9d). Wastes collected in SWMU 48-004(a) were then pumped into a RLW collection pipe located along the basement ceiling. This line discharged into a RLW collection vault located on the east side of building 48-1 (Appendix C, C-9e).

Collection of samples beneath the sumps is not feasible. Although the sumps are no longer used to collect waste, they still comprise part of the containment system for building 48-1, which is a nuclear facility. Breaching of this containment system to collect samples is not allowed under the current nuclear safety requirements for operating the facility.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the pipelines and tanks associated with SWMU 48-004(a). The SWMU 48-004(a) waste collection system was not designed to be pressure tested, and pressure testing would also not be feasible. The sumps themselves are not completely enclosed and were not designed to maintain pressure. The associated pipelines were also not designed to be pressure tested. The waste stream characterization report for building 48-1 identified 135 drains connected to the collection system feeding into SWMU 48-004(a) (Appendix C, C-9f). All these drains would have to be sealed to pressure test the line. The discharge line was connected to the RLW collection system that goes to TA-50.

This waste collection system was designed and operated to minimize the potential for releases to the environment. The collection pipes in the basement are located in pipe trenches, which provide secondary containment (i.e., the pipes are not buried directly in the ground). Similarly, the collection pipes from the first floor are contained within the building itself. The discharge line leaving the building is part of the RLW collection system and is doubly contained. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 48-1 has been completed.

5.7.4.2 SWMU 48-004(b)

Delayed investigation is proposed for SWMU 48-004(b) because characterizing this site, which is located inside an active nuclear facility, is not feasible. Available information, including past sampling near the site, indicates a very low likelihood of past releases to the environment. Even if such releases had occurred, any residual contamination would be located beneath the floor of building 48-1 or the parking lot outside the building, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants. Radioactive liquid waste was discharged into the SWMU 48-004(b) sumps from two collection lines connected to floor drains and equipment drains in the basement of building 48-1 (Appendix C, C-9c). Three collection lines connected to sink drains and floor drains in laboratories on the first floor of building 48-1 also discharged to SWMU 48-004(a) (Appendix C, C-9d). Wastes collected in SWMU 48-004(b) were then pumped into a RLW collection pipe that discharged into a RLW collection vault located outside the south end of building 48-1 (Appendix C, C-9e).

Collection of samples beneath the sumps is not feasible. Although the sumps are no longer used to collect waste, they still comprise part of the containment system for building 48-1, which is a nuclear facility. Breaching of this containment system to collect samples is not allowed under the nuclear safety requirements for operating the building.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the pipelines and tanks associated with SWMU 48-004(b). The SWMU 48-004(a) waste collection system was not designed to be pressure tested, and pressure testing is also not feasible. The sumps themselves are not completely enclosed and were not designed to maintain pressure. The associated pipelines are also not designed to be pressure tested. The waste stream characterization report for building 48-1 identified 24 drains that were connected to the collection system feeding into SWMU 48-004(a) (Appendix C, C-9f). All these drains would have to be sealed to pressure test the line. The discharge line was connected to the RLW collection system that goes to TA-50.

The collection lines in the basement are located beneath the basement floor and are not accessible for sampling without penetrating the floor, which is part of the building's containment system. Previous

sampling conducted outside building, however, should be sufficient to determine whether releases from the line had occurred in the past. If a release had occurred, it is likely that the released wastewater would have flowed along the bottom of the pipe trench through the permeable backfill rather than directly downward into the tuff. Samples were collected previously near the south end of building 48-1 for SWMUs 48-002(a and b) and 48-005 (LANL 2008, 100750, Figures 5.2-1 through 5.2-4). These sampling locations are near the waste line that runs from the building to the collection manhole and probably would have detected any contamination associated with a release from the waste line or sump. As discussed in sections 5.3, 5.4, and 5.8, the results from analysis of these samples do not indicate a release of contamination. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 48-1 has been completed.

5.7.4.3 SWMU 48-004(c)

Delayed investigation is proposed for SWMU 48-004(c) because characterizing this site, which is located inside an active nuclear facility, is not feasible. Available information, including the design features of the site, indicates a very low likelihood of past releases to the environment. Even if such releases had occurred, any residual contamination would be located beneath the floor of building 48-1, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

RLW was discharged into the SWMU 48-004(c) sumps from two collection lines connected to floor drains and sink drains in laboratories on the first floor of building 48-1 and from four floor drains and two sink drains in the hot cell area on the first floor (Appendix C, C-9d). These collection lines and drains connect to a collection line in the basement that previously flowed to the sump and that now discharges to an RLW discharge line the exits the north side of building 48-1 (Appendix C, C-9e).

Collection of samples beneath the sump is not feasible. Although the sumps are no longer used to collect waste, they still comprise part of the containment system for building 48-1, which is a nuclear facility. Breaching of this containment system to collect samples is not allowed under the nuclear safety requirements for operating the facility.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the pipelines and tanks associated with SWMU 48-004(c). The SWMU 48-004(c) waste collection system was not designed to be pressure tested, and pressure testing is also not feasible. The sumps themselves are not completely enclosed and were not designed to maintain pressure. The pipelines were also not designed to be pressure tested. The waste stream characterization report for building 48-1 identified 25 drains connected to the collection system feeding into SWMU 48-004(c) (Appendix C, C-9f). All these drains would have to be sealed to pressure test the line. The discharge line was connected to the RLW collection system that goes to TA-50.

This waste collection system was designed and operated to minimize the potential for releases to the environment. The collection pipes are located in the basement, and any releases would be observed and contained within the building. The discharge line leaving the building is part of the RLW collection system and is double-contained. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 48-1 has been completed.

5.8 SWMU 48-005—Waste Lines

5.8.1 Site Description and Operational History

SWMU 48-005 consists of segments of inactive RLW lines at TA-48 and an associated outfall (Figure 5.8-1). From 1957 to 1965, these waste lines were part of the system used to convey RLW from TA-48 to the WWTP plant at TA-45 (Consolidated Unit 45-001-00). Beginning in 1963, new waste lines were installed to carry wastes to the new treatment facilities at TA-50. By 1967, the waste lines leading to TA-45 were decommissioned but remained in place. Some of the waste lines were removed in two campaigns conducted in 1981 and 1984 (LANL 1992, 007513). SWMU 48-005 contains the remaining portions of waste lines, which are all inside the TA-48 security fence. The remaining waste lines are all 3-in.-diameter cast-iron pipe and consist of a 200-ft section of line 34 running west from building 48-1, a 300-ft section of line 36 that runs south from the north wing of building 48-1, and a 50-ft section of line 38 that runs south from building 48-1. These lines, located at depths of 10 to 11 ft bgs, were not removed because they lie beneath structures, roadways, or utilities. The remaining sections of lines 34 and 36 were surveyed for radioactivity during line-removal activities. Line 34 was found to have low levels of alpha activity, and line 36 had no detectable activity (Elder et al. 1986, 006666). The remaining portion of line 38 was not surveyed. SWMU 48-005 also includes an outfall on the edge of Mortandad Canyon north of building 48-1 that was the discharge point of line 37. Line 37 was connected to sumps in the north basement of building 48-1 and was completely removed in 1981 (LANL 1992, 007666).

5.8.2 Relationship to Other SWMUs and AOCs

The waste line segments of SWMU 48-005 are all inside the TA-48 security fence, and the associated outfall of SWMU 48-005 follows a drainage between the drainage of SWMU 48-007(f) to the west and the drainage of SWMU 48-007(c) to the east (Figure 5.8-1). The drainage of the outfall of SWMU 48-005 eventually joins the drainage of SWMU 48-007(f).

5.8.3 Summary of Previous Investigations for SWMU 48-005

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

Based on the responses to NMED's review (NMED 1996, 053810) of the Phase I RFI (LANL 1996, 054448; LANL 1996, 055064), a SAP was prepared to collect of additional samples to be analyzed for metals, radionuclides, SVOCs, and VOCs (LANL 1997, 055326). Sampling was conducted in 1997, but the data have not been reported. Decision-level data from the 1993 and 1997 investigations are included in this report.

5.8.4 Site Contamination

Delayed investigation is proposed for the inactive waste line portion of SWMU 48-005 until D&D of TA-48 facilities. Delayed investigation is proposed because fully characterizing the waste line, which is located next to an active nuclear facility, is not feasible. The rationale for not investigating that portion of the site is presented in section 5.8.7. The investigation activities for the remainder of the site are discussed in the following sections.

5.8.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 48-005 are shown in Figure 5.8-1. Table 5.8-1 provides the sampling locations, depths, and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 48-005 will consist of the following activities:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, tritium, and pH.

Samples collected from the Mortandad Canyon drainage during other investigations were used as applicable to determine whether lateral extent has been defined for SWMU 48-005.

5.8.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.8-2 lists the inorganic chemicals above BVs at SWMU 48-005. The identification of inorganic COPCs is presented in Appendix I, section I-5.6.1.

The inorganic chemicals identified as COPCs at SWMU 48-005 are antimony, cadmium, chromium, copper, manganese, mercury, nitrate, perchlorate, selenium, silver, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.8-2.

Organic Chemicals

Table 5.8-3 lists the organic chemicals detected at SWMU 48-005. The identification of organic COPCs is presented in Appendix I, section I-5.6.2.

The organic chemicals identified as COPCs at SWMU 48-005 are acenaphthene; acetone; anthracene; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; and toluene.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 5.8-3.

Radionuclides

Table 5.8-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.6.3.

The radionuclides identified as COPCs at SWMU 48-005 are americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, and thorium-230.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.8-4.

5.8.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 48-005 are discussed in Appendix I, section I-5.6.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 48-005, except for the lateral and vertical extent of chromium and perchlorate, and the inactive waste line portion of the SWMU (see section 5.8.7).

5.8.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no human health risk-screening assessment was performed.

5.8.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at AOC 48-001, no ecological risk-screening assessment was performed.

5.8.7 Delayed Site Investigation Rationale

Delayed investigation is proposed for the inactive waste line portion of SWMU 48-005 because this waste line is located next to an active nuclear facility. Previous investigations conducted at SWMU 48-005, while not sufficient to determine nature and extent of contamination, provide data indicating it is unlikely releases occurred from the waste lines while they were in operation. In addition, the results of previous sampling do not indicate high levels of contamination (i.e., all results are less than industrial SSLs). These results are consistent with the findings of the waste line removal project, which generally reported very low levels of contamination in the waste lines at TA-48. The low level of contamination detected was one of the considerations in making the decision to leave the lines in place (Elder et al. 1986, 006666, p. A-24). Finally, the waste lines are inactive so no opportunity for future releases exists, and any residual contamination is located beneath buildings or asphalt paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation.

During the 1993 RFI, subsurface samples were collected from nine boreholes drilled along the locations of the remaining waste lines. Six of the boreholes were drilled to a depth of 15 ft bgs, and three to five samples were collected from each borehole. Three of the six 15-ft boreholes were along the former location of line 34, west of the TA-48 security fence, two were along line 37, and one was at the end of line 38. All three remaining boreholes were along the former location of line 34 west of the TA-48 security fence. Two of the boreholes were drilled to a depth of 7 ft bgs, and two samples were collected from each

borehole. The remaining borehole was installed to a depth of 8 ft bgs, and one sample was collected from this borehole. Samples were submitted for analysis of radionuclides, inorganic chemicals, and organic chemicals. Most of the samples collected from these boreholes were analyzed in mobile radiological laboratories or on-site fixed laboratories, and most of the data are screening-level data. The screening assessment performed as part of the RFI report concluded that radionuclides were the only COPCs. The report noted further actions were not feasible because of the location of the site and recommended that further actions be deferred until D&D of the TA-48 facilities (LANL 1995, 050289, p. 4-34). Decision-level data from the 1993 RFI are presented in the HIR for Upper Mortandad Canyon Aggregate Area, and radionuclides are the only COPCs identified. Activities of all radionuclides detected or detected above BV in boreholes decrease with depth.

The previous and proposed sampling should be sufficient to determine whether major releases from the waste lines occurred while the lines were active. If a major release had occurred, it is likely that the released wastewater would have flowed along the bottom of the pipe trench through the permeable backfill. Therefore, it should be possible to detect releases from samples collected along the waste line as well as at the end of the pipe trench where the waste lines were cut.

During the 1993 RFI, no samples were collected along the section of line 34 that was left in place. However, samples were collected from a 15-ft-deep borehole near the end of line 34 (location 48-02021). These samples were analyzed in a fixed laboratory for americium-241, isotopic plutonium, isotopic uranium, isotopic thorium, and gamma-emitting radionuclides. The only radionuclides detected, or detected above FV, were cobalt-60 at 0.12 pCi/g, cesium-137 at 3.73 pCi/g, and ruthenium-106 at 2.46 pCi/g (LANL 1995, 050289, p. 4-26). These detections were all in the sample from 2.5–3.7 ft bgs, and these radionuclides were not detected in samples collected from 9–10 and 14–15 ft bgs. These detected activities are all less than residential SALs. Based on the distribution of contaminants and the activities detected, these results do not appear to indicate a major past release from the waste line.

During the 1993 RFI, samples were collected from two 15-ft-deep boreholes along line 37 (locations 48-02024 and 48-02025). The only radionuclide detected or detected above BV was thorium-230, which was detected at 3.85 pCi/g at 4.0–5.0 ft bgs at location 48-02024 and 3.11 pCi/g at 5.5–6.5 ft bgs and 2.07 pCi/g at 13–14 ft bgs at location 48-02025. These activities are less than 2 times BV and do not appear to indicate a release from the waste line. In addition to this previous sampling, additional sampling was performed at the outfall at the end of the pipe that was left in place and is described above.

During the 1993 RFI, samples collected from the 15-ft-deep borehole at the end of line 38 (location 48-02026) were analyzed in a fixed laboratory for americium-241, isotopic plutonium, isotopic uranium, isotopic thorium, and gamma-emitting radionuclides. Radionuclides detected or detected above FV were americium-241 (5.27 pCi/g at 6.0–7.4 ft bgs), plutonium-238 (5.19 pCi/g at 1.5–2.5 ft bgs and 223 pCi/g at 6.0–7.4 ft bgs), plutonium-239 (11.9 pCi/g at 6.0–7.4 ft bgs), and uranium-234 (2.04 pCi/g at 14–15 ft bgs) (LANL 2007, 098955, p. 171). With the exception of uranium-234, the maximum activity occurred in the sample from 6.0–7.4 ft bgs, and no radionuclides were detected in the deeper sample from 14–15 ft bgs. The detection of uranium-234 in the deep sample was slightly above BV (2.04 pCi/g versus 1.98 pCi/g) and probably represents naturally occurring uranium. The detected activities are all less than residential SALs, with the exception of the highest activity of plutonium-238, which is less than the industrial SAL. Based on the distribution of contaminants and the activities detected, these results do not appear to indicate a major release from the waste line.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the lines associated with SWMU 48-005. Pressure testing to determine the integrity of the remaining sections of waste lines is infeasible. The line removal project report states the lines left in place were sealed on both

ends using a quick-setting, hard-curing concrete with an adhesive additive. If the lines were too deep to seal in this manner, a seal was made by pouring 1 to 2 yd^3 of concrete around the end of the pipe (Elder et al. 1986, 006666, p. 18). Therefore, access to the interior of the pipelines to perform any type of integrity assessment is not possible. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of the TA-48 facilities has been completed.

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

5.9.1 Site Description and Operational History

Consolidated Unit 48-007(a)-00 consists of SWMUs 48-007(a and d) and 48-010 (Figure 5.9-1). These SWMUs include two active stormwater outfalls and a surface impoundment that receives discharge from the outfalls. These SWMUs also formerly received wastewater from the main radiochemistry laboratory in building 48-1.

SWMU 48-007(a) is an outfall formerly used to discharge treated cooling tower blowdown from two cooling towers located on the roof of building 48-1. This outfall is located east of building 48-1. Up to 750 gal./h of cooling tower blowdown were discharged from the outfall. Discharge from this outfall flowed to an unlined surface impoundment, SWMU 48-010. Water used in these cooling towers was treated to control scale, corrosion, and biological growth. Additives used included Garratt Callahan (G.C.) Formula 227-L, a corrosion and scaling inhibitor, and G.C. Formula 314-T, a biocide. Specific hazardous chemicals present in these additives, if any, are not known. Approximately 60% of the water in the cooling towers was evaporated, causing the chemical additives to be concentrated in the blowdown. This outfall formerly operated as an NPDES-permitted outfall (045/046 EPA 03A) but was removed from the NPDES permit on December 6, 1999, because industrial wastewater discharges to the outfall had been discontinued earlier in the year (LANL 1992, 007666). Stormwater continues to flow through the outfall.

SWMU 48-007(d) is an outfall formerly used to discharge noncontact cooling water that cooled a vacuum pump housed in the south end of building 48-1. This outfall is located east of building 48-1. Up to 4000 gal./d of cooling water was discharged from the outfall. Discharge from this outfall flowed to SWMU 48-010. This outfall formerly operated as an NPDES-permitted outfall (153 EPA 04A) but was removed from the NPDES permit on July 20, 1998, because industrial wastewater discharges to the outfall had been discontinued earlier in the year (LANL 1992, 007666). Stormwater continues to flow through the outfall.

SWMU 48-010 is an unlined surface impoundment that was constructed in 1978 by excavating directly into the tuff. The surface impoundment is located approximately 300 ft east of building 48-1 and 150 ft south of building 48-45. The surface impoundment formerly received cooling tower blowdown discharged from SWMU 48-007(a), noncontact cooling water discharged from SWMU 48-007(d), and stormwater runoff from the parking lot for building 48-45. Currently, the impoundment receives only stormwater from the parking lot. A wetland has developed around the impoundment. The impoundment and surrounding wetland cover approximately 100 ft × 150 ft. SWMU 48-010 discharges to the east into a side canyon that is a tributary to Mortandad Canyon (LANL 1992, 007666).

5.9.2 Relationship to Other SWMUs and AOCs

Consolidated Unit 48-007(a)-00 is located on the southeast corner of TA-48 and the outfalls follow the drainage into Mortandad Canyon to the east.

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

In 1993, a Phase I RFI was conducted at SWMUs 48-007(a and d) outfalls. The outfall locations were surveyed for radiation and organic vapors. The survey results indicated radiation levels were at background levels, and organic vapors were not detected. A parking lot was constructed east of building 48-1 that required the outfalls to be moved. The discharge from the SWMU 48-007(d) outfall was combined with the discharge from the SWMU 48-007(a) outfall. Therefore, samples were collected where the combined flows discharge to the impoundment. The samples were field screened for radioactivity and organic chemicals and submitted for analysis of inorganic chemicals and radionuclides using a combination of fixed and mobile laboratories. Because the fixed analytical laboratory was not able to complete all required analyses, soil and water samples were collected again in May 1995. The RFI activities and results were presented in the RFI report (LANL 1995, 050289).

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

Based on the responses to NMED's review of the Phase I RFI report (LANL 1996, 054448; LANL 1996, 055064), a SAP was prepared to collect additional samples to be analyzed for metals, radionuclides, SVOCs, and VOCs (LANL 1997, 055326). Sampling was conducted in 1997, but the data have not been reported. Decision-level data from the 1993 and 1997 investigations are included in this report.

5.9.4 Site Contamination

5.9.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at Consolidated Unit 48-007(a)-00 are shown in Figure 5.9-1. Table 5.9-1 provides the sampling locations, depths, objectives, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at Consolidated Unit 48-007(a)-00 consisted of the following activities in 2009:

- Soil and tuff samples were collected at five locations from four depth intervals: the surface interval, the soil/tuff interface interval, and the intervals beginning 10 ft and 15 ft below the soil/tuff interface. Two of the new sampling locations were downgradient of the outfalls, and the other three were next to the wetland area.

- Sediment and tuff samples were collected at five locations from two depth intervals: the surface sediment interval and the soil/tuff interval in the drainage at the head of Effluent Canyon.

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), dioxins and furans, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, strontium-90, tritium, and pH.

Samples collected from the Mortandad Canyon drainage immediately below the site during other investigations (Figure 5.9-1) were used as appropriate to determine whether lateral extent has been defined for Consolidated Unit 48-007(a)-00.

5.9.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.9.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.9-2 lists the inorganic chemicals above BVs at Consolidated Unit 48-007(a)-00. The identification of inorganic COPCs is presented in Appendix I, section I-5.7.1.

The inorganic chemicals identified as COPCs at Consolidated Unit 48-007(a)-00 are antimony, cadmium, chromium, hexavalent chromium, copper, total cyanide, manganese, mercury, nitrate, perchlorate, selenium, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.9-2.

Organic Chemicals

Table 5.9-3 lists the organic chemicals detected at Consolidated Unit 48-007(a)-00. The identification of organic COPCs is presented in Appendix I, section I-5.7.2.

The organic chemicals identified as COPCs at Consolidated Unit 48-007(a)-00 are acenaphthene; acetone, anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.9-1.

Radionuclides

Table 5.9-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.7.3.

The radionuclides identified as COPCs at Consolidated Unit 48-007(a)-00 are cesium-137, plutonium-238, plutonium-239/240, thorium-227, tritium, uranium-234, uranium-235/236, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.9-3.

5.9.4.4 Nature and Extent of Contamination

The nature and extent of contamination at Consolidated Unit 48-007(a)-00 are discussed in Appendix I, section I-5.7.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

5.9.5 Summary of Human Health Risk Screening

The human health risk-screening assessment for Consolidated Unit 48-007(a)-00 is discussed in Appendix J, sections J-4.2.4 and J-4.4.

The total excess cancer risks for the industrial and residential scenarios are 3×10^{-6} and 1×10^{-5}, respectively. These risks are below or equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.02 and 0.1, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 0.4 mrem/yr and 2 mrem/yr, respectively, which are below the DOE target dose limit of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 6×10^{-8}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 3×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk-screening assessment results, no potential unacceptable risks or doses from COPCs exist for the industrial and residential scenarios at Consolidated Unit 48-007(a)-00.

5.9.6 Summary of Ecological Risk Screening

The ecological risk-screening assessment is presented in Appendix J, section J-5.4. No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous canyon studies.

5.10 SWMU 48-007(b)—Cooling Tower Outfall from Building 48-1

5.10.1 Site Description and Operational History

SWMU 48-007(b) is an outfall that formerly discharged noncontact cooling water used to cool a magnet and laser housed in the main radiochemistry laboratory in building 48-1 (Figure 5.10-1). This outfall is

located north of building 48-1 and formerly discharged up to 4300 gal./d of cooling water. Water discharged from the outfall flowed into Mortandad Canyon (LANL 1992, 007666). This outfall formerly operated as an NPDES-permitted outfall (016 EPA 04A) but was removed from the NPDES permit on September 19, 1997, because industrial wastewater discharges were discontinued. Presently, the outfall receives only stormwater (LANL 2007, 098955).

5.10.2 Relationship to Other SWMUs and AOCs

The outfall of SWMU 48-007(b) follows a drainage into Mortandad Canyon, and the closest SWMU or AOC is the drainage of SWMU 48-007(c), which is approximately 150 ft to the west.

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

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

In 1997, additional soil samples were collected at SWMU 48-007(b) and submitted for laboratory analysis of radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565). Decision-level data from the 1993 and 1997 investigations are included in this report.

5.10.4 Site Contamination

5.10.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 48-007(b) are shown in Figure 5.10-1. Table 5.10-1 provides the sampling locations and the analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 48-007(b) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, tritium, and pH.

Samples collected from the Mortandad Canyon drainage during other investigations were used as applicable to determine whether lateral extent has been defined for SWMU 48-007(b).

5.10.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.10.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.10-2 lists the inorganic chemicals above BVs at SWMU 48-007(b). The identification of inorganic COPCs is presented in Appendix I, section I-5.8.1.

The inorganic chemicals identified as COPCs at SWMU 48-007(b) are aluminum, antimony, cadmium, chromium, hexavalent chromium, copper, iron, lead, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.10-2.

Organic Chemicals

Table 5.10-3 lists the organic chemicals detected at SWMU 48-007(b). The identification of organic COPCs is presented in Appendix I, section I-5.8.2.

The organic chemicals identified as COPCs at SWMU 48-007(b) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.10-1.

Radionuclides

Table 5.10-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.8.3.

The radionuclide identified as a COPC at SWMU 48-007(b) is cesium-137.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.10-3.

5.10.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 48-007(b) are discussed in Appendix I, section I-5.8.5.

The vertical extent of aluminum, chromium, iron, lead, nickel, perchlorate, and vanadium is not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

5.10.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(b), no human health risk-screening assessment was performed.

5.10.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(b), no ecological risk-screening assessment was performed.

5.11 SWMU 48-007(c)—Floor Drain Outfall from Building 48-1

5.11.1 Site Description and Operational History

SWMU 48-007(c) is an outfall that formerly received discharges from nine floor drains, a trench drain, and six roof drains at building 48-1 (Figure 5.11-1). This outfall is located north of building 48-1 and discharges into Mortandad Canyon (LANL 1992, 007666). Former sources of discharge to the floor drains included floor washings, backflow preventers, drainage and condensate from a vacuum pump, steam condensate, a boiler drain, a fire drain, and a water heater pressure relief valve. This outfall formerly operated as an NPDES-permitted outfall (131 EPA 04A) but was removed from the NPDES permit on January 14, 1998, because industrial wastewater discharges were discontinued (LANL 1997, 056565). Currently, this outfall receives only stormwater.

5.11.2 Relationship to Other SWMUs and AOCs

The outfall of SWMU 48-007(c) follows a drainage that is almost parallel to the drainage of SWMU 48-005, which is approximately 90 ft to the west.

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

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

In 1997, additional soil samples at SWMU 48-007(c) were collected and submitted for laboratory analysis of radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565). Decision-level data from the 1993 and 1997 investigations are included in this report.

5.11.4 Site Contamination

5.11.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 48-007(c) are shown in Figure 5.11-1. Table 5.11-1 provides the sampling locations, depths, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 48-007(c) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, hexavalent chromium, nitrate, perchlorate, cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, tritium, and pH.

Samples collected from the Mortandad Canyon drainage during other investigations will be used as applicable to determine whether lateral extent has been defined for SWMU 48-007(c).

5.11.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.11-2 lists the inorganic chemicals above BVs at SWMU 48-007(c). The identification of inorganic COPCs is presented in Appendix I, section I-5.9.1.

The inorganic chemicals identified as COPCs at SWMU 48-007(c) are antimony, cadmium, chromium, copper, iron, lead, nitrate, perchlorate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.11-2.

Organic Chemicals

Table 5.11-3 lists the organic chemicals detected at SWMU 48-007(c). The identification of organic COPCs is presented in Appendix I, section I-5.9.2.

The organic chemicals identified as COPCs at SWMU 48-007(c) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin;

1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.11-1.

Radionuclides

Table 5.11-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.9.3.

The radionuclides identified as COPCs at SWMU 48-007(c) are cesium-137 and uranium-235.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.11-3.

5.11.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 48-007(c) are discussed in Appendix I, section I-5.9.5.

The vertical extent of chromium and the lateral and vertical extent of lead are not defined at multiple locations. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at SWMU 48-007(c).

5.11.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(c), no human health risk-screening assessment was performed.

5.11.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(c), no ecological risk-screening assessment was performed.

5.12 SWMU 48-007(f)—Outfall from Building 48-46

5.12.1 Site Description and Operational History

SWMU 48-007(f) is an inactive outfall that formerly received discharges from two sink drains in an office and laboratory building (building 48-46). This outfall is located north of building 48-1 (Figure 5.12-1) and discharged into Mortandad Canyon (LANL 1992, 007666). In approximately 1993, the outfall ceased to operate. This outfall formerly operated as an NPDES-permitted outfall (137 EPA 04A) but was removed from the NPDES permit on December 6, 1995.

5.12.2 Relationship to Other SWMUs and AOCs

The outfall of SWMU 48-007(f) follows a drainage that eventually joins the drainage of SWMU 48-005.

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

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

In 1997, additional soil samples were collected at SWMU 48-007(f) and analyzed for radionuclides. The RFI activities and results were presented in the RFI report (LANL 1997, 056565). Decision-level data from the 1993 and 1997 investigations are included in this report.

5.12.4 Site Contamination

5.12.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 48-007(f) are shown in Figure 5.12-1. Table 5.12-1 provides the sampling locations, depths, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 48-007(f) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, tritium, isotopic uranium, and pH.

5.12.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.12.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.12-2 lists the inorganic chemicals above BVs at SWMU 48-007(f). The identification of inorganic COPCs is presented in Appendix I, section I-5.10.1.

The inorganic chemicals identified as COPCs at SWMU 48-007(f) are antimony, barium, cadmium, chromium, copper, manganese, nitrate, perchlorate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.12-2.

Organic Chemicals

Table 5.12-3 lists the organic chemicals detected at SWMU 48-007(f). The identification of organic COPCs is presented in Appendix I, section I-5.10.2.

The organic chemicals identified as COPCs at SWMU 48-007(f) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 5.12-1.

Radionuclides

Table 5.12-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-5.10.3.

The radionuclides identified as COPCs at SWMU 48-007(f) are cesium-137, plutonium-239/240, and tritium.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown in Figure 5.12-3.

5.12.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 48-007(f) are discussed in Appendix I, section I-5.10.5.

The lateral and vertical extent of chromium and the vertical extent of barium and manganese are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

5.12.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(f), no human health risk-screening assessment was performed.

5.12.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 48-007(f), no ecological risk-screening assessment was performed.

5.13 AOC 48-011—Radiation Detector Disposal Shaft

5.13.1 Site Description and Operational History

AOC 48-011 consists of a 3-ft-diameter × 65-ft-deep shaft reportedly drilled in 1976 or 1977 into the tuff on the east side of building 48-1 (Figure 5.13-1) for use in radiation-counting experiments. As part of these experiments, a 2-ft-diameter × 3-ft-long stainless-steel cylinder containing a sodium-iodide radiation detector was lowered into the shaft. This cylinder also contained approximately 3000 lb of lead shielding. As the cylinder was being lowered into the shaft, the cable broke and the cylinder fell to the bottom of the shaft. Because efforts to retrieve the cylinder were unsuccessful, it was left in place and covered (LANL 1992, 007666).

5.13.2 Relationship to Other SWMUs and AOCs

AOC 48-011 is located on the east side (north end) of building 48-1. There is no SWMU or AOC within 150 ft of AOC 48-011.

5.13.3 Summary of Previous Investigations for AOC 48-011

No previous investigation activities have been conducted at this AOC.

5.13.4 Site Contamination

5.13.4.1 Soil, Rock, and Sediment Sampling

The sampling location at AOC 48-011 is shown in Figure 5.13-1. Table 5.13-1 provides the sampling location, depths, objectives, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 48-011 will consist of the following activities in 2009:

- Tuff samples were collected at one location from four depth intervals: the intervals beginning at 65 ft bgs, 75 ft bgs, 85 ft bgs and 100 ft bgs. The sampling location was on the downslope side of the shaft.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, tritium, and pH.

5.13.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.13.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 5.13-2 lists the inorganic chemicals above BVs at AOC 48-011. The identification of inorganic COPCs is presented in Appendix I, section I-5.11.1.

The inorganic chemicals identified as COPCs at AOC 48-011 are antimony, nitrate, perchlorate, and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 5.13-2.

Organic Chemicals

Table 5.13-3 lists the organic chemicals detected at AOC 48-011. The identification of organic COPCs is presented in Appendix I, section I-5.11.2.

The organic chemicals identified as COPCs at AOC 48-011 are Aroclor-1254; benzoic acid; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,1,2-trichloroethane.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 5.13-3.

Radionuclides

No radionuclides were detected or detected above BVs/FVs at AOC 48-011. The identification of radionuclide COPCs is presented in Appendix I, section I-5.11.3.

No radionuclides are identified as COPCs at AOC 48-011.

5.13.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 48-011 are discussed in Appendix I, section I-5.13.5.

The vertical extent for all inorganic and organic COPCs is defined at AOC 48-011. Lateral extent was not evaluated because only one location was sampled, as directed by the approved work plan (LANL 2008, 100750; NMED 2008, 101110).

5.13.5 Summary of Human Health Risk Screening

The samples and the potential contamination associated with the disposal shaft are at 65 ft bgs or deeper. A risk-screening assessment was conducted using maximum detected concentrations of the COPCs from the sampled depths. The human health risk-screening assessment for AOC 48-011 is discussed in Appendix J, sections J-4.2.5 and J-4.4.

The total excess cancer risk for the residential scenario is 9×10^{-9}; which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.002, which is below the NMED target HI of 1.0 (NMED 2009, 106420).

Based on the preliminary risk-screening assessment results, there are no potential unacceptable risks from COPCs for the residential scenario.

5.13.6 Summary of Ecological Risk Screening

The samples and the potential contamination associated with the disposal shaft are at 65 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted at AOC 48-011.

5.14 AOC 48-012—Soil Contamination

5.14.1 Site Description and Operational History

AOC 48-012 is a small area of stained soil discovered in August 2002 during routine trenching operations east of building 48-1 (Figure 5.14-1). After the stained soil was discovered, trenching operations were shut down in the area, and the site was reported to NMED as a one-time spill.

5.14.2 Relationship to Other SWMUs and AOCs

AOC 48-012 is located approximately 70 ft to the east of AOC 48-002(e), a container storage area, north of building 48-89 and between buildings 48-17 and 48-214.

5.14.3 Summary of Previous Investigations for AOC 48-012

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

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

In May 2003, a VCA report was submitted to NMED (LANL 2003, 080917). The report details the investigation and the cleanup activities associated with AOC 48-012. Decision-level data from the VCA are included in this report.

5.14.4 Site Contamination

5.14.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at AOC 48-012 are shown in Figure 5.14-1. Table 5.14-1 provides the sampling locations, depths, and analyses requested. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at AOC 48-012 consisted of the following activities in 2009:

- Soil and tuff samples were collected at four locations from three depth intervals: the soil/tuff interface interval and intervals beginning 10 ft and 15 ft below the soil/tuff interface. The sampling locations were outside, but within 2 ft of, the perimeter of the former excavation.

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

5.14.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

5.14.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Organic Chemicals

Table 5.14-2 lists the organic chemicals detected at AOC 48-012. The identification of organic COPCs is presented in Appendix I, section I-5.12.1.

The organic chemicals identified as COPCs at AOC 48-012 are acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; dibenzofuran; 2,4-dimethylphenol; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; 2-methylphenol; 4-methylphenol; naphthalene; phenanthrene; and pyrene.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 5.14-2.

5.14.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 48-012 are discussed in Appendix I, section I-5.12.3.

The lateral and vertical extent of all organic COPCs are defined at AOC 48-012.

5.14.5 Summary of Human Health Risk Screening

The human health risk-screening assessment for AOC 48-012 is discussed in Appendix J, sections J-4.2.6 and J-4.4.

The total excess cancer risks for the construction worker and residential scenarios are 1×10^{-5} and 5×10^{-4}, respectively. The risk for the construction worker scenario is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420), while the risk for the residential scenario is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.05 and 0.1 respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420).

Based on the risk-screening assessment results, no potential unacceptable risk from COPCs exists for the construction worker scenario. Potential unacceptable excess cancer risk exists for the residential scenario, primarily because of dibenz(a,h)anthracene.

5.14.6 Summary of Ecological Risk Screening

One sample was collected from 4–5 ft bgs but had no detections. The remaining samples and the potential contamination associated with the soil contamination are 6 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted.

6.0 TA-50 BACKGROUND AND FIELD-INVESTIGATION RESULTS

6.1 Background of TA-50

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

Seven AOCs and 12 SWMUs located in TA-50 are addressed in this investigation report.

- SWMU 50-001(a) is the TA-50 RLWTF (building 50-1).
- AOC 50-001(b) is an active drainline system transferring liquid waste to the RLWTF.
- SWMU 50-002(a) is an underground reinforced concrete vault (building 50-2) that houses equipment, tanks, and transfer lines, all of which are associated with the RLWTF.
- Consolidated Unit 50-002(b)-00 consists of SWMUs 50-002(b and c).
    - ❖ SWMUs 50-002(b) and 50-002(c) are the waste tanks (structures 50-67 and 50-68, respectively) and associated inlet and outlet lines housed in an underground reinforced-concrete vault (structure 50-66) at the RLWTF.
- AOC 50-002(d) is a decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-5) at the RLWTF.
- AOC 50-003(a) is a former RCRA interim status unit located in room 59 of building 50-1 to store containers of solid, cemented mixed-transuranic (TRU) sludge resulting from waste treatment activities.
- Consolidated Unit 50-004(a)-00 consists of SWMUs 50-004(a, b, and c).
    - ❖ SWMU 50-004(a) is the location of former underground radioactive liquid waste and industrial waste lines.
    - ❖ SWMU 50-004(b) is the location of a former underground vault (structure 50-3) that housed three stainless-steel lined concrete storage tanks.
    - ❖ SWMU 50-004(c) consists of 13 industrial waste lines and 3 associated manholes that discharged to the underground tank vault [SWMU 50-004(b)].
- SWMU 50-006(a) is the site of two accidental operational releases from the sump.
- SWMU 50-006(c) is the surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants from historical stack emissions at TA-50.
- SWMU 50-006(d) is a TA-50 drainline (structure 50-64) and associated NPDES-permitted Outfall 051 in Mortandad Canyon for treated wastewater from the RLWTF.
- AOC 50-007 is the former incinerator complex in building 50-37.
- AOC 50-008 is formerly a volume reduction facility, currently the waste characterization, reduction, and repackaging facility (WCRRF), in building 50-69.
- SWMU 50-009 is MDA C.

- AOC 50-010 is the former vehicle decontamination bay located in room 34B of the RLWTF, building 50-1.
- SWMU 50-011(a) is the former septic system at the south end of the RLWTF.
- AOC 50-011(b) are the two sanitary wastewater lift stations (structures 50-91 and 50-92) and associated piping.

6.1.1 Operational History

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

The incinerator complex (building 50-37), built in 1975, and the volume-reduction facility (building 50-69), built in 1983, were prototype facilities for developing and testing improved methods of handling and treating certain types of radioactive waste.

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

6.1.2 Summary of Releases

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

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

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

6.1.3 Current Site Usage and Status

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

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

6.2.1 Site Description and Operational History

SWMU 50-001(a) consists of the TA-50 RLWTF (building 50-1) (Figure 6.2-1). This treatment plant treats LLW water from various parts of the Laboratory. The TA-50 RLWTF has operated continuously since its construction in 1963. The TA-50 RLWTF primarily removes TRU elements using neutralization, flocculation and clarification, pH control, ion-exchange filtration, and ultrafiltration, and reverse-osmosis

processes. Treated effluent is monitored and discharged to an NPDES-permitted outfall [SWMU 50-006(d)] in Mortandad Canyon. Associated with the TA-50 RLWTF is a system of drainlines and tanks that transfers, treats, and temporarily stores the liquid waste and treated sludge. The drainlines and tanks are not part of SWMU 50-001(a). The drainlines are SWMU 50-001(b), and the tanks are SWMU 50-002(a) and Consolidated Unit 50-002(b)-00.

In July 1990, core samples collected from boreholes drilled through the floor of building 50-1, around the pH-adjustment tank (also known as the grit chamber), indicated the inlet line to the pH-adjustment tank had leaked. Therefore, influent wastes were rerouted to building 50-2 (LANL 1992, 007672).

6.2.2 Relationship to Other SWMUs and AOCs

SWMU 50-001(a) is the TA-50 RLWTF that treats LLW water from various parts of the Laboratory. Associated with the TA-50 RLWTF is a system of drainlines and tanks [SWMUs 50-001(b) and 50-002(a) and Consolidated Unit 50-002(b)-00] that transfers, treats, and temporarily stores liquid waste and treated sludge. Consolidated Unit 50-004(a)-00 is the former underground RLW and industrial waste systems that connected to RLWTF (only one component, waste line 56, still exists). Treated effluent at RLWTF is monitored and discharged to an NPDES-permitted outfall [SWMU 50-006(d)] in Mortandad Canyon. SWMU 50-011(a) is a former septic system at the south end of RLWTF. Also, AOCs 50-002(d), 50-003(a), and 50-010 are located within the RLWTF.

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

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

6.2.4 Delayed Site Investigation Rationale

SWMU 50-001(a) consists of an active RLWTF that is also a Hazard Category 2 Nuclear Facility. The investigation work plan (LANL 2008, 100750) proposed delaying site characterization and investigation until future D&D of the RLWTF. NMED approved this proposal (NMED 2008, 101110).

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

6.3.1 Site Description and Operational History

AOC 50-001(b) is the active underground drainline system through which RLW is collected and transferred throughout TA-50 facilities, including the RLWTF (building 50-1) (Figure 6.3-1). The collection system was installed in 1982 and typically consists of an 8-in.-diameter high-density polyethylene (HDPE) pipe (to protect against corrosion) within a 12-in.-diameter HDPE pipe that provides double containment and a leak-detection system. Underground vaults and manholes were installed at piping junctions and other strategic locations. At each vault/manhole, the outer pipe on the RLW line terminates at the structure wall to allow the annular space to be monitored for the detection of leaks from the inner piping (Appendix C, C-10a through C-10d). Each vault/manhole is equipped with transmitting detectors that will signal an alarm to the RLWTF monitoring stations if any liquid is detected in the annulus between the inner and outer pipes. The RLW lines and vaults/manholes are sloped to provide gravity flow so any liquid from a leak in the interior line would flow within the containment pipe to the downstream vault/manhole where it would be detected. Each vault/manhole provides secondary containment for piping running through the structure and is equipped with a sump and a liquid sensor that will transmit an alarm to the RLWTF monitoring stations if any liquid is detected. The interior of each vault/manhole is coated to prevent infiltration of any contaminated liquid waste. All penetrations to each vault/manholes are sealed to

prevent the infiltration of surface water (Appendix C, C-10a through C-10d). The leak detection system on the RLW collection system is tested routinely, and the vaults are inspected monthly. The leak detection system has never indicated leakage of waste from the inner pipe into the outer containment pipe.

Vault/manhole 50-072 is the central collection area at the TA-50 RLWTF for most incoming RLW. Three RLW lines feed into vault 50-072:

- In 1982, a major line connecting several TAs to this vault was constructed to replace an old RLW line [Consolidated Unit 50-004(a)-00]. The new RLW line consists of a double polyethylene pipe that enters structure 50-72 from the north side of Pecos Drive (LANL 1992, 007672).
- Another RLW line tied into structure 50-72, completed in 1982, transports RLW from structure 50-73 (a vault), which receives wastes from building 50-69 (a volume reduction facility, AOC 50-008) and building 50-37 (the incinerator complex, AOC 50-007). This line is a 6-in. polyethylene line within a 10-in. polyethylene line.
- A third line, also installed in 1982, transports RLW from TA-55 to structure 50-72 through two manholes (structures 50-16 and 50-78). The line consists of an inner stainless-steel pipe within a polyvinyl chloride (PVC) pipe.

A single drainline carried all influent from structure 50-72 into the grit tank at building 50-1 until a leak around the grit tank was detected in 1990 (LANL 1992, 007672). The line now bypasses the grit chamber and passes through the neutralization chamber before it connects to the building 50-2 tank vault [SWMU 50-002(a)]. This portion of the line consists of an inner 8-in. schedule 40 stainless-steel pipe and an outer 10-in. schedule 10 stainless-steel pipe. Structure 50-7, another manhole of the influent RLW collection system, is connected to the waste line from the tank truck unloading station (structure 50-77). Structure 50-7 has been out of service since the early 1990s (LANL 1992, 007672).

Four other RLW lines run from TA-55 to building 50-1 through structure 50-106 to tanks in an underground vault (structure 50-66). Three of the lines are 1.5-in. stainless-steel lines, each located within an outer 3-in. PVC pipe. Two of the three lines carry caustic and acid TRU wastes with high radioactivity. The third line is a spare that has never been used. The fourth line, which is for non-TRU industrial waste, is a 2-in.-diameter stainless-steel line within an outer 3-in. PVC. The lines operate by gravity flow, and the end of each is monitored continuously for leaks at TA-55 and at two acid pits (structures 50-57 and 50-66) by a drip-tray and conductivity probe system wired to a computer for continuous readout. The three nonindustrial waste lines were replaced in 1994. The new lines were tied into the existing lines in 2005 and were put into service in 2008. According to the 1990 SWMU report, there was some concern about contamination from the waste lines carrying TA-55 effluent because the original vacuum seals reportedly lost their integrity (LANL 1990, 007513). However, the drip pans at TA-55 and TA-50 have never collected fluid that would have indicated a release from the inner waste lines. The area where the lines enter building 50-1 and the area west and north of the RLW tank farm (building 50-2) were sampled in August 1990; analytical results showed no radionuclides detected above BVs (LANL 1992, 007672).

6.3.2 Relationship to Other SWMUs and AOCs

AOC 50-001(b) is an active underground drainline system transferring liquid waste to the RLWTF [SWMU 50-001(a)]. One of the Consolidated Unit 50-004(a)-00 RLW lines was connected to a manhole of AOC 50-001(b) until 1982 when the line was removed and replaced with the new double-walled RLW line. Another waste line that transports low-level radioactive liquids from AOCs 50-007 and 50-008 also connects to the manhole of AOC 50-001(b). A drainline from the manhole of AOC 50-001(b) eventually connects to SWMU 50-002(a).

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

During tie-in activities for the new RLW lines at TA-55 in 2005, six samples were collected from a depth of 0 to 0.5 ft beneath the bottom of the four existing AOC 50-001(b) RLW lines (13.5 ft to 14 ft bgs) in an excavation between buildings 55-4 and 55-2 (sample IDs MD50-05-60732, MD50-05-60733, MD50-05-60734, MD50-05-60735, MD50-05-60738, and MD50-05-60739) (Appendix C, C-10e through C-10l). The samples were field screened for radioactivity and submitted to the Laboratory's SMO for analysis of VOCs, SVOCs, perchlorate, metals, cyanide, gamma spectroscopy, americium-241, isotopic plutonium, isotopic uranium, tritium, strontium-90, and nitrates. Field screening showed no elevated radioactivity above background. No radionuclides were detected above BVs. Methylene chloride was detected in one sample. Chromium and zinc were each detected in one sample above BVs.

6.3.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 50-001(b) because characterizing this site, which is located adjacent to an active nuclear facility, is not feasible. Site access for equipment needed for subsurface investigations is extremely limited. Available information, including the design features of the site, indicates a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath buildings or paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the waste lines associated with AOC 50-001(b). The waste collection lines and manholes were designed as a gravity flow system and were not designed to be pressure tested. Rather than using pressure testing as a means of integrity assessment, the system utilizes a double-containment leak-detection system. As described in section 6.3.1, all the drainline segments are double-containment lines, and the underground vaults provide double containment at all joints and connections. The double-containment design allows for continuous monitoring for leaks from the inner pipes that transport the wastewater. Leak-detection monitoring has been performed since the system was placed in service in 1982. No releases from the waste conveyance system to the environment have been detected, and the likelihood of undetected releases is very remote.

The leak detection system on the RLW collection system is routinely tested, and the vaults are inspected on a monthly basis. To date, all instances of detection of liquid within the containment vaults have been determined to have been caused by infiltration of stormwater rather than leaks from the pipes. The collection system is 27 yr old, and the seals on vault/manhole penetrations to prevent the infiltration of stormwater are degrading. Inspections conducted in 2007 and 2008 indicate stormwater is consistently infiltrating many of the manholes/vaults. Any water discovered in a manhole/vault is sampled and analyzed for gross-alpha radioactivity. To date, results have confirmed the source of water in the vaults/manholes is from infiltration of stormwater and not from leaks in the RLW lines (Appendix C, C-10m and C-10n). The Laboratory is in the process of implementing upgrades to the vaults, including replacing the seals. The system will continue to be maintained and monitored for as long as it is operational. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of the TA-50 facility has been completed.

6.4 SWMU 50-002(a)—Underground Tanks

6.4.1 Site Description and Operational History

SWMU 50-002(a) consists of an underground, reinforced-concrete vault (building 50-2) (Figure 6.2-1) that houses an equipment room, six flow-through process tanks, and several waste-transfer lines, all of which are associated with the TA-50 RLWTF (building 50-1) (reference engineering drawings). The floor of the vault is 17 ft below ground. The holding tanks located within the vault (building 50-2) include two influent tanks (25,000 gal. and 75,000 gal.) and two 25,000-gal. tanks used to store treated waste for reuse. The fifth tank (capacity 25,000 gal.) flows into the 75,000-gal. tank and was previously used to store waste during D&D activities; this tank was equipped with a new liner and is available for standby use. The sixth tank (capacity 30,000 gal.) originally functioned as a holding tank for low-level sludge. In June 2001, the 30,000-gal. tank was drained, rinsed, and taken off-line by closing its valve; currently, this tank is available for standby use (Appendix C, C-11a through C-11g). The tanks are part of the building foundation with concrete tops and are not designed to be pressure tested. Each tank is equipped with level indicators tied into the RLWTF monitoring and alarm system that is monitored 24 hr/d.

Wastes are transported to the vault (building 50-2) through a system of transfer lines. Waste transfer lines include six cast-iron lines (including lines 55 and 67) connecting the RLWTF (building 50-1) to the equipment room in the vault (building 50-2); four steel lines added in 1984 to connect room 61 to the equipment room in building 50-2; five cast-iron lines from drains in building 50-1 and one cast-iron line from a sink in the former vehicle-decontamination bay in building 50-1 to the former D&D tank in building 50-2; an influent line connecting building 50-2 to a 100,000-gal. holding tank (structure 50-90); and an effluent line connecting the holding tank to one of the 25,000-gal. influent tanks in the building 50-2 vault. The waste transfer lines are equipped with flow-monitoring detectors and are not designed to be pressure tested.

In July and September 1974, two separate, unintentional operational releases occurred from the overflow of a sump in building 50-2. Both releases caused untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent) and into the outfall area at the head of Ten Site Canyon [SWMU 50-006(a)]. In February 1975, waste line 67 was plugged at its outfall. In 1990, the integrity of the building 50-2 concrete walls and the pipelines tied from the tank farm to building 50-1 were checked, and no leaks were found (LANL 1992, 007672). The area west and north of the RLW tank farm (building 50-2) was sampled by IT Corporation in August 1990; analytical results showed no radionuclides detected above BVs (LANL 1992, 007672).

6.4.2 Relationship to Other SWMUs and AOCs

All the components of SWMU 50-002(a) are associated with RLWTF [SWMU 50-001(a)]. In July and September 1974, two separate unintentional operational releases occurred from the overflow of a sump in SWMU 50-002(a). Both releases caused untreated wastewater to be discharged to through waste lines into the outfall area at the head of Ten Site Canyon [SWMU 50-006(a)].

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

During RFI activities implemented in 1995, one near-surface sample was collected from a depth of 0.33 to 0.66 ft bgs at SWMU 50-002(a); no additional RFI activities have been conducted at this SWMU. The sample was analyzed for metals, uranium, PCBs/pesticides, SVOCs, VOCs, gamma spectroscopy, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Chromium and cobalt were detected above BVs and tritium was detected above the BV.

6.4.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for SWMU 50-002(a) because characterizing this site, which is located inside an active nuclear facility, is not feasible. Available information, including the design features of the site, indicates a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath the floor of building 50-2, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the waste tanks and lines associated with SWMU 50-002(a). The waste collection and transfer system inside building 50-2 is not designed to be pressure tested and relies on other means of leak detection. As described in section 6.4.1, each tank in building 50-2 is equipped with a level indicator tied into the RLWTF monitoring and alarm system, which is monitored 24 hr/d, and the waste transfer lines are equipped with flow monitors. No releases from the tanks or waste transfer lines to the environment have been detected, and the likelihood of undetected releases is very remote.

The Laboratory is in the process of designing a new RLWTF at TA-50 that will include new influent and effluent storage tanks and new waste-transfer lines. The tanks in vault 50-002 and the waste transfer lines will continue to be maintained and monitored for as long as it is operational. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of vault 50-002 has been completed.

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

6.5.1 Site Description and Operational History

Consolidated Unit 50-002(b)-00 consists of SWMUs 50-002(b and c), two waste tanks (structures 50-67 and 50-68) and their associated inlet and outlet lines housed in an underground reinforced-concrete tank vault (structure 50-66) at the TA-50 RLWTF [building 50-1, SWMU 50-001(a)] (Figure 6.3-1). The concrete vault measures 18 ft × 16 ft × 14 ft deep and is located about 30 ft from the southwest corner of building 50-1. The two waste tanks and the tank vault were constructed exclusively to store radioactive caustic waste (structure 50-67) and acidic waste (structure 50-68) from TA-55, where TRU wastes are generated. TRU wastes are processed separately from other wastes. The inlet lines consist of four stainless-steel pipes encased in PVC. One line is a capped backup. The second line carries radioactive acid waste to the acid waste tank. The third line carries radioactive caustic waste to the caustic tank. Wastes are transferred from the tanks through two double stainless-steel lines to room 60, building 50-1. The operation is monitored for criticality hazards, and necessary adjustments are made before treatment. The fourth line carries RLW to a manhole (structure 50-72) [AOC 50-001(b)]. No documented releases are associated with Consolidated Unit 50-002(b)-00 (LANL 1992, 007672).

6.5.2 Relationship to Other SWMUs and AOCs

All components of Consolidated Unit 50-002(b)-00 are associated with RLWTF [SWMU 50-001(a)].

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

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

6.5.4 Delayed Site Investigation Rationale

Consolidated Unit 50-002(b)-00 is an active system. The investigation work plan (LANL 2008, 100750) proposed that site characterization and investigation be delayed until the tanks are removed. NMED approved this proposal (NMED 2008, 101110).

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

6.6.1 Site Description and Operational History

AOC 50-002(d) is a decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-5) located at building 50-1 (the RLWTF) (Figure 6.6-1). The tank is outside and next to the north wall of room 63D. Before it was decommissioned, the tank was used to store product (nitric acid). The storage tank was part of the ion-exchange column system at the RLWTF (building 50-1). The ion-exchange system was designed to remove any radioisotopes not previously removed by the clariflocculator system at the RLWTF. Because the clariflocculator system was so successful in removing radioisotopes from wastewater to levels consistently below DOE limits at the time, the ion-exchange column was rarely used, and the tank was consequently never filled to capacity. In late 1964, a new tank (structure 50-5) replaced the original nitric acid tank after the original rubber-lined carbon steel tank reportedly leaked; however, there are no records documenting a release from the former tank. The new tank is supported on concrete saddles that extend 5 ft bgs. A concrete sump filled with limestone chips (structure 50-12) was installed beneath the new tank. The tank was vented to the sump to neutralize any nitric acid vapors emitted when the tank was filled. In accordance with the Laboratory's stormwater pollution prevention plan (SWPPP), concrete containment walls and a concrete slab were installed around the tank (Appendix C, C-12a). In 1996, the tank was decommissioned (emptied, triple rinsed, and all piping and valves disconnected from the building and plugged) (LANL 2000, 067470.24). Since the tank has been decommissioned it, cannot be pressure tested; however, visual inspection reveals the tank remains in good condition.

6.6.2 Relationship to Other SWMUs and AOCs

AOC 50-002(d) is next to the north wall of room 63D of building 50-1. AOC 50-003(a) is located in room 59 of building 50-1, which is immediately east of AOC 50-002(d).

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

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

6.6.4 Site Contamination

Sampling of the sump was performed beneath the storage tank, and the results of the investigation are described below. Investigation of the soil beneath the tank and sump will be delayed until the tank is removed (see section 6.6.7).

6.6.4.1 Swipe Sampling

Four swipe samples were collected from the concrete sump beneath the storage tank. The samples were analyzed for, TAL metals, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 6.6-1 provides the sampling locations and analyses requested. Figure 6.6-1 shows the sampling locations.

6.6.4.2 Field-Screening Results

Because only swipe samples were collected at AOC 50-002(d), field screening was not performed.

6.6.4.3 Swipe Sampling Analytical Results

Inorganic Chemicals

Table 6.6-2 lists the inorganic chemicals detected on swipe samples from AOC 50-002(d). Discussion of inorganic chemicals on the swipe samples is presented in Appendix I, section I-6.5.1.

The inorganic chemicals detected on swipe samples at AOC 50-002(d) are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc. Because the tank was used only to store nitric acid, the inorganic chemicals detected are unrelated to AOC 50-002(d).

The sampling locations and detected concentrations of inorganic chemicals are shown in Figure 6.6-2.

Organic Chemicals

Table 6.6-3 lists the organic chemicals detected on swipe samples from AOC 50-002(d). Discussion of organic chemicals detected on the swipe samples is presented in Appendix I, section I-6.5.2.

The organic chemicals detected on swipe samples at AOC 50-002(d) are acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene. Because the tank was used only to store nitric acid, the organic chemicals detected are unrelated to AOC 50-002(d).

Sampling locations and detected concentrations of organic chemicals are shown in Figure 6.6-3.

Radionuclides

No radionuclides were detected on the swipe samples collected at AOC 50-002(d).

6.6.4.4 Nature and Extent of Contamination

The nature and extent of contamination at AOC 50-002(d) are discussed in Appendix I, section I-6.5.5.

Because the tank was used only to store nitric acid, the COPCs identified are unrelated to AOC 50-002(d). Further investigation is delayed (see section 6.6.7).

6.6.5 Summary of Human Health Risk Screening

A human health risk-screening assessment is not possible using the available data (swipe samples only) for AOC 50-002(d).

6.6.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment is not possible using the available data (swipe samples only) for AOC 50-002(d).

6.6.7 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 50-002(d) because characterizing this site, which is located next to an active nuclear facility, is not feasible. Site access for equipment needed for subsurface investigations is extremely limited. Available information, including the design features of the site, indicates a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath buildings or paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the tank. The tank was not designed to be pressure tested, and alternate means of leak detection (e.g., inspections) were available. There is no available documentation to confirm the original 1964 nitric acid tank leaked. An undetected leak of nitric acid is unlikely because of safety concerns for the personnel. Even if minor releases had occurred, once the former tank was removed, excavation of soil to install of two 5-ft-deep concrete saddles for the new tank resulted in the removal of soil potentially contaminated from historical releases of nitric acid. Additionally, carbonates found in native basic soils would aid in neutralization of any released nitric acid. Residual nitrate would likely have biodegraded in the 44 yr since the first tank was removed. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of the TA-50 RLWTF has been completed.

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

6.7.1 Site Description and Operational History

AOC 50-003(a) is a former RCRA interim-status unit that was located in room 59 of building 50-1 (Figure 6.2-1). This unit was used to store containers of solid, cemented, mixed-TRU sludge resulting from waste treatment activities. During its period of operation, this AOC operated in accordance with the requirements of 20.4.1.600 New Mexico Administrative Code (NMAC) 4.1 and 40 CFR 265, Subparts A–D and I. NMED approved clean closure for AOC 50-003(a) in November 2004 (NMED 2004, 098488). Investigation was not proposed in the investigation work plan (LANL 2008, 100750) because this is a RCRA closure site.

6.7.2 Relationship to Other SWMUs and AOCs

AOC 50-003(a) is located in room 59 of building 50-1, which is immediately east of AOC 50-002(d).

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

No previous investigation activities were conducted at AOC 50-003(a) because this site was subject to RCRA closure requirements.

6.7.4 Current Site Status

AOC 50-003(a) was approved for clean closure by NMED in November 2004 (NMED 2004, 098488). No additional investigation or other actions are required for this site.

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

6.8.1 Site Description and Operational History

Consolidated Unit 50-004(a)-00 (Figure 6.8-1) consists of SWMUs 50-004(a, b, and c), which are former components and one existing component (waste line 56) of the TA-50 RLWTF.

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

SWMU 50-004(b) is the location of a decommissioned underground vault (structure 50-3) that housed three stainless-steel-lined concrete storage tanks. The tanks, ranging in volume from 1000 to 4500 gal., were used to collect and store wastewater from the former Omega Reactor at TA-02. Waste lines to this tank vault included waste line 49 from TA-35 and waste line 50 from building 50-1. Waste line 49, the vault, and the tanks were removed in 1989. Soil sampled during decommissioning was screened for radionuclides and chemical constituents. No elevated concentrations were detected (LANL 1992, 007672).

SWMU 50-004(c) consists of 13 industrial waste lines (lines 44, 45, 45a, 46, 47, 48, 48a, 49, 54, 55, 56, 65, and 67) and three associated manholes (structures 50-6, 50-55, and 50-56) that discharged to the decommissioned underground tank vault (structure 50-3). With the exception of waste line 56, all waste lines and manholes associated with the underground vault [SWMU 50-004(b)] were removed between 1981 and 1989 (Elder et al. 1986, 006666; LANL 1992, 007672). Waste line 56 remains in service. Radionuclide contamination encountered during decommissioning of the waste lines and manholes was remediated to regulatory levels through removal of the pipe and soil to approximately 19 ft bgs. Field screening for radionuclides confirmed regulatory levels were met (LANL 1992, 007672).

6.8.2 Relationship to Other SWMUs and AOCs

Consolidated Unit 50-004(a)-00 consists of former components and one existing component (waste line 56) of the TA-50 RLWTF. The line systems run across the northwest corner of TA-50 and are associated with various buildings at TA-50.

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

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

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

At SWMU 50-004(c), 67 samples were collected from depths up to approximately 14 ft in 29 locations. Samples were field screened for radionuclides and organic vapors and submitted for off-site laboratory

analysis of organic chemicals, inorganic chemicals, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1996, 054836).

In 2001, additional samples were collected and analyzed for metals, radionuclides, PCBs, pesticides, SVOCs, TPH-DRO, and VOCs (LANL 2005, 087834).

Decision-level data from the 1994 and 2001 investigation activities are included in this report.

6.8.4 Site Contamination

6.8.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at Consolidated Unit 50-004(a)-00 are shown in Figure 6.8-1. Table 6.8-1 provides the sampling locations, depths, and analyses requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at Consolidated Unit 50-004(a)-00 consisted of the following activities in 2009:

- Tuff samples were collected at two locations (previous sampling locations 50-03038 and 50-03021) from two depth intervals: the intervals beginning 15 ft bgs and 20 ft bgs.
- Tuff samples were collected at two locations (previous sampling locations 50-03005 and 50-03001) from three depth intervals: the intervals beginning 10 ft bgs, 15 ft bgs, and 20 ft bgs.
- Tuff samples were collected at four locations from five depth intervals: the surface interval, soil/tuff interface interval, the interval beginning 5 ft below the soil/tuff interface, the interval beginning 10 ft below the soil/tuff interface, and the interval beginning 15 ft below the soil/tuff interface.
- Tuff samples were collected at 24 locations from three depths intervals: the base of the pipeline backfill, soil/tuff interface interval directly below the backfill, and the interval beginning 5 ft below the pipeline.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH.

6.8.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

6.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.8-2 lists the inorganic chemicals above BVs at Consolidated Unit 50-004(a)-00. The identification of inorganic COPCs is presented in Appendix I, section I-6.7.1.

The inorganic chemicals identified as COPCs at Consolidated Unit 50-004(a)-00 are antimony, barium, beryllium, cadmium, chromium, cobalt, copper, cyanide (total), iron, magnesium, mercury, nickel, nitrate, perchlorate, selenium, thallium, and vanadium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 6.8-1.

Organic Chemicals

Table 6.8-3 lists the organic chemicals detected at Consolidated Unit 50-004(a)-00. The identification of organic COPCs is presented in Appendix I, section I-6.7.2.

The organic chemicals identified as COPCs at Consolidated Unit 50-004(a)-00 are 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; chrysene; di-n-butylphthalate; 1,1-dichloroethene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichloroethene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 6.8-2.

Radionuclides

Table 6.8-4 lists the radionuclides detected or detected above BVs/FVs or detected in samples with no applicable BVs/FVs at Consolidated Unit 50-004(a)-00. The identification of radionuclide COPCs is presented in Appendix I, section I-6.7.3.

The radionuclides identified as COPCs at Consolidated Unit 50-004(a)-00 are americium-241, cesium-137, plutonium-238, plutonium-238/240, tritium, and uranium-235/236.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 6.8-3.

6.8.4.4 Nature and Extent of Contamination

The nature and extent of contamination at Consolidated Unit 50-004(a)-00 are discussed in Appendix I, section I-6.7.5.

The vertical extent of chromium, the lateral extent of nickel, and the lateral and vertical extent of barium, beryllium, cobalt, and copper are not defined. The vertical extent of plutonium-239/240 and tritium are not defined at multiple locations. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined.

6.8.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 50-004(a)-00, no human health risk-screening assessment was performed.

6.8.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at Consolidated Unit 50-004(a)-00, no ecological risk-screening assessment was performed.

6.9 SWMU 50-006(a)—Operational Releases from Sump

6.9.1 Site Description and Operational History

SWMU 50-006(a) is the outfall area at the head of Ten Site Canyon (Figure 6.9-1) impacted by two accidental operational releases when a sump in a pumping station (building 50-2) overflowed, causing untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent). The releases occurred in July and September 1974 (LANL 1995, 049925). In February 1975, waste line 67 was plugged at its outfall. A soil sample collected from the outfall area when waste line 67 was plugged showed elevated levels of gross-alpha radioactivity. Analysis of additional soil samples collected below the waste line 67 outfall in September 1976 showed elevated levels of gross-alpha radioactivity extending 984 ft downgradient of the outfall. In 1981, both waste lines 55 and 67 were completely removed (Elder et al. 1986, 003089). During waste line removal, elevated levels of radionuclides, including plutonium-239, ruthenium-106, cesium-137, strontium-89, and yttrium-90, were detected. As a result, the outfall area was partially remediated by the removal of 70 m^3 of contaminated soil from the outfall location (LANL 1992, 007672).

6.9.2 Relationship to Other SWMUs and AOCs

SWMU 50-006(a) drains into Ten Site Canyon, which is located northeast of SWMU 50-009 (MDA C).

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

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

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

Decision-level data from the 1993 investigation and the 1996 IA activities are included in this report.

6.9.4 Site Contamination

6.9.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 50-006(a) are shown in Figure 6.9-1. Table 6.9-1 provides the sampling locations, depths, and the analyses requested for each sample. The sampling locations were selected to bracket the former discharge point where the release occurred, to supplement the existing sampling locations both upstream and downstream in the drainage, and to confirm the results of the partial cleanup performed in 1981. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 50-006(a) consisted of the following activities in 2009:

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

Samples were analyzed at off-site fixed laboratories for TAL metals, anions, perchlorate, total phosphorous, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, tritium, and pH.

6.9.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

6.9.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.9-2 lists the inorganic chemicals above BVs at SWMU 50-006(a). The identification of inorganic COPCs is presented in Appendix I, section I-6.8.1.

The inorganic chemicals identified as COPCs at SWMU 50-006(a) are antimony, cadmium, chromium, fluoride, nickel, nitrate, total phosphorous, selenium, silver, thallium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 6.9-2.

Organic Chemicals

Table 6.9-3 lists the organic chemicals detected at SWMU 50-006(a). The identification of organic COPCs is presented in Appendix I, section I-6.8.2.

The organic chemicals identified as COPCs at SWMU 50-006(a) are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total

pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 6.9-1.

Radionuclides

Table 6.9-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-6.8.3.

The radionuclides identified as COPCs at SWMU 50-006(a) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 6.9-2.

6.9.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 50-006(a) are discussed in Appendix I, section I-6.8.5.

The lateral and vertical extent of cadmium and fluoride and the vertical extent of chromium are not defined. The lateral and vertical extent of all other inorganic, organic, and radionuclide COPCs are defined at SWMU 50-006(a).

6.9.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 50-006(a), no human health risk-screening assessment was performed.

6.9.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 50-006(a), no ecological risk-screening assessment was performed.

6.10 SWMU 50-006(c)—Operational Release

6.10.1 Site Description and Operational History

SWMU 50-006(c) consists of the surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants (primarily plutonium and americium) from historical stack emissions at TA-50 (Figure 6.10-1). Emission sources included seven exhaust stacks that ventilated hoods for specific operations at the facility. Buildings 50-1, 50-37, and 50-69 are monitored for radioactive emissions, and the resulting data were reported to EPA Region 6 (LANL 1992, 007672; LANL 1995, 049925).

6.10.2 Relationship to Other SWMUs and AOCs

Emission sources at TA-50 include seven exhaust stacks in buildings 50-1, 50-37, and 50-69. SWMU 50-006(c) consists of surface soil contamination resulting from air deposition from the stack emissions, which could potentially cover the surface and near surface soil throughout TA-50.

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

A Phase I RFI was conducted in 1993 at SWMU 50-006(c) to determine the nature and extent of any radionuclides and hazardous constituents. The RFI also included AOCs 50-007 and 50-008, potential surface soil contamination from airborne releases from the incinerator complex (building 50-37) and the volume reduction facility (building 50-69). The SWMU and AOCs were investigated as an aggregate because their boundaries are indistinguishable. Samples were collected from five unpaved areas around buildings 50-1, 50-37, and 50-69. Sampling locations were biased toward natural drainage channels, and soil samples were collected from a total of 51 locations. The samples were analyzed for inorganic chemicals, organic chemicals, PCBs, and radionuclides. The RFI activities and results were presented in the RFI report (LANL 1995, 049925).

Decision-level data from the 1993 investigation activities are included in this report.

6.10.4 Site Contamination

6.10.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 50-006(c) are shown in Figure 6.10-1. Table 6.10-1 provides the sampling locations, depths, and the analyses requested for each sample. The approved work plan (LANL 2008, 100750) did not propose collect samples specifically from SWMU 50-006(c). The samples included in the evaluation of SWMU 50-006(c) are previously collected samples and surface samples collected as part of the characterization of Consolidated Unit 50-004(a)-00 and SWMUs 50-006(a and d). Coordinates of sampling locations are presented in Table 1.4-1.

Samples were analyzed at off-site fixed laboratories for TAL metals, anions, perchlorate, SVOCs, PCBs, dioxins and furans, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and strontium-90.

6.10.4.2 Soil, Rock, and Sediment Field-Screening Results

No samples were collected specifically for SWMU 50-006(c) in 2009, and no field screening was performed. Section 6.8.4.2 presents field-screening results for Consolidated Unit 50-004(a)-00; section 6.9.4.2 presents results for SWMU 50-006(a); and section 6.11.4.2 presents results for SWMU 50-006(d). Field-screening results are presented in Table 1.4-2.

6.10.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.10-2 lists the inorganic chemicals above BVs at SWMU 50-006(c). The identification of inorganic COPCs is presented in Appendix I, section I-6.9.1.

The inorganic chemicals identified as COPCs at SWMU 50-006(c) are antimony, cadmium, chromium, fluoride, nitrate, perchlorate, selenium, and zinc.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 6.10-1.

Organic Chemicals

Table 6.10-3 lists the organic chemicals detected at SWMU 50-006(c). The identification of organic COPCs is presented in Appendix I, section I-6.9.2.

The organic chemicals identified as COPCs at SWMU 50-006(c) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; diethylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 6.10-2.

Radionuclides

Table 6.10-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-6.9.3.

The radionuclides identified as COPCs at SWMU 50-006(c) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, thorium-232, and tritium.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 6.10-3.

6.10.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 50-006(c) are discussed in Appendix I, section I-6.9.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

6.10.5 Summary of Human Health Risk Screening

The human health risk-screening assessment for SWMU 50-006(c) is discussed in Appendix J, sections J-4.2.7 and J-4.4.

The total excess cancer risks for the industrial, construction worker, and residential scenarios are 5×10^{-6}, 5×10^{-7}, and 2×10^{-5}, respectively. The risks for the industrial and construction worker scenarios are below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk for the residential scenario is from PAHs from the asphalt roads and parking lots. If the PAHs are eliminated from the risk assessment calculations the excess cancer risk is reduced to 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.003, 0.002, and 0.01, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 18 mrem/yr, 15 mrem/yr, and 28 mrem/yr, respectively, which are above the DOE target dose of 15 mrem/yr (DOE 2000, 067489) for the industrial and residential scenarios. However, as discussed in

the uncertainty analysis (Appendix J, section J-4.3.2, p. J-17), the doses are in part influenced by thorium-2322, which is naturally occurring. By subtracting the background concentration (2.33 pCi/g) for thorium-232 from the EPC, the total doses are 11 mrem/yr, 12 mrem/yr, and 26 mrem/yr for the industrial, construction worker, and residential scenarios, respectively. The elevated dose for the residential scenario is primarily from cobalt-60. The total dose for the industrial scenario is below the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

The total dose for the industrial scenario is equivalent to a total risk of 3×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the construction worker scenario is equivalent to a total risk of 3×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 5×10^{-5}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

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

6.10.6 Summary of Ecological Risk Screening

The ecological risk-screening assessment is presented in Appendix J, section J-5.4. No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous canyon studies.

6.11 SWMU 50-006(d)—Drainline and Associated NPDES-Permitted Outfall

6.11.1 Site Description and Operational History

SWMU 50-006(d) consists of a TA-50 drainline (structure 50-64) and associated NPDES-permitted Outfall 051 in Mortandad Canyon for treated wastewater from the RLWTF (building 50-1) (Figure 6.11-1). Structure 50-64 is a 6-in.-diameter iron discharge pipe that was rerouted in 1983 to accommodate construction of the TA-35 target fabrication facility (building 35-213). In 1985, EPA Region 6 issued an administrative order to DOE requiring modification of the outfall to mitigate ongoing stream-bank erosion caused by the discharge pipe ending 25 ft short of the stream channel. DOE extended the pipe into the stream channel, and subsequently EPA Region 6 closed the order in 1986 (LANL 1992, 007672).

6.11.2 Relationship to Other SWMUs and AOCs

The drainline of SWMU 50-006(d) runs along the east side of building 50-1 and discharges into Mortandad Canyon.

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

A total of 52 samples were collected in 1993 from 27 locations in the canyon downgradient from SWMU 50-006(d), from depths ranging between 0 and 4 ft bgs. Samples were analyzed for

gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, tritium, PCBs, and SVOCs. Decision-level data from the 1993 investigation activities are included in this report.

6.11.4 Site Contamination

6.11.4.1 Soil, Rock, and Sediment Sampling

The sampling locations at SWMU 50-006(d) are shown in Figure 6.11-1. Table 6.11-1 provides the sampling locations, depths, and the analyses requested for each sample. Locations were selected to characterize the area immediately below the discharge point and downslope areas where discharged liquids may have flowed before entering the main Mortandad Canyon drainage. Coordinates of sampling locations are presented in Table 1.4-1. Sampling at SWMU 50-006(d) consisted of the following activities in 2009:

- Soil and tuff samples were collected at four locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. The samples were collected from below the outfall.
- Soil and tuff samples were collected at two locations from three depth intervals: the surface interval, the soil/tuff interface interval, and the interval beginning 5 ft below the soil/tuff interface. The samples were collected from the drainage.
- Tuff samples were collected at 12 locations from two depth intervals: the base of the pipe and the interval beginning 5 ft below the base of the pipe.

Samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, total cyanide, SVOCs, VOCs (in samples deeper than 0.5 ft bgs), PCBs, dioxins and furans, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, tritium, and pH.

6.11.4.2 Soil, Rock, and Sediment Field-Screening Results

No elevated organic vapors were detected during PID screening of samples. No radiological screening results exceeded twice the daily site background levels. There were no changes to sampling or other activities because of field-screening results. Field-screening results are presented in Table 1.4-2.

6.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.11-2 lists the inorganic chemicals above BVs at SWMU 50-006(d). The identification of inorganic COPCs is presented in Appendix I, section I-6.10.1.

The inorganic chemicals identified as COPCs at SWMU 50-006(d) are antimony, cadmium, chromium, copper, mercury, nitrate, perchlorate, and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown on Plate 6.11-1.

Organic Chemicals

Table 6.11-3 lists the organic chemicals detected at SWMU 50-006(d). The identification of organic COPCs is presented in Appendix I, section I-6.10.2.

The organic chemicals identified as COPCs at SWMU 50-006(d) are 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; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; toluene; and 1,3-xylene+1,4-xylene.

Sampling locations and detected concentrations of organic COPCs are shown on Plate 6.11-2.

Radionuclides

Table 6.11-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-6.10.3.

The radionuclides identified as COPCs at SWMU 50-006(d) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, uranium-234, uranium-235/236 and uranium-238.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs are shown on Plate 6.11-3.

6.11.4.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 50-006(d) are discussed in Appendix I, section I-6.10.5.

The lateral and vertical extent of copper, mercury, nitrate, and perchlorate are not defined near the outfall (location MO-605085). The lateral and vertical extent of PCBs and the lateral extent of PAHs are not defined. The vertical extent of americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, and uranium-234 is not defined. The lateral and vertical extent of all other inorganic and organic COPCs and the lateral extent of all radionuclide COPCs are defined.

6.11.5 Summary of Human Health Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 50-006(d), no human health risk-screening assessment was performed.

6.11.6 Summary of Ecological Risk Screening

Because the extent of contamination is not defined for some COPCs at SWMU 50-006(d), no ecological risk-screening assessment was performed.

6.12 AOC 50-007—Incinerator

6.12.1 Site Description and Operational History

AOC 50-007 is a former incinerator complex that was housed in building 50-37 (Figure 6.12-1). The incinerator complex was constructed in 1975 and consisted of the incinerator, various waste-feed components, and two waste-feed tanks. The incinerator was located in room 112. The former solid and liquid waste-feed system was located in room 115. The liquid feed system preparation room was bermed and had no floor drains. The maximum waste inventory allowed in room 115 was 600 gal. in two waste-feed tanks.

The incinerator complex was equipped with an off-gas treatment unit, and the exhaust air system from the incinerator included two high-efficiency particulate air (HEPA) filters. Liquid effluent generated by the off-gas aqueous scrub system was filtered to remove solids before transfer to a double instrument-monitored pipeline to the RLWTF (building 50-1). Ash was stabilized in concrete.

From 1978 to 1987, 23 test burns were successfully conducted for RCRA and TSCA wastes. EPA issued a permit for the incineration of PCBs in 1984, and NMED included the incinerator in a 1989 Hazardous Waste Facility Permit (HWFP) (LANL 1992, 007672). Actual waste streams incinerated at building 50-37 after the permits were issued included radioactively contaminated PCBs and scintillation cocktails. Operation of the incinerator was discontinued in 1987 (LANL 1992, 007672). The incinerator and associated equipment have been removed, and closure of the unit under the RCRA permit was approved by NMED (1998, 106948). Investigation was not proposed in the investigation work plan (LANL 2008, 100750) because this is a RCRA closure site.

6.12.2 Relationship to Other SWMUs and AOCs

AOC 50-007 is housed in building 50-37, and its liquid waste effluent was transferred through AOC 50-001(b) to RLWTF [SWMU 50-001(a)].

6.12.3 Summary of Previous Investigations for AOC 50-007

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

6.12.4 Current Site Status

AOC 50-007 was approved for clean closure by NMED in July 1998 (NMED 1998, 106948). No additional investigation or other actions are required at this site.

6.13 AOC 50-008—Reduction Site

6.13.1 Site Description and Operational History

AOC 50-008 is the waste characterization, reduction, and repackaging facility (formerly the volume-reduction facility) located at TA-50 in building 50-69 (Figure 6.12-1). This active facility was constructed in 1979 to reduce the size of large TRU-contaminated metallic items and repackage them into standard-size containers. The facility, first used in 1982, is an active permitted storage unit operated in accordance with the requirements of 20.4.1.500 NMAC; 40 CFR 264, Subparts A–D and I; and the Laboratory HWFP. Investigation was not proposed in the investigation work plan (LANL 2008, 100750) because this site is an active RCRA unit.

6.13.2 Relationship to Other SWMUs and AOCs

AOC 50-008 is housed in building 50-69 and its liquid waste effluent is transferred through AOC 50-001(b) to RLWTF [SWMU 50-001(a)].

6.13.3 Summary of Previous Investigations for AOC 50-008

A Phase I RFI was conducted in 1993 at AOC 50-008. All data from that investigation are screening-level data only, and are not included in this report.

6.13.4 Current Site Status

AOC 50-008 is an active permitted storage unit operated in accordance with the requirements of 20.4.1.500 NMAC; 40 CFR 264, Subparts A–D and I; and the Laboratory HWFP. Because this unit is subject to RCRA operating and closure requirements, it is not subject to investigation or other corrective action requirements of the Consent Order.

6.14 SWMU 50-009—Material Disposal Area (MDA C)

6.14.1 Site Description and Operational History

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area for Laboratory-derived waste (Plate 6.1-1). MDA C operated from May 1948 to April 1974. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at the Laboratory; waste included uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits (6 pits and 1 chemical pit) and 108 shafts were excavated into the overlying soil and tuff (LANL 1992, 007672).

6.14.2 Relationship to Other SWMUs and AOCs

MDA C is located to the south of various TA-50 buildings (and associated SWMUs and AOCs) and bounded by Pajarito Road to the north. It is a stand-alone site and is investigated separately.

6.14.3 Summary of Previous Investigations for SWMU 50-009

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

6.14.4 Current Site Status

A Phase II investigation of MDA C was completed in March 2009, and the investigation report (LANL 2009, 106047) was submitted to NMED in May 2009.

6.15 AOC 50-010—Decontamination Facility

6.15.1 Site Description and Operational History

AOC 50-010 is a former vehicle decontamination bay that was located in room 34B of the TA-50 RLWTF (building 50-1) (Figure 6.2-1). The area was used to clean radioactive contamination from vehicles and large objects used to transport RLW to TA-50. Liquid wastes generated during decontamination activities were transferred to tanks at building 50-2 through a floor drain and waste line (Santa Fe Engineering Ltd. 1993, 064050). The waste line connecting the floor drains in room 34B and the storage tanks in vault building 50-2 is no longer used. The decontamination bay was operated from 1963 to October 1999; the bay was enclosed in 1983. Areas north, east and south of room 34B were sampled in August 1990 as part of the grit-chamber investigation; analytical results showed no radionuclides detected above BVs (LANL 1992, 007672, pp. 2-35 to 2-37). Room 34B currently houses two 25,000-gal. storage tanks for treated effluent from the RLWTF (Appendix C, C-13a through C-13f). The treated effluent is sampled and analyzed to ensure NPDES permit requirements are met before it is discharged to the SWMU 50-006(d) NPDES-permitted Outfall 051 in Mortandad Canyon. The floor drains in room 34B are open and piped directly to the 75,000-gal. influent tank in vault building 50-2.

6.15.2 Relationship to Other SWMUs and AOCs

AOC 50-010 is located in room 34B of building 50-1 [SWMU 50-001(a)] and the liquid waste generated was transferred to the storage tanks of SWMU 50-002(a) (vault 50-002) through a floor drain and waste line. Vault building 50-2 is located approximately 12 ft south of room 34B of building 50-1.

6.15.3 Summary of Previous Investigations for AOC 50-010

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

6.15.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 50-010 because the site is located within an active nuclear facility and direct sampling to determine if releases from the system had occurred is not feasible. The four active waste-transfer lines are located within the 12-ft-wide breezeway between room 34B and vault building 50-2, thus prohibiting drill-rig access. Available information, including the design features of the site and past sampling results, indicates a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath buildings or paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing of the tank and associated influent and effluent lines. The tank and lines were not designed to be pressure tested and alternate means of leak detection, such as inspections, can be used. No evidence of a release from AOC 50-010 to the environment was found in boreholes drilled nearby in 1990, and the likelihood of undetected releases from the floor drains and drainline is very remote. Even if a release had occurred in the past, no current exposure pathway or mechanism exists for transport to receptors.

The Laboratory is in the process of designing a new RLWTF at TA-50 that will include new influent and effluent storage tanks and new waste transfer lines. The tanks and waste transfer line in room 34B of building 50-1 will continue to be maintained and monitored for as long as it is operational. For these

reasons, it is proposed that site characterization and investigation be delayed until future D&D of the TA-50 facility has been completed.

6.16 SWMU 50-011(a)—Septic System

6.16.1 Site Description and Operational History

SWMU 50-011(a) is the location of a former septic system that was installed at TA-50 in 1964 at the south end of the RLWTF (building 50-1) (Figure 6.16-1). The septic system consisted of an influent line from building 50-1 that discharged to a manhole (structure 50-9) and then to a septic tank (structure 50-10). The effluent line from the tank tied to a distribution box (structure 50-11), which discharged to four parallel perforated pipes traversing a leach field.

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

With the exception of the perforated pipe installed vertically as a seepage pit at the east end of the leach field in 1978, the entire septic system was removed in 1983. A RLW storage tank (structure 50-90) was constructed at the former location of the septic tank. Between 2004 and 2006, building 50-83 and the asphalt pad that covered the area formerly occupied by the septic system were removed during site preparation activities for the new pump house and tank vault (building 50-250) at the RLWTF. Building 50-250 now occupies the former locations of the seepage pit and leach field.

6.16.2 Relationship to Other SWMUs and AOCs

The inlet pipe of SWMU 50-011(a) was from building 50-1 [SWMU 50-001(a)].

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

During the Phase I RFI conducted in 1994 at SWMU 50-011(a), seven samples were collected from seven sampling locations from depths of 6 to 7 ft bgs, 6.5 to 7.5 ft bgs, 7 to 8 ft bgs, 7.25 to 8.75 ft bgs, 7.75 to 8.5 ft bgs, and 8 to 9 ft bgs. The samples were field screened for VOCs and radioactivity and submitted for analysis of metals, gamma-emitting radionuclides, tritium, uranium, isotopic plutonium, isotopic uranium, strontium-90, PCBs, SVOCs, and VOCs. The Phase I RFI activities and data were presented in the RFI report; results showed no metals or radionuclides detected above BVs and acetone and 2-butanone detected at trace concentrations in three samples (LANL 1996, 054836).

In December 2001, geotechnical and waste characterization samples were collected from eight boreholes, including one next to the SWMU 50-011(a) seepage pit (borehole 2, sampling location 50-24235), to determine the feasibility of constructing a new pump house and influent storage tank vault at TA-50. Samples were collected from depths of 3 to 4 ft bgs, 6.5 to 7.5 ft bgs, 24 to 25 ft bgs, 70 to 71 ft bgs, and 90 to 91.5 ft bgs and analyzed for metals, gamma spectroscopy, isotopic plutonium, isotopic uranium, strontium-90, PCBs, pesticides, SVOCs, TPH-DRO, and VOCs. The results were presented in a report entitled “TA-50 Soil Characterization Analytical Report” (LANL 2005, 087834) and showed no detections of VOCs, SVOCs, PCBs, or pesticides and no detection of metals above BVs. Plutonium-239/240 was detected in the samples collected from 3 to 4 ft bgs and 6.5 to 7.5 ft bgs, and strontium-90 was detected in the sample collected from 6.5 to 7.5 ft bgs; none of the radionuclides were detected in the deeper samples collected from borehole 2 (LANL 2005, 087834).

In 2004, the Laboratory began construction of a new pump house and influent storage tank vault (building 50-250) at TA-50. After construction was completed, access to the SWMU 50-011(a) seepage pit and former leach field location was feasible because of the presence of new active RLW lines and the new influent pump house and tank vault to be constructed at the location of the seepage pit. Locations of buildings, utilities, RLW lines, and building 50-250 are shown in Figure 6.2-1. Therefore, the Laboratory prepared a SAP addendum to the OU 1147 RFI work plan to collect supplemental samples at SWMU 50-011(a) while access to the site was still available (LANL 2003, 098995). In October 2004, two boreholes were drilled to a depth of 60 ft bgs at locations approximately 20 ft downgradient of the seepage pit (sampling locations 50-23549 and 50-23548). Three subsurface samples were collected from each borehole from depths of 50 to 52.5 ft, 52.5 to 55 ft bgs, and 57.5 to 60 ft bgs. The total depth of the seepage pit was 50 ft bgs. The two boreholes were to be located approximately 5 ft northeast and southeast of the seepage pit at SWMU 50-011(a); however, the seepage pit was not located until November 2004. When the seepage pit was finally located during excavation activities for the new pump house and tank vault, it was determined that the two new boreholes were actually located approximately 19 ft northeast and 18 ft southeast of the actual seepage pit location and not close enough to characterize potential contamination from the pit. The data from these boreholes was not reported because of their distance from the seepage pit. These locations were subsequently excavated to accommodate the new tank farm foundation.

The actual seepage pit location was identified and surveyed in November 2004, and four samples were collected from sampling location 50-24250 within the seepage pit as the pit was being excavated and the perforated pipe was removed. Sample MD50-05-57476 was collected from 16 to 16.5 ft bgs within the new pump house excavation, and samples MD50-05-57555, MD50-05-57556, and MD50-05-57558 were collected from the bottom of the excavation for the new pump house from a depth of 32 ft to 32.5 ft bgs. All the samples collected for SWMU 50-011(a) in 2004 were field screened for VOCs and radioactivity and submitted for analysis of VOCs, metals, cesium-137 by gamma spectroscopy, tritium by liquid scintillation, americium-241 by alpha spectroscopy, isotopic plutonium, isotopic uranium, and perchlorate (Appendix C, C-14a). In a May 2003 record of communication, NMED agreed not to include SVOCs and PCBs in the analytical suite (Appendix C, C-14b). Analytical data showed no VOCs were detected. Calcium, mercury, and zinc were each detected above BVs in one sample, and nitrate was detected in all four samples. Americium-241 was detected at activities of 0.0337 pCi/g and 0.279 pCi/g in two fill samples; plutonium-238 was detected in one fill sample at an activity of 0.056 pCi/g and in one tuff samples at an activity of 0.034 pCi/g); plutonium-239/240 was detected in two fill samples at activities of 0.0446 pCi/g and 0.046 pCi/g and in one tuff samples at an activity of 0.031 pCi/g; and tritium was detected in three fill samples at activities of 0.0338 pCi/g, 4.762 pCi/g and 6.478 pCi/g.

6.16.4 Current Site Status

Sampling locations 50-24250, 50-25427, 50-25429, 50-23548, and 50-23549 were excavated along with the seepage pit during construction activities for the new pump house and tank vault (building 50-250) at the TA-50 RLWTF. The bottom of the foundation of building 50-250 is approximately 32 ft bgs and is located directly over the former locations of the AOC 50-011(a) seepage pit and eastern portion of the leach field. The remaining components of the septic system were removed between 1978 and 1983. Data from multiple sampling events described above show no evidence of a release other than sanitary wastewater from the former septic system and sporadic detections of radionuclides at low activities.

6.16.5 Site Contamination

6.16.5.1 Soil, Rock, and Sediment Sampling

The results of samples collected in 1994, 2004, and 2006 are presented in this investigation report. The sampling locations at SWMU 50-011(a) are shown in Figure 6.16-1. Table 6.16-1 provides the sampling locations, depths, and the analyses requested for each sample. Coordinates of sampling locations are presented in Table 1.4-1.

6.16.5.2 Soil, Rock, and Sediment Field-Screening Results

No samples were collected at SWMU 50-011(a) in 2009, and no field screening was performed.

6.16.5.3 Soil, Rock, and Sediment Sampling Analytical Results

Inorganic Chemicals

Table 6.16-2 lists the inorganic chemicals above BVs at SWMU 50-011(a). The identification of inorganic COPCs is presented in Appendix I, section I-6.15.1.

The inorganic chemicals identified as COPCs at SWMU 50-011(a) are antimony and selenium.

The sampling locations and detected concentrations of inorganic COPCs above BVs are shown in Figure 6.16-2.

Organic Chemicals

Table 6.16-3 lists the organic chemicals detected at SWMU 50-011(a). The identification of organic COPCs is presented in Appendix I, section I-6.15.2.

The organic chemical identified as a COPC at SWMU 50-011(a) is acetone.

Sampling locations and detected concentrations of organic COPCs are shown in Figure 6.16-3.

Radionuclides

Table 6.16-4 lists the radionuclides detected or detected above BVs/FVs. The identification of radionuclide COPCs is presented in Appendix I, section I-6.15.3.

The radionuclides identified as COPCs at SWMU 50-011(a) are plutonium-238, plutonium-239/240, and tritium.

The sampling locations and concentrations of radionuclide COPCs detected or detected above FVs or in samples with no applicable FV are shown in Figure 6.16-4.

6.16.5.4 Nature and Extent of Contamination

The nature and extent of contamination at SWMU 50-011(a) are discussed in Appendix I, section I-6.15.5.

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 50-011(a).

6.16.6 Summary of Human Health Risk Screening

The human health risk-screening assessment for SWMU 50-011(a) is discussed in Appendix J, sections J-4.2.8 and J-4.4.

No carcinogenic COPCs were found at this site. The HIs for the construction worker and residential scenarios are 0.0004 and 0.001, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 0.04 and 0.06 mrem/yr, respectively, which are below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the construction worker scenario is equivalent to a total risk of 8×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 5×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

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

6.16.7 Summary of Ecological Risk Screening

The ecological risk-screening assessments are presented in Appendix J, section J-5.4. No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous canyon studies.

6.17 SWMU 50-011(b)—Lift Station

6.17.1 Site Description and Operational History

AOC 50-011(b) consists of two active sanitary wastewater lift stations (structures 50-91 and 50-92) and approximately 400 ft of piping that transport sanitary wastewater from the TA-50 RLWTF (building 50-1) to the main line that is connected to the TA-46 SWSC plant (Figure 6.3-1). The lift stations are located at on the west side of building 50-1 at TA-50: one next to the southwest corner of building 50-1 and one next to the northwest corner of building 50-1. These sanitary lift stations and associated drainlines were installed in 1983 as part of a utility upgrade and are tied only to drains building 50-1 restrooms, water fountains, and equipment rooms containing hot water heaters and boilers in building 50-1 (Santa Fe Engineering Ltd. 1993, 064050). One lift station serves the north end of building 50-1, and the second lift station serves the south end of the building. This sanitary wastewater system is still active. The wastewater is pumped through each lift station to a 6-in. main on the west side of the building. The 6-in. main runs across Pecos Drive to a sanitary sewer manhole and joins the 5-in. gravity main to the SWSC plant at TA-46 (LANL 1992, 007672).

The SWSC plant, which receives all the sanitary waste handled by these lift stations, is operated in accordance with the Laboratory's NPDES Permit for Outfall 13S. To support the treatment and discharge standards specified by the NPDES permit, the SWSC plant requires detailed characterization of all incoming waste streams, and all incoming wastes are required to meet the waste acceptance criteria specified for sanitary liquid waste. Samples are collected from the SWSC plant outfall on a regular basis to demonstrate the effectiveness of the program, as specified in the permit. The Laboratory's Water Quality Group periodically collects and analyzes samples from this permitted outfall to ensure NPDES permit requirements are being met. Collectively, these requirements comprise a program that addresses the active management and treatment of the sanitary wastewater generated at TA-50.

6.17.2 Relationship to Other SWMUs and AOCs

AOC 50-011(b) is an active sanitary wastewater system that transports sanitary wastewater from building 50-1 [SWMU 50-001(a)] to the main line that leads to the TA-46 SWSC plant.

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

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

6.17.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for AOC 50-011(b) because characterizing this site, which is located next to an active nuclear facility, is not feasible. Site access for equipment needed for subsurface investigations is extremely limited. Available information, including the characteristics of the wastewater managed by the system, indicates a very low likelihood of past releases of hazardous chemicals to the environment. Even if a release had occurred, any residual contamination would be located beneath paved areas, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing the tanks and all influent and effluent lines associated with AOC 50-011(b). Pressure testing is not feasible because the system was not designed to be pressure tested. The lift stations themselves are not designed to be sealed and pressurized and could not be tested in this manner. The influent lines are gravity flow lines that are open to a number of drains and cannot be pressurized. The effluent lines are designed for pressure equal to the lift to the manhole but are not configured in a way that would allow pressure testing.

The potential for releases of hazardous constituents and/or radionuclides is very low because of the nature of the wastewater received by the system. The sanitary lift stations and associated drainlines are tied to drains in building 50-1 restrooms, water fountains, and equipment rooms containing hot water heaters and boilers and have therefore only managed sanitary wastewater (Santa Fe Engineering 1993, 064050). Discharge of hazardous chemicals and radionuclides to the system is prohibited by Laboratory procedures. No releases to the environment from the AOC 50-011(b) sanitary wastewater system were reported or documented, and the likelihood of undetected releases is very remote. The lift stations and drainlines will continue to be maintained and monitored for as long as the system is operational. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of the TA-50 facility has been completed.

7.0 TA-55 BACKGROUND AND FIELD-INVESTIGATION RESULTS

7.1 Background of TA-55

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

One SWMU (55-008) located in TA-55 is addressed in this investigation report.

- SWMU 55-008 consists of sumps, tanks, and pumps in the basement of the Plutonium Facility, building 55-4.

7.1.1 Operational History

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

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

7.1.2 Summary of Releases

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

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

7.1.3 Current Site Usage and Status

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

7.2 SWMU 55-008—Sumps and Tanks

7.2.1 Site Description and Operational History

SWMU 55-8 consists of active sumps, tanks, and pumps in the basement of the plutonium building (building 55-4), which is the primary site for plutonium processing, fabrication, and research at the Laboratory (Figure 7.1-1). Six sumps/pumps, each with a capacity of 3 ft^3, collect spills and mop-water generated in the building. Four 8-in.-diameter × 4-ft-long condensate tank pumps and eight 8-in.-diameter × 4-ft-long blowdown tanks receive condensate from cooling coils. It is possible that the liquids discharged to these units may have contained small amounts of hazardous and/or radioactive constituents. All liquids collected and contained within these units are transferred through a direct pipeline to the RLWTF at TA-50, and none of these units release liquids to the environment (LANL 1992, 007672).

7.2.2 Relationship to Other SWMUs and AOCs

SWMU 55-008 is located in the basement of building 55-4 and is the only site under investigation in TA-55.

7.2.3 Summary of Previous Investigations for SWMU 55-008

No RFI activities have been conducted at this SWMU.

7.2.4 Delayed Site Investigation Rationale

Delayed investigation is proposed for SWMU 55-008 because characterizing this site, which is located inside an active nuclear facility, is not feasible. Available information, including the design features of the site and the results of recent and historical inspections, indicate a very low likelihood of past releases to the environment. Even if a release had occurred, any residual contamination would be located beneath the floor of building 55-4, effectively preventing exposure to receptors and preventing contact with infiltrating precipitation that could cause migration of contaminants.

The NMED approval with modifications letter (NMED 2008, 101110) required pressure testing the tanks associated with SWMU 55-008. Pressure testing is not feasible because the tanks were not designed to be pressure tested, and alternate means of leak detection are available. The tanks are all located in the basement of a building and can be inspected to determine if they are leaking. The sumps in the basement of building 55-4 are designed to capture and contain any liquid releases in the basement and provide a means to convey the contained liquid to the TA-50 RLWTF. Any releases from the condensate tank pumps, blowdown tanks, or other sources of liquid in the basement of building 55-4 would be contained by the sumps and could not be released directly to the environment.

The NMED approval with modifications letter (NMED 2008, 101110) also required collection of samples from beneath the SWMU 55-008 sumps. Collecting samples beneath the sumps to determine whether releases have occurred is not feasible. Building 55-4 is regulated by DOE as a Category 2 nuclear facility subject to the requirements of 10 CFR 830, Nuclear Safety Management. Pursuant to these requirements, building 55-4 is designed and operated to prevent unintentional releases of radioactive materials. Various levels of containment are used to prevent releases and the building structure itself provides one level of containment. The sumps, which are built into the basement floor, are part of this containment system. Deliberately breaching the containment provided by the sumps to collect soil samples beneath them is not allowed.

The sumps that are part of SWMU 55-004 are described in the 1990 SWMU report as six 3 ft × 3 ft × 3 ft deep sumps that receive spills and mop water (LANL 1990, 007514). No other descriptive information concerning the locations of the sumps was provided, nor was such information contained in the OU 1129 RFI work plan (LANL 1992, 007666). A recent inspection of the basement of building 55-4 identified 11 sumps, which are described in Appendix C (C-15a). Because it is not known which 6 of these sumps are the ones referred to in the SWMU report, all 11 are included in the appendix.

The sumps are built into the basement floor of building 55-4. Construction details for the sumps are included in engineering drawing LA-KY-G-1121 (Appendix C, C-15b) and show that the sumps are constructed of 10-in. thick reinforced concrete. The drawing shows the interior dimensions of the sumps to be 3 ft ¼ in. × 3 ft ¼ in. × 2 ft 3 in. deep. The drawing also calls for the interior surfaces of the sumps to be painted and for the exterior surface of the concrete be coated with “Waterstop” sealant.

As noted in Table 7.2-1, no cracks or other damage to the sumps was identified during inspections performed in June 2009. Several of the sumps were noted as needing repainting, but no damage to the underlying concrete was observed. Photographs of the sumps were taken during the inspection and are provided in Appendix C (C-15c).

Facility staff compiled available inspection logs for the sumps and these are presented in Appendix C (C-15d). These inspection records show that the sumps were inspected on some sort of routine basis from 1991 until around 2004. Inspection frequencies generally ranged from monthly to annually. The inspection records show the sumps and grates were generally cleaned at the time of the inspection, and if any water was present it was sampled. In all cases, the water met criteria for discharge. Maintenance activities were limited to occasional replacement of pumps or installation of switches. No mention was made in any of the inspection records of any issues with the integrity of the sumps. Building 55-4 staff reported that actions have been undertaken to resume routine inspections of the sumps and to repaint the sumps where the paint was noted to be in poor condition. For these reasons, it is proposed that site characterization and investigation be delayed until future D&D of building 55-4 has been completed.

8.0 CONCLUSIONS

8.1 Nature and Extent of Contamination

The nature and extent of contamination have been defined for nine of the sites investigated during the 2009 Upper Mortandad Canyon Aggregate Area investigation. Summaries of the nature and extent of contamination and remaining extent requirements are presented in the following sections.

8.1.1 TA-03

The nature and extent of contamination are not defined for the following sites in TA-03:

- AOC 03-004(c)—lateral extent of barium, chromium, copper, and manganese; vertical extent of chromium
- AOC 03-004(d)—lateral extent of chromium
- AOC 03-007—lateral and vertical extent of chromium
- SWMU 03-045(h)—lateral and vertical extent of barium, lateral extent of antimony
- SWMU 03-049(a)—vertical extent of chromium, lateral extent of dioxins/furans
- Consolidated Unit 03-049(b)-00—lateral extent of aluminum, chromium, total cyanide, lead, and perchlorate; vertical extent of PCBs; lateral and vertical extent of tritium
- SWMU 03-049(e)—vertical extent of antimony, chromium, hexavalent chromium, selenium, and zinc
- SWMU 03-054(e)—vertical extent of chromium and zinc; lateral and vertical extent of phthalates and dioxins/furans; lateral extent of PAHs
- AOC C-03-006—lateral and vertical extent of chromium

The nature and extent of contamination are defined for SWMU 03-034(a).

The nature and extent of contamination are defined for AOC 03-041.

8.1.2 TA-35

The nature and extent of contamination are not defined for either site at TA-35:

- SWMU 35-016(g)—lateral and vertical extent of cesium-137
- SWMU 35-016(h)—lateral and vertical extent of chromium; lateral extent of PAHs

8.1.3 Former TA-42

The vertical extent of tritium is not defined for Consolidated Unit 42-001(a)-99 to a depth of 51.5 ft bgs.

8.1.4 TA-48

The nature and extent of contamination are not defined for the following sites in TA-48:

- AOC 48-001—lateral extent of total cyanide
- SWMUs 48-002(a and b)—vertical extent of perchlorate
- SWMU 48-003—vertical extent of strontium-90
- SWMU 48-005—lateral and vertical extent of chromium and perchlorate
- SWMU 48-007(b)—vertical extent of aluminum, chromium, iron, lead, nickel, perchlorate, and vanadium
- SWMU 48-007(c)—vertical extent of chromium; lateral and vertical extent of lead
- SWMU 48-007(f)—lateral and vertical extent of chromium; vertical extent of barium and manganese

The nature and extent of contamination are defined for the following sites:

- AOC 48-002(e)
- Consolidated Unit 48-007(a)-00
- AOC 48-011
- AOC 48-012

8.1.5 TA-50

The nature and extent of contamination are not defined for the following sites in TA-50:

- Consolidated Unit 50-004(a)-00—vertical extent of chromium, plutonium-239/240, and tritium; lateral extent of nickel; lateral and vertical extent of barium, beryllium, cobalt, and copper
- SWMU 50-006(a)—lateral and vertical extent of cadmium and fluoride; vertical extent of chromium
- SWMU 50-006(d)—lateral and vertical extent of copper, mercury, nitrate, perchlorate, and PCBs; lateral extent of PAHs; vertical extent of americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, and uranium-234

The nature and extent of contamination are defined for the following sites:

- AOC 50-002(d)
- SWMU 50-006(c)
- SWMU 50-011(a)

8.1.6 TA-55

SWMU 55-008 was not sampled during the 2009 investigation.

8.2 Summary of Risk-Screening Assessments

Human health risk-screening assessments were performed for eight sites and ecological risk-screening assessments were performed for four sites for which the nature and extent of contamination have been defined. Ecological risk-screening assessments were not performed for four sites because samples were collected at depths greater than 5 ft bgs where no complete pathways to receptors are present. At AOC 50-002(d), only swipe samples were collected, and risk-screening assessments could not be performed.

8.2.1 Human Health Risk Screening Assessment

Human health risk-screening assessments are presented in Appendix J, section J-4.0.

All eight sites evaluated were determined to have no potential unacceptable risks or doses to human health under the current and reasonably foreseeable land uses. Two sites were determined to pose a potential unacceptable risk or dose to human health under the residential scenario.

SWMU 03-034(a) was found to pose no potential unacceptable risk or dose to human health for the residential scenario.

AOC 03-041 was found to pose no potential unacceptable risk or dose to human health for the industrial and residential scenarios.

AOC 48-002(e) was found to pose no potential unacceptable risk to human health for the residential scenario.

Consolidated Unit 48-007(a)-00 (which includes 3 sites) was found to pose no potential unacceptable risk or dose to human health for the industrial and residential scenarios.

AOC 48-011 was found to pose no potential unacceptable risk to human health for the residential scenario.

AOC 48-012 was found to pose no potential unacceptable risk to human health for the construction worker scenario. There was also no potential unacceptable hazard to human health for the residential scenario risk, but there was a potential unacceptable cancer risk to human health for the residential scenario. The total excess cancer risk for the residential scenario (5×10^{-4}) is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420), primarily from dibenz(a,h)anthracene.

SWMU 50-006(c) was found to pose no potential unacceptable risks to human health for the industrial, construction worker, and residential scenarios. The total doses under the industrial and construction worker scenarios do not exceed the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario does exceed the DOE target dose 15 mrem/yr from primarily cobalt-60.

SWMU 50-011(a) was found to pose no potential unacceptable risk or dose to human health for the construction worker and residential scenarios.

Sites at TA-03, former TA-42, TA-35, TA-48, TA-50, and TA-55 are not accessible by the public and are not planned for release by DOE in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 CFR 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

8.2.2 Ecological Risk Screening Assessment

The ecological risk-screening assessments were performed for four sites (AOC 03-041, AOC 48-002[e], Consolidated Unit 48-007[a]-00, and SWMU 50-006[c]). An ecological risk-screening assessment was not performed for SWMU 03-034(a), AOC 48-011, AOC 48-012, and AOC 50-011(a) because samples were collected from depths at which receptors are not exposed to contaminants. The ecological risk-screening assessments are presented in Appendix J, section J-5.0. No risks to ecological receptors are present at any SWMU, AOCs, and consolidated unit evaluated.

9.0 RECOMMENDATIONS

The determination of site status is based on the results of the risk-screening assessments and the determination of nature and extent. Depending upon the decision scenario used, the sites are recommended as corrective action complete either with or without controls, or for additional action. The residential scenario is the only scenario under which corrective action complete without controls is applicable; that is, no additional corrective actions or conditions are necessary. The other decision scenarios (industrial, construction worker, and recreational) result in corrective action complete with controls; that is, some type of institutional controls must be in place to ensure that the land use remains consistent with site cleanup levels. The current and reasonably foreseeable future land use for the Upper Mortandad Canyon Aggregate Area is industrial.

9.1 Additional Field Characterization Activities

The extent of contamination has not been defined for 31 of the sites investigated in the Upper Mortandad Canyon Aggregate Area (Table 9.1-1). Additional sampling is needed to define the extent of contamination for one or more COPCs at the following sites:

- AOC 03-004(c)—lateral extent of barium, chromium, copper, and manganese; vertical extent of chromium
- AOC 03-004(d)—lateral extent of chromium
- AOC 03-007—lateral and vertical extent of chromium
- SWMU 03-045(h)—lateral and vertical extent of barium, lateral extent of antimony
- SWMU 03-049(a)—vertical extent of chromium; lateral extent of dioxins/furans; lateral and vertical extent of tritium

- Consolidated Unit 03-049(b)-00—lateral extent of aluminum, chromium, total cyanide, lead, and perchlorate; vertical extent of PCBs
- SWMU 03-049(e)—vertical extent of antimony, chromium, hexavalent chromium, selenium, and zinc
- SWMU 03-054(e)—vertical extent of chromium and zinc; lateral and vertical extent of phthalates and dioxins/furans; lateral extent of PAHs
- AOC C-03-006—lateral and vertical extent of chromium
- SWMU 35-016(g)—lateral and vertical extent of cesium-137
- SWMU 35-016(h)—lateral and vertical extent of chromium; lateral extent of PAHs
- Consolidated Unit 42-001(a)-99—vertical extent of tritium
- AOC 48-001—lateral extent of total cyanide
- SWMUs 48-002(a and b)—vertical extent of perchlorate
- SWMU 48-003—vertical extent of strontium-90
- SWMU 48-005—lateral and vertical extent of chromium and perchlorate
- SWMU 48-007(b)—vertical extent of aluminum, chromium, iron, lead, nickel, perchlorate, and vanadium
- SWMU 48-007(c)—vertical extent of chromium; lateral and vertical extent of lead
- SWMU 48-007(f)—lateral and vertical extent of chromium; vertical extent of barium and manganese
- Consolidated Unit 50-004(a)-00—vertical extent of chromium, plutonium-239/240, and tritium; lateral extent of nickel; lateral and vertical extent of barium, beryllium, cobalt, and copper
- SWMU 50-006(a)—lateral and vertical extent of cadmium and fluoride; vertical extent of chromium
- SWMU 50-006(d)—lateral and vertical extent of copper, mercury, nitrate, perchlorate, and PCBs; lateral extent of PAHs; vertical extent of americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, and uranium-234

Sample results at one site, AOC 50-002(d), do not indicate a release related to the site, but additional sampling will be necessary when the site is decommissioned to determine whether contaminants are present beneath the concrete sump structure.

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 collected will be used to confirm the extent of contamination has been defined and to complete human health and ecological risk-screening assessments for all remaining sites. The results will be presented in a Phase II investigation report for the Upper Mortandad Canyon Aggregate Area.

9.2 Request for Certificates of Completion

Eleven sites for which the nature and extent of contamination are defined do not pose a potential unacceptable risk or dose under current and reasonably foreseeable future land use scenarios (industrial

and/or construction worker). These sites are AOCs 03-041, 48-012, and 50-011(a), SWMU 50-006(c), and Consolidated Unit 48-007(a)-00 (consisting of three SWMUs). AOCs 03-041 and 50-011(a), and Consolidated Unit 48-007(a)-00 also do not pose a potential unacceptable risk or dose under a residential scenario. Three other sites [SWMU 03-034(a) and AOCs 48-002(e); and 48-011] do not pose a potential unacceptable risk or dose under a residential scenario. For AOC 50-002(d), only swipe samples were collected, so no risk-screening assessments were conducted. At these sites, the Laboratory recommends no further investigation or remediation activities are warranted.

At SWMU 50-006(c) there is a potential unacceptable dose and at AOC 48-012 there is potential unacceptable risk under the residential scenario. However, because residential is not the current and reasonably foreseeable future land use, no remediation is warranted to address these issues.

The following eight sites have been found not to pose potential unacceptable risks or doses to human health under a residential scenario.

- SWMU 03-034(a)
- AOC 03-041
- AOC 48-002(e)
- Consolidated Unit 48-007(a)-00 [consisting of SWMUs 48-007(a), 48-007(d), and 48-010]
- AOC 48-011
- AOC 50-011(a)

The Laboratory is requesting certificates of completion from NMED for corrective action complete without controls for these sites because they do not pose potential unacceptable risks or doses under a residential scenario and to the environment.

The following two sites do not to pose potential unacceptable risks or doses to human health under the industrial and/or construction worker scenario.

- SWMU 50-006(c)
- AOC 48-012

The Laboratory requests certificates of completion from NMED for corrective action complete with controls for these sites. The Laboratory intends to retain ownership of the property indefinitely and will continue to restrict the property to industrial use only. The controls required include continuation of the current land use (i.e., industrial) and maintenance of current site conditions. The Laboratory has several processes in place to ensure work conducted within the site boundaries is performed with the appropriate controls to protect future workers from exposure to potential contamination.

9.3 Schedule for Recommended Activities

A Phase II investigation work plan will be developed and submitted to NMED 6 months 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.

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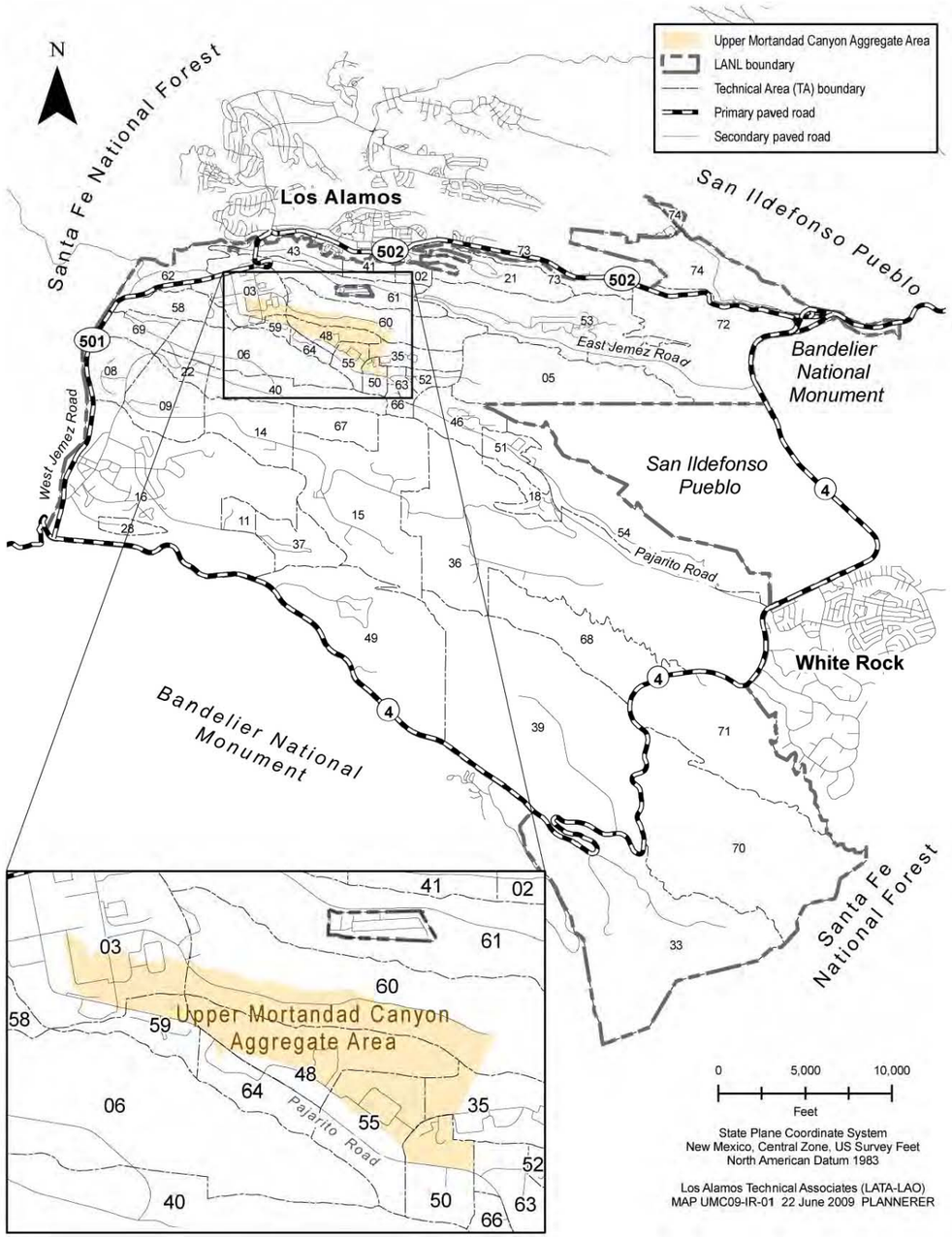


Figure 1.1-1 Location of Upper Mortandad Canyon Aggregate Area with respect to Laboratory technical areas

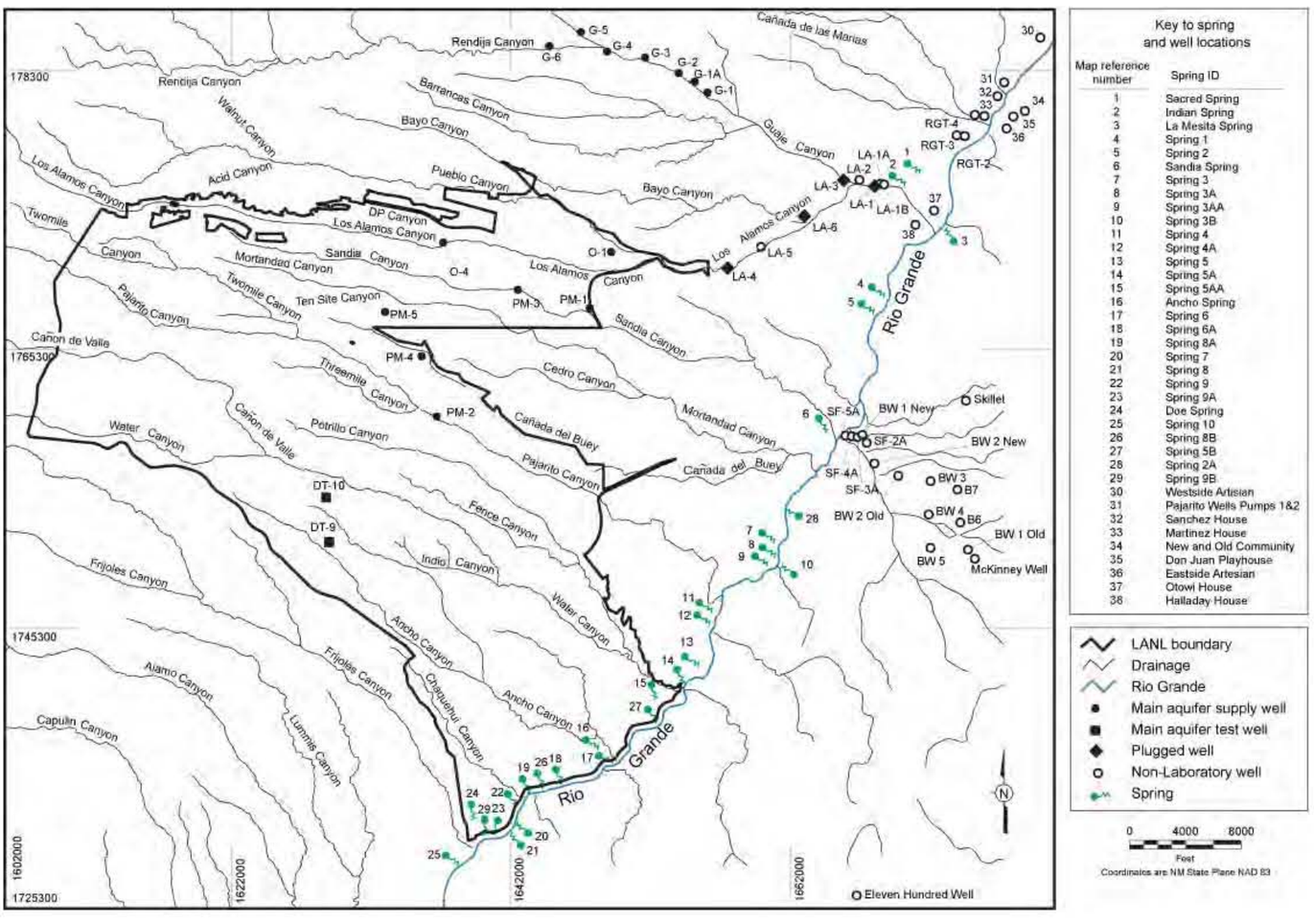


Figure 1.5-1 Surface water drainage to the Rio Grande

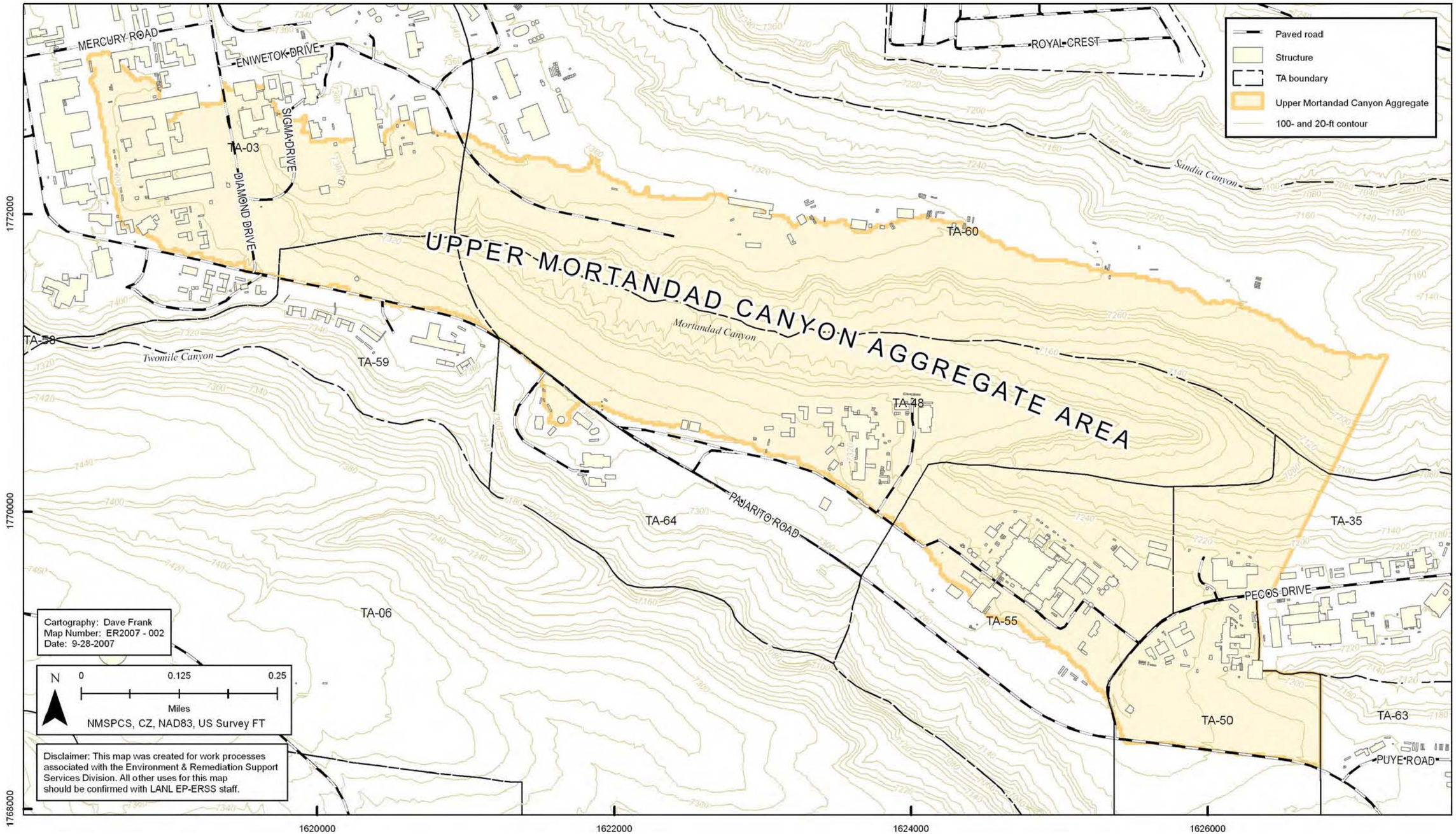


Figure 1.5-2 Location of Upper Mortandad Canyon Aggregate Area and its surrounding land holdings

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

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

Figure 1.5-3 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau

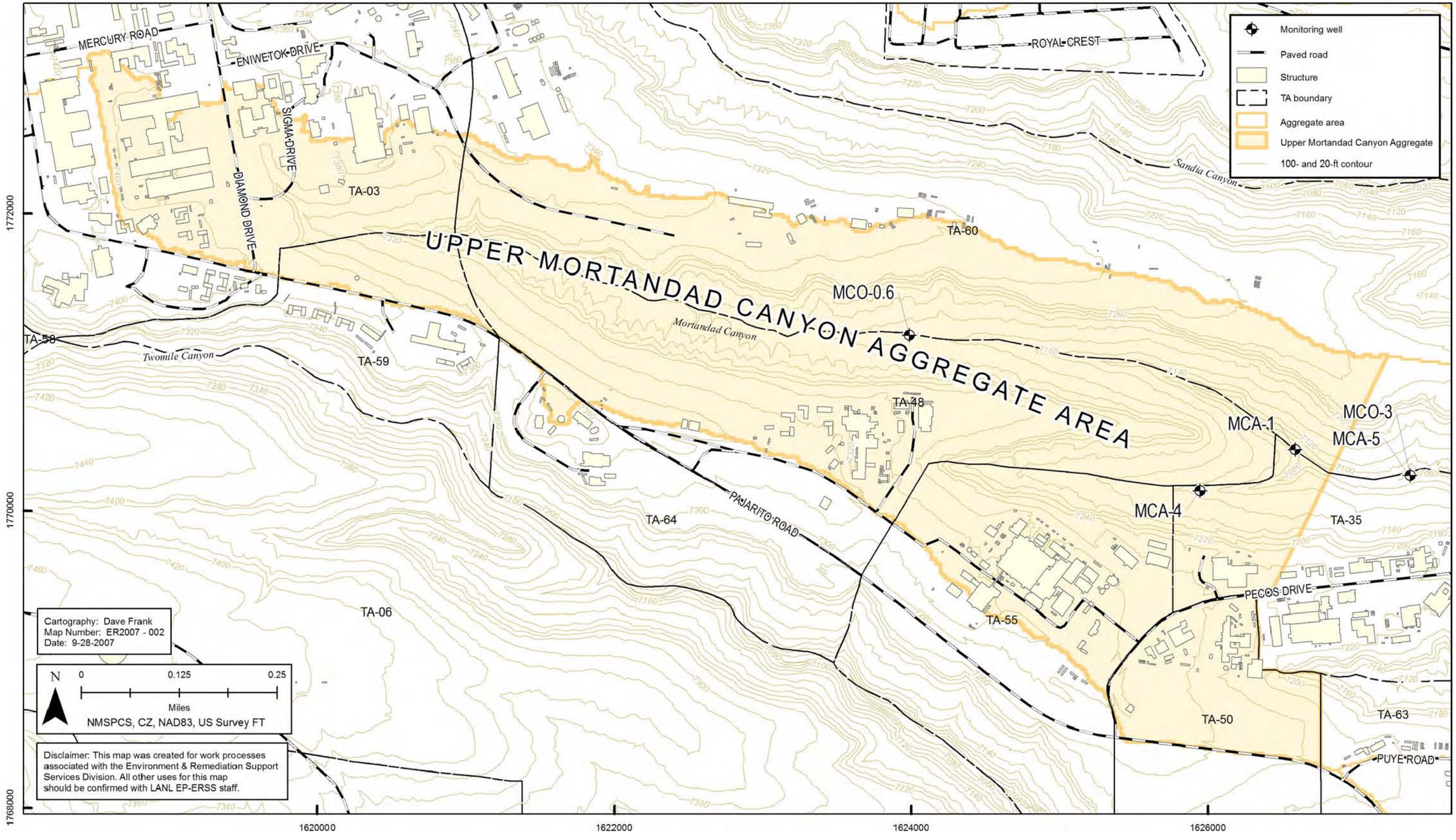


Figure 1.5-4 Existing groundwater monitoring wells in the vicinity of Upper Mortandad Canyon Aggregate Area

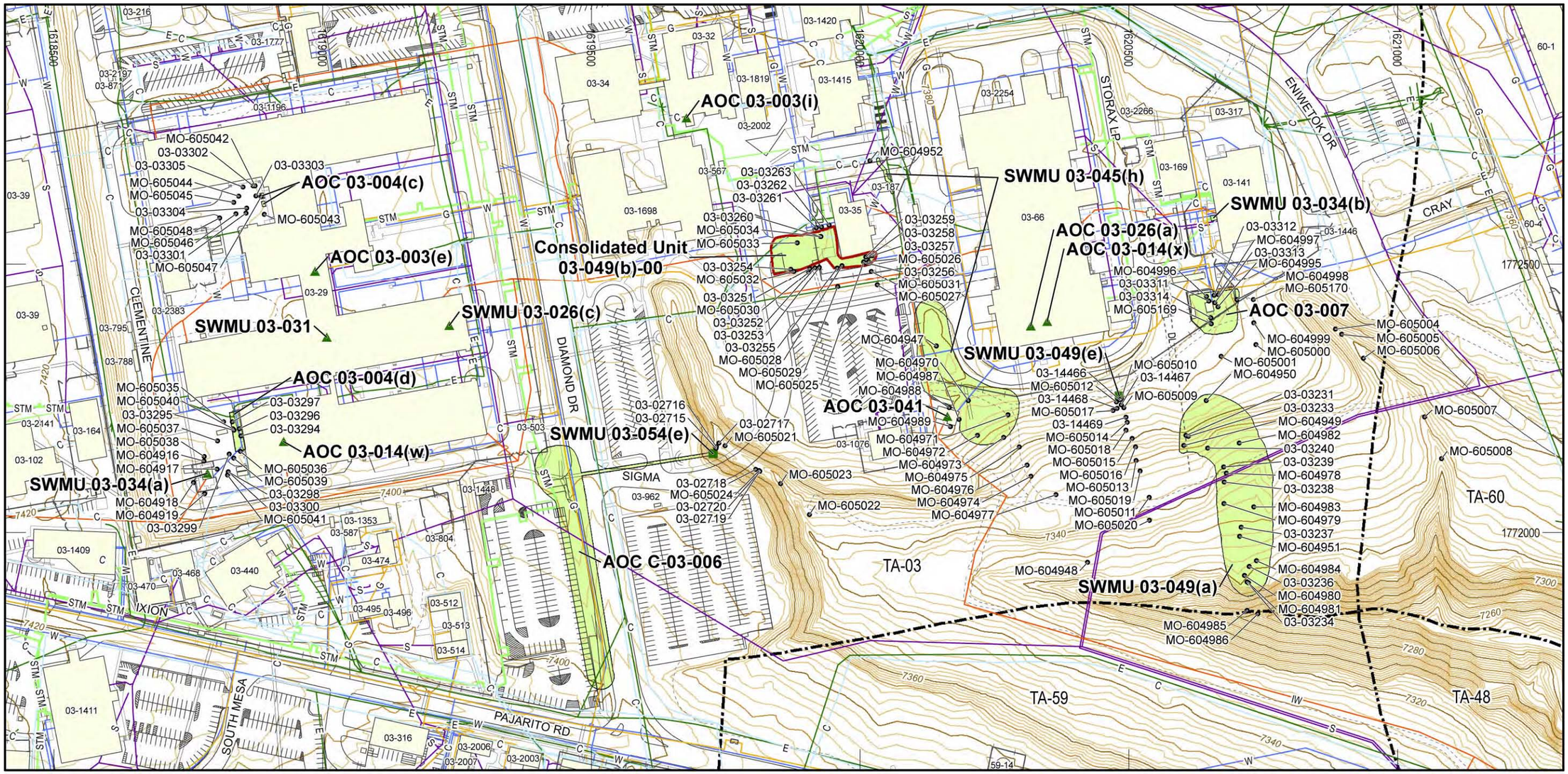


Figure 2.1-1 TA-03 site map

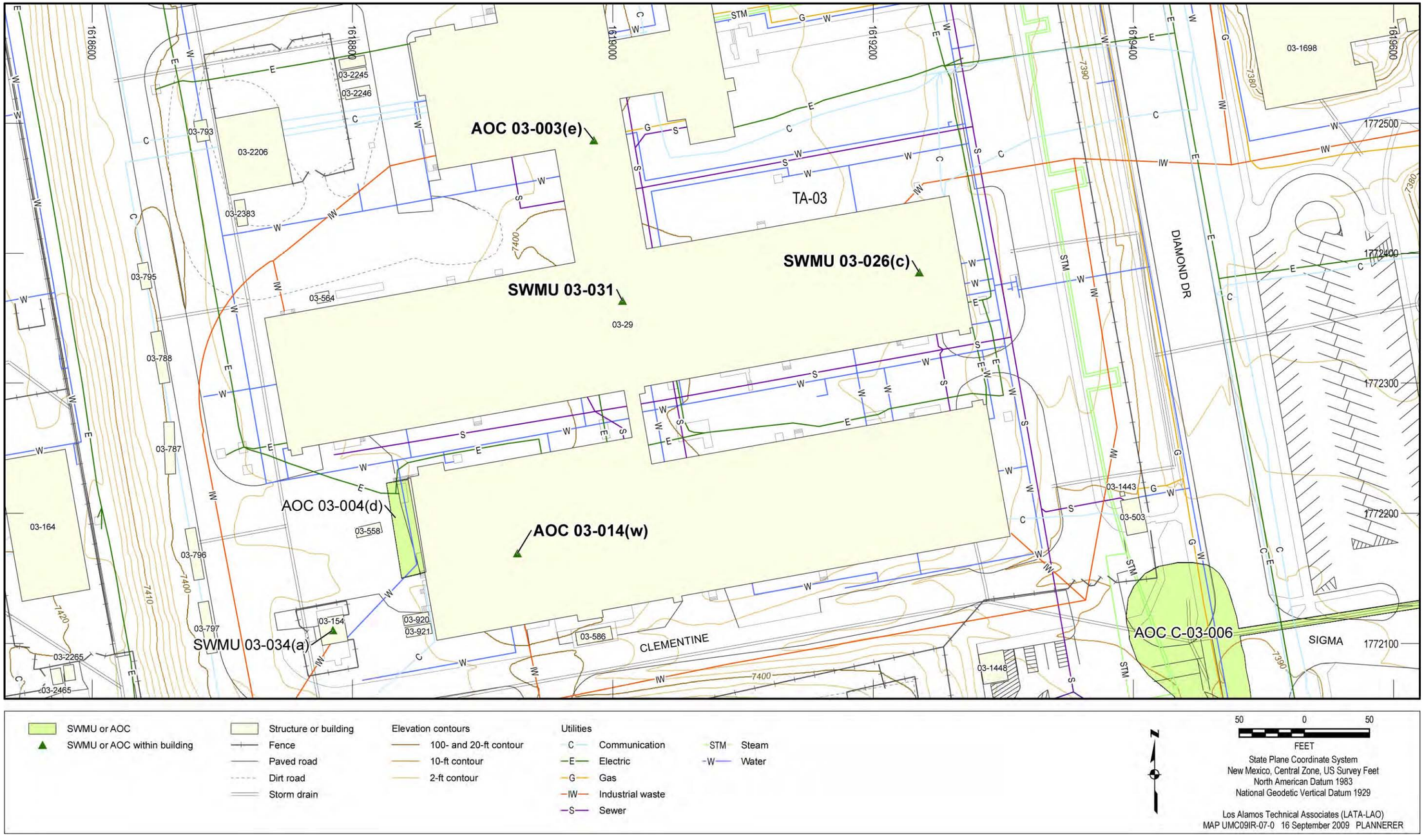


Figure 2.2-1 Site map of AOC 03-003(e), AOC 03-014(w), SWMU 03-026(c), and SWMU 03-031

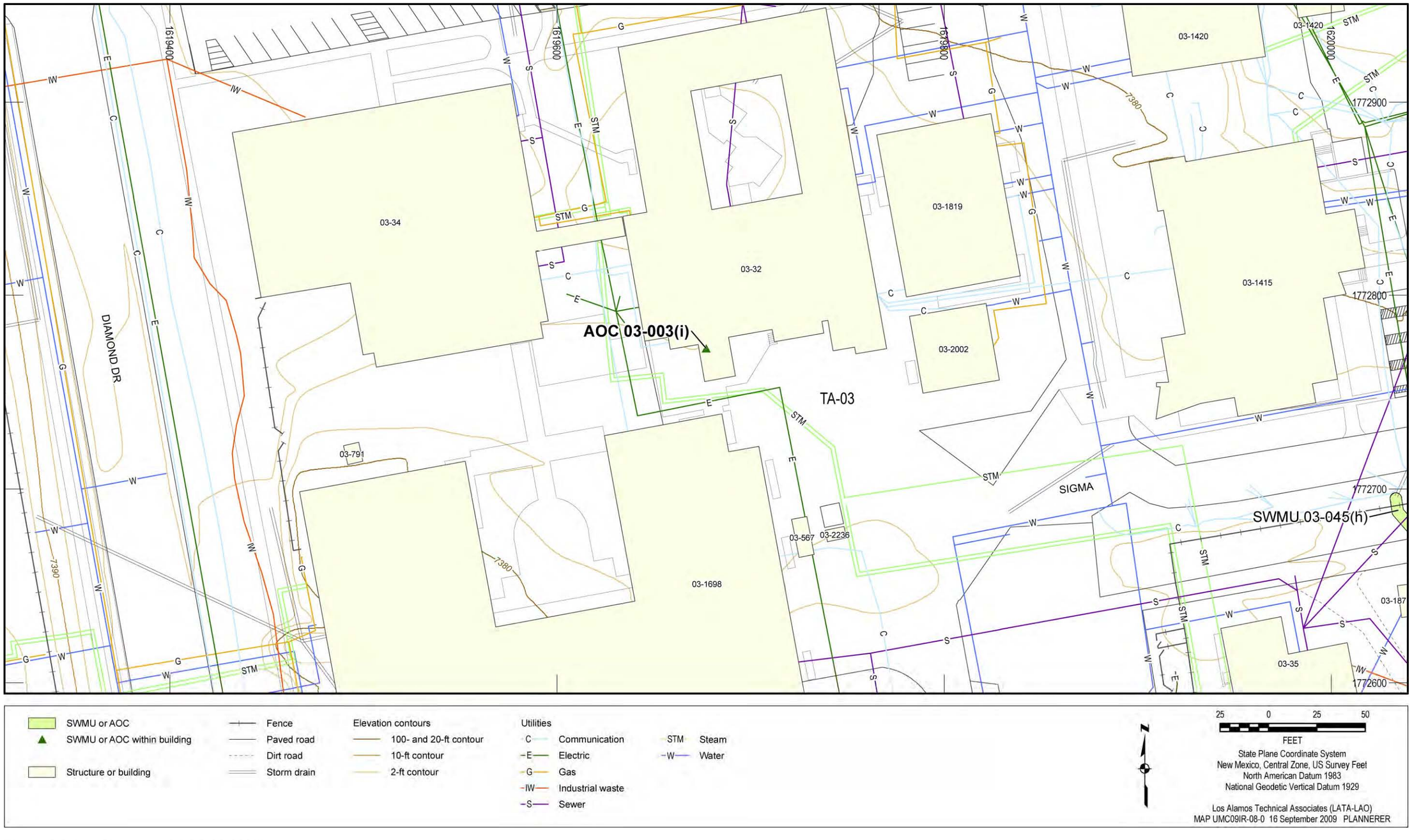


Figure 2.3-1 Site map of AOC 03-003(i)

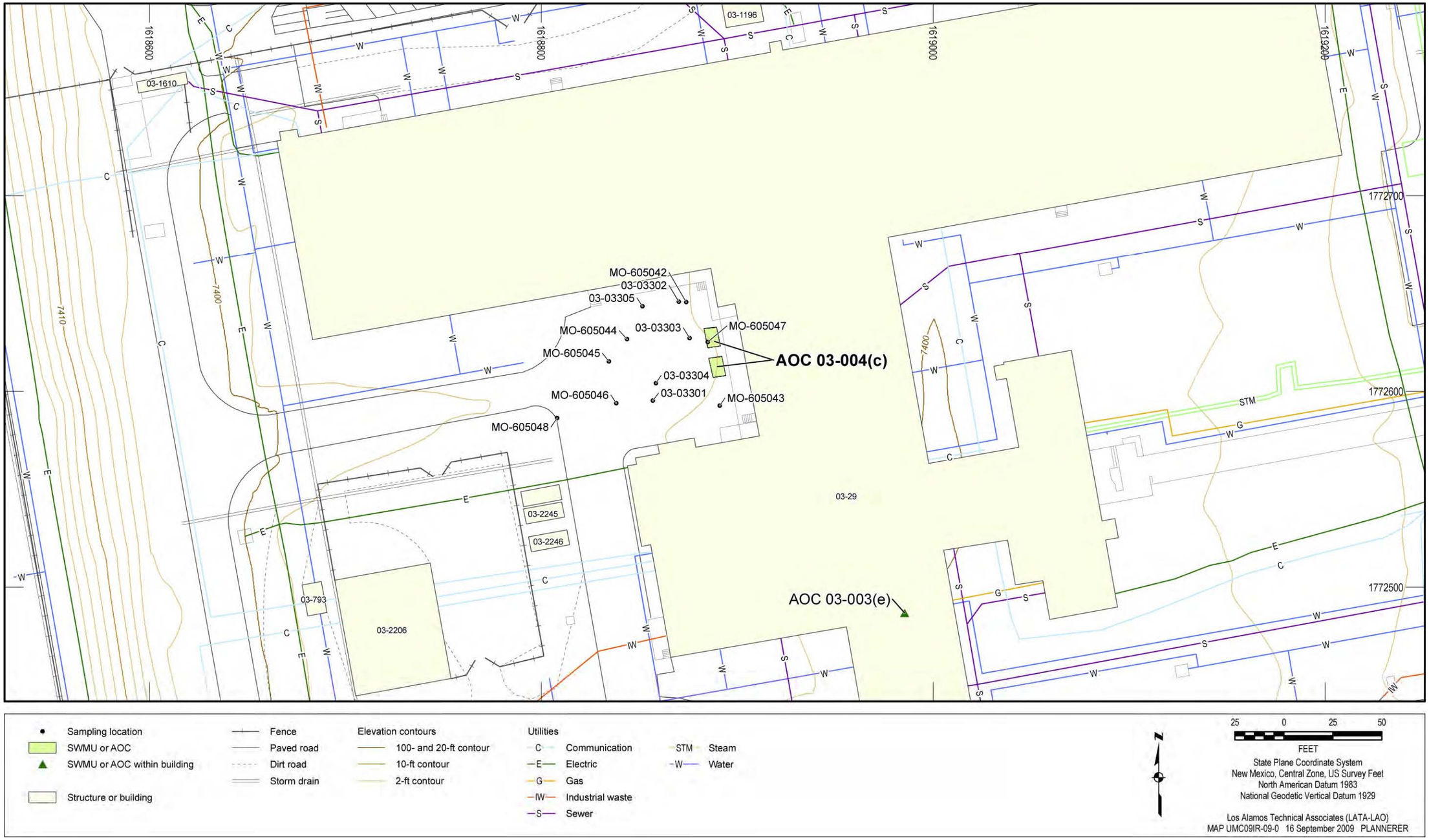


Figure 2.4-1 Site map and sampling locations at AOC 03-004(c)

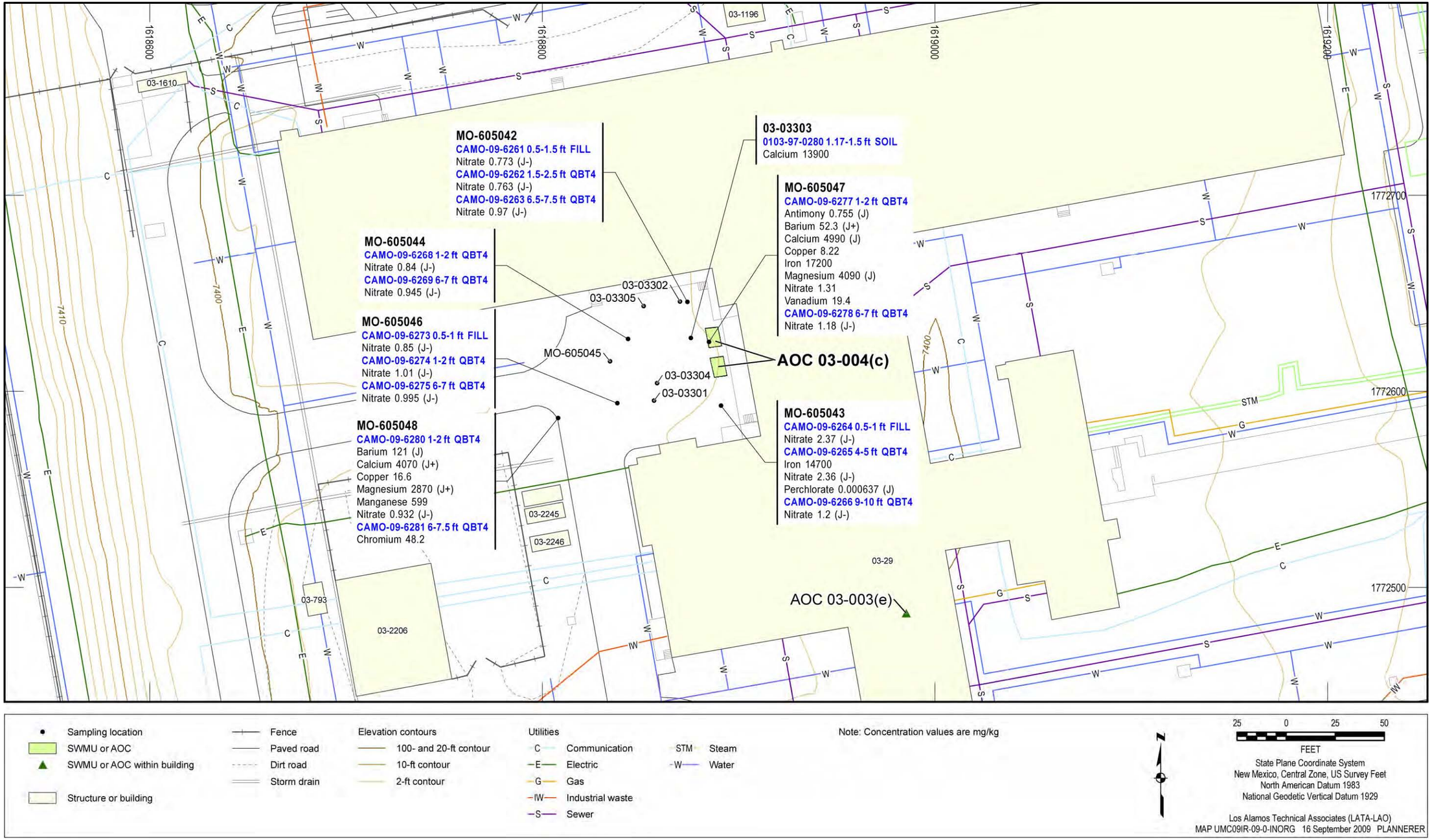


Figure 2.4-2 Inorganic COPCs detected or detected above BVs at AOC 03-004(c)

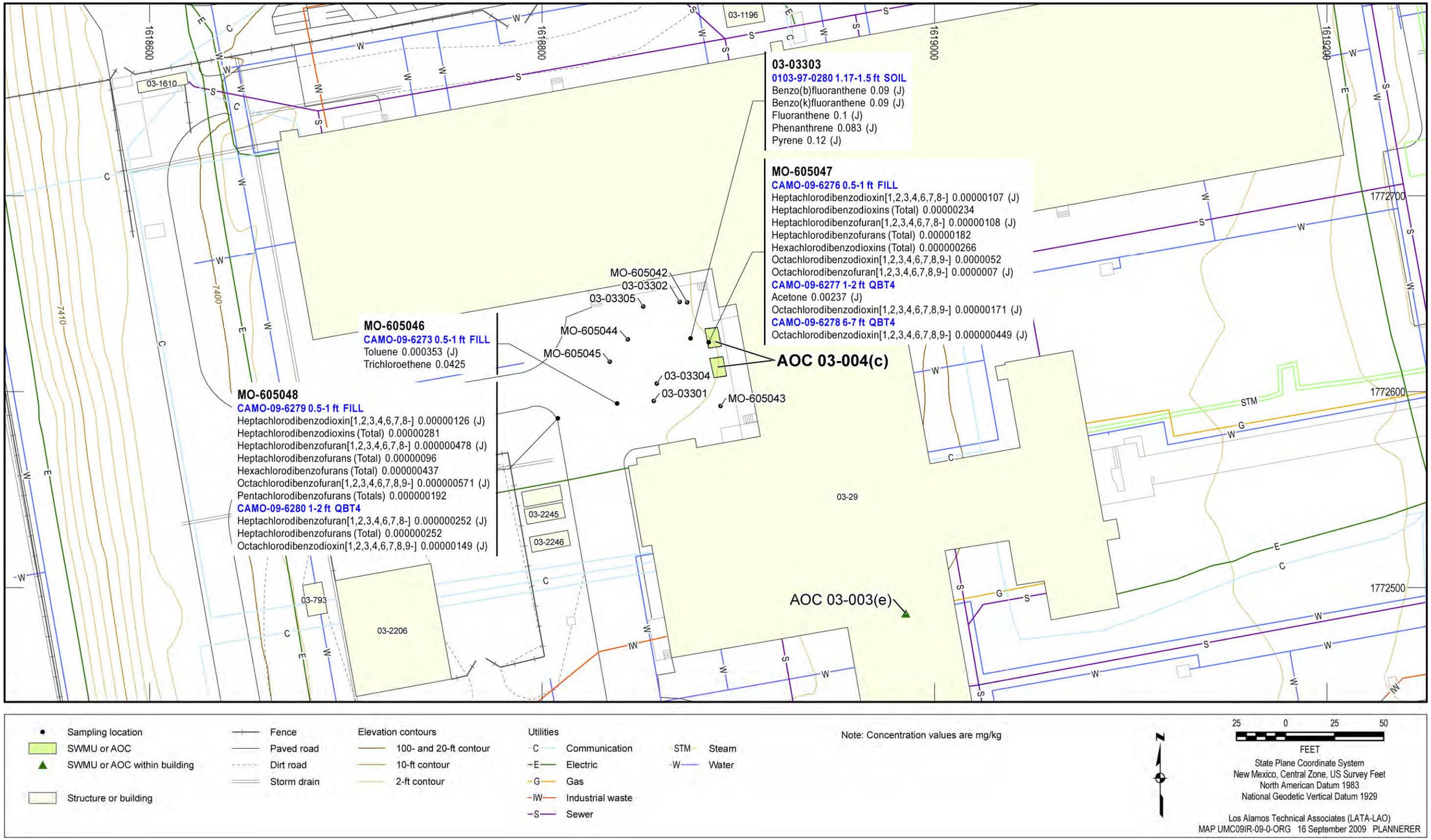


Figure 2.4-3 Organic COPCs detected at AOC 03-004(c)

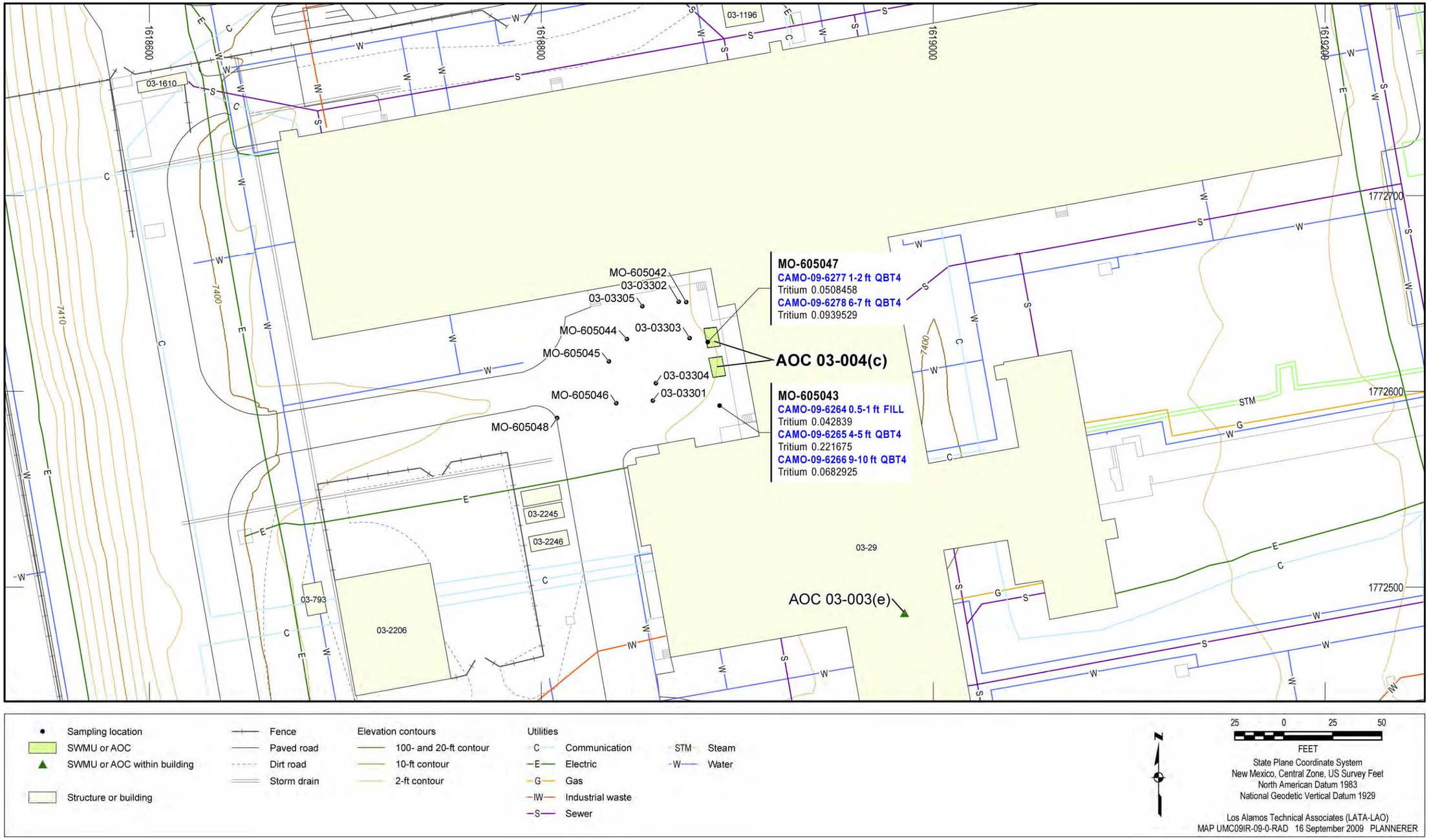


Figure 2.4-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-004(c)

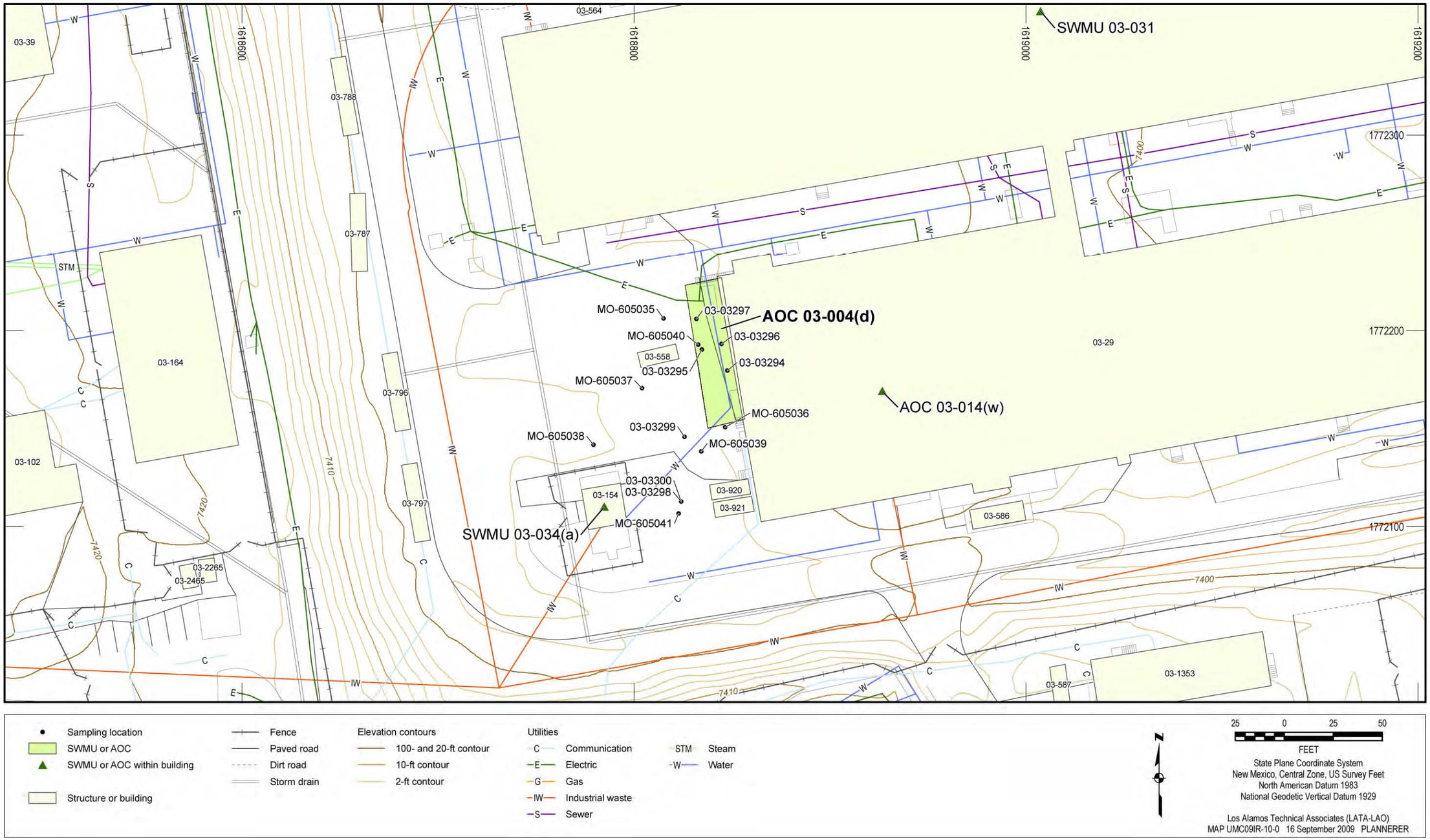


Figure 2.5-1 Site map and sampling locations at AOC 03-004(d)

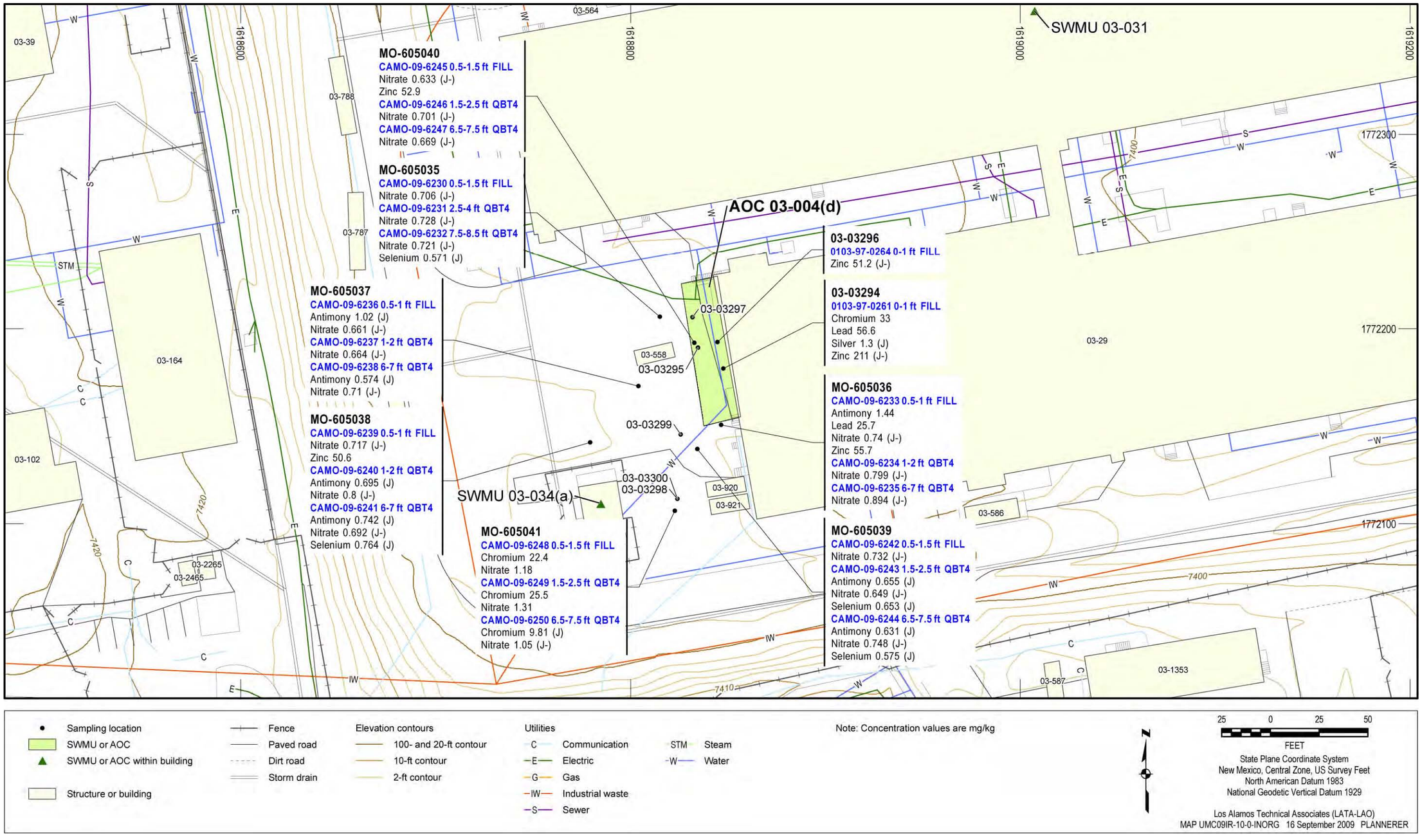


Figure 2.5-2 Inorganic COPCs detected or detected above BVs at AOC 03-004(d)

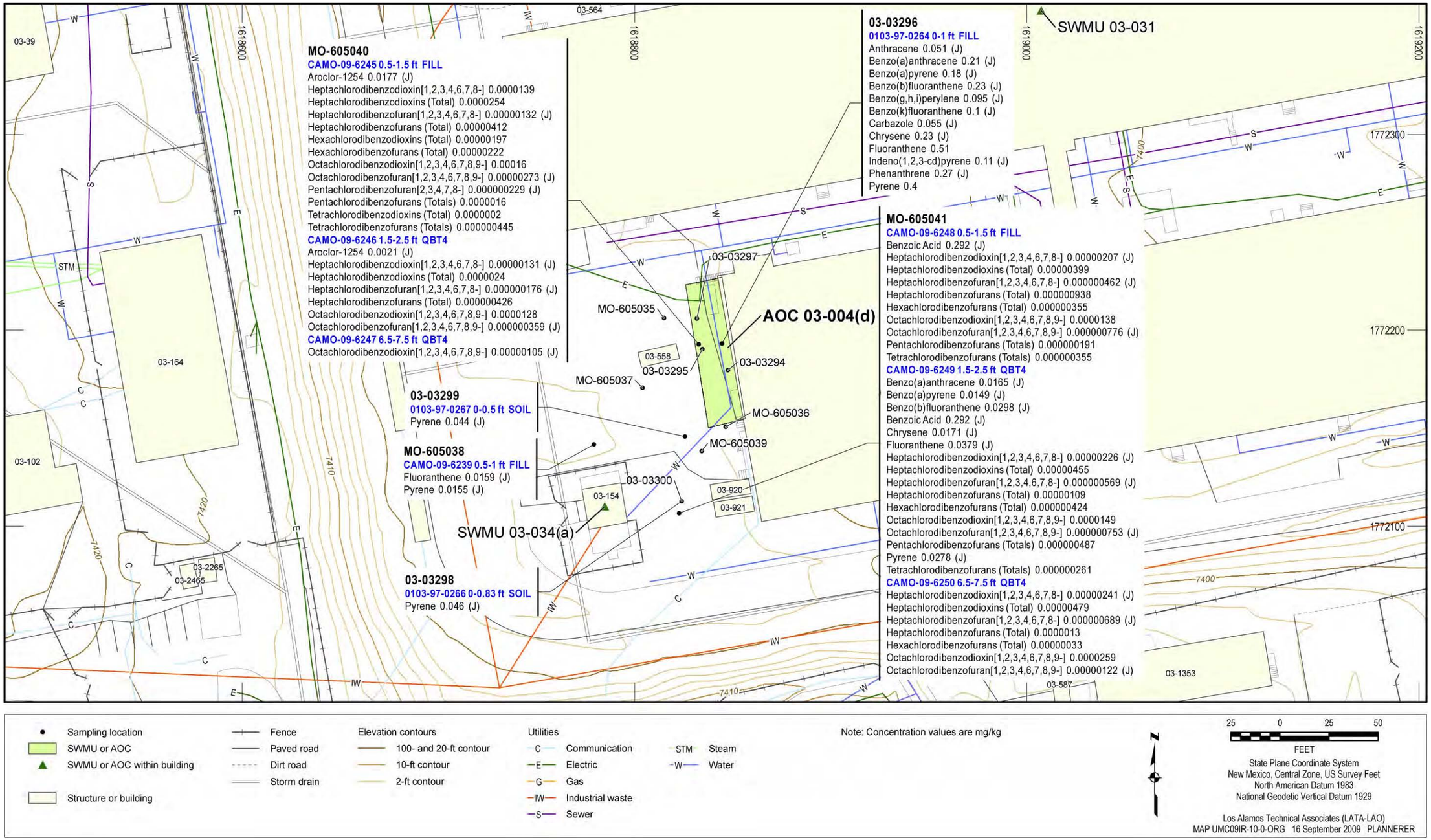


Figure 2.5-3 Organic COPCs detected at AOC 03-004(d)

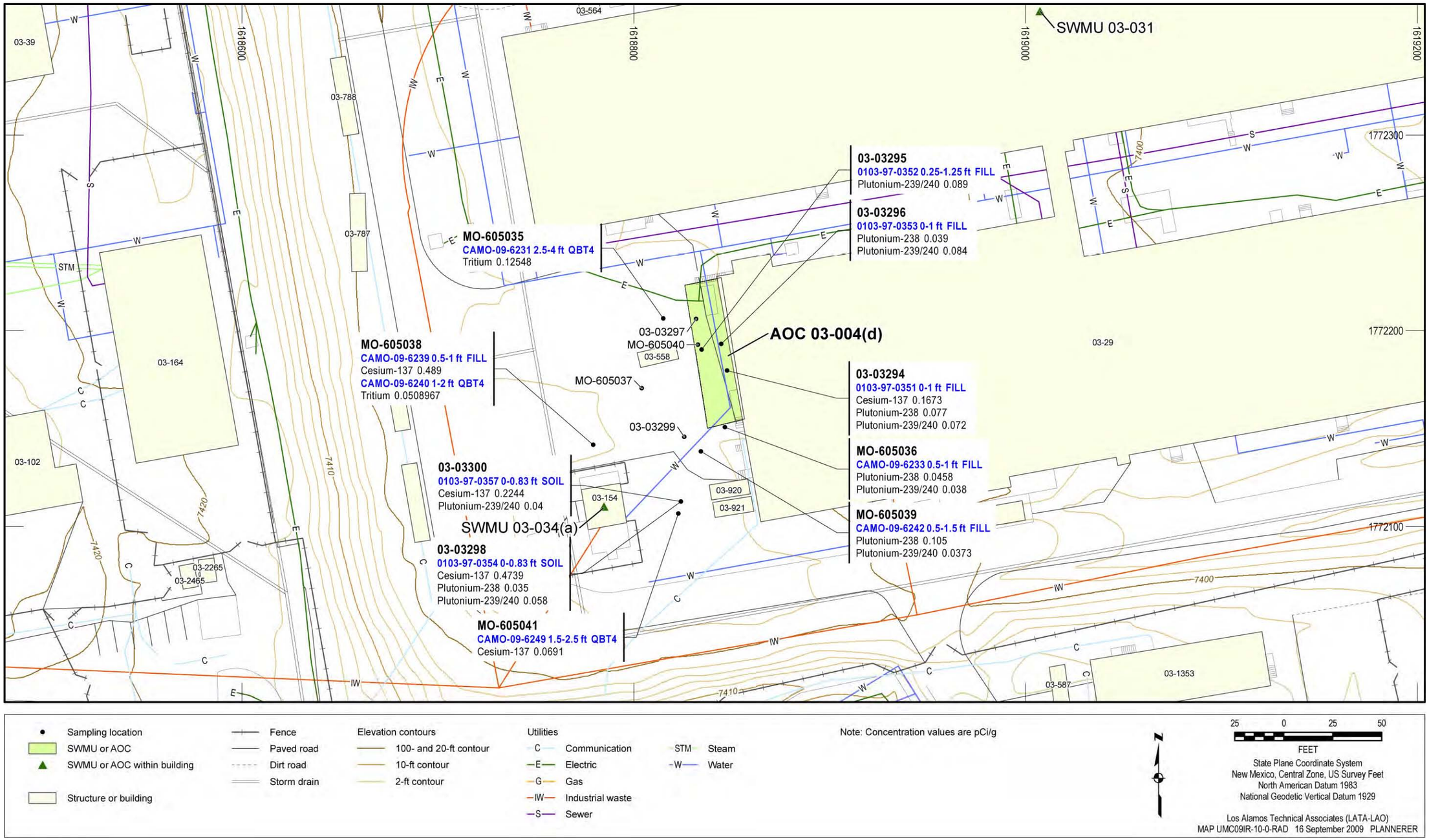


Figure 2.5-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-004(d)

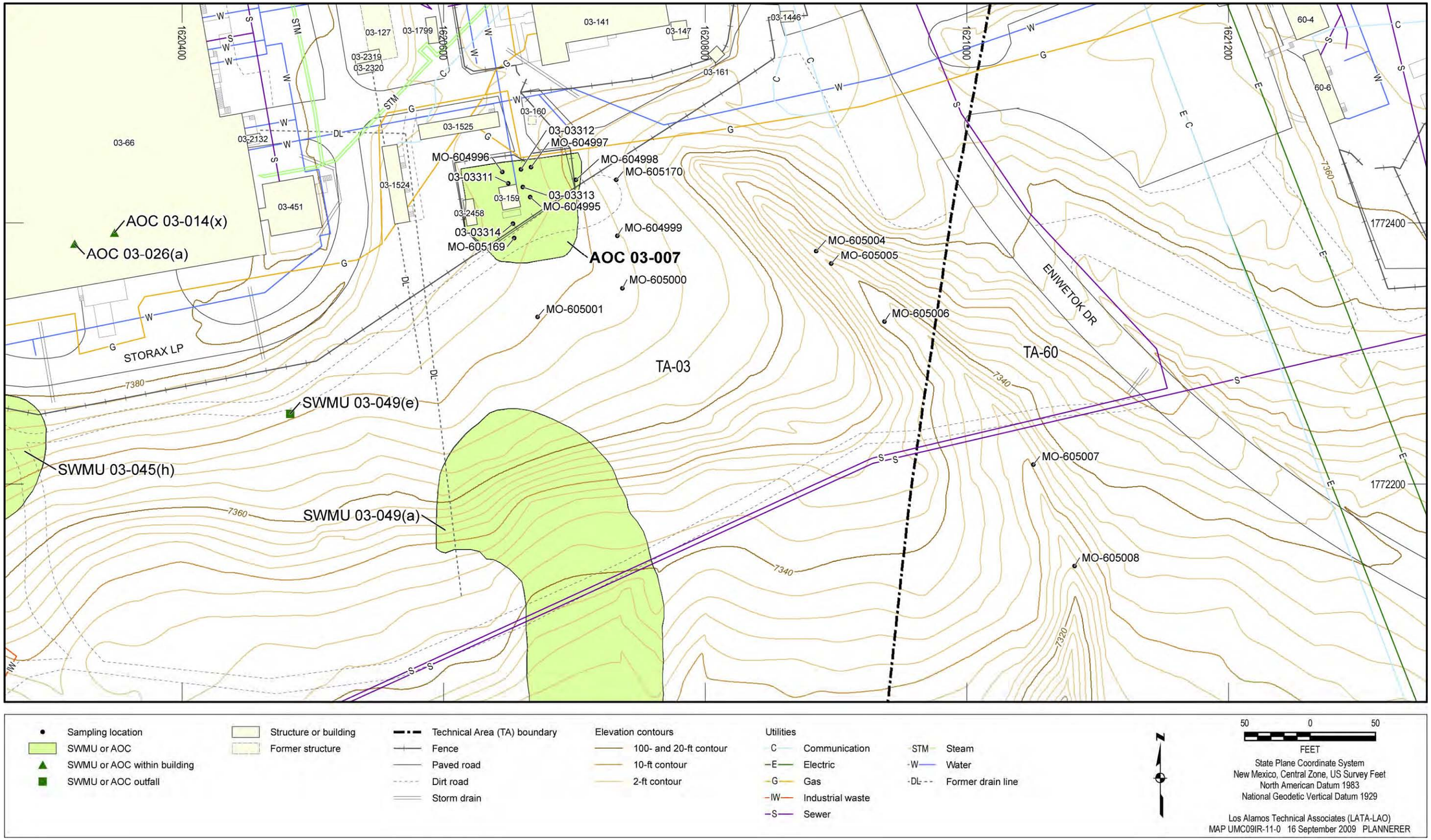


Figure 2.6-1 Site map and sampling locations at AOC 03-007

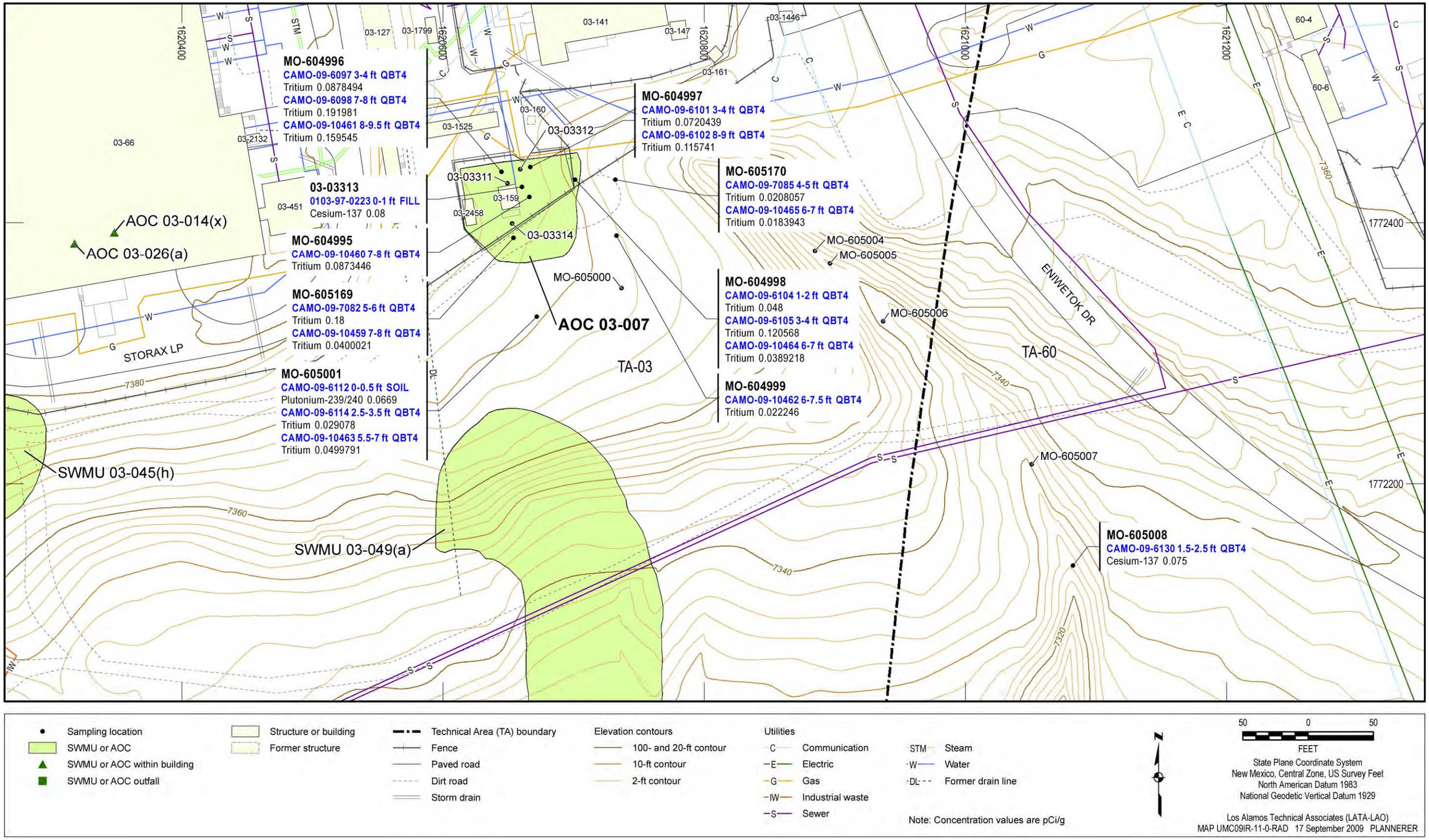


Figure 2.6-2 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-007

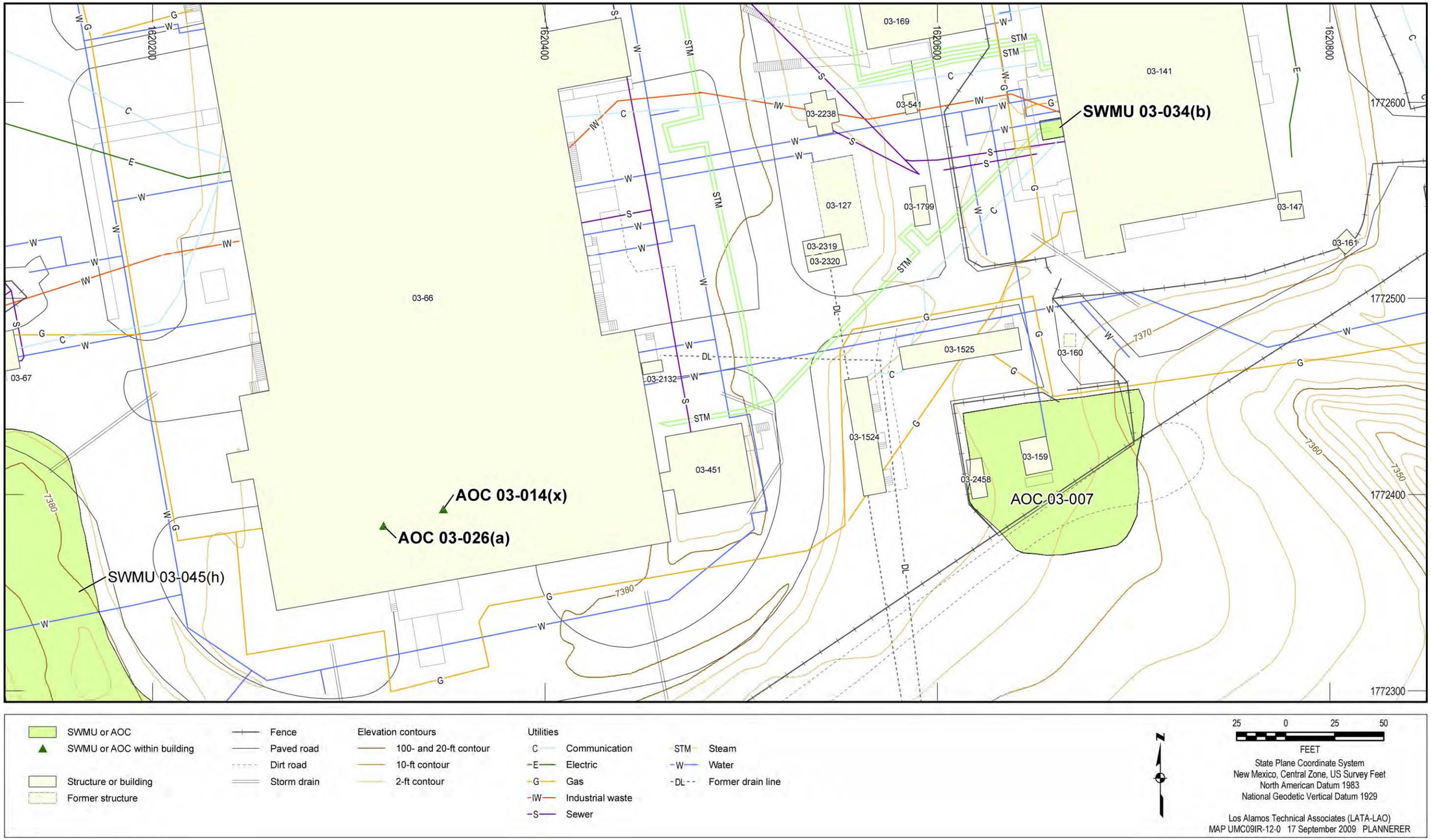


Figure 2.8-1 Site map of AOC 03-014(x), AOC 03-026(a), and SWMU 03-034(b)

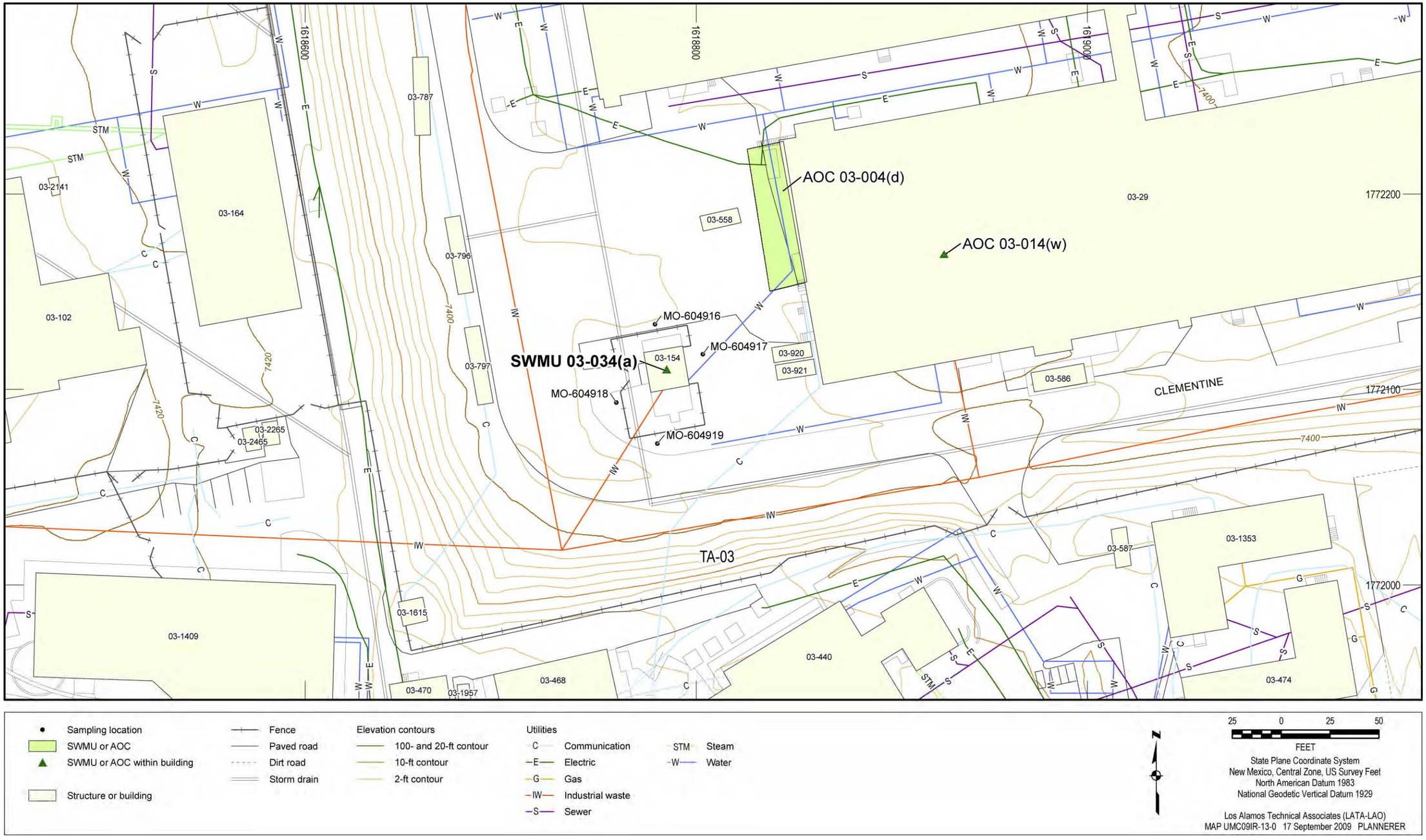


Figure 2.12-1 Site map and sampling locations at SWMU 03-034(a)

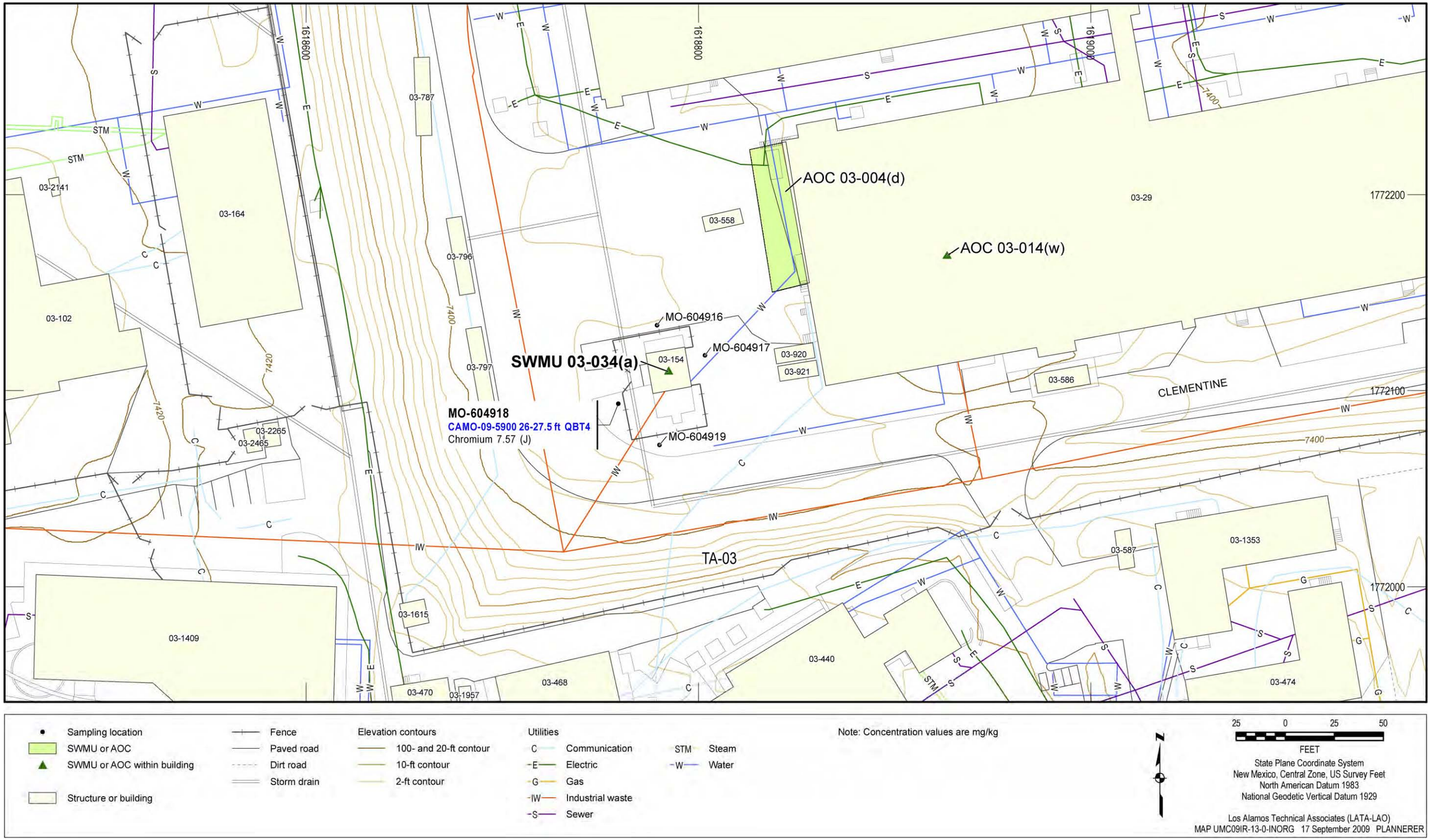


Figure 2.12-2 Inorganic COPCs detected or detected above BVs at SWMU 03-034(a)

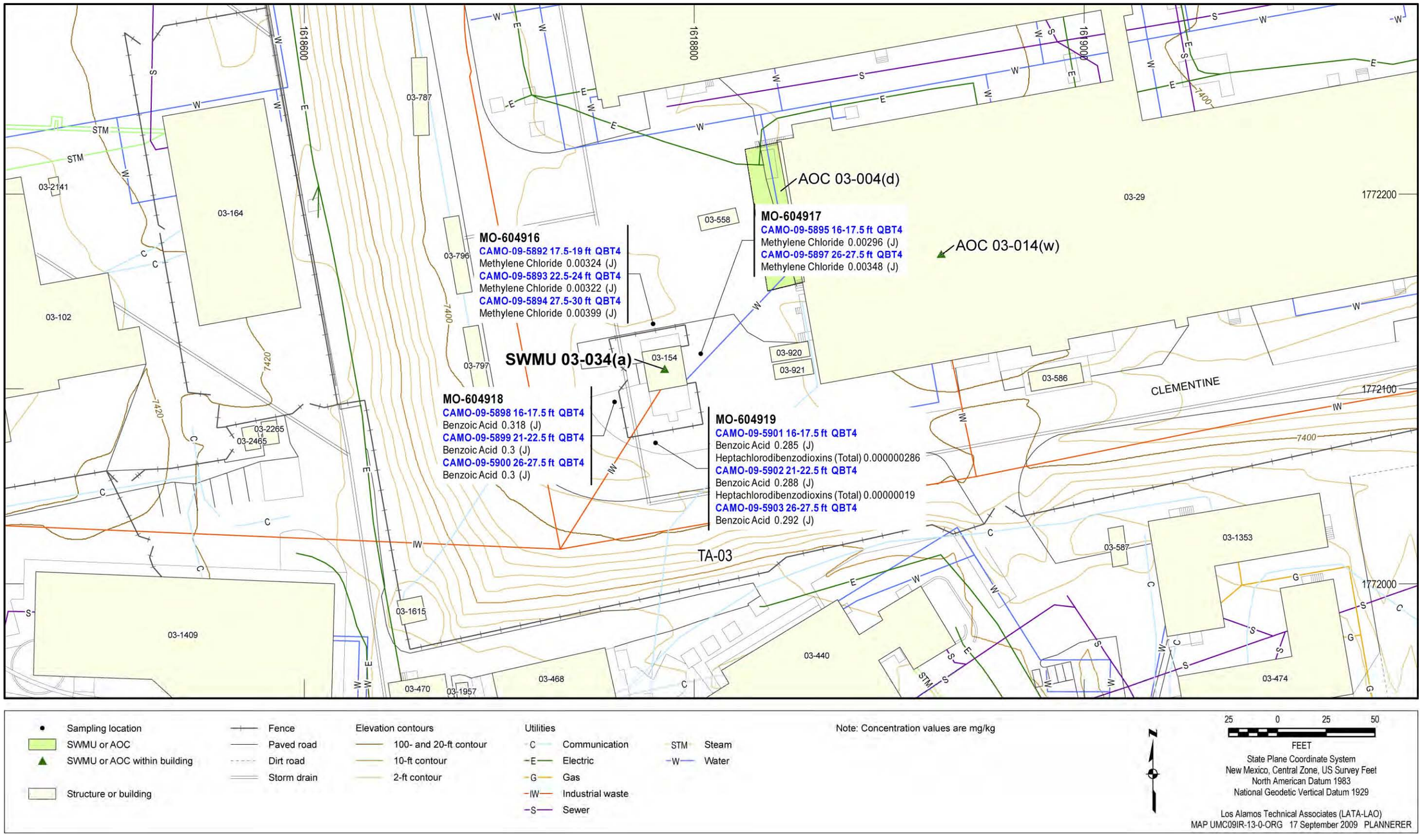


Figure 2.12-3 Organic COPCs detected at SWMU 03-034(a)

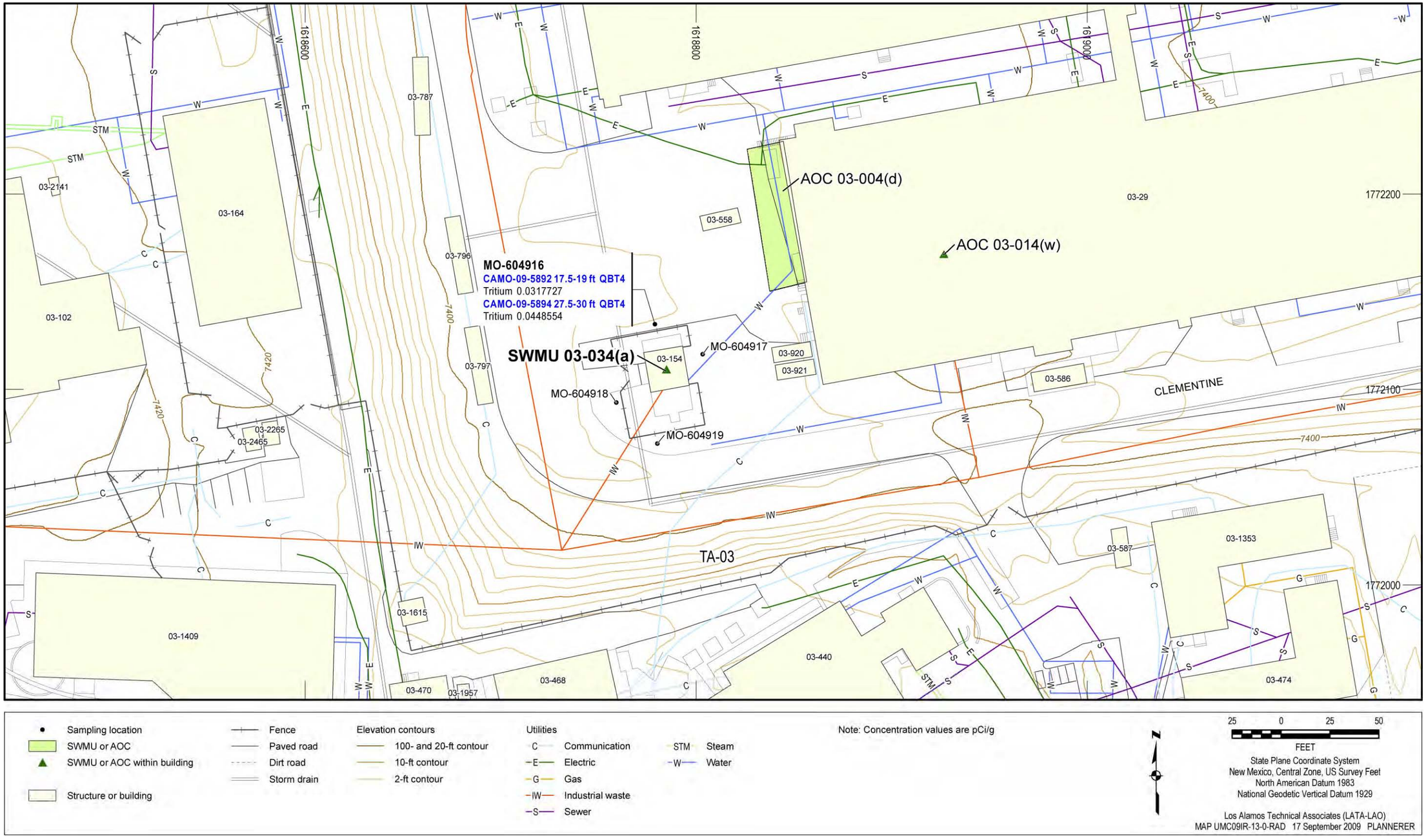


Figure 2.12-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-034(a)

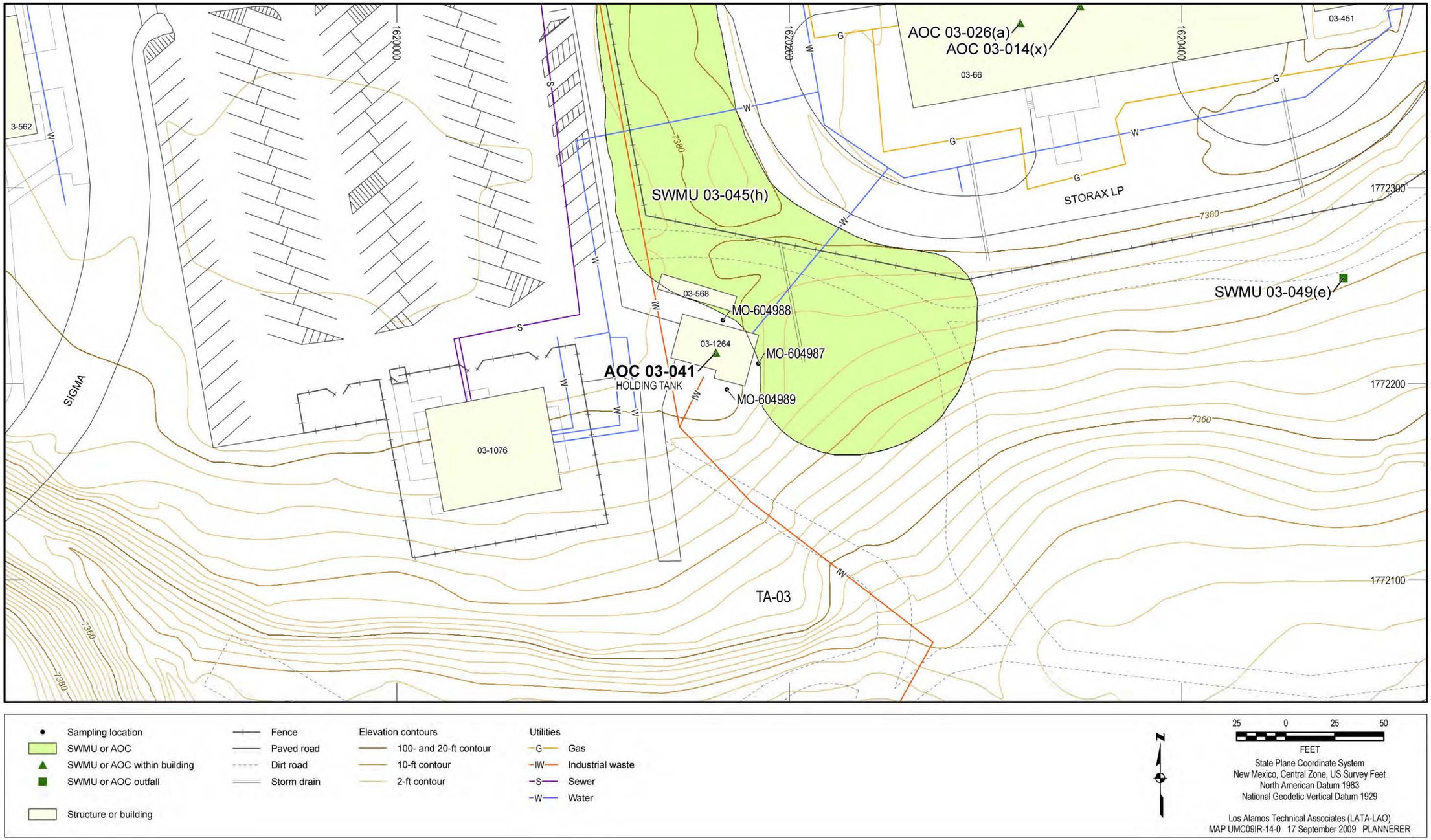


Figure 2.14-1 Site map and sampling locations at AOC 03-041

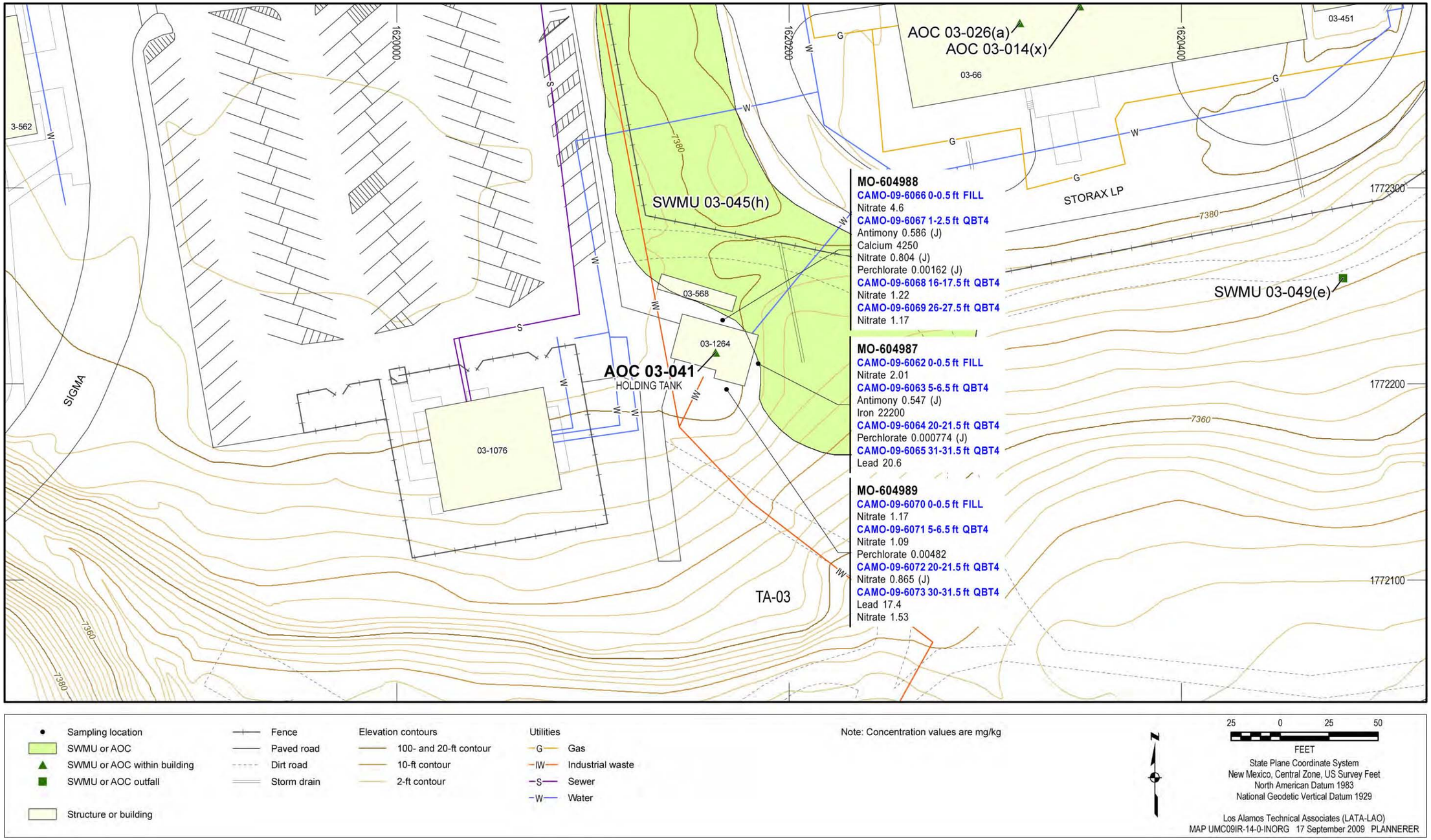


Figure 2.14-2 Inorganic COPCs detected or detected above BVs at AOC 03-041

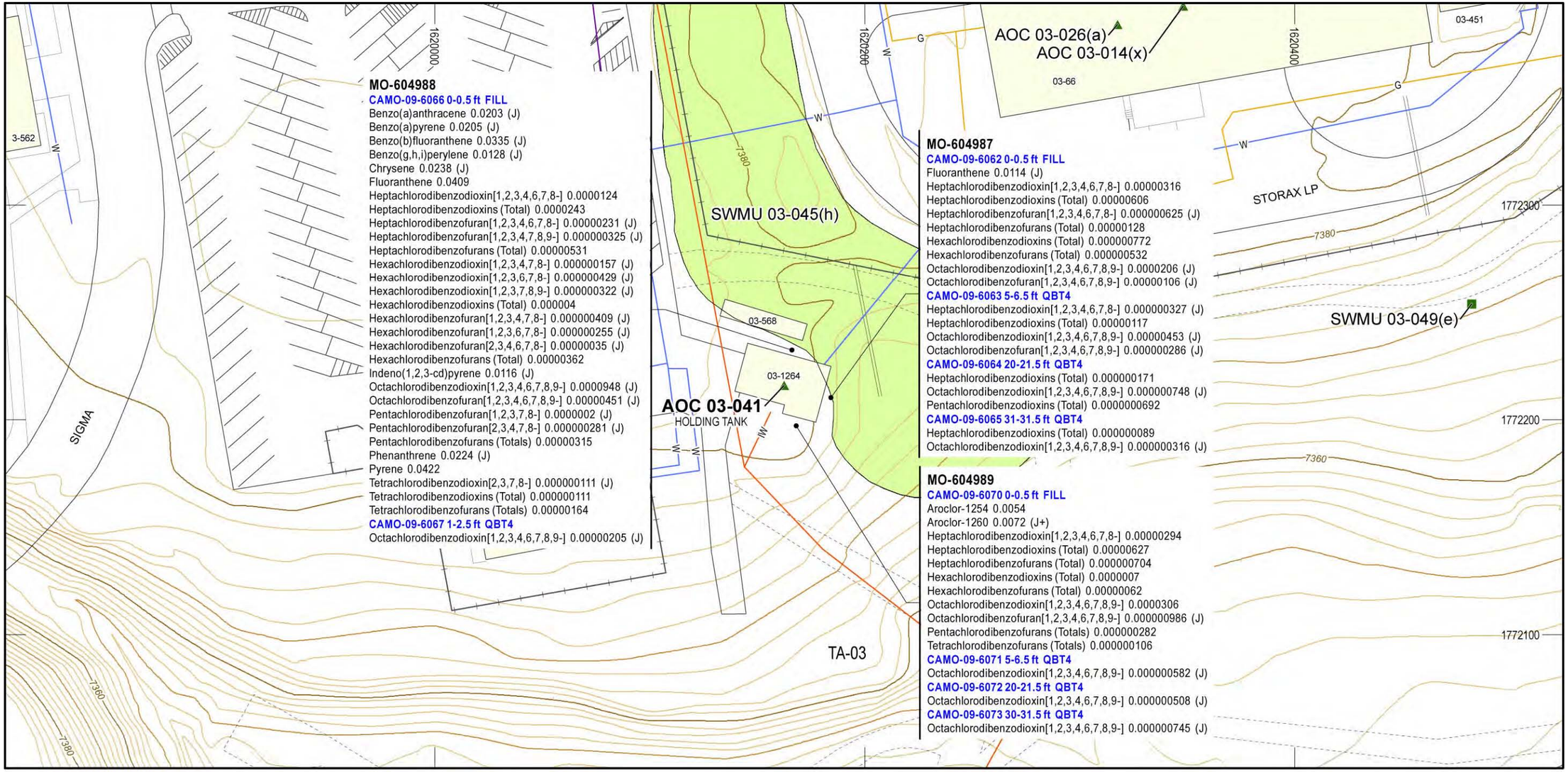


Figure 2.14-3 Organic COPCs detected at AOC 03-041

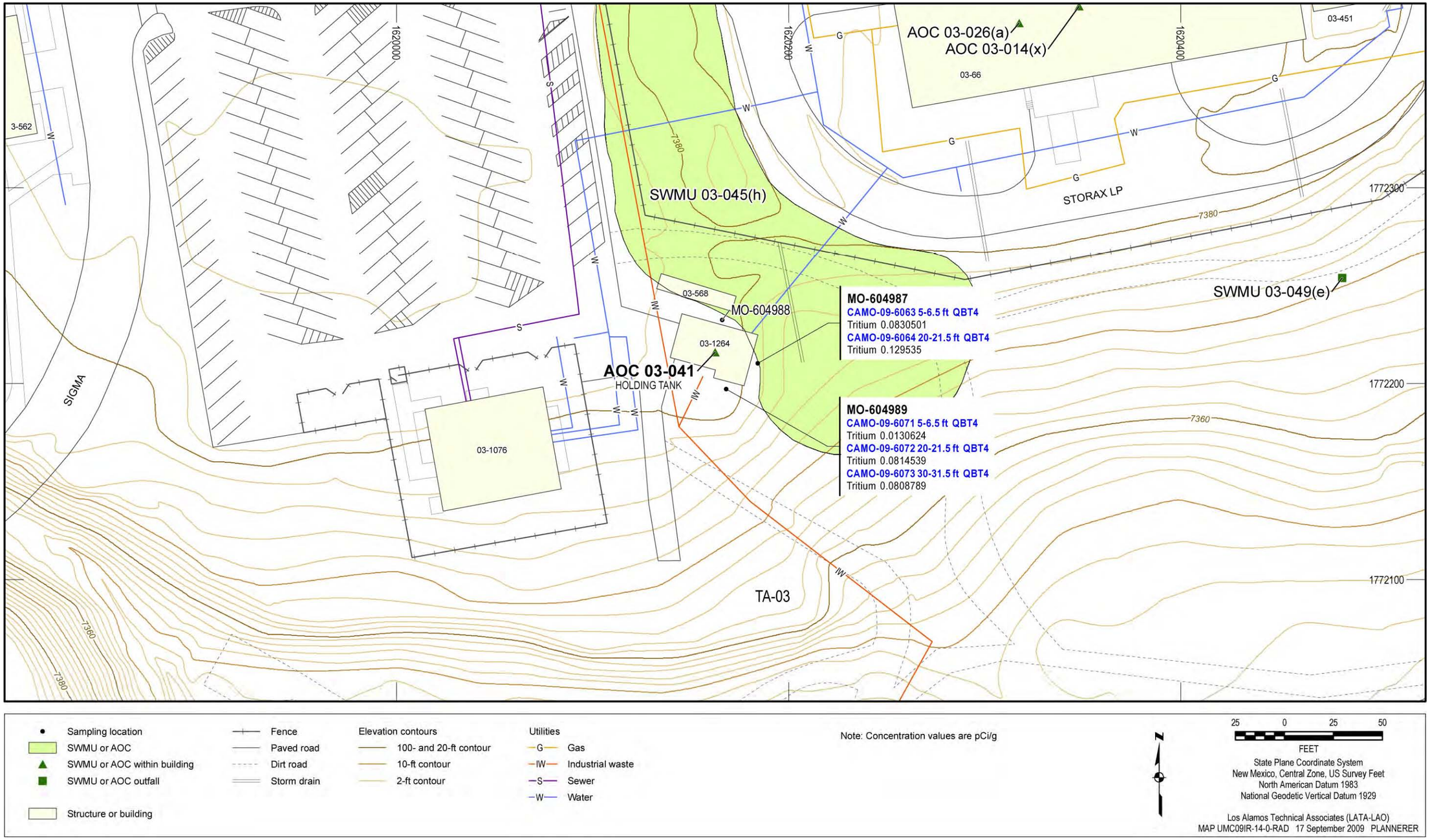


Figure 2.14-4 Radionuclides COPCs detected or detected above BVs/FVs at AOC 03-041

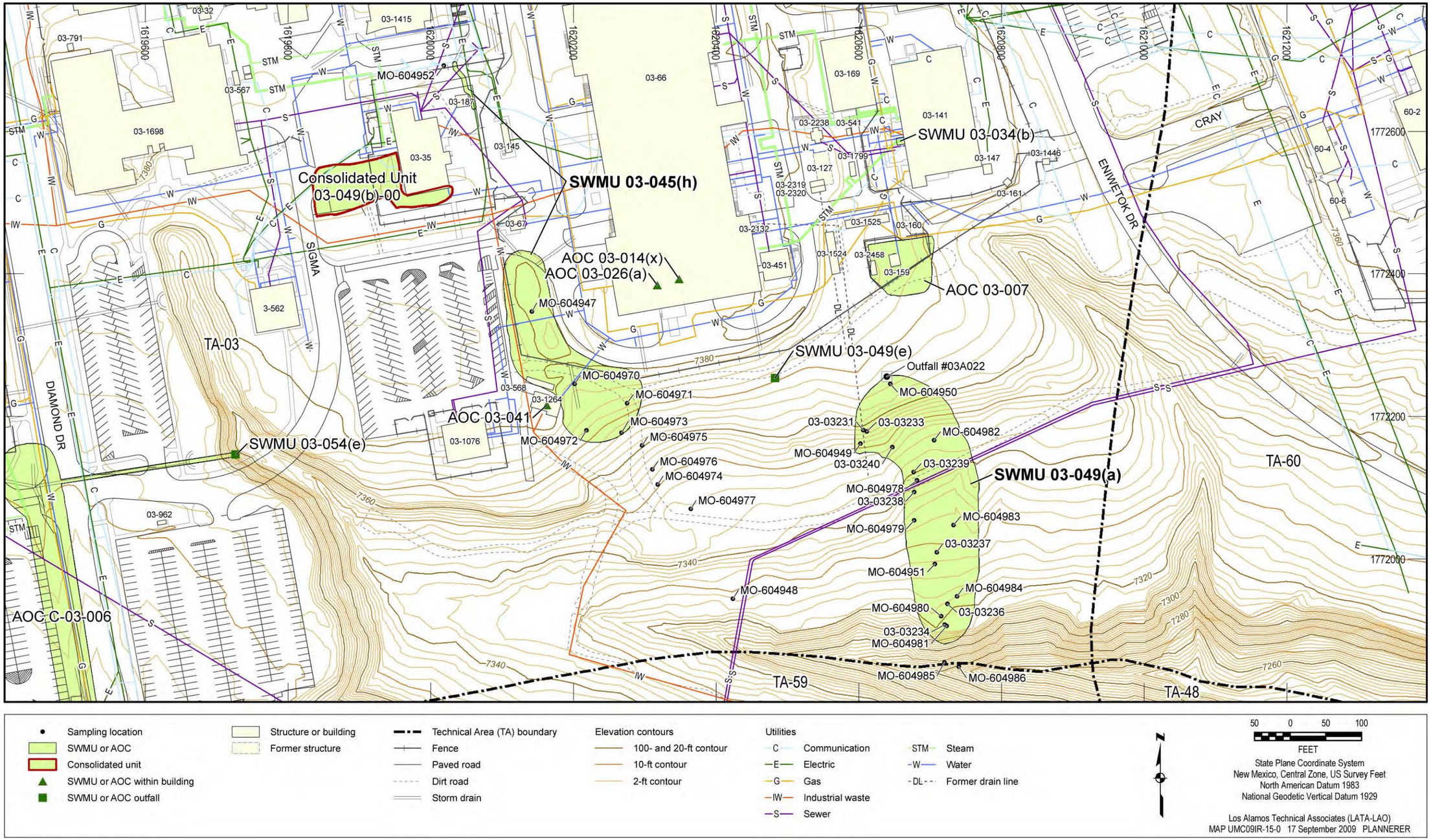


Figure 2.15-1 Site map and sampling locations at SWMUs 03-045(h) and 03-049(a) [Consolidated Unit 03-045(h)-00]

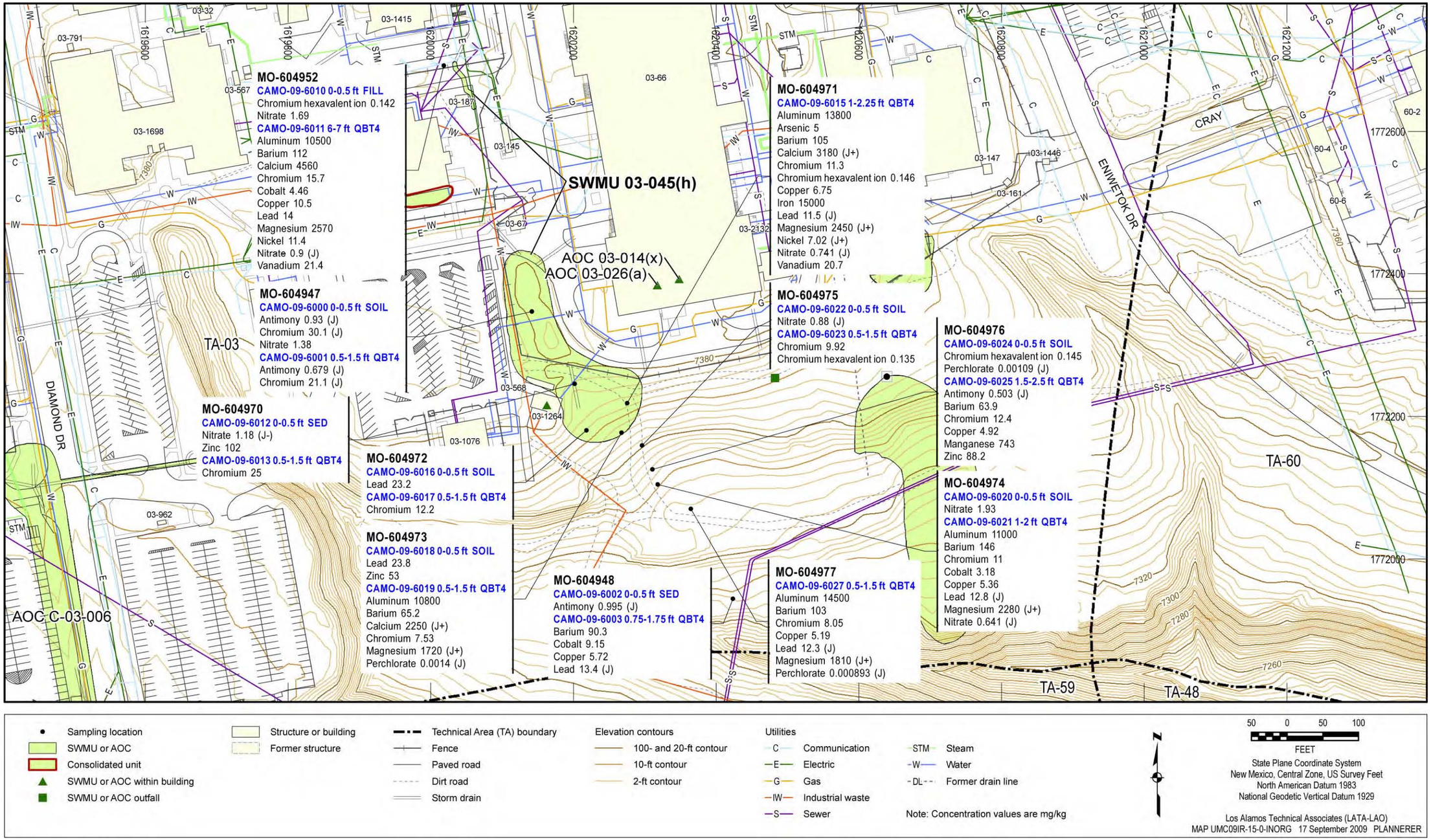


Figure 2.15-2 Inorganic COPCs detected or detected above BVs at SWMU 03-045(h)

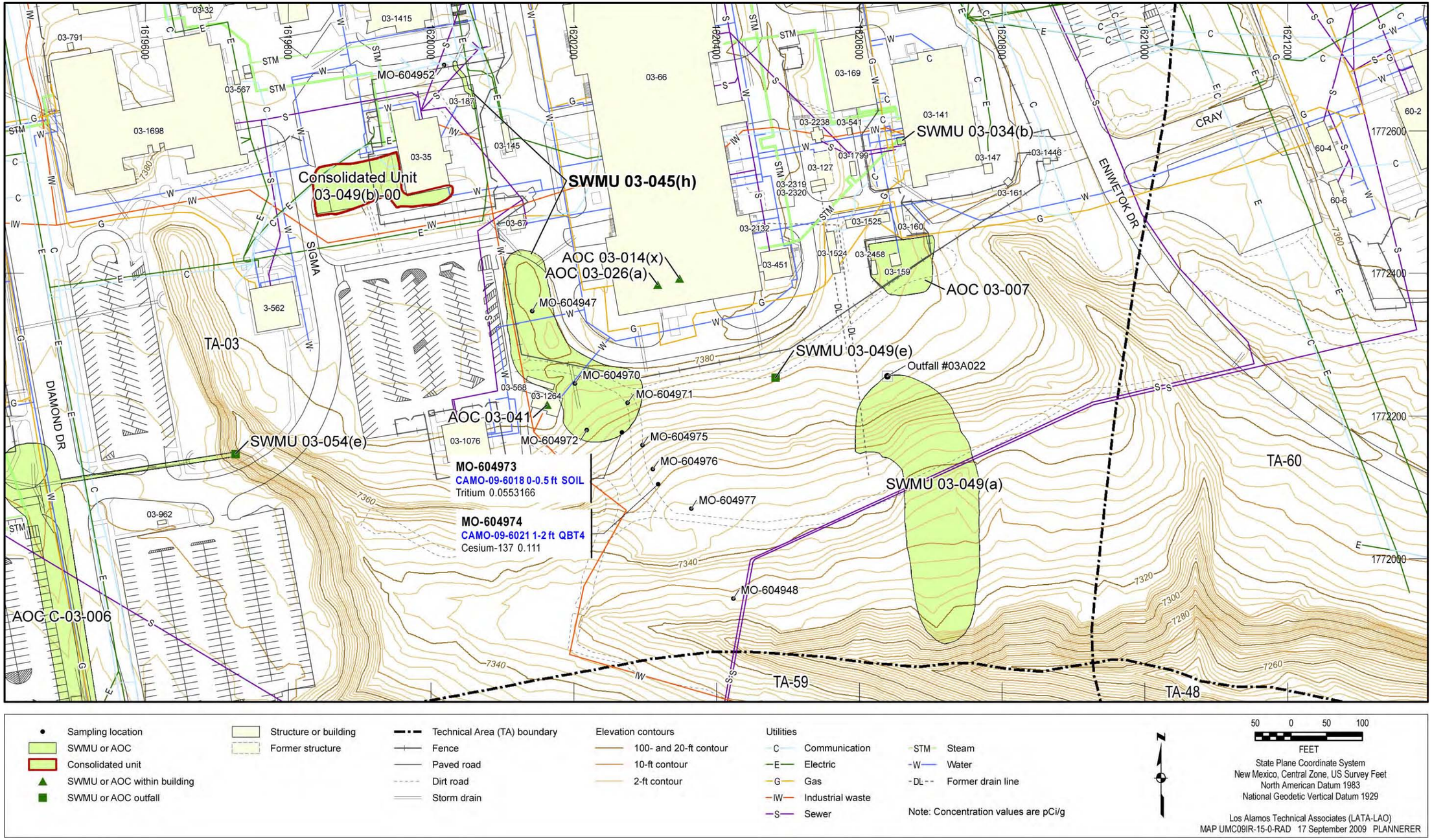


Figure 2.15-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-045(h)

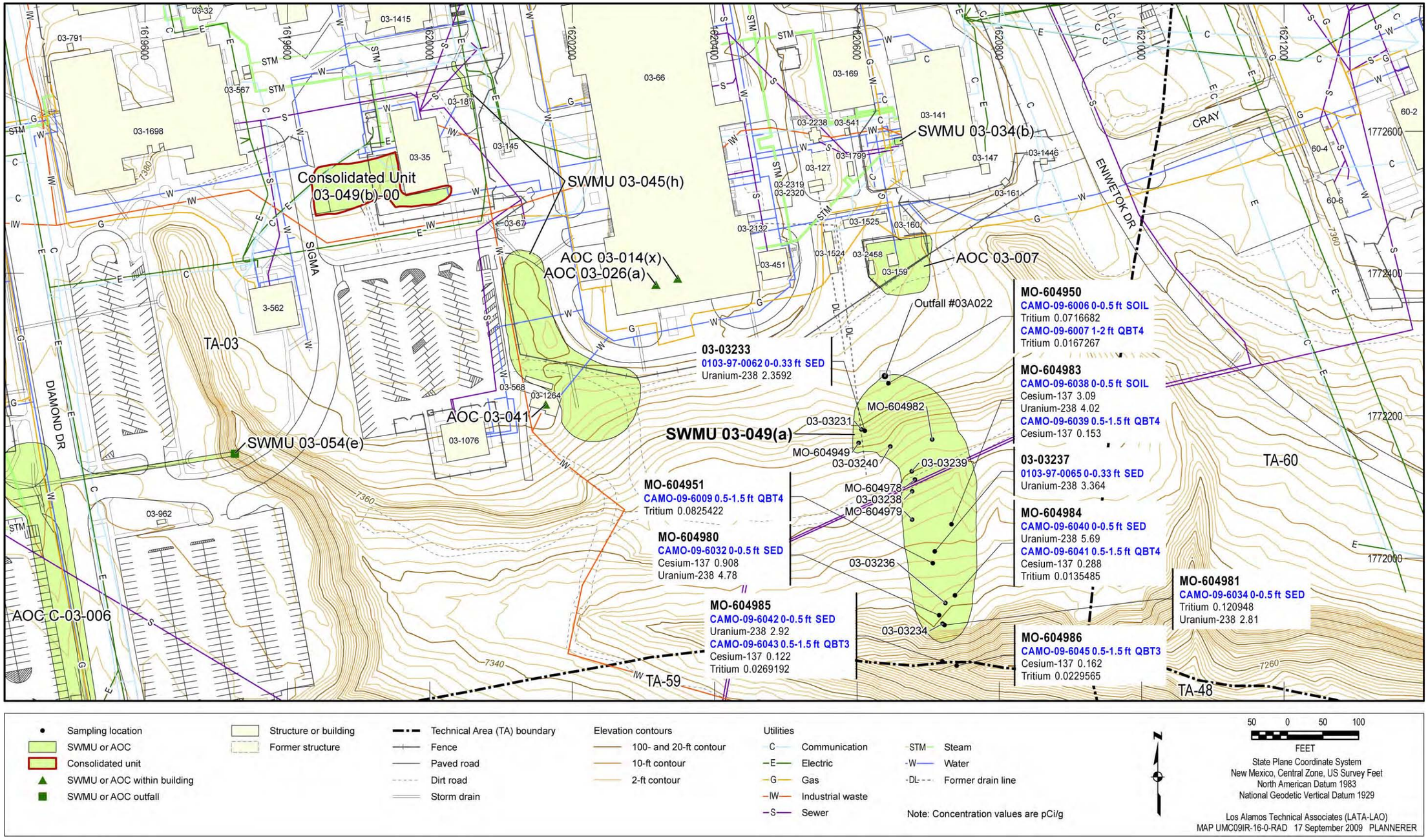


Figure 2.16-1 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-049(a)

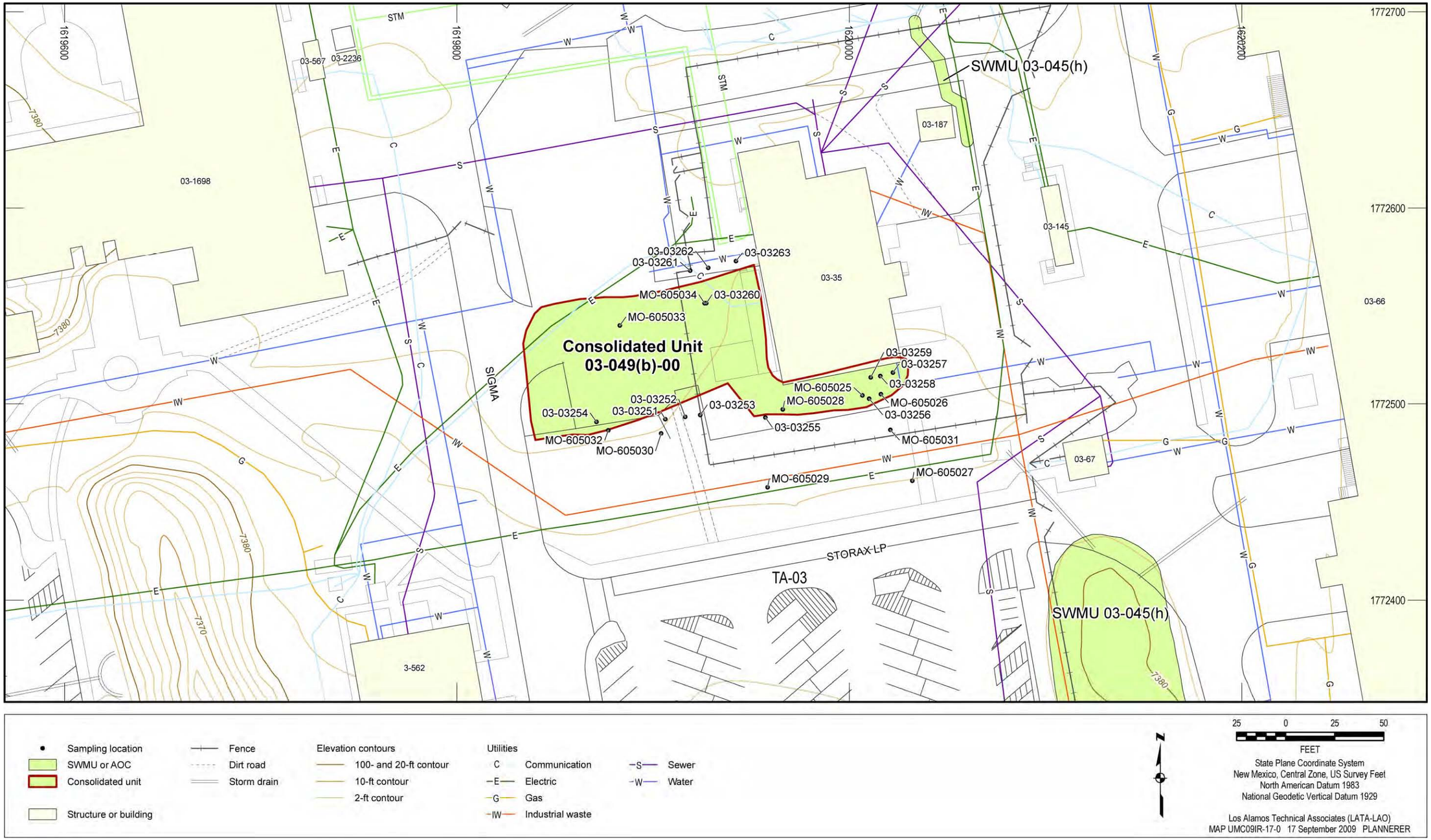


Figure 2.17-1 Site map and sampling locations at Consolidated Unit 03-049(b)-00

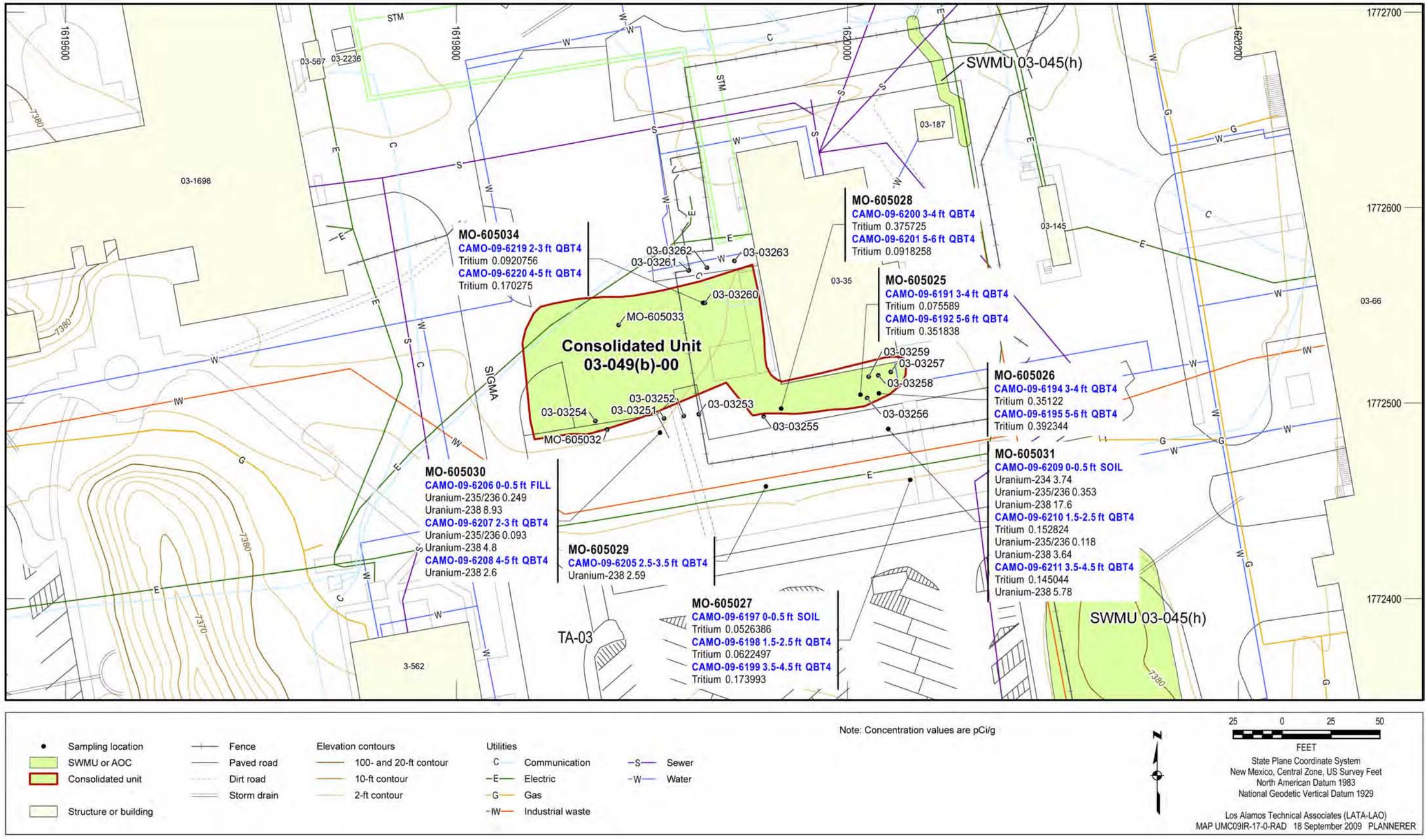


Figure 2.17-2 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 03-049(b)-00

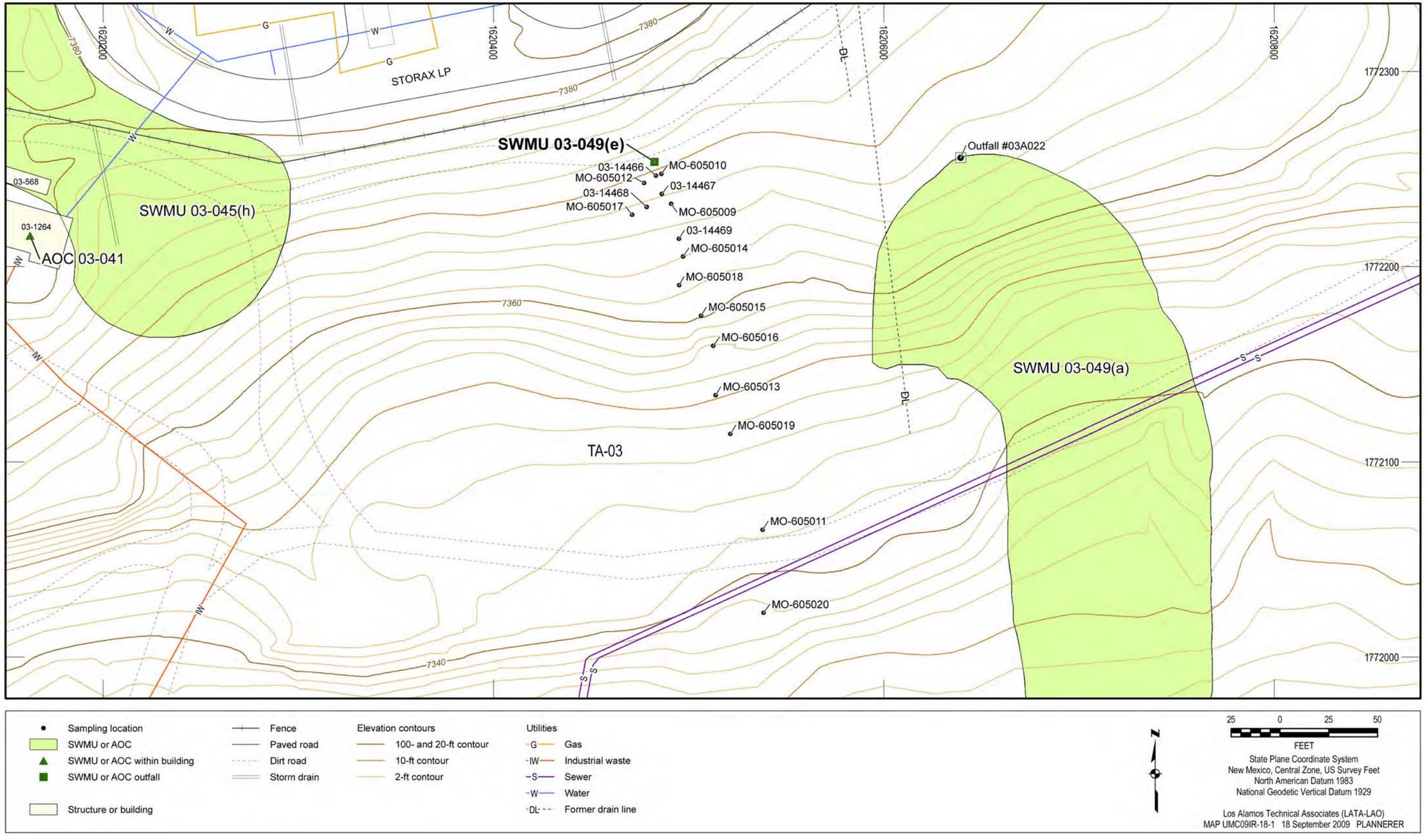


Figure 2.18-1 Site map and sampling locations at SWMU 03-049(e)

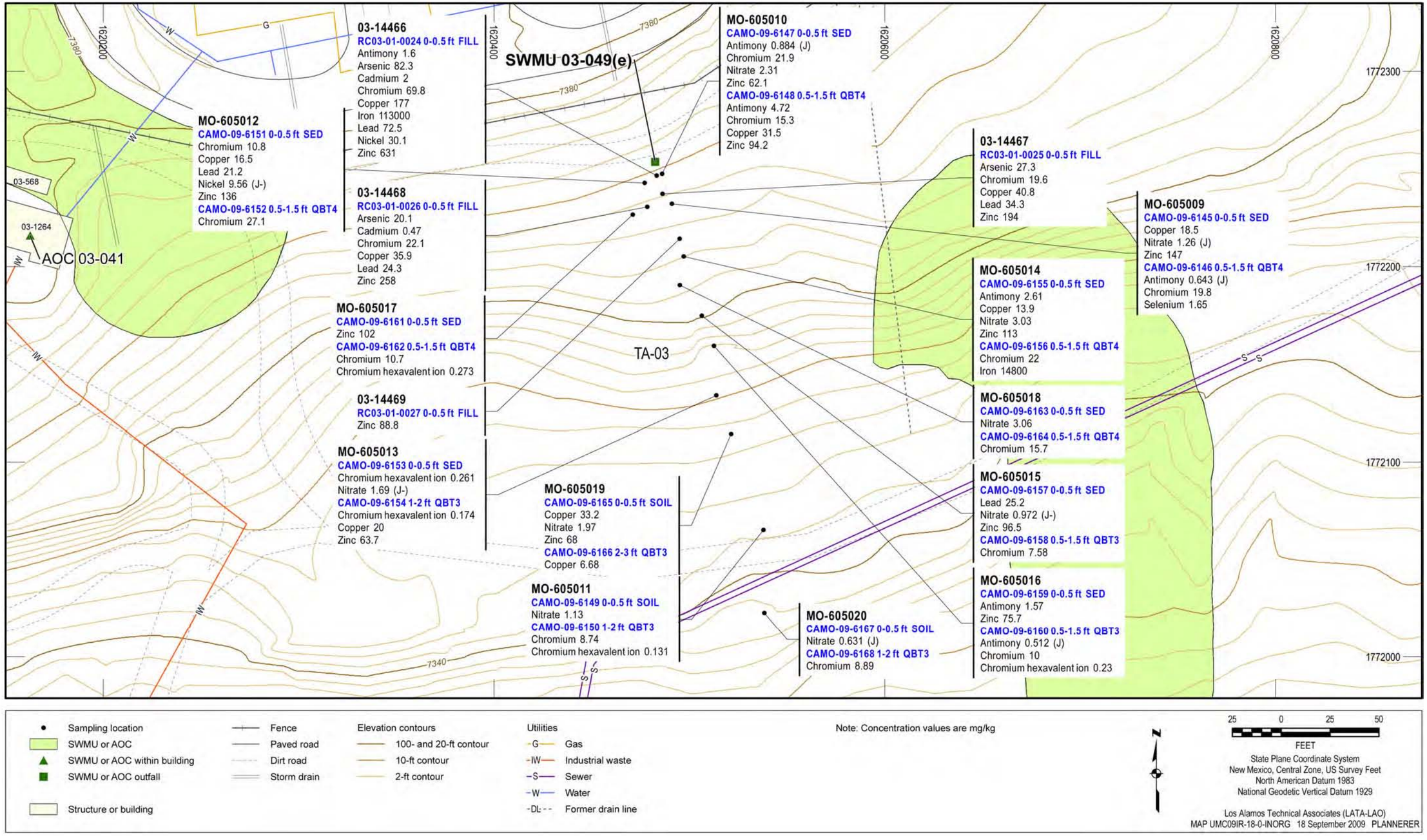


Figure 2.18-2 Inorganic COPCs detected or detected above BVs at SWMU 03-049(e)

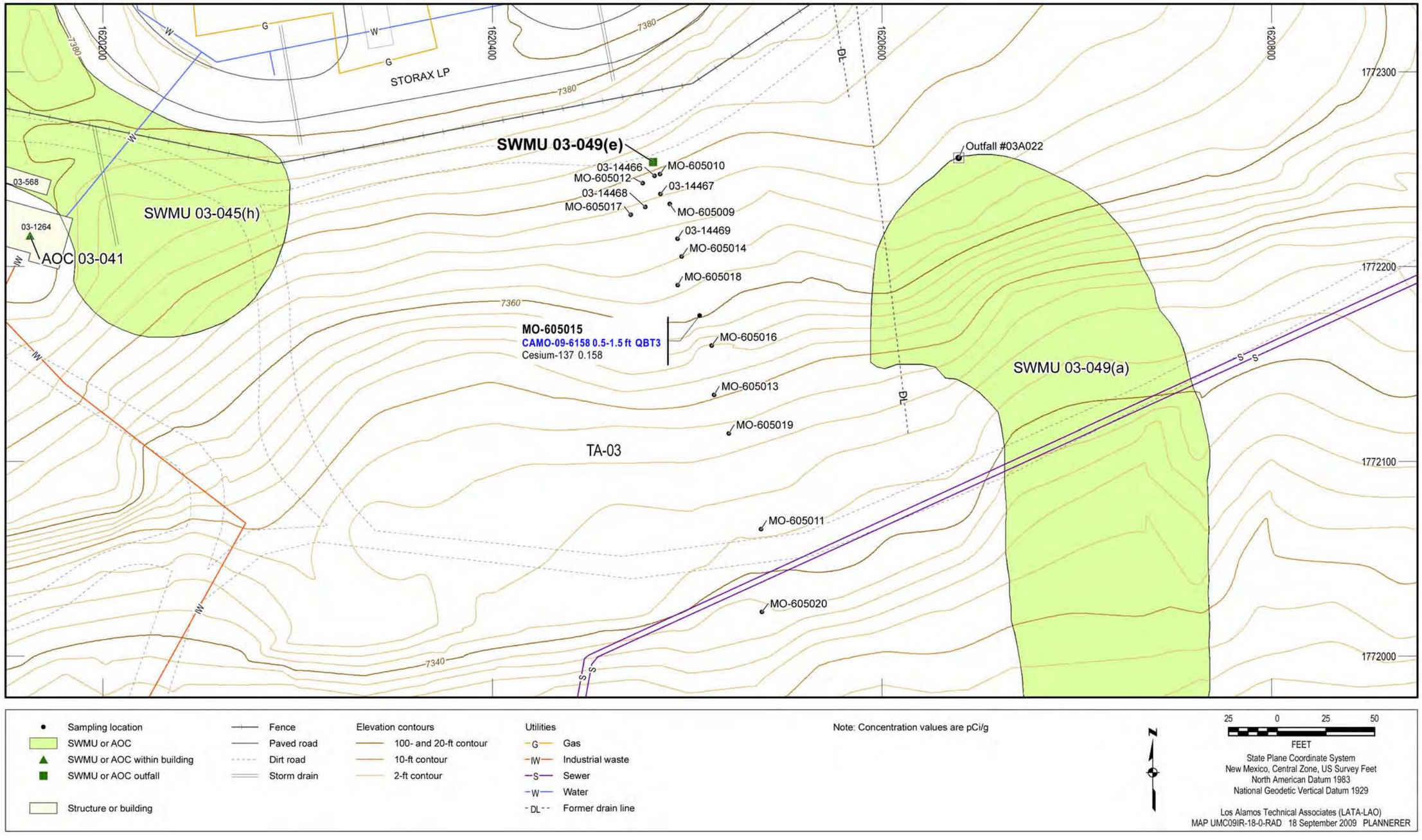


Figure 2.18-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-049(e)

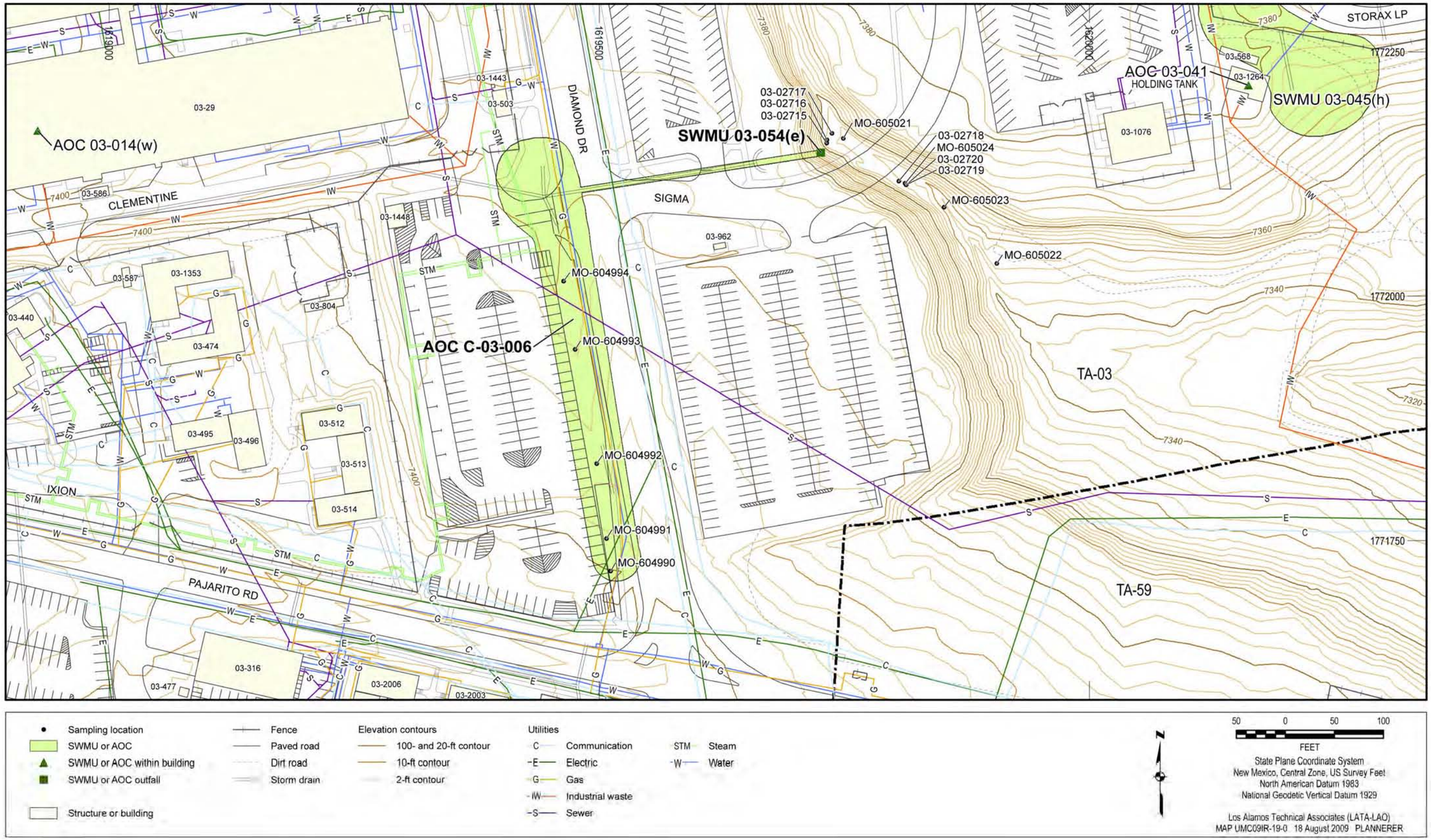


Figure 2.19-1 Site map and sampling locations at SWMU 03-054(e) and AOC C-03-006

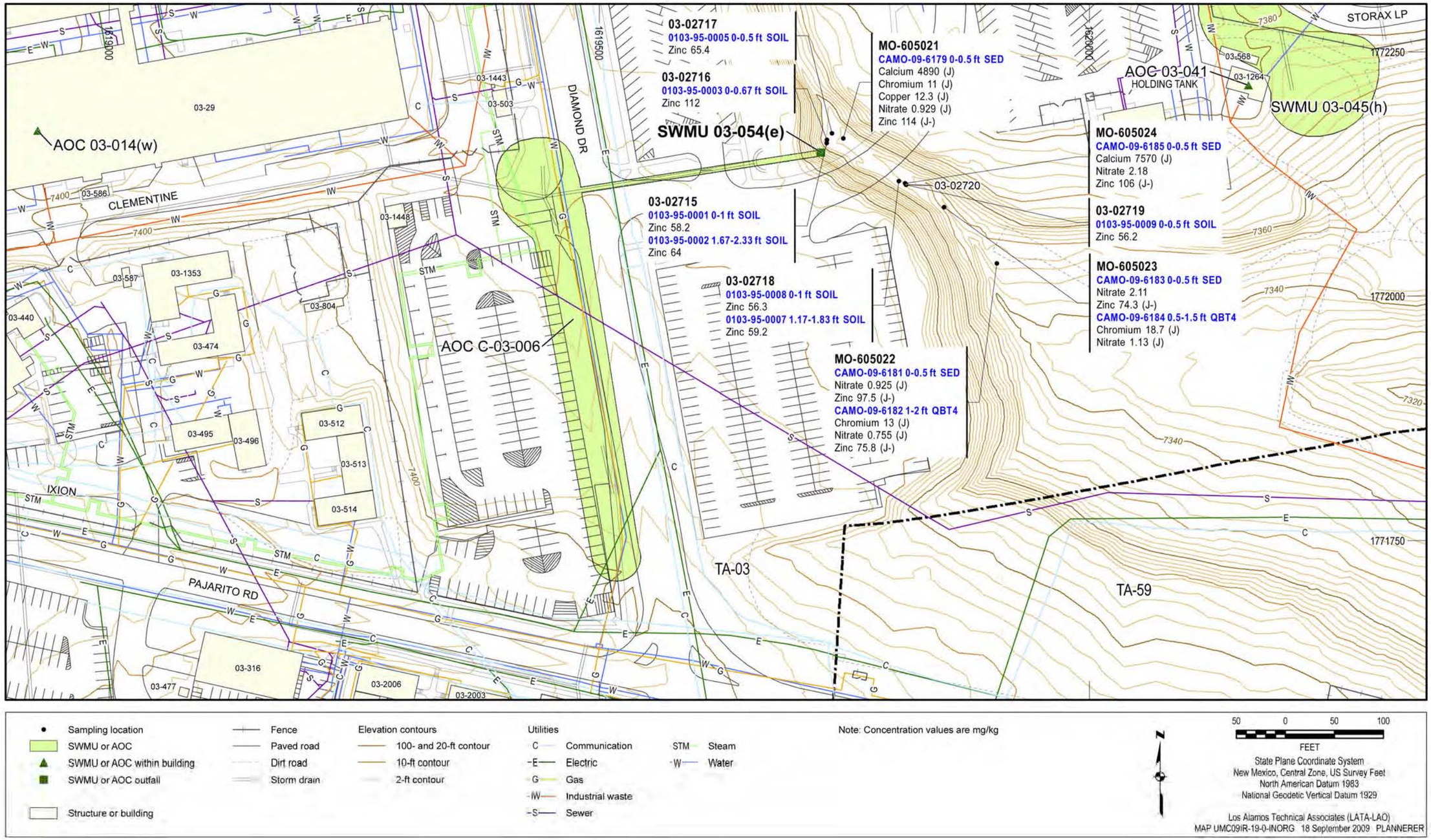


Figure 2.19-2 Inorganic COPCs detected or detected above BVs at SWMU 03-054(e)

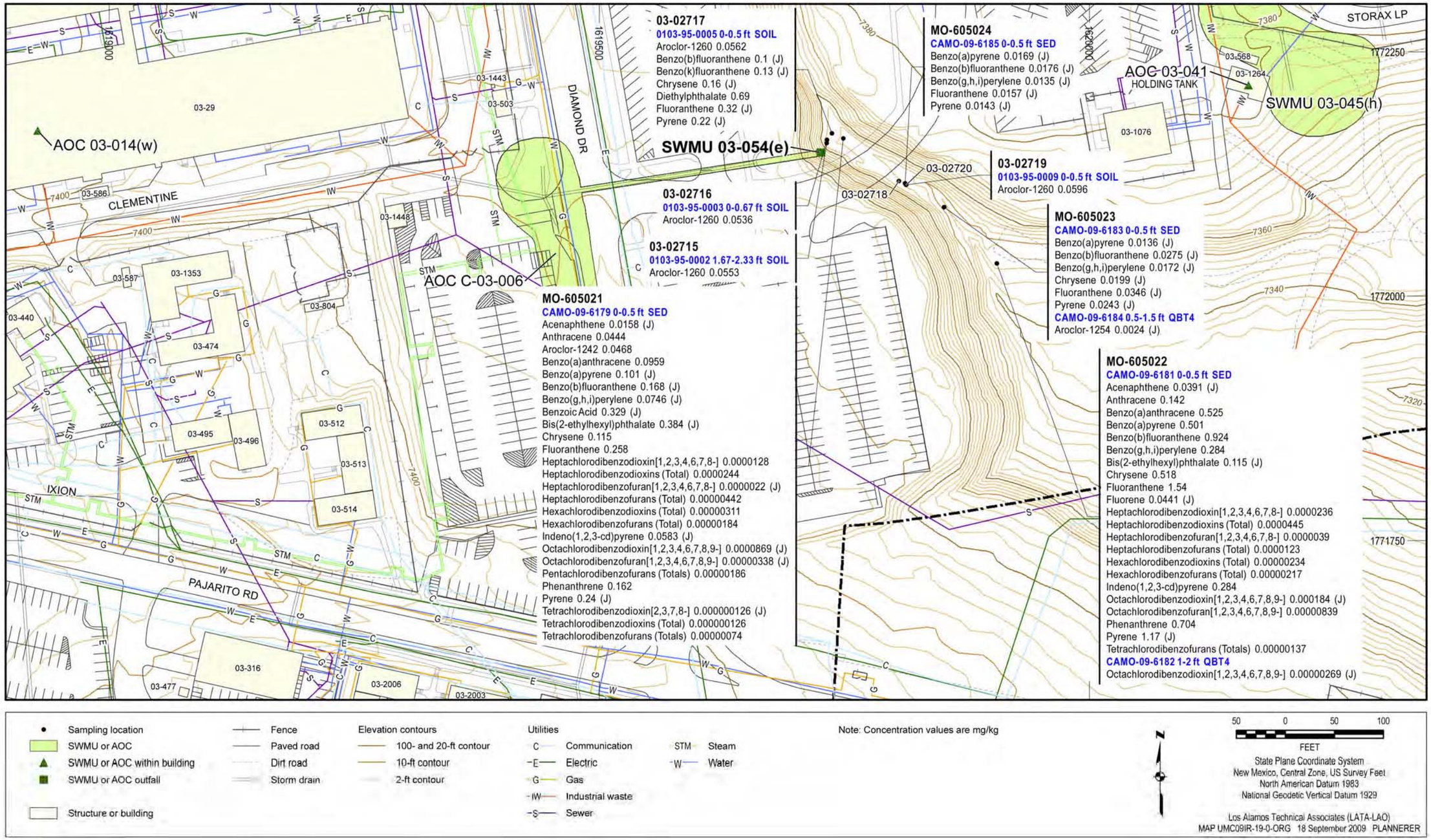


Figure 2.19-3 Organic COPCs detected at SWMU 03-054(e)

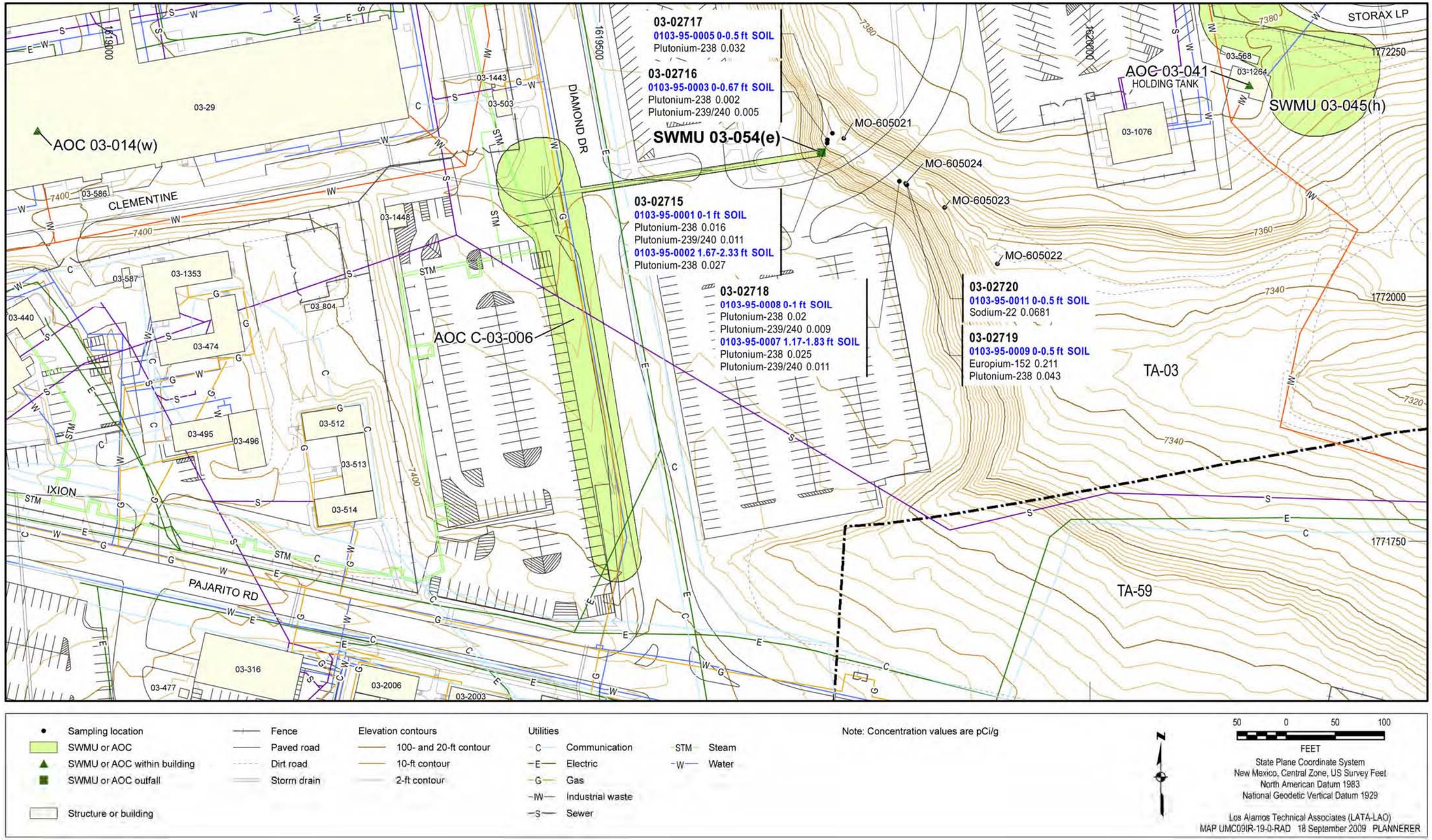


Figure 2.19-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 03-054(e)

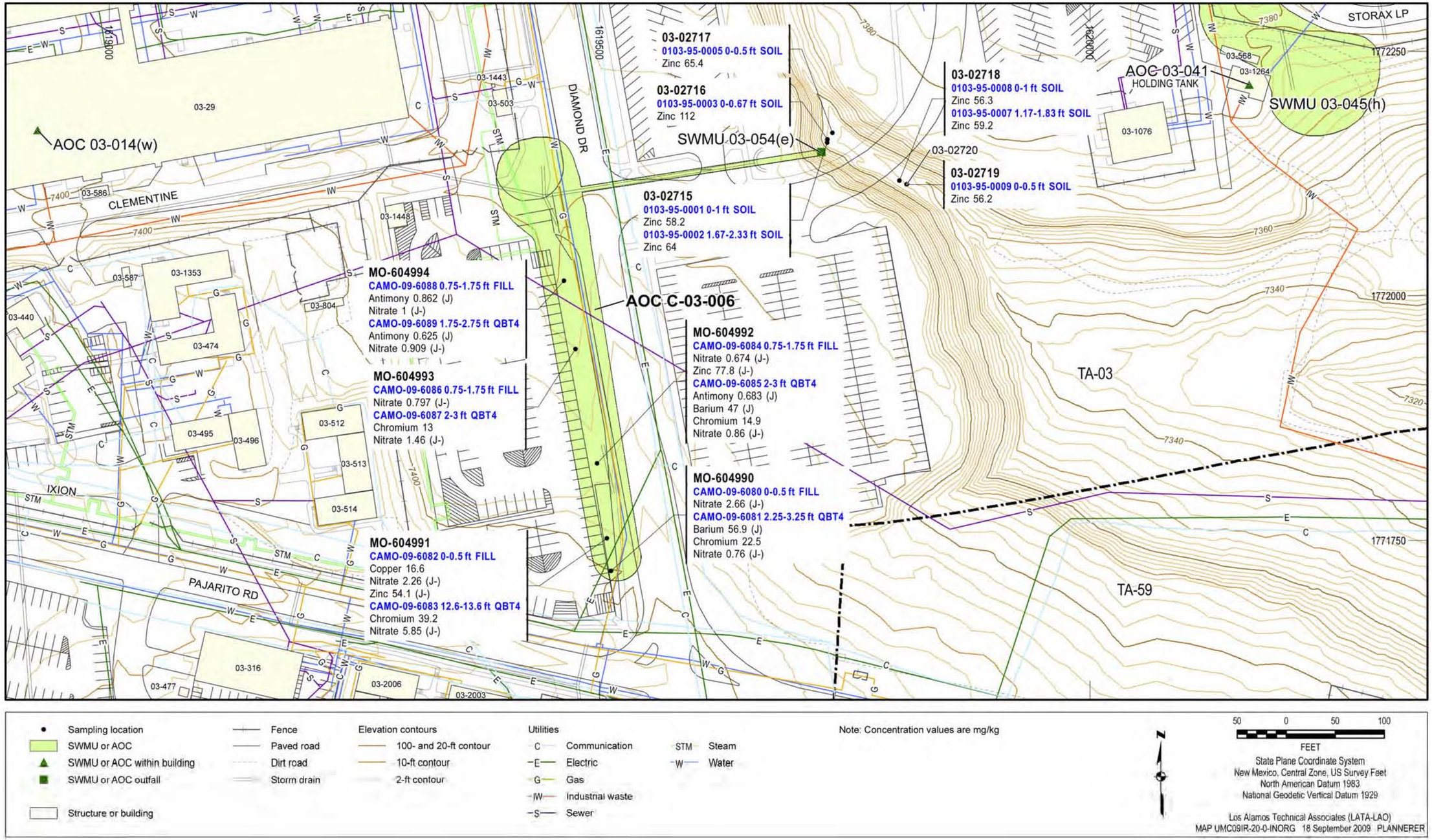


Figure 2.20-1 Inorganic COPCs detected or detected above BVs at AOC C-03-006

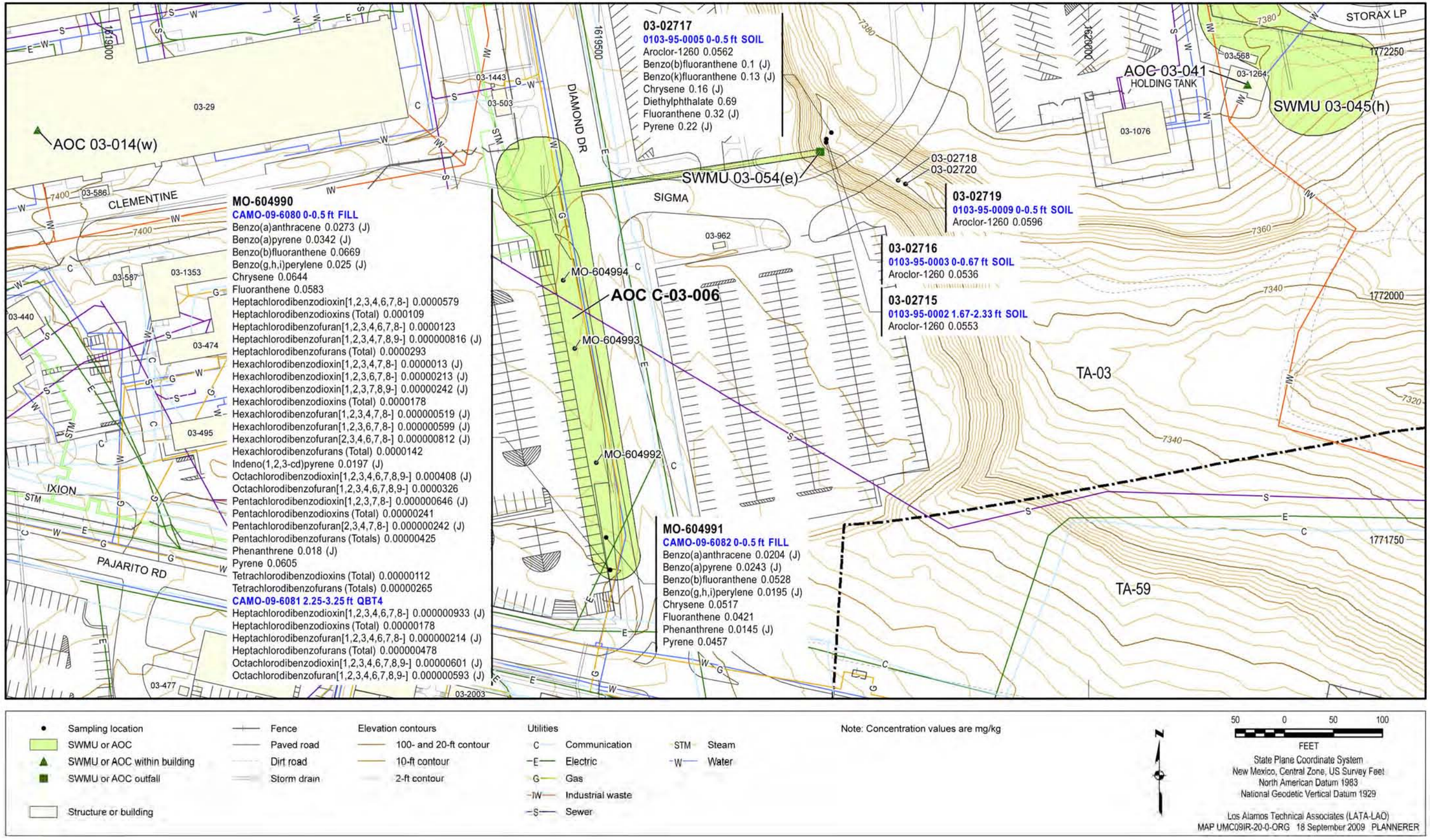


Figure 2.20-2 Organic COPCs detected at AOC C-03-006

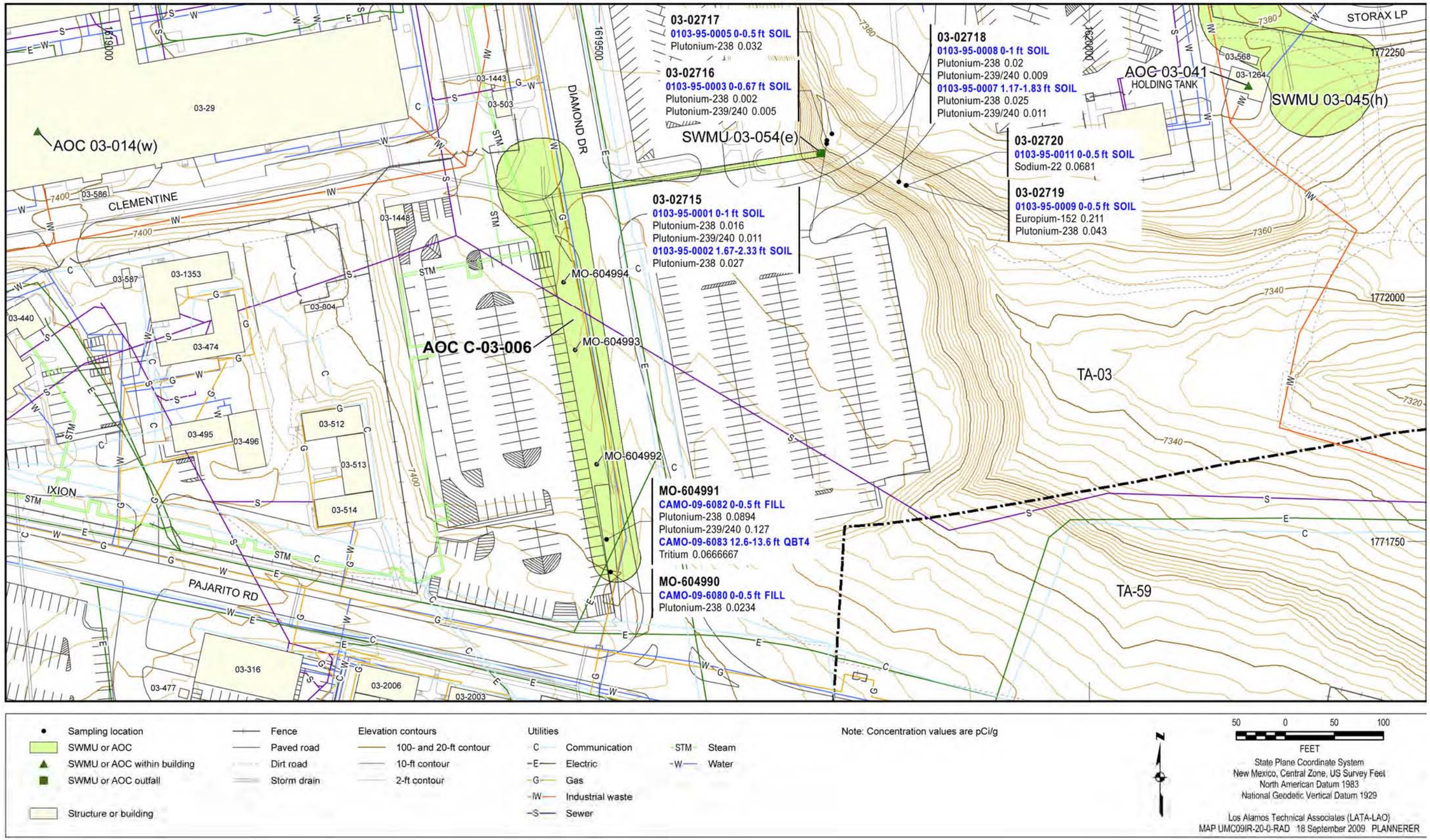


Figure 2.20-3 Radionuclides COPCs detected or detected above BVs/FVs at AOC C-03-006

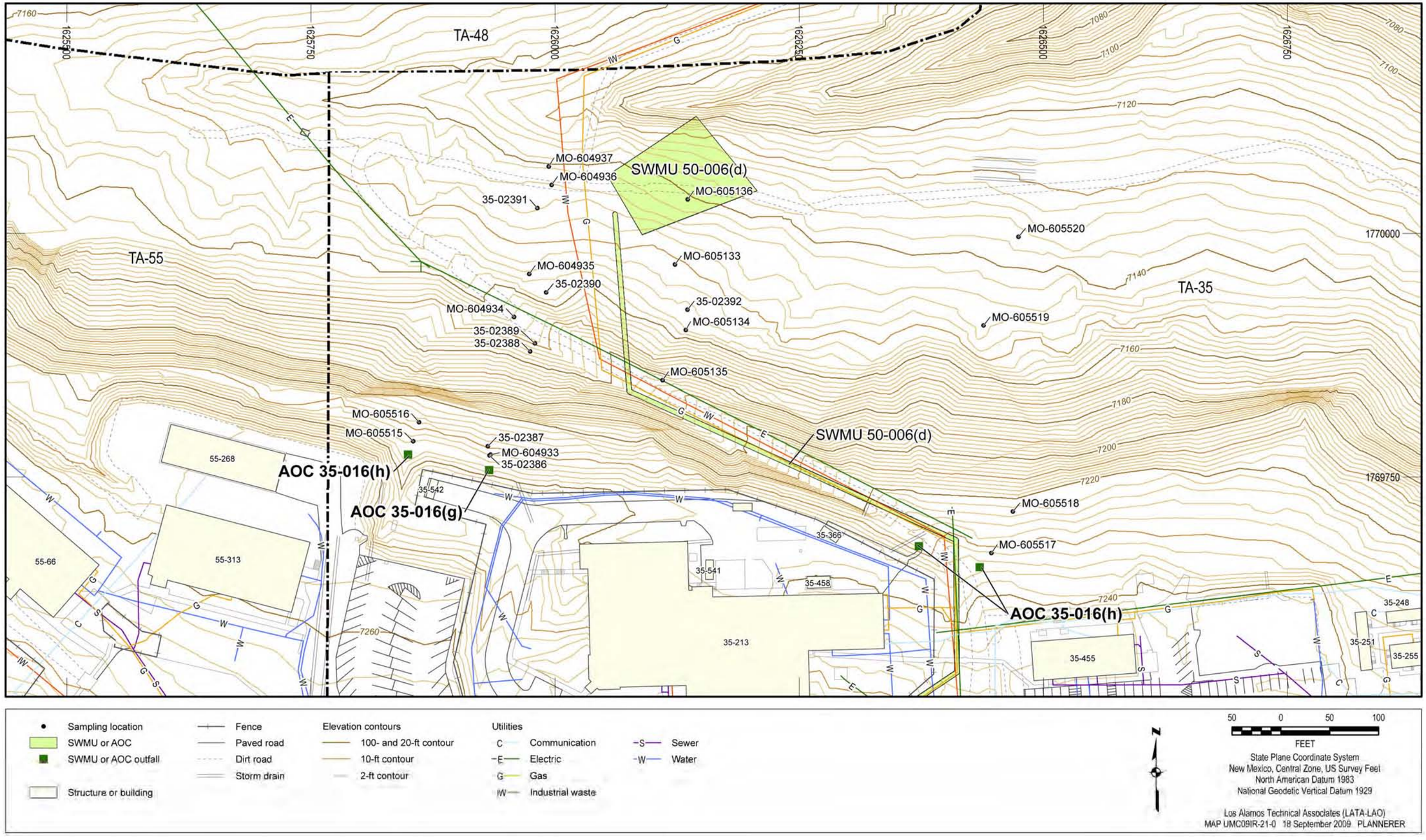


Figure 3.1-1 Site map and sampling locations at SWMUs 35-016(g) and 35-016(h)

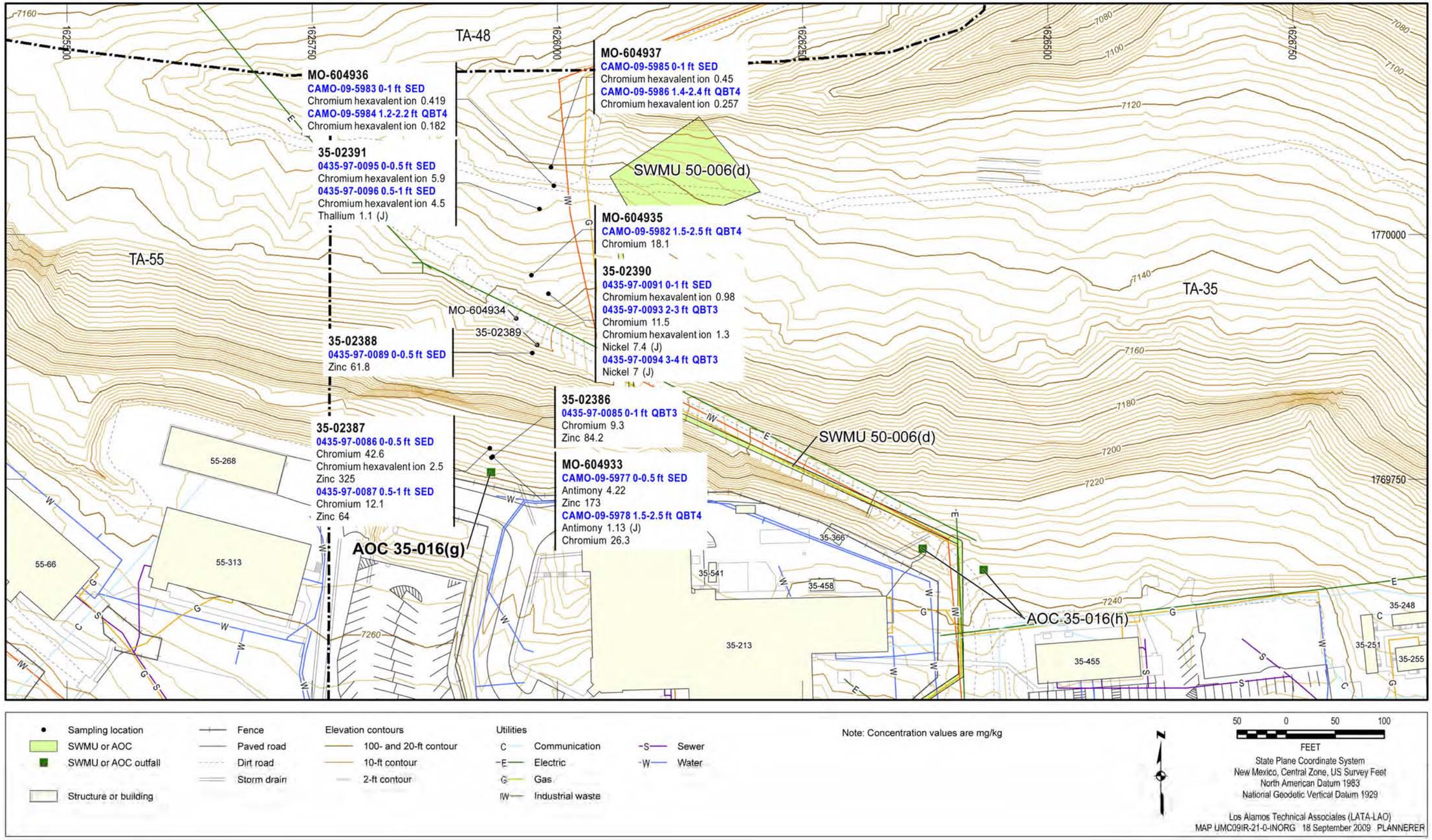


Figure 3.2-1 Inorganic COPCs detected or detected above BVs at SWMU 35-016(g)

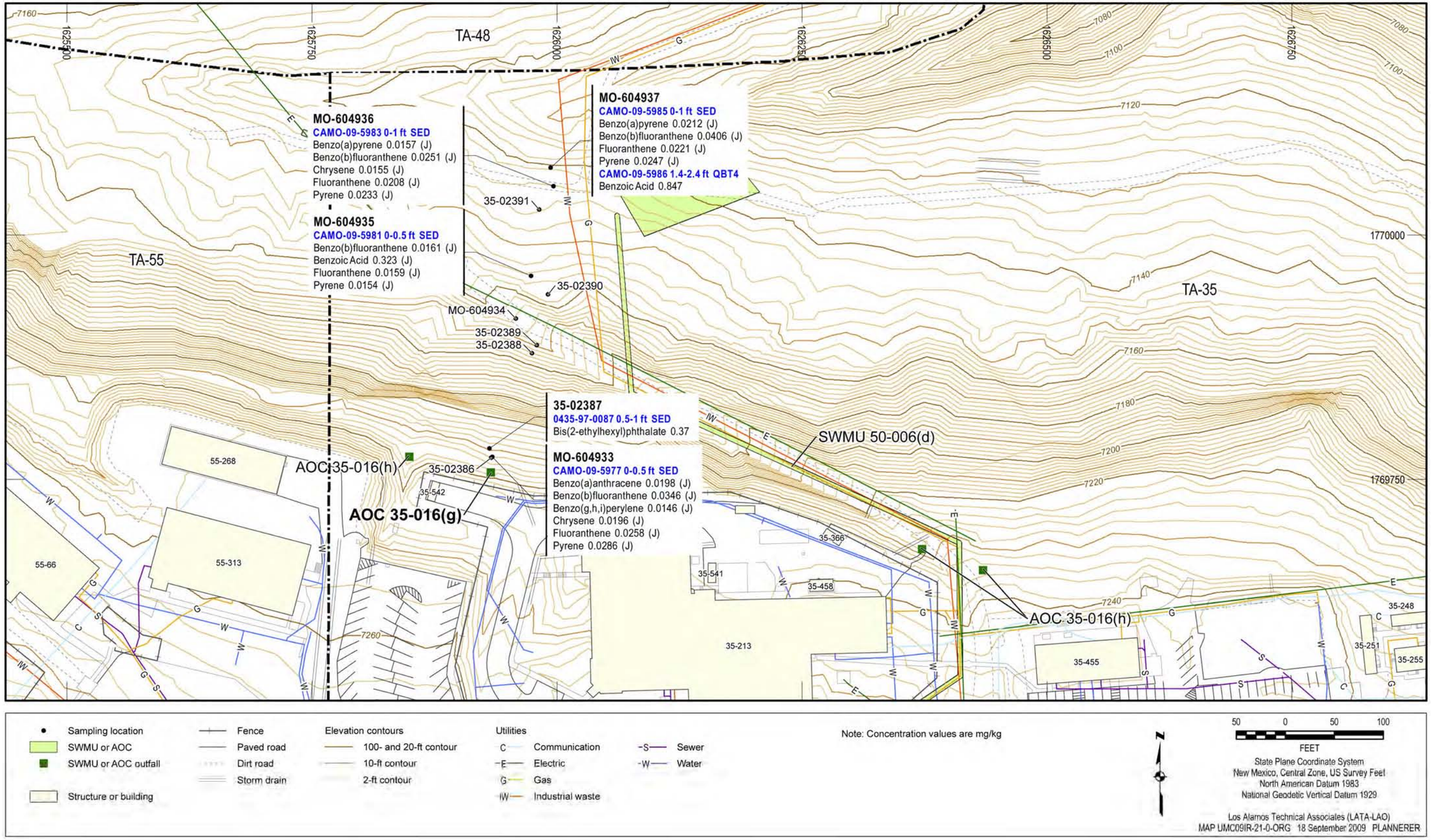


Figure 3.2-2 Organic COPCs detected at SWMU 35-016(g)

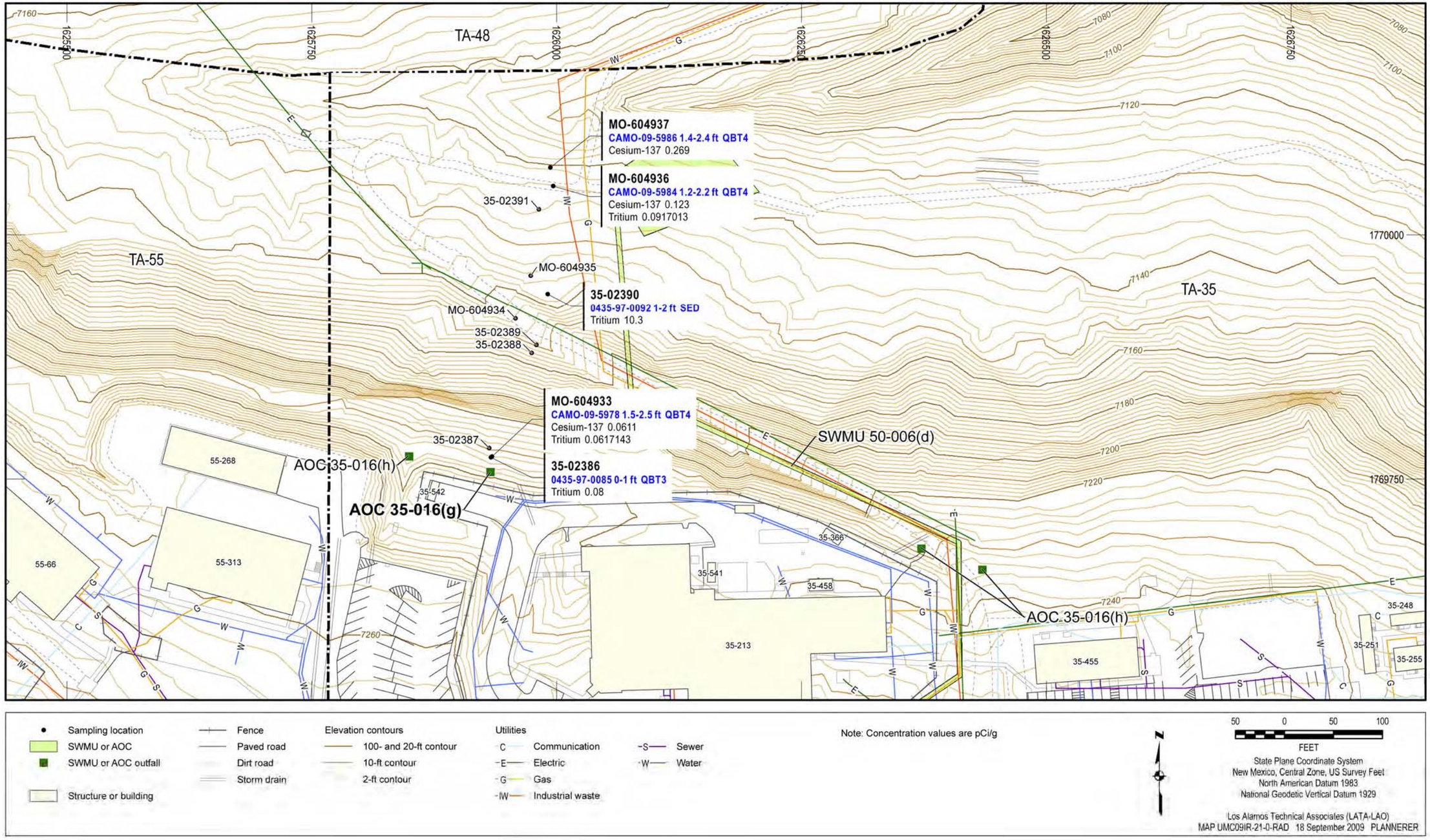


Figure 3.2-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 35-016(g)

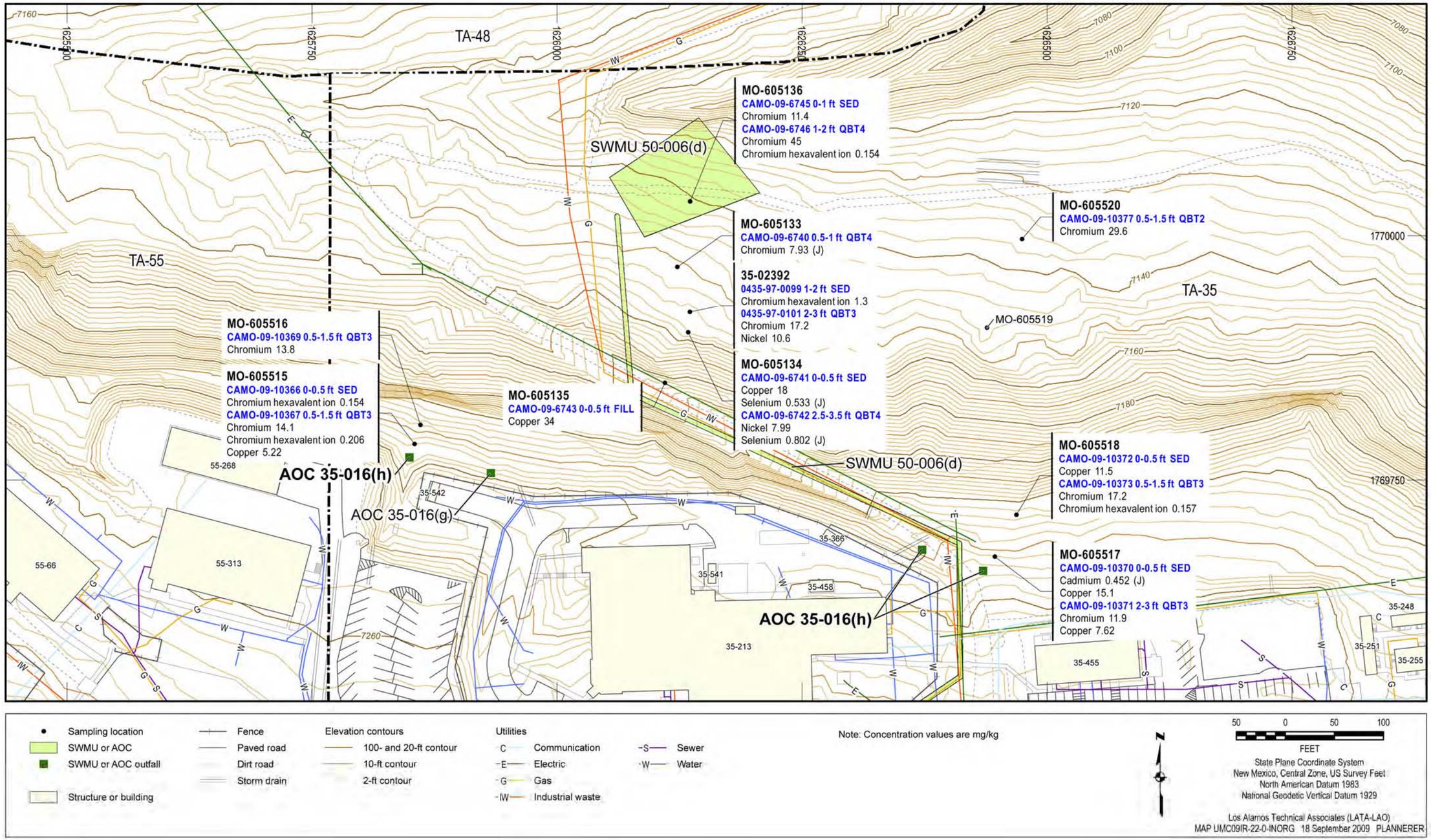


Figure 3.3-1 Inorganic COPCs detected or detected above BVs at SWMU 35-016(h)

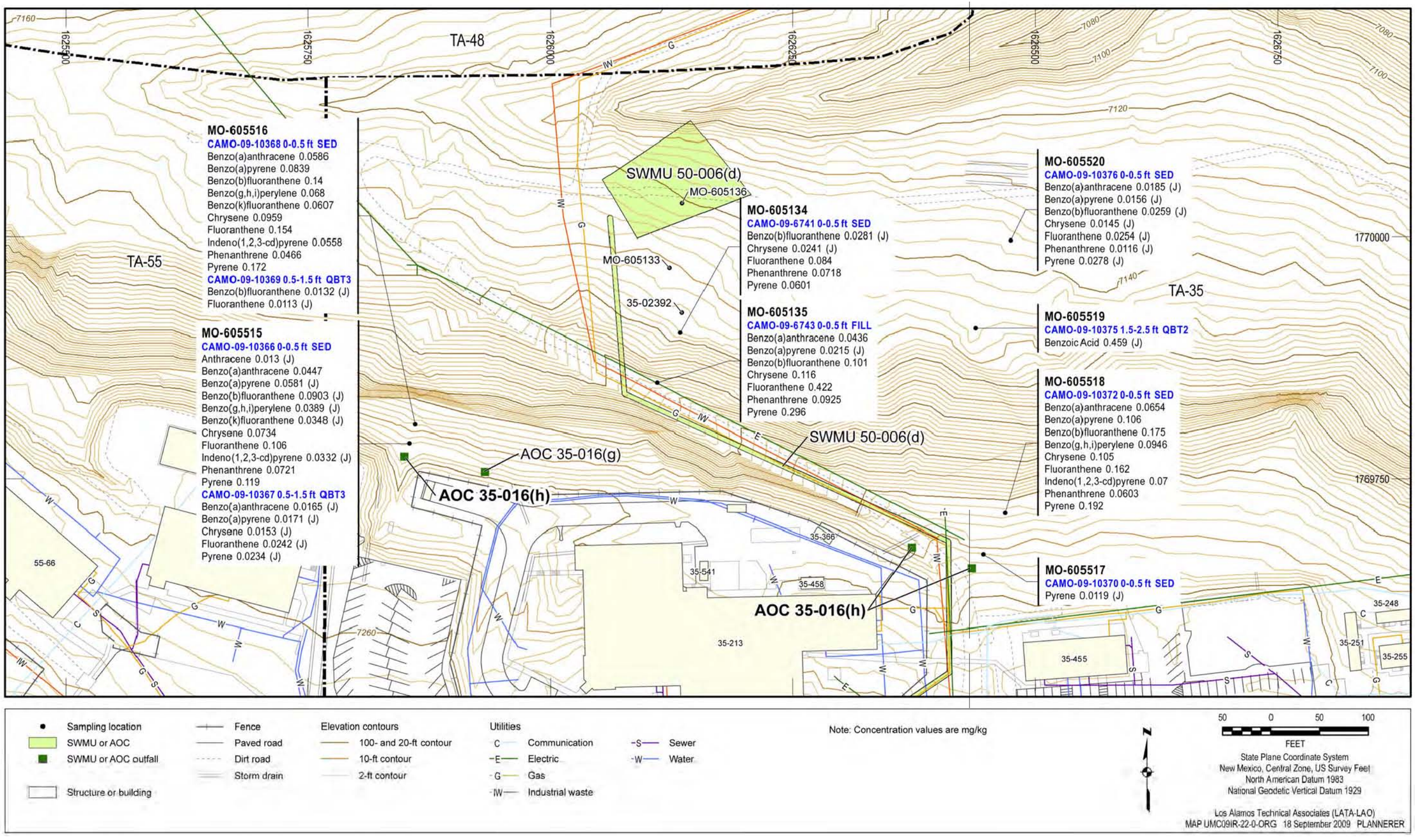


Figure 3.3-2 Organic COPCs detected at SWMU 35-016(h)

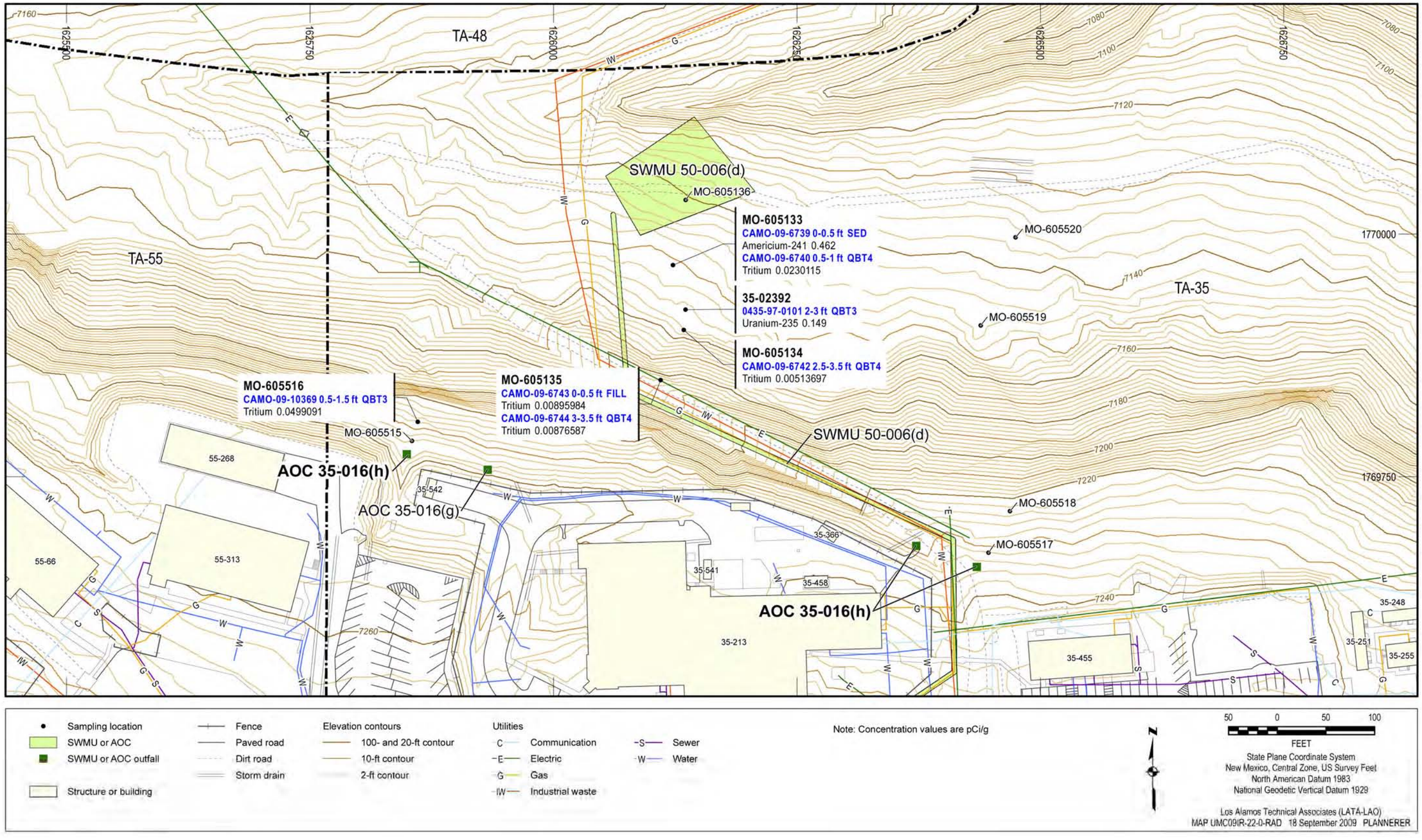


Figure 3.3-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 35-016(h)

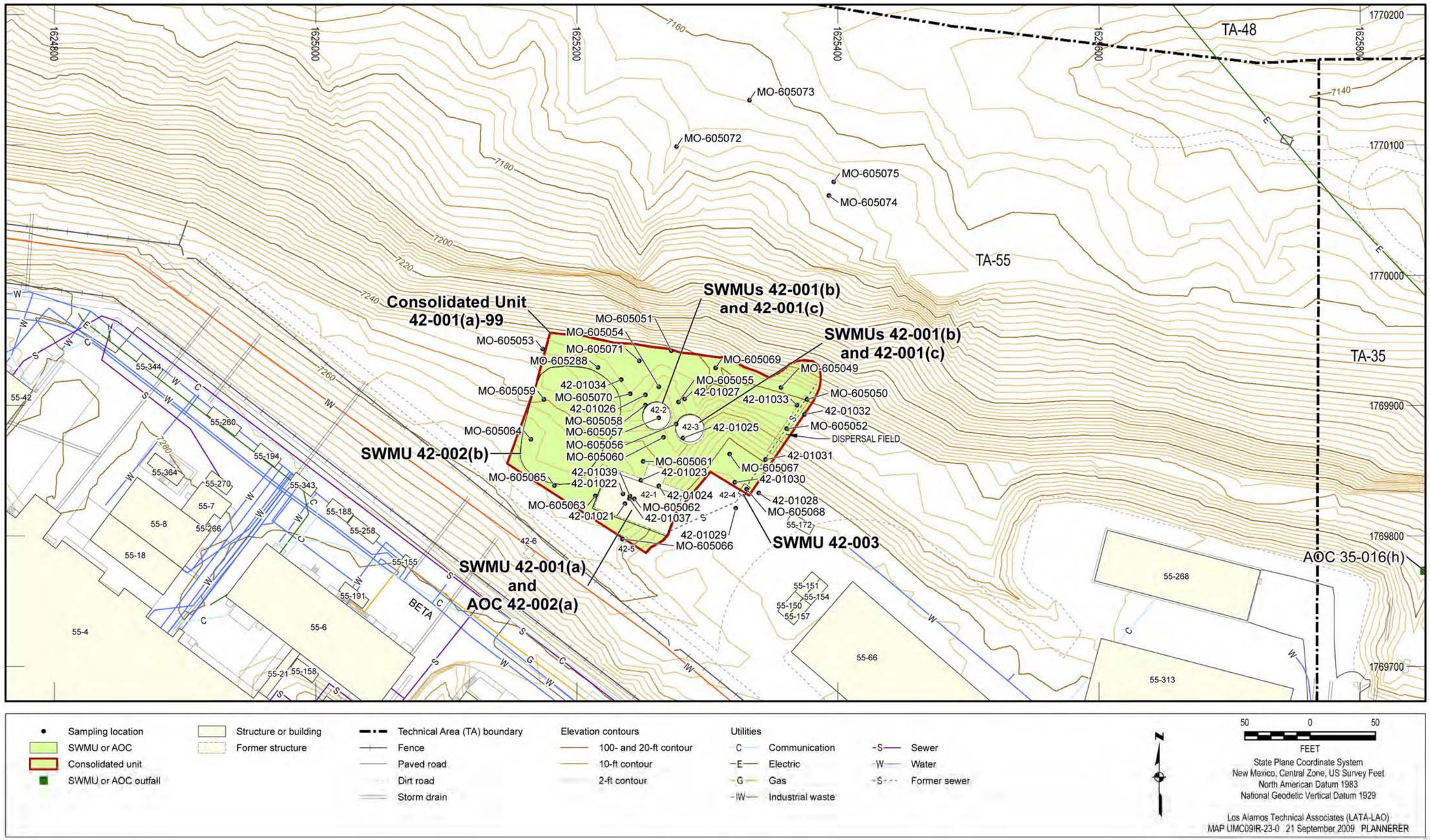


Figure 4.1-1 TA-42 site map and sampling locations at Consolidated Unit 42-001(a)-99

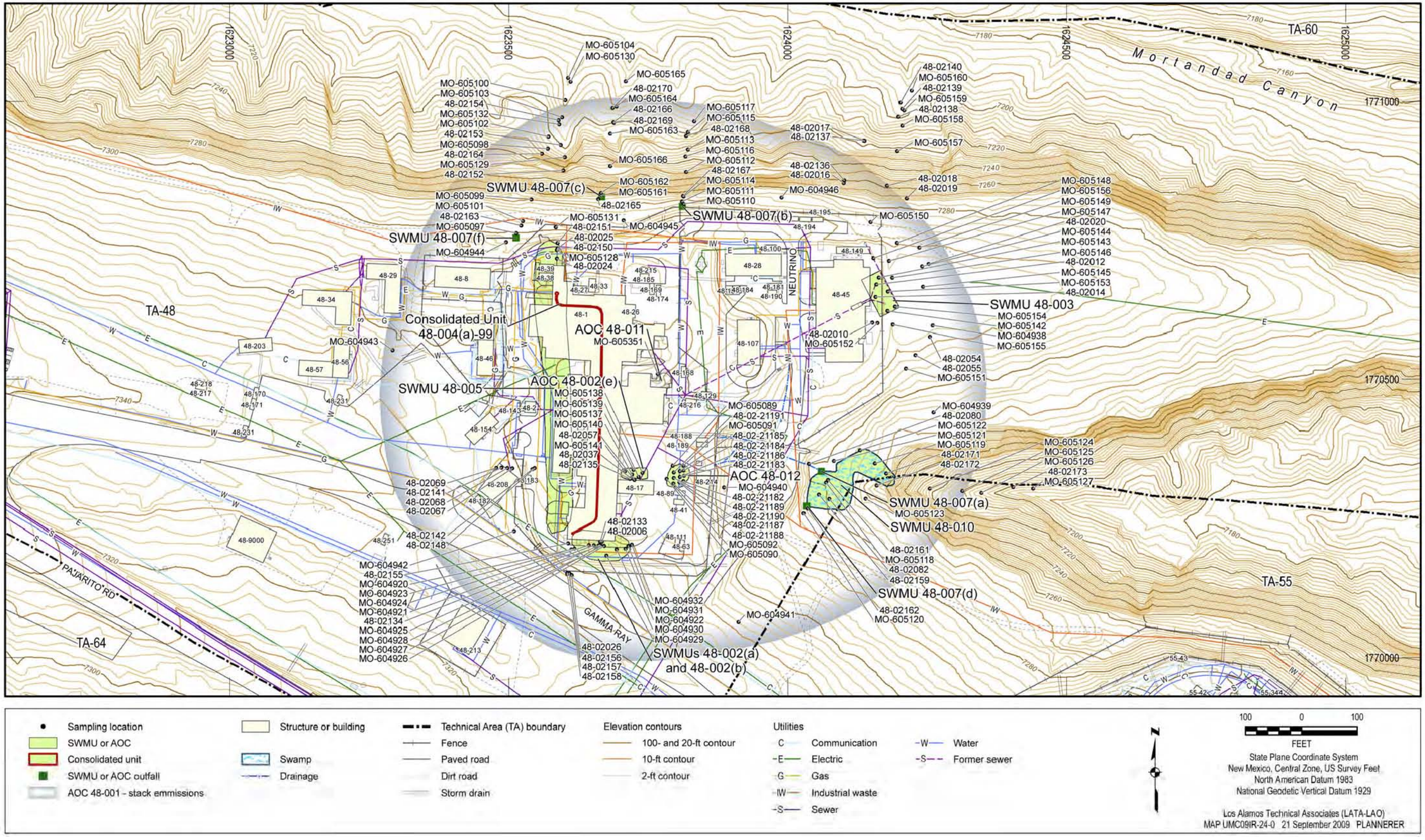


Figure 5.1-1 TA-48 site map and sampling locations

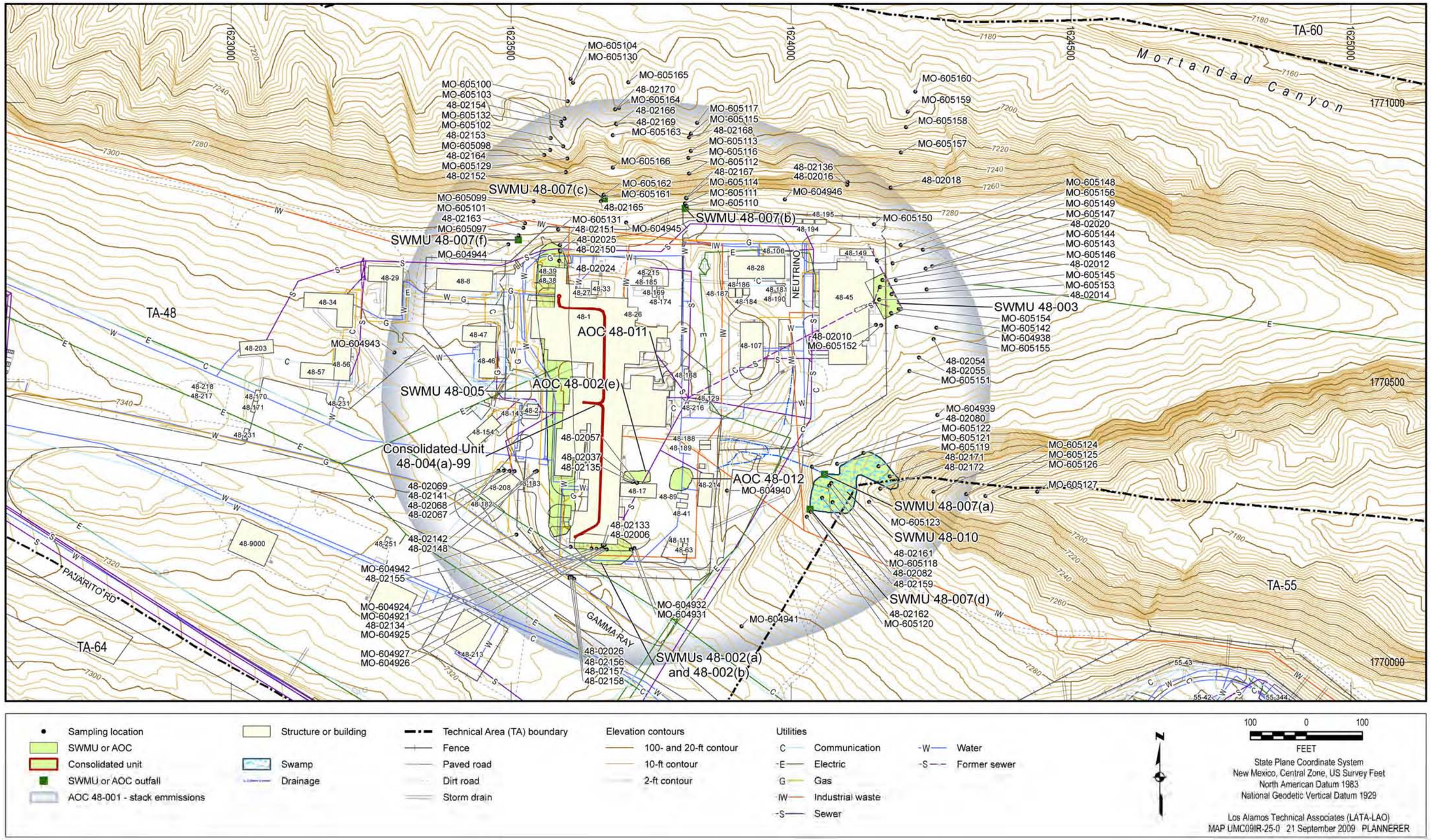


Figure 5.2-1 Site map and sampling locations at AOC 48-001

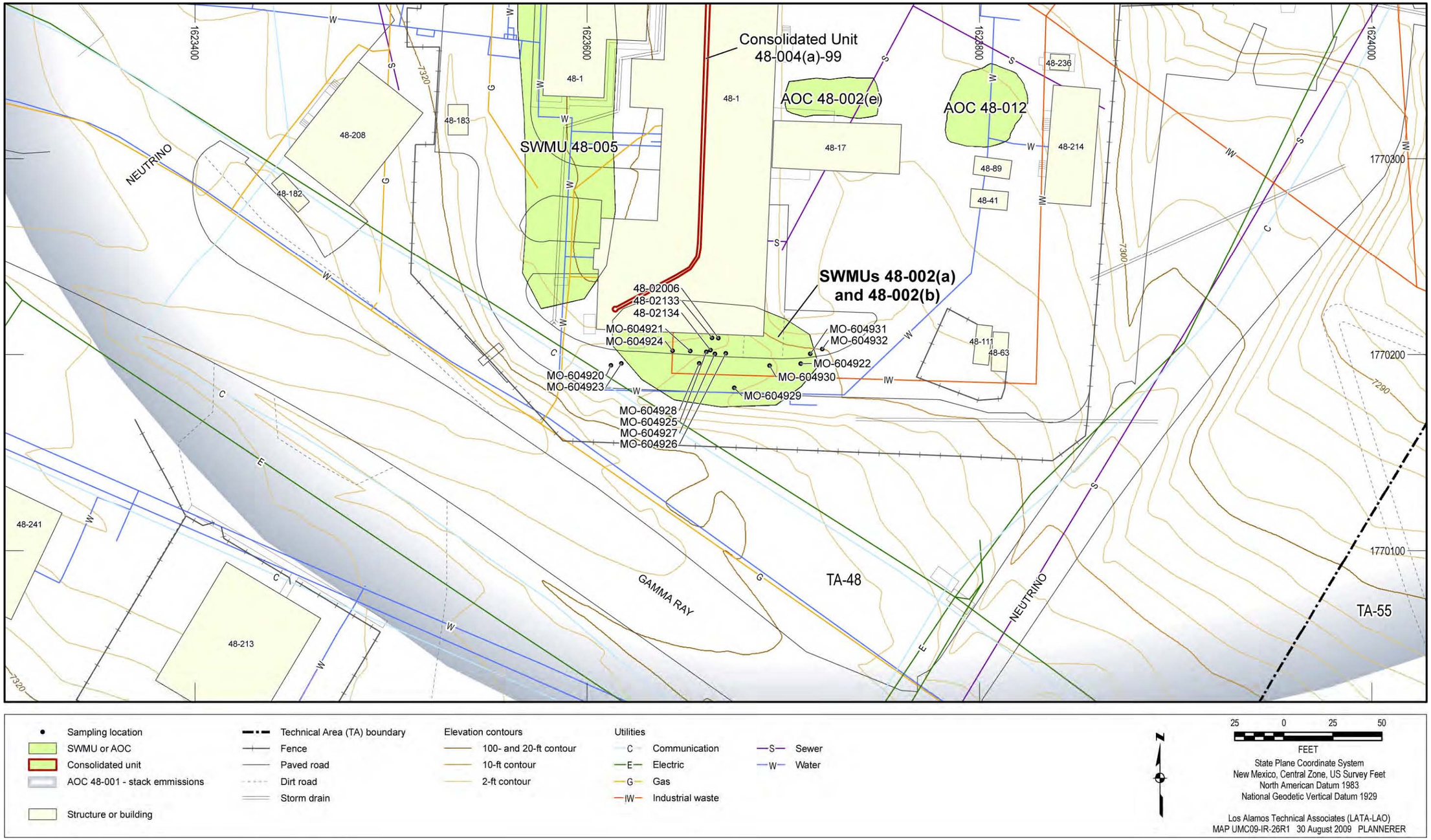


Figure 5.3-1 Site map and sampling locations at SWMUs 48-002(a) and 48-002(b)

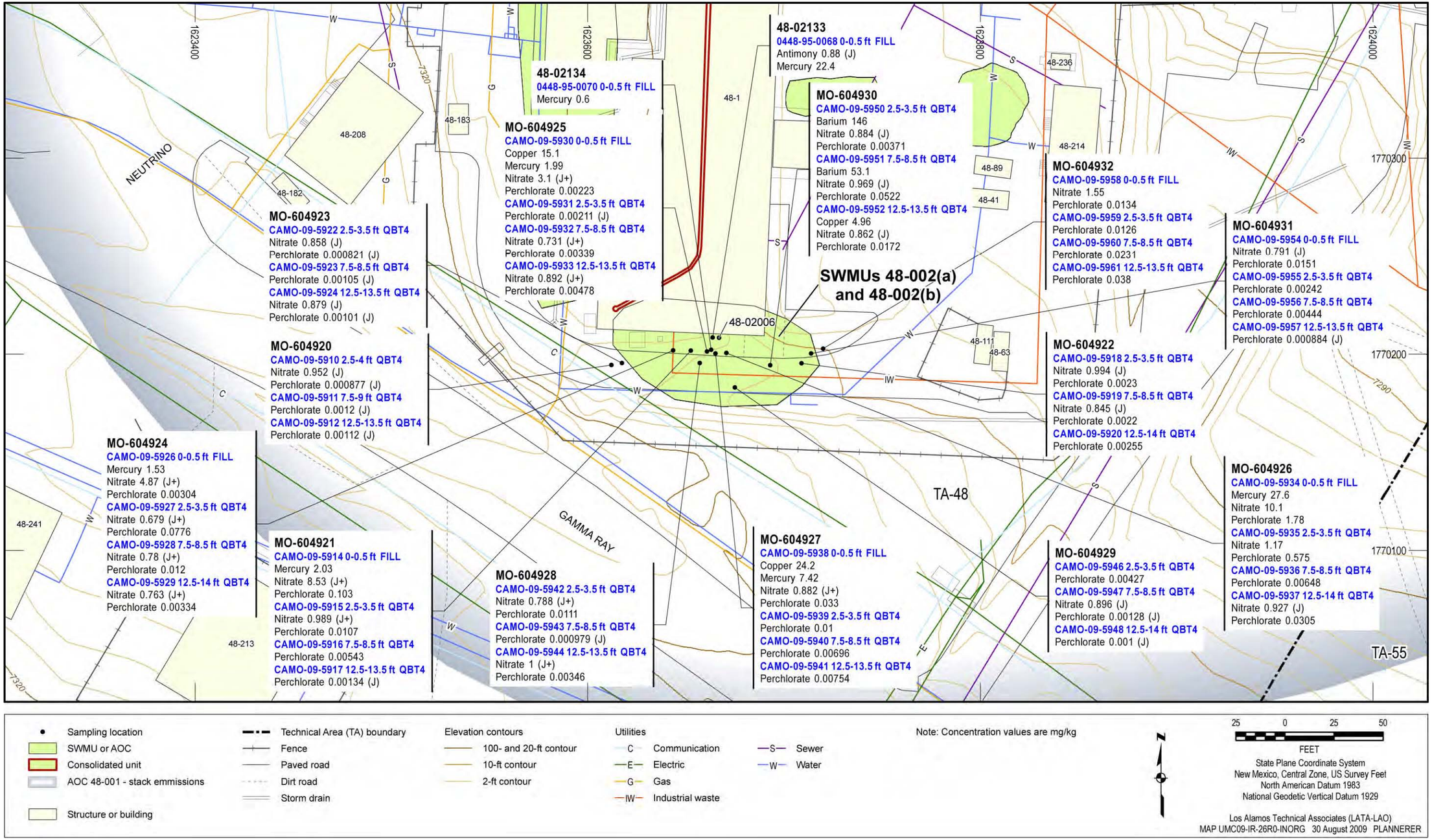


Figure 5.3-2 Inorganic COPCs detected or detected above BVs at SWMUs 48-002(a) and 48-002(b)

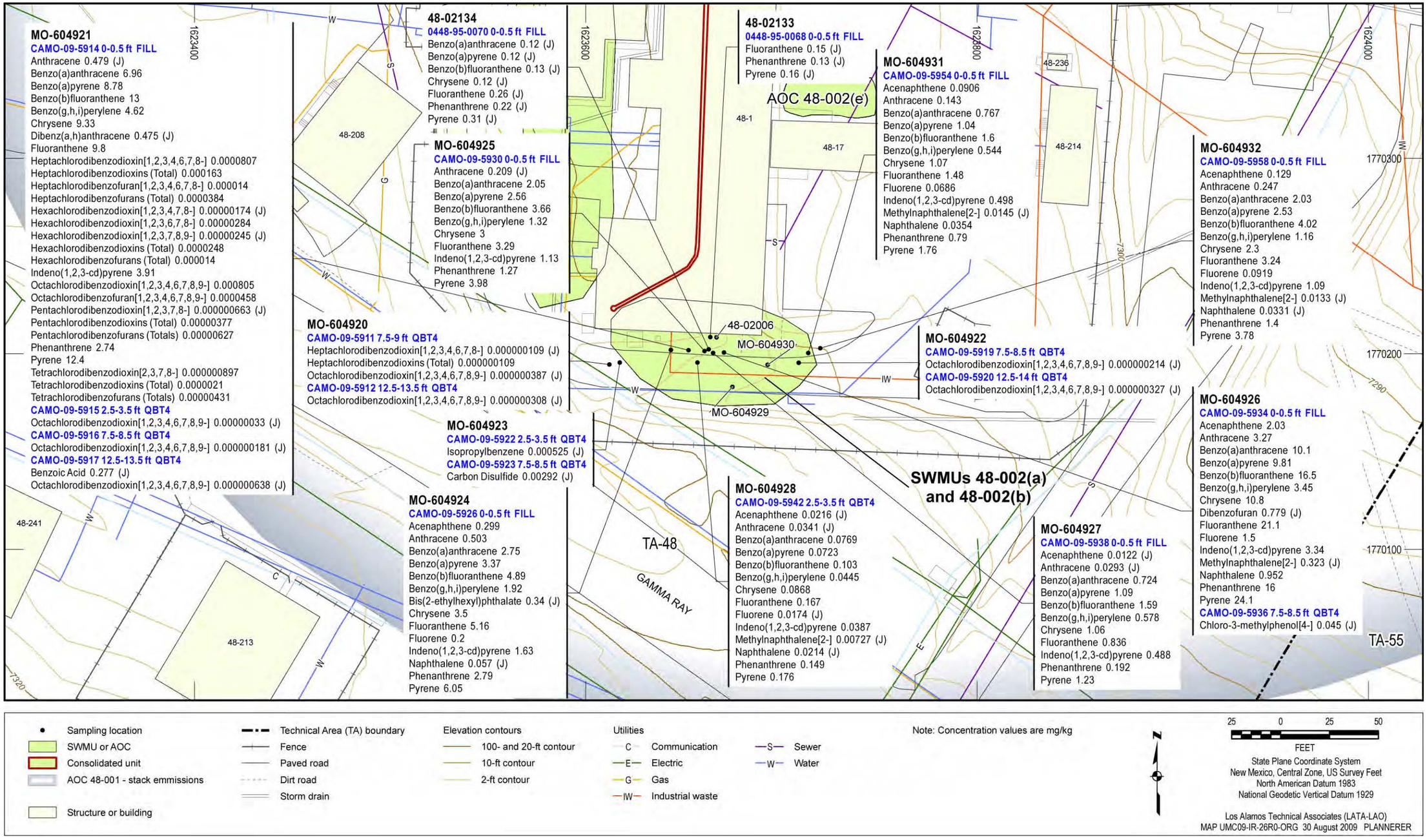


Figure 5.3-3 Organic COPCs detected at SWMUs 48-002(a) and 48-002(b)

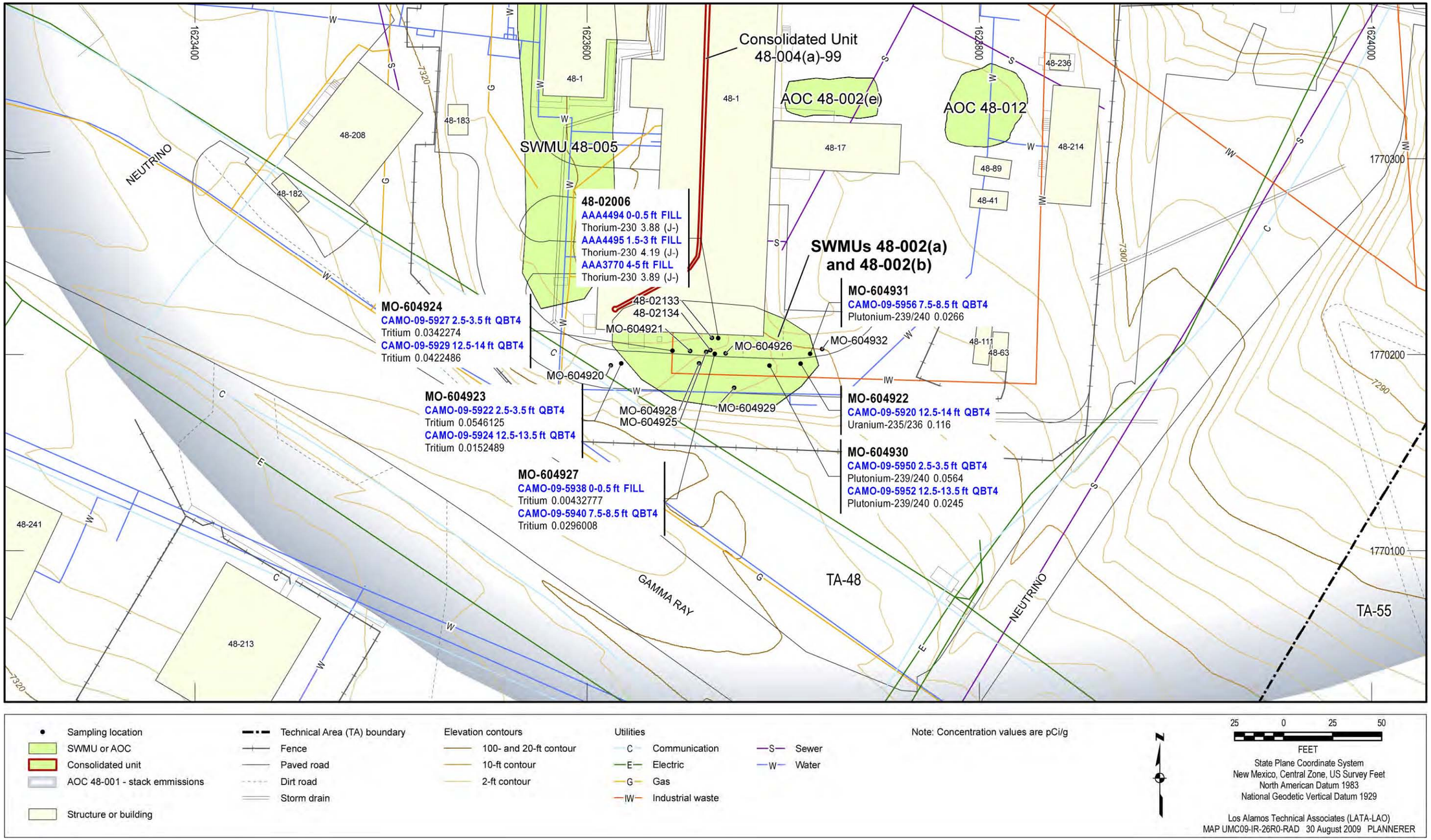


Figure 5.3-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMUs 48-002(a) and 48-002(b)

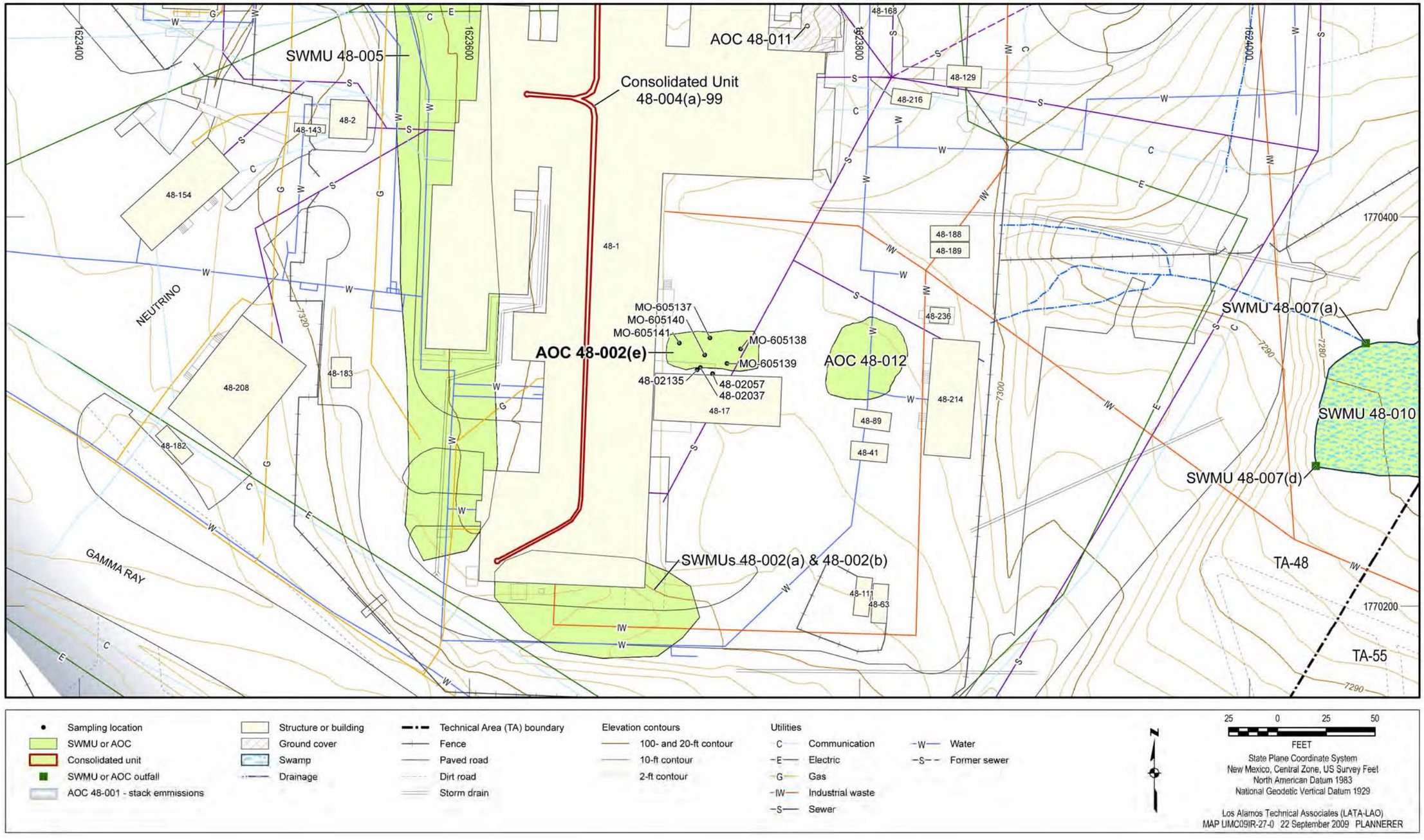


Figure 5.5-1 Site map and sampling locations at AOC 48-002(e)

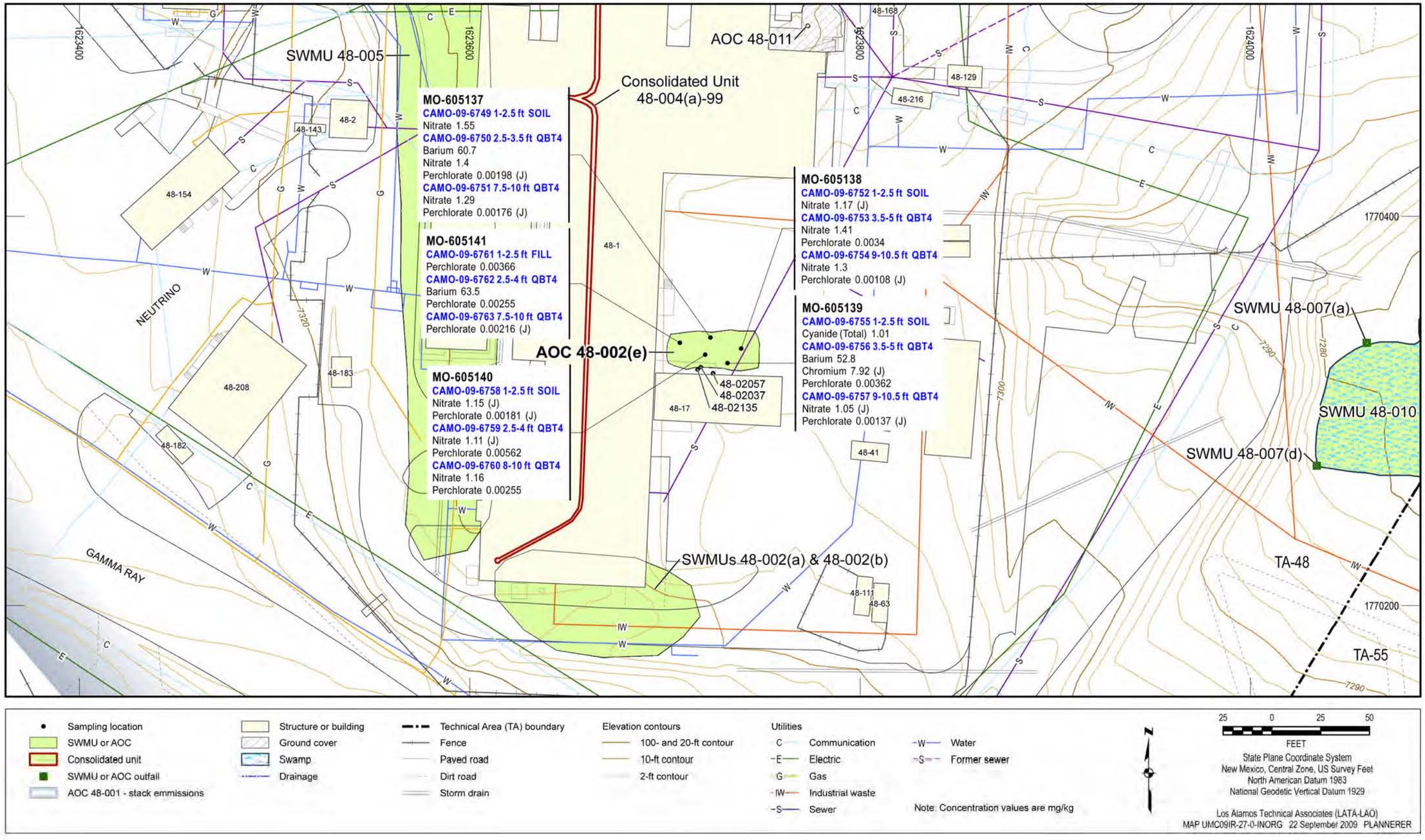


Figure 5.5-2 Inorganic COPCs detected or detected above BVs at AOC 48-002(e)

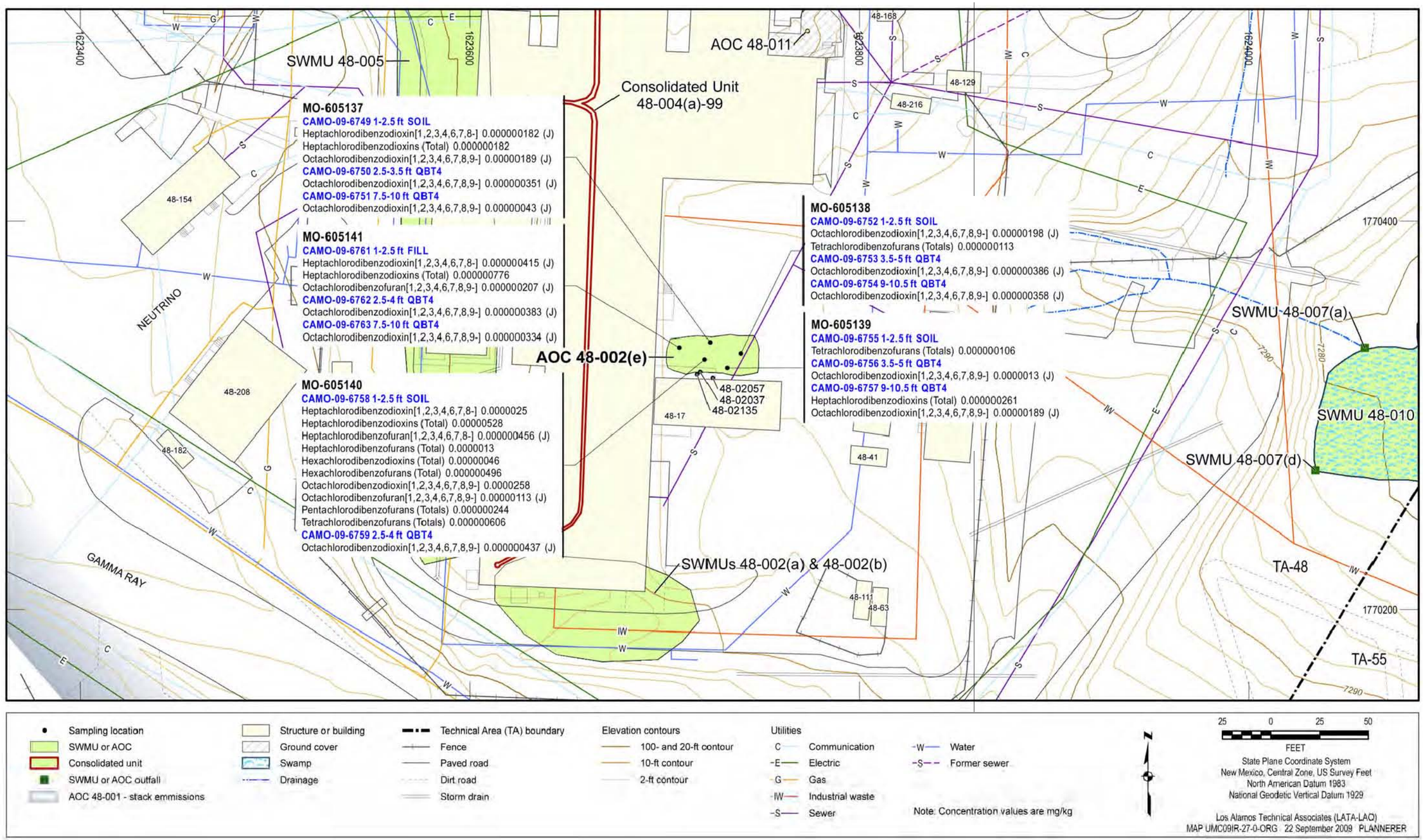


Figure 5.5-3 Organic COPCs detected at AOC 48-002(e)

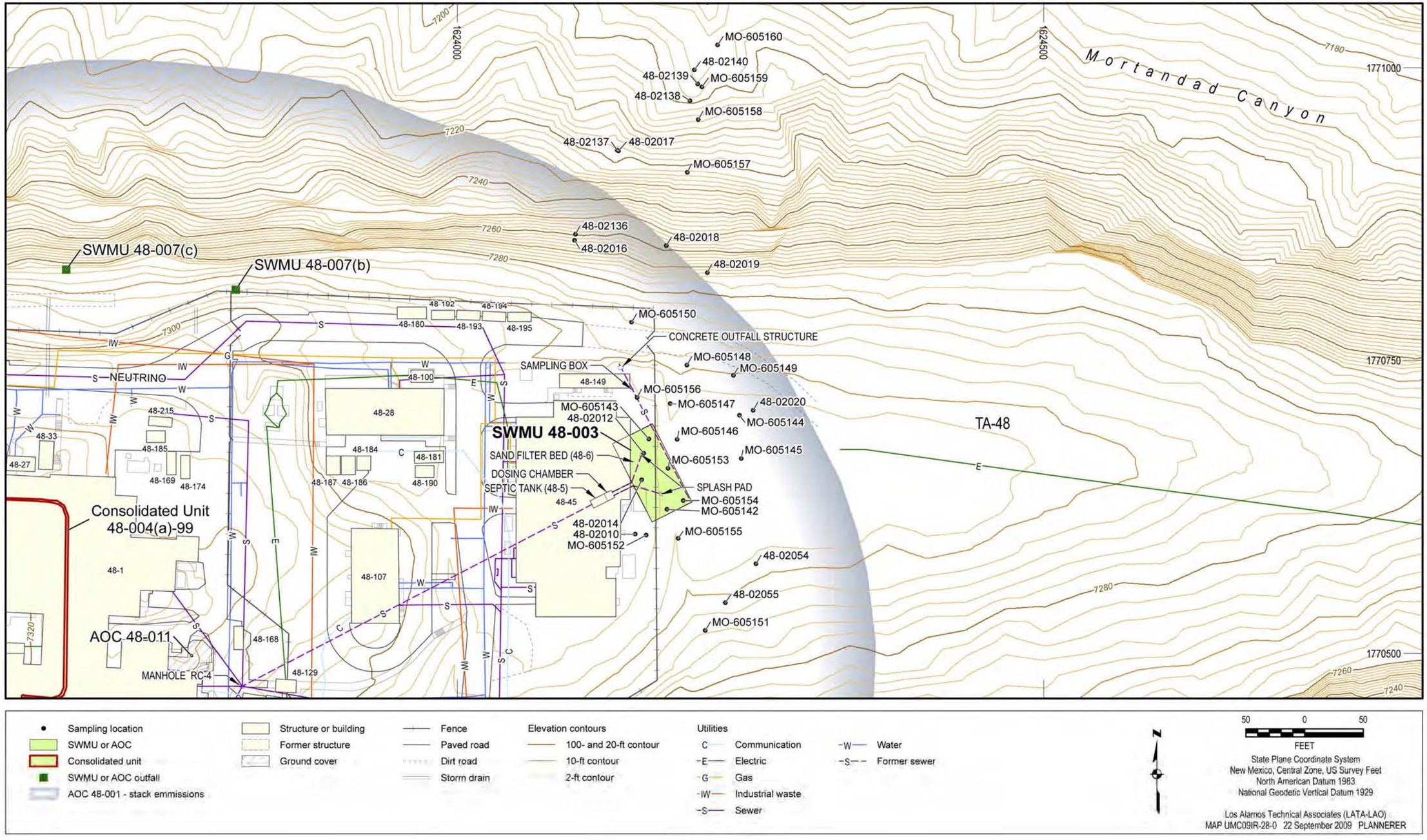


Figure 5.6-1 Site map and sampling locations at SWMU 48-003

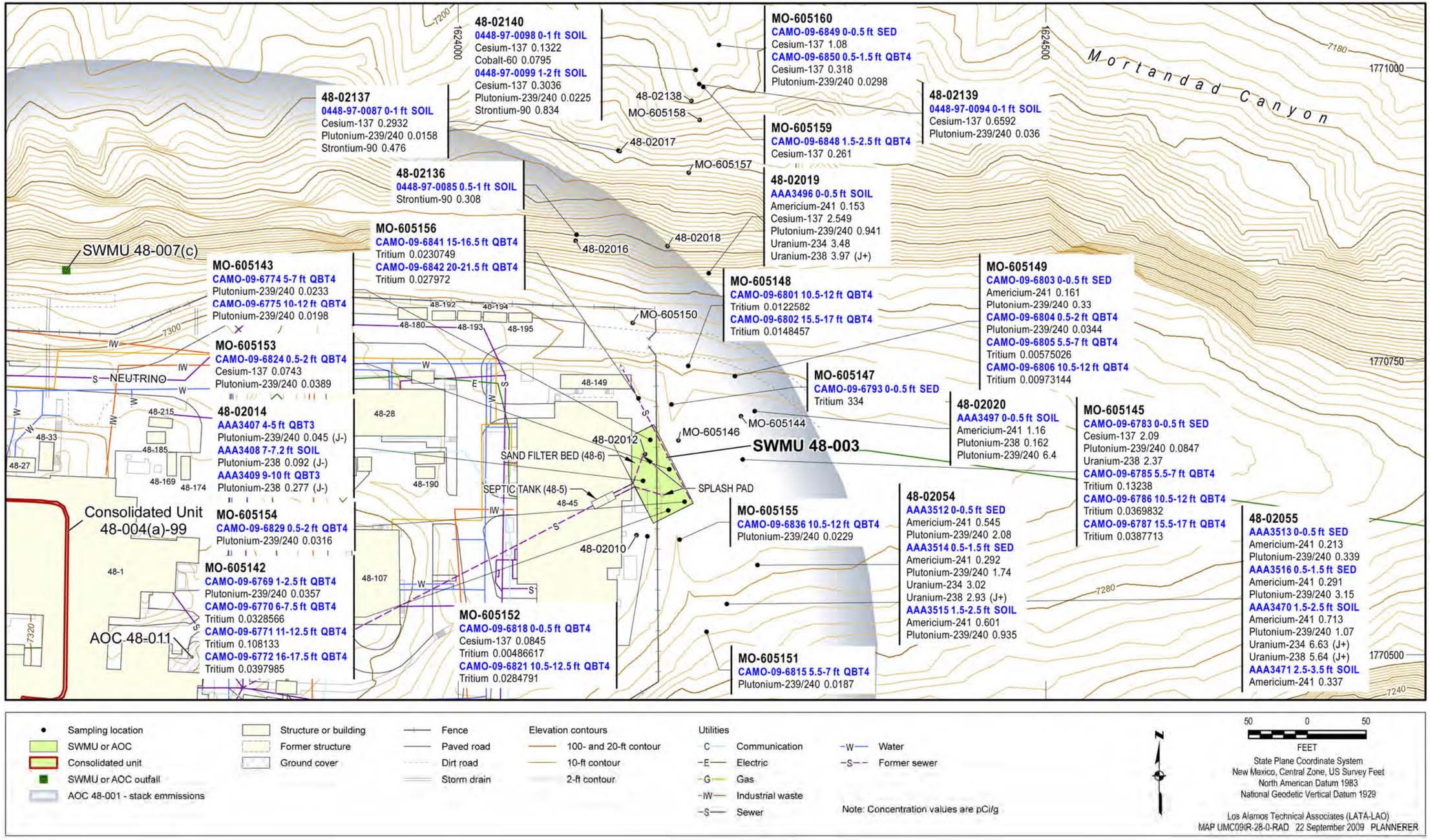


Figure 5.6-2 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-003

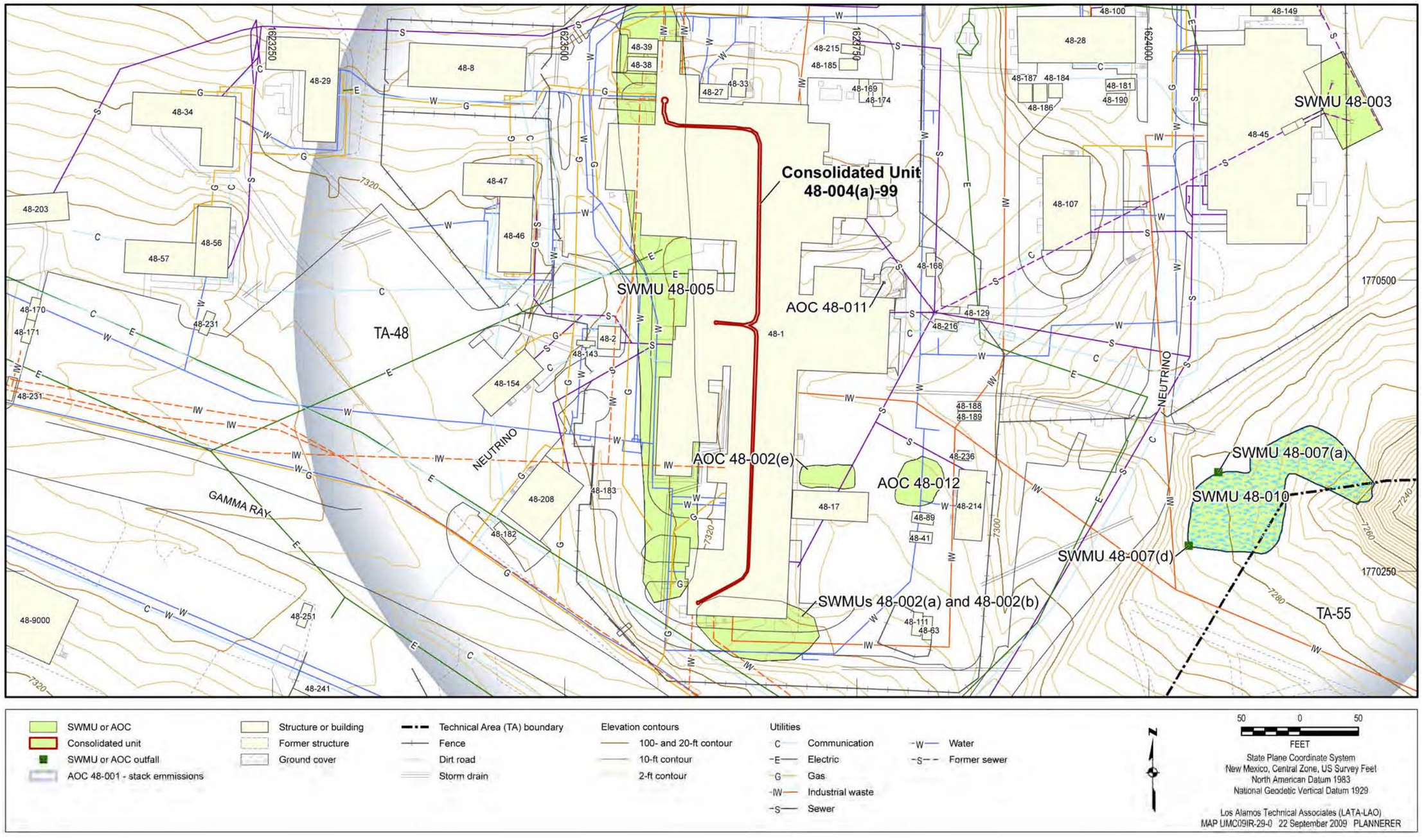


Figure 5.7-1 Site map of Consolidated Unit 48-004(a)-99

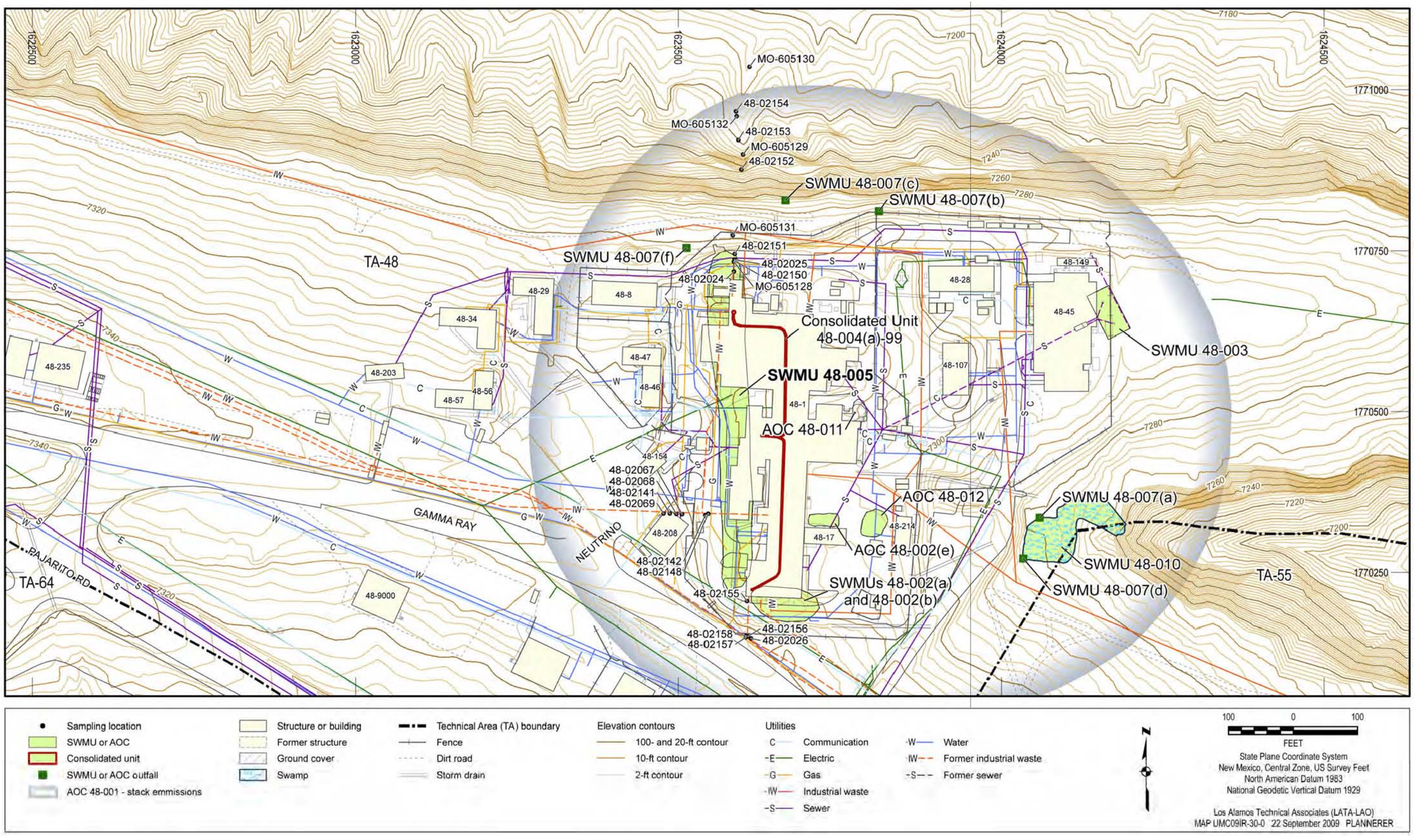


Figure 5.8-1 Site map and sampling locations at SWMU 48-005

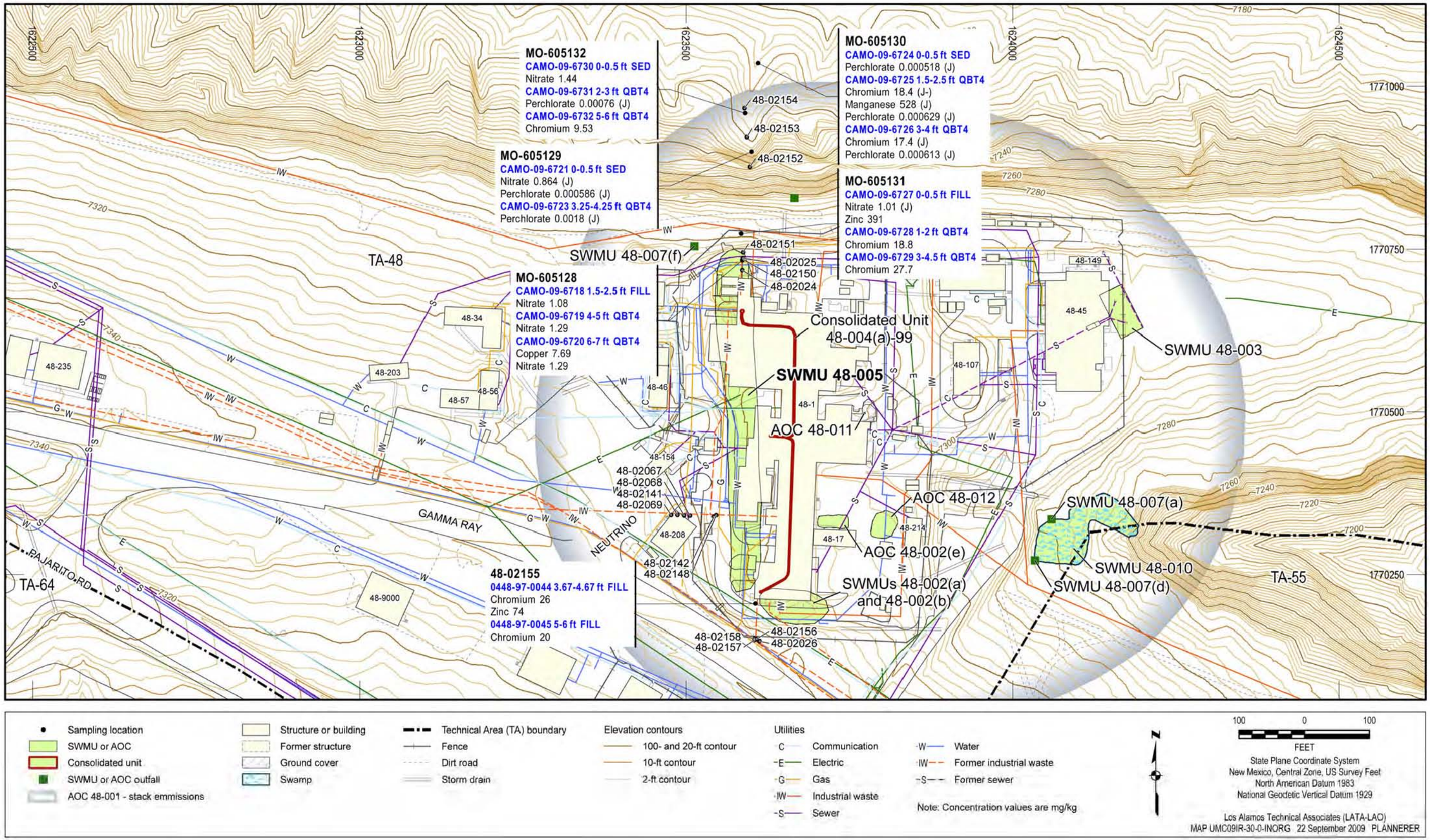


Figure 5.8-2 Inorganic COPCs detected or detected above BVs at SWMU 48-005

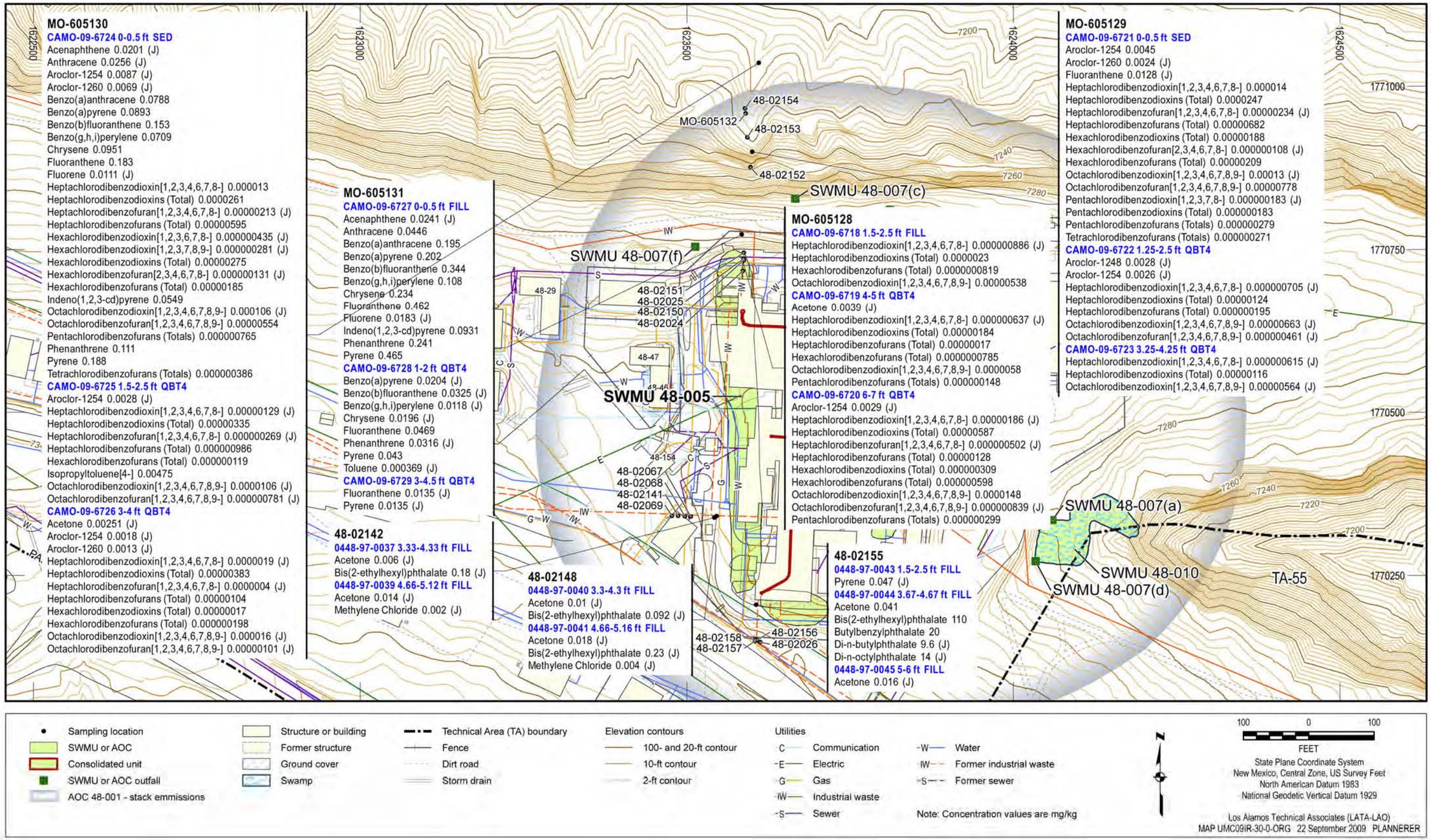


Figure 5.8-3 Organic COPCs detected at SWMU 48-005

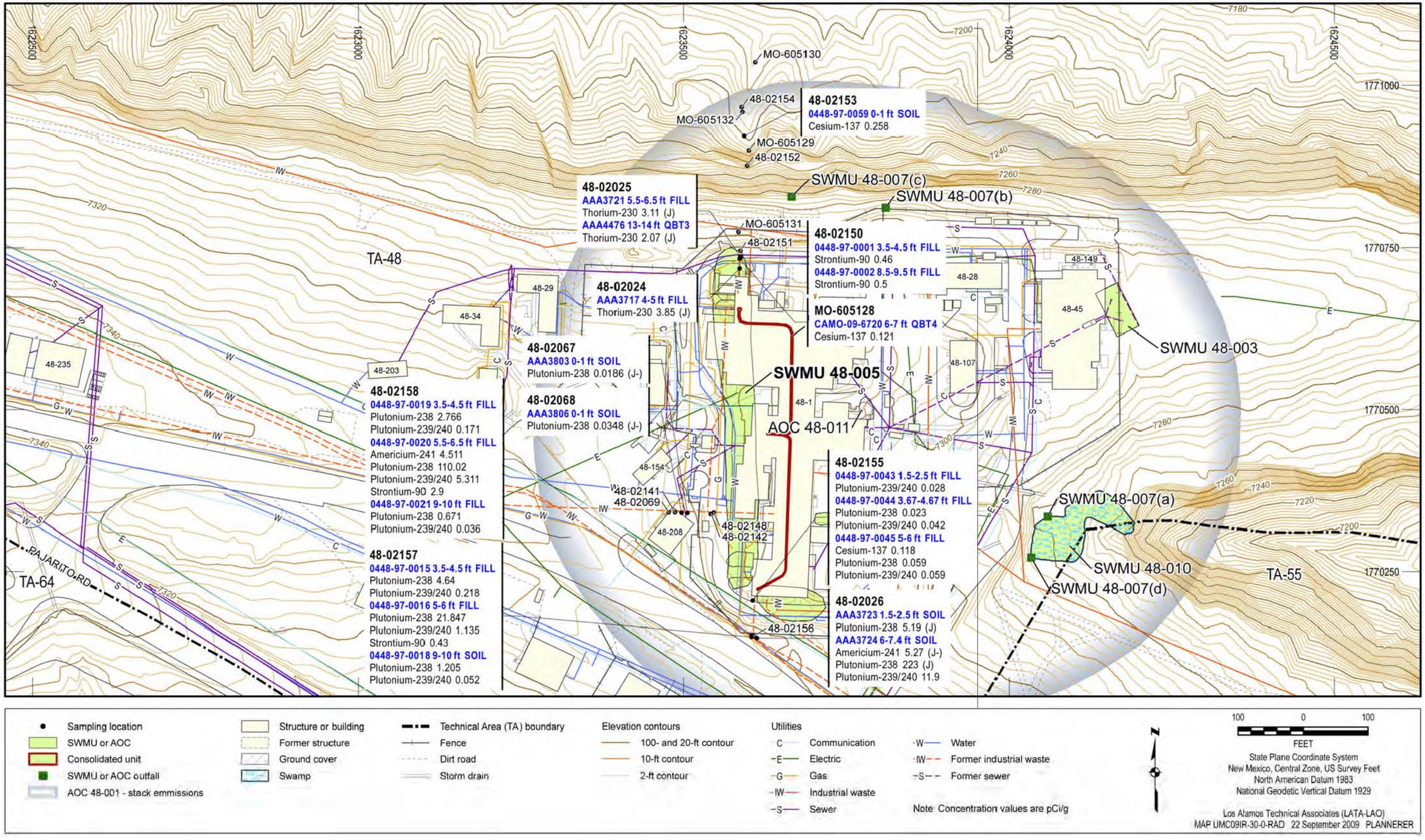


Figure 5.8-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-005

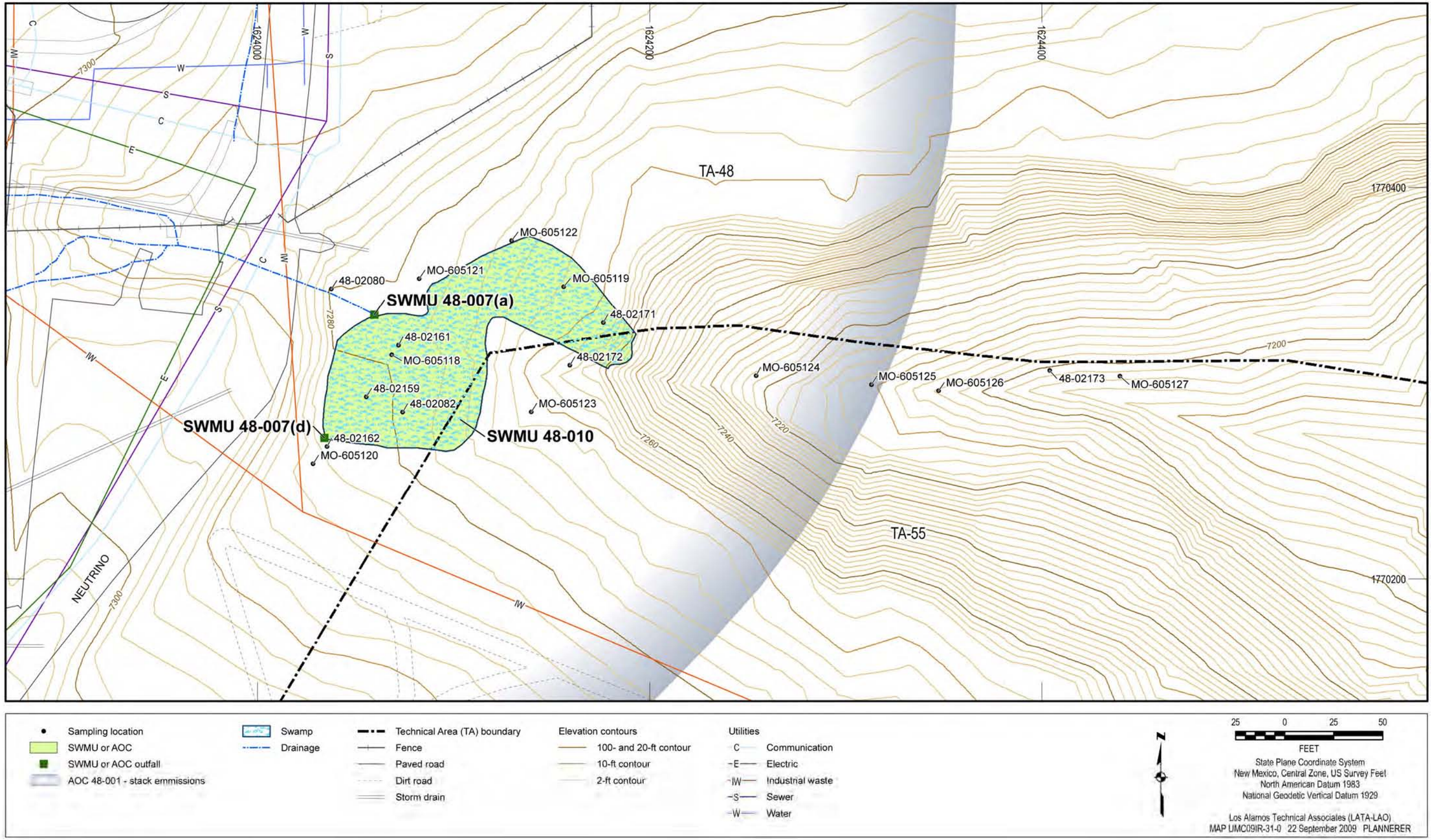


Figure 5.9-1 Site map and sampling locations at Consolidated Unit 48-007(a)-00

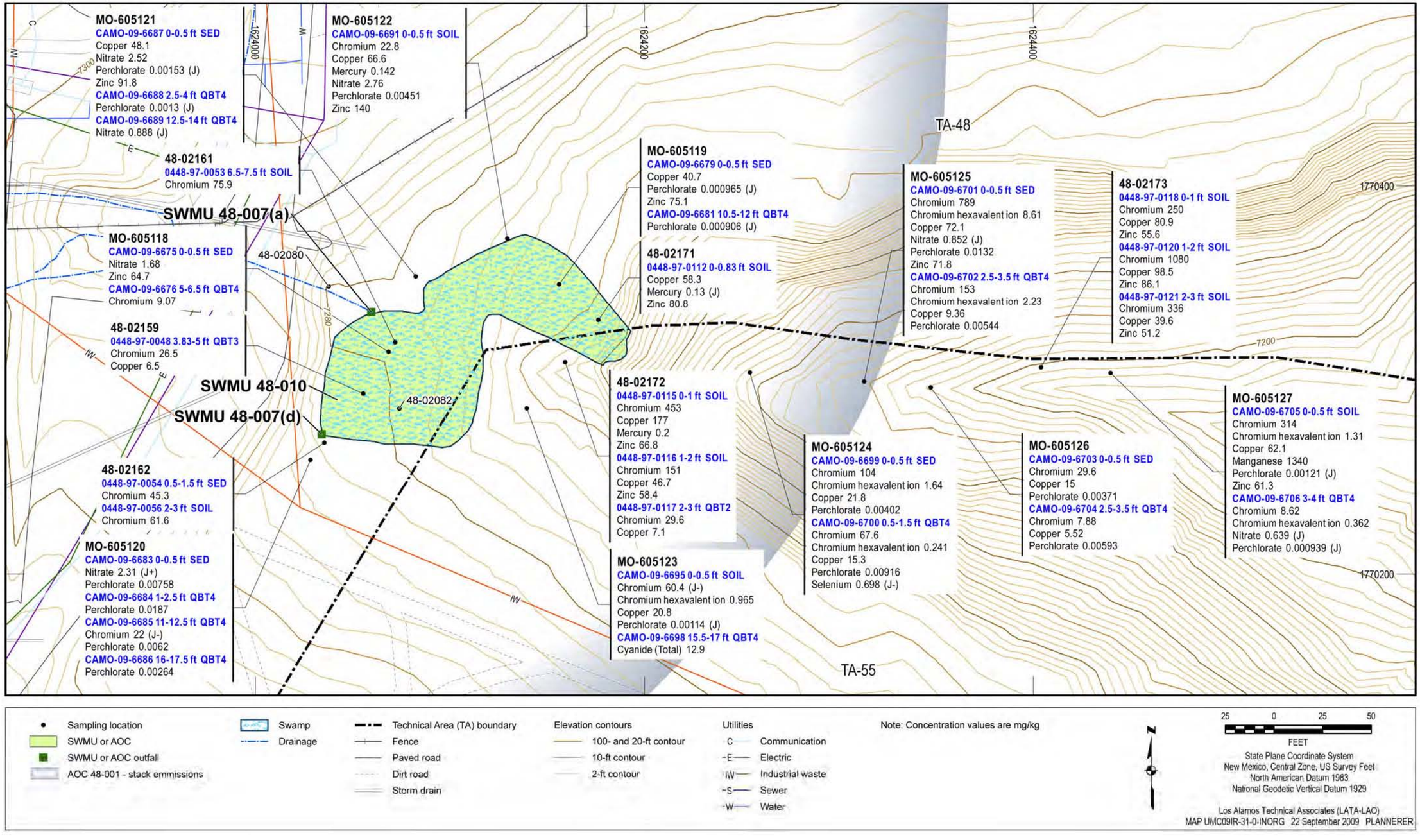


Figure 5.9-2 Inorganic COPCs detected or detected above BVs at Consolidated Unit 48-007(a)-00

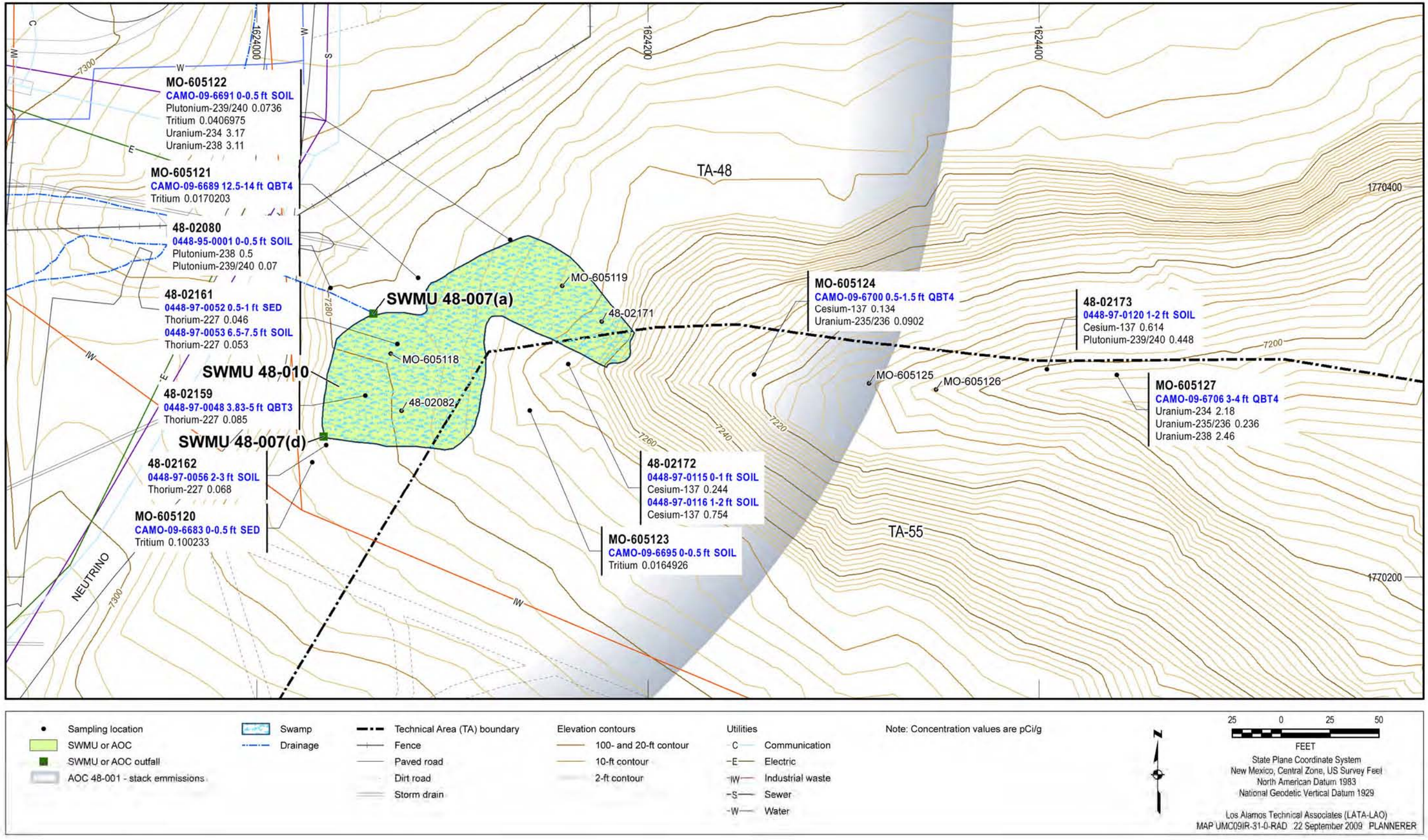


Figure 5.9-3 Radionuclides COPCs detected or detected above BVs/FVs at Consolidated Unit 48-007(a)-00

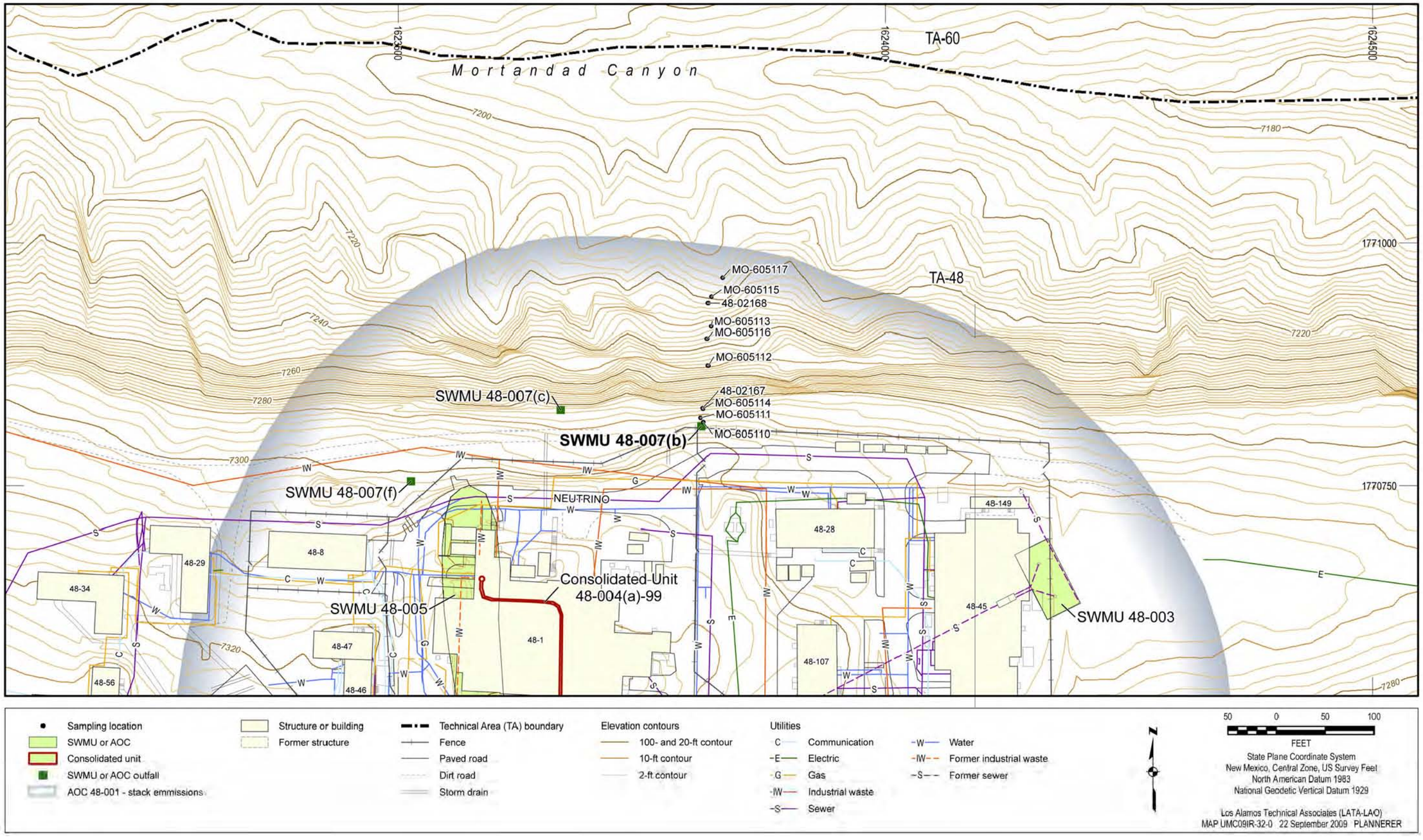


Figure 5.10-1 Site map and sampling locations at SWMU 48-007(b)

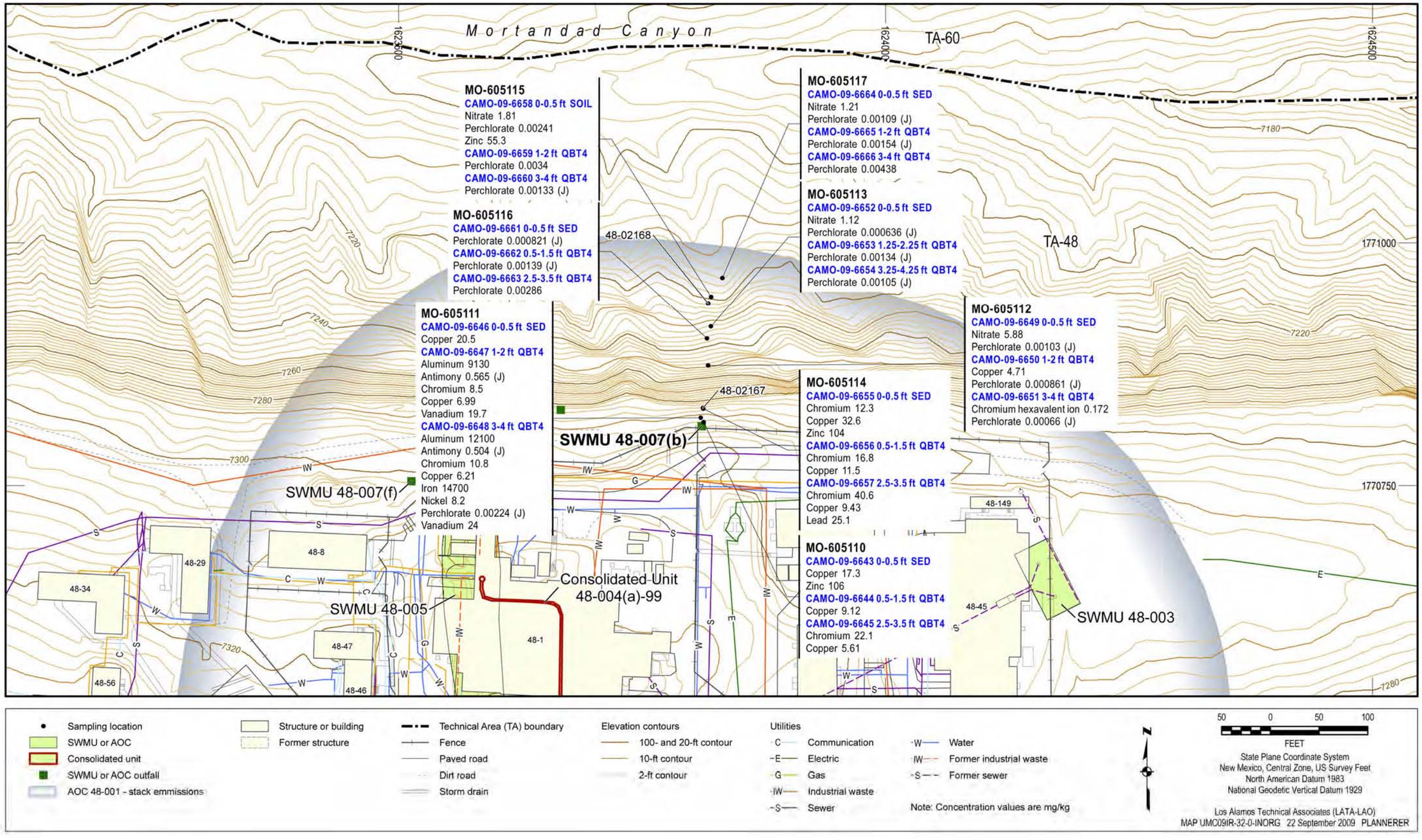


Figure 5.10-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(b)

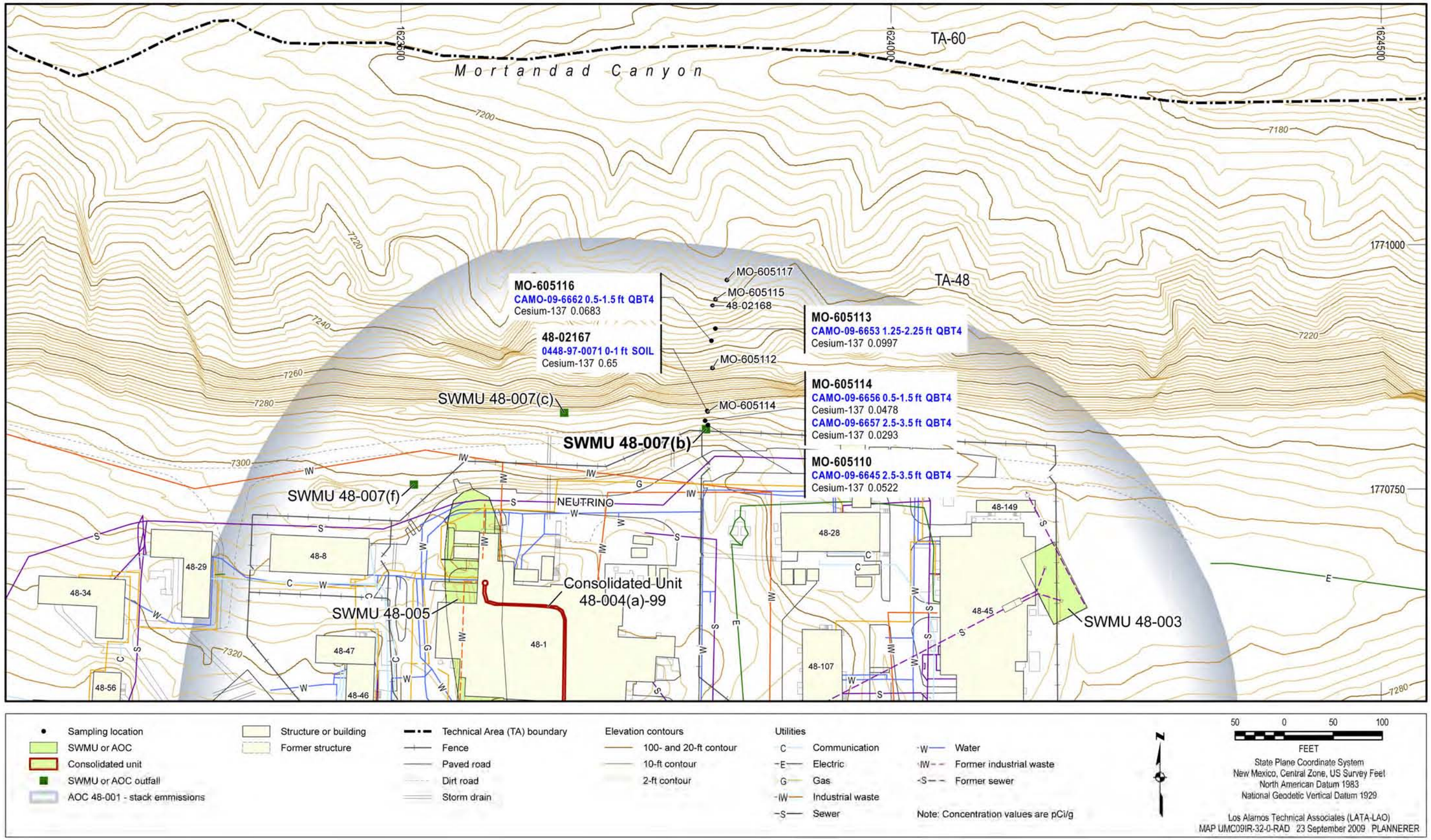


Figure 5.10-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(b)

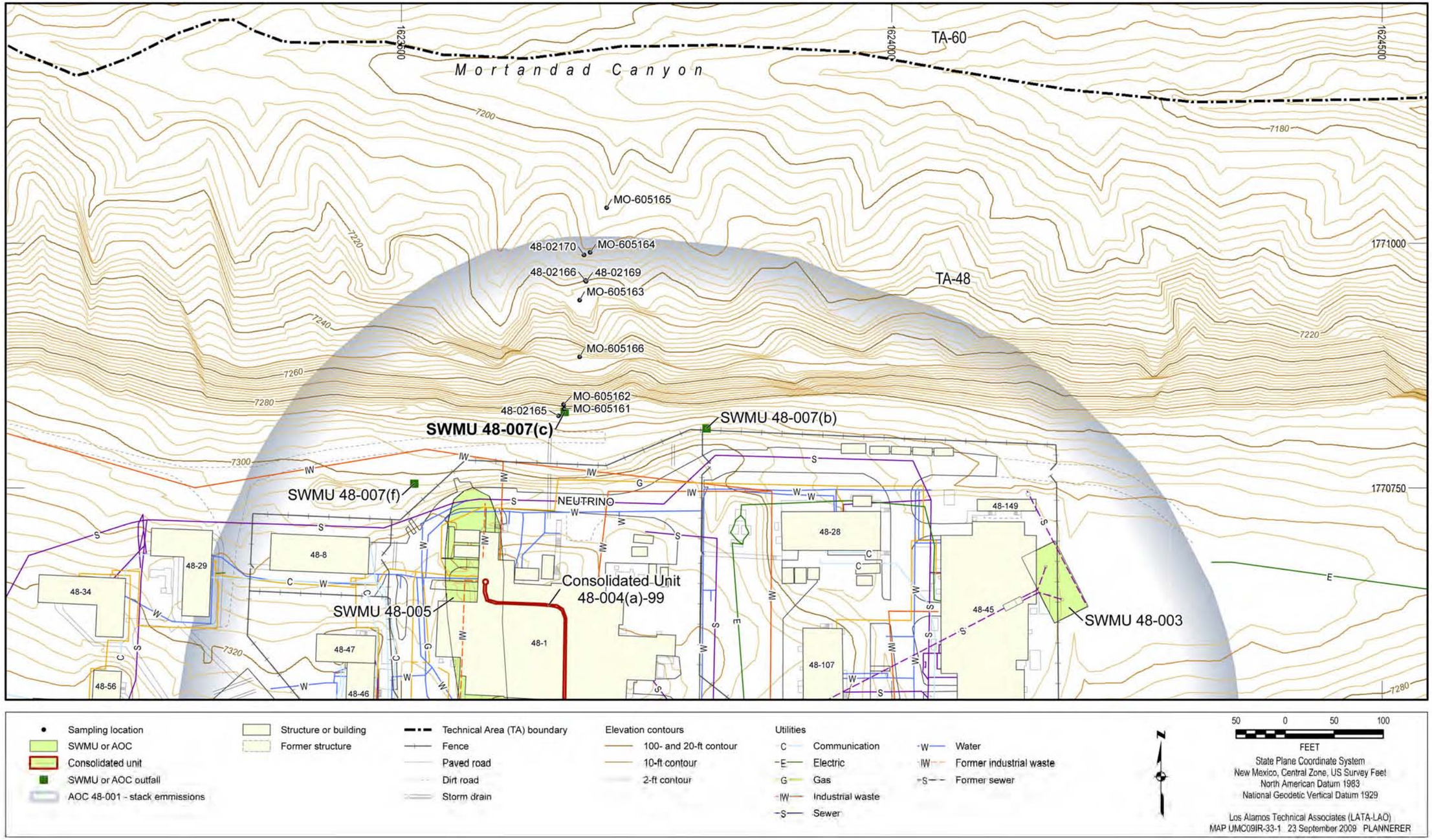


Figure 5.11-1 Site map and sampling locations at SWMU 48-007(c)

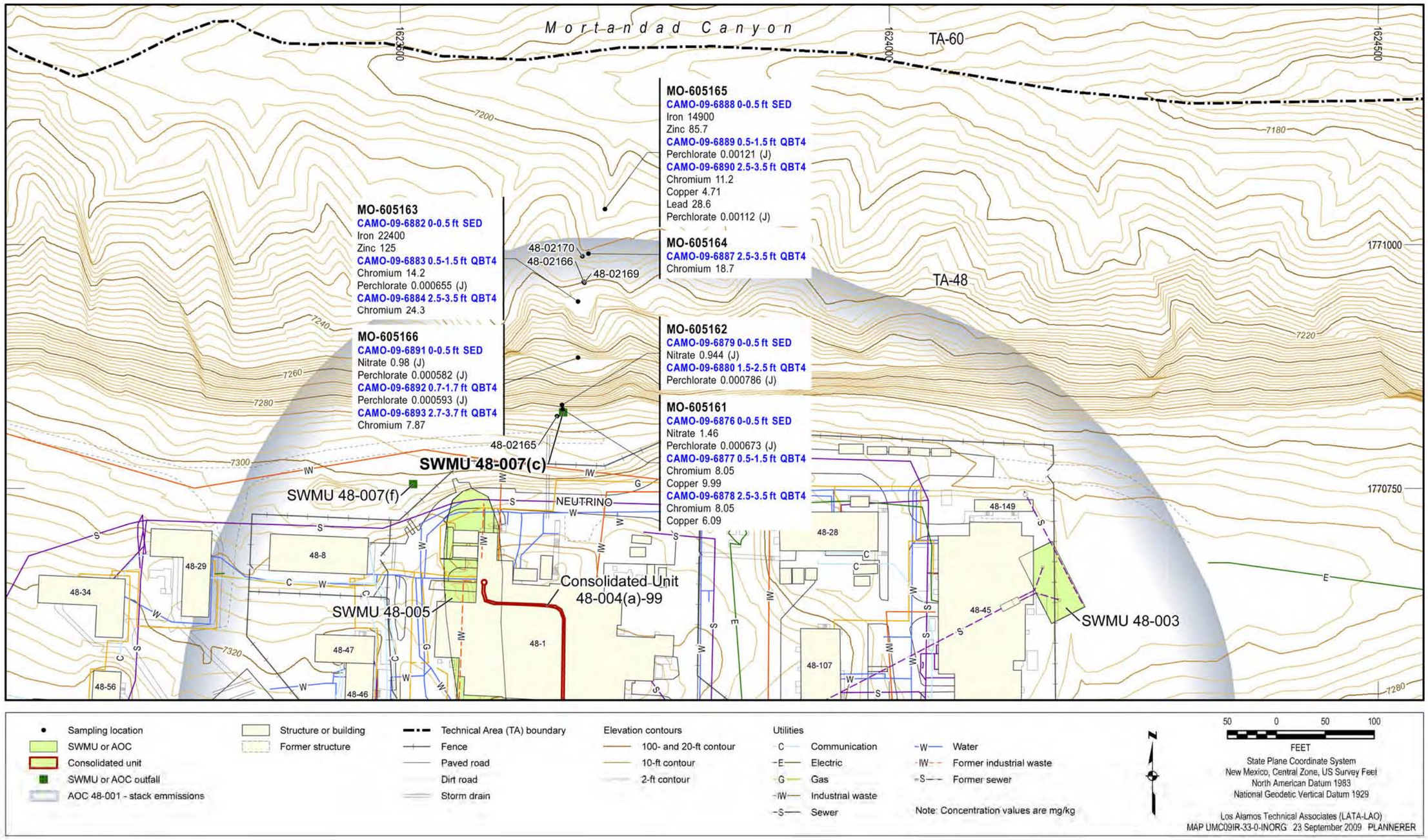


Figure 5.11-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(c)

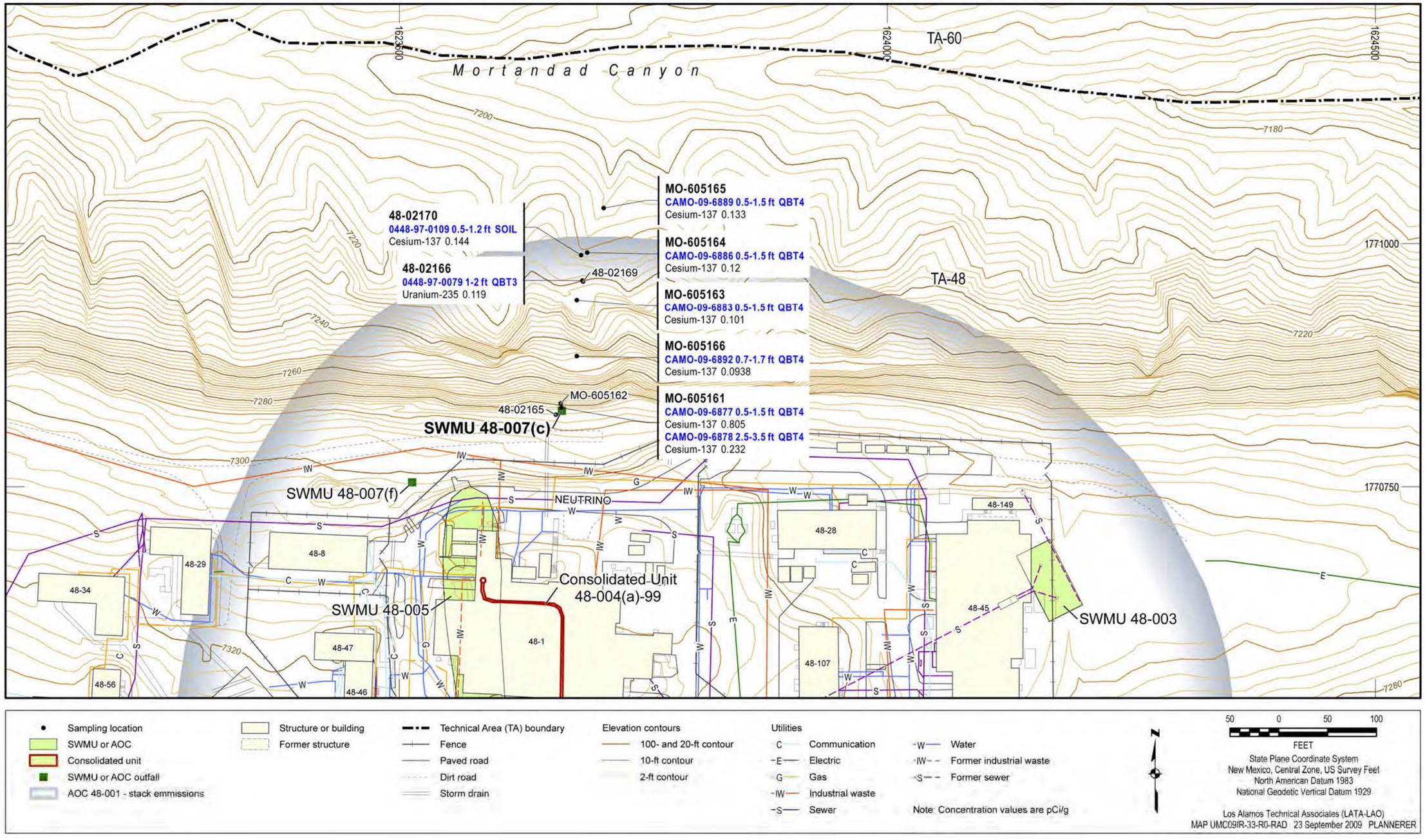


Figure 5.11-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(c)

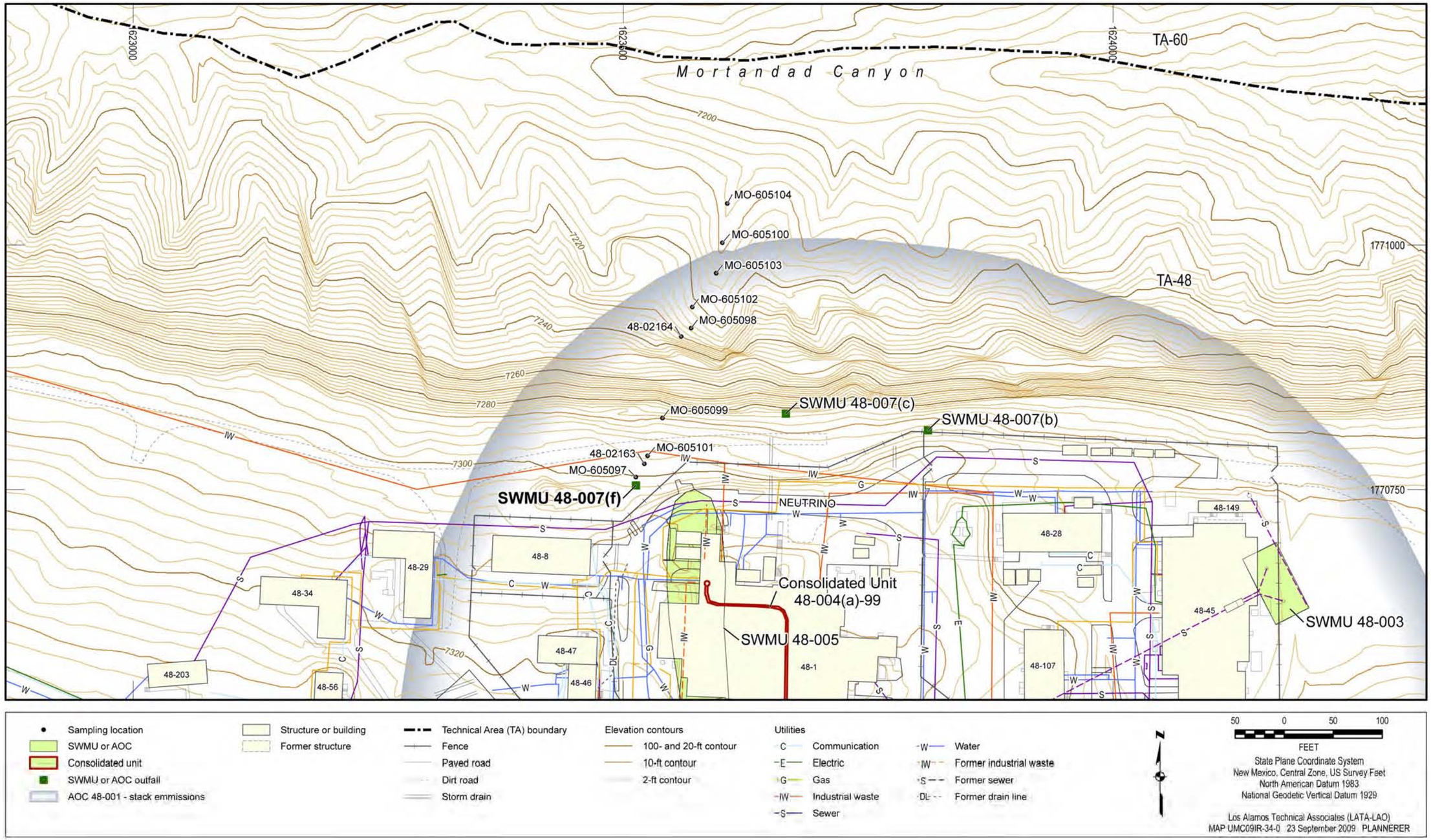


Figure 5.12-1 Site map and sampling locations at SWMU 48-007(f)

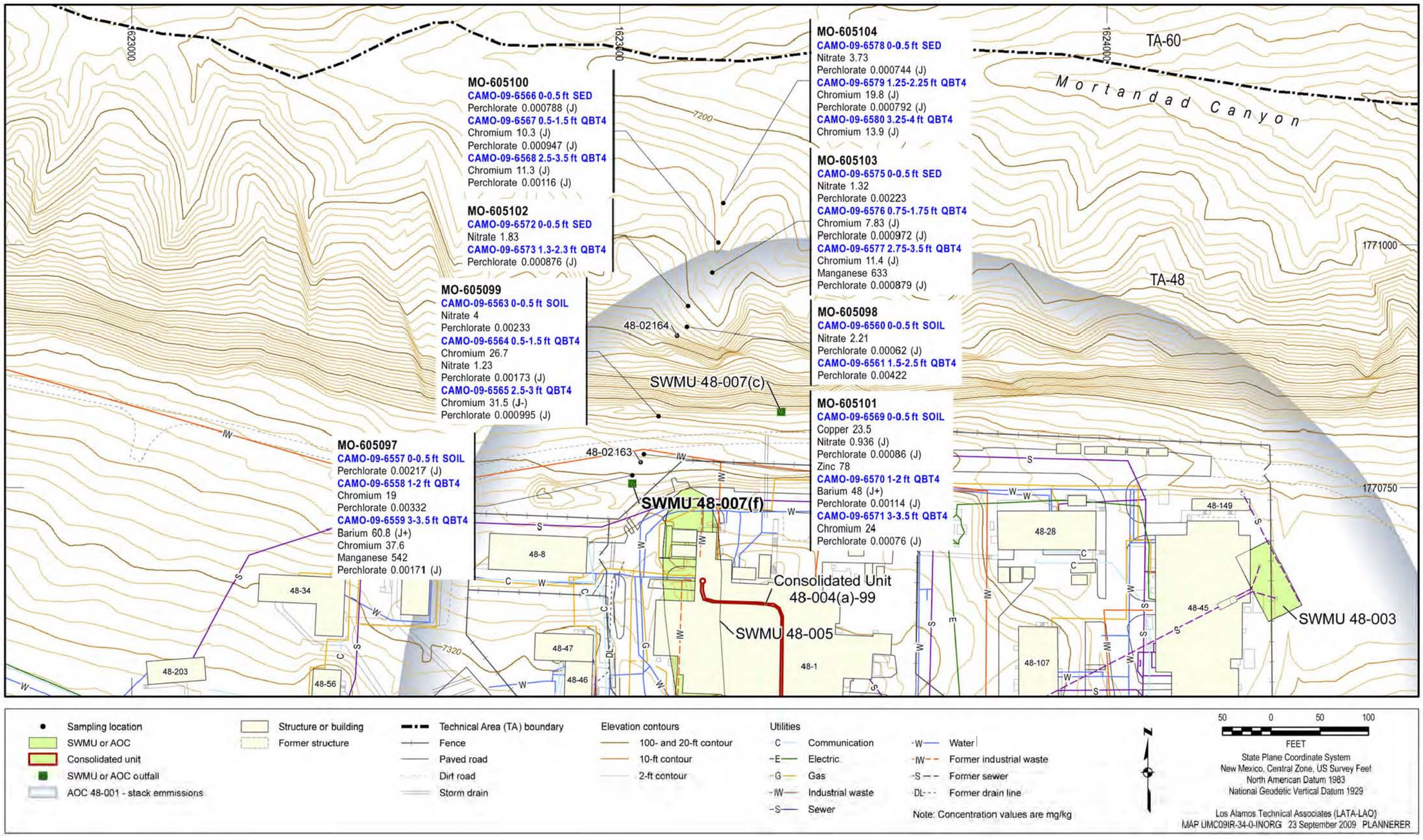


Figure 5.12-2 Inorganic COPCs detected or detected above BVs at SWMU 48-007(f)

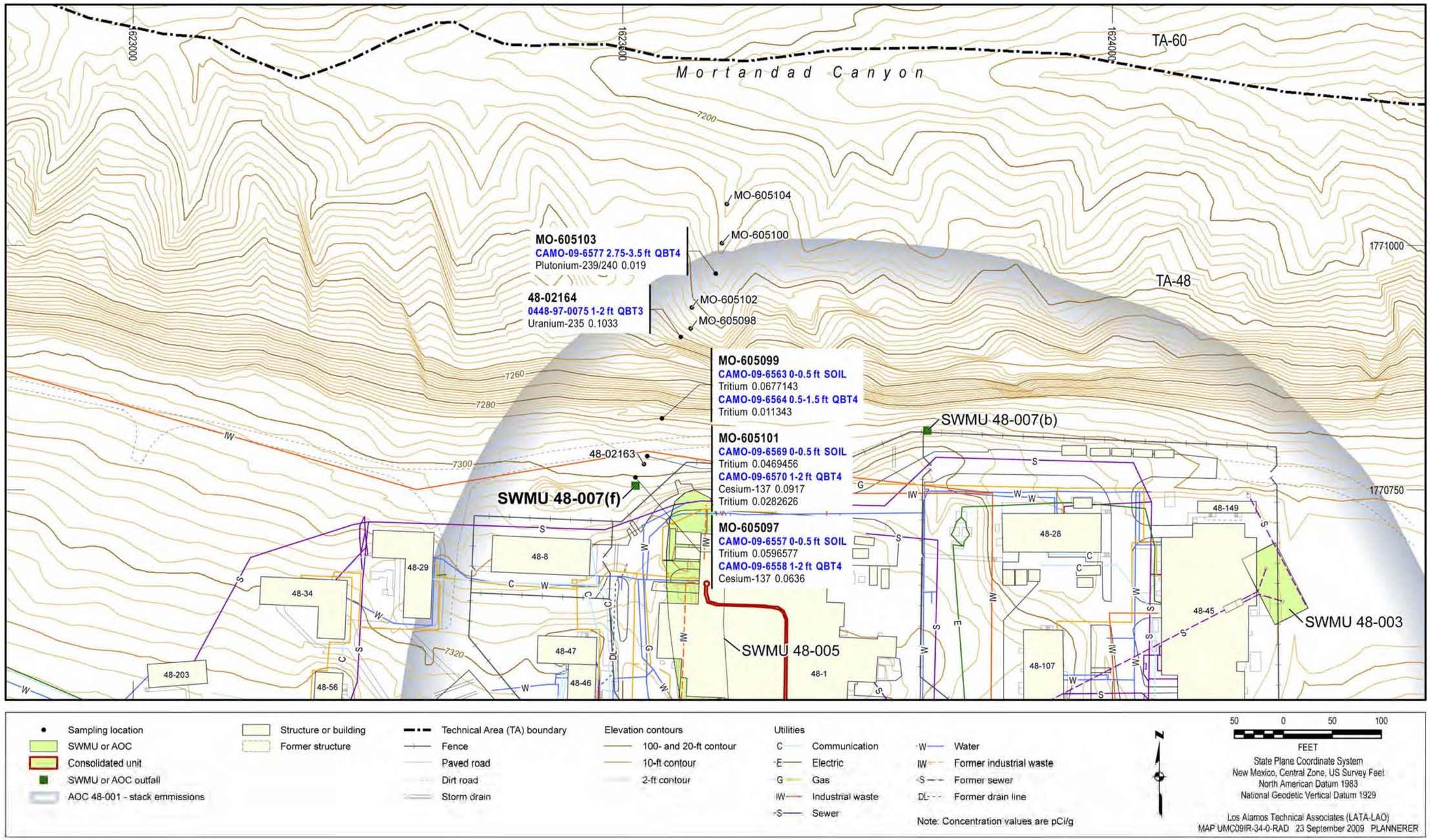


Figure 5.12-3 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 48-007(f)

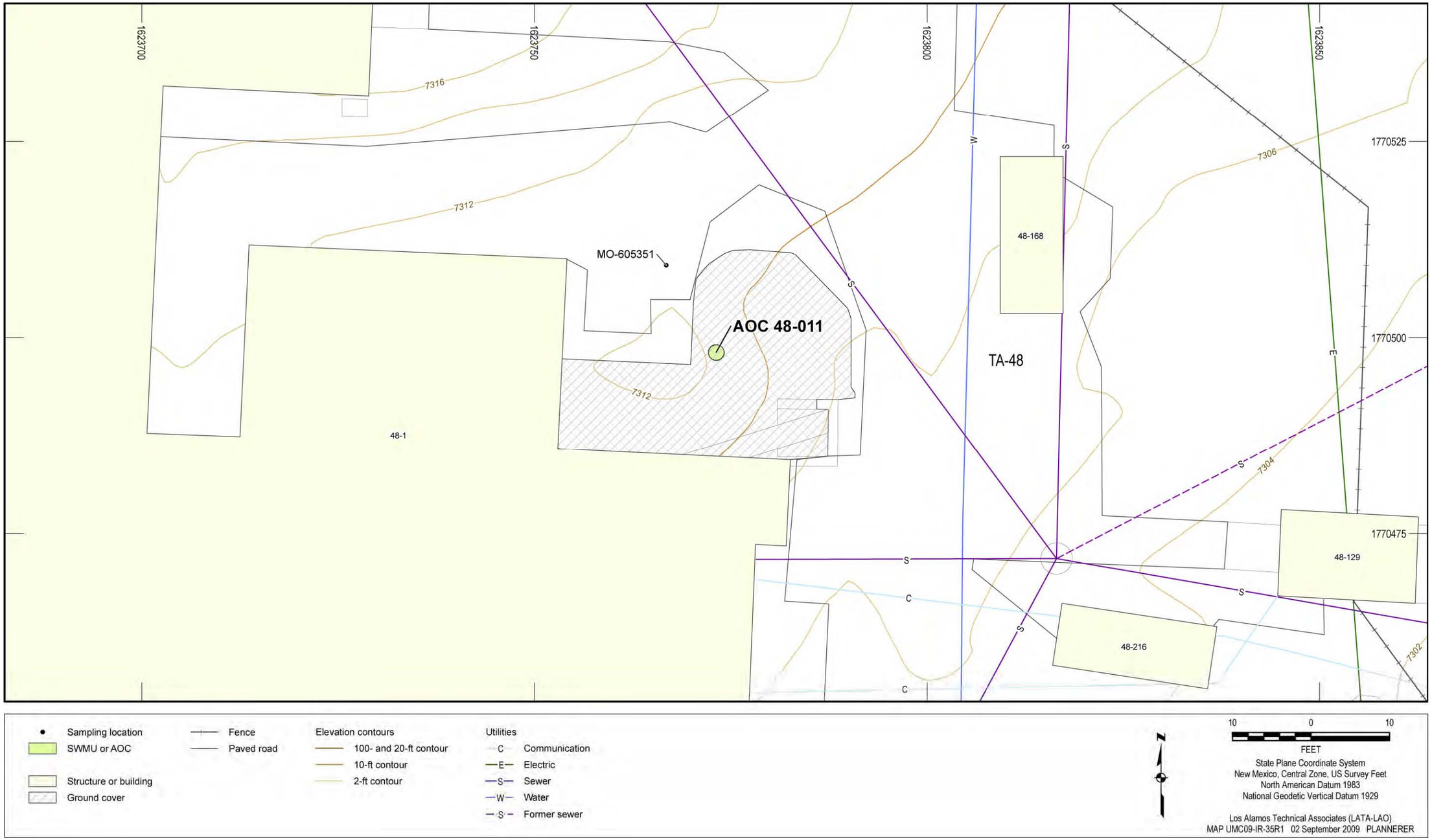


Figure 5.13-1 Site map and sampling locations at AOC 48-011

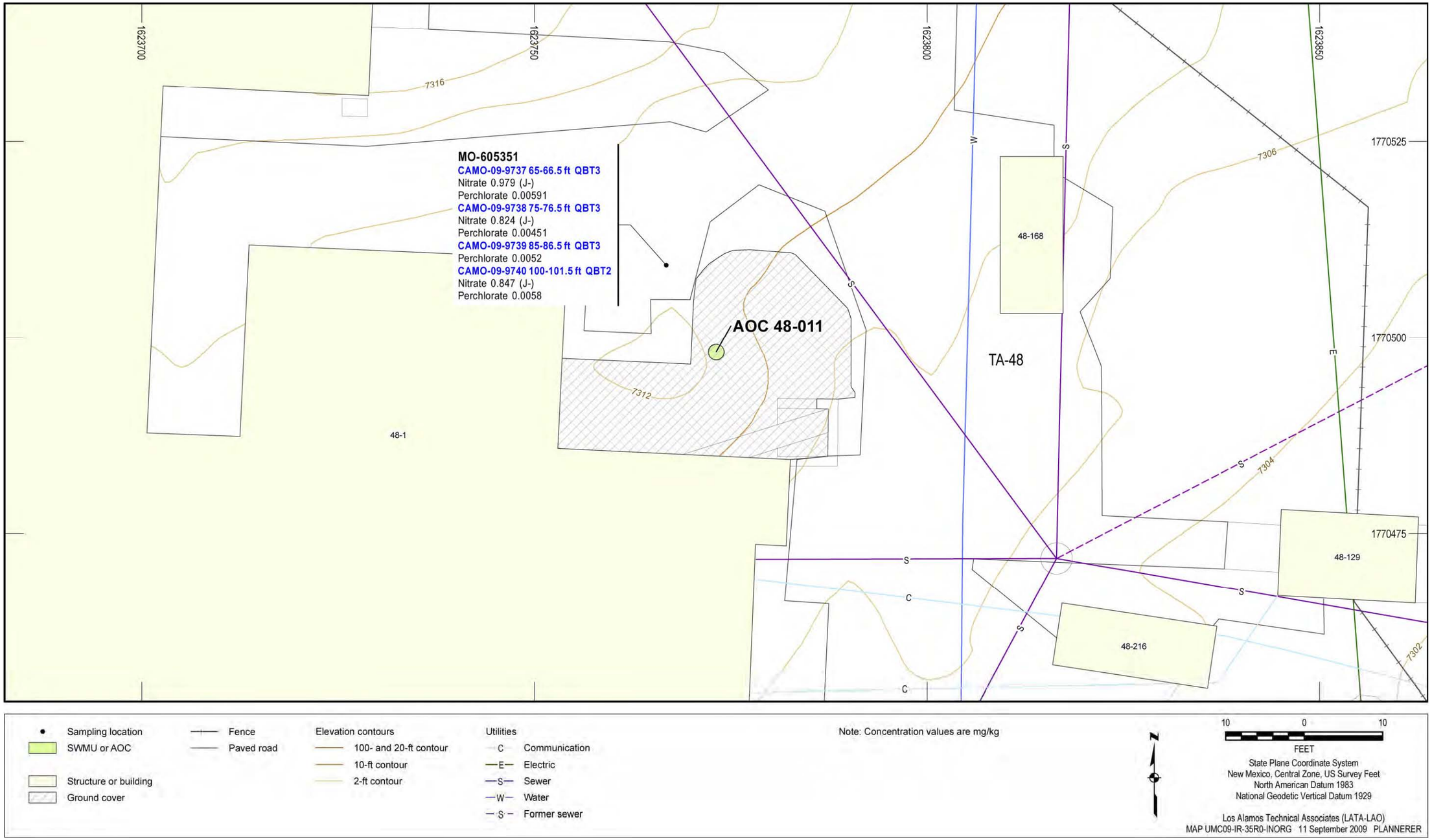


Figure 5.13-2 Inorganic COPCs detected or detected above BVs at AOC 48-011

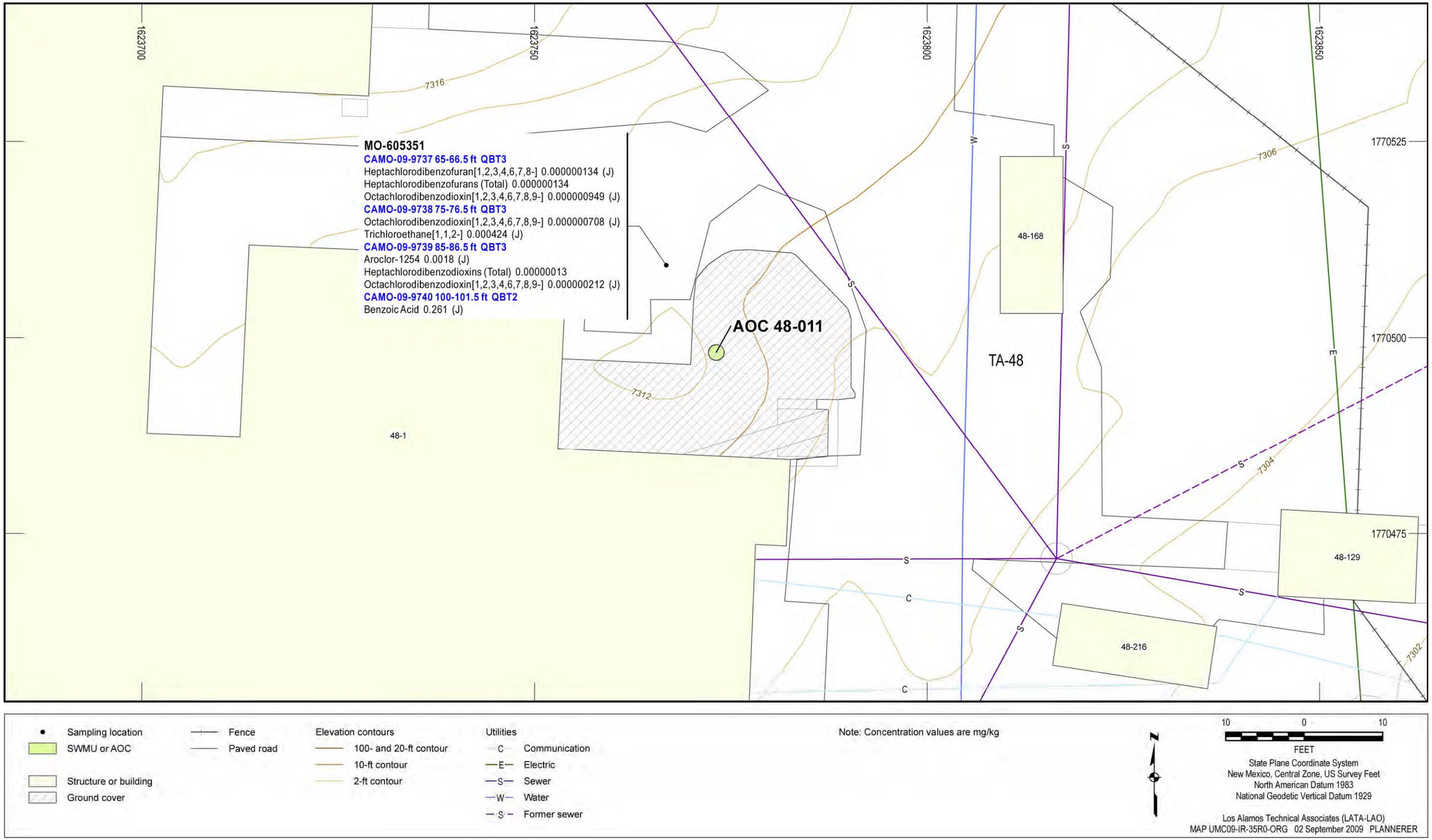


Figure 5.13-3 Organic COPCs detected at AOC 48-011

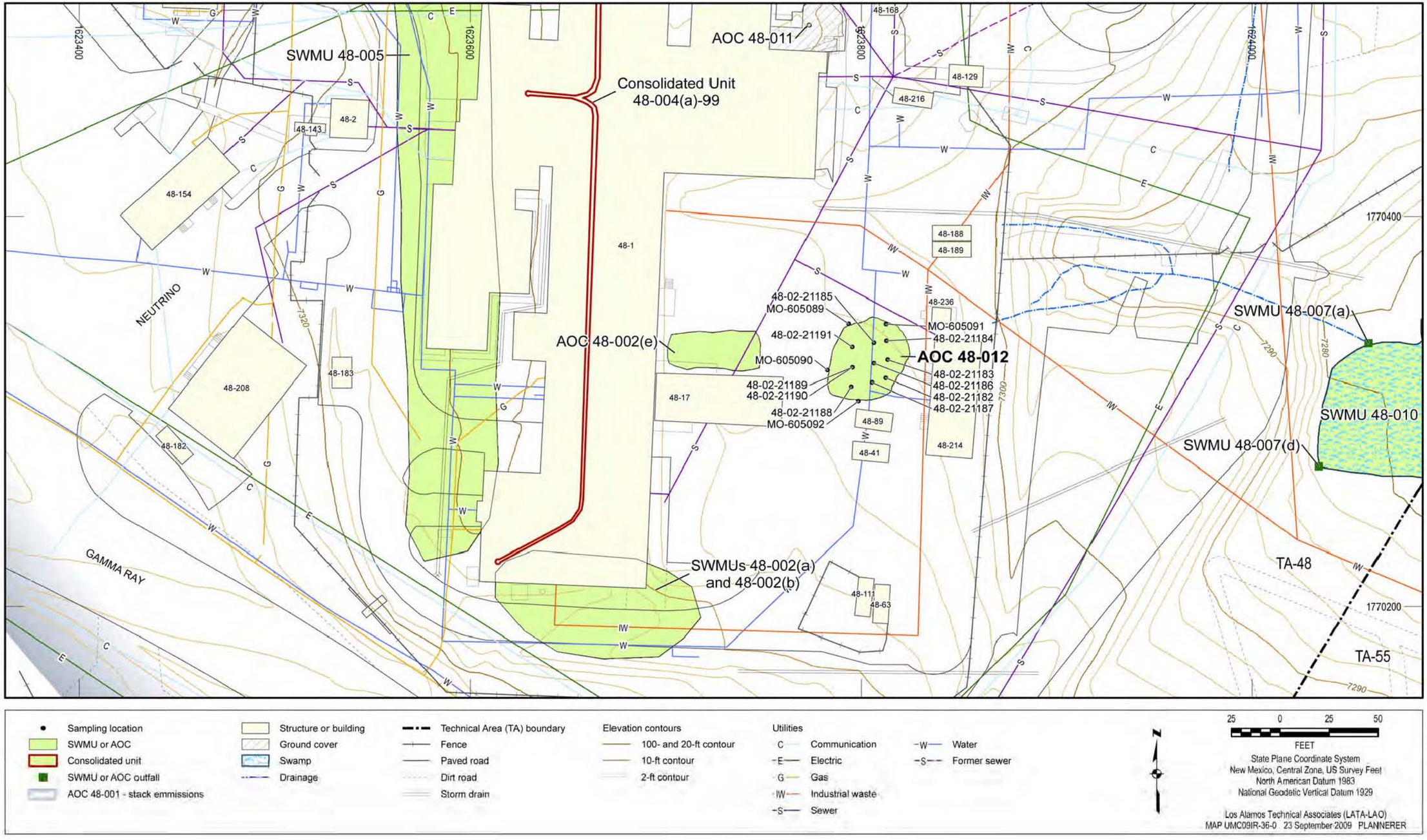


Figure 5.14-1 Site map and sampling locations at AOC 48-012

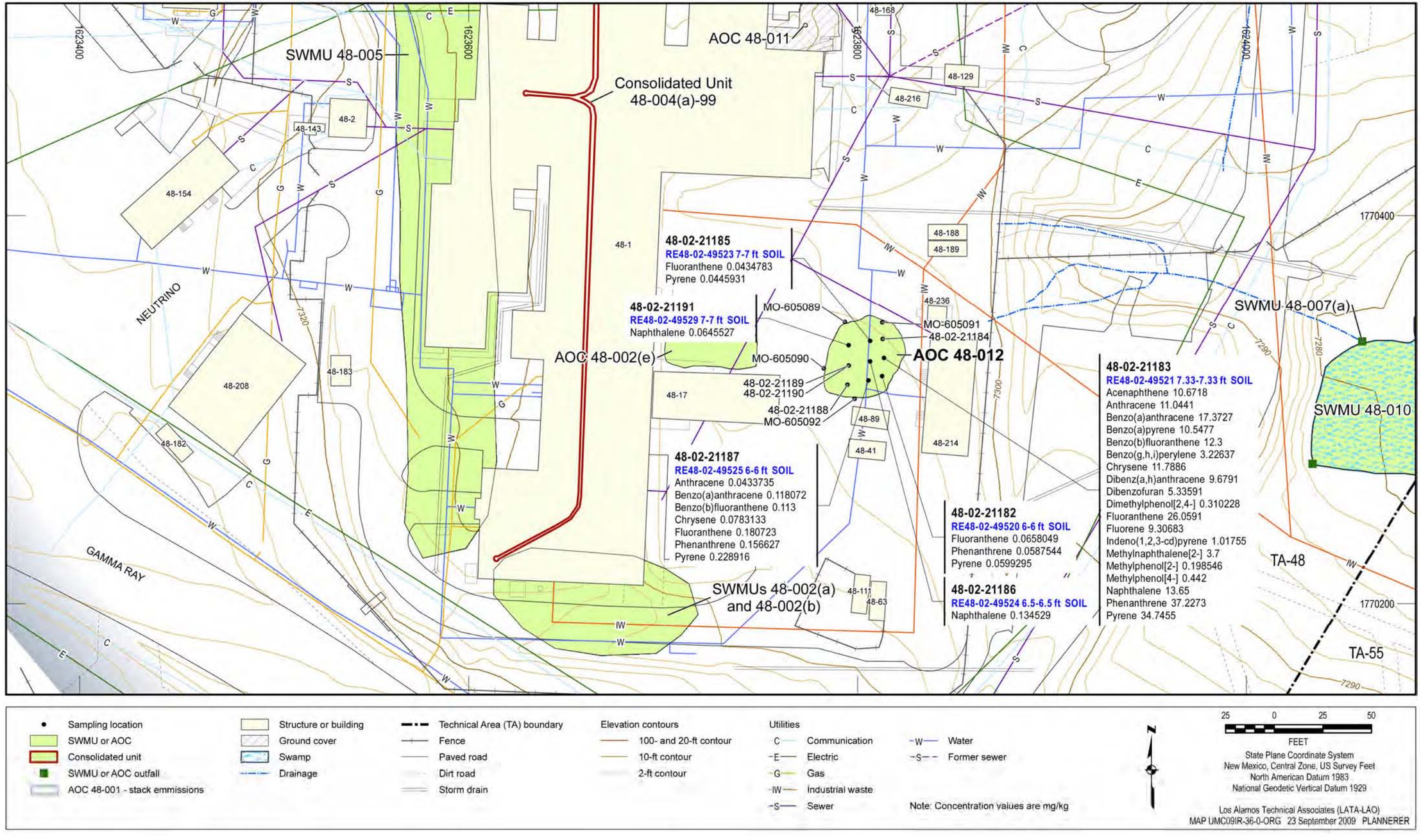


Figure 5.14-2 Organic COPCs detected at AOC 48-012

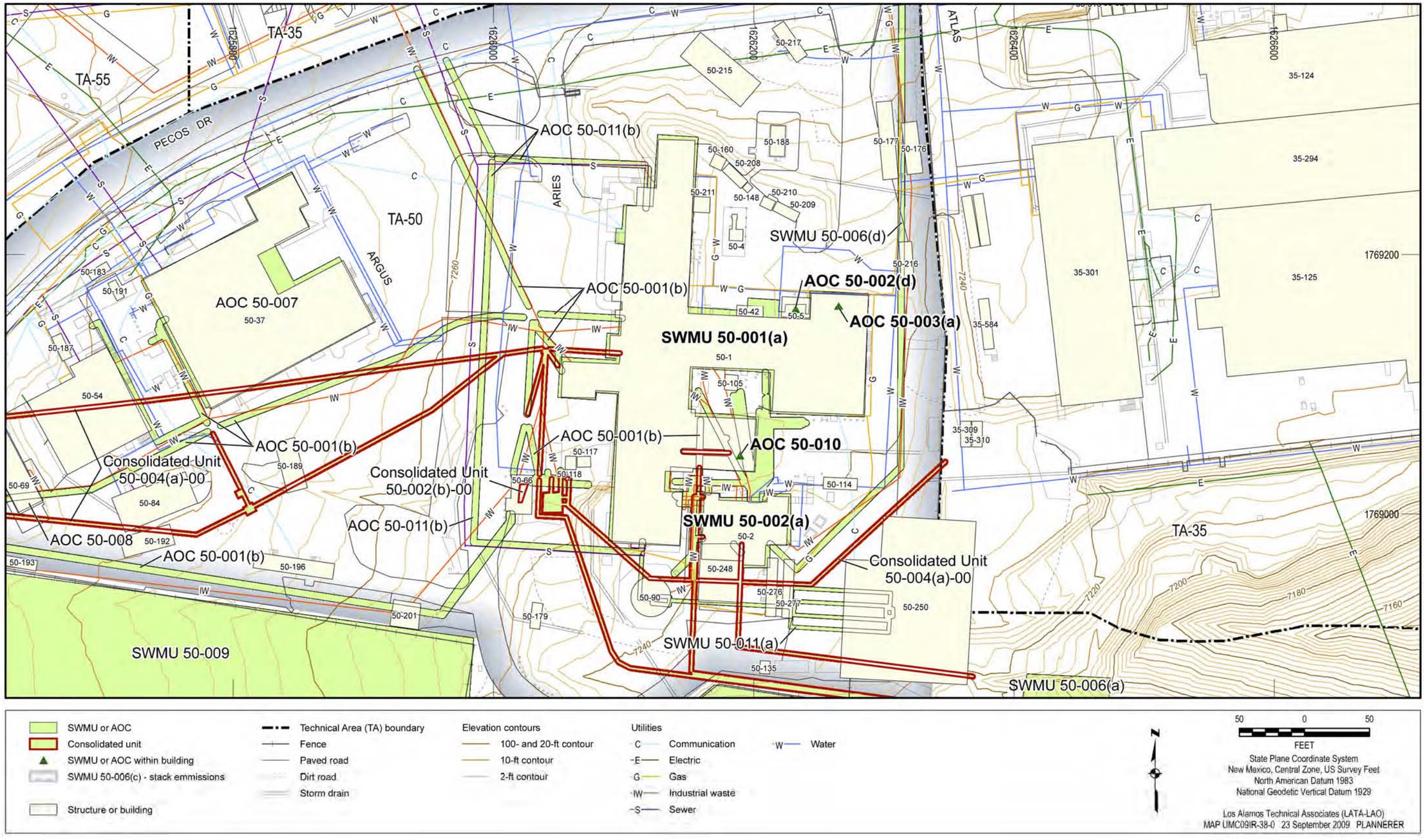


Figure 6.2-1 Site map of SWMU 50-001(a), SWMU 50-002(a), SWMU 50-002(d), AOC 50-003(a), and AOC 50-010

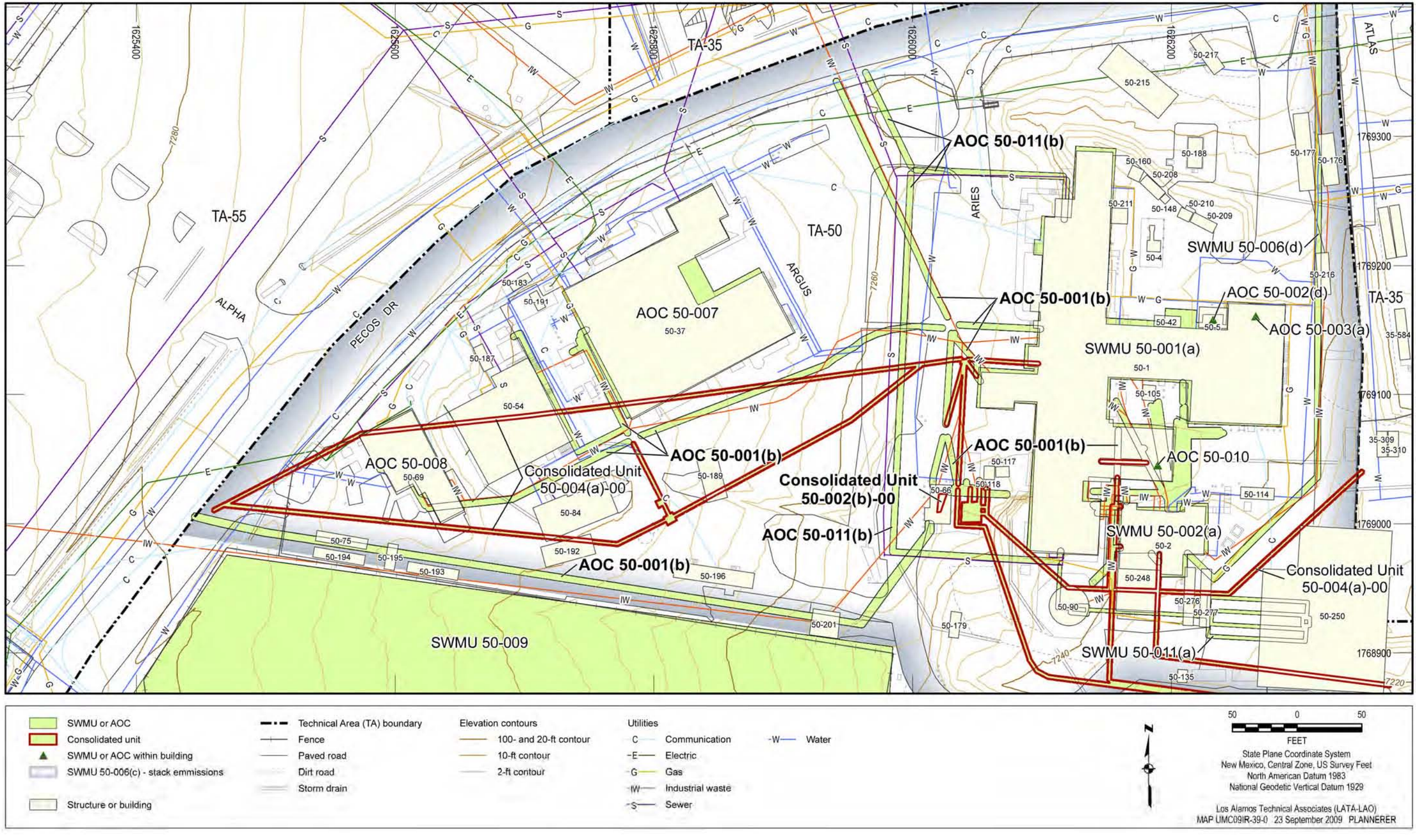


Figure 6.3-1 Site map of AOC 50-001(b), Consolidated Unit 50-002(b)-00, and SWMU 50-011(b)



Figure 6.6-1 Site map and sampling locations at AOC 50-002(d)

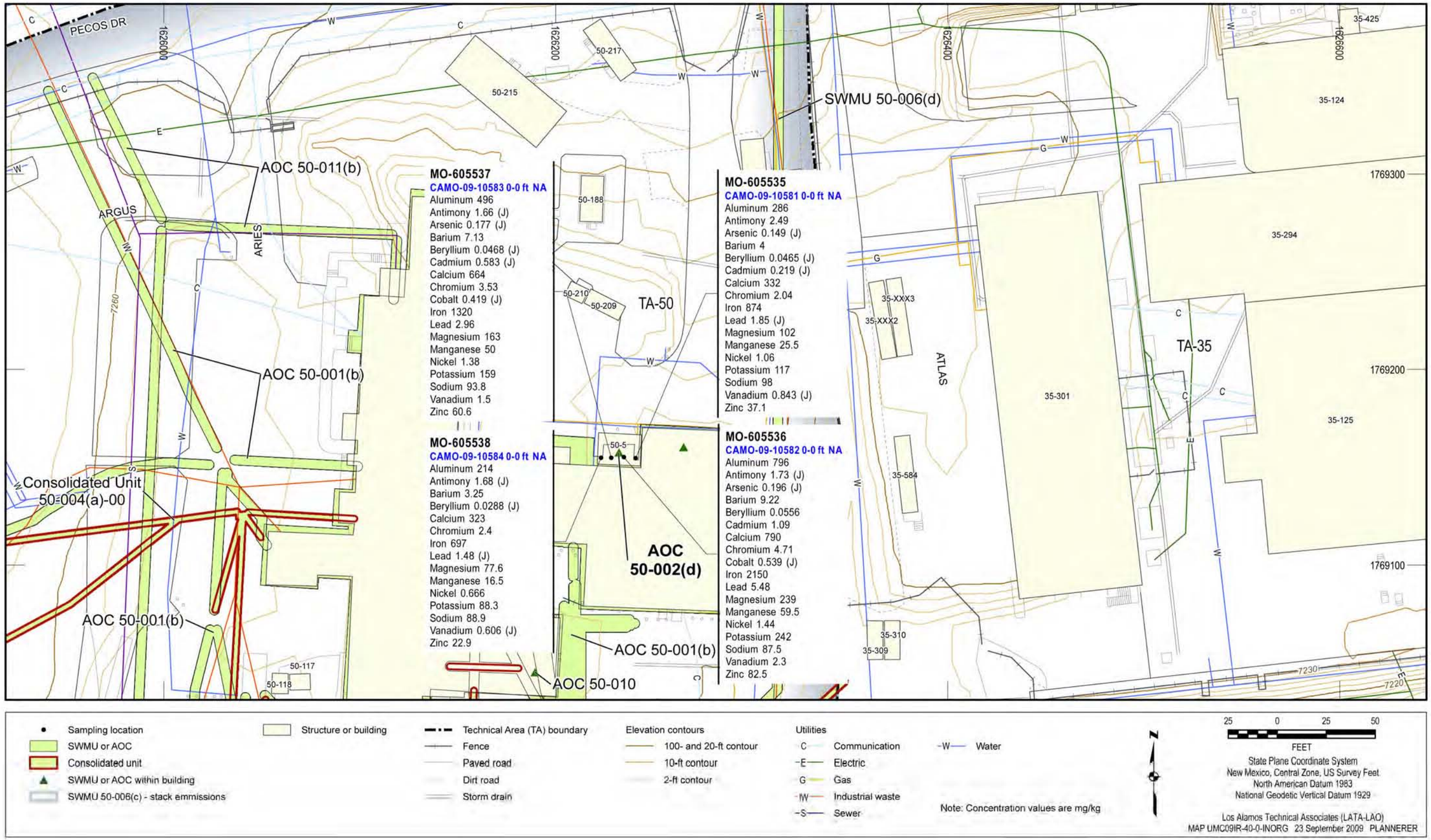


Figure 6.6-2 Inorganic COPCs detected or detected above BVs at AOC 50-002(d)

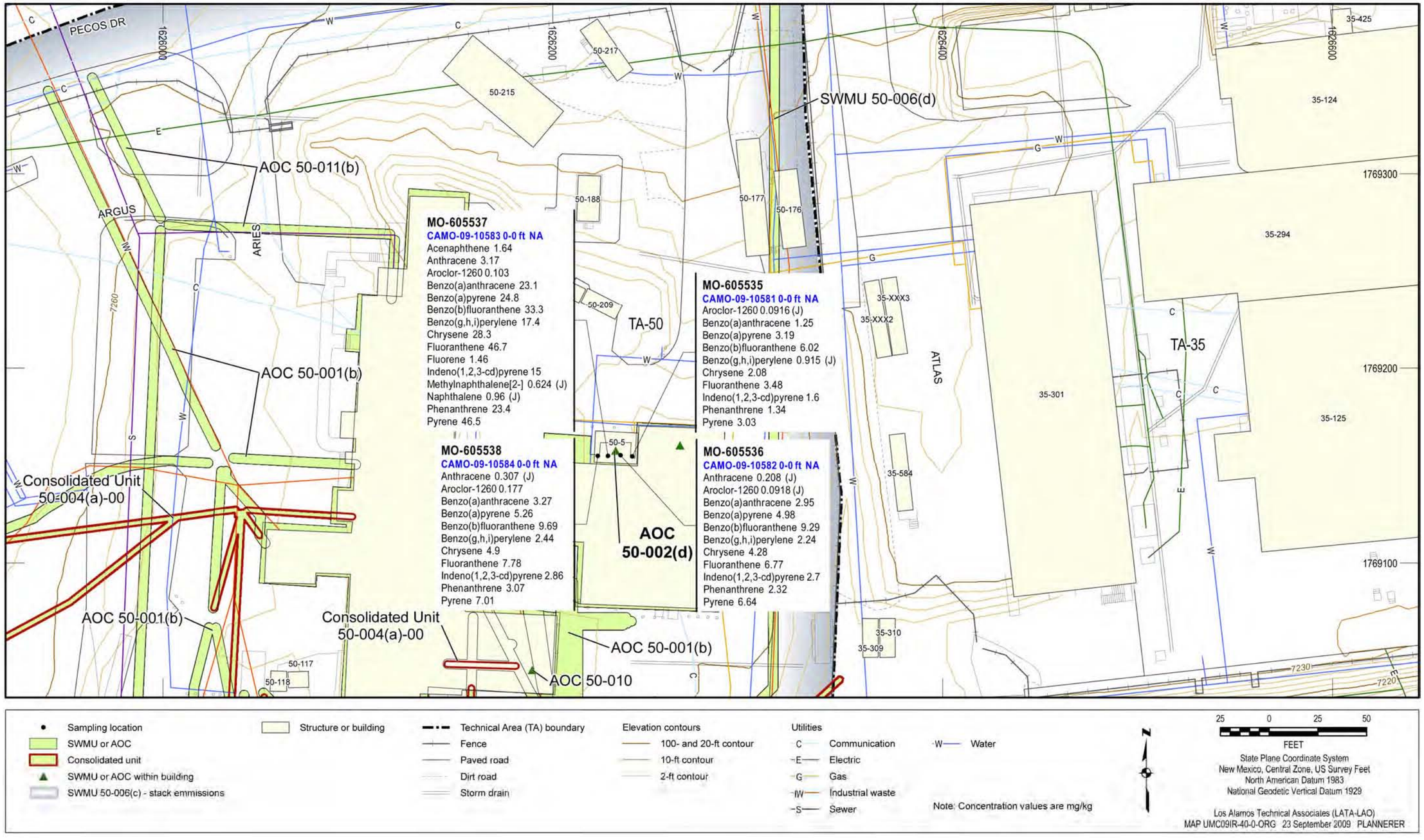


Figure 6.6-3 Organic COPCs detected at AOC 50-002(d)

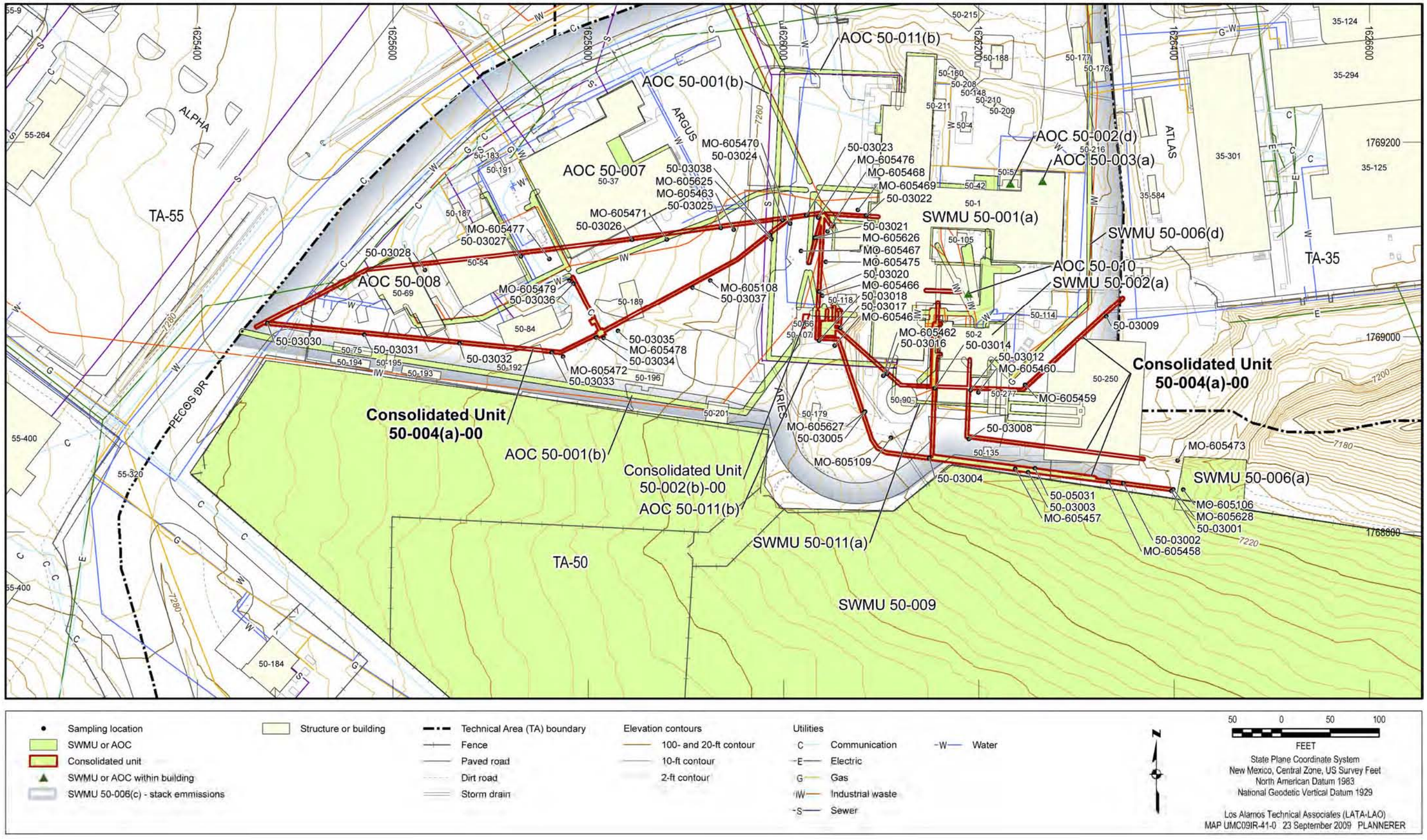


Figure 6.8-1 Site map and sampling locations at Consolidated Unit 50-004(a)-00

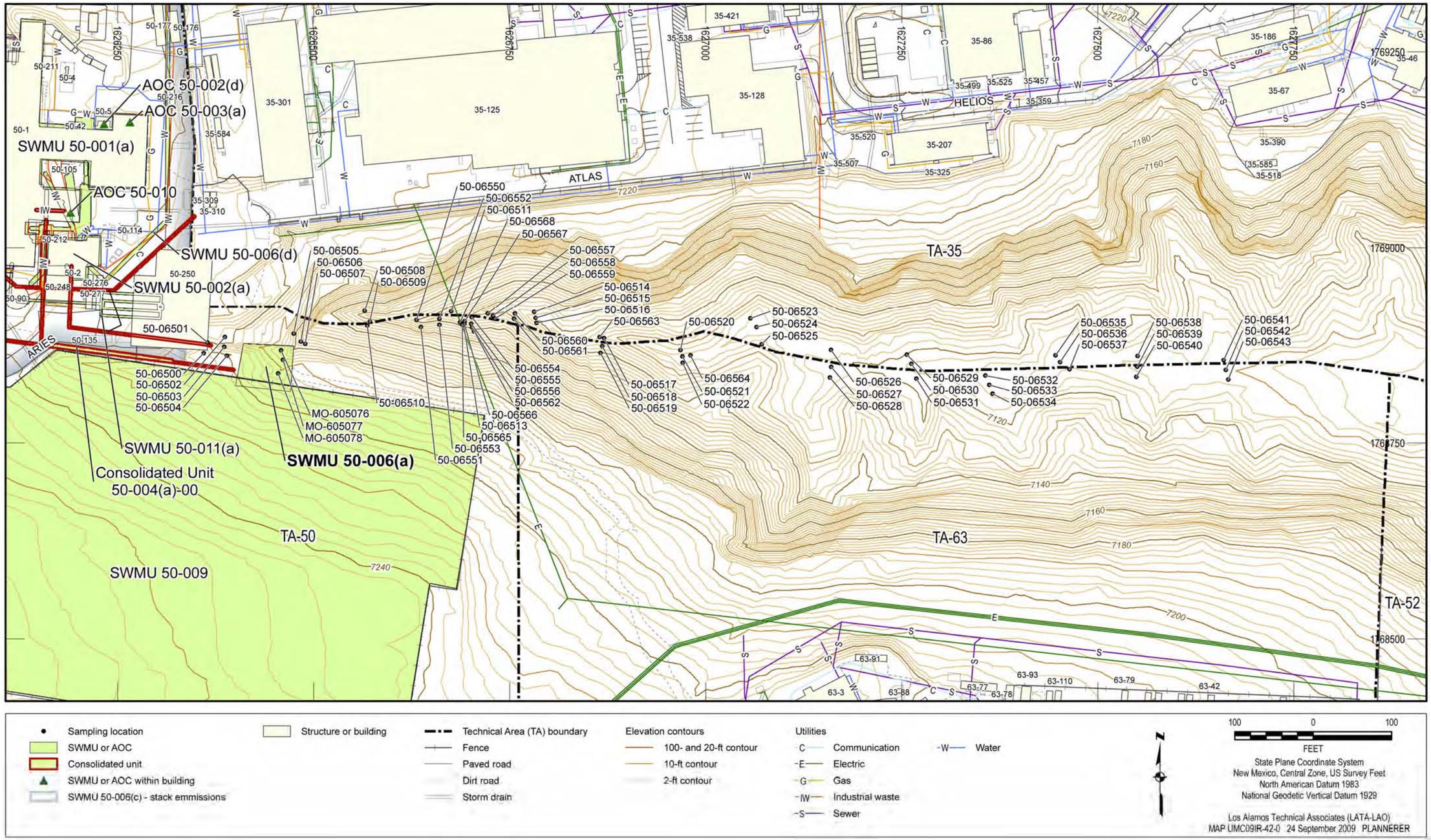


Figure 6.9-1 Site map and sampling locations at SWMU 50-006(a)

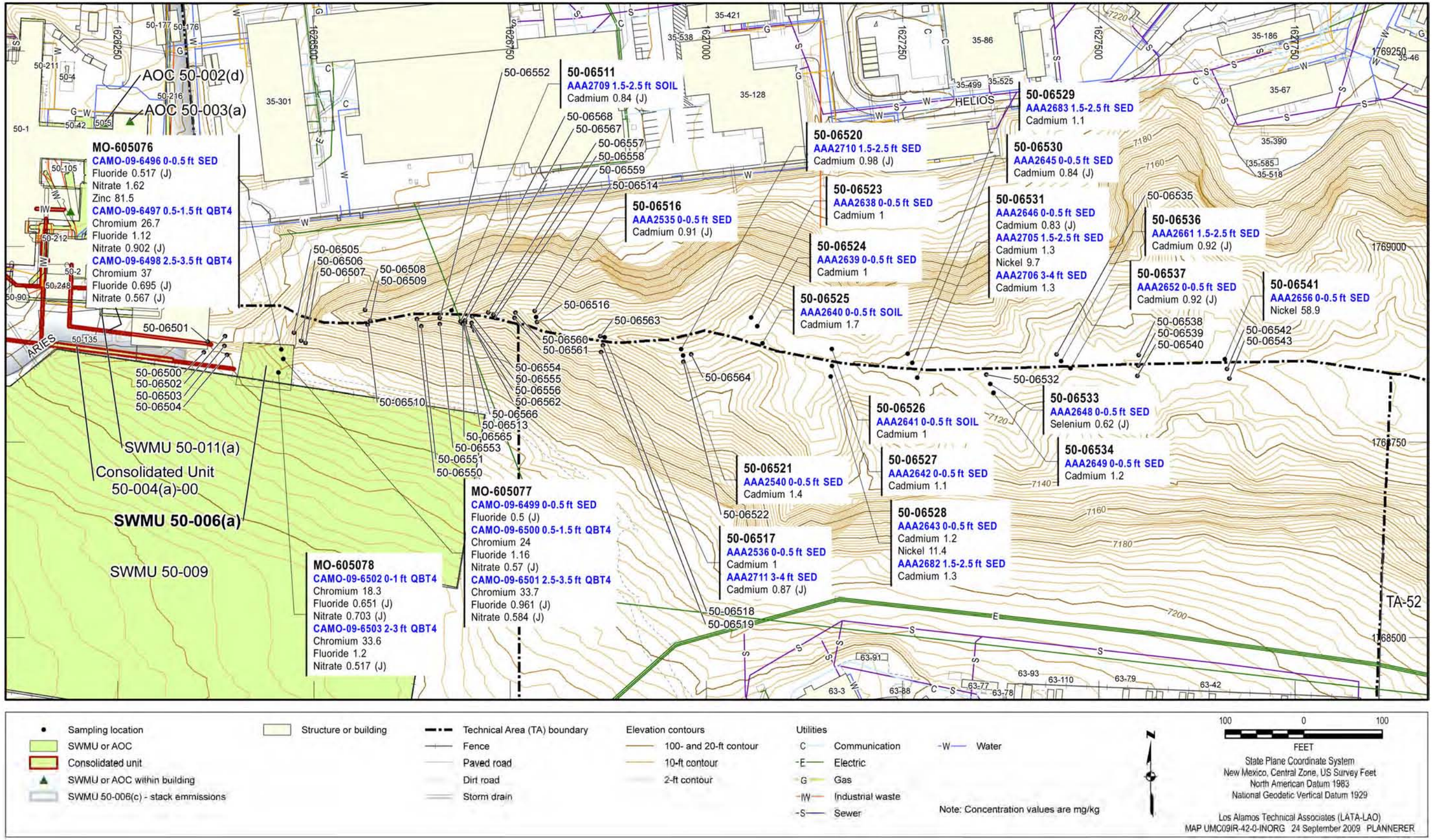


Figure 6.9-2 Inorganic COPCs detected or detected above BVs at SWMU 50-006(a)

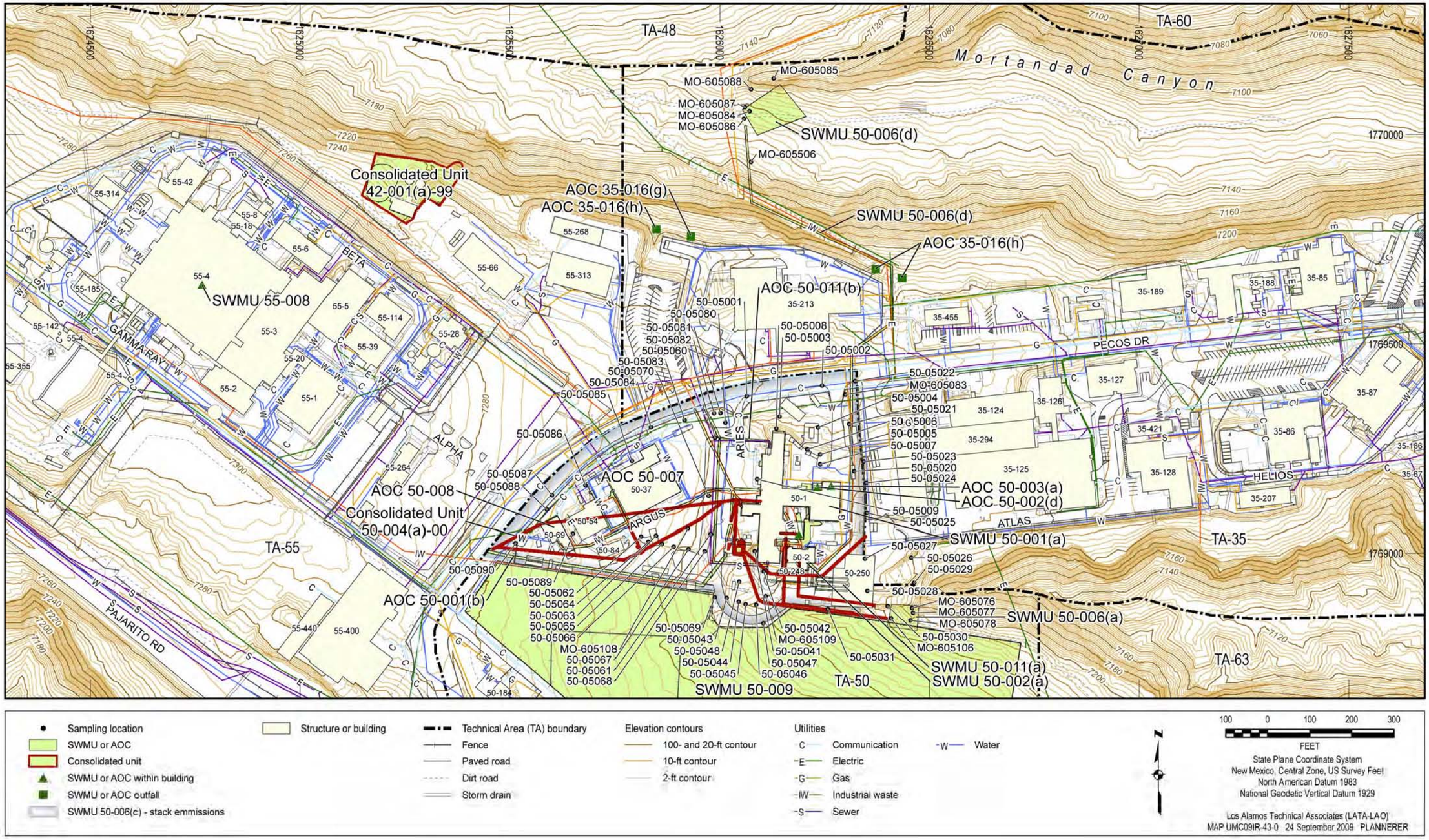


Figure 6.10-1 Site map and sampling locations at SWMU 50-006(c)

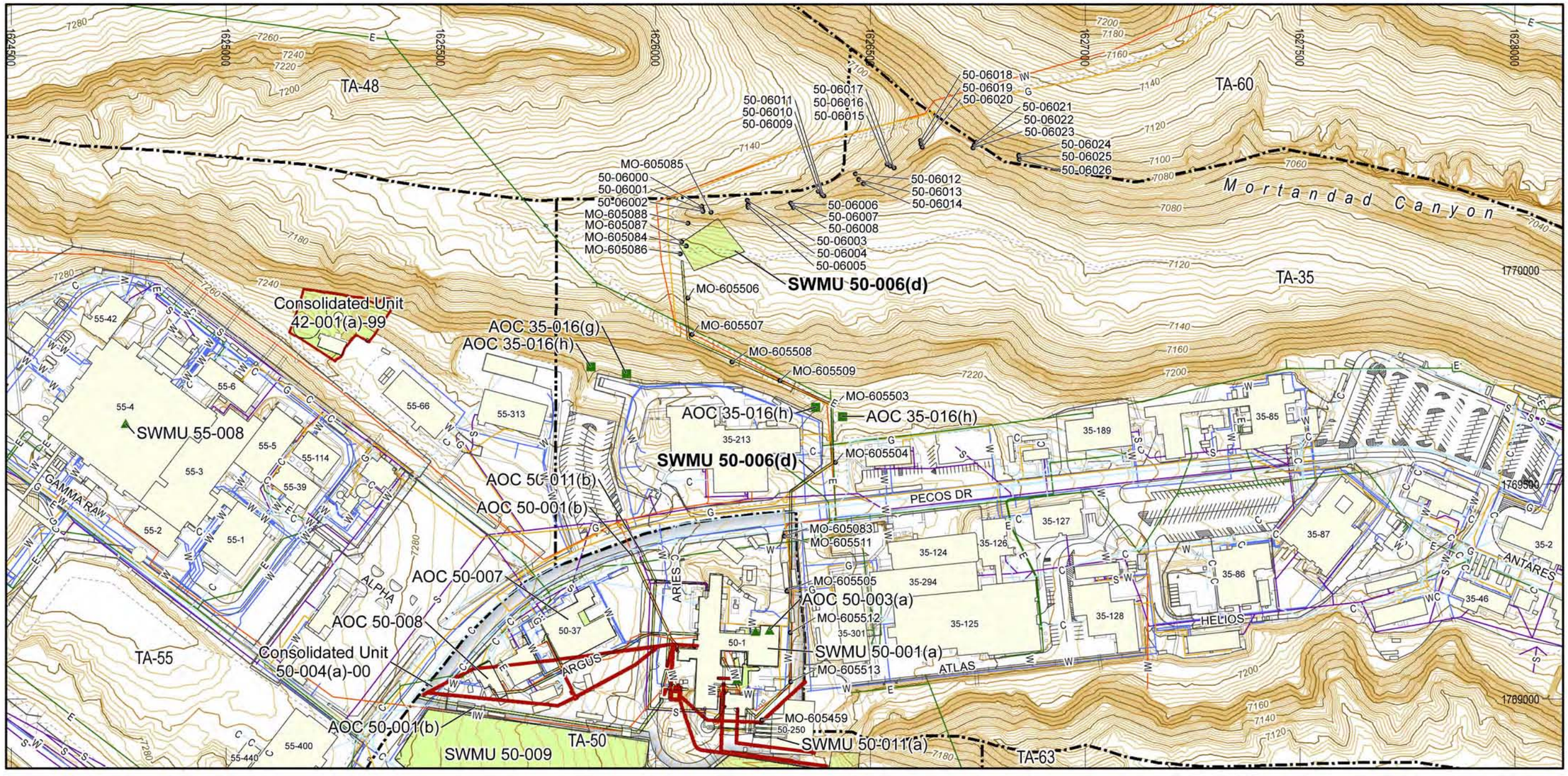


Figure 6.11-1 Site map and sampling locations at SWMU 50-006(d)

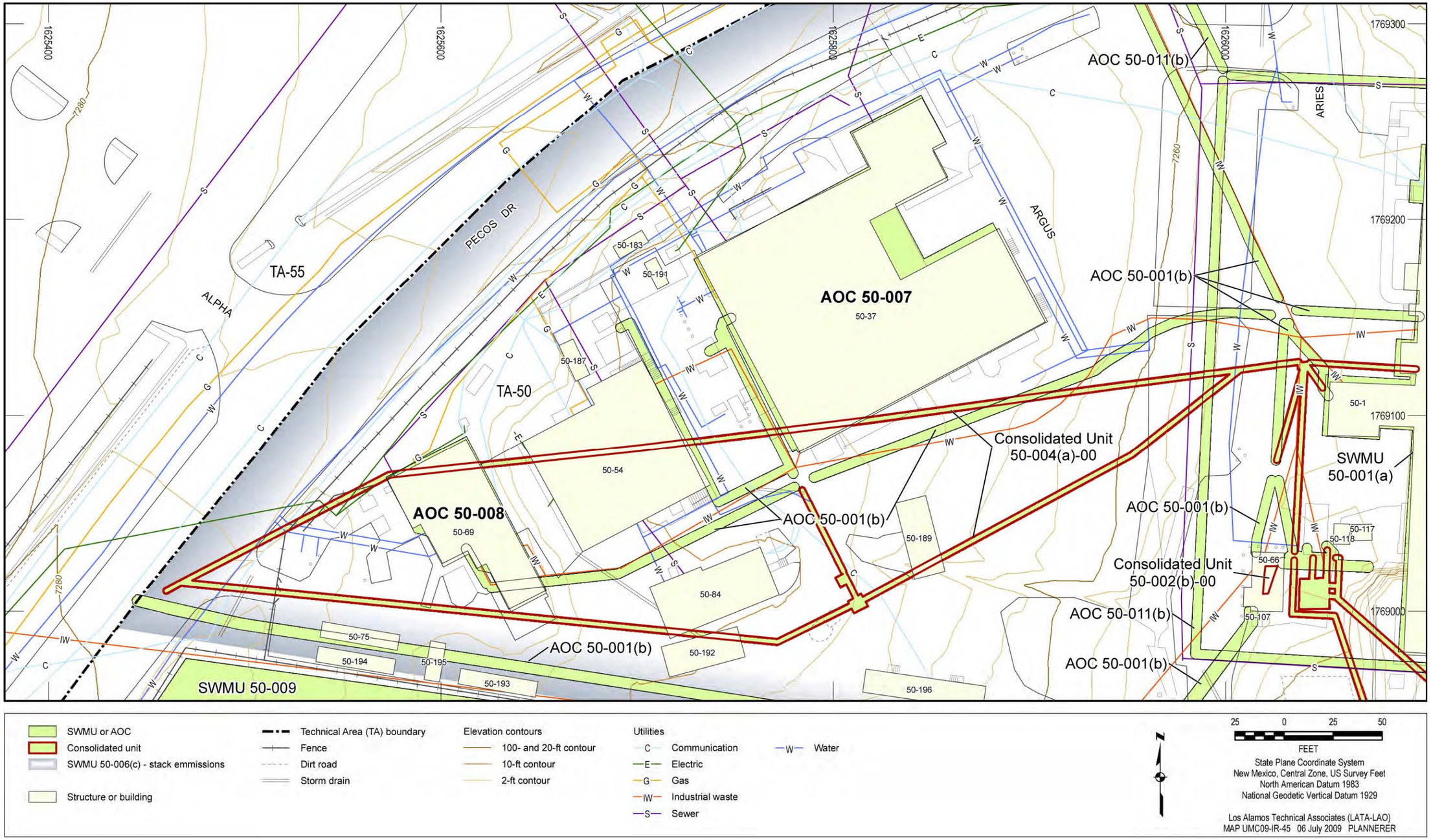


Figure 6.12-1 Site map of AOC 50-007 and AOC 50-008

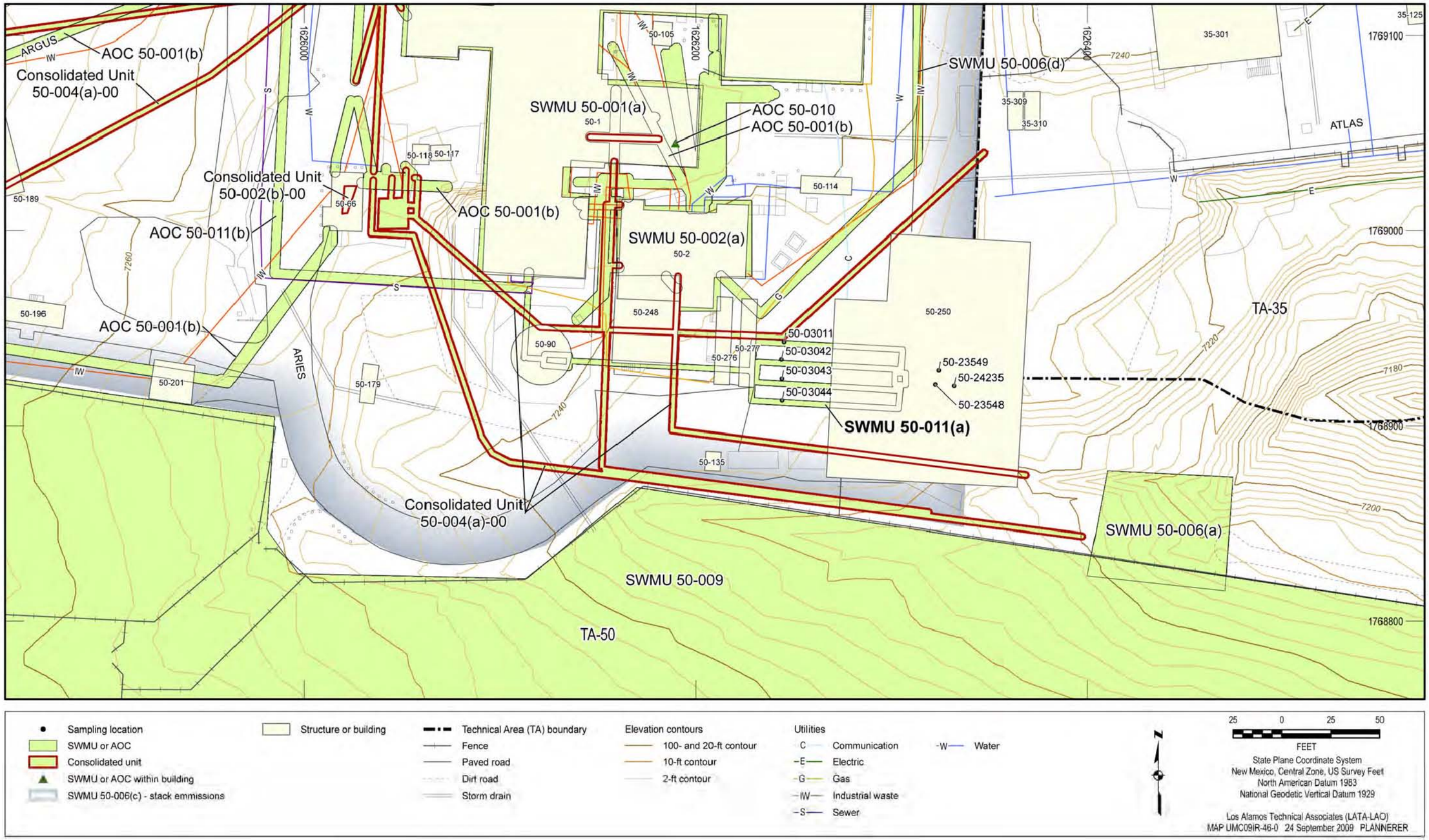


Figure 6.16-1 Site map and sampling locations at SWMU 50-011(a)

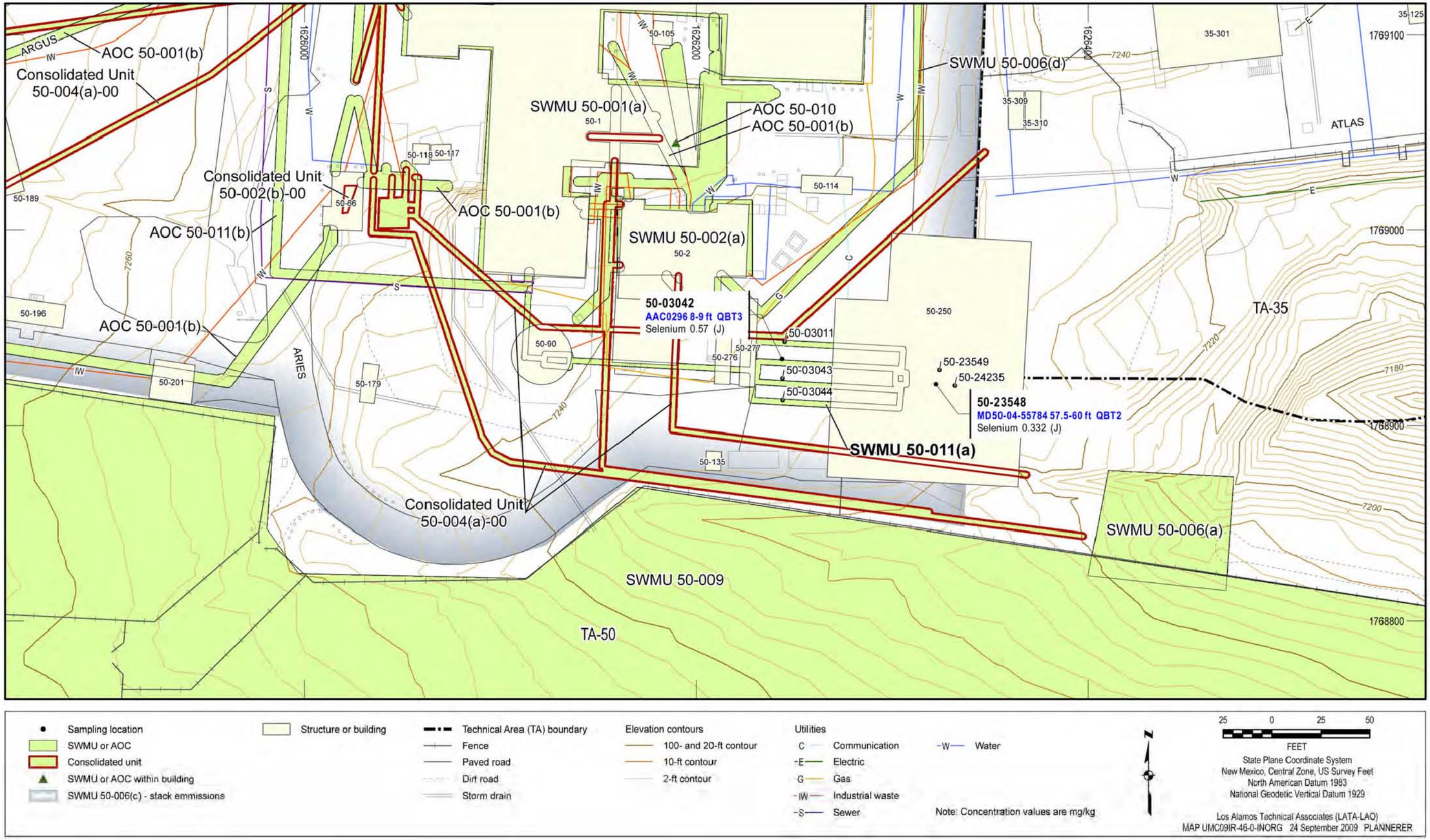


Figure 6.16-2 Inorganic COPCs detected or detected above BVs at SWMU 50-011(a)

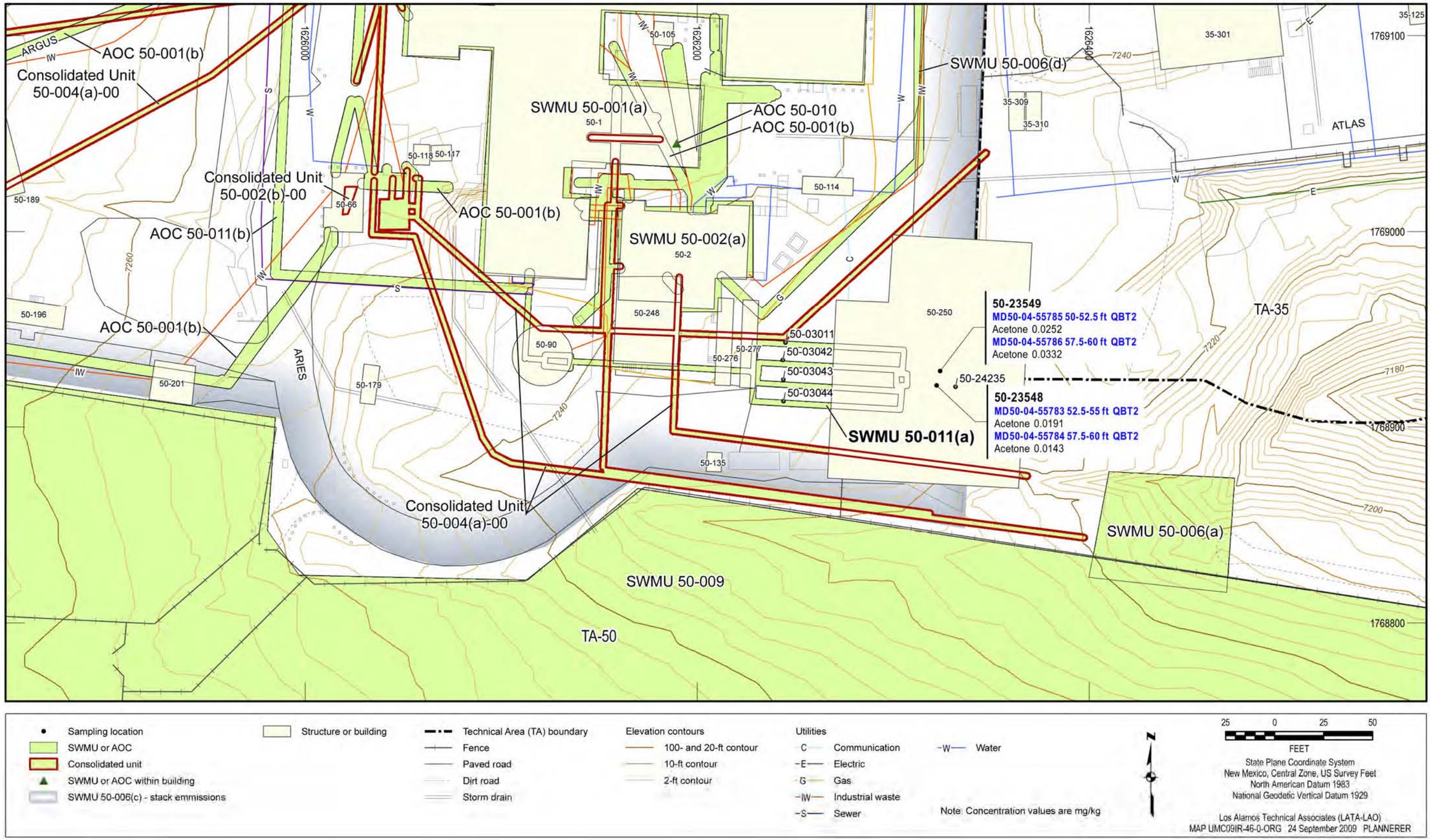


Figure 6.16-3 Organic COPCs detected at SWMU 50-011(a)

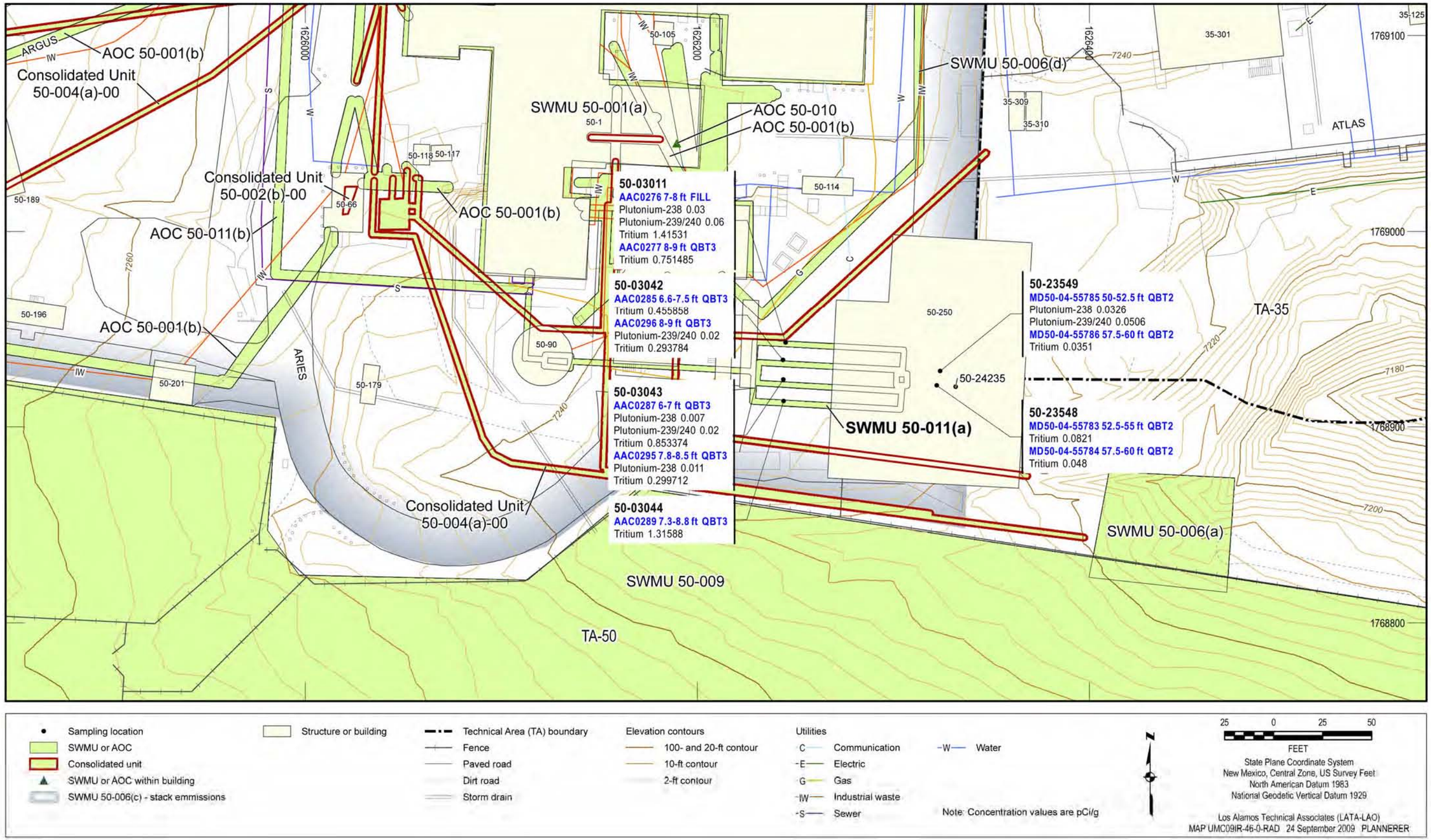


Figure 6.16-4 Radionuclides COPCs detected or detected above BVs/FVs at SWMU 50-011(a)

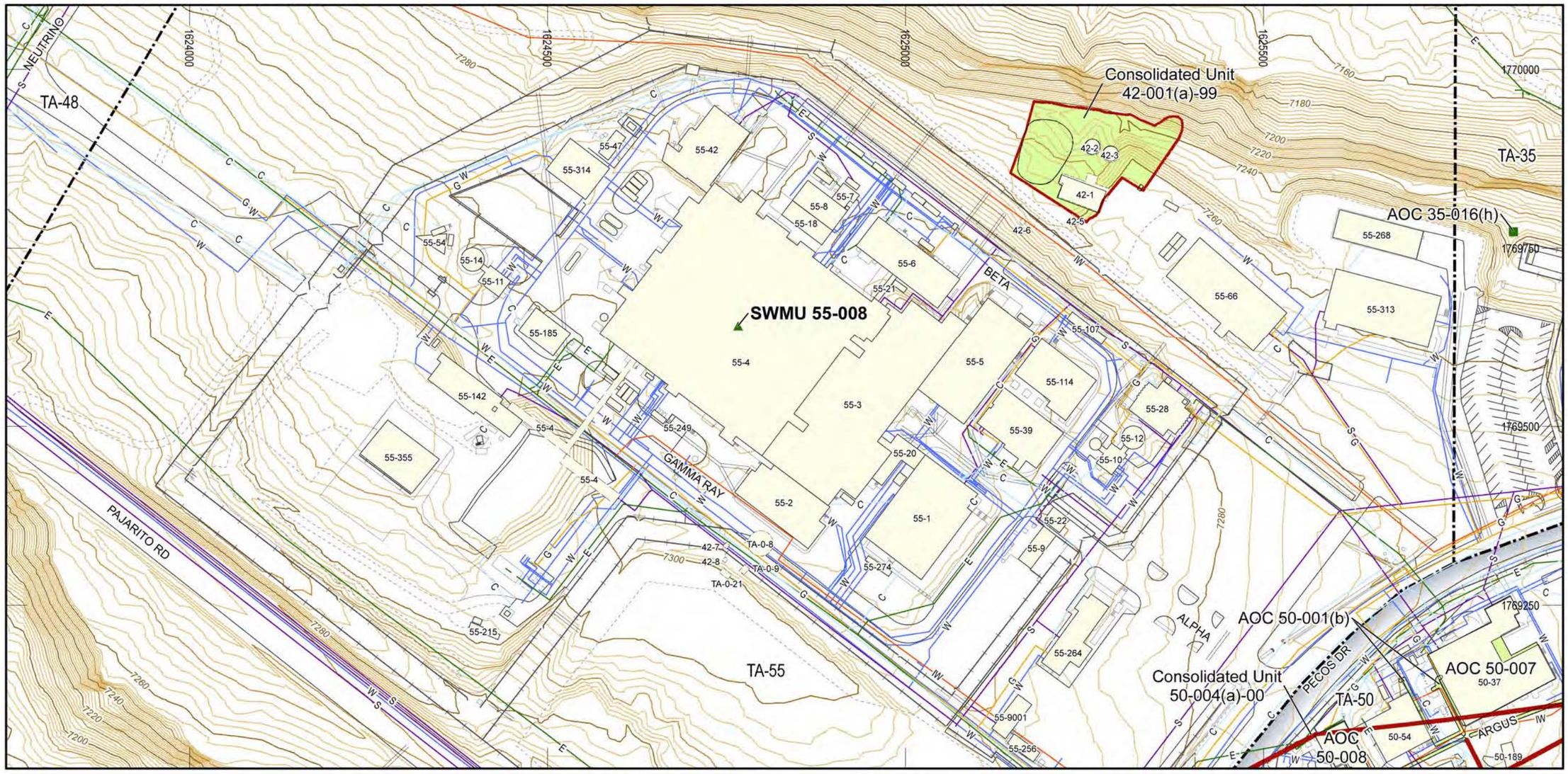


Figure 7.1-1 Site map of TA-55 and SWMU 55-008

Table 1.1-1
Sites Under Investigation in Upper Mortandad Canyon Aggregate Area

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
TA-03				
	AOC 03-003(e)	Storage area (transformers)—PCB only site in the basement of the CMR Building (03-29)	No RFI activity	None; previously approved for delay characterization (NMED 2008, 101110)
	AOC 03-003(i)	Storage area (transformer)—PCB only site in a vault beneath the Cryogenics Building (03-32)	No RFI activity	None; propose to delay until D&D
	AOC 03-004(c)	Storage area at the main loading dock of the CMR Building (03-29)	1997 RFI	Sampled
	AOC 03-004(d)	Storage area, former location of a dumpster at the west end of Wing 9 of the CMR Building (03-29)	1997 RFI	Sampled
	AOC 03-007	Decommissioned firing site located southwest of the Beryllium Technology Facility (03-141)	1997 RFI	Sampled
	AOC 03-014(w)	Floor drain in the CMR Building (03-29)	No RFI activity	None; propose to delay until D&D
	AOC 03-014(x)	Floor drain in the Sigma Building (03-66)	No RFI activity	None; propose to delay until D&D
	AOC 03-026(a)	Sump located in the southeast corner of an open pump pit directly adjacent to and west of the SWMU 03-037 holding tanks	No RFI activity	None; propose to delay until D&D
	SWMU 03-026(c)	Aboveground holding tanks for returning chilled water in the basement of the CMR Building (03-29)	No RFI activity	None; propose to delay until D&D
	SWMU 03-031	Radioactive liquid waste system in the CMR Building (03-29)	No RFI activity	None; propose to delay until D&D
	SWMU 03-034(a)	Pumphouse (structure 03-154) and associated radioactive liquid waste tanks	No RFI activity	Sampled
	SWMU 03-034(b)	Active industrial waste sump and tank located on the west side of the Beryllium Technology Facility (03-141)	No RFI activity	None; propose to delay until D&D

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
	AOC 03-041	Unloading station (structure 03-1264) designed as a holding tank for industrial low-level radioactive wastewater, located approximately 140 ft southwest of the Sigma Building (03-66)	No RFI activity	Sampled
Consolidated Unit 03-045(h)-00	SWMU 03-045(h)	Former NPDES-permitted outfall at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (03-187); ultimately drains into Sandia Canyon	No RFI activity	Sampled
	SWMU 03-049(a)	NPDES-permitted outfall south of the Sigma Building (03-66) that discharges treated cooling water from a cooling tower (03-127) and roof-drain runoff to Mortandad Canyon	1997 RFI	Sampled
Consolidated Unit 03-049(b)-00	SWMU 03-049(b)	Discharge area from a former vacuum pump at the south wall of the Press Building (03-35)	1997 RFI	Sampled
	AOC C-03-014	Equipment storage area located southwest of the Press Building (03-35)		
	SWMU 03-049(e)	Outfall from a single pipe that connects three roof drains, located south of the Sigma Building (03-66)	2001 Collected samples	Sampled
	SWMU 03-054(e)	Outfall located in upper Mortandad Canyon, receives roof drains and stormwater runoff at the CMR Building (03-29); received an unintentional one-time release from an industrial waste manhole (AOC C-03-006) in 1974	1995 RFI	Sampled
	AOC C-03-006	Unintentional overflow at an industrial waste line manhole in 1974 that discharged to the outfall [SWMU 03-054(e)]	1995 RFI	Sampled
TA-35				
	SWMU 35-016(g)	Drain and outfall from building 35-213	1995 RFI 1997 Collected samples	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
	SWMU 35-016(h)	Stormdrains and outfalls associated with building 35-213	1995 RFI	Sampled
TA-42				
Consolidated Unit 42-001(a)-00	SWMU 42-001(a)	Former location for building 42-1 that housed the incinerator	1978 D&D and samples collected 1991 Collected samples 1992 RFI	Sampled
	SWMU 42-001(b)	Former location of one of the two ash storage tanks associated with the incinerator		
	SWMU 42-001(c)	Former location of the other ash storage tank		
	AOC 42-002(a)	Former location of an indoor storage and decontamination area (building 42-1)		
	SWMU 42-002(b)	Former location of the outdoor decontamination area (driveway west and north of building 42-1)		
	SWMU 42-003	Former location of a septic system that served building 42-1		
TA-48				
	AOC 48-001	Air exhaust system of building 48-1	1991 Collected samples 1993 RFI	Sampled
	SWMU 48-002(a)	Former container storage area located at the southwest corner of building 48-1	1993 RFI 1995 Expedited cleanup	Sampled
	SWMU 48-002(b)	Former container storage area located at a loading dock on the south side of building 48-1	1993 RFI 1995 Expedited cleanup	Sampled
	AOC 48-002(e)	Former container storage area located on the east side of building 48-1	1993 RFI 1997 Collected samples	Sampled
	SWMU 48-003	Former septic system that served TA-48 from 1957 to 1986	1993 RFI 1997 Collected samples	Sampled
Consolidated Unit 48-004(a)-99	SWMU 48-004(a)	Two sumps located below the floor of the shop (Room 50) of building 48-1	No RFI activity	None; propose to delay until D&D

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
Consolidated Unit 48-004(a)-99 (continued)	SWMU 48-004(b)	Three sets of tanks located in the south basement of building 48-1		
	SWMU 48-004(c)	Two tanks located in the north basement of building 48-1		
	SWMU 48-005	Segments of inactive radioactive liquid waste lines at TA-48 and an associated outfall	1993 RFI 1997 Collected samples	Sampled
Consolidated Unit 48-007(a)-00	SWMU 48-007(a)	Former NPDES-permitted outfall located east of building 48-1; currently discharges stormwater to SWMU 48-010	1993 RFI 1997 Collected samples	Sampled
	SWMU 48-007(d)	Former NPDES-permitted outfall located east of building 48-1; currently discharges stormwater to SWMU 48-010		
	SWMU 48-010	Surface impoundment located approximately 300 ft east of building 48-1 and 150 ft south of building 48-45; discharges into a tributary to Mortandad Canyon		
	SWMU 48-007(b)	Former NPDES-permitted outfall located north of building 48-1; currently discharges stormwater into Mortandad Canyon	1993 RFI 1997 Collected samples	Sampled
	SWMU 48-007(c)	Former NPDES-permitted outfall located north of building 48-1; currently discharges stormwater into Mortandad Canyon	1993 RFI 1997 Collected samples	Sampled
	SWMU 48-007(f)	Former NPDES-permitted outfall located north of building 48-1 that received discharges from two sink drains in building 48-46 and discharged into Mortandad Canyon	1993 RFI 1997 Collected samples	Sampled
	AOC 48-011	A 3-ft diameter by 65-ft deep shaft that was drilled into tuff on the east side of building 48-1; inside the shaft is a 2-ft diameter by 3-ft long stainless-steel cylinder that contains a sodiumiodide radiation detector	No RFI activity	Sampled

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
	AOC 48-012	Soil contamination discovered in August 2002 during trenching east of building 48-1	2002 Excavated soil and collected samples (VCA)	Sampled
TA-50				
	SWMU 50-001(a)	TA-50 radioactive liquid waste treatment facility (RLWTF, building 50-1)	No RFI activity	None; previously approved for delay characterization (NMED 2008, 101110)
	AOC 50-001(b)	Active underground drain line system transferring liquid waste to the RLWTF	2001 and 2005 Collected samples	None; propose to delay until D&D
	SWMU 50-002(a)	Underground reinforced concrete vault (building 50-2) that houses equipments, tanks, and transfer lines, all of which are associated with the RLWTF	1995 Collected one sample	None; propose to delay until D&D
Consolidated Unit 50-002(b)-00	SWMU 50-002(b)	Waste tank (structure 50-67) and associated inlet and outlet lines housed in an underground reinforced-concrete vault (structure 50-66) at the RLWTF	No RFI activity	None; previously approved for delay characterization (NMED 2008, 101110)
	SWMU 50-002(c)	Waste tank (structure 50-68) and associated inlet and outlet lines housed in an underground reinforced-concrete vault (structure 50-66) at the RLWTF		
	AOC 50-002(d)	Decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-5) at the RLWTF	No RFI activity	Sampled (Swipe)
	AOC 50-003(a)	Former RCRA interim status unit located in Room 59 of building 50-1 to store containers of solid, cemented mixed-TRU sludge resulting from waste treatment activities	No RFI activity	None; site closed under RCRA permit (NMED 2004, 098488)
Consolidated Unit 50-004(a)-00	SWMU 50-004(a)	Location of former underground radioactive liquid waste and industrial waste lines	1994 RFI 2001 Collected samples	Sampled
	SWMU 50-004(b)	Location of a former underground vault (structure 50-3) that housed three stainless-steel-lined concrete storage tanks		

Table 1.1-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Investigation(s) Prior to 2009	Investigation Conducted in 2009
Consolidated Unit 50-004(a)-00 (continued)	SWMU 50-004(c)	Thirteen industrial waste lines and three associated manholes that discharged to the underground tank vault [SWMU 50-004(b)]		
	SWMU 50-006(a)	Two accidental operational releases from sump	1993 RFI 1996 Excavated soil and collected samples (IA)	Sampled
	SWMU 50-006(c)	Surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants from historical stack emissions at TA-50	1993 RFI	None; previously approved for no additional sampling (NMED 2008, 101110)
	SWMU 50-006(d)	A TA-50 drain line (structure 50-64) and associated NPDES-permitted outfall (051) in Mortandad Canyon for treated wastewater from the RLWTF	1993 Collected samples in the canyon downgradient from the SWMU	Sampled
	AOC 50-007	Former incinerator complex in building 50-37	1993 RFI	None; site closed under RCRA permit
	AOC 50-008	Formerly volume reduction facility, currently the waste characterization, reduction, and repackaging facility (WCRRF), in building 50-69	No RFI activity	None; active permitted storage unit
	SWMU 50-009	Material disposal area (MDA C)	Investigation reported in LANL 2009, 106047	Investigation reported in LANL 2009, 106047
	AOC 50-010	Former vehicle decontamination bay located in Room 34B of the RLWTF	No RFI activity	None; propose to delay until D&D
	SWMU 50-011(a)	Former septic system at the south end of the RLWTF	1994 RFI 2001 Collected samples 2004 Collected samples	None; additional information on removal provided per NMED request (NMED 2008, 101110)
	AOC 50-011(b)	Two sanitary wastewater lift stations (structures 50-91 and 50-92) and associated piping	No RFI activity	None; propose to delay until D&D
TA-55				
	SWMU 55-008	Sumps, tanks, and pumps in the basement of the Plutonium building (55-4)	No RFI activity	None; propose to delay until D&D

Note: Shading denotes consolidated unit.

Table 1.4-1
Surveyed Coordinates for Locations Sampled in 2009

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
TA-03			
03-004(c)	MO-605042	1618873.84	1772645.46
03-004(c)	MO-605043	1618891	1772592.64
03-004(c)	MO-605044	1618843.61	1772626.47
03-004(c)	MO-605045	1618834.487	1772615.18
03-004(c)	MO-605046	1618838.25	1772593.83
03-004(c)	MO-605047	1618884.89	1772625.02
03-004(c)	MO-605048	1618807.99	1772586.24
03-004(d)	MO-605035	1618815.01	1772206.13
03-004(d)	MO-605036	1618846.543	1772150.75
03-004(d)	MO-605037	1618804.013	1772170.582
03-004(d)	MO-605038	1618779.231	1772141.694
03-004(d)	MO-605039	1618834.28	1772138.4
03-004(d)	MO-605040	1618832.7	1772192.84
03-004(d)	MO-605041	1618822.713	1772106.739
03-007	MO-604995	1620666.009	1772419.823
03-007	MO-604996	1620644.799	1772439.025
03-007	MO-604997	1620666.78	1772442.569
03-007	MO-604998	1620701.092	1772432.98
03-007	MO-604999	1620732.777	1772390.179
03-007	MO-605000	1620736.615	1772349.655
03-007	MO-605001	1620671.71	1772327.728
03-007	MO-605004	1620884.871	1772378.393
03-007	MO-605005	1620896.247	1772368.513
03-007	MO-605006	1620936.936	1772324.289
03-007	MO-605007	1621050.82	1772214.84
03-007	MO-605008	1621082.41	1772137.358
03-007	MO-605169	1620653.856	1772388.426
03-007	MO-605170	1620731.849	1772433.024
03-034(a)	MO-604916	1618778.843	1772133.224
03-034(a)	MO-604917	1618803.279	1772117.923
03-034(a)	MO-604918	1618759.084	1772093.208
03-034(a)	MO-604919	1618780.131	1772072.259
03-041	MO-604987	1620184.206	1772210.273
03-041	MO-604988	1620166.058	1772232.32
03-041	MO-604989	1620168.074	1772197.099

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
03-045(h)	MO-604947	1620141.738	1772346.883
03-045(h)	MO-604948	1620423.523	1771944.333
03-045(h)	MO-604952	1620018.174	1772692.334
03-045(h)	MO-604970	1620201.449	1772245.575
03-045(h)	MO-604971	1620275.25	1772218.738
03-045(h)	MO-604972	1620218.222	1772180.496
03-045(h)	MO-604973	1620267.199	1772177.141
03-045(h)	MO-604974	1620318.189	1772104.682
03-045(h)	MO-604975	1620296.116	1772159.292
03-045(h)	MO-604976	1620310.844	1772125.625
03-045(h)	MO-604977	1620364.548	1772070.261
03-049(a)	MO-604949	1620602.47	1772161.804
03-049(a)	MO-604950	1620644.271	1772245.484
03-049(a)	MO-604951	1620706.414	1771993.013
03-049(a)	MO-604978	1620681.512	1772110.542
03-049(a)	MO-604979	1620677.384	1772054.05
03-049(a)	MO-604980	1620715.38	1771920.109
03-049(a)	MO-604981	1620722.968	1771906.19
03-049(a)	MO-604982	1620705.733	1772166.515
03-049(a)	MO-604983	1620732.783	1772047.674
03-049(a)	MO-604984	1620737.679	1771947.666
03-049(a)	MO-604985	1620720.152	1771855.292
03-049(a)	MO-604986	1620740.306	1771848.936
03-049(b)-00	MO-605025	1620006.672	1772504.232
03-049(b)-00	MO-605026	1620016.108	1772504.852
03-049(b)-00	MO-605027	1620032.073	1772460.692
03-049(b)-00	MO-605028	1619966.097	1772497.108
03-049(b)-00	MO-605029	1619958.323	1772457.438
03-049(b)-00	MO-605030	1619904.1	1772484.792
03-049(b)-00	MO-605031	1620020.931	1772486.672
03-049(b)-00	MO-605032	1619877.055	1772486.417
03-049(b)-00	MO-605033	1619882.942	1772539.835
03-049(b)-00	MO-605034	1619926.138	1772551.223
03-049(e)	MO-605009	1620490.961	1772232.199
03-049(e)	MO-605010	1620486.029	1772247.561
03-049(e)	MO-605011	1620537.868	1772065.271
03-049(e)	MO-605012	1620477.109	1772242.855
03-049(e)	MO-605013	1620513.772	1772133.983
03-049(e)	MO-605014	1620497.142	1772205.133

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
03-049(e)	MO-605015	1620506.305	1772174.871
03-049(e)	MO-605016	1620512.531	1772159.427
03-049(e)	MO-605017	1620470.974	1772226.663
03-049(e)	MO-605018	1620495.088	1772190.469
03-049(e)	MO-605019	1620521.273	1772114.317
03-049(e)	MO-605020	1620538.363	1772022.616
03-054(e)	MO-605021	1619748.955	1772161.4
03-054(e)	MO-605022	1619905.659	1772033.257
03-054(e)	MO-605023	1619851.863	1772090.997
03-054(e)	MO-605024	1619812.193	1772115.417
C-03-006	MO-604990	1619511.522	1771718.632
C-03-006	MO-604991	1619507.274	1771752.007
C-03-006	MO-604992	1619497.406	1771828.541
C-03-006	MO-604993	1619475.253	1771945.301
C-03-006	MO-604994	1619463.537	1772015.211
TA-35			
35-016(g)	MO-604933	1625933.916	1769772.973
35-016(g)	MO-604934	1625957.874	1769914.017
35-016(g)	MO-604935	1625973.517	1769958.274
35-016(g)	MO-604936	1625996.405	1770049.953
35-016(g)	MO-604937	1625993.638	1770068.944
35-016(h)	MO-605133	1626122.648	1769968.24
35-016(h)	MO-605134	1626133.841	1769900.743
35-016(h)	MO-605135	1626109.971	1769849.28
35-016(h)	MO-605136	1626135.732	1770035.11
35-016(h)	MO-605515	1625854.645	1769786.693
35-016(h)	MO-605516	1625860.63	1769806.311
35-016(h)	MO-605517	1626446.72	1769671.706
35-016(h)	MO-605518	1626468.88	1769714.539
35-016(h)	MO-605519	1626438.901	1769905.437
35-016(h)	MO-605520	1626474.643	1769996.546
TA-42			
42-001(a)-99	MO-605049	1625356.424	1769913.731
42-001(a)-99	MO-605050	1625376.248	1769904.58
42-001(a)-99	MO-605051	1625272.364	1769941.863
42-001(a)-99	MO-605052	1625360.848	1769882.283
42-001(a)-99	MO-605053	1625173.875	1769943.166
42-001(a)-99	MO-605054	1625262.927	1769914.215
42-001(a)-99	MO-605055	1625277.978	1769902.513

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
42-001(a)-99	MO-605056	1625276.147	1769885.694
42-001(a)-99	MO-605057	1625262.769	1769890.424
42-001(a)-99	MO-605058	1625252.568	1769900.176
42-001(a)-99	MO-605059	1625174.806	1769904.613
42-001(a)-99	MO-605060	1625266.333	1769875.603
42-001(a)-99	MO-605061	1625250.906	1769857.109
42-001(a)-99	MO-605062	1625244.051	1769828.42
42-001(a)-99	MO-605063	1625214.219	1769830.63
42-001(a)-99	MO-605064	1625164.889	1769874.046
42-001(a)-99	MO-605065	1625182.827	1769838.559
42-001(a)-99	MO-605066	1625235.11	1769797.649
42-001(a)-99	MO-605067	1625317.075	1769862.671
42-001(a)-99	MO-605068	1625330.072	1769835.838
42-001(a)-99	MO-605069	1625306.445	1769928.758
42-001(a)-99	MO-605070	1625240.931	1769908.855
42-001(a)-99	MO-605071	1625247.95	1769934.1
42-001(a)-99	MO-605072	1625276.418	1770098.774
42-001(a)-99	MO-605073	1625332.183	1770134.261
42-001(a)-99	MO-605074	1625393.081	1770061.32
42-001(a)-99	MO-605075	1625396.717	1770071.78
42-001(a)-99	MO-605288	1625216.3	1769929.091
TA-48			
48-001	MO-604921	1623652.458	1770201.755
48-001	MO-604924	1623643.53	1770201.843
48-001	MO-604925	1623660.685	1770201.318
48-001	MO-604926	1623670.62	1770200.563
48-001	MO-604927	1623665.033	1770200.295
48-001	MO-604931	1623713.746	1770200.287
48-001	MO-604932	1623719.921	1770202.786
48-001	MO-604938	1624259.71	1770596.371
48-001	MO-604939	1624261.114	1770440.557
48-001	MO-604940	1623885.473	1770305.47
48-001	MO-604941	1623911.584	1770062.953
48-001	MO-604942	1623509.077	1770226.893
48-001	MO-604943	1623291.335	1770552.041
48-001	MO-604944	1623494.774	1770746.687
48-001	MO-604945	1623705.292	1770785.422
48-001	MO-604946	1623989.071	1770826.684
48-001	MO-605097	1623513.031	1770762.731

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
48-001	MO-605098	1623569.328	1770914.987
48-001	MO-605099	1623540.016	1770823.207
48-001	MO-605100	1623601.097	1771002.392
48-001	MO-605101	1623524.973	1770784.482
48-001	MO-605102	1623570.555	1770936.487
48-001	MO-605103	1623595.077	1770971.286
48-001	MO-605104	1623606.226	1771042.555
48-001	MO-605110	1623813.058	1770815.148
48-001	MO-605111	1623810.238	1770819.544
48-001	MO-605112	1623817.702	1770873.218
48-001	MO-605113	1623820.689	1770913.455
48-001	MO-605114	1623812.892	1770828.751
48-001	MO-605115	1623820.827	1770944.262
48-001	MO-605116	1623816.648	1770901.199
48-001	MO-605117	1623832.285	1770963.706
48-001	MO-605118	1624068.38	1770314.325
48-001	MO-605119	1624156.069	1770349.271
48-001	MO-605120	1624028.256	1770258.669
48-001	MO-605121	1624082.445	1770353.421
48-001	MO-605122	1624129.536	1770372.892
48-001	MO-605123	1624139.567	1770285.203
48-001	MO-605124	1624254.312	1770303.63
48-001	MO-605125	1624313.102	1770299.1
48-001	MO-605126	1624347.349	1770295.889
48-001	MO-605127	1624439.829	1770303.435
48-001	MO-605129	1623600.167	1770899.796
48-001	MO-605130	1623610.199	1771035.549
48-001	MO-605131	1623584.085	1770773.02
48-001	MO-605132	1623590.262	1770958.394
48-001	MO-605142	1624178.646	1770622.66
48-001	MO-605143	1624163.25	1770682.734
48-001	MO-605144	1624240.532	1770702.96
48-001	MO-605145	1624242.041	1770666.131
48-001	MO-605146	1624187.467	1770682.343
48-001	MO-605147	1624181.363	1770712.923
48-001	MO-605148	1624195.714	1770745.67
48-001	MO-605149	1624235.4	1770737.073
48-001	MO-605150	1624148.458	1770782.356
48-001	MO-605151	1624211.313	1770519.241

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
48-001	MO-605152	1624160.819	1770600.632
48-001	MO-605153	1624179.552	1770657.678
48-001	MO-605154	1624192.533	1770630.207
48-001	MO-605155	1624188.306	1770597.906
48-001	MO-605156	1624153.288	1770718.055
48-001	MO-605157	1624196.155	1770910.779
48-001	MO-605158	1624205.323	1770955.822
48-001	MO-605159	1624208.426	1770983.727
48-001	MO-605160	1624221.894	1771019.529
48-001	MO-605161	1623665.856	1770830.8
48-001	MO-605162	1623665.306	1770835.193
48-001	MO-605163	1623681.673	1770941.761
48-001	MO-605164	1623692.426	1770990.73
48-001	MO-605165	1623709.294	1771036.301
48-001	MO-605166	1623681.631	1770883.787
48-002(a and b)	MO-604920	1623612.042	1770194.424
48-002(a and b)	MO-604921	1623652.458	1770201.755
48-002(a and b)	MO-604922	1623708.844	1770195.31
48-002(a and b)	MO-604923	1623617.415	1770195.419
48-002(a and b)	MO-604924	1623643.53	1770201.843
48-002(a and b)	MO-604925	1623660.685	1770201.318
48-002(a and b)	MO-604926	1623670.62	1770200.563
48-002(a and b)	MO-604927	1623665.033	1770200.295
48-002(a and b)	MO-604928	1623657.063	1770195.413
48-002(a and b)	MO-604929	1623674.991	1770182.893
48-002(a and b)	MO-604930	1623692.977	1770194.334
48-002(a and b)	MO-604931	1623713.746	1770200.287
48-002(a and b)	MO-604932	1623719.921	1770202.786
48-002(e)	MO-605137	1623723.279	1770337.611
48-002(e)	MO-605138	1623738.992	1770331.909
48-002(e)	MO-605139	1623732.078	1770324.465
48-002(e)	MO-605140	1623720.593	1770328.853
48-002(e)	MO-605141	1623707.539	1770334.881
48-003	MO-605142	1624178.646	1770622.66
48-003	MO-605143	1624163.25	1770682.734
48-003	MO-605144	1624240.532	1770702.96
48-003	MO-605145	1624242.041	1770666.131
48-003	MO-605146	1624187.467	1770682.343
48-003	MO-605147	1624181.363	1770712.923

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
48-003	MO-605148	1624195.714	1770745.67
48-003	MO-605149	1624235.4	1770737.073
48-003	MO-605150	1624148.458	1770782.356
48-003	MO-605151	1624211.313	1770519.241
48-003	MO-605152	1624160.819	1770600.632
48-003	MO-605153	1624179.552	1770657.678
48-003	MO-605154	1624192.533	1770630.207
48-003	MO-605155	1624188.306	1770597.906
48-003	MO-605156	1624153.288	1770718.055
48-003	MO-605157	1624196.155	1770910.779
48-003	MO-605158	1624205.323	1770955.822
48-003	MO-605159	1624208.426	1770983.727
48-003	MO-605160	1624221.894	1771019.529
48-005	MO-605128	1623585.822	1770732.568
48-005	MO-605129	1623600.167	1770899.796
48-005	MO-605130	1623610.199	1771035.549
48-005	MO-605131	1623584.085	1770773.02
48-005	MO-605132	1623590.262	1770958.394
48-007(a)-00	MO-605118	1624068.38	1770314.325
48-007(a)-00	MO-605119	1624156.069	1770349.271
48-007(a)-00	MO-605120	1624028.256	1770258.669
48-007(a)-00	MO-605121	1624082.445	1770353.421
48-007(a)-00	MO-605122	1624129.536	1770372.892
48-007(a)-00	MO-605123	1624139.567	1770285.203
48-007(a)-00	MO-605124	1624254.312	1770303.63
48-007(a)-00	MO-605125	1624313.102	1770299.1
48-007(a)-00	MO-605126	1624347.349	1770295.889
48-007(a)-00	MO-605127	1624439.829	1770303.435
48-007(b)	MO-605110	1623813.058	1770815.148
48-007(b)	MO-605111	1623810.238	1770819.544
48-007(b)	MO-605112	1623817.702	1770873.218
48-007(b)	MO-605113	1623820.689	1770913.455
48-007(b)	MO-605114	1623812.892	1770828.751
48-007(b)	MO-605115	1623820.827	1770944.262
48-007(b)	MO-605116	1623816.648	1770901.199
48-007(b)	MO-605117	1623832.285	1770963.706
48-007(c)	MO-605161	1623665.856	1770830.8
48-007(c)	MO-605162	1623665.306	1770835.193
48-007(c)	MO-605163	1623681.673	1770941.761

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
48-007(c)	MO-605164	1623692.426	1770990.73
48-007(c)	MO-605165	1623709.294	1771036.301
48-007(c)	MO-605166	1623681.631	1770883.787
48-007(f)	MO-605097	1623513.031	1770762.731
48-007(f)	MO-605098	1623569.328	1770914.987
48-007(f)	MO-605099	1623540.016	1770823.207
48-007(f)	MO-605100	1623601.097	1771002.392
48-007(f)	MO-605101	1623524.973	1770784.482
48-007(f)	MO-605102	1623570.555	1770936.487
48-007(f)	MO-605103	1623595.077	1770971.286
48-007(f)	MO-605104	1623606.226	1771042.555
48-011	MO-605351	1623766.778	1770509.233
48-012	MO-605089	1623793.456	1770344.969
48-012	MO-605090	1623782.6	1770321.019
48-012	MO-605091	1623812.789	1770344.65
48-012	MO-605092	1623798.506	1770305.394
TA-50			
50-002(d)	MO-605535	1626240.676	1769154.569
50-002(d)	MO-605536	1626234.71	1769155.151
50-002(d)	MO-605537	1626228.308	1769154.86
50-002(d)	MO-605538	1626223.07	1769154.86
50-004(a)-00	MO-605106	1626409.35	1768843.232
50-004(a)-00	MO-605108	1625925.034	1769058.295
50-004(a)-00	MO-605109	1626109.95	1768896.487
50-004(a)-00	MO-605457	1626237.428	1768864.696
50-004(a)-00	MO-605458	1626332.633	1768851.307
50-004(a)-00	MO-605459	1626247.286	1768950.678
50-004(a)-00	MO-605460	1626199.6	1768942.9
50-004(a)-00	MO-605462	1626102.122	1768960.146
50-004(a)-00	MO-605463	1625948.976	1769110.385
50-004(a)-00	MO-605464	1626052.329	1768990.928
50-004(a)-00	MO-605466	1626039.791	1769042.747
50-004(a)-00	MO-605467	1626017.891	1769088.484
50-004(a)-00	MO-605468	1626044.97	1769108.476
50-004(a)-00	MO-605469	1626076.203	1769130.488
50-004(a)-00	MO-605470	1626006.851	1769116.523
50-004(a)-00	MO-605471	1625880.48	1769100.369
50-004(a)-00	MO-605472	1625774.15	1768979.665
50-004(a)-00	MO-605473	1626403.588	1768873.202

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
50-004(a)-00	MO-605475	1626043.191	1769077.421
50-004(a)-00	MO-605476	1626035.579	1769122.798
50-004(a)-00	MO-605477	1625760.168	1769080.426
50-004(a)-00	MO-605478	1625815.802	1768998.791
50-004(a)-00	MO-605479	1625780.737	1769057.87
50-004(a)-00	MO-605625	1625987.725	1769100.585
50-004(a)-00	MO-605626	1626033.477	1769102.423
50-004(a)-00	MO-605627	1626082.466	1768922.43
50-004(a)-00	MO-605628	1626399.15	1768843.657
50-006(a)	MO-605076	1626458.076	1768868.106
50-006(a)	MO-605077	1626460.654	1768856.019
50-006(a)	MO-605078	1626454.435	1768838.624
50-006(c)	MO-605076	1626458.076	1768868.106
50-006(c)	MO-605077	1626460.654	1768856.019
50-006(c)	MO-605078	1626454.435	1768838.624
50-006(c)	MO-605083	1626299.328	1769378.7
50-006(c)	MO-605084	1626071.088	1770055.978
50-006(c)	MO-605085	1626129.003	1770134.79
50-006(c)	MO-605086	1626057.363	1770037.801
50-006(c)	MO-605087	1626060.277	1770065.645
50-006(c)	MO-605088	1626074.69	1770108.752
50-006(c)	MO-605106	1626409.35	1768843.232
50-006(c)	MO-605108	1625925.034	1769058.295
50-006(c)	MO-605109	1626109.95	1768896.487
50-006(c)	MO-605506	1626074.68	1769935.295
50-006(d)	MO-605083	1626299.328	1769378.7
50-006(d)	MO-605084	1626071.088	1770055.978
50-006(d)	MO-605085	1626129.003	1770134.79
50-006(d)	MO-605086	1626057.363	1770037.801
50-006(d)	MO-605087	1626060.277	1770065.645
50-006(d)	MO-605088	1626074.69	1770108.752
50-006(d)	MO-605459	1626247.286	1768950.678
50-006(d)	MO-605503	1626417.084	1769683.923
50-006(d)	MO-605504	1626418.339	1769550.326
50-006(d)	MO-605505	1626305.659	1769250.672
50-006(d)	MO-605506	1626074.68	1769935.295
50-006(d)	MO-605507	1626084.333	1769850.018
50-006(d)	MO-605508	1626177.765	1769784.371
50-006(d)	MO-605509	1626289.431	1769741.124

Table 1.4-1 (continued)

SWMU or AOC	Location ID	Easting (ft)	Northing (ft)
50-006(d)	MO-605511	1626299.328	1769378.7
50-006(d)	MO-605512	1626313.198	1769154.312
50-006(d)	MO-605513	1626314.541	1769039.817

Table 1.4-2
Field Screening Results for Samples Collected in 2009

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-004(c)	MO-605042	0.5–1.5	CAMO-09-6261	0.0	0.0	619.0
03-004(c)	MO-605042	1.5–2.5	CAMO-09-6262	0.0	0.0	578.0
03-004(c)	MO-605042	6.5–7.5	CAMO-09-6263	0.0	0.0	946.0
03-004(c)	MO-605043	0.5–1	CAMO-09-6264	0.4	26.0	865.0
03-004(c)	MO-605043	4–5	CAMO-09-6265	0.0	2.0	1042.0
03-004(c)	MO-605043	9–10	CAMO-09-6266	0.0	0.0	565.0
03-004(c)	MO-605044	0.5–1	CAMO-09-6267	0.0	0.0	1083.0
03-004(c)	MO-605044	1–2	CAMO-09-6268	0.0	0.0	640.0
03-004(c)	MO-605044	6–7	CAMO-09-6269	0.0	0.0	803.0
03-004(c)	MO-605045	0.5–1	CAMO-09-6270	0.0	0.0	653.0
03-004(c)	MO-605045	1–2	CAMO-09-6272	0.0	0.0	905.0
03-004(c)	MO-605045	6–7	CAMO-09-6271	0.0	0.0	1076.0
03-004(c)	MO-605046	0.5–1	CAMO-09-6273	0.0	0.0	1021.0
03-004(c)	MO-605046	1–2	CAMO-09-6274	0.0	26.0	933.0
03-004(c)	MO-605046	6–7	CAMO-09-6275	0.0	8.0	1069.0
03-004(c)	MO-605047	0.5–1	CAMO-09-6276	0.0	2.0	633.0
03-004(c)	MO-605047	1–2	CAMO-09-6277	0.0	0.0	905.0
03-004(c)	MO-605047	6–7	CAMO-09-6278	0.0	0.0	905.0
03-004(c)	MO-605048	0.5–1	CAMO-09-6279	0.0	0.0	742.0
03-004(c)	MO-605048	1–2	CAMO-09-6280	0.0	0.0	647.0
03-004(c)	MO-605048	6–7.5	CAMO-09-6281	0.0	0.0	865.0
03-004(d)	MO-605035	0.5–1.5	CAMO-09-6230	0.0	39.0	1189.0
03-004(d)	MO-605035	2.5–4	CAMO-09-6231	0.0	4.0	1053.0
03-004(d)	MO-605035	7.5–8.5	CAMO-09-6232	0.0	10.0	1162.0
03-004(d)	MO-605036	0.5–1	CAMO-09-6233	0.0	4.0	671.0
03-004(d)	MO-605036	1–2	CAMO-09-6234	0.0	39.0	978.0
03-004(d)	MO-605036	6–7	CAMO-09-6235	0.0	16.0	841.0
03-004(d)	MO-605037	0.5–1	CAMO-09-6236	0.0	27.0	937.0
03-004(d)	MO-605037	1–2	CAMO-09-6237	0.0	10.0	1019.0
03-004(d)	MO-605037	6–7	CAMO-09-6238	0.0	10.0	133.0
03-004(d)	MO-605038	0.5–1	CAMO-09-6239	0.0	21.0	548.0
03-004(d)	MO-605038	1–2	CAMO-09-6240	0.0	10.0	998.0
03-004(d)	MO-605038	6–7	CAMO-09-6241	0.0	16.0	855.0
03-004(d)	MO-605039	0.5–1.5	CAMO-09-6242	0.0	27.0	978.0
03-004(d)	MO-605039	1.5–2.5	CAMO-09-6243	0.0	16.0	1121.0
03-004(d)	MO-605039	6.5–7.5	CAMO-09-6244	0.0	10.0	773.0
03-004(d)	MO-605040	0.5–1.5	CAMO-09-6245	1.3	39.0	944.0

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-004(d)	MO-605040	1.5–2.5	CAMO-09-6246	0.0	0.0	801.0
03-004(d)	MO-605040	6.5–7.5	CAMO-09-6247	0.0	33.0	991.0
03-004(d)	MO-605041	0.5–1.5	CAMO-09-6248	2.2	27.0	1207
03-004(d)	MO-605041	1.5–2.5	CAMO-09-6249	0.0	16.0	1077
03-004(d)	MO-605041	6.5–7.5	CAMO-09-6250	0.0	21.0	1059.0
03-007	MO-604995	2–3	CAMO-09-6095	4.3	0.0	0
03-007	MO-604995	7–8	CAMO-09-10460	0.0	37.0	927
03-007	MO-604996	3–4	CAMO-09-6097	0.0	0.0	22
03-007	MO-604996	7–8	CAMO-09-6098	0.0	27.0	0
03-007	MO-604996	8–9.5	CAMO-09-10461	0.0	20.0	624
03-007	MO-604997	3–4	CAMO-09-6101	0.0	0.0	0
03-007	MO-604997	8–9	CAMO-09-6102	0.0	0.0	0
03-007	MO-604998	0–0.5	CAMO-09-6103	5.1	0.0	371
03-007	MO-604998	1–2	CAMO-09-6104	1.8	43.0	460
03-007	MO-604998	3–4	CAMO-09-6105	1.6	20.0	371
03-007	MO-604998	6–7	CAMO-09-10464	0.0	0.0	855
03-007	MO-604999	0–0.5	CAMO-09-6106	0.0	0.0	261
03-007	MO-604999	0.75–1.75	CAMO-09-6107	0.0	30.0	279
03-007	MO-604999	2.75–3.75	CAMO-09-6108	0.0	12.0	976
03-007	MO-604999	6–7.5	CAMO-09-10462	0.0	8.0	110
03-007	MO-605000	0–0.5	CAMO-09-6109	0.0	13.0	0
03-007	MO-605000	1–2	CAMO-09-6110	0.0	30.0	54
03-007	MO-605000	3–4	CAMO-09-6111	0.0	18.0	204
03-007	MO-605000	6–7	CAMO-09-10458	0.0	29	890
03-007	MO-605001	0–0.5	CAMO-09-6112	16.0	1.0	0
03-007	MO-605001	0.5–1.5	CAMO-09-6113	8.8	36.0	122
03-007	MO-605001	2.5–3.5	CAMO-09-6114	0.0	30.0	0
03-007	MO-605001	5.5–7	CAMO-09-10463	0.0	6.0	1326
03-007	MO-605004	0–0.5	CAMO-09-6121	2.3	0.0	237
03-007	MO-605004	0.5–2	CAMO-09-6122	0.0	0.0	364
03-007	MO-605005	0–0.5	CAMO-09-6123	2.7	0.0	428
03-007	MO-605005	0.5–1.5	CAMO-09-6124	0.0	0.0	326
03-007	MO-605006	0–0.5	CAMO-09-6125	3.2	0.0	489
03-007	MO-605006	1–2	CAMO-09-6126	0.0	0.0	401
03-007	MO-605007	0–0.5	CAMO-09-6127	3.8	0.0	299
03-007	MO-605007	1.5–2.5	CAMO-09-6128	0.0	0.0	753
03-007	MO-605008	0–0.5	CAMO-09-6129	4.2	0.0	578
03-007	MO-605008	1.5–2.5	CAMO-09-6130	0.0	0.0	510

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-007	MO-605169	0–0.5	CAMO-09-7080	0.0	1.0	0
03-007	MO-605169	2–3	CAMO-09-7081	0.0	47.0	279
03-007	MO-605169	5–6	CAMO-09-7082	0.0	36.0	0
03-007	MO-605169	7–8	CAMO-09-10459	0.0	18.0	829.0
03-007	MO-605170	0–0.5	CAMO-09-7083	0.0	13.0	0
03-007	MO-605170	1–2	CAMO-09-7084	0.0	6.0	1753
03-007	MO-605170	4–5	CAMO-09-7085	0.0	0.0	1535
03-007	MO-605170	6–7	CAMO-09-10465	0.0	8.0	1264
03-034(a)	MO-604916	17.5–19	CAMO-09-5892	0.0	47.8	2000
03-034(a)	MO-604916	22.5–24	CAMO-09-5893	64.0	40.8	1700
03-034(a)	MO-604916	27.5–30	CAMO-09-5894	0.0	41.0	1600
03-034(a)	MO-604917	16–17.5	CAMO-09-5895	0.0	46.0	1860
03-034(a)	MO-604917	21–22.5	CAMO-09-5896	0.0	48.0	1880
03-034(a)	MO-604917	26–27.5	CAMO-09-5897	0.0	38.0	1900
03-034(a)	MO-604918	16–17.5	CAMO-09-5898	2.0	22.0	798
03-034(a)	MO-604918	21–22.5	CAMO-09-5899	3.7	22.0	866
03-034(a)	MO-604918	26–27.5	CAMO-09-5900	4.5	16.0	771
03-034(a)	MO-604919	16–17.5	CAMO-09-5901	5.9	33.0	900
03-034(a)	MO-604919	21–22.5	CAMO-09-5902	6.0	0.0	764
03-034(a)	MO-604919	26–27.5	CAMO-09-5903	2.5	0.0	682
03-041	MO-604987	0–0.5	CAMO-09-6062	73.5	0.0	592
03-041	MO-604987	5–6.5	CAMO-09-6063	72.0	0.0	1198
03-041	MO-604987	20–21.5	CAMO-09-6064	119.0	0.0	1151
03-041	MO-604987	30–31.5	CAMO-09-6065	68.3	0.0	1014
03-041	MO-604988	0–0.5	CAMO-09-6066	93.8	0.0	817
03-041	MO-604988	1–2.5	CAMO-09-6067	131.0	0.0	946
03-041	MO-604988	16–17.5	CAMO-09-6068	127.0	0.0	1157
03-041	MO-604988	26–27.5	CAMO-09-6069	133.0	0.0	728
03-041	MO-604989	0–0.5	CAMO-09-6070	3.4	0.0	505
03-041	MO-604989	5–6.5	CAMO-09-6071	43.0	0.0	1316
03-041	MO-604989	20–21.5	CAMO-09-6072	26.0	23.0	1213
03-041	MO-604989	30–31.5	CAMO-09-6073	19.0	0.0	866
03-045(h)	MO-604947	0–0.5	CAMO-09-6000	9.0	11.0	896
03-045(h)	MO-604947	0.5–1.5	CAMO-09-6001	5.8	0.0	746
03-045(h)	MO-604948	0–0.5	CAMO-09-6002	7.3	4	255
03-045(h)	MO-604948	0.75–1.75	CAMO-09-6003	0.0	21	405
03-045(h)	MO-604952	0–0.5	CAMO-09-6010	8.7	6.0	235
03-045(h)	MO-604952	6–7	CAMO-09-6011	3.5	0.0	481

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-045(h)	MO-604970	0–0.5	CAMO-09-6012	2.2	0.0	382
03-045(h)	MO-604970	0.5–1.5	CAMO-09-6013	0.0	4.0	560
03-045(h)	MO-604971	0–0.5	CAMO-09-6014	3.6	43.0	2000
03-045(h)	MO-604971	1–2.25	CAMO-09-6015	0.3	17.0	1180
03-045(h)	MO-604972	0–0.5	CAMO-09-6016	16.7	33.0	35
03-045(h)	MO-604972	0.5–1.5	CAMO-09-6017	3.3	0.0	15
03-045(h)	MO-604973	0–0.5	CAMO-09-6018	12.1	15.0	1150
03-045(h)	MO-604973	0.5–1.5	CAMO-09-6019	2.1	16.0	1150
03-045(h)	MO-604974	0–0.5	CAMO-09-6020	9.2	13.0	1100
03-045(h)	MO-604974	1–2	CAMO-09-6021	5.6	14.0	1100
03-045(h)	MO-604975	0–0.5	CAMO-09-6022	1.2	15.0	1100
03-045(h)	MO-604975	0.5–1.5	CAMO-09-6023	0.0	15.0	1120
03-045(h)	MO-604976	0–0.5	CAMO-09-6024	8.2	13.0	1100
03-045(h)	MO-604976	1.5–2.5	CAMO-09-6025	6.0	17.0	1200
03-045(h)	MO-604977	0–0.5	CAMO-09-6026	11.3	14.0	1210
03-045(h)	MO-604977	0.5–1.5	CAMO-09-6027	7.6	15.0	1110
03-049(a)	MO-604949	0–0.5	CAMO-09-6047	0.0	26.0	0
03-049(a)	MO-604949	1.5–2.5	CAMO-09-6005	0.0	20.0	0
03-049(a)	MO-604950	0–0.5	CAMO-09-6006	0.0	17.0	929
03-049(a)	MO-604950	1–2	CAMO-09-6007	0.0	0.0	920
03-049(a)	MO-604951	0–0.5	CAMO-09-6008	5.7	0.0	343
03-049(a)	MO-604951	0.5–1.5	CAMO-09-6009	3.2	23.0	520
03-049(a)	MO-604978	0–0.5	CAMO-09-6028	0.0	0.0	0
03-049(a)	MO-604978	0.5–1.5	CAMO-09-6029	0.0	8.0	7
03-049(a)	MO-604979	0–0.5	CAMO-09-6030	2.7	26.0	0
03-049(a)	MO-604979	1–2	CAMO-09-6031	2.1	3.0	0
03-049(a)	MO-604980	0–0.5	CAMO-09-6032	1.7	0.0	0
03-049(a)	MO-604980	0.5–1.5	CAMO-09-6033	2.1	14.0	0
03-049(a)	MO-604981	0–0.5	CAMO-09-6034	5.6	29.0	656
03-049(a)	MO-604981	0.5–1.5	CAMO-09-6035	4.3	17.0	452
03-049(a)	MO-604982	0–0.5	CAMO-09-6036	5.1	8.0	0
03-049(a)	MO-604982	1–2	CAMO-09-6037	2.3	8.0	0
03-049(a)	MO-604983	0–0.5	CAMO-09-6038	4.3	0.0	704
03-049(a)	MO-604983	0.5–1.5	CAMO-09-6039	6.7	11.0	493
03-049(a)	MO-604984	0–0.5	CAMO-09-6040	8.2	11.0	622
03-049(a)	MO-604984	0.5–1.5	CAMO-09-6041	2.4	11.0	622
03-049(a)	MO-604985	0–0.5	CAMO-09-6042	5.6	0.0	343
03-049(a)	MO-604985	0.5–1.5	CAMO-09-6043	0.0	17.0	1331

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-049(a)	MO-604986	0–0.5	CAMO-09-6044	2.1	17.0	1419
03-049(a)	MO-604986	0.5–1.5	CAMO-09-6045	0.0	2.3	1324
03-049(b)-00	MO-605025	3–4	CAMO-09-6191	6.7	0.0	596
03-049(b)-00	MO-605025	5–6	CAMO-09-6192	5.1	3.0	841
03-049(b)-00	MO-605025	8–9	CAMO-09-10478	0.0	12	1558
03-049(b)-00	MO-605026	3–4	CAMO-09-6194	3.4	14.0	419
03-049(b)-00	MO-605026	5–6	CAMO-09-6195	8.1	0.0	378
03-049(b)-00	MO-605026	8–10	CAMO-09-10477	0.0	24	1530
03-049(b)-00	MO-605027	0–0.5	CAMO-09-6197	13.3	16	303
03-049(b)-00	MO-605027	1.5–2.5	CAMO-09-6198	7.7	31	112
03-049(b)-00	MO-605027	3.5–4.5	CAMO-09-6199	4.2	16	85
03-049(b)-00	MO-605027	6.5–7.5	CAMO-09-10472	0.0	24	1551
03-049(b)-00	MO-605028	3–4	CAMO-09-6200	6.2	33.0	0
03-049(b)-00	MO-605028	5–6	CAMO-09-6201	6.7	16.0	163
03-049(b)-00	MO-605028	8–9	CAMO-09-10479	0.0	0.0	450
03-049(b)-00	MO-605029	0–0.5	CAMO-09-6203	0.6	4	310
03-049(b)-00	MO-605029	0.5–1.5	CAMO-09-6204	10.9	4	255
03-049(b)-00	MO-605029	2.5–3.5	CAMO-09-6205	5.1	10	126
03-049(b)-00	MO-605029	5.5–6.5	CAMO-09-10471	0.0	24	1231
03-049(b)-00	MO-605030	0–0.5	CAMO-09-6206	3.8	2	313
03-049(b)-00	MO-605030	2–3	CAMO-09-6207	9.8	0	136
03-049(b)-00	MO-605030	4–5	CAMO-09-6208	8.7	26	333
03-049(b)-00	MO-605030	7–8	CAMO-09-10473	0.0	6	1244
03-049(b)-00	MO-605031	0–0.5	CAMO-09-6209	10.7	0.0	298
03-049(b)-00	MO-605031	1.5–2.5	CAMO-09-6210	7.4	3.0	528
03-049(b)-00	MO-605031	3.5–4.5	CAMO-09-6211	6.8	0.0	473
03-049(b)-00	MO-605031	6.5–7.5	CAMO-09-10476	0.0	24	1558
03-049(b)-00	MO-605032	0–0.5	CAMO-09-6212	9.7	0	0
03-049(b)-00	MO-605032	1.5–2.5	CAMO-09-6213	10.2	0	102
03-049(b)-00	MO-605032	3.5–4.5	CAMO-09-6214	0.5	31	74
03-049(b)-00	MO-605032	6.5–7.5	CAMO-09-10474	0.0	1	1047
03-049(b)-00	MO-605033	1–2	CAMO-09-6215	9.6	0	224
03-049(b)-00	MO-605033	4–5	CAMO-09-6216	6.8	0	408
03-049(b)-00	MO-605033	6–7	CAMO-09-10475	0.0	29	1203
03-049(b)-00	MO-605034	2–3	CAMO-09-6219	5.6	0.0	115
03-049(b)-00	MO-605034	4–5	CAMO-09-6220	3.1	28.0	238
03-049(b)-00	MO-605034	7–8	CAMO-09-10480	0.0	26.0	42
03-049(e)	MO-605009	0–0.5	CAMO-09-6145	17.4	12.0	106

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
03-049(e)	MO-605009	0.5–1.5	CAMO-09-6146	12.3	23.0	208
03-049(e)	MO-605010	0–0.5	CAMO-09-6147	11.6	17.0	344
03-049(e)	MO-605010	0.5–1.5	CAMO-09-6148	5.8	12.0	617
03-049(e)	MO-605011	0–0.5	CAMO-09-6149	4.5	7.0	464
03-049(e)	MO-605011	1–2	CAMO-09-6150	1.5	1.0	307
03-049(e)	MO-605012	0–0.5	CAMO-09-6151	13.2	0.0	351
03-049(e)	MO-605012	0.5–1.5	CAMO-09-6152	9.5	0.0	378
03-049(e)	MO-605013	0–0.5	CAMO-09-6153	0.0	19.0	1087
03-049(e)	MO-605013	1–2	CAMO-09-6154	0.0	19.0	596
03-049(e)	MO-605014	0–0.5	CAMO-09-6155	2.3	0.0	425
03-049(e)	MO-605014	0.5–1.5	CAMO-09-6156	2.1	0.0	432
03-049(e)	MO-605015	0–0.5	CAMO-09-6157	0.0	8.0	617
03-049(e)	MO-605015	0.5–1.5	CAMO-09-6158	0.0	19.0	950
03-049(e)	MO-605016	0–0.5	CAMO-09-6159	0.0	2.0	801
03-049(e)	MO-605016	0.5–1.5	CAMO-09-6160	0.0	0.0	794
03-049(e)	MO-605017	0–0.5	CAMO-09-6161	0.0	0.0	521
03-049(e)	MO-605017	0.5–1.5	CAMO-09-6162	0.0	8.0	766
03-049(e)	MO-605018	0–0.5	CAMO-09-6163	3.3	0.0	371
03-049(e)	MO-605018	0.5–1.5	CAMO-09-6164	1.9	0.0	389
03-049(e)	MO-605019	0–0.5	CAMO-09-6165	0.0	13.0	341
03-049(e)	MO-605019	2–3	CAMO-09-6166	0.0	30.0	41
03-049(e)	MO-605020	0–0.5	CAMO-09-6167	7.1	13.0	0
03-049(e)	MO-605020	1–2	CAMO-09-6168	4.6	7.0	0
03-054(e)	MO-605021	0–0.5	CAMO-09-6179	0.0	10.0	789
03-054(e)	MO-605022	0–0.5	CAMO-09-6181	0.0	0.0	965
03-054(e)	MO-605022	1–2	CAMO-09-6182	0.0	36.0	1493
03-054(e)	MO-605023	0–0.5	CAMO-09-6183	0.0	15.0	1402
03-054(e)	MO-605023	0.5–1.5	CAMO-09-6184	0.0	15.0	1783
03-054(e)	MO-605024	0–0.5	CAMO-09-6185	0.0	5.0	1147
C-03-006	MO-604990	0–0.5	CAMO-09-6080	24.0	0.0	190
C-03-006	MO-604990	2.25–3.25	CAMO-09-6081	0.0	0.0	435
C-03-006	MO-604991	0–0.5	CAMO-09-6082	14.3	0.0	490
C-03-006	MO-604991	12.6–13.6	CAMO-09-6083	0.0	0.0	333
C-03-006	MO-604992	0.75–1.75	CAMO-09-6084	0.0	0.0	674
C-03-006	MO-604992	2–3	CAMO-09-6085	0.0	0.0	347
C-03-006	MO-604993	0.75–1.75	CAMO-09-6086	3.2	0.0	313
C-03-006	MO-604993	2–3	CAMO-09-6087	0.0	0.0	279
C-03-006	MO-604994	0.75–1.75	CAMO-09-6088	0.2	0.0	326

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
C-03-006	MO-604994	1.75–2.75	CAMO-09-6089	0.0	0.0	463
35-016(g)	MO-604933	0–0.5	CAMO-09-5977	729	53	2470
35-016(g)	MO-604933	1.5–2.5	CAMO-09-5978	0.5	71	2780
35-016(g)	MO-604934	0–0.5	CAMO-09-5979	2200	35	1983
35-016(g)	MO-604934	1–2	CAMO-09-5980	11.2	23	1814
35-016(g)	MO-604935	0–0.5	CAMO-09-5981	401	23	1748
35-016(g)	MO-604935	1.5–2.5	CAMO-09-5982	130	41	2220
35-016(g)	MO-604936	0–1	CAMO-09-5983	1.8	70	807
35-016(g)	MO-604936	1.2–2.2	CAMO-09-5984	0.7	40	702
35-016(g)	MO-604937	0–1	CAMO-09-5985	11.2	84	688
35-016(g)	MO-604937	1.4–2.4	CAMO-09-5986	5.2	33	879
35-016(h)	MO-605133	0–0.5	CAMO-09-6739	0	23	2830
35-016(h)	MO-605133	0.5–1	CAMO-09-6740	9.1	71	2660
35-016(h)	MO-605134	0–0.5	CAMO-09-6741	2.4	77	2550
35-016(h)	MO-605134	2.5–3.5	CAMO-09-6742	38.2	41	2520
35-016(h)	MO-605135	0–0.5	CAMO-09-6743	0	47	2150
35-016(h)	MO-605135	3–3.5	CAMO-09-6744	0	35	2560
35-016(h)	MO-605136	0–1	CAMO-09-6745	15.2	70	1584
35-016(h)	MO-605136	1–2	CAMO-09-6746	0.0	40	1268
35-016(h)	MO-605515	0–0.5	CAMO-09-10366	0.0	0	30
35-016(h)	MO-605515	0.5–1.5	CAMO-09-10367	1.6	0	228
35-016(h)	MO-605516	0–0.5	CAMO-09-10368	0.0	17	3
35-016(h)	MO-605516	0.5–1.5	CAMO-09-10369	1.2	17	105
35-016(h)	MO-605517	0–0.5	CAMO-09-10370	0.0	28	534
35-016(h)	MO-605517	2–3	CAMO-09-10371	0.0	11	575
35-016(h)	MO-605518	0–0.5	CAMO-09-10372	0.0	11	548
35-016(h)	MO-605518	0.5–1.5	CAMO-09-10373	0.0	17	745
35-016(h)	MO-605519	0–0.5	CAMO-09-10374	1.3	11	854
35-016(h)	MO-605519	1.5–2.5	CAMO-09-10375	2.0	11	1215
35-016(h)	MO-605520	0–0.5	CAMO-09-10376	0.8	34	950
35-016(h)	MO-605520	0.5–1.5	CAMO-09-10377	11.3	23	1215
42-001(a)-99	MO-605049	0–0.5	CAMO-09-6330	30.0	73	2480
42-001(a)-99	MO-605049	2.5–4	CAMO-09-6331	0.0	16	1087
42-001(a)-99	MO-605049	7.5–9	CAMO-09-6332	0.0	46	3100
42-001(a)-99	MO-605049	12.5–14	CAMO-09-6333	1.6	39	848
42-001(a)-99	MO-605049	22.5–24	CAMO-09-6334	0.4	68	937
42-001(a)-99	MO-605049	32.5–34	CAMO-09-6335	1.2	76	809
42-001(a)-99	MO-605050	0–0.5	CAMO-09-6336	7.9	66	2790

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
42-001(a)-99	MO-605050	2.5–4	CAMO-09-6337	0.0	59	2960
42-001(a)-99	MO-605050	7.5–9	CAMO-09-6338	0.0	66	3000
42-001(a)-99	MO-605050	12.5–14	CAMO-09-6339	0.0	44	2960
42-001(a)-99	MO-605050	22.5–24	CAMO-09-6340	0.0	22	2940
42-001(a)-99	MO-605050	32.5–34	CAMO-09-6341	0.0	66	3030
42-001(a)-99	MO-605051	0–0.5	CAMO-09-6342	0.0	16	404
42-001(a)-99	MO-605051	2.5–4	CAMO-09-6343	1.7	53	920
42-001(a)-99	MO-605051	7.5–9	CAMO-09-6344	5.0	61	909
42-001(a)-99	MO-605051	12.5–14	CAMO-09-6345	0.0	53	709
42-001(a)-99	MO-605051	22.5–24	CAMO-09-6346	0.0	53	471
42-001(a)-99	MO-605051	32.5–34	CAMO-09-6347	0.0	39	587
42-001(a)-99	MO-605052	0–0.5	CAMO-09-6348	42.1	125	3060
42-001(a)-99	MO-605052	2.5–4	CAMO-09-6349	38.0	96	2940
42-001(a)-99	MO-605052	7.5–9	CAMO-09-6350	0.0	81	3250
42-001(a)-99	MO-605052	12.5–14	CAMO-09-6351	0.0	81	3120
42-001(a)-99	MO-605052	22.5–24	CAMO-09-6352	0.0	96	3090
42-001(a)-99	MO-605052	32.5–34	CAMO-09-6353	0.0	88	2930
42-001(a)-99	MO-605053	0–1.5	CAMO-09-6354	0.0	18	363
42-001(a)-99	MO-605053	5–6.5	CAMO-09-6355	0.0	19	171
42-001(a)-99	MO-605053	10–11.5	CAMO-09-6356	0.0	15	255
42-001(a)-99	MO-605053	20–21.5	CAMO-09-6357	0.0	22	305
42-001(a)-99	MO-605053	30–31.5	CAMO-09-6358	0.0	19	288
42-001(a)-99	MO-605054	0–0.5	CAMO-09-6360	56.0	47	602
42-001(a)-99	MO-605054	7.5–9	CAMO-09-6361	0.0	55	866
42-001(a)-99	MO-605054	12.5–15	CAMO-09-6362	6.5	70	938
42-001(a)-99	MO-605054	17.5–19	CAMO-09-6363	0.0	13	1637
42-001(a)-99	MO-605054	27.5–29.5	CAMO-09-6364	1.8	103	1187
42-001(a)-99	MO-605054	37.5–40	CAMO-09-6365	0.0	97.5	1847
42-001(a)-99	MO-605055	0–0.5	CAMO-09-6366	0.0	24	432
42-001(a)-99	MO-605055	8.5–10	CAMO-09-6367	0.0	54	838
42-001(a)-99	MO-605055	13.5–15	CAMO-09-6368	0.0	24	1043
42-001(a)-99	MO-605055	18.5–20	CAMO-09-6369	0.0	39	1187
42-001(a)-99	MO-605055	28.5–30	CAMO-09-6370	0.0	32	926
42-001(a)-99	MO-605055	38.5–40	CAMO-09-6371	0.0	98	937
42-001(a)-99	MO-605056	0–0.5	CAMO-09-6372	0.0	49	738
42-001(a)-99	MO-605056	8.5–10	CAMO-09-6373	0.0	42	1209
42-001(a)-99	MO-605056	13.5–15	CAMO-09-6374	0.0	49	1209
42-001(a)-99	MO-605056	18.5–20	CAMO-09-6375	0.0	49	1265

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
42-001(a)-99	MO-605056	28.5–30	CAMO-09-6376	0.0	79	1054
42-001(a)-99	MO-605056	38.5–40	CAMO-09-6377	0.0	71	1137
42-001(a)-99	MO-605057	0–0.5	CAMO-09-6378	0.7	88	2510
42-001(a)-99	MO-605057	8.5–10	CAMO-09-6379	11.8	0	998
42-001(a)-99	MO-605057	13.5–15	CAMO-09-6380	11.8	0	1459
42-001(a)-99	MO-605057	18.5–20	CAMO-09-6381	19.8	91	843
42-001(a)-99	MO-605057	28.5–30	CAMO-09-6382	0.0	39	899
42-001(a)-99	MO-605057	38.5–40	CAMO-09-6383	57.0	54	965
42-001(a)-99	MO-605058	0–0.5	CAMO-09-6384	0.0	49	721
42-001(a)-99	MO-605058	8.5–10	CAMO-09-6385	0.0	65	987
42-001(a)-99	MO-605058	13.5–15	CAMO-09-6386	0.0	20	1337
42-001(a)-99	MO-605058	18.5–20	CAMO-09-6387	0.0	0	1426
42-001(a)-99	MO-605058	28.5–30	CAMO-09-6388	0.0	35	1431
42-001(a)-99	MO-605058	38.5–40	CAMO-09-6389	0.0	35	1159
42-001(a)-99	MO-605059	0–0.5	CAMO-09-6390	0	22	1201
42-001(a)-99	MO-605059	3–5	CAMO-09-6391	5.3	11	1528
42-001(a)-99	MO-605059	8–9.5	CAMO-09-6392	0	16	1398
42-001(a)-99	MO-605059	13–14.5	CAMO-09-6393	0	0	1385
42-001(a)-99	MO-605059	23–24.5	CAMO-09-6394	3.5	20	1353
42-001(a)-99	MO-605059	33–34.5	CAMO-09-6395	8.8	43	1176
42-001(a)-99	MO-605060	0–0.5	CAMO-09-6396	2900	0	694
42-001(a)-99	MO-605060	1.75–2.1	CAMO-09-6397	3.4	5	1348
42-001(a)-99	MO-605060	2.5–3.25	CAMO-09-6398	26.1	71	2110
42-001(a)-99	MO-605061	0–0.5	CAMO-09-6402	0.2	0	460
42-001(a)-99	MO-605061	7.5–9	CAMO-09-6403	0.0	6	1198
42-001(a)-99	MO-605061	12.5–14	CAMO-09-6404	0.0	0	1132
42-001(a)-99	MO-605061	17.5–19	CAMO-09-6405	0.0	20	1354
42-001(a)-99	MO-605061	27.5–29	CAMO-09-6406	0.0	0	1215
42-001(a)-99	MO-605061	38.5–40	CAMO-09-6407	0.0	0	937
42-001(a)-99	MO-605062	0–0.5	CAMO-09-6408	0.0	0	754
42-001(a)-99	MO-605062	5–6.5	CAMO-09-6409	0.0	0	1170
42-001(a)-99	MO-605062	10–11.5	CAMO-09-6410	0.0	20	1132
42-001(a)-99	MO-605062	15–16.5	CAMO-09-6411	0.8	22	1001
42-001(a)-99	MO-605062	25–26.5	CAMO-09-6412	1.4	59	624
42-001(a)-99	MO-605062	35–36.5	CAMO-09-6413	0.0	59	580
42-001(a)-99	MO-605063	0–0.5	CAMO-09-6414	0.0	30	274
42-001(a)-99	MO-605063	2.5–4	CAMO-09-6415	0.0	20	305
42-001(a)-99	MO-605063	7.5–9	CAMO-09-6416	0.0	18	235

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
42-001(a)-99	MO-605063	12.5–14	CAMO-09-6417	0.0	17	205
42-001(a)-99	MO-605063	22.5–24	CAMO-09-6418	0.0	28	352
42-001(a)-99	MO-605063	32.5–34	CAMO-09-6419	0.0	15	165
42-001(a)-99	MO-605064	0–0.5	CAMO-09-6420	0	45	1569
42-001(a)-99	MO-605064	1–2.5	CAMO-09-6421	0	28	1582
42-001(a)-99	MO-605064	6–7.5	CAMO-09-6422	0	28	1698
42-001(a)-99	MO-605064	11–12.5	CAMO-09-6423	0	22	1453
42-001(a)-99	MO-605064	21–22.5	CAMO-09-6424	0	11	1303
42-001(a)-99	MO-605064	31–32.5	CAMO-09-6425	0	34	1664
42-001(a)-99	MO-605065	0–0.5	CAMO-09-6426	0	68	548
42-001(a)-99	MO-605065	2.5–4	CAMO-09-6427	0	28	1201
42-001(a)-99	MO-605065	7.5–9	CAMO-09-6428	0	11	1548
42-001(a)-99	MO-605065	12.5–14	CAMO-09-6429	0	34	1460
42-001(a)-99	MO-605065	22.5–24	CAMO-09-6430	0	16	1337
42-001(a)-99	MO-605065	32.5–34	CAMO-09-6431	0	28	1405
42-001(a)-99	MO-605066	0–0.5	CAMO-09-6432	0.0	30	224
42-001(a)-99	MO-605066	2.5–4	CAMO-09-6433	1.6	89	585
42-001(a)-99	MO-605066	7.5–9	CAMO-09-6434	0.0	89	1007
42-001(a)-99	MO-605066	12.5–14	CAMO-09-6435	1.6	52	613
42-001(a)-99	MO-605066	22.5–24	CAMO-09-6436	0.0	59	1035
42-001(a)-99	MO-605066	32.5–34	CAMO-09-6437	0.0	111	951
42-001(a)-99	MO-605067	20–22.5	CAMO-09-6438	0.0	94	1081
42-001(a)-99	MO-605067	30–32.5	CAMO-09-6439	0.0	101	1264
42-001(a)-99	MO-605067	40–42.5	CAMO-09-6440	0.0	49	764
42-001(a)-99	MO-605067	50–52.5	CAMO-09-6441	0.0	49	881
42-001(a)-99	MO-605068	20–21.5	CAMO-09-6442	0.0	123	875
42-001(a)-99	MO-605068	30–31.5	CAMO-09-6443	0.0	86	1086
42-001(a)-99	MO-605068	40–41.5	CAMO-09-6444	386.0	49	897
42-001(a)-99	MO-605068	50–51.5	CAMO-09-6445	612.0	71	936
42-001(a)-99	MO-605069	0–1	CAMO-09-6446	0.0	43	1037
42-001(a)-99	MO-605069	1–2	CAMO-09-6447	0.0	50	1287
42-001(a)-99	MO-605070	0–1	CAMO-09-6448	0.0	80	777
42-001(a)-99	MO-605070	1.3–2.3	CAMO-09-6449	0.0	64	453
42-001(a)-99	MO-605071	0–1	CAMO-09-6450	0.0	87	771
42-001(a)-99	MO-605071	1–2	CAMO-09-6451	0.0	94	1415
42-001(a)-99	MO-605072	0–1	CAMO-09-6452	0.0	59	803
42-001(a)-99	MO-605072	1.3–2.3	CAMO-09-6453	0.0	81	797
42-001(a)-99	MO-605073	0–1	CAMO-09-6454	0.0	81	643

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
42-001(a)-99	MO-605073	1–2	CAMO-09-6455	0.0	59	1016
42-001(a)-99	MO-605074	0–1	CAMO-09-6456	0.0	36	980
42-001(a)-99	MO-605074	1.5–2.5	CAMO-09-6457	0.0	81	1058
42-001(a)-99	MO-605075	0–1	CAMO-09-6458	0.0	59	975
42-001(a)-99	MO-605075	1–2	CAMO-09-6459	0.0	59	1480
42-001(a)-99	MO-605288	0–0.5	CAMO-09-8852	141.0	53	2381
42-001(a)-99	MO-605288	2.75–3.5	CAMO-09-8853	65.7	35	2281
42-001(a)-99	MO-605288	4–4.5	CAMO-09-8854	1299.0	23	2500
48-001	MO-604938	0–0.5	CAMO-09-5989	0.0	0	245
48-001	MO-604939	0–0.5	CAMO-09-5990	0.0	17	286
48-001	MO-604940	0–0.5	CAMO-09-5991	0.0	17	328
48-001	MO-604941	0–0.5	CAMO-09-5992	0.0	0	313
48-001	MO-604942	0–0.5	CAMO-09-5993	0.0	0	238
48-001	MO-604943	0–0.5	CAMO-09-5994	0.0	0	722
48-001	MO-604944	0–0.5	CAMO-09-5995	0.0	0	483
48-001	MO-604945	0–0.5	CAMO-09-5996	0.8	0	674
48-001	MO-604946	0–0.5	CAMO-09-5997	0.0	0	579
48-002(a and b)	MO-604920	2.5–4	CAMO-09-5910	0.0	0	1200
48-002(a and b)	MO-604920	7.5–9	CAMO-09-5911	0.0	0	1445
48-002(a and b)	MO-604920	12.5–13.5	CAMO-09-5912	0.0	0	2300
48-002(a and b)	MO-604921	0–0.5	CAMO-09-5914	0.0	0	1102
48-002(a and b)	MO-604921	2.5–3.5	CAMO-09-5915	0.0	0	1102
48-002(a and b)	MO-604921	7.5–8.5	CAMO-09-5916	0.0	0	1129
48-002(a and b)	MO-604921	12.5–13.5	CAMO-09-5917	0.0	0	1163
48-002(a and b)	MO-604922	2.5–3.5	CAMO-09-5918	0.0	4	1144
48-002(a and b)	MO-604922	7.5–8.5	CAMO-09-5919	0.0	4	1348
48-002(a and b)	MO-604922	12.5–14	CAMO-09-5920	0.0	0	1212
48-002(a and b)	MO-604923	2.5–3.5	CAMO-09-5922	0.0	3	1432
48-002(a and b)	MO-604923	7.5–8.5	CAMO-09-5923	0.0	8	1398
48-002(a and b)	MO-604923	12.5–13.5	CAMO-09-5924	0.0	26	1360
48-002(a and b)	MO-604924	0–0.5	CAMO-09-5926	0.0	0	1109
48-002(a and b)	MO-604924	2.5–3.5	CAMO-09-5927	0.0	0	1225
48-002(a and b)	MO-604924	7.5–8.5	CAMO-09-5928	0.0	17	1320
48-002(a and b)	MO-604924	12.5–14	CAMO-09-5929	0.0	0	1265
48-002(a and b)	MO-604925	0–0.5	CAMO-09-5930	0.0	0	1041
48-002(a and b)	MO-604925	2.5–3.5	CAMO-09-5931	0.0	0	823
48-002(a and b)	MO-604925	7.5–8.5	CAMO-09-5932	0.0	0	1361
48-002(a and b)	MO-604925	12.5–13.5	CAMO-09-5933	0.0	0	986

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-002(a and b)	MO-604926	0–0.5	CAMO-09-5934	0.0	9	882
48-002(a and b)	MO-604926	2.5–3.5	CAMO-09-5935	0.0	0	957
48-002(a and b)	MO-604926	7.5–8.5	CAMO-09-5936	0.0	4	1181
48-002(a and b)	MO-604926	12.5–14	CAMO-09-5937	0.0	0	800
48-002(a and b)	MO-604927	0–0.5	CAMO-09-5938	0.0	0	1238
48-002(a and b)	MO-604927	2.5–3.5	CAMO-09-5939	0.0	0	1034
48-002(a and b)	MO-604927	7.5–8.5	CAMO-09-5940	0.0	0	870
48-002(a and b)	MO-604927	12.5–13.5	CAMO-09-5941	0.0	0	932
48-002(a and b)	MO-604928	2.5–3.5	CAMO-09-5942	0.0	0	1245
48-002(a and b)	MO-604928	7.5–8.5	CAMO-09-5943	0.0	0	1456
48-002(a and b)	MO-604928	12.5–13.5	CAMO-09-5944	0.0	0	1456
48-002(a and b)	MO-604929	2.5–3.5	CAMO-09-5946	0.0	15	957
48-002(a and b)	MO-604929	7.5–8.5	CAMO-09-5947	0.0	9	888
48-002(a and b)	MO-604929	12.5–14	CAMO-09-5948	0.0	15	711
48-002(a and b)	MO-604930	2.5–3.5	CAMO-09-5950	0.0	4	616
48-002(a and b)	MO-604930	7.5–8.5	CAMO-09-5951	0.0	21	950
48-002(a and b)	MO-604930	12.5–13.5	CAMO-09-5952	0.0	4	548
48-002(a and b)	MO-604931	0–0.5	CAMO-09-5954	0.0	0	1052
48-002(a and b)	MO-604931	2.5–3.5	CAMO-09-5955	0.0	0	1127
48-002(a and b)	MO-604931	7.5–8.5	CAMO-09-5956	0.0	0	759
48-002(a and b)	MO-604931	12.5–13.5	CAMO-09-5957	0.0	4	1032
48-002(a and b)	MO-604932	0–0.5	CAMO-09-5958	0.0	0	1273
48-002(a and b)	MO-604932	2.5–3.5	CAMO-09-5959	0.0	0	1239
48-002(a and b)	MO-604932	7.5–8.5	CAMO-09-5960	0.0	0	987
48-002(a and b)	MO-604932	12.5–13.5	CAMO-09-5961	0.0	4	1103
48-002(e)	MO-605137	1–2.5	CAMO-09-6749	0.0	0	156
48-002(e)	MO-605137	2.5–3.5	CAMO-09-6750	0.0	19	654
48-002(e)	MO-605137	7.5–10	CAMO-09-6751	0.0	14	627
48-002(e)	MO-605138	1–2.5	CAMO-09-6752	0.0	0	327
48-002(e)	MO-605138	3.5–5	CAMO-09-6753	0.0	19	606
48-002(e)	MO-605138	9–10.5	CAMO-09-6754	0.0	8	749
48-002(e)	MO-605139	1–2.5	CAMO-09-6755	0.0	8	545
48-002(e)	MO-605139	3.5–5	CAMO-09-6756	0.0	0	252
48-002(e)	MO-605139	9–10.5	CAMO-09-6757	0.0	8	708
48-002(e)	MO-605140	1–2.5	CAMO-09-6758	0.0	0	490
48-002(e)	MO-605140	2.5–4	CAMO-09-6759	0.0	2	470
48-002(e)	MO-605140	8–10	CAMO-09-6760	0.0	14	913
48-002(e)	MO-605141	1–2.5	CAMO-09-6761	0.0	0	946

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-002(e)	MO-605141	2.5–4	CAMO-09-6762	0.0	11	864
48-002(e)	MO-605141	7.5–10	CAMO-09-6763	0.0	0	830
48-003	MO-605142	0–0.5	CAMO-09-6768	4.9	17	1096
48-003	MO-605142	1–2.5	CAMO-09-6769	3.7	5	817
48-003	MO-605142	6–7.5	CAMO-09-6770	3.6	0	837
48-003	MO-605142	11–12.5	CAMO-09-6771	3.0	5	939
48-003	MO-605142	16–17.5	CAMO-09-6772	2.7	0	742
48-003	MO-605143	0–0.5	CAMO-09-6773	4.7	15	262
48-003	MO-605143	5–7	CAMO-09-6774	0.0	35	240
48-003	MO-605143	10–12	CAMO-09-6775	0.0	35	245
48-003	MO-605143	15–17	CAMO-09-6776	0.0	35	258
48-003	MO-605143	20–22	CAMO-09-6777	0.0	20	235
48-003	MO-605144	0–0.5	CAMO-09-6778	0.0	25	1362
48-003	MO-605144	0.5–2	CAMO-09-6779	0.0	19	1082
48-003	MO-605144	5.5–7	CAMO-09-6780	0.0	30	1273
48-003	MO-605144	10.5–12	CAMO-09-6781	0.0	7	1505
48-003	MO-605144	15.5–17	CAMO-09-6782	0.0	19	1164
48-003	MO-605145	0–0.5	CAMO-09-6783	7.3	5	1069
48-003	MO-605145	0.5–2	CAMO-09-6784	5.1	17	905
48-003	MO-605145	5.5–7	CAMO-09-6785	6.1	28	899
48-003	MO-605145	10.5–12	CAMO-09-6786	5.9	28	1082
48-003	MO-605145	15.5–17	CAMO-09-6787	3.5	0	790
48-003	MO-605146	0–0.5	CAMO-09-6788	0.0	0	1049
48-003	MO-605146	0.5–2	CAMO-09-6789	5.0	44	1356
48-003	MO-605146	5.5–7	CAMO-09-6790	3.3	27	1200
48-003	MO-605146	10.5–12	CAMO-09-6791	0.0	21	1111
48-003	MO-605146	15.5–17	CAMO-09-6792	0.0	10	1091
48-003	MO-605147	0–0.5	CAMO-09-6793	0.0	26	947
48-003	MO-605147	0.5–2	CAMO-09-6794	0.0	37	879
48-003	MO-605147	5.5–7	CAMO-09-6795	0.0	8	1220
48-003	MO-605147	10.5–12	CAMO-09-6796	0.0	8	1438
48-003	MO-605147	15.5–17.5	CAMO-09-6797	0.0	0	968
48-003	MO-605148	0–0.5	CAMO-09-6798	1.9	14	1349
48-003	MO-605148	0.5–2	CAMO-09-6799	2.7	26	1145
48-003	MO-605148	5.5–7	CAMO-09-6800	1.4	3	1179
48-003	MO-605148	10.5–12	CAMO-09-6801	1.3	31	1322
48-003	MO-605148	15.5–17	CAMO-09-6802	1.9	20	1029
48-003	MO-605149	0–0.5	CAMO-09-6803	0.8	0	1281

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-003	MO-605149	0.5–2	CAMO-09-6804	5.9	31	1308
48-003	MO-605149	5.5–7	CAMO-09-6805	1.4	20	1465
48-003	MO-605149	10.5–12	CAMO-09-6806	0.9	37	1172
48-003	MO-605149	15.5–17	CAMO-09-6807	0.2	20	1356
48-003	MO-605150	0–0.5	CAMO-09-6808	6.1	10	259
48-003	MO-605150	2.5–4	CAMO-09-6809	3.5	30	246
48-003	MO-605150	7.5–9	CAMO-09-6810	3.5	20	227
48-003	MO-605150	12.5–14	CAMO-09-6811	0.0	20	232
48-003	MO-605150	17.5–19	CAMO-09-6812	0.0	41	238
48-003	MO-605151	0–0.5	CAMO-09-6813	1.8	15	282
48-003	MO-605151	0.5–2	CAMO-09-6814	2.9	35	264
48-003	MO-605151	5.5–7	CAMO-09-6815	2.0	10	254
48-003	MO-605151	10.5–12	CAMO-09-6816	3.9	10	266
48-003	MO-605151	15.5–17	CAMO-09-6817	0.0	30	245
48-003	MO-605152	0–0.5	CAMO-09-6818	0.0	37	595
48-003	MO-605152	0.5–2	CAMO-09-6819	0.0	31	704
48-003	MO-605152	5.5–7	CAMO-09-6820	0.0	37	977
48-003	MO-605152	10.5–12.5	CAMO-09-6821	0.0	26	949
48-003	MO-605152	15.5–17	CAMO-09-6822	0.0	3	731
48-003	MO-605153	0–0.5	CAMO-09-6823	0.0	33	1254
48-003	MO-605153	0.5–2	CAMO-09-6824	0.0	33	798
48-003	MO-605153	5.5–7	CAMO-09-6825	0.0	4	661
48-003	MO-605153	10.5–12	CAMO-09-6826	0.8	10	491
48-003	MO-605153	15.5–17	CAMO-09-6827	0.0	33	1159
48-003	MO-605154	0–0.5	CAMO-09-6828	3.7	5	1021
48-003	MO-605154	0.5–2	CAMO-09-6829	3.7	0	912
48-003	MO-605154	5.5–7	CAMO-09-6830	2.0	0	969
48-003	MO-605154	10.5–12	CAMO-09-6831	6.1	0	769
48-003	MO-605154	15.5–17	CAMO-09-6832	5.8	0	592
48-003	MO-605155	0–0.5	CAMO-09-6833	5.0	0	919
48-003	MO-605155	0.5–2	CAMO-09-6834	0.0	5	721
48-003	MO-605155	5.5–7	CAMO-09-6835	1.0	0	456
48-003	MO-605155	10.5–12	CAMO-09-6836	0.8	11	1178
48-003	MO-605155	15.5–17	CAMO-09-6837	4.3	11	939
48-003	MO-605156	0–0.5	CAMO-09-6838	2.0	43	1542
48-003	MO-605156	5–6.5	CAMO-09-6839	0.0	8	1242
48-003	MO-605156	10–11.5	CAMO-09-6840	0.0	14	1269
48-003	MO-605156	15–16.5	CAMO-09-6841	0.0	37	1237

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-003	MO-605156	20–21.5	CAMO-09-6842	0.0	3	1167
48-003	MO-605157	0–0.5	CAMO-09-6843	0.0	33	518
48-003	MO-605157	0.5–1.5	CAMO-09-6844	0.0	21	491
48-003	MO-605158	0–0.5	CAMO-09-6845	0.0	0	539
48-003	MO-605158	1–2	CAMO-09-6846	0.0	16	443
48-003	MO-605159	0–0.5	CAMO-09-6847	0.0	39	607
48-003	MO-605159	1.5–2.5	CAMO-09-6848	0.0	4	273
48-003	MO-605160	0–0.5	CAMO-09-6849	0.0	16	532
48-003	MO-605160	0.5–1.5	CAMO-09-6850	0.0	21	464
48-005	MO-605128	1.5–2.5	CAMO-09-6718	1.2	0	914
48-005	MO-605128	4–5	CAMO-09-6719	0.0	0	1595
48-005	MO-605128	6–7	CAMO-09-6720	0.0	0	1507
48-005	MO-605129	0–0.5	CAMO-09-6721	0.0	22	1761
48-005	MO-605129	1.25–2.5	CAMO-09-6722	0.0	65	2000
48-005	MO-605129	3.25–4.25	CAMO-09-6723	0.0	29	2060
48-005	MO-605130	0–0.5	CAMO-09-6724	0.0	0	456
48-005	MO-605130	1.5–2.5	CAMO-09-6725	0.0	30	640
48-005	MO-605130	3–4	CAMO-09-6726	16.2	26	368
48-005	MO-605131	0–0.5	CAMO-09-6727	8.2	0	921
48-005	MO-605131	1–2	CAMO-09-6728	2.9	5	1302
48-005	MO-605131	3–4.5	CAMO-09-6729	0.0	0	1241
48-005	MO-605132	0–0.5	CAMO-09-6730	12.6	53	2110
48-005	MO-605132	2–3	CAMO-09-6731	2.2	59	1961
48-005	MO-605132	5–6	CAMO-09-6732	4.3	35	2040
48-007(a)-00	MO-605118	0–0.5	CAMO-09-6675	0.0	35	1584
48-007(a)-00	MO-605118	5–6.5	CAMO-09-6676	5.0	29	1683
48-007(a)-00	MO-605118	15–16.5	CAMO-09-6677	2.4	55	2440
48-007(a)-00	MO-605118	20–21.5	CAMO-09-6678	1.3	53	2640
48-007(a)-00	MO-605119	0–0.5	CAMO-09-6679	2231.0	0	786
48-007(a)-00	MO-605119	0.5–2	CAMO-09-6680	1200.0	24	762
48-007(a)-00	MO-605119	10.5–12	CAMO-09-6681	936.0	35	799
48-007(a)-00	MO-605119	15.5–17	CAMO-09-6682	340.0	11	945
48-007(a)-00	MO-605120	0–0.5	CAMO-09-6683	0.0	19	1144
48-007(a)-00	MO-605120	1–2.5	CAMO-09-6684	0.0	2	1144
48-007(a)-00	MO-605120	11–12.5	CAMO-09-6685	0.0	0	837
48-007(a)-00	MO-605120	16–17.5	CAMO-09-6686	0.0	13	960
48-007(a)-00	MO-605121	0–0.5	CAMO-09-6687	2416.0	0	841
48-007(a)-00	MO-605121	2.5–4	CAMO-09-6688	1379.0	0	696

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-007(a)-00	MO-605121	12.5–14	CAMO-09-6689	877.0	0	841
48-007(a)-00	MO-605121	17.5–19	CAMO-09-6690	281.0	0	957
48-007(a)-00	MO-605122	0–0.5	CAMO-09-6691	2341.0	0	854
48-007(a)-00	MO-605122	2.5–4	CAMO-09-6692	558.0	0	951
48-007(a)-00	MO-605122	12.5–14	CAMO-09-6693	414.0	17	1188
48-007(a)-00	MO-605122	17.5–19	CAMO-09-6694	218.0	17	1158
48-007(a)-00	MO-605123	0–0.5	CAMO-09-6695	0.0	30	1110
48-007(a)-00	MO-605123	0.5–2	CAMO-09-6696	0.0	0	1314
48-007(a)-00	MO-605123	10.5–12	CAMO-09-6697	0.0	34	1409
48-007(a)-00	MO-605123	15.5–17	CAMO-09-6698	0.0	13	1416
48-007(a)-00	MO-605124	0–0.5	CAMO-09-6699	0.0	6	299
48-007(a)-00	MO-605124	0.5–1.5	CAMO-09-6700	6.0	0	545
48-007(a)-00	MO-605125	0–0.5	CAMO-09-6701	0.2	0	343
48-007(a)-00	MO-605125	2.5–3.5	CAMO-09-6702	0.0	0	388
48-007(a)-00	MO-605126	0–0.5	CAMO-09-6703	7.2	6	306
48-007(a)-00	MO-605126	2.5–3.5	CAMO-09-6704	0.0	0	252
48-007(a)-00	MO-605127	0–0.5	CAMO-09-6705	0.0	0	13
48-007(a)-00	MO-605127	3–4	CAMO-09-6706	0.0	0	483
48-007(b)	M0-605116	0–0.5	CAMO-09-6661	0.0	20	221
48-007(b)	M0-605116	0.5–1.5	CAMO-09-6662	0.0	25	212
48-007(b)	M0-605116	2.5–3.5	CAMO-09-6663	0.0	50	212
48-007(b)	M0-605117	0–0.5	CAMO-09-6664	0.0	25	229
48-007(b)	M0-605117	1–2	CAMO-09-6665	0.0	30	249
48-007(b)	M0-605117	3–4	CAMO-09-6666	0.0	15	237
48-007(b)	MO-605110	0–0.5	CAMO-09-6643	0.0	20	656
48-007(b)	MO-605110	0.5–1.5	CAMO-09-6644	0.0	37	492
48-007(b)	MO-605110	2.5–3.5	CAMO-09-6645	0.0	3	574
48-007(b)	MO-605111	0–0.5	CAMO-09-6646	0.0	14	513
48-007(b)	MO-605111	1–2	CAMO-09-6647	0.0	20	663
48-007(b)	MO-605111	3–4	CAMO-09-6648	0.0	37	349
48-007(b)	MO-605112	0–0.5	CAMO-09-6649	0.0	20	184
48-007(b)	MO-605112	1–2	CAMO-09-6650	0.0	20	200
48-007(b)	MO-605112	3–4	CAMO-09-6651	0.0	25	208
48-007(b)	MO-605113	0–0.5	CAMO-09-6652	0.0	35	214
48-007(b)	MO-605113	1.25–2.25	CAMO-09-6653	0.0	20	230
48-007(b)	MO-605113	3.25–4.25	CAMO-09-6654	0.0	25	272
48-007(b)	MO-605114	0–0.5	CAM0-09-6655	0.0	14	605
48-007(b)	MO-605114	0.5–1.5	CAM0-09-6656	0.0	20	615

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-007(b)	MO-605114	2.5–3.5	CAM0-09-6657	0.0	37	492
48-007(b)	MO-605115	0–0.5	CAMO-09-6658	0.0	20	208
48-007(b)	MO-605115	1–2	CAMO-09-6659	0.0	35	206
48-007(b)	MO-605115	3–4	CAMO-09-6660	0.0	20	220
48-007(c)	MO-605161	0–0.5	CAMO-09-6876	0.0	17	326
48-007(c)	MO-605161	0.5–1.5	CAMO-09-6877	0.0	0	313
48-007(c)	MO-605161	2.5–3.5	CAMO-09-6878	0.0	17	463
48-007(c)	MO-605162	0–0.5	CAMO-09-6879	0.0	0	313
48-007(c)	MO-605162	1.5–2.5	CAMO-09-6880	0.0	0	435
48-007(c)	MO-605162	3.5–4.5	CAMO-09-6881	0.0	0	585
48-007(c)	MO-605163	0–0.5	CAMO-09-6882	0.0	11	612
48-007(c)	MO-605163	0.5–1.5	CAMO-09-6883	0.0	0	497
48-007(c)	MO-605163	2.5–3.5	CAMO-09-6884	0.0	0	27
48-007(c)	MO-605164	0–0.5	CAMO-09-6885	0.0	0	156
48-007(c)	MO-605164	0.5–1.5	CAMO-09-6886	0.0	11	292
48-007(c)	MO-605164	2.5–3.5	CAMO-09-6887	0.0	17	578
48-007(c)	MO-605165	0–0.5	CAMO-09-6888	0.0	0	54
48-007(c)	MO-605165	0.5–1.5	CAMO-09-6889	0.0	17	401
48-007(c)	MO-605165	2.5–3.5	CAMO-09-6890	0.0	5	510
48-007(c)	MO-605166	0–0.5	CAMO-09-6891	0.0	0	258
48-007(c)	MO-605166	0.7–1.7	CAMO-09-6892	0.0	0	40
48-007(c)	MO-605166	2.7–3.7	CAMO-09-6893	0.0	11	142
48-007(f)	MO-605097	0–0.5	CAMO-09-6557	> 10,000	0	410
48-007(f)	MO-605097	1–2	CAMO-09-6558	> 10,000	0	385
48-007(f)	MO-605097	3–3.5	CAMO-09-6559	> 10,000	0	623
48-007(f)	MO-605098	0–0.5	CAMO-09-6560	223.0	0	319
48-007(f)	MO-605098	1.5–2.5	CAMO-09-6561	50.7	2	667
48-007(f)	MO-605098	3.5–4.5	CAMO-09-6562	60.2	7	251
48-007(f)	MO-605099	0–0.5	CAMO-09-6563	0.0	0	370
48-007(f)	MO-605099	0.5–1.5	CAMO-09-6564	0.0	0	258
48-007(f)	MO-605099	2.5–3	CAMO-09-6565	3275.0	0	401
48-007(f)	MO-605100	0–0.5	CAMO-09-6566	11.0	14	368
48-007(f)	MO-605100	0.5–1.5	CAMO-09-6567	0.0	0	157
48-007(f)	MO-605100	2.5–3.5	CAMO-09-6568	0.0	3	450
48-007(f)	MO-605101	0–0.5	CAMO-09-6569	750.0	6	426
48-007(f)	MO-605101	1–2	CAMO-09-6570	3497.0	0	284
48-007(f)	MO-605101	3–3.5	CAMO-09-6571	229.0	0	607
48-007(f)	MO-605102	0–0.5	CAMO-09-6572	11.6	0	830

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
48-007(f)	MO-605102	1.3–2.3	CAMO-09-6573	0.0	0	517
48-007(f)	MO-605102	3.3–4.3	CAMO-09-6574	0.0	0	353
48-007(f)	MO-605103	0–0.5	CAMO-09-6575	5.0	8	382
48-007(f)	MO-605103	0.75–1.75	CAMO-09-6576	0.0	20	327
48-007(f)	MO-605103	2.75–3.5	CAMO-09-6577	0.0	0	566
48-007(f)	MO-605104	0–0.5	CAMO-09-6578	2.2	14	355
48-007(f)	MO-605104	1.25–2.25	CAMO-09-6579	0.0	26	573
48-007(f)	MO-605104	3.25–4	CAMO-09-6580	3.0	37	729
48-011	MO-605351	65–66.5	CAMO-09-9737	17.7	24	681
48-011	MO-605351	75–76.5	CAMO-09-9738	12.5	30	858
48-011	MO-605351	85–86.5	CAMO-09-9739	22.0	30	1096
48-011	MO-605351	100–101.5	CAMO-09-9740	21.4	47	1055
48-012	MO-605089	7.5–8.5	CAMO-09-6537	0.0	12	1236
48-012	MO-605089	17.5–18.5	CAMO-09-6538	9.3	12	991
48-012	MO-605089	22.5–23.5	CAMO-09-6539	0.9	6	1032
48-012	MO-605090	6–7	CAMO-09-6540	0.8	0	613
48-012	MO-605090	16–17	CAMO-09-6541	0.9	0	681
48-012	MO-605090	21–22	CAMO-09-6542	0.0	21	756
48-012	MO-605091	7.5–8.5	CAMO-09-6543	0.0	6	1175
48-012	MO-605091	17.5–18.5	CAMO-09-6544	0.0	18	1475
48-012	MO-605091	22.5–23.5	CAMO-09-6545	0.0	29	1230
48-012	MO-605092	4–5	CAMO-09-6546	0.9	12	650
48-012	MO-605092	14–15	CAMO-09-6547	0.0	18	1236
48-012	MO-605092	19–20	CAMO-09-6548	0.0	18	1018
50-002(d)	MO-605535	0–0	CAMO-09-10581	NA[c]	0	88
50-002(d)	MO-605536	0–0	CAMO-09-10582	NA	0	88
50-002(d)	MO-605537	0–0	CAMO-09-10583	NA	0	88
50-002(d)	MO-605538	0–0	CAMO-09-10584	NA	0	88
50-004(a)-00	MO-605106	0–0.5	CAMO-09-6603	12.5	13	787
50-004(a)-00	MO-605106	1–2	CAMO-09-6604	82.8	8	576
50-004(a)-00	MO-605106	6–7	CAMO-09-6605	0.0	31	555
50-004(a)-00	MO-605108	0–1	CAMO-09-6621	0.0	0	701
50-004(a)-00	MO-605108	12.5–14	CAMO-09-6622	0.0	0	1164
50-004(a)-00	MO-605108	17.5–19	CAMO-09-6623	0.0	0	932
50-004(a)-00	MO-605108	22.5–24	CAMO-09-6624	0.0	0	1137
50-004(a)-00	MO-605108	27.5–29	CAMO-09-6625	0.0	0	408
50-004(a)-00	MO-605109	0–0.5	CAMO-09-6626	20.4	23	399
50-004(a)-00	MO-605109	8.5–9.5	CAMO-09-6627	0.0	23	855

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
50-004(a)-00	MO-605109	13.5–15	CAMO-09-6628	0.0	0	808
50-004(a)-00	MO-605109	18.5–20	CAMO-09-6629	0.0	40	760
50-004(a)-00	MO-605109	23.5–25	CAMO-09-6630	0.0	12	964
50-004(a)-00	MO-605457	3.5–5	CAMO-09-9941	0.0	19	1059
50-004(a)-00	MO-605457	5–6	CAMO-09-9942	0.0	19	1373
50-004(a)-00	MO-605457	10–11	CAMO-09-9943	0.0	25	1168
50-004(a)-00	MO-605458	2.5–3.5	CAMO-09-9944	7.8	0	306
50-004(a)-00	MO-605458	3.5–4.5	CAMO-09-9945	6.8	0	347
50-004(a)-00	MO-605458	8.5–9.5	CAMO-09-9946	0.0	31	978
50-004(a)-00	MO-605459	2–3	CAMO-09-9947	0.0	33	899
50-004(a)-00	MO-605459	3–4	CAMO-09-9948	0.0	33	1212
50-004(a)-00	MO-605459	8–9	CAMO-09-9949	0.0	39	953
50-004(a)-00	MO-605460	3.5–4.5	CAMO-09-9950	0.0	5	674
50-004(a)-00	MO-605460	4.5–5.5	CAMO-09-9951	0.0	10	879
50-004(a)-00	MO-605460	9.5–10.5	CAMO-09-9952	0.0	33	742
50-004(a)-00	MO-605462	9–10	CAMO-09-9956	0.0	22	722
50-004(a)-00	MO-605462	10–11	CAMO-09-9957	0.0	28	1022
50-004(a)-00	MO-605462	15–16	CAMO-09-9958	0.0	39	606
50-004(a)-00	MO-605463	7–8	CAMO-09-9959	0.0	16	584
50-004(a)-00	MO-605463	8–9	CAMO-09-9960	0.0	4	509
50-004(a)-00	MO-605463	13–14.5	CAMO-09-9961	0.0	0	447
50-004(a)-00	MO-605464	4–5	CAMO-09-9962	0.0	22	1182
50-004(a)-00	MO-605464	5–6	CAMO-09-9963	0.0	0	1080
50-004(a)-00	MO-605464	10–11	CAMO-09-9964	0.0	11	1162
50-004(a)-00	MO-605466	6–7	CAMO-09-9968	0.0	23	235
50-004(a)-00	MO-605466	7–8	CAMO-09-9969	0.0	0	712
50-004(a)-00	MO-605466	12–13	CAMO-09-9970	0.0	17	474
50-004(a)-00	MO-605467	4–5	CAMO-09-9971	0.0	12	406
50-004(a)-00	MO-605467	5–6	CAMO-09-9972	0.0	23	944
50-004(a)-00	MO-605467	10–11	CAMO-09-9973	0.0	0	964
50-004(a)-00	MO-605468	4–5	CAMO-09-9974	0.0	39	706
50-004(a)-00	MO-605468	5–6	CAMO-09-9975	0.0	4	584
50-004(a)-00	MO-605468	10–11	CAMO-09-9976	0.0	0	509
50-004(a)-00	MO-605469	8–9	CAMO-09-9977	0.0	0	733
50-004(a)-00	MO-605469	9–10	CAMO-09-9978	0.0	4	529
50-004(a)-00	MO-605469	14–15	CAMO-09-9979	0.0	0	815
50-004(a)-00	MO-605470	2.5–3.5	CAMO-09-9980	1.4	23	943
50-004(a)-00	MO-605470	3.5–5	CAMO-09-9981	0.0	17	1250

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
50-004(a)-00	MO-605470	8.5–10	CAMO-09-9982	0.0	23	1175
50-004(a)-00	MO-605471	8–9	CAMO-09-9983	0.0	16	740
50-004(a)-00	MO-605471	9–10	CAMO-09-9984	0.0	0	638
50-004(a)-00	MO-605471	14–15	CAMO-09-9985	0.0	22	665
50-004(a)-00	MO-605472	7–8	CAMO-09-9986	0.0	6	889
50-004(a)-00	MO-605472	8–9.5	CAMO-09-9987	0.0	17	1073
50-004(a)-00	MO-605472	13–14	CAMO-09-9988	0.0	6	923
50-004(a)-00	MO-605473	2–3	CAMO-09-9989	0.0	35	937
50-004(a)-00	MO-605473	3–4	CAMO-09-9990	0.0	16	1049
50-004(a)-00	MO-605475	4–5	CAMO-09-9995	0.0	28	545
50-004(a)-00	MO-605475	5–6	CAMO-09-9996	0.0	22	892
50-004(a)-00	MO-605475	10–12.5	CAMO-09-9997	0.0	39	940
50-004(a)-00	MO-605476	16.5–17.5	CAMO-09-9998	0.0	17	481
50-004(a)-00	MO-605476	17.5–18.5	CAMO-09-9999	0.0	29	665
50-004(a)-00	MO-605476	22.5–23.5	CAMO-09-10000	0.0	29	617
50-004(a)-00	MO-605477	4–5	CAMO-09-10001	0.0	26	1216
50-004(a)-00	MO-605477	5–6	CAMO-09-10002	0.0	0	1332
50-004(a)-00	MO-605477	10–11	CAMO-09-10003	0.0	26	1393
50-004(a)-00	MO-605478	7.5–8.5	CAMO-09-10004	0.0	20	1127
50-004(a)-00	MO-605478	8.5–9.5	CAMO-09-10005	0.0	0	725
50-004(a)-00	MO-605478	13.5–14.5	CAMO-09-10006	0.0	20	1325
50-004(a)-00	MO-605479	7–8	CAMO-09-10007	0.0	0	930
50-004(a)-00	MO-605479	8–9	CAMO-09-10008	0.0	20	1345
50-004(a)-00	MO-605479	13–14	CAMO-09-10009	0.0	0	1611
50-004(a)-00	MO-605625	15–17	CAMO-09-6601	139.0	0	817
50-004(a)-00	MO-605625	20–21.5	CAMO-09-6602	115.0	0	974
50-004(a)-00	MO-605626	15–16.5	CAMO-09-6608	0.0	0	1511
50-004(a)-00	MO-605626	20–22.5	CAMO-09-6609	0.0	0	1477
50-004(a)-00	MO-605627	10–11	CAMO-09-6610	0.0	19	1016
50-004(a)-00	MO-605627	15–16	CAMO-09-6611	0.0	13	941
50-004(a)-00	MO-605627	20–21	CAMO-09-6612	0.0	30	1132
50-004(a)-00	MO-605628	5–6	CAMO-09-6613	0.0	28	1748
50-004(a)-00	MO-605628	7–8	CAMO-09-6614	0.0	11	1714
50-004(a)-00	MO-605628	10–11	CAMO-09-6615	0.0	34	1555
50-006(a)	MO-605076	0–0.5	CAMO-09-6496	3.4	11	648
50-006(a)	MO-605076	0.5–1.5	CAMO-09-6497	0.0	23	1261
50-006(a)	MO-605076	2.5–3.5	CAMO-09-6498	0.0	17	4111
50-006(a)	MO-605077	0–0.5	CAMO-09-6499	6.0	11	948

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
50-006(a)	MO-605077	0.5–1.5	CAMO-09-6500	0.0	51	1145
50-006(a)	MO-605077	2.5–3.5	CAMO-09-6501	0.0	40	1193
50-006(a)	MO-605078	0–1	CAMO-09-6502	0.0	22	1466
50-006(a)	MO-605078	2–3	CAMO-09-6503	0.0	16	1431
50-006(d)	MO-605083	0–0.5	CAMO-09-6512	0.0	8	1577
50-006(d)	MO-605083	0.5–1.5	CAMO-09-6513	0.0	19	914
50-006(d)	MO-605083	5.5–7	CAMO-09-6514	0.0	48	1138
50-006(d)	MO-605084	0–0.5	CAMO-09-6515	0.0	2	1536
50-006(d)	MO-605084	1.5–2.5	CAMO-09-6516	0.0	25	1393
50-006(d)	MO-605084	6.5–7.5	CAMO-09-6517	0.0	31	1066
50-006(d)	MO-605085	0–0.5	CAMO-09-6518	0.0	75	905
50-006(d)	MO-605085	1.5–2.5	CAMO-09-6519	0.0	17	1624
50-006(d)	MO-605086	0–0.5	CAMO-09-6521	0.0	42	1359
50-006(d)	MO-605086	1–2	CAMO-09-6522	0.0	24	954
50-006(d)	MO-605086	6–7	CAMO-09-6523	0.0	36	1397
50-006(d)	MO-605087	0–0.5	CAMO-09-6524	0.0	37	1857
50-006(d)	MO-605087	0.5–1.5	CAMO-09-6525	0.0	31	1700
50-006(d)	MO-605087	5.5–6.5	CAMO-09-6526	0.0	37	1727
50-006(d)	MO-605088	0–0.5	CAMO-09-6527	1.3	17	875
50-006(d)	MO-605088	1.5–2.5	CAMO-09-6528	2.0	23	657
50-006(d)	MO-605088	3.5–4	CAMO-09-6529	0.0	167	3820
50-006(d)	MO-605503	9–10	CAMO-09-10137	0.0	0	1386
50-006(d)	MO-605503	14–15	CAMO-09-10138	0.0	0	1079
50-006(d)	MO-605504	9–10	CAMO-09-10139	0.0	0	1236
50-006(d)	MO-605504	14–15	CAMO-09-10140	0.0	6	1338
50-006(d)	MO-605505	9–10	CAMO-09-10141	0.0	42	934
50-006(d)	MO-605505	14–15	CAMO-09-10142	0.0	48	777
50-006(d)	MO-605506	0–0.5	CAMO-09-10143	0.0	36	1179
50-006(d)	MO-605506	5.5–6.5	CAMO-09-10144	2.1	30	0
50-006(d)	MO-605507	9–10	CAMO-09-10145	0.0	31	1267
50-006(d)	MO-605507	14–15	CAMO-09-10146	0.0	2	1240
50-006(d)	MO-605508	8.5–9.5	CAMO-09-10147	0.0	31	862
50-006(d)	MO-605508	13.5–15	CAMO-09-10148	0.0	14	412
50-006(d)	MO-605509	8–9	CAMO-09-10149	0.0	8	1216
50-006(d)	MO-605509	13–14	CAMO-09-10150	0.0	25	1257
50-006(d)	MO-605511	9–10	CAMO-09-10153	0.0	30	1029
50-006(d)	MO-605511	14–15	CAMO-09-10154	0.0	7	879
50-006(d)	MO-605512	8–9	CAMO-09-10155	0.0	0	906

Table 1.4-2 (continued)

AOC/SWMU	Location ID	Depth (ft)	Sample ID	PID (ppm[a])	Alpha (dpm[b])	Beta/ Gamma (dpm)
50-006(d)	MO-605512	13–14	CAMO-09-10156	0.0	8	790
50-006(d)	MO-605513	8–10	CAMO-09-10157	0.0	2	988
50-006(d)	MO-605513	13–14	CAMO-09-10158	0.0	8	558

[a] ppm = Parts per million.

[b] dpm = Disintegrations per minute.

[c] NA = Not analyzed.

Table 1.4-3
Crosswalk of Proposed and Sampled Locations

SWMU or AOC	Proposed Location	Location ID
TA-03		
03-004(c)	4c-1	MO-605042
03-004(c)	4c-2	MO-605047
03-004(c)	4c-3	MO-605043
03-004(c)	4c-4	MO-605044
03-004(c)	4c-5	MO-605045
03-004(c)	4c-6	MO-605046
03-004(c)	4c-7	MO-605048
03-004(d)	4d-1	MO-605035
03-004(d)	4d-2	MO-605040
03-004(d)	4d-3	MO-605036
03-004(d)	4d-4	MO-605037
03-004(d)	4d-5	MO-605038
03-004(d)	4d-6	MO-605039
03-004(d)	4d-7	MO-605041
03-007	7-1	MO-605169
03-007	7-2	MO-604995
03-007	7-3	MO-604996
03-007	7-4	MO-604997
03-007	7-5	MO-604998
03-007	7-6	MO-605170
03-007	7-7	MO-604999
03-007	7-8	MO-605000
03-007	7-9	MO-605001
03-007	7-10	MO-605004
03-007	7-11	MO-605005
03-007	7-12	MO-605006
03-007	7-13	MO-605007
03-007	7-14	MO-605008
03-034(a)	34a-1	MO-604916
03-034(a)	34a-2	MO-604917
03-034(a)	34a-3	MO-604919
03-034(a)	34a-4	MO-604918
03-041	41-1	MO-604989
03-041	41-2	MO-604987
03-041	41-3	MO-604988
03-045(h)	45h-1	MO-604947

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
03-045(h)	45h-2	MO-604970
03-045(h)	45h-3	MO-604971
03-045(h)	45h-4	MO-604972
03-045(h)	45h-5	MO-604973
03-045(h)	45h-6	MO-604974
03-045(h)	45h-7	MO-604948
03-045(h)	45h-8	MO-604952
03-045(h)	45h-9	MO-604975
03-045(h)	45h-10	MO-604976
03-045(h)	45h-11	MO-604977
03-049(a)	49a-1	MO-604949
03-049(a)	49a-2	MO-604978
03-049(a)	49a-3	MO-604979
03-049(a)	49a-4	MO-604951
03-049(a)	49a-5	MO-604980
03-049(a)	49a-6	MO-604981
03-049(a)	49a-7	MO-604950
03-049(a)	49a-8	MO-604982
03-049(a)	49a-9	MO-604983
03-049(a)	49a-10	MO-604984
03-049(a)	49a-11	MO-604985
03-049(a)	49a-12	MO-604986
03-049(b)-00	49b-1	MO-605031
03-049(b)-00	49b-2	MO-605025
03-049(b)-00	49b-3	MO-605026
03-049(b)-00	49b-4	MO-605027
03-049(b)-00	49b-5	MO-605028
03-049(b)-00	49b-6	MO-605029
03-049(b)-00	49b-7	MO-605030
03-049(b)-00	49b-8	MO-605032
03-049(b)-00	49b-9	MO-605033
03-049(b)-00	49b-10	MO-605034
03-049(e)	49e-1	MO-605012
03-049(e)	49e-2	MO-605009
03-049(e)	49e-3	MO-605017
03-049(e)	49e-4	MO-605014
03-049(e)	49e-5	MO-605018
03-049(e)	49e-6	MO-605015
03-049(e)	49e-7	MO-605010

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
03-049(e)	49e-8	MO-605016
03-049(e)	49e-9	MO-605013
03-049(e)	49e-10	MO-605019
03-049(e)	49e-11	MO-605011
03-049(e)	49e-12	MO-605020
03-054(e)	54e-1	MO-605021
03-054(e)	54e-2	MO-605024
03-054(e)	54e-3	MO-605023
03-054(e)	54e-4	MO-605022
C-03-006	06-1	MO-604990
C-03-006	06-2	MO-604991
C-03-006	06-3	MO-604992
C-03-006	06-4	MO-604993
C-03-006	06-5	MO-604994
TA-35		
35-016(g)	16g-1	MO-604933
35-016(g)	16g-2	MO-604934
35-016(g)	16g-3	MO-604935
35-016(g)	16g-4	MO-604936
35-016(g)	16g-5	MO-604937
35-016(h)	16h-1	MO-605135
35-016(h)	16h-2	MO-605134
35-016(h)	16h-3	MO-605133
35-016(h)	16h-4	MO-605136
35-016(h)	16h-5	MO-605515
35-016(h)	16h-6	MO-605516
35-016(h)	16h-7	MO-605517
35-016(h)	16h-8	MO-605518
35-016(h)	16h-9	MO-605519
35-016(h)	16h-10	MO-605520
TA-42		
42-001(a)-99	1a-1	MO-605049
42-001(a)-99	1a-2	MO-605050
42-001(a)-99	1a-3	MO-605051
42-001(a)-99	1a-4	MO-605052
42-001(a)-99	1a-5 (ha)	MO-605288
42-001(a)-99	1a-5 (rig)	MO-605053
42-001(a)-99	1a-6	MO-605054
42-001(a)-99	1a-7	MO-605055

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
42-001(a)-99	1a-8	MO-605067
42-001(a)-99	1a-9	MO-605056
42-001(a)-99	1a-10	MO-605057
42-001(a)-99	1a-11	MO-605058
42-001(a)-99	1a-12	MO-605059
42-001(a)-99	1a-13	MO-605060
42-001(a)-99	1a-14	MO-605061
42-001(a)-99	1a-15	MO-605068
42-001(a)-99	1a-16	MO-605062
42-001(a)-99	1a-17	MO-605063
42-001(a)-99	1a-18	MO-605064
42-001(a)-99	1a-19	MO-605065
42-001(a)-99	1a-20	MO-605066
42-001(a)-99	1a-21	MO-605069
42-001(a)-99	1a-22	MO-605070
42-001(a)-99	1a-23	MO-605071
42-001(a)-99	1a-24	MO-605072
42-001(a)-99	1a-25	MO-605073
42-001(a)-99	1a-26	MO-605074
42-001(a)-99	1a-27	MO-605075
TA-48		
48-001	1-1	MO-604938
48-001	1-2	MO-604939
48-001	1-3	MO-604940
48-001	1-4	MO-604941
48-001	1-5	MO-604942
48-001	1-6	MO-604943
48-001	1-7	MO-604944
48-001	1-8	MO-604945
48-001	1-9	MO-604946
48-002(a and b)	2a-1	MO-604920
48-002(a and b)	2a-2	MO-604923
48-002(a and b)	2a-3	MO-604924
48-002(a and b)	2a-4	MO-604921
48-002(a and b)	2a-5	MO-604925
48-002(a and b)	2a-6	MO-604926
48-002(a and b)	2a-7	MO-604927
48-002(a and b)	2a-8	MO-604928
48-002(a and b)	2a-9	MO-604929

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
48-002(a and b)	2a-10	MO-604930
48-002(a and b)	2a-11	MO-604931
48-002(a and b)	2a-12	MO-604932
48-002(a and b)	2a-13	MO-604922
48-002(e)	2e-1	MO-605140
48-002(e)	2e-2	MO-605139
48-002(e)	2e-3	MO-605138
48-002(e)	2e-4	MO-605137
48-002(e)	2e-5	MO-605141
48-003	3-1	MO-605153
48-003	3-2	MO-605154
48-003	3-3	MO-605142
48-003	3-4	MO-605143
48-003	3-5	MO-605155
48-003	3-6	MO-605144
48-003	3-7	MO-605145
48-003	3-8	MO-605146
48-003	3-9	MO-605147
48-003	3-10	MO-605148
48-003	3-11	MO-605149
48-003	3-12	MO-605150
48-003	3-13	MO-605156
48-003	3-14	MO-605157
48-003	3-15	MO-605158
48-003	3-16	MO-605159
48-003	3-17	MO-605160
48-003	3-18	MO-605151
48-003	3-19	MO-605152
48-005	5-1	MO-605128
48-005	5-2	MO-605131
48-005	5-3	MO-605129
48-005	5-4	MO-605132
48-005	5-5	MO-605130
48-007(a)-00	7a-1	MO-605120
48-007(a)-00	7a-2	MO-605118
48-007(a)-00	7a-3	MO-605121
48-007(a)-00	7a-4	MO-605122
48-007(a)-00	7a-5	MO-605119
48-007(a)-00	7a-6	MO-605123

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
48-007(a)-00	7a-7	MO-605124
48-007(a)-00	7a-8	MO-605125
48-007(a)-00	7a-9	MO-605126
48-007(a)-00	7a-10	MO-605127
48-007(b)	7b-1	MO-605110
48-007(b)	7b-2	MO-605111
48-007(b)	7b-3	MO-605114
48-007(b)	7b-4	MO-605115
48-007(b)	7b-5	MO-605112
48-007(b)	7b-6	M0-605116
48-007(b)	7b-7	MO-605113
48-007(b)	7b-8	M0-605117
48-007(c)	7c-1	MO-605161
48-007(c)	7c-2	MO-605162
48-007(c)	7c-3	MO-605163
48-007(c)	7c-4	MO-605164
48-007(c)	7c-5	MO-605165
48-007(c)	7c-6	MO-605166
48-007(f)	7f-1	MO-605097
48-007(f)	7f-2	MO-605101
48-007(f)	7f-3	MO-605098
48-007(f)	7f-4	MO-605102
48-007(f)	7f-5	MO-605099
48-007(f)	7f-6	MO-605103
48-007(f)	7f-7	MO-605100
48-007(f)	7f-8	MO-605104
48-011	11-1	MO-605351
48-012	12-1	MO-605089
48-012	12-2	MO-605090
48-012	12-3	MO-605091
48-012	12-4	MO-605092
TA-50		
50-002(d)	2d-1	MO-605535
50-002(d)	2d-2	MO-605536
50-002(d)	2d-3	MO-605537
50-002(d)	2d-4	MO-605538
50-004(a)-00	4a-1	MO-605625
50-004(a)-00	4a-2	MO-605626
50-004(a)-00	4a-3	MO-605627

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
50-004(a)-00	4a-4	MO-605628
50-004(a)-00	4a-5	MO-605106
50-004(a)-00	4a-6	not collected
50-004(a)-00	4a-7	MO-605108
50-004(a)-00	4a-8	MO-605109
50-004(a)-00	4a-9	MO-605457
50-004(a)-00	4a-10	MO-605458
50-004(a)-00	4a-11	MO-605473
50-004(a)-00	4a-12	not collected
50-004(a)-00	4a-13	MO-605459
50-004(a)-00	4a-14	MO-605460
50-004(a)-00	4a-15	not collected
50-004(a)-00	4a-16	MO-605462
50-004(a)-00	4a-17	not collected
50-004(a)-00	4a-18	MO-605464
50-004(a)-00	4a-19	not collected
50-004(a)-00	4a-20	MO-605466
50-004(a)-00	4a-21	MO-605475
50-004(a)-00	4a-22	MO-605467
50-004(a)-00	4a-23	MO-605476
50-004(a)-00	4a-24	MO-605468
50-004(a)-00	4a-25	MO-605469
50-004(a)-00	4a-26	MO-605470
50-004(a)-00	4a-27	MO-605463
50-004(a)-00	4a-28	MO-605471
50-004(a)-00	4a-29	MO-605477
50-004(a)-00	4a-30	not collected
50-004(a)-00	4a-31	not collected
50-004(a)-00	4a-32	not collected
50-004(a)-00	4a-33	not collected
50-004(a)-00	4a-34	MO-605472
50-004(a)-00	4a-35	MO-605478
50-004(a)-00	4a-36	MO-605479
50-006(a)	6a-1	MO-605076
50-006(a)	6a-2	MO-605077
50-006(a)	6a-3	MO-605078
50-006(d)	6d-1	MO-605083
50-006(d)	6d-2	MO-605086
50-006(d)	6d-3	MO-605087

Table 1.4-3 (continued)

SWMU or AOC	Proposed Location	Location ID
50-006(d)	6d-4	MO-605084
50-006(d)	6d-5	MO-605088
50-006(d)	6d-6	MO-605085
50-006(d)	6d-7	MO-605506
50-006(d)	6d-8	MO-605507
50-006(d)	6d-9	MO-605508
50-006(d)	6d-10	MO-605509
50-006(d)	6d-11	MO-605503
50-006(d)	6d-12	MO-605504
50-006(d)	6d-14	MO-605511
50-006(d)	6d-15	MO-605505
50-006(d)	6d-16	MO-605512
50-006(d)	6d-17	MO-605513

Table 1.6-1
Soil Screening Levels and Screening Action Levels
for COPCs in Upper Mortandad Canyon Aggregate Area

Analyte Name	Industrial Risk	Residential Risk	Construction Worker Risk
Inorganic Chemicals (mg/kg)			
Antimony	454	31.3	n/a*
Barium	224000	15600	n/a
Cadmium	1120	77.9	n/a
Chromium	14000	2800	14000
Copper	45400	3130	n/a
Cyanide (Total)	22700	1560	n/a
Fluoride	68100	4690	18600
Iron	795000	54800	n/a
Lead	800	400	n/a
Manganese	145000	10700	n/a
Nitrate	1820000	125000	496000
Perchlorate	795	54.8	217
Selenium	5680	391	1550
Thallium	74.9	5.16	n/a
Zinc	341000	23500	92900
Organic Chemicals (mg/kg)			
Acenaphthene	36700	3440	18600
Acetone	851000	67500	n/a
Anthracene	183000	17200	66800
Aroclor-1254	1.12	1.12	4.36
Aroclor-1260	8.26	1.7	75.8
Benzo(a)anthracene	23.4	4.81	213
Benzo(a)pyrene	2.34	0.481	21.3
Benzo(b)fluoranthene	23.4	4.81	213
Benzo(g,h,i)perylene	18300	1720	6680
Benzo(k)fluoranthene	234	48.1	2060
Benzoic Acid	2500000	240000	n/a
Bis(2-ethylhexyl)phthalate	1370	280	4760
Butanone[2-]	369000	39600	n/a
Carbazole	15000	1500	n/a
Chrysene	2340	481	20600
Dibenz(a,h)anthracene	2.34	0.481	21.3
Dibenzofuran	1620	142	552
Diethyl phthalate	547000	48900	191000
Dimethylphenol[2,4-]	13700	1220	4760

Table 1.6-1 (continued)

Analyte Name	Industrial Risk	Residential Risk	Construction Worker Risk
Di-n-butylphthalate	68400	6110	23800
Fluoranthene	24400	2290	8910
Fluorene	24400	2290	8910
Indeno(1,2,3-cd)pyrene	23.4	4.81	213
Isopropyltoluene[4-]	14900	3210	n/a
Methylene Chloride	1090	199	n/a
Methylnaphthalene[2-]	4100	310	12400
Methylphenol[2-]	31000	3100	155000
Methylphenol[4-]	3100	310	15500
Naphthalene	252	45	702
Phenanthrene	20500	1830	7150
Pyrene	18300	1720	6680
2,3,7,8-TCDD equivalent	20400	414000	28400
Toluene	57900	5570	n/a
Trichloroethane[1,1,2-]	94.3	17.2	n/a
Trichlorofluoromethane	6760	2010	n/a
Trimethylbenzene[1,2,4-]	280	67	n/a
Radionuclides (pCi/g)			
Americium-241	180	30	34
Cesium-137	23	5.6	18
Cobalt-60	5.1	1.3	4.1
Plutonium-238	240	37	40
Plutonium-239/240	210	33	36
Thorium-232	5	15	15
Tritium	440000	750	320000
Uranium-234	1500	170	n/a
Uranium-235/236	87	17	n/a
Uranium-238	430	86	n/a

*n/a = Not applicable.

Table 2.4-1
Samples Collected and Analyses Requested at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-97-0275	03-03301	1.25–1.50	SOIL	—*	—	—	—	—	—	3415R	—	—	3414R	—	—
0103-97-0279	03-03302	1.17–1.50	SOIL	—	—	—	—	—	—	3415R	—	—	3414R	—	—
0103-97-0280	03-03303	1.17–1.50	SOIL	—	—	—	—	—	—	3415R	—	—	3414R	—	—
0103-97-0278	03-03304	0.33–1.42	SOIL	—	—	—	—	—	—	3415R	—	—	3414R	—	—
0103-97-0277	03-03305	1.17–1.42	SOIL	—	—	—	—	—	—	3415R	—	—	3414R	3414R	—
CAMO-09-6261	MO-605042	0.50–1.50	FILL	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	—	09-2225
CAMO-09-6262	MO-605042	1.50–2.50	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6263	MO-605042	6.50–7.50	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6264	MO-605043	0.50–1.00	FILL	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	—	09-2225
CAMO-09-6265	MO-605043	4.00–5.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6266	MO-605043	9.00–10.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6267	MO-605044	0.50–1.00	FILL	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	—	09-2225
CAMO-09-6268	MO-605044	1.00–2.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6269	MO-605044	6.00–7.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6270	MO-605045	0.50–1.00	FILL	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	—	09-2225
CAMO-09-6272	MO-605045	1.00–2.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6271	MO-605045	6.00–7.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6273	MO-605046	0.50–1.00	FILL	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6274	MO-605046	1.00–2.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6275	MO-605046	6.00–7.00	QBT4	09-2225	—	09-2226	09-2226	09-2226	09-2226	09-2225	—	09-2225	09-2223	09-2223	09-2225
CAMO-09-6276	MO-605047	0.50–1.00	FILL	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	—	09-2225
CAMO-09-6277	MO-605047	1.00–2.00	QBT4	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	09-2223	09-2225
CAMO-09-6278	MO-605047	6.00–7.00	QBT4	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	09-2223	09-2225
CAMO-09-6279	MO-605048	0.50–1.00	FILL	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	—	09-2225
CAMO-09-6280	MO-605048	1.00–2.00	QBT4	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	09-2223	09-2225
CAMO-09-6281	MO-605048	6.00–7.50	QBT4	09-2225	09-2224	09-2226	09-2226	09-2226	09-2226	09-2225	09-2223	09-2225	09-2223	09-2223	09-2225

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.4-2
Inorganic Chemicals above BVs at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium
SOIL,FILL Background Value[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**39.6**
QBT4 Background Value[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**1**	**17**
0103-97-0275	03-03301	1.25–1.50	SOIL	—[c]	6.6 (UJ)	—	—	0.55 (U)	—	—	—	—	—	—	—	—	—	NA[d]	NA	—	1.9 (U)	—
0103-97-0279	03-03302	1.17–1.50	SOIL	—	5.7 (UJ)	—	—	0.47 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	1.7 (U)	—
0103-97-0280	03-03303	1.17–1.50	SOIL	—	7.1 (UJ)	—	—	0.59 (U)	13900	—	—	—	—	—	—	—	—	NA	NA	—	2.1 (U)	—
0103-97-0278	03-03304	0.33–1.42	SOIL	—	6.9 (UJ)	—	—	0.57 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	2 (U)	—
0103-97-0277	03-03305	1.17–1.42	SOIL	—	6.6 (UJ)	—	—	0.55 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	1.9 (U)	—
CAMO-09-6261	MO-605042	0.50–1.50	FILL	—	1.09 (U)	—	—	0.546 (U)	—	—	—	—	—	—	—	—	—	0.773 (J-)	—	—	—	—
CAMO-09-6262	MO-605042	1.50–2.50	QBT4	—	1.16 (U)	—	—	—	—	7.55 (U)	—	—	—	—	—	—	—	0.763 (J-)	—	1.14 (U)	—	—
CAMO-09-6263	MO-605042	6.50–7.50	QBT4	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.97 (J-)	—	1.11 (U)	—	—
CAMO-09-6264	MO-605043	0.50–1.00	FILL	—	1.02 (U)	—	—	0.508 (U)	—	—	—	—	—	—	—	—	—	2.37 (J-)	—	—	—	—
CAMO-09-6265	MO-605043	4.00–5.00	QBT4	—	1.17 (U)	—	1.25	—	—	9.86 (U)	—	—	14700	—	—	—	—	2.36 (J-)	0.000637 (J)	1.19 (U)	—	—
CAMO-09-6266	MO-605043	9.00–10.00	QBT4	—	1.12 (U)	—	—	—	—	7.33 (U)	—	—	—	—	—	—	—	1.2 (J-)	—	1.12 (U)	—	—
CAMO-09-6267	MO-605044	0.50–1.00	FILL	—	1.07 (U)	—	—	0.535 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6268	MO-605044	1.00–2.00	QBT4	—	1.16 (U)	—	—	—	—	8.61 (U)	—	—	—	—	—	—	—	0.84 (J-)	—	1.13 (U)	—	—
CAMO-09-6269	MO-605044	6.00–7.00	QBT4	—	1.07 (U)	—	—	—	—	8.25 (U)	—	—	—	—	—	—	—	0.945 (J-)	—	1.11 (U)	—	—
CAMO-09-6270	MO-605045	0.50–1.00	FILL	—	1.03 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6272	MO-605045	1.00–2.00	QBT4	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.12 (U)	—	—
CAMO-09-6271	MO-605045	6.00–7.00	QBT4	—	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.08 (U)	—	—
CAMO-09-6273	MO-605046	0.50–1.00	FILL	—	1.07 (U)	—	—	0.534 (U)	—	—	—	—	—	—	—	—	—	0.85 (J-)	—	—	—	—
CAMO-09-6274	MO-605046	1.00–2.00	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.01 (J-)	—	1.07 (U)	—	—
CAMO-09-6275	MO-605046	6.00–7.00	QBT4	—	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.995 (J-)	—	1.09 (U)	—	—
CAMO-09-6276	MO-605047	0.50–1.00	FILL	—	1.07 (U)	—	—	0.537 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6277	MO-605047	1.00–2.00	QBT4	20200 (J)	0.755 (J)	52.3 (J+)	—	—	4990 (J)	11.8 (U)	—	8.22	17200	—	4090 (J)	—	—	1.31	—	1.2 (UJ)	—	19.4
CAMO-09-6278	MO-605047	6.00–7.00	QBT4	—	1.12 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.18 (J-)	—	1.07 (U)	—	—
CAMO-09-6279	MO-605048	0.50–1.00	FILL	—	1.04 (U)	—	—	0.522 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6280	MO-605048	1.00–2.00	QBT4	21700	1.28 (U)	121 (J)	3.17	—	4070 (J+)	8.32 (U)	4.83	16.6	—	17.8	2870 (J+)	599	12.9 (U)	0.932 (J-)	—	1.28 (U)	—	—
CAMO-09-6281	MO-605048	6.00–7.50	QBT4	—	1.04 (U)	—	—	—	—	48.2	—	—	—	—	—	—	—	—	—	1.08 (U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.4-3
Organic Chemicals Detected at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)
0103-97-0280	03-03303	1.17–1.50	SOIL	NA[a]	0.09 (J)	0.09 (J)	0.1 (J)	NA	NA	NA	NA	NA
CAMO-09-6273	MO-605046	0.50–1.00	FILL	—[b]	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6276	MO-605047	0.50–1.00	FILL	NA	—	—	—	0.00000107 (J)	0.00000234	0.00000108 (J)	0.00000182	0.000000266
CAMO-09-6277	MO-605047	1.00–2.00	QBT4	0.00237 (J)	—	—	—	—	—	—	—	—
CAMO-09-6278	MO-605047	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6279	MO-605048	0.50–1.00	FILL	NA	—	—	—	0.00000126 (J)	0.00000281	0.000000478 (J)	0.00000096	—
CAMO-09-6280	MO-605048	1.00–2.00	QBT4	—	—	—	—	—	—	0.000000252 (J)	0.000000252	—

Table 2.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Toluene	Trichloroethene
0103-97-0280	03-03303	1.17–1.50	SOIL	NA	NA	NA	NA	0.083 (J)	0.12 (J)	NA	NA
CAMO-09-6273	MO-605046	0.50–1.00	FILL	NA	NA	NA	NA	—	—	0.000353 (J)	0.0425
CAMO-09-6276	MO-605047	0.50–1.00	FILL	—	0.0000052	0.0000007 (J)	—	—	—	NA	NA
CAMO-09-6277	MO-605047	1.00–2.00	QBT4	—	0.00000171 (J)	—	—	—	—	—	—
CAMO-09-6278	MO-605047	6.00–7.00	QBT4	—	0.000000449 (J)	—	—	—	—	—	—
CAMO-09-6279	MO-605048	0.50–1.00	FILL	0.000000437	—	0.000000571 (J)	0.000000192	—	—	NA	NA
CAMO-09-6280	MO-605048	1.00–2.00	QBT4	—	0.00000149 (J)	—	—	—	—	—	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 2.4-4
Radionuclides Detected or Detected above BVs/FVs at AOC 03-004(c)

Sample ID	Location ID	Depth (ft)	Media	Tritium
SOIL,FILL Background Value[a]				**na[b]**
QBT4 Background Value[a]				**na**
CAMO-09-6264	MO-605043	0.50–1.00	FILL	0.042839
CAMO-09-6265	MO-605043	4.00–5.00	QBT4	0.221675
CAMO-09-6266	MO-605043	9.00–10.00	QBT4	0.0682925
CAMO-09-6277	MO-605047	1.00–2.00	QBT4	0.0508458
CAMO-09-6278	MO-605047	6.00–7.00	QBT4	0.0939529

Note: Results are in pCi/g.

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

[b] na = Not available.

Table 2.5-1
Samples Collected and Analyses Requested at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotipic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-97-0261	03-03294	0.00–1.00	FILL	—*	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0351	03-03294	0.00–1.00	FILL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0262	03-03294	3.00–4.00	FILL	—	—	—	—	—	—	3413R	—	—	3412R	3412R	—
0103-97-0263	03-03295	0.25–1.25	FILL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0352	03-03295	0.25–1.25	FILL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0264	03-03296	0.00–1.00	FILL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0353	03-03296	0.00–1.00	FILL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0265	03-03296	3.00–4.00	FILL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0268	03-03297	0.25–0.50	SOIL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0356	03-03297	0.25–0.50	SOIL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0266	03-03298	0.00–0.83	SOIL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0354	03-03298	0.00–0.83	SOIL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0267	03-03299	0.00–0.50	SOIL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0355	03-03299	0.00–0.50	SOIL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
0103-97-0269	03-03300	0.00–0.83	SOIL	—	—	—	—	—	—	3413R	—	—	3412R	—	—
0103-97-0357	03-03300	0.00–0.83	SOIL	—	—	3731R	—	3731R	3731R	—	—	—	—	—	—
CAMO-09-6230	MO-605035	0.50–1.50	FILL	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	—	09-2212
CAMO-09-6231	MO-605035	2.50–4.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6232	MO-605035	7.50–8.50	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6233	MO-605036	0.50–1.00	FILL	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	—	09-2212
CAMO-09-6234	MO-605036	1.00–2.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6235	MO-605036	6.00–7.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6236	MO-605037	0.50–1.00	FILL	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	—	09-2212
CAMO-09-6237	MO-605037	1.00–2.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6238	MO-605037	6.00–7.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6239	MO-605038	0.50–1.00	FILL	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	—	09-2212
CAMO-09-6240	MO-605038	1.00–2.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6241	MO-605038	6.00–7.00	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6242	MO-605039	0.50–1.50	FILL	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	—	09-2212
CAMO-09-6243	MO-605039	1.50–2.50	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212
CAMO-09-6244	MO-605039	6.50–7.50	QBT4	09-2212	—	09-2213	09-2213	09-2213	09-2213	09-2212	—	09-2212	09-2210	09-2210	09-2212

Table 2.5-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6245	MO-605040	0.50–1.50	FILL	09-2212	09-2211	09-2213	09-2213	09-2213	09-2213	09-2212	09-2210	09-2212	09-2210	—	09-2212
CAMO-09-6246	MO-605040	1.50–2.50	QBT4	09-2212	09-2211	09-2213	09-2213	09-2213	09-2213	09-2212	09-2210	09-2212	09-2210	09-2210	09-2212
CAMO-09-6247	MO-605040	6.50–7.50	QBT4	09-2212	09-2211	09-2213	09-2213	09-2213	09-2213	09-2212	09-2210	09-2212	09-2210	09-2210	09-2212
CAMO-09-6248	MO-605041	0.50–1.50	FILL	09-2174	09-2173	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174
CAMO-09-6249	MO-605041	1.50–2.50	QBT4	09-2174	09-2173	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174	09-2174
CAMO-09-6250	MO-605041	6.50–7.50	QBT4	09-2212	09-2211	09-2213	09-2213	09-2213	09-2213	09-2212	09-2210	09-2212	09-2210	09-2210	09-2212

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.5-2
Inorganic Chemicals above BVs at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Calcium	Chromium	Lead	Nickel	Nitrate	Selenium	Silver	Thallium	Zinc
SOIL,FILL Background Value[a]				**0.83**	**1.83**	**0.4**	**6120**	**19.3**	**22.3**	**15.4**	**na[b]**	**1.52**	**1**	**0.73**	**48.8**
QBT4 Background Value[a]				**0.5**	**1.21**	**1.63**	**2200**	**7.14**	**11.2**	**6.58**	**na**	**0.3**	**1**	**1.1**	**63.5**
0103-97-0261	03-03294	0.00–1.00	FILL	7.7 (U)	—[c]	0.74 (J)	7840	33	56.6	—	NA[d]	—	1.3 (J)	—	211 (J-)
0103-97-0262	03-03294	3.00–4.00	FILL	8.2 (U)	—	0.92 (J)	—	—	—	—	NA	—	—	—	—
0103-97-0263	03-03295	0.25–1.25	FILL	8.1 (U)	—	0.7 (U)	—	—	—	—	NA	—	—	2 (U)	—
0103-97-0264	03-03296	0.00–1.00	FILL	7.5 (U)	—	0.65 (U)	—	—	—	—	NA	—	—	—	51.2 (J-)
0103-97-0265	03-03296	3.00–4.00	FILL	8.2 (U)	—	0.71 (U)	—	—	—	—	NA	—	—	—	—
0103-97-0268	03-03297	0.25–0.50	SOIL	8.1 (U)	—	0.7 (U)	—	—	—	—	NA	—	—	2.1 (U)	—
0103-97-0266	03-03298	0.00–0.83	SOIL	7.1 (U)	—	0.61 (U)	—	—	—	—	NA	—	—	1.9 (U)	—
0103-97-0267	03-03299	0.00–0.50	SOIL	7.8 (U)	—	0.67 (U)	—	—	—	—	NA	—	—	1.8 (U)	—
0103-97-0269	03-03300	0.00–0.83	SOIL	7.6 (U)	—	0.85 (J)	—	—	—	—	NA	—	—	1.9 (U)	—
CAMO-09-6230	MO-605035	0.50–1.50	FILL	1.14 (U)	—	0.572 (U)	—	—	—	—	0.706 (J-)	—	—	—	—
CAMO-09-6231	MO-605035	2.50–4.00	QBT4	—	—	—	—	—	—	—	0.728 (J-)	1.16 (U)	—	—	—
CAMO-09-6232	MO-605035	7.50–8.50	QBT4	1.11 (U)	—	—	—	—	—	—	0.721 (J-)	0.571 (J)	—	—	—
CAMO-09-6233	MO-605036	0.50–1.00	FILL	1.44	—	0.56 (U)	11700	—	25.7	—	0.74 (J-)	—	—	—	55.7
CAMO-09-6234	MO-605036	1.00–2.00	QBT4	1.18 (U)	—	—	—	—	—	—	0.799 (J-)	1.18 (U)	—	—	—
CAMO-09-6235	MO-605036	6.00–7.00	QBT4	—	—	—	—	—	—	—	0.894 (J-)	1.11 (U)	—	—	—
CAMO-09-6236	MO-605037	0.50–1.00	FILL	1.02 (J)	—	0.577 (U)	—	—	—	—	0.661 (J-)	—	—	—	—
CAMO-09-6237	MO-605037	1.00–2.00	QBT4	1.15 (U)	—	—	—	—	—	—	0.664 (J-)	1.15 (U)	—	—	—
CAMO-09-6238	MO-605037	6.00–7.00	QBT4	0.574 (J)	—	—	—	—	—	—	0.71 (J-)	1.12 (U)	—	—	—
CAMO-09-6239	MO-605038	0.50–1.00	FILL	—	—	0.554 (U)	—	—	—	—	0.717 (J-)	—	—	—	50.6
CAMO-09-6240	MO-605038	1.00–2.00	QBT4	0.695 (J)	—	—	—	—	—	—	0.8 (J-)	1.14 (U)	—	—	—
CAMO-09-6241	MO-605038	6.00–7.00	QBT4	0.742 (J)	—	—	—	—	—	—	0.692 (J-)	0.764 (J)	—	—	—
CAMO-09-6242	MO-605039	0.50–1.50	FILL	1.16 (U)	—	0.578 (U)	—	—	—	—	0.732 (J-)	—	—	—	—
CAMO-09-6243	MO-605039	1.50–2.50	QBT4	0.655 (J)	—	—	—	—	—	—	0.649 (J-)	0.653 (J)	—	—	—
CAMO-09-6244	MO-605039	6.50–7.50	QBT4	0.631 (J)	—	—	—	—	—	—	0.748 (J-)	0.575 (J)	—	—	—
CAMO-09-6245	MO-605040	0.50–1.50	FILL	1.12 (U)	—	0.558 (U)	—	—	—	—	0.633 (J-)	—	—	—	52.9
CAMO-09-6246	MO-605040	1.50–2.50	QBT4	1.22 (U)	—	—	—	—	—	—	0.701 (J-)	1.18 (U)	—	—	—
CAMO-09-6247	MO-605040	6.50–7.50	QBT4	1.07 (U)	—	—	—	—	—	—	0.669 (J-)	1.07 (U)	—	—	—
CAMO-09-6248	MO-605041	0.50–1.50	FILL	1.17 (U)	—	0.585 (U)	—	22.4	—	—	1.18	—	—	—	—
CAMO-09-6249	MO-605041	1.50–2.50	QBT4	1.11 (U)	—	—	—	25.5	—	6.66 (J+)	1.31	1.11 (U)	—	—	—
CAMO-09-6250	MO-605041	6.50–7.50	QBT4	1.18 (U)	2.14	—	—	9.81 (J)	—	—	1.05 (J-)	1.14 (U)	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 2.5-3
Organic Chemicals Detected at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1254	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Carbazole	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
0103-97-0264	03-03296	0.00–1.00	FILL	0.051 (J)	NA[a]	0.21 (J)	0.18 (J)	0.23 (J)	0.095 (J)	0.1 (J)	—[b]	0.055 (J)	0.23 (J)	0.51	NA	NA
0103-97-0266	03-03298	0.00–0.83	SOIL	—	NA	—	—	—	—	—	—	—	—	—	NA	NA
0103-97-0267	03-03299	0.00–0.50	SOIL	—	NA	—	—	—	—	—	—	—	—	—	NA	NA
CAMO-09-6239	MO-605038	0.50–1.00	FILL	—	NA	—	—	—	—	—	—	NA	—	0.0159 (J)	NA	NA
CAMO-09-6245	MO-605040	0.50–1.50	FILL	—	0.0177 (J)	—	—	—	—	—	—	NA	—	—	0.0000139	0.0000254
CAMO-09-6246	MO-605040	1.50–2.50	QBT4	—	0.0021 (J)	—	—	—	—	—	—	NA	—	—	0.00000131 (J)	0.0000024
CAMO-09-6247	MO-605040	6.50–7.50	QBT4	—	—	—	—	—	—	—	—	NA	—	—	—	—
CAMO-09-6248	MO-605041	0.50–1.50	FILL	—	—	—	—	—	—	—	0.292 (J)	NA	—	—	0.00000207 (J)	0.00000399
CAMO-09-6249	MO-605041	1.50–2.50	QBT4	—	—	0.0165 (J)	0.0149 (J)	0.0298 (J)	—	—	0.292 (J)	NA	0.0171 (J)	0.0379 (J)	0.00000226 (J)	0.00000455
CAMO-09-6250	MO-605041	6.50–7.50	QBT4	—	—	—	—	—	—	—	—	NA	—	—	0.00000241 (J)	0.00000479

Table 2.5-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
0103-97-0264	03-03296	0.00–1.00	FILL	NA	NA	NA	NA	0.11 (J)	NA	NA	NA	NA	0.27 (J)	0.4	NA	NA
0103-97-0266	03-03298	0.00–0.83	SOIL	NA	NA	NA	NA	—	NA	NA	NA	NA	—	0.046 (J)	NA	NA
0103-97-0267	03-03299	0.00–0.50	SOIL	NA	NA	NA	NA	—	NA	NA	NA	NA	—	0.044 (J)	NA	NA
CAMO-09-6239	MO-605038	0.50–1.00	FILL	NA	NA	NA	NA	—	NA	NA	NA	NA	—	0.0155 (J)	NA	NA
CAMO-09-6245	MO-605040	0.50–1.50	FILL	0.00000132 (J)	0.00000412	0.00000197	0.00000222	—	0.00016	0.00000273 (J)	0.000000229 (J)	0.0000016	—	—	0.0000002	0.000000445
CAMO-09-6246	MO-605040	1.50–2.50	QBT4	0.000000176 (J)	0.000000426	—	—	—	0.0000128	0.000000359 (J)	—	—	—	—	—	—
CAMO-09-6247	MO-605040	6.50–7.50	QBT4	—	—	—	—	—	0.00000105 (J)	—	—	—	—	—	—	—
CAMO-09-6248	MO-605041	0.50–1.50	FILL	0.000000462 (J)	0.000000938	—	0.000000355	—	0.0000138	0.000000776 (J)	—	0.000000191	—	—	—	0.000000355
CAMO-09-6249	MO-605041	1.50–2.50	QBT4	0.000000569 (J)	0.00000109	—	0.000000424	—	0.0000149	0.000000753 (J)	—	0.000000487	—	0.0278 (J)	—	0.000000261
CAMO-09-6250	MO-605041	6.50–7.50	QBT4	0.000000689 (J)	0.0000013	—	0.00000033	—	0.0000259	0.00000122 (J)	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] NA = Not Analyzed
[b] — = Not detected.

Table 2.5-4
Radionuclides Detected or Detected above BVs/FVs at AOC 03-004(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium
SED Background Value[a]				**0.9**	**0.006**	**0.068**	**0.093**
SOIL,FILL Background Value[a]				**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**
0103-97-0351	03-03294	0.00–1.00	FILL	—[d]	0.077	0.072	NA[e]
0103-97-0352	03-03295	0.25–1.25	FILL	—	—	0.089	NA
0103-97-0353	03-03296	0.00–1.00	FILL	—	0.039	0.084	NA
0103-97-0354	03-03298	0.00–0.83	SOIL	—	0.035	0.058	NA
CAMO-09-6231	MO-605035	2.50–4.00	QBT4	—	—	—	0.12548
CAMO-09-6233	MO-605036	0.50–1.00	FILL	—	0.0458	—	—
CAMO-09-6240	MO-605038	1.00–2.00	QBT4	—	—	—	0.0508967
CAMO-09-6242	MO-605039	0.50–1.50	FILL	—	0.105	0.0373	—
CAMO-09-6249	MO-605041	1.50–2.50	QBT4	0.0691	—	—	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

[e] NA = Not Analyzed.

Table 2.6-1
Samples Collected and Analyses Requested at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-97-0221	03-03311	0.00–1.00	FILL	—*	—	—	—	3409R	—	3411R	—	3410R	—	—	3408R	3408R	—
0103-97-0222	03-03312	0.00–1.00	FILL	—	—	—	—	3409R	—	3411R	—	3410R	—	—	3408R	—	—
0103-97-0223	03-03313	0.00–1.00	FILL	—	—	3426R	—	3409R	—	3411R	—	3410R	—	—	3408R	—	—
0103-97-0224	03-03314	0.00–1.00	FILL	—	—	—	—	3409R	—	3411R	—	3410R	—	—	3408R	3408R	—
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	09-2327	09-2325	09-2327	09-2328	09-2326	09-2328	09-2328	09-2328	09-2327	—	09-2327	09-2326	09-2326	09-2327
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	09-2458	09-2456	09-2458	09-2458	09-2457	09-2458	09-2458	09-2458	09-2458	—	09-2458	09-2457	09-2457	09-2458
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	09-2327	09-2325	09-2327	09-2328	09-2326	09-2328	09-2328	09-2328	09-2327	—	09-2327	09-2326	09-2326	09-2327
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	09-2327	09-2325	09-2327	09-2328	09-2326	09-2328	09-2328	09-2328	09-2327	—	09-2327	09-2326	09-2326	09-2327
CAMO-09-10461	MO-604996	8.00–9.50	QBT4	09-2458	09-2456	09-2458	09-2458	09-2457	09-2458	09-2458	09-2458	09-2458	—	09-2458	09-2457	09-2457	09-2458
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	09-2327	09-2325	09-2327	09-2328	09-2326	09-2328	09-2328	09-2328	09-2327	—	09-2327	09-2326	09-2326	09-2327
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	09-2327	09-2325	09-2327	09-2328	09-2326	09-2328	09-2328	09-2328	09-2327	—	09-2327	09-2326	09-2326	09-2327
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	09-2291	09-2299	09-2291	09-2291	09-2290	09-2291	09-2291	09-2291	09-2291	—	09-2291	09-2290	—	09-2291
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	09-2291	09-2299	09-2291	09-2291	09-2290	09-2291	09-2291	09-2291	09-2291	—	09-2291	09-2290	09-2290	09-2291
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	09-2291	09-2299	09-2291	09-2291	09-2290	09-2291	09-2291	09-2291	09-2291	—	09-2291	09-2290	09-2290	09-2291
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	09-2508	09-2507	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	—	09-2508	09-2508	09-2508	09-2508
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	—	09-2086
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-6108	MO-604999	2.75–3.75	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	09-2458	09-2456	09-2458	09-2458	09-2457	09-2458	09-2458	09-2458	09-2458	—	09-2458	09-2457	09-2457	09-2458
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	—	09-2086
CAMO-09-6110	MO-605000	1.00–2.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-6111	MO-605000	3.00–4.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	09-2437	09-2436	09-2437	09-2437	09-2437	09-2437	09-2437	09-2437	09-2437	—	09-2437	09-2437	09-2437	09-2437
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	—	09-2086
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-6114	MO-605001	2.50–3.50	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	—	09-2086	09-2085	09-2085	09-2086
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	09-2473	09-2472	09-2473	09-2473	09-2473	09-2473	09-2473	09-2473	09-2473	—	09-2473	09-2473	09-2473	09-2473
CAMO-09-6121	MO-605004	0.00–0.50	SED	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	—	09-2072
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	09-2071	09-2072
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	—	09-2072
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	09-2071	09-2072
CAMO-09-6125	MO-605006	0.00–0.50	SED	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	—	09-2072
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	09-2071	09-2072
CAMO-09-6127	MO-605007	0.00–0.50	SED	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	—	09-2072

Table 2.6-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	09-2071	09-2072
CAMO-09-6129	MO-605008	0.00–0.50	SED	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	—	09-2072
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	09-2072	09-2081	09-2072	09-2073	09-2071	09-2073	09-2073	09-2073	09-2072	—	09-2072	09-2071	09-2071	09-2072
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	—	09-2086
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	09-2085	09-2086
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	09-2085	09-2086
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	09-2437	09-2436	09-2437	09-2437	09-2437	09-2437	09-2437	09-2437	09-2437	—	09-2437	09-2437	09-2437	09-2437
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	—	09-2086
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	09-2085	09-2086
CAMO-09-7085	MO-605170	4.00–5.00	QBT4	09-2086	09-2084	09-2086	09-2087	09-2085	09-2087	09-2087	09-2087	09-2086	09-2085	09-2086	09-2085	09-2085	09-2086
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	09-2508	09-2507	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508	09-2508

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.6-2
Inorganic Chemicals above BVs at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**543**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**19.7**	**60.2**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
0103-97-0221	03-03311	0.00–1.00	FILL	—[c]	5.5 (UJ)	—	—	—	0.46 (U)	—	—	—	—	—	—	—	—	—	NA[d]	NA	—	1.6 (U)	—	—
0103-97-0222	03-03312	0.00–1.00	FILL	—	6.2 (UJ)	—	—	—	0.51 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	1.8 (U)	—	—
0103-97-0223	03-03313	0.00–1.00	FILL	—	6.1 (UJ)	—	—	—	0.88 (J)	—	—	—	—	—	—	—	—	—	NA	NA	—	1.8 (U)	—	—
0103-97-0224	03-03314	0.00–1.00	FILL	—	6.3 (UJ)	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	1.8 (U)	—	—
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	10600	1.11 (UJ)	3.1	92.6	—	—	2300	14.7	4.29 (J)	6.98	—	—	1960	—	8.83 (J-)	—	—	1.12 (UJ)	—	23.9	—
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—	0.724 (U)	2.83	110	1.99	—	—	—	4.02	—	—	11.7	—	945 (J-)	21.8 (J-)	—	0.000554 (J)	1.07 (U)	—	—	—
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	10200	1.11 (UJ)	3.03	261	1.75	—	3110	10.2	6.25 (J)	10.2	—	11.5 (J)	2230	502 (J+)	13.5 (J-)	2.12	—	1.12 (UJ)	—	24.4	—
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	13000	1.15 (UJ)	3.29	262	—	—	3880	13	18.8 (J)	12.9	15200	15.7 (J)	2540	1100 (J+)	12.9 (J-)	2	—	1.13 (UJ)	—	32.4	—
CAMO-09-10461	MO-604996	8.00–9.50	QBT4	—	0.747 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.66 (J-)	0.000746 (J)	1.13 (U)	—	—	—
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	12600	—	3	71.8	—	—	3090	11.7	—	8.4	—	—	2270	—	10.3 (J-)	2.88	—	1.12 (UJ)	—	22.9	—
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	12800	1.14 (UJ)	2.96	163	1.46	—	3960	12.9	5.55 (J)	11.7	15000	12.5 (J)	2740	—	19.2 (J-)	1.2	—	1.14 (UJ)	—	29.5	—
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	—	1.27 (UJ)	—	—	—	0.633 (U)	—	—	—	—	—	—	—	—	—	1.88	—	—	—	—	—
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	14800	0.504 (U)	4.12	130 (J-)	1.83	—	4170	13.3	6.33	13	15700	12.8	3070 (J+)	499 (J-)	15.5 (J+)	0.501 (J)	0.00164 (J)	1.13 (U)	—	29.1	—
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	18200	1.19 (UJ)	—	382 (J-)	2.13	—	5580	16.2	8.17	14	21200	15.8	3830 (J+)	1750 (J-)	22.7 (J+)	0.572 (J)	0.0115	0.828 (J)	—	34.9	—
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	1.05 (U)	—	—	—	—	—	17.3	—	—	—	14	—	—	—	—	0.0031	0.583 (J)	—	—	—
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	—	1.23 (UJ)	—	—	—	0.615 (U)	—	—	—	—	—	—	—	—	—	1.01 (J+)	—	—	—	—	—
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	16100	1.11 (UJ)	—	181 (J+)	—	—	2970 (J+)	12.8	4.14	8.15	16900	13.4	2740 (J+)	—	8.05	—	0.000633 (J)	1.11 (UJ)	—	26.4	—
CAMO-09-6108	MO-604999	2.75–3.75	QBT4	—	1.03 (UJ)	—	—	—	—	—	13	—	—	—	—	—	—	—	—	—	1.05 (UJ)	—	—	—
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	1.17 (U)	—	—	—	—	—	—	—	—	—	—	—	—	9.33 (J-)	—	0.00282	1.03 (U)	—	—	—
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	—	1.15 (UJ)	—	—	—	0.577 (U)	—	—	—	—	—	—	—	—	—	1.18 (J+)	—	—	—	—	—
CAMO-09-6110	MO-605000	1.00–2.00	QBT4	—	1.07 (UJ)	—	81.9 (J+)	—	—	2470 (J+)	12.5	—	—	—	—	—	—	—	—	—	1.09 (UJ)	—	—	—
CAMO-09-6111	MO-605000	3.00–4.00	QBT4	—	1.03 (UJ)	—	—	—	—	—	18	—	—	—	—	—	—	—	—	—	1.03 (UJ)	—	—	—
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	—	1.03 (U)	—	—	—	—	—	11.2	—	—	—	—	—	—	—	—	—	1.01 (U)	2.15	—	—
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	—	1.22 (UJ)	—	—	—	—	—	—	—	—	—	23.7	—	—	—	—	—	—	—	—	—
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	16600	1.1 (UJ)	—	215 (J+)	—	—	5020 (J+)	17.4	—	9.13	17100	14.1	2690 (J+)	—	7.85	—	0.00288	1.12 (UJ)	—	22.8	—
CAMO-09-6114	MO-605001	2.50–3.50	QBT4	9580	1.08 (UJ)	—	216 (J+)	—	—	9850 (J+)	22.9	—	5.02	—	14.7	2470 (J+)	—	—	—	0.0053	1.11 (UJ)	—	—	—
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	0.905 (U)	—	—	—	—	—	—	—	—	—	15.4	—	—	—	—	—	0.994 (U)	—	—	—
CAMO-09-6121	MO-605004	0.00–0.50	SED	—	1.26 (U)	—	—	—	0.628 (U)	—	16.7 (J)	—	—	—	—	—	—	—	0.985 (J)	—	1.21 (U)	—	—	—
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	—	1.04 (U)	4.04	87.4 (J-)	—	—	—	7.96 (J)	3.86 (J)	4.75 (J)	—	—	—	—	—	0.575 (J)	—	1.03 (U)	—	18.1	—
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	—	1.23 (U)	—	—	—	0.617 (U)	—	—	—	—	—	—	—	—	—	0.832 (J)	—	—	—	—	51.2 (J)
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	7960	1.03 (U)	3.49	105 (J-)	—	—	—	8.23 (J)	4.89 (J)	5.02 (J)	—	12.6 (J)	—	—	—	0.603 (J)	—	1.07 (U)	—	20.7	—
CAMO-09-6125	MO-605006	0.00–0.50	SED	—	1.16 (U)	—	—	—	0.578 (U)	—	12.5 (J)	—	—	—	—	—	—	—	0.756 (J)	—	1.14 (U)	—	—	—

Table 2.6-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**543**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**19.7**	**60.2**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	—	1.01 (U)	—	—	—	—	—	—	—	—	—	13.2 (J)	—	—	—	0.571 (J)	—	1.03 (U)	—	—	70.8 (J)
CAMO-09-6127	MO-605007	0.00–0.50	SED	—	1.1 (U)	—	—	—	0.549 (U)	—	—	—	—	—	—	—	—	—	0.656 (J)	—	1.09 (U)	—	—	—
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	—	1.02 (U)	—	—	—	—	—	19.1 (J)	—	—	—	—	—	—	—	0.604 (J)	—	1 (U)	—	—	—
CAMO-09-6129	MO-605008	0.00–0.50	SED	—	1.23 (U)	—	—	—	0.615 (U)	—	—	—	—	—	—	—	—	—	0.691 (J)	—	1.2 (U)	—	—	—
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	—	1.1 (U)	—	—	—	—	—	33.5 (J)	—	—	—	12.5 (J)	—	—	—	0.64 (J)	—	1.09 (U)	—	—	—
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	—	1.13 (UJ)	—	—	—	0.564 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	13700	1.16 (UJ)	3.14	111 (J+)	—	—	2950 (J+)	13.5	6.51	8.64	19000	18.2	2440 (J+)	484	9.28	—	0.00145 (J)	1.13 (UJ)	—	44.6	—
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	13600	1.15 (UJ)	2.93	271 (J+)	2.54	—	5350 (J+)	15.2	6.92	6.84	15800	—	2660 (J+)	—	21.9	—	0.00557	1.14 (UJ)	—	18.1	—
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	1.05 (U)	—	—	—	—	—	—	—	7.77	—	—	—	—	8.32 (J-)	2.56 (J-)	0.00193 (J)	1.05 (U)	3.75	—	—
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	—	1.22 (UJ)	—	—	—	0.608 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	64.6
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	11100	1.07 (UJ)	—	282 (J+)	—	—	3990 (J+)	22.4	—	5.02	15700	—	2300 (J+)	—	9.51	—	0.00382	1.09 (UJ)	—	—	—
CAMO-09-7085	MO-605170	4.00–5.00	QBT4	—	1.07 (UJ)	—	83.9 (J+)	—	—	2490 (J+)	28.6	—	—	—	—	—	—	7.64	—	0.0024	1.06 (UJ)	—	—	—
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	1.02 (U)	—	—	—	—	—	16.1	—	—	—	—	—	—	—	—	0.00214	0.625 (J)	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.6-3
Organic Chemicals Detected at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Chloro-3-methylphenol[4-]	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene
0103-97-0223	03-03313	0.00–1.00	FILL	—[a]	—	NA[b]	—	NA	NA	—	—	—	—	—	0.71 (J)	—	—	—	—	—
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	—	—	NA	—	NA	NA	0.031 (J)	0.0236 (J)	0.045	—	—	—	—	—	0.0286 (J)	—	—
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	—	0.0021 (J-)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	—	—	NA	0.0218 (J)	NA	NA	0.075	0.0785	0.139	0.0468	—	—	—	—	0.088	—	—
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	0.0407	0.0393 (J)	NA	0.0438	NA	NA	0.0662	0.0627	0.0671	0.0526	0.0554 (J)	—	0.0438 (J)	0.0382 (J)	0.0639	0.0469 (J)	0.0475 (J)
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	0.0208 (J)	—	NA	0.0329 (J)	NA	NA	0.136	0.128 (J)	0.216 (J)	0.0774 (J)	—	—	—	—	0.133	—	0.0245 (J)
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6121	MO-605004	0.00–0.50	SED	—	—	NA	0.0304 (J)	NA	NA	0.133	0.152	0.268	0.0864	—	—	—	—	0.157	—	—
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	0.0263 (J)	—	NA	0.0524	NA	NA	0.18	0.171	0.289	0.0841	—	—	—	—	0.171	—	—
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6125	MO-605006	0.00–0.50	SED	—	—	NA	0.0113 (J)	NA	NA	0.0527	0.0565	0.0946	0.0379 (J)	—	—	—	—	0.059	—	—
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	—	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6127	MO-605007	0.00–0.50	SED	—	—	NA	0.00866 (J)	NA	NA	0.0336 (J)	0.036 (J)	0.0628	0.0198 (J)	—	—	—	—	0.038	—	—
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	—	—	—	—	NA	NA	—	—	0.0146 (J)	—	—	—	—	—	—	—	—
CAMO-09-6129	MO-605008	0.00–0.50	SED	—	—	NA	—	NA	NA	—	0.0135 (J)	0.0228 (J)	—	—	—	—	—	—	—	—
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	—	—	—	—	NA	NA	—	—	0.0124 (J)	—	—	—	—	—	—	—	—
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	—	—	NA	0.00915 (J)	—	0.0135	0.051	0.0548	0.0992	0.0298 (J)	—	—	—	—	0.0627	—	—
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Chloro-3-methylphenol[4-]	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	—	0.00201 (J)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	—	—	NA	0.0159 (J)	0.0136	0.0103	0.076	0.0786	0.145	0.0434	—	—	—	—	0.0864	—	—
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	—	0.00203 (J-)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
0103-97-0223	03-03313	0.00–1.00	FILL	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	0.0682	—	0.0000134	0.0000281	0.000002 (J)	—	0.00000518	—	0.000000664 (J)	0.000000587 (J)	0.00000563	—
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	0.177	—	0.000014	0.0000308	0.00000202 (J)	—	0.00000538	0.000000342 (J)	0.000000561 (J)	0.000000399 (J)	0.00000608	0.000000233 (J)
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	0.0793	0.0392 (J)	0.00000654	0.0000137	0.00000141 (J)	0.00000036 (J)	0.00000364	—	0.000000305 (J)	0.000000249 (J)	0.00000226	—
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	0.279	0.0145 (J)	0.0000257	0.0000542	0.00000401	0.000000273 (J)	0.00000996	—	0.00000113 (J)	0.00000101 (J)	0.0000095	0.000000485 (J)
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6121	MO-605004	0.00–0.50	SED	0.334	0.0134 (J)	0.000267	0.00058	0.0000339	0.00000331	0.000105	0.00000447	0.0000114	0.00000823	0.000109	0.0000027
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	—	—	0.00000747	0.000016	0.00000105 (J)	—	0.0000032	—	—	—	0.00000149	—
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	0.41	0.0165 (J)	0.000114	0.000245	0.0000149	0.00000144 (J)	0.0000447	0.00000212 (J)	0.0000055	0.0000043	0.000048	0.00000151 (J)
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	—	—	0.0000037	0.00000789	0.000000459 (J)	—	0.000000459	—	—	—	—	—
CAMO-09-6125	MO-605006	0.00–0.50	SED	0.131	—	0.0000768	0.000166	0.00000832	—	0.0000263	0.00000173 (J)	0.00000366	0.00000298	0.0000329	0.00000088 (J)
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6127	MO-605007	0.00–0.50	SED	0.0855	—	0.0000878	0.000189	0.0000104	0.00000105 (J)	0.0000328	0.00000157 (J)	0.00000378	0.00000305	0.0000348	0.000000937 (J)
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	0.0218 (J)	—	0.0000157	0.0000338	0.00000243 (J)	—	0.00000757	—	0.00000102 (J)	—	0.00000603	—
CAMO-09-6129	MO-605008	0.00–0.50	SED	0.0377 (J)	—	0.0000447	0.0000978	0.000006	0.000000511 (J)	0.0000194	—	0.00000187 (J)	0.00000158 (J)	0.0000156	0.00000057 (J)
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	0.0192 (J)	—	0.0000248	0.0000523	0.0000035	—	0.0000109	—	0.00000113 (J)	—	0.0000078	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	0.112	—	0.00000683	0.0000206	0.00000109 (J)	—	0.00000268	—	—	—	0.0000028	—
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	0.169	—	0.0000208	0.0000449	0.00000299	—	0.00000731	—	0.000000934 (J)	—	0.00000786	0.00000035 (J)
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	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-]
0103-97-0223	03-03313	0.00–1.00	FILL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	—	—	—	—	—	—	0.00000223 (J)	—	—	—	—	—
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—	—	—	—	—	—	0.000000599 (J)	—	—	—	—	—
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	—	—	—	—	—	—	0.00000369 (J)	—	—	—	—	—
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	—	—	—	—	—	—	0.00000107 (J)	—	—	—	—	—
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	—	—	—	—	—	—	0.00000299 (J)	—	—	—	—	—
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	—	—	—	—	—	—	0.00000242 (J)	—	—	—	—	—
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	—	0.000000247 (J)	0.0000033	—	—	—	0.000104	0.00000463 (J)	—	0.000000481	—	—
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	—	—	—	—	—	—	0.00000157 (J)	—	—	—	—	—
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	—	—	—	—	—	—	0.00000153 (J)	—	—	—	—	—
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	—	—	—	—	—	0.0000015 (J)	—	—	—	—	—
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	0.000000242 (J)	0.000000298 (J)	0.00000407	0.0421	—	—	0.000118	0.00000495 (J)	0.00000022 (J)	0.00000106	0.000000139 (J)	—
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	—	—	—	—	—	—	0.0000021 (J)	—	—	—	—	—
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	—	—	—	—	—	0.000000657 (J)	—	—	—	—	—
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	—	—	0.0000021	0.0527	0.0407	0.034 (J)	0.0000617	0.00000397 (J)	—	—	—	—
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	—	—	—	—	—	—	0.00000258 (J)	—	—	—	—	—
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	0.000000418 (J)	0.00000052 (J)	0.00000727	0.0569 (J)	—	—	0.000212	0.00000947	0.000000316 (J)	0.000000893	0.000000232 (J)	—
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	—	—	—	—	—	—	0.00000159 (J)	—	—	—	—	—
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	—	—	—	—	—	0.0000022 (J)	—	—	—	—	—
CAMO-09-6121	MO-605004	0.00–0.50	SED	0.00000241 (J)	0.00000363	0.0000592	0.0853	—	—	0.00208 (J)	0.0000695	0.00000261	0.0000177	—	—
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	—	—	—	—	—	—	0.0000717 (J)	0.00000229 (J)	—	—	—	—
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	0.00000143 (J)	0.00000204 (J)	0.0000271	0.0878	—	—	0.000865 (J)	0.0000281	0.00000139 (J)	0.00000813	0.000000352 (J)	—
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	—	—	—	—	—	—	0.0000298 (J)	—	—	—	—	—
CAMO-09-6125	MO-605006	0.00–0.50	SED	—	—	0.0000141	0.0353 (J)	—	—	0.000578 (J)	0.0000178	—	0.00000368	0.000000233 (J)	0.000000508 (J)
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	—	—	—	—	—	—	0.00000434 (J)	—	—	—	—	—
CAMO-09-6127	MO-605007	0.00–0.50	SED	0.000000809 (J)	0.00000118 (J)	0.0000176	0.0191 (J)	—	—	0.000617 (J)	0.0000199	0.00000105 (J)	0.00000419	0.000000286 (J)	0.000000675 (J)
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	—	—	0.000000609	—	—	—	0.000114 (J)	0.00000494 (J)	—	0.000000411	—	—
CAMO-09-6129	MO-605008	0.00–0.50	SED	0.000000543 (J)	0.000000729 (J)	0.0000103	—	—	—	0.000348 (J)	0.0000121	—	0.000000782	—	—
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	—	—	0.00000339	—	—	—	0.000193 (J)	0.00000834	0.000000276 (J)	0.000000719	—	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	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-]
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	—	—	0.00000152	0.0276 (J)	—	—	0.0000497	0.00000196 (J)	—	—	—	0.000000276 (J)
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	—	—	—	—	—	—	0.00000346 (J)	—	—	—	—	—
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	—	—	—	—	—	—	0.00000124 (J)	—	—	—	—	—
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	—	—	—	—	—	0.00000312 (J)	—	—	—	—	—
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	—	0.000000302 (J)	0.00000559	0.0426	—	—	0.000168	0.00000607	—	0.00000109	—	0.000000366 (J)
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	—	—	—	—	—	—	0.0000019 (J)	—	—	—	—	—
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]
0103-97-0223	03-03313	0.00–1.00	FILL	NA	—	—	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6095	MO-604995	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6103	MO-604998	0.00–0.50	SOIL	0.00000165	0.0343 (J)	0.0663	—	—	—	0.000000906	NA	NA	NA
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6106	MO-604999	0.00–0.50	SOIL	0.00000321	0.088	0.169	—	—	—	0.00000102	NA	NA	NA
CAMO-09-6107	MO-604999	0.75–1.75	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6109	MO-605000	0.00–0.50	SOIL	0.00000198	0.0566	0.0794	—	—	—	0.000000395	NA	NA	NA
CAMO-09-10458	MO-605000	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	0.00000368	0.159	0.319	—	—	0.000000733	0.00000351	NA	NA	NA
CAMO-09-6113	MO-605001	0.50–1.50	QBT4	—	—	—	—	—	—	8.86E-08	—	—	—
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6121	MO-605004	0.00–0.50	SED	0.0000238	0.152	0.276	0.000000513	0.00000138	0.00000241	0.000013	NA	NA	NA
CAMO-09-6122	MO-605004	0.50–2.00	QBT4	—	—	—	—	—	—	—	0.00238	0.000613 (J)	—
CAMO-09-6123	MO-605005	0.00–0.50	SOIL	0.0000123	0.198	0.347	0.000000268 (J)	0.000000822	0.0000012	0.00000793	NA	NA	NA
CAMO-09-6124	MO-605005	0.50–1.50	QBT4	—	—	—	—	—	—	0.000000248	0.000844 (J)	0.000634 (J)	—
CAMO-09-6125	MO-605006	0.00–0.50	SED	0.00000666	0.0632	0.114	0.000000158 (J)	0.000000489	—	0.00000164	NA	NA	NA
CAMO-09-6126	MO-605006	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6127	MO-605007	0.00–0.50	SED	0.00000827	0.0442	0.0756	0.000000208 (J)	0.000000792	0.000000798	0.00000551	NA	NA	NA
CAMO-09-6128	MO-605007	1.50–2.50	QBT4	0.000000675	0.0105 (J)	0.0177 (J)	—	—	—	—	—	—	—
CAMO-09-6129	MO-605008	0.00–0.50	SED	0.00000493	0.0209 (J)	0.0334 (J)	—	—	0.000000881	0.00000295	NA	NA	NA
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	—	—	0.0149 (J)	—	—	—	0.00000164	—	0.000491 (J)	—
CAMO-09-7080	MO-605169	0.00–0.50	SOIL	0.00000236	0.0411	0.107	—	0.000000404	—	0.00000166	NA	NA	NA

Table 2.6-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]
CAMO-09-7081	MO-605169	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	0.000481 (J)
CAMO-09-7083	MO-605170	0.00–0.50	SOIL	0.00000401	0.0814	0.156	—	0.000000379	—	0.00000319	NA	NA	NA
CAMO-09-7084	MO-605170	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 2.6-4
Radionuclides Detected or Detected above BVs/FVs at AOC 03-007

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium
SOIL,FILL Background Value[a]				**1.65[b]**	**0.054[b]**	**na[c]**
QBT4 Background Value[a]				**na**	**na**	**na**
CAMO-09-10460	MO-604995	7.00–8.00	QBT4	—[d]	—	0.0873446
CAMO-09-6097	MO-604996	3.00–4.00	QBT4	—	—	0.0878494
CAMO-09-6098	MO-604996	7.00–8.00	QBT4	—	—	0.191981
CAMO-09-10461	MO-604996	8.00–9.50	QBT4	—	—	0.159545
CAMO-09-6101	MO-604997	3.00–4.00	QBT4	—	—	0.0720439
CAMO-09-6102	MO-604997	8.00–9.00	QBT4	—	—	0.115741
CAMO-09-6104	MO-604998	1.00–2.00	QBT4	—	—	0.048
CAMO-09-6105	MO-604998	3.00–4.00	QBT4	—	—	0.120568
CAMO-09-10464	MO-604998	6.00–7.00	QBT4	—	—	0.0389218
CAMO-09-10462	MO-604999	6.00–7.50	QBT4	—	—	0.022246
CAMO-09-6112	MO-605001	0.00–0.50	SOIL	—	0.0669	—
CAMO-09-6114	MO-605001	2.50–3.50	QBT4	—	—	0.029078
CAMO-09-10463	MO-605001	5.50–7.00	QBT4	—	—	0.0499791
CAMO-09-6130	MO-605008	1.50–2.50	QBT4	0.075	—	—
CAMO-09-7082	MO-605169	5.00–6.00	QBT4	—	—	0.18
CAMO-09-10459	MO-605169	7.00–8.00	QBT4	—	—	0.0400021
CAMO-09-7085	MO-605170	4.00–5.00	QBT4	—	—	0.0208057
CAMO-09-10465	MO-605170	6.00–7.00	QBT4	—	—	0.0183943

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

Table 2.12-1
Samples Collected and Analyses Requested at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-5892	MO-604916	17.50–19.00	QBT4	09-2191	—*	09-2191	09-2191	09-2191	09-2191	09-2191	—	09-2191	09-2191	09-2191	09-2191
CAMO-09-5893	MO-604916	22.50–24.00	QBT4	09-2191	—	09-2191	09-2191	09-2191	09-2191	09-2191	—	09-2191	09-2191	09-2191	09-2191
CAMO-09-5894	MO-604916	27.50–30.00	QBT4	09-2191	—	09-2191	09-2191	09-2191	09-2191	09-2191	—	09-2191	09-2191	09-2191	09-2191
CAMO-09-5895	MO-604917	16.00–17.50	QBT4	09-2192	—	09-2192	09-2192	09-2192	09-2192	09-2192	—	09-2192	09-2192	09-2192	09-2192
CAMO-09-5896	MO-604917	21.00–22.50	QBT4	09-2192	—	09-2192	09-2192	09-2192	09-2192	09-2192	—	09-2192	09-2192	09-2192	09-2192
CAMO-09-5897	MO-604917	26.00–27.50	QBT4	09-2192	—	09-2192	09-2192	09-2192	09-2192	09-2192	—	09-2192	09-2192	09-2192	09-2192
CAMO-09-5898	MO-604918	16.00–17.50	QBT4	09-2171	—	09-2172	09-2172	09-2172	09-2172	09-2171	—	09-2171	09-2169	09-2169	09-2171
CAMO-09-5899	MO-604918	21.00–22.50	QBT4	09-2171	—	09-2172	09-2172	09-2172	09-2172	09-2171	—	09-2171	09-2169	09-2169	09-2171
CAMO-09-5900	MO-604918	26.00–27.50	QBT4	09-2171	—	09-2172	09-2172	09-2172	09-2172	09-2171	—	09-2171	09-2169	09-2169	09-2171
CAMO-09-5901	MO-604919	16.00–17.50	QBT4	09-2171	09-2170	09-2172	09-2172	09-2172	09-2172	09-2171	09-2169	09-2171	09-2169	09-2169	09-2171
CAMO-09-5902	MO-604919	21.00–22.50	QBT4	09-2171	09-2170	09-2172	09-2172	09-2172	09-2172	09-2171	09-2169	09-2171	09-2169	09-2169	09-2171
CAMO-09-5903	MO-604919	26.00–27.50	QBT4	09-2171	09-2170	09-2172	09-2172	09-2172	09-2172	09-2171	09-2169	09-2171	09-2169	09-2169	09-2171

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.12-2
Inorganic Chemicals above BVs at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Beryllium	Chromium	Total Cyanide	Selenium
QBT4 Background Value[a]				0.5	1.21	7.14	0.5	0.3
CAMO-09-5892	MO-604916	17.50–19.00	QBT4	0.89 (U)	—[b]	—	—	1.1 (U)
CAMO-09-5893	MO-604916	22.50–24.00	QBT4	0.99 (U)	—	—	—	1.11 (U)
CAMO-09-5894	MO-604916	27.50–30.00	QBT4	0.899 (U)	—	—	—	1.14 (U)
CAMO-09-5895	MO-604917	16.00–17.50	QBT4	1.11 (U)	—	—	—	1.11 (U)
CAMO-09-5896	MO-604917	21.00–22.50	QBT4	1.14 (U)	1.76	—	—	1.12 (U)
CAMO-09-5897	MO-604917	26.00–27.50	QBT4	1.13 (U)	—	—	—	1.1 (U)
CAMO-09-5898	MO-604918	16.00–17.50	QBT4	1.18 (U)	—	—	—	1.18 (U)
CAMO-09-5899	MO-604918	21.00–22.50	QBT4	1.13 (U)	—	—	—	1.14 (U)
CAMO-09-5900	MO-604918	26.00–27.50	QBT4	1.16 (U)	—	7.57 (J)	—	1.14 (U)
CAMO-09-5901	MO-604919	16.00–17.50	QBT4	1.09 (U)	—	—	0.569	1.12 (U)
CAMO-09-5902	MO-604919	21.00–22.50	QBT4	1.1 (U)	—	—	—	1.13 (U)
CAMO-09-5903	MO-604919	26.00–27.50	QBT4	1.16 (U)	—	—	—	1.12 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above BV.

Table 2.12-3
Organic Chemicals Detected at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Heptachlorodibenzodioxins (Total)	Methylene Chloride
CAMO-09-5892	MO-604916	17.50–19.00	QBT4	—[a]	NA[b]	0.00324 (J)
CAMO-09-5893	MO-604916	22.50–24.00	QBT4	—	NA	0.00322 (J)
CAMO-09-5894	MO-604916	27.50–30.00	QBT4	—	NA	0.00399 (J)
CAMO-09-5895	MO-604917	16.00–17.50	QBT4	—	NA	0.00296 (J)
CAMO-09-5897	MO-604917	26.00–27.50	QBT4	—	NA	0.00348 (J)
CAMO-09-5898	MO-604918	16.00–17.50	QBT4	0.318 (J)	NA	—
CAMO-09-5899	MO-604918	21.00–22.50	QBT4	0.3 (J)	NA	—
CAMO-09-5900	MO-604918	26.00–27.50	QBT4	0.3 (J)	NA	—
CAMO-09-5901	MO-604919	16.00–17.50	QBT4	0.285 (J)	0.000000286	—
CAMO-09-5902	MO-604919	21.00–22.50	QBT4	0.288 (J)	0.00000019	—
CAMO-09-5903	MO-604919	26.00–27.50	QBT4	0.292 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] — = Not detected.
[b] NA = Not analyzed.

Table 2.12-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-034(a)

Sample ID	Location ID	Depth (ft)	Media	Tritium
QBT4 Background Value[a]				**na[b]**
CAMO-09-5892	MO-604916	17.50–19.00	QBT4	0.0317727
CAMO-09-5894	MO-604916	27.50–30.00	QBT4	0.0448554

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] na = Not available.

Table 2.14-1
Samples Collected and Analyses Requested at AOC 03-041

Sample Id	Location Id	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6062	MO-604987	0.00–0.50	FILL	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	—	09-2136
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6065	MO-604987	31.00–31.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6066	MO-604988	0.00–0.50	FILL	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	—	09-2136
CAMO-09-6067	MO-604988	1.00–2.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6068	MO-604988	16.00–17.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6069	MO-604988	26.00–27.50	QBT4	09-2136	09-2134	09-2137	09-2137	09-2137	09-2137	09-2136	—	09-2136	09-2135	09-2135	09-2136
CAMO-09-6070	MO-604989	0.00–0.50	FILL	09-2110	09-2108	09-2111	09-2111	09-2111	09-2111	09-2110	09-2109	09-2110	09-2109	—	09-2110
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	09-2110	09-2108	09-2111	09-2111	09-2111	09-2111	09-2110	09-2109	09-2110	09-2109	09-2109	09-2110
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	09-2110	09-2108	09-2111	09-2111	09-2111	09-2111	09-2110	09-2109	09-2110	09-2109	09-2109	09-2110
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	09-2110	09-2108	09-2111	09-2111	09-2111	09-2111	09-2110	09-2109	09-2110	09-2109	09-2109	09-2110

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 2.14-2
Inorganic Chemicals above BVs at AOC 03-041

Sample Id	Location Id	Depth (ft)	Media	Antimony	Beryllium	Cadmium	Calcium	Chromium	Iron	Lead	Manganese	Nitrate	Perchlorate	Selenium	Silver
FILL Background Value[a]				**0.83**	**1.83**	**0.4**	**6120**	**19.3**	**21500**	**22.3**	**671**	**na[b]**	**na**	**1.52**	**1**
QBT4 Background Value[a]				**0.5**	**1.21**	**1.63**	**2200**	**7.14**	**14500**	**11.2**	**482**	**na**	**na**	**0.3**	**1**
CAMO-09-6062	MO-604987	0.00–0.50	FILL	—[c]	—	0.553 (U)	—	—	—	—	—	2.01	—	—	—
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	0.547 (J)	—	—	—	—	22200	—	—	—	—	1.06 (U)	1.18
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	—	—	—	—	—	—	—	487	—	0.000774 (J)	1.09 (U)	—
CAMO-09-6065	MO-604987	31.00–31.50	QBT4	1.02 (U)	—	—	—	—	—	20.6	—	—	—	1.05 (U)	—
CAMO-09-6066	MO-604988	0.00–0.50	FILL	—	—	0.535 (U)	—	—	—	—	—	4.6	—	—	—
CAMO-09-6067	MO-604988	1.00–2.50	QBT4	0.586 (J)	—	—	4250	7.45	—	—	—	0.804 (J)	0.00162 (J)	1.17 (U)	—
CAMO-09-6068	MO-604988	16.00–17.50	QBT4	1.08 (U)	—	—	—	—	—	—	—	1.22	—	1.06 (U)	—
CAMO-09-6069	MO-604988	26.00–27.50	QBT4	—	—	—	—	—	—	—	—	1.17	—	1.13 (U)	—
CAMO-09-6070	MO-604989	0.00–0.50	FILL	1.09 (U)	—	0.545 (U)	—	—	—	—	—	1.17	—	—	—
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	0.999 (U)	—	—	—	—	—	—	—	1.09	0.00482	0.991 (U)	—
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	0.865 (J)	—	1.05 (U)	—
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	1.08 (U)	1.44	—	—	—	—	17.4	—	1.53	—	1.08 (U)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 4.14-3
Organic Chemicals Detected at AOC 03-041

Sample Id	Location Id	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
CAMO-09-6062	MO-604987	0.00–0.50	FILL	NA[a]	NA	—[b]	—	—	—	—	0.0114 (J)	0.00000316	0.00000606	0.000000625 (J)
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	NA	NA	—	—	—	—	—	—	0.000000327 (J)	0.00000117	—
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	NA	NA	—	—	—	—	—	—	—	0.000000171	—
CAMO-09-6065	MO-604987	31.00–31.50	QBT4	NA	NA	—	—	—	—	—	—	—	0.000000089	—
CAMO-09-6066	MO-604988	0.00–0.50	FILL	NA	NA	0.0203 (J)	0.0205 (J)	0.0335 (J)	0.0128 (J)	0.0238 (J)	0.0409	0.0000124	0.0000243	0.00000231 (J)
CAMO-09-6067	MO-604988	1.00–2.50	QBT4	NA	NA	—	—	—	—	—	—	—	—	—
CAMO-09-6070	MO-604989	0.00–0.50	FILL	0.0054	0.0072 (J+)	—	—	—	—	—	—	0.00000294	0.00000627	—
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	—	—	—	—	—	—	—	—	—	—	—

Table 4.14-3 (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[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
CAMO-09-6062	MO-604987	0.00–0.50	FILL	—	0.00000128	—	—	—	0.000000772	—	—	—	0.000000532	—
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6065	MO-604987	31.00–31.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6066	MO-604988	0.00–0.50	FILL	0.000000325 (J)	0.00000531	0.000000157 (J)	0.000000429 (J)	0.000000322 (J)	0.000004	0.000000409 (J)	0.000000255 (J)	0.00000035 (J)	0.00000362	0.0116 (J)
CAMO-09-6067	MO-604988	1.00–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6070	MO-604989	0.00–0.50	FILL	—	0.000000704	—	—	—	0.0000007	—	—	—	0.00000062	—
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	—	—	—	—	—	—	—	—	—	—	—

Table 4.14-3 (continued)

Sample Id	Location Id	Depth (ft)	Media	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
CAMO-09-6062	MO-604987	0.00–0.50	FILL	0.0000206 (J)	0.00000106 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	0.00000453 (J)	0.000000286 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	0.000000748 (J)	—	6.92E-08	—	—	—	—	—	—	—	—
CAMO-09-6065	MO-604987	31.00–31.50	QBT4	0.000000316 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6066	MO-604988	0.00–0.50	FILL	0.0000948 (J)	0.00000451 (J)	—	0.0000002 (J)	0.000000281 (J)	0.00000315	0.0224 (J)	0.0422	0.000000111 (J)	0.000000111	0.00000164
CAMO-09-6067	MO-604988	1.00–2.50	QBT4	0.00000205 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6070	MO-604989	0.00–0.50	FILL	0.0000306	0.000000986 (J)	—	—	—	0.000000282	—	—	—	—	0.000000106
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	0.000000582 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	0.000000508 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	0.000000745 (J)	—	—	—	—	—	—	—	—	—	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 2.14-4
Radionuclides Detected or Detected above BVs/FVs at AOC 03-041

Sample Id	Location Id	Depth (ft)	Media	Tritium
QBT4 Background Value[a]				**na[b]**
CAMO-09-6063	MO-604987	5.00–6.50	QBT4	0.0830501
CAMO-09-6064	MO-604987	20.00–21.50	QBT4	0.129535
CAMO-09-6071	MO-604989	5.00–6.50	QBT4	0.0130624
CAMO-09-6072	MO-604989	20.00–21.50	QBT4	0.0814539
CAMO-09-6073	MO-604989	30.00–31.50	QBT4	0.0808789

Note: Results are in pCi/g.

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

[b] na = Not available.

Table 2.15-1
Samples Collected and Analyses Requested at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6000	MO-604947	0.00–0.50	SOIL	09-2247	09-2248	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	—*	09-2247
CAMO-09-6001	MO-604947	0.50–1.50	QBT4	09-2247	09-2248	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247	09-2247
CAMO-09-6002	MO-604948	0.00–0.50	SED	09-2208	09-2207	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	—	09-2208
CAMO-09-6003	MO-604948	0.75–1.75	QBT4	09-2208	09-2207	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208	09-2208
CAMO-09-6010	MO-604952	0.00–0.50	FILL	09-2307	09-2306	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	—	09-2307
CAMO-09-6011	MO-604952	6.00–7.00	QBT4	09-2307	09-2306	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307	09-2307
CAMO-09-6012	MO-604970	0.00–0.50	SED	09-2167	—	09-2168	09-2168	09-2167	09-2168	09-2167	—	09-2167	09-2166	—	09-2167
CAMO-09-6013	MO-604970	0.50–1.50	QBT4	09-2167	—	09-2168	09-2168	09-2167	09-2168	09-2167	—	09-2167	09-2166	09-2166	09-2167
CAMO-09-6014	MO-604971	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6015	MO-604971	1.00–2.25	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189
CAMO-09-6016	MO-604972	0.00–0.50	SOIL	09-2167	—	09-2168	09-2168	09-2167	09-2168	09-2167	—	09-2167	09-2166	—	09-2167
CAMO-09-6017	MO-604972	0.50–1.50	QBT4	09-2167	—	09-2168	09-2168	09-2167	09-2168	09-2167	—	09-2167	09-2166	09-2166	09-2167
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6019	MO-604973	0.50–1.50	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189
CAMO-09-6020	MO-604974	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189
CAMO-09-6022	MO-604975	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6023	MO-604975	0.50–1.50	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189
CAMO-09-6024	MO-604976	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6025	MO-604976	1.50–2.50	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189
CAMO-09-6026	MO-604977	0.00–0.50	SOIL	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	—	09-2189
CAMO-09-6027	MO-604977	0.50–1.50	QBT4	09-2189	—	09-2190	09-2190	09-2189	09-2190	09-2189	—	09-2189	09-2188	09-2188	09-2189

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.15-2
Inorganic Chemicals above BVs at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**543**	**9.38**	**na**	**na**	**0.3**	**19.7**	**60.2**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
CAMO-09-6000	MO-604947	0.00–0.50	SOIL	—[c]	0.93 (J)	—	—	—	0.526 (U)	—	30.1 (J)	—	—	—	—	—	—	—	—	1.38	—	—	—	—
CAMO-09-6001	MO-604947	0.50–1.50	QBT4	—	0.679 (J)	—	—	—	—	—	21.1 (J)	—	—	—	—	—	—	—	—	—	—	1.16 (UJ)	—	—
CAMO-09-6002	MO-604948	0.00–0.50	SED	—	0.995 (J)	—	—	—	0.591 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.16 (U)	—	—
CAMO-09-6003	MO-604948	0.75–1.75	QBT4	—	—	—	90.3	—	—	—	—	—	9.15	5.72	—	13.4 (J)	—	—	—	—	—	1.07 (U)	—	—
CAMO-09-6010	MO-604952	0.00–0.50	FILL	—	1.13 (UJ)	—	—	—	0.567 (U)	—	—	0.142 (J)	—	—	—	—	—	—	—	1.69	—	—	—	—
CAMO-09-6011	MO-604952	6.00–7.00	QBT4	10500	1.12 (UJ)	—	112	1.4	—	4560	15.7	—	4.46	10.5	—	14	2570	—	11.4	0.9 (J)	—	1.14 (U)	21.4	—
CAMO-09-6012	MO-604970	0.00–0.50	SED	—	—	—	—	—	0.578 (U)	—	—	—	—	—	—	—	—	—	—	1.18 (J-)	—	1.19 (U)	—	102
CAMO-09-6013	MO-604970	0.50–1.50	QBT4	—	1.23 (U)	—	—	—	—	—	25	—	—	—	—	—	—	—	—	—	—	1.22 (U)	—	—
CAMO-09-6014	MO-604971	0.00–0.50	SOIL	—	1.16 (U)	—	—	—	0.579 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6015	MO-604971	1.00–2.25	QBT4	13800	1.16 (U)	5	105	—	—	3180 (J+)	11.3	0.146 (J)	—	6.75	15000	11.5 (J)	2450 (J+)	—	7.02 (J+)	0.741 (J)	—	1.17 (UJ)	20.7	—
CAMO-09-6016	MO-604972	0.00–0.50	SOIL	—	1.12 (U)	—	—	—	0.559 (U)	—	—	—	—	—	—	23.2	—	—	—	—	—	—	—	—
CAMO-09-6017	MO-604972	0.50–1.50	QBT4	—	1.09 (U)	—	—	—	—	—	12.2	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	—	1.16 (U)	—	—	—	0.582 (U)	—	—	—	—	—	—	23.8	—	—	—	—	—	—	—	53
CAMO-09-6019	MO-604973	0.50–1.50	QBT4	10800	1.09 (U)	—	65.2	—	—	2250 (J+)	7.53	—	—	—	—	—	1720 (J+)	—	—	—	0.0014 (J)	1.07 (UJ)	—	—
CAMO-09-6020	MO-604974	0.00–0.50	SOIL	—	1.15 (U)	—	—	—	0.575 (U)	—	—	—	—	—	—	—	—	—	—	1.93	—	—	—	—
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	11000	—	—	146	—	—	—	11	—	3.18	5.36	—	12.8 (J)	2280 (J+)	—	—	0.641 (J)	—	1.04 (UJ)	—	—
CAMO-09-6022	MO-604975	0.00–0.50	SOIL	—	1.19 (U)	—	—	—	0.596 (U)	—	—	—	—	—	—	—	—	—	—	0.88 (J)	—	—	—	—
CAMO-09-6023	MO-604975	0.50–1.50	QBT4	—	1.07 (U)	—	—	—	—	—	9.92	0.135 (J)	—	—	—	—	—	—	—	—	—	1.06 (UJ)	—	—
CAMO-09-6024	MO-604976	0.00–0.50	SOIL	—	—	—	—	—	0.566 (U)	—	—	0.145 (J)	—	—	—	—	—	—	—	—	0.00109 (J)	—	—	—
CAMO-09-6025	MO-604976	1.50–2.50	QBT4	—	0.503 (J)	—	63.9	—	—	—	12.4	—	—	4.92	—	—	—	743	—	—	—	1.16 (UJ)	—	88.2
CAMO-09-6026	MO-604977	0.00–0.50	SOIL	—	—	—	—	—	0.565 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6027	MO-604977	0.50–1.50	QBT4	14500	1.1 (U)	—	103	—	—	—	8.05	—	—	5.19	—	12.3 (J)	1810 (J+)	—	—	—	0.000893 (J)	1.08 (UJ)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 2.15-3
Organic Chemicals Detected at SWMU 03-045(h)

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	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
CAMO-09-6000	MO-604947	0.00–0.50	SOIL	—[a]	NA[b]	—	0.0276	0.0346	—	—	—	—	—	—	—	—	—	—	0.0000128	0.0000529
CAMO-09-6001	MO-604947	0.50–1.50	QBT4	—	—	0.016 (J)	—	0.0027 (J)	0.0751	0.096	0.174	0.0789 (J)	—	—	0.0999	—	0.218	—	—	0.00000135
CAMO-09-6002	MO-604948	0.00–0.50	SED	—	NA	—	—	0.0032 (J)	0.0255 (J)	0.0214 (J)	0.0345 (J)	—	—	—	0.0211 (J)	—	0.0455	—	0.0000779	0.000166
CAMO-09-6003	MO-604948	0.75–1.75	QBT4	—	—	—	—	—	0.0112 (J)	—	0.0142 (J)	—	0.304 (J)	—	0.0115 (J)	—	0.0237 (J)	—	0.00000752	0.0000167
CAMO-09-6010	MO-604952	0.00–0.50	FILL	—	NA	—	0.0193	0.0196	—	—	0.0155 (J)	—	—	—	—	—	0.0236 (J)	—	0.0000845	0.000194
CAMO-09-6011	MO-604952	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000459	0.0000108
CAMO-09-6012	MO-604970	0.00–0.50	SED	—	NA	0.0239 (J)	NA	NA	0.138	0.168	0.352	0.11	—	—	0.173	—	0.458	—	NA	NA
CAMO-09-6013	MO-604970	0.50–1.50	QBT4	0.0138 (J)	—	0.041 (J)	NA	NA	0.0921	0.0896	0.155	0.0613	0.369 (J)	0.0889 (J)	0.103	—	0.295	—	NA	NA
CAMO-09-6014	MO-604971	0.00–0.50	SOIL	—	NA	—	NA	NA	0.0246 (J)	0.0194 (J)	0.0317 (J)	0.0153 (J)	—	—	0.0241 (J)	—	0.0408	—	NA	NA
CAMO-09-6015	MO-604971	1.00–2.25	QBT4	—	—	0.00865 (J)	NA	NA	0.0221 (J)	0.0174 (J)	0.0267 (J)	—	—	—	0.0194 (J)	—	0.0417	—	NA	NA
CAMO-09-6016	MO-604972	0.00–0.50	SOIL	—	NA	—	NA	NA	0.0386	0.0482	0.0872	0.0279 (J)	0.315 (J)	—	0.0504	—	0.118	—	NA	NA
CAMO-09-6017	MO-604972	0.50–1.50	QBT4	—	0.0319 (J)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	NA	NA
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	0.0294 (J)	NA	0.0327 (J)	NA	NA	0.155	0.155	0.281	0.0631	—	—	0.159	0.0231 (J)	0.368	0.0177 (J)	NA	NA
CAMO-09-6020	MO-604974	0.00–0.50	SOIL	—	NA	—	NA	NA	0.0242 (J)	0.0257 (J)	0.0487	0.0171 (J)	—	—	0.0308 (J)	—	0.0587	—	NA	NA
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	—	—	—	NA	NA	0.0147 (J)	—	0.016 (J)	—	—	—	—	—	0.0231 (J)	—	NA	NA
CAMO-09-6022	MO-604975	0.00–0.50	SOIL	—	NA	0.0117 (J)	NA	NA	0.0665	0.0655	0.111	0.0398	—	—	0.0648	0.0123 (J)	0.139	—	NA	NA
CAMO-09-6026	MO-604977	0.00–0.50	SOIL	—	NA	—	NA	NA	0.0294 (J)	0.03 (J)	—	0.0194 (J)	—	—	0.0362 (J)	—	0.069	—	NA	NA

Table 2.15-3 (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-]	Hexachlorodibenzofurans (Total)
CAMO-09-6000	MO-604947	0.00–0.50	SOIL	0.00000173 (J)	0.000000184 (J)	0.00000468	—	0.000000436 (J)	—	0.00000568	0.000000521 (J)	—	—	0.000000254 (J)	0.00000346
CAMO-09-6001	MO-604947	0.50–1.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6002	MO-604948	0.00–0.50	SED	0.000012	0.00000116 (J)	0.000049	0.000000665 (J)	0.00000271	0.00000112 (J)	0.000018	0.000000662 (J)	0.000000372 (J)	—	0.000000683 (J)	0.0000171
CAMO-09-6003	MO-604948	0.75–1.75	QBT4	0.00000133 (J)	—	0.00000493	—	—	—	0.00000114	—	—	—	—	0.00000165
CAMO-09-6010	MO-604952	0.00–0.50	FILL	0.00000861	0.00000103 (J)	0.0000332	0.000000673 (J)	0.0000026 (J)	0.00000139 (J)	0.0000191	0.00000131 (J)	0.000000583 (J)	0.000000361 (J)	0.000000784 (J)	0.0000168
CAMO-09-6011	MO-604952	6.00–7.00	QBT4	0.000000152 (J)	—	0.000000494	—	0.000000298 (J)	—	0.00000173	—	—	—	—	0.000000461
CAMO-09-6012	MO-604970	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6013	MO-604970	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6014	MO-604971	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6015	MO-604971	1.00–2.25	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6016	MO-604972	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6017	MO-604972	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6020	MO-604974	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6022	MO-604975	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6026	MO-604977	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
CAMO-09-6000	MO-604947	0.00–0.50	SOIL	—	0.0000802	0.00000415 (J)	—	—	0.000000219 (J)	0.000000623 (J)	0.00000642	—	—	0.00000049	0.00000109	0.00000779
CAMO-09-6001	MO-604947	0.50–1.50	QBT4	0.0618 (J)	0.00000333 (J)	0.000000172 (J)	—	—	—	—	—	0.0998	0.169	—	—	—
CAMO-09-6002	MO-604948	0.00–0.50	SED	—	0.000948	0.0000331	0.000000323 (J)	0.000000551	—	0.000000174 (J)	0.00000312	—	0.036 (J)	0.000000416	—	0.000000689
CAMO-09-6003	MO-604948	0.75–1.75	QBT4	—	0.000101	0.00000299 (J)	—	—	—	—	0.000000213	—	0.0137 (J)	—	—	—
CAMO-09-6010	MO-604952	0.00–0.50	FILL	—	0.00136 (J)	0.0000157	0.000000407 (J)	0.00000192	0.000000194 (J)	0.000000495 (J)	0.00000505	0.0148 (J)	0.0187 (J)	—	0.000000588 (J)	0.00000442
CAMO-09-6011	MO-604952	6.00–7.00	QBT4	—	0.000047 (J)	0.000000334 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6012	MO-604970	0.00–0.50	SED	0.0985	NA	NA	NA	NA	NA	NA	NA	0.165	0.316	NA	NA	NA
CAMO-09-6013	MO-604970	0.50–1.50	QBT4	0.0602	NA	NA	NA	NA	NA	NA	NA	0.158	0.188	NA	NA	NA
CAMO-09-6014	MO-604971	0.00–0.50	SOIL	0.0133 (J)	NA	NA	NA	NA	NA	NA	NA	0.0211 (J)	0.0371 (J)	NA	NA	NA
CAMO-09-6015	MO-604971	1.00–2.25	QBT4	—	NA	NA	NA	NA	NA	NA	NA	0.0306 (J)	0.0392 (J)	NA	NA	NA
CAMO-09-6016	MO-604972	0.00–0.50	SOIL	0.0272 (J)	NA	NA	NA	NA	NA	NA	NA	0.019 (J)	0.0864	NA	NA	NA
CAMO-09-6017	MO-604972	0.50–1.50	QBT4	—	NA	NA	NA	NA	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	0.0672	NA	NA	NA	NA	NA	NA	NA	0.185	0.304	NA	NA	NA
CAMO-09-6020	MO-604974	0.00–0.50	SOIL	0.0167 (J)	NA	NA	NA	NA	NA	NA	NA	0.0238 (J)	0.0477	NA	NA	NA
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	—	NA	NA	NA	NA	NA	NA	NA	0.0138 (J)	0.0211 (J)	NA	NA	NA
CAMO-09-6022	MO-604975	0.00–0.50	SOIL	0.0356 (J)	NA	NA	NA	NA	NA	NA	NA	0.0626	0.121	NA	NA	NA
CAMO-09-6026	MO-604977	0.00–0.50	SOIL	0.0137 (J)	NA	NA	NA	NA	NA	NA	NA	0.0298 (J)	0.0603	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 2.15-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-045(h)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium
SOIL Background Value[a]				**1.65[b]**	**na[c]**
QBT4 Background Value[a]				**na**	**na**
CAMO-09-6018	MO-604973	0.00–0.50	SOIL	—[d]	0.0553166
CAMO-09-6021	MO-604974	1.00–2.00	QBT4	0.111	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

Table 2.16-1
Samples Collected and Analyses Requested at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-97-0061	03-03231	0.00–0.33	SED	—*	—	—	—	3363R	3364R	3363R	—	—	—	3362R	3363R
0103-97-0062	03-03233	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	3362R	3363R
0103-97-0063	03-03234	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
0103-97-0064	03-03236	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
0103-97-0065	03-03237	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
0103-97-0066	03-03238	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
0103-97-0067	03-03239	0.00–0.33	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
0103-97-0068	03-03240	0.00–0.25	SED	—	—	—	—	3363R	3364R	3363R	—	—	—	—	3363R
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	09-2452	09-2450	09-2453	09-2453	09-2452	09-2453	09-2452	09-2451	09-2452	09-2451	—	09-2452
CAMO-09-6005	MO-604949	1.50–2.50	QBT3	09-2452	09-2450	09-2453	09-2453	09-2452	09-2453	09-2452	09-2451	09-2452	09-2451	09-2451	09-2452
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	09-2478	09-2476	09-2479	09-2479	09-2478	09-2479	09-2478	09-2477	09-2478	09-2477	—	09-2478
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	09-2478	09-2476	09-2479	09-2479	09-2478	09-2479	09-2478	09-2477	09-2478	09-2477	09-2477	09-2478
CAMO-09-6008	MO-604951	0.00–0.50	SED	09-2478	09-2476	09-2479	09-2479	09-2478	09-2479	09-2478	09-2477	09-2478	09-2477	—	09-2478
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	09-2478	09-2476	09-2479	09-2479	09-2478	09-2479	09-2478	09-2477	09-2478	09-2477	09-2477	09-2478
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	—	09-2452
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	09-2451	09-2452
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	—	09-2452
CAMO-09-6031	MO-604979	1.00–2.00	QBT4	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	09-2451	09-2452
CAMO-09-6032	MO-604980	0.00–0.50	SED	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	—	09-2452
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	09-2451	09-2452
CAMO-09-6034	MO-604981	0.00–0.50	SED	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	—	09-2478
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	09-2477	09-2478
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	—	09-2452
CAMO-09-6037	MO-604982	1.00–2.00	QBT4	09-2452	—	09-2453	09-2453	09-2452	09-2453	09-2452	—	09-2452	09-2451	09-2451	09-2452
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	09-2477	09-2478	09-2477	—	09-2478
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	09-2477	09-2478
CAMO-09-6040	MO-604984	0.00–0.50	SED	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	—	09-2478
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	09-2477	09-2478
CAMO-09-6042	MO-604985	0.00–0.50	SED	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	—	09-2478
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	09-2477	09-2478
CAMO-09-6044	MO-604986	0.00–0.50	SED	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	—	09-2478
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	09-2478	—	09-2479	09-2479	09-2478	09-2479	09-2478	—	09-2478	09-2477	09-2477	09-2478

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.16-2
Inorganic Chemicals above BVs at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]				**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**543**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**482**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
0103-97-0061	03-03231	0.00–0.33	SED	1.1 (U)	—[c]	—	—	—	—	68.2 (J-)	—	—	446	—	25.1	—	29.9	NA[d]	NA	0.84 (U)	—	1.8 (J)	—	422
0103-97-0062	03-03233	0.00–0.33	SED	2.3 (U)	—	—	—	—	5590	152 (J-)	—	—	663	17400	53.9	—	29.5	NA	NA	1.8 (U)	1.1 (J)	1.5 (U)	24.7 (J)	421
0103-97-0063	03-03234	0.00–0.33	SED	1.2 (U)	—	—	—	—	—	274 (J-)	—	—	68.2	14900	25.2	—	12.8 (J)	NA	NA	0.99 (U)	—	0.81 (U)	—	356
0103-97-0064	03-03236	0.00–0.33	SED	1.2 (U)	—	—	—	—	—	264 (J-)	—	—	80.7	—	51.2	—	22.3	NA	NA	0.92 (U)	—	0.75 (U)	—	222
0103-97-0065	03-03237	0.00–0.33	SED	3.3 (U)	6 (J)	171 (J)	—	—	4990	198 (J-)	—	14.7 (J)	310	19200	92.6	1110 (J-)	55.7	NA	NA	2.6 (U)	1.2 (U)	2.1 (U)	34.8 (J)	564
0103-97-0066	03-03238	0.00–0.33	SED	0.95 (U)	—	—	—	—	—	—	—	—	17.6	—	—	—	—	NA	NA	0.75 (U)	—	—	—	—
0103-97-0067	03-03239	0.00–0.33	SED	2.3 (U)	—	—	—	—	—	86.3 (J-)	—	—	161	—	29.7	—	16.2 (J)	NA	NA	1.8 (U)	—	1.5 (U)	—	270
0103-97-0068	03-03240	0.00–0.25	SED	1.3 (U)	—	—	—	—	—	41.3 (J-)	—	—	155	—	56.6	—	21.1	NA	NA	1 (U)	—	0.84 (U)	—	226
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	1.18 (U)	—	—	—	0.59 (U)	—	—	—	—	—	—	—	—	—	2.98	0.000637 (J)	—	—	—	—	65.5
CAMO-09-6005	MO-604949	1.50–2.50	QBT3	1.16 (U)	—	—	1.4	—	—	12.6 (J)	—	—	8.89 (J)	—	—	—	—	0.588 (J)	—	1.18 (U)	1.68	—	—	—
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	1.37 (U)	—	—	—	0.554 (U)	—	—	—	—	—	—	—	—	—	0.924 (J-)	—	—	—	—	—	—
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	0.917 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.02 (UJ)	—	—	—	—
CAMO-09-6008	MO-604951	0.00–0.50	SED	1.07 (U)	—	—	—	—	—	30.2	—	—	38.6	—	—	—	12.5	2.85 (J-)	—	1.28 (UJ)	—	—	—	105
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	0.837 (U)	—	—	—	—	—	15.9	—	—	13.6	—	—	—	—	1.31 (J-)	—	1.15 (UJ)	—	—	—	75.6
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	1.14 (U)	—	—	—	0.568 (U)	—	193 (J)	0.914 (J)	—	—	—	—	—	—	1.06 (J)	—	—	—	—	—	70
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	1.15 (U)	—	—	—	—	—	144 (J)	—	—	10.7 (J)	—	—	—	—	0.597 (J)	0.000626 (J)	1.19 (U)	—	—	—	—
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	1.26 (U)	—	—	—	0.629 (U)	—	329 (J)	2.8	—	37.3 (J)	—	—	—	—	0.587 (J)	—	—	—	—	—	128
CAMO-09-6031	MO-604979	1.00–2.00	QBT4	1.15 (U)	—	—	—	—	—	30.1 (J)	0.31 (J)	—	7.14 (J)	—	—	—	—	—	—	1.11 (U)	—	—	—	—
CAMO-09-6032	MO-604980	0.00–0.50	SED	1.23 (U)	—	—	—	0.615 (U)	—	26.7 (J)	1.22 (J)	—	22.5 (J)	—	—	—	—	—	—	1.21 (U)	—	—	—	—
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	1.11 (U)	—	—	—	—	—	7.28 (J)	—	—	—	—	—	—	—	—	—	1.12 (U)	—	—	—	—
CAMO-09-6034	MO-604981	0.00–0.50	SED	4.18 (U)	—	—	—	0.483 (J)	7890 (J-)	449	—	—	107	—	39.9	—	22.2	—	—	1.27 (UJ)	—	—	22.7	272
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	—	—	—	—	—	—	9.57	0.156 (J)	—	8.77	—	—	—	—	—	—	0.998 (UJ)	—	—	—	69.4
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	1.23 (U)	—	—	—	0.613 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	53.4
CAMO-09-6037	MO-604982	1.00–2.00	QBT4	1.04 (U)	—	—	—	—	—	13.8 (J)	0.216 (J)	—	4.75 (J)	—	—	—	—	0.482 (J)	—	1.05 (U)	—	—	—	—
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	1.22 (U)	—	—	—	—	—	—	—	—	—	—	33.6	—	—	—	—	—	—	—	—	54.9
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	1.36 (U)	—	—	—	—	—	15	—	—	—	—	—	—	—	—	—	1.08 (UJ)	—	—	—	—
CAMO-09-6040	MO-604984	0.00–0.50	SED	4.11 (U)	4.02 (J-)	152	—	1.1	5950 (J-)	465	—	10.2	318	14100	156	1140	58.4	—	0.000921 (J)	0.862 (J-)	1.48	—	—	499

Table 2.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]				**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**543**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**482**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	2.81 (U)	—	—	—	—	—	241	—	—	52.7	—	23.4	—	15.3	—	—	1.01 (UJ)	—	—	—	259
CAMO-09-6042	MO-604985	0.00–0.50	SED	1.5 (U)	—	—	—	0.406 (J)	4620 (J-)	58.9	—	—	55.4	—	36.6	—	26.6	—	—	1.18 (UJ)	—	—	—	134
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	2.33 (U)	—	—	—	—	—	165	—	—	52.3	—	31.7	—	17.4	—	—	1.08 (UJ)	—	—	—	161
CAMO-09-6044	MO-604986	0.00–0.50	SED	1.33 (U)	—	—	—	—	—	73.8	—	—	71.3	—	36.8	—	47.7	—	0.0016 (J)	1.14 (UJ)	—	—	—	158
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	1.05 (U)	—	—	—	—	—	31	—	—	12	—	—	—	7.15	—	—	1.08 (UJ)	—	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.16-3
Organic Chemicals Detected at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene
0103-97-0061	03-03231	0.00–0.33	SED	NA[a]	—[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.013 (J)	NA	NA	NA	NA
0103-97-0062	03-03233	0.00–0.33	SED	NA	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	0.0409 (J)	NA	0.0592	—	0.129	0.179	0.229	0.34	0.0799	0.0923	—	NA	0.208	—	0.448	0.033 (J)
CAMO-09-6005	MO-604949	1.50–2.50	QBT3	—	—	—	—	0.123	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	—	NA	—	0.0048	0.0056	0.0458	0.0523	0.104	0.0287 (J)	—	0.0856 (J)	NA	0.056	—	0.12	—
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6008	MO-604951	0.00–0.50	SED	—	NA	0.0144 (J)	0.0432	0.0208	0.079	0.0926	0.195	0.0495	—	—	NA	0.11	—	0.211	—
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	—	—	—	0.0094	0.0053	0.0592	0.07	0.139	0.0435	—	—	—	0.0823	—	0.159	—
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	0.028 (J)	NA	0.0456	NA	NA	0.11	0.162	0.281	0.0419	—	—	NA	0.127	—	0.253	0.0212 (J)
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	—	—	—	NA	NA	0.0295 (J)	0.0946	0.168	—	—	—	—	0.0362 (J)	—	0.075	—
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	—	NA	0.0168 (J)	NA	NA	0.0767	0.15	0.271	0.0365 (J)	—	—	NA	0.0954	—	0.207	—
CAMO-09-6032	MO-604980	0.00–0.50	SED	0.0162 (J)	NA	0.0302 (J)	NA	NA	0.192	0.29	0.553	0.149	—	0.121 (J)	NA	0.299	—	0.495	0.0125 (J)
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	—	0.00444 (J)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6034	MO-604981	0.00–0.50	SED	0.0191 (J)	NA	—	NA	NA	0.156	0.175	0.359	0.0973	—	0.0918 (J)	NA	0.194	0.0293 (J)	0.415	0.0129 (J)
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	—	—	—	NA	NA	—	—	0.0169 (J)	—	—	—	—	—	—	0.017 (J)	—
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	—	NA	—	NA	NA	0.0438	0.119	0.187	0.0162 (J)	—	—	NA	0.0533	—	0.104	—
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	0.0162 (J)	NA	—	0.0372	0.0356	0.0663	0.0725	0.135	0.0329 (J)	—	0.322 (J)	NA	0.0758	—	0.185	—
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	—	—	—	NA	NA	—	—	—	—	—	0.085 (J)	—	—	—	0.0125 (J)	—
CAMO-09-6040	MO-604984	0.00–0.50	SED	0.0476	NA	—	NA	NA	0.654	0.835	1.7	0.474	—	0.15 (J)	NA	0.958	0.121	1.7	0.0521
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	—	—	—	NA	NA	0.0524	0.0595	0.12	0.0405	—	0.109 (J)	—	0.0714	0.0128 (J)	0.153	—
CAMO-09-6042	MO-604985	0.00–0.50	SED	—	NA	—	NA	NA	0.0844	0.103	0.214	0.0601	—	0.107 (J)	NA	0.113	0.0188 (J)	0.224	—
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	—	—	—	NA	NA	0.0384	0.0495	0.101	0.031 (J)	—	0.0893 (J)	—	0.0579	—	0.11	—
CAMO-09-6044	MO-604986	0.00–0.50	SED	—	NA	—	NA	NA	0.111	0.132	0.286	0.081	—	0.118 (J)	NA	0.148	0.0243 (J)	0.299	—
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	—	—	—	NA	NA	0.0242 (J)	0.0266 (J)	0.054	0.0166 (J)	—	—	—	0.0303 (J)	—	0.0595	—

Table 2.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	**Heptachlorodibenzodioxins (Total)**	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**Heptachlorodibenzofuran[1,2,3,4,7,8,9-]**	**Heptachlorodibenzofurans (Total)**	**Hexachlorodibenzodioxin[1,2,3,4,7,8-]**	**Hexachlorodibenzodioxin[1,2,3,6,7,8-]**	**Hexachlorodibenzodioxin[1,2,3,7,8,9-]**	**Hexachlorodibenzodioxins (Total)**	**Hexachlorodibenzofuran[1,2,3,4,7,8-]**
0103-97-0061	03-03231	0.00–0.33	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0062	03-03233	0.00–0.33	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	0.000834	0.00166	0.0000873	0.00000879	0.0003	0.00000686 (J)	0.0000309	0.0000145	0.000222	0.00000477
CAMO-09-6005	MO-604949	1.50–2.50	QBT3	0.0000231	0.000046	0.00000305	0.000000615 (J)	0.0000107	0.000000209 (J)	0.000000858 (J)	0.000000386 (J)	0.00000555	0.00000054 (J)
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	0.00000915	0.0000182	0.00000122 (J)	—	0.00000274	—	0.000000402 (J)	0.000000445 (J)	0.00000329	0.000000139 (J)
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	0.000000496 (J)	0.000000991	—	—	—	—	—	—	—	—
CAMO-09-6008	MO-604951	0.00–0.50	SED	0.00234	0.00476	0.00031	0.0000284	0.00128	0.000014 (J)	0.0000789	0.0000314	0.000484	0.0000105
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	0.000935	0.00188	0.00012	0.0000113	0.000483	0.00000572 (J)	0.0000319	0.0000126	0.000192	0.0000043
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6032	MO-604980	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6034	MO-604981	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6040	MO-604984	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6042	MO-604985	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6044	MO-604986	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)
0103-97-0061	03-03231	0.00–0.33	SED	NA	NA	NA	NA	NA	0.011 (J)	NA	NA	NA	NA
0103-97-0062	03-03233	0.00–0.33	SED	NA	NA	NA	NA	NA	0.012	NA	NA	NA	NA
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	0.00000341	—	0.00000616	0.000126	0.106	NA	0.00778 (J-)	0.000173	0.00000314	0.0000214
CAMO-09-6005	MO-604949	1.50–2.50	QBT3	—	—	—	0.00000418	—	—	0.000274	0.00000684	—	—
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	0.000000147 (J)	—	0.000000148 (J)	0.0000019	0.0285 (J)	NA	0.0000802	0.00000198 (J)	—	—
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	—	—	—	—	—	—	0.00000455 (J)	—	—	—
CAMO-09-6008	MO-604951	0.00–0.50	SED	0.00000727	0.00000313	0.0000156	0.000395	0.0483	NA	0.0294	0.00113	0.0000078	0.0000525
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	0.00000286	0.00000124 (J)	0.00000641	0.000147	0.0415	—	0.0112	0.000437	0.00000297	0.0000177
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	NA	NA	NA	NA	0.0663	NA	NA	NA	NA	NA
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	NA	NA	NA	NA	0.0688	NA	NA	NA	NA	NA
CAMO-09-6032	MO-604980	0.00–0.50	SED	NA	NA	NA	NA	0.151	NA	NA	NA	NA	NA
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6034	MO-604981	0.00–0.50	SED	NA	NA	NA	NA	0.0966	NA	NA	NA	NA	NA
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	NA	NA	NA	NA	0.0534	NA	NA	NA	NA	NA
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	NA	NA	NA	NA	0.0332 (J)	NA	NA	NA	NA	NA
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6040	MO-604984	0.00–0.50	SED	NA	NA	NA	NA	0.45	NA	NA	NA	NA	NA
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	NA	NA	NA	NA	0.0351	—	NA	NA	NA	NA
CAMO-09-6042	MO-604985	0.00–0.50	SED	NA	NA	NA	NA	0.0586	NA	NA	NA	NA	NA
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	NA	NA	NA	NA	0.0301 (J)	—	NA	NA	NA	NA
CAMO-09-6044	MO-604986	0.00–0.50	SED	NA	NA	NA	NA	0.0741	NA	NA	NA	NA	NA
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	NA	NA	NA	NA	0.0153 (J)	—	NA	NA	NA	NA

Table 2.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
0103-97-0061	03-03231	0.00–0.33	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—
0103-97-0062	03-03233	0.00–0.33	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—
CAMO-09-6047	MO-604949	0.00–0.50	SOIL	0.000000537 (J)	0.00000135 (J)	0.0000244	0.285	0.494	0.000000166 (J)	0.00000119	0.000000709	0.00000381	NA
CAMO-09-6005	MO-604949	1.50–2.50	QBT3		0.000000238 (J)	0.00000107	—	—	—	—	—	0.000000185	—
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	—	0.00000022 (J)	0.00000105	0.0455	0.104	—	—	—	0.00000141	NA
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6008	MO-604951	0.00–0.50	SED	0.000000897 (J)	0.00000299	0.0000231	0.0635	0.185	0.00000114	0.000014	0.000000904	0.0000202	NA
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	0.000000337 (J)	0.00000123 (J)	0.0000289	0.0502	0.139	0.000000468 (J)	0.00000479	—	0.00000709	—
CAMO-09-6028	MO-604978	0.00–0.50	SOIL	NA	NA	NA	0.163	0.3	NA	NA	NA	NA	NA
CAMO-09-6029	MO-604978	0.50–1.00	QBT4	NA	NA	NA	0.038 (J)	0.0695	NA	NA	NA	NA	—
CAMO-09-6030	MO-604979	0.00–0.50	SOIL	NA	NA	NA	0.0978	0.203	NA	NA	NA	NA	NA
CAMO-09-6032	MO-604980	0.00–0.50	SED	NA	NA	NA	0.18	0.588	NA	NA	NA	NA	NA
CAMO-09-6033	MO-604980	0.50–1.50	QBT4	NA	NA	NA	—	—	NA	NA	NA	NA	0.000535 (J)
CAMO-09-6034	MO-604981	0.00–0.50	SED	NA	NA	NA	0.15	0.363	NA	NA	NA	NA	NA
CAMO-09-6035	MO-604981	0.50–1.50	QBT4	NA	NA	NA	—	0.0146 (J)	NA	NA	NA	NA	—
CAMO-09-6036	MO-604982	0.00–0.50	SOIL	NA	NA	NA	0.0433	0.121	NA	NA	NA	NA	NA
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	NA	NA	NA	0.103	0.155	NA	NA	NA	NA	NA
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	NA	NA	NA	—	—	NA	NA	NA	NA	0.000586 (J)
CAMO-09-6040	MO-604984	0.00–0.50	SED	NA	NA	NA	0.564	1.66	NA	NA	NA	NA	NA
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	NA	NA	NA	0.0648	0.133	NA	NA	NA	NA	0.000347 (J)
CAMO-09-6042	MO-604985	0.00–0.50	SED	NA	NA	NA	0.0671	0.198	NA	NA	NA	NA	NA
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	NA	NA	NA	0.0318 (J)	0.0895	NA	NA	NA	NA	—
CAMO-09-6044	MO-604986	0.00–0.50	SED	NA	NA	NA	0.0785	0.253	NA	NA	NA	NA	NA
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	NA	NA	NA	0.0173 (J)	0.0482	NA	NA	NA	NA	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 2.16-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-049(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.9**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**1.65[b]**	**na[c]**	**2.59**	**0.2**	**2.29**
QBT3,QBT4 Background Value[a]				**na**	**na**	**1.98**	**0.09**	**1.93**
0103-97-0062	03-03233	0.00–0.33	SED	NA[d]	NA	—[e]	—	2.3592
0103-97-0065	03-03237	0.00–0.33	SED	NA	NA	—	—	3.364
CAMO-09-6006	MO-604950	0.00–0.50	SOIL	—	0.0716682	—	—	—
CAMO-09-6007	MO-604950	1.00–2.00	QBT4	—	0.0167267	—	—	—
CAMO-09-6009	MO-604951	0.50–1.50	QBT4	—	0.0825422	—	—	—
CAMO-09-6032	MO-604980	0.00–0.50	SED	0.908	—	3.84	—	4.78
CAMO-09-6034	MO-604981	0.00–0.50	SED	—	0.120948	2.62	—	2.81
CAMO-09-6038	MO-604983	0.00–0.50	SOIL	3.09	—	2.73	—	4.02
CAMO-09-6039	MO-604983	0.50–1.50	QBT4	0.153	—	—	—	—
CAMO-09-6040	MO-604984	0.00–0.50	SED	—	—	2.92	—	5.69
CAMO-09-6041	MO-604984	0.50–1.50	QBT4	0.288	0.0135485	—	—	—
CAMO-09-6042	MO-604985	0.00–0.50	SED	—	—	3.36	0.233	2.92
CAMO-09-6043	MO-604985	0.50–1.50	QBT3	0.122	0.0269192	—	—	—
CAMO-09-6045	MO-604986	0.50–1.50	QBT3	0.162	0.0229565	—	—	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

[d] NA = Not analyzed.

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

Table 2.17-1
Samples Collected and Analyses Requested at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Total Cyanide
0103-97-0101	03-03251	0.00–0.83	SOIL	—*	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0102	03-03252	0.00–0.83	SOIL	—	—	—	—	—	3369R	3368R	—	—	3368R	3368R	—
0103-97-0103	03-03253	0.00–0.92	SOIL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0104	03-03254	0.00–0.83	FILL	—	—	—	—	3370R	3369R	3368R	—	—	3368R	—	—
0103-97-0105	03-03255	0.00–0.83	FILL	—	—	—	—	3370R	3369R	3368R	—	—	3368R	—	—
0103-97-0106	03-03256	0.00–0.83	FILL	—	—	—	—	3370R	3369R	3368R	—	—	3368R	—	—
0103-97-0107	03-03257	0.00–1.00	SOIL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0108	03-03258	0.00–1.00	SOIL	—	—	—	—	—	3369R	3368R	—	—	3368R	3368R	—
0103-97-0109	03-03259	0.00–1.00	SOIL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0110	03-03260	0.00–1.00	FILL	—	—	—	—	3370R	3369R	3368R	—	—	3368R	3368R	—
0103-97-0111	03-03261	0.00–1.00	FILL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0112	03-03262	0.00–1.00	FILL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
0103-97-0113	03-03263	0.00–1.00	FILL	—	—	—	—	—	3369R	3368R	—	—	3368R	—	—
CAMO-09-6191	MO-605025	3.00–4.00	QBT4	09-2293	—	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-6192	MO-605025	5.00–6.00	QBT4	09-2293	—	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	09-2435	—	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6194	MO-605026	3.00–4.00	QBT4	09-2293	—	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	09-2293	—	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	09-2435	—	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	—	09-2205
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	09-2204	09-2205
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	09-2204	09-2205
CAMO-09-10472	MO-605027	6.50–7.50	QBT4	09-2435	—	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	09-2266	—	09-2267	09-2267	09-2267	09-2266	09-2265	09-2266	09-2265	09-2265	09-2265	09-2266
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	09-2266	—	09-2267	09-2267	09-2267	09-2266	09-2265	09-2266	09-2265	09-2265	09-2265	09-2266
CAMO-09-10479	MO-605028	8.00–9.00	QBT4	09-2455	—	09-2455	—	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	—	09-2205
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	09-2204	09-2205
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	09-2205	—	09-2206	09-2206	09-2206	09-2205	09-2204	09-2205	09-2204	09-2204	09-2204	09-2205
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	09-2435	—	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6206	MO-605030	0.00–0.50	FILL	09-2221	—	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	—	09-2221
CAMO-09-6207	MO-605030	2.00–3.00	QBT4	09-2221	—	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221
CAMO-09-6208	MO-605030	4.00–5.00	QBT4	09-2221	—	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221

Table 2.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	TPH-DRO	VOCs	Total Cyanide
CAMO-09-10473	MO-605030	7.00–8.00	QBT4	09-2435	—	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	09-2293	09-2300	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	—	09-2293
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	09-2293	09-2300	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	09-2293	09-2300	09-2294	09-2294	09-2294	09-2293	09-2292	09-2293	09-2292	09-2292	09-2292	09-2293
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	09-2435	09-2445	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6212	MO-605032	0.00–0.50	FILL	09-2221	09-2219	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	—	09-2221
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	09-2221	09-2219	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	09-2221	09-2219	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221
CAMO-09-10474	MO-605032	6.50–7.50	QBT4	09-2435	09-2445	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	09-2221	09-2219	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	09-2221	09-2219	09-2222	09-2222	09-2222	09-2221	09-2220	09-2221	09-2220	09-2220	09-2220	09-2221
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	09-2435	09-2445	09-2435	—	09-2435	09-2435	09-2434	09-2435	09-2434	09-2434	09-2434	09-2435
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	09-2266	09-2264	09-2267	09-2267	09-2267	09-2266	09-2265	09-2266	09-2265	09-2265	09-2265	09-2266
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	09-2266	09-2264	09-2267	09-2267	09-2267	09-2266	09-2265	09-2266	09-2265	09-2265	09-2265	09-2266
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	09-2455	09-2454	09-2455	—	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455	09-2455

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.17-2
Inorganic Chemicals above BVs at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**
0103-97-0101	03-03251	0.00–0.83	SOIL	—[c]	4.64 (U)	—	—	—	0.464 (U)	—	—	—	244	NA[d]
0103-97-0102	03-03252	0.00–0.83	SOIL	—	5.06 (U)	—	—	—	0.506 (U)	—	—	—	151	NA
0103-97-0103	03-03253	0.00–0.92	SOIL	—	3.97 (U)	—	—	—	—	—	—	—	19.6	NA
0103-97-0104	03-03254	0.00–0.83	FILL	—	5.77 (U)	—	—	—	0.577 (U)	—	—	—	—	NA
0103-97-0105	03-03255	0.00–0.83	FILL	—	4.98 (U)	—	—	—	0.498 (U)	—	—	9.47	—	NA
0103-97-0106	03-03256	0.00–0.83	FILL	—	4.13 (U)	—	—	—	0.413 (U)	—	—	—	—	NA
0103-97-0107	03-03257	0.00–1.00	SOIL	—	4.79 (U)	—	—	—	0.479 (U)	—	—	—	—	NA
0103-97-0108	03-03258	0.00–1.00	SOIL	—	4.84 (U)	—	—	—	0.484 (U)	—	—	—	—	NA
0103-97-0109	03-03259	0.00–1.00	SOIL	—	4.77 (U)	—	—	—	0.477 (U)	—	—	—	—	NA
0103-97-0110	03-03260	0.00–1.00	FILL	—	5.16 (U)	—	—	—	0.516 (U)	—	—	—	—	NA
0103-97-0111	03-03261	0.00–1.00	FILL	—	4.35 (U)	—	—	—	0.435 (U)	—	—	—	—	NA
0103-97-0112	03-03262	0.00–1.00	FILL	—	4.46 (U)	—	—	—	0.446 (U)	—	—	—	—	NA
0103-97-0113	03-03263	0.00–1.00	FILL	—	4.8 (U)	—	—	—	0.48 (U)	—	—	—	—	NA
CAMO-09-6191	MO-605025	3.00–4.00	QBT4	17800	—	3.3	298 (J-)	1.71	—	4670	14	15.7	10.8	—
CAMO-09-6192	MO-605025	5.00–6.00	QBT4	8770	—	—	69 (J-)	—	—	—	14.7	—	5.26	—
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	—	1.11 (U)	—	—	—	—	—	—	—	—	—
CAMO-09-6194	MO-605026	3.00–4.00	QBT4	15000	—	4.04	213 (J-)	1.93	—	4520	12.4	3.8	10.2	—
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	9810	1.17 (UJ)	—	154 (J-)	1.82	—	2380	24.4	—	6.22	—
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	—	1.07 (U)	—	—	—	—	—	—	—	—	—
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	—	0.931 (U)	—	—	—	0.583 (U)	—	—	—	—	—
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	20000	0.982 (U)	3.84	278 (J+)	1.67	—	6040	15.1	7.36	11.3	—
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	13200	0.733 (U)	—	59.4 (J+)	1.31	—	3040	12	3.59	6.06	—
CAMO-09-10472	MO-605027	6.50–7.50	QBT4	—	1.12 (U)	—	—	—	—	—	—	—	—	—
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	22200	1.27 (U)	—	485 (J)	2.8	—	5060	17.8	6.04	9.15	—
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	—	—	—	101 (J)	—	—	—	28.7	—	—	—
CAMO-09-10479	MO-605028	8.00–9.00	QBT4	—	1.09 (U)	—	—	—	—	—	9.58	—	—	—
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	—	1.06 (U)	—	—	—	0.582 (U)	—	82.2	—	—	26.4
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	—	0.825 (U)	—	67 (J+)	—	—	—	10.1	—	—	—
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	7490	—	—	77.1 (J+)	—	—	—	13.9	—	—	—
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	—	1.17 (U)	—	—	—	—	—	7.4	—	—	—
CAMO-09-6206	MO-605030	0.00–0.50	FILL	—	1.78 (U)	—	—	—	0.547 (U)	—	—	—	17.7	—
CAMO-09-6207	MO-605030	2.00–3.00	QBT4	17100	1.12 (U)	—	296 (J+)	1.9	—	4320 (J)	13.3	11	12.5	—

Table 2.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**
CAMO-09-6208	MO-605030	4.00–5.00	QBT4	16500	1.16 (U)	4.01	181 (J+)	2.47	—	4340 (J)	10.1	11.2	8.27	—
CAMO-09-10473	MO-605030	7.00–8.00	QBT4	13600	1.14 (U)	—	—	—	—	2260 (J)	7.64	—	8.25 (J)	—
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	—	—	—	—	—	0.552 (U)	—	—	—	—	—
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	15100	0.519 (U)	2.85	131 (J-)	1.77	—	4910	13.1	5.32	11.3	—
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	13800	1.14 (UJ)	—	142 (J-)	1.91	—	3750	32.2	3.2	7.64	—
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	1.1 (U)	—	—	—	—	—	—	—	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	—	1.03 (J)	—	—	—	—	—	—	—	15.4	—
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	17000	1.2 (U)	—	121 (J+)	2.4	—	4670 (J)	9.71	5.28	9.01	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	16500	1.15 (U)	—	83.7 (J+)	1.22	—	4020 (J)	14.9	3.18	7.07	—
CAMO-09-10474	MO-605032	6.50–7.50	QBT4	—	1.12 (U)	5.86	—	—	—	—	8.3	—	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	—	0.509 (U)	—	108 (J+)	—	—	3270 (J)	9.75	—	—	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	0.906 (U)	—	108 (J+)	—	—	3440 (J)	9.16	3.65	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	1.15 (U)	—	—	—	—	—	—	—	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	20900	0.563 (J)	—	373 (J)	1.59	—	8380	17	3.33	6.34	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	—	1.14 (U)	—	—	—	—	—	14.6	—	—	—
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	1.12 (U)	—	—	—	—	—	—	—	—	—

Table 2.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
SOIL,FILL Background Value[a]				**21500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
QBT4 Background Value[a]				**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**1.1**	**17**	**63.5**
0103-97-0101	03-03251	0.00–0.83	SOIL	—	102	—	—	—	NA	NA	—	—	—	109
0103-97-0102	03-03252	0.00–0.83	SOIL	—	72.2	—	—	—	NA	NA	—	—	—	85.2
0103-97-0103	03-03253	0.00–0.92	SOIL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0104	03-03254	0.00–0.83	FILL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0105	03-03255	0.00–0.83	FILL	—	—	—	1090	—	NA	NA	—	—	—	—
0103-97-0106	03-03256	0.00–0.83	FILL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0107	03-03257	0.00–1.00	SOIL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0108	03-03258	0.00–1.00	SOIL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0109	03-03259	0.00–1.00	SOIL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0110	03-03260	0.00–1.00	FILL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0111	03-03261	0.00–1.00	FILL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0112	03-03262	0.00–1.00	FILL	—	—	—	—	—	NA	NA	—	—	—	—
0103-97-0113	03-03263	0.00–1.00	FILL	—	—	—	—	—	NA	NA	—	—	—	—
CAMO-09-6191	MO-605025	3.00–4.00	QBT4	16700	17.4	3230 (J+)	—	16.4 (J+)	3.77	—	1.21 (U)	—	31.4	—
CAMO-09-6192	MO-605025	5.00–6.00	QBT4	—	—	1810 (J+)	—	10.6 (J+)	6.51	0.000759 (J+)	1.18 (U)	—	—	—
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	—	—	—	—	—	—	—	1.09 (U)	—	—	—
CAMO-09-6194	MO-605026	3.00–4.00	QBT4	15500	12	3380 (J+)	—	25.6 (J+)	3.1	—	1.2 (U)	—	26.4	—
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	—	—	2100 (J+)	—	20.6 (J+)	4.98	—	1.2 (U)	—	—	—
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	—	—	—	—	—	—	0.000572 (J)	1.11 (U)	—	—	—
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	—	—	—	—	—	1.08 (J)	—	—	—	—	—
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	20500	26.6	3550	—	14.2	0.754 (J)	0.0034	0.716 (J)	—	36.7	—
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	16200	26.8	2560	—	14.9	0.625 (J)	0.00303	1.16 (U)	—	20	—
CAMO-09-10472	MO-605027	6.50–7.50	QBT4	—	—	—	—	—	—	—	1.11 (U)	—	—	—
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	20700	15.2	5170	666	31.3 (J)	5.44 (J-)	—	1.27 (UJ)	—	27.2	—
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	—	—	—	—	8.13 (J)	5.64 (J-)	0.000732 (J)	1.17 (UJ)	—	—	—
CAMO-09-10479	MO-605028	8.00–9.00	QBT4	—	—	—	—	—	—	0.000754 (J)	0.61 (J-)	—	—	—
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	—	63.5	—	—	—	—	0.000835 (J)	—	—	—	—
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	—	11.6	—	—	—	0.625 (J)	—	1.12 (U)	—	—	—
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	—	—	—	—	7.76	0.676 (J)	0.00141 (J)	0.596 (J)	—	—	—
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	—	—	—	—	—	—	—	1.14 (U)	—	—	—
CAMO-09-6206	MO-605030	0.00–0.50	FILL	—	24.9	—	—	—	1.37	—	—	—	—	—
CAMO-09-6207	MO-605030	2.00–3.00	QBT4	19500	41.3	3480 (J+)	1410	15.5 (J+)	0.682 (J)	—	1.15 (UJ)	—	31	—
CAMO-09-6208	MO-605030	4.00–5.00	QBT4	21000	17.4	3160 (J+)	1140	23.4 (J+)	0.615 (J)	0.00163 (J)	1.13 (UJ)	—	25.6	—
CAMO-09-10473	MO-605030	7.00–8.00	QBT4	—	—	—	572 (J)	7 (J+)	—	0.000726 (J)	1.14 (U)	—	—	—

Table 2.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
SOIL,FILL Background Value[a]				**21500**	**22.3**	**4610**	**671**	**15.4**	**na[b]**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
QBT4 Background Value[a]				**14500**	**11.2**	**1690**	**482**	**6.58**	**na**	**na**	**0.3**	**1.1**	**17**	**63.5**
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	—	—	—	—	—	3.88	—	—	—	—	—
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	15300	13.9	3300 (J+)	—	16.8 (J+)	0.535 (J)	0.00134 (J+)	1.12 (U)	—	26.8	—
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	15100	11.7	2700 (J+)	—	16.4 (J+)	0.614 (J)	0.000943 (J+)	1.15 (U)	—	18.4	—
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	—	—	—	—	—	—	1.1 (U)	—	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	—	—	—	—	—	0.659 (J)	—	—	—	—	95.6
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	14800	16.6	3790 (J+)	719	26.6 (J+)	0.632 (J)	—	1.21 (UJ)	—	17.9	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	—	11.9	2740 (J+)	—	11 (J+)	0.622 (J)	—	1.17 (UJ)	—	—	—
CAMO-09-10474	MO-605032	6.50–7.50	QBT4	—	—	—	—	7.08 (J+)	—	—	1.12 (U)	—	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	—	—	—	—	—	0.949 (J)	—	1.2 (UJ)	—	—	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	—	—	—	8.74 (J+)	0.941 (J)	—	1.19 (UJ)	—	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	—	—	—	—	—	—	1.16 (U)	1.16 (U)	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	18300	—	3710	—	13.5 (J)	1.88 (J-)	—	1.21 (UJ)	—	21.4	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	—	—	—	—	—	1.69 (J-)	—	1.09 (UJ)	—	—	—
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	—	—	—	—	—	—	0.561 (J-)	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.17-3
Organic Chemicals Detected at Consolidated Unit 03-049(b)-00

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	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene
0103-97-0101	03-03251	0.00–0.83	SOIL	NA[a]	NA	NA	—[b]	12	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0102	03-03252	0.00–0.83	SOIL	NA	—	NA	—	7.3	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0103	03-03253	0.00–0.92	SOIL	NA	NA	NA	—	3.9	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0104	03-03254	0.00–0.83	FILL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0105	03-03255	0.00–0.83	FILL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0106	03-03256	0.00–0.83	FILL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0107	03-03257	0.00–1.00	SOIL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0108	03-03258	0.00–1.00	SOIL	NA	—	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0109	03-03259	0.00–1.00	SOIL	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0110	03-03260	0.00–1.00	FILL	NA	—	NA	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0111	03-03261	0.00–1.00	FILL	NA	NA	NA	—	0.38	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0112	03-03262	0.00–1.00	FILL	NA	NA	NA	—	0.052	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0113	03-03263	0.00–1.00	FILL	NA	NA	NA	—	0.078	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	—	0.00626	—	0.12	0.143	0.0601	—	—	—	—	—	—	—	—	—	—
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	—	0.00758	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	0.109 (J)	NA	0.158	—	0.0195 (J)	0.0161 (J)	0.311	0.365	0.51	0.247 (J)	—	0.307	0.0215 (J)	—	0.906	0.103 (J)
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0144 (J)	—
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	—	NA	0.0243 (J)	—	0.011 (J)	0.0114 (J)	0.0551	0.0627	0.0935	0.0611 (J)	—	0.0639	—	—	0.189	—
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	—	—	0.0106 (J)	—	0.0096	0.0064	0.0257 (J)	0.023 (J)	0.038 (J)	0.0178 (J)	—	0.0244 (J)	—	—	0.0739	—
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	—	—	0.00794 (J)	—	0.0397	0.0181	0.024 (J)	0.0246 (J)	0.0408	0.0179 (J)	—	0.0248 (J)	—	—	0.0578	—
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	—	—	—	0.068	0.0836	0.0369	—	—	—	—	—	—	—	—	—	—
CAMO-09-6206	MO-605030	0.00–0.50	FILL	0.152	NA	0.228	—	0.735	0.312	0.55	0.51	0.59	0.349	0.268	0.56	—	—	1.54	0.118
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	2.38	NA	3.54	—	0.345	0.201	7.17	6.21	9.65	4.97	—	6.6	—	1.14 (J)	21	2.13
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	—	—	—	—	—	—	0.0166 (J)	0.0132 (J)	0.0218 (J)	—	—	0.0147 (J)	—	—	0.0402	—
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	0.0512	—	0.0936	—	0.0039	—	0.171	0.144	0.223	0.135	—	0.163	—	—	0.548	0.0434
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	0.00595	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	—	NA	—	—	0.232	0.0939	—	—	0.179 (J)	—	—	—	—	—	0.292 (J)	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	—	—	—	—	—	0.0029 (J)	—	—	—	—	—	—	—	—	0.0276 (J)	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	0.00763	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	—	—	—	—	0.0028 (J)	0.0025 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
0103-97-0101	03-03251	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0102	03-03252	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0103	03-03253	0.00–0.92	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0104	03-03254	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0105	03-03255	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0106	03-03256	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0107	03-03257	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0108	03-03258	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0109	03-03259	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0110	03-03260	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0111	03-03261	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0112	03-03262	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0113	03-03263	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6206	MO-605030	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	0.0000175	0.0000372	0.00000226 (J)	0.000000313 (J)	0.00000614	0.000000204 (J)	0.000000666 (J)	0.000000464 (J)	0.00000622	0.00000104 (J)
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	0.0000493	0.000361	0.00000324	0.000000464 (J)	0.0000165	—	0.000000535 (J)	—	0.0000176	0.0000006 (J)
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	0.0000151	0.000131	0.00000158 (J)	—	0.00000674	—	—	—	0.00000548	0.000000272 (J)

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	0.0000205	0.0000434	0.00000421	0.000000467 (J)	0.00000948	0.000000385 (J)	0.000000952 (J)	0.000000701 (J)	0.00000851	0.00000113 (J)
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	0.000000151 (J)	0.000000151	—	—	—	—	—	—	—	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	0.000000235 (J)	0.000000506	—	—	—	—	—	—	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	0.000000528 (J)	0.00000112	0.00000017 (J)	—	0.000000379	—	—	—	—	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	0.000000412	—	—	—	—	—	—	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	0.000000173 (J)	0.000000173	—	—	—	—	—	—	—	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	0.000000427 (J)	0.000000931	0.000000147 (J)	—	0.000000311	—	—	—	0.000000197	—
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
0103-97-0101	03-03251	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0102	03-03252	0.00–0.83	SOIL	NA	NA	NA	NA	NA	0.002 (J)	NA	—	NA	NA	NA
0103-97-0103	03-03253	0.00–0.92	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0104	03-03254	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0105	03-03255	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0106	03-03256	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0107	03-03257	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0108	03-03258	0.00–1.00	SOIL	NA	NA	NA	NA	NA	—	NA	—	NA	NA	NA
0103-97-0109	03-03259	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0110	03-03260	0.00–1.00	FILL	NA	NA	NA	NA	NA	—	NA	—	NA	NA	NA
0103-97-0111	03-03261	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0112	03-03262	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0103-97-0113	03-03263	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	NA	NA	NA	NA	0.231 (J)	NA	0.0352 (J)	0.051	NA	NA	NA
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	NA	NA	NA	NA	0.0548 (J)	NA	—	—	NA	NA	NA
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	NA	NA	NA	NA	0.0152 (J)	—	—	—	NA	NA	NA
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	NA	NA	NA	NA	0.0148 (J)	—	—	—	NA	NA	NA
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6206	MO-605030	0.00–0.50	FILL	NA	NA	NA	NA	0.328 (J)	NA	0.0204 (J)	0.0414	NA	NA	NA
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	0.000000516 (J)	0.000000184 (J)	0.000000568 (J)	0.00000701	4.71	NA	0.541	1.36	0.000111	0.000004 (J)	0.000000134 (J)
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	0.0000000962 (J)	—	0.000000165 (J)	0.00000493	—	—	—	—	0.000263	0.0000164	—
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	—	—	0.000000073 (J)	0.00000233	0.12	—	0.00913 (J)	0.0227 (J)	0.000109	0.00000762	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	—	—	—	—	—	—	—	0.000000807 (J)	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	0.000000757 (J)	0.000000246 (J)	0.000000614 (J)	0.00000931	—	NA	—	—	0.000144 (J)	0.00000698	0.000000242 (J)
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	0.000000786 (J)	—	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	0.00000152 (J)	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	0.00000558 (J)	0.000000273 (J)	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	—	—	—	—	—	—	—	0.0000018 (J)	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	0.00000145 (J)	—	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	—	—	—	0.000000187	—	—	—	—	0.00000279 (J)	0.000000254 (J)	—
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	0.000000444 (J)	—	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Total Petroleum Hydrocarbons Diesel Range Organics
0103-97-0101	03-03251	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130
0103-97-0102	03-03252	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.004 (J)	190
0103-97-0103	03-03253	0.00–0.92	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	130
0103-97-0104	03-03254	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.5
0103-97-0105	03-03255	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13
0103-97-0106	03-03256	0.00–0.83	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98
0103-97-0107	03-03257	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.5
0103-97-0108	03-03258	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	3400 (J+)
0103-97-0109	03-03259	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1100
0103-97-0110	03-03260	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	16
0103-97-0111	03-03261	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38
0103-97-0112	03-03262	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70
0103-97-0113	03-03263	0.00–1.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17
CAMO-09-10478	MO-605025	8.00–9.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	—
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	3.91 (J)
CAMO-09-10477	MO-605026	8.00–10.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	—
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	NA	NA	NA	NA	0.702	0.551 (J)	NA	NA	NA	NA	15.8
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	1.38 (J)
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	NA	NA	NA	NA	—	0.0146 (J)	NA	NA	NA	—	—
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	2.09 (J)
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	1.75 (J)
CAMO-09-6203	MO-605029	0.00–0.50	SOIL	NA	NA	NA	NA	0.0878	0.109 (J)	NA	NA	NA	NA	5.27
CAMO-09-6204	MO-605029	0.50–1.50	QBT4	NA	NA	NA	NA	—	0.049	NA	NA	NA	—	3.75 (J)
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	NA	NA	NA	NA	—	0.0579	NA	NA	NA	—	3 (J)
CAMO-09-10471	MO-605029	5.50–6.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	—	—

Table 2.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Total Petroleum Hydrocarbons Diesel Range Organics
CAMO-09-6206	MO-605030	0.00–0.50	FILL	NA	NA	NA	NA	1.18	1.24	NA	NA	NA	NA	59.5 (J+)
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	0.000000656	0.00000059 (J)	0.00000209 (J)	0.0000127	18.2	17	0.000000901	0.00000471	0.0000241	NA	268
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	—	—	—	0.000000116	0.0301 (J)	0.0316 (J)	—	—	—	—	—
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	—	—	—	—	0.441	0.372	—	—	6.58E-08	—	3.15 (J)
CAMO-09-10476	MO-605031	6.50–7.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6212	MO-605032	0.00–0.50	FILL	0.000000516	0.000000401 (J)	0.00000115 (J)	0.0000122	—	0.208 (J)	0.00000203	0.00000244	0.0000162	NA	13.5
CAMO-09-6213	MO-605032	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6214	MO-605032	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6215	MO-605033	1.00–2.00	QBT4	—	—	—	—	0.0197 (J)	0.0215 (J)	—	—	—	—	—
CAMO-09-6216	MO-605033	4.00–5.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10475	MO-605033	6.00–7.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	—	—	—	—	—	—	—	—	—	—	2.23 (J)
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	—	—	—	0.000000127	—	—	—	—	—	—	1.47 (J)
CAMO-09-10480	MO-605034	7.00–8.00	QBT4	—	—	—	—	—	—	—	—	—	—	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 2.17-4
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 03-049(b)-00

Sample ID	Location ID	Depth (ft)	Media	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SOIL,FILL Background Value[a]				**na[b]**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**1.98**	**0.09**	**1.93**
CAMO-09-6191	MO-605025	3.00–4.00	QBT4	0.075589	—[c]	—	—
CAMO-09-6192	MO-605025	5.00–6.00	QBT4	0.351838	—	—	—
CAMO-09-6194	MO-605026	3.00–4.00	QBT4	0.35122	—	—	—
CAMO-09-6195	MO-605026	5.00–6.00	QBT4	0.392344	—	—	—
CAMO-09-6197	MO-605027	0.00–0.50	SOIL	0.0526386	—	—	—
CAMO-09-6198	MO-605027	1.50–2.50	QBT4	0.0622497	—	—	—
CAMO-09-6199	MO-605027	3.50–4.50	QBT4	0.173993	—	—	—
CAMO-09-6200	MO-605028	3.00–4.00	QBT4	0.375725	—	—	—
CAMO-09-6201	MO-605028	5.00–6.00	QBT4	0.0918258	—	—	—
CAMO-09-6205	MO-605029	2.50–3.50	QBT4	—	—	—	2.59
CAMO-09-6206	MO-605030	0.00–0.50	FILL	—	—	0.249	8.93
CAMO-09-6207	MO-605030	2.00–3.00	QBT4	—	—	0.093	4.8
CAMO-09-6208	MO-605030	4.00–5.00	QBT4	—	—	—	2.6
CAMO-09-6209	MO-605031	0.00–0.50	SOIL	—	3.74	0.353	17.6
CAMO-09-6210	MO-605031	1.50–2.50	QBT4	0.152824	—	0.118	3.64
CAMO-09-6211	MO-605031	3.50–4.50	QBT4	0.145044	—	—	5.78
CAMO-09-6219	MO-605034	2.00–3.00	QBT4	0.0920756	—	—	—
CAMO-09-6220	MO-605034	4.00–5.00	QBT4	0.170275	—	—	—

Note: Results are in pCi/g.

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

[b] na = Not available.

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

Table 2.18-1
Samples Collected and Analyses Requested at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
RC03-01-0024	03-14466	0.00–0.50	FILL	9417R	—*	—	—	—	9417R	—	—	—	—	—
RC03-01-0025	03-14467	0.00–0.50	FILL	9417R	—	—	—	—	9417R	—	—	—	—	—
RC03-01-0026	03-14468	0.00–0.50	FILL	9417R	—	—	—	—	9417R	—	—	—	—	—
RC03-01-0027	03-14469	0.00–0.50	FILL	9417R	—	—	—	—	9417R	—	—	—	—	—
CAMO-09-6145	MO-605009	0.00–0.50	SED	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	09-2309	09-2310	09-2309	-	09-2310
CAMO-09-6146	MO-605009	0.50–1.50	QBT4	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	09-2309	09-2310	09-2309	09-2309	09-2310
CAMO-09-6147	MO-605010	0.00–0.50	SED	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	09-2309	09-2310	09-2309	—	09-2310
CAMO-09-6148	MO-605010	0.50–1.50	QBT4	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	09-2309	09-2310	09-2309	09-2309	09-2310
CAMO-09-6149	MO-605011	0.00–0.50	SOIL	09-2401	09-2399	09-2401	09-2401	09-2401	09-2401	09-2400	09-2401	09-2400	—	09-2401
CAMO-09-6150	MO-605011	1.00–2.00	QBT3	09-2401	09-2399	09-2401	09-2401	09-2401	09-2401	09-2400	09-2401	09-2400	09-2400	09-2401
CAMO-09-6151	MO-605012	0.00–0.50	SED	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	—	09-2310	09-2309	—	09-2310
CAMO-09-6152	MO-605012	0.50–1.50	QBT4	09-2310	09-2308	09-2310	09-2310	09-2310	09-2310	—	09-2310	09-2309	09-2309	09-2310
CAMO-09-6153	MO-605013	0.00–0.50	SED	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	—	09-2367
CAMO-09-6154	MO-605013	1.00–2.00	QBT3	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	09-2366	09-2367
CAMO-09-6155	MO-605014	0.00–0.50	SED	09-2352	09-2351	09-2352	09-2352	09-2352	09-2352	—	09-2352	09-2352	—	09-2352
CAMO-09-6156	MO-605014	0.50–1.50	QBT4	09-2352	09-2351	09-2352	09-2352	09-2352	09-2352	—	09-2352	09-2352	09-2352	09-2352
CAMO-09-6157	MO-605015	0.00–0.50	SED	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	—	09-2367
CAMO-09-6158	MO-605015	0.50–1.50	QBT3	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	09-2366	09-2367
CAMO-09-6159	MO-605016	0.00–0.50	SED	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	—	09-2367
CAMO-09-6160	MO-605016	0.50–1.50	QBT3	09-2367	09-2365	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	09-2366	09-2367
CAMO-09-6161	MO-605017	0.00–0.50	SED	09-2367	—	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	—	09-2367
CAMO-09-6162	MO-605017	0.50–1.50	QBT4	09-2367	—	09-2367	09-2367	09-2367	09-2367	—	09-2367	09-2366	09-2366	09-2367
CAMO-09-6163	MO-605018	0.00–0.50	SED	09-2352	—	09-2352	09-2352	09-2352	09-2352	—	09-2352	09-2352	—	09-2352
CAMO-09-6164	MO-605018	0.50–1.50	QBT4	09-2352	—	09-2352	09-2352	09-2352	09-2352	—	09-2352	09-2352	09-2352	09-2352
CAMO-09-6165	MO-605019	0.00–0.50	SOIL	09-2401	—	09-2401	09-2401	09-2401	09-2401	—	09-2401	09-2400	—	09-2401
CAMO-09-6166	MO-605019	2.00–3.00	QBT3	09-2401	—	09-2401	09-2401	09-2401	09-2401	—	09-2401	09-2400	09-2400	09-2401
CAMO-09-6167	MO-605020	0.00–0.50	SOIL	09-2401	—	09-2401	09-2401	09-2401	09-2401	—	09-2401	09-2400	—	09-2401
CAMO-09-6168	MO-605020	1.00–2.00	QBT3	09-2401	—	09-2401	09-2401	09-2401	09-2401	—	09-2401	09-2400	09-2400	09-2401

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.18-2
Inorganic Chemicals above BVs at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Nitrate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**543**	**9.38**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**15.4**	**na**	**1.52**	**1**	**48.8**
QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**482**	**6.58**	**na**	**0.3**	**1**	**63.5**
RC03-01-0024	03-14466	0.00–0.50	FILL	1.6	82.3	—[c]	2	69.8	NA[d]	8.9	177	113000	72.5	740	30.1	NA	—	—	631
RC03-01-0025	03-14467	0.00–0.50	FILL	—	27.3	—	—	19.6	NA	—	40.8	—	34.3	—	—	NA	—	—	194
RC03-01-0026	03-14468	0.00–0.50	FILL	—	20.1	—	0.47	22.1	NA	—	35.9	—	24.3	—	—	NA	—	—	258
RC03-01-0027	03-14469	0.00–0.50	FILL	—	—	—	—	—	NA	—	—	—	—	—	—	NA	—	—	88.8
CAMO-09-6145	MO-605009	0.00–0.50	SED	—	—	—	0.636 (U)	—	—	—	18.5	—	—	—	—	1.26 (J)	1.26 (U)	—	147
CAMO-09-6146	MO-605009	0.50–1.50	QBT4	0.643 (J)	—	—	—	19.8	—	—	—	—	—	—	—	—	1.65	—	—
CAMO-09-6147	MO-605010	0.00–0.50	SED	0.884 (J)	—	—	0.648 (U)	21.9	—	—	—	—	—	—	—	2.31	1.31 (U)	—	62.1
CAMO-09-6148	MO-605010	0.50–1.50	QBT4	4.72	—	—	—	15.3	—	—	31.5	—	—	—	—	—	1.28 (U)	—	94.2
CAMO-09-6149	MO-605011	0.00–0.50	SOIL	1.09 (U)	—	—	0.546 (U)	—	—	—	—	—	—	—	—	1.13	—	—	—
CAMO-09-6150	MO-605011	1.00–2.00	QBT3	1.06 (U)	—	—	—	8.74	0.131 (J)	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6151	MO-605012	0.00–0.50	SED	1.27 (U)	—	—	0.634 (U)	10.8	—	—	16.5	—	21.2	—	9.56 (J-)	—	1.27 (U)	—	136
CAMO-09-6152	MO-605012	0.50–1.50	QBT4	1.21 (U)	—	—	—	27.1	—	—	—	—	—	—	—	—	1.25 (U)	—	—
CAMO-09-6153	MO-605013	0.00–0.50	SED	—	—	—	0.604 (U)	—	0.261 (J)	—	—	—	—	—	—	1.69 (J-)	1.19 (U)	—	—
CAMO-09-6154	MO-605013	1.00–2.00	QBT3	—	—	—	—	—	0.174 (J)	—	20	—	—	—	—	—	1.18 (U)	—	63.7
CAMO-09-6155	MO-605014	0.00–0.50	SED	2.61	—	—	0.613 (U)	—	—	—	13.9	—	—	—	—	3.03	1.23 (U)	—	113
CAMO-09-6156	MO-605014	0.50–1.50	QBT4	1.16 (U)	—	—	2.89 (U)	22	—	—	—	14800	—	—	—	—	1.17 (U)	2.08	—
CAMO-09-6157	MO-605015	0.00–0.50	SED	—	—	—	0.626 (U)	—	—	—	—	—	25.2	—	—	0.972 (J-)	1.28 (U)	—	96.5
CAMO-09-6158	MO-605015	0.50–1.50	QBT3	1.18 (U)	—	—	—	7.58	—	—	—	—	—	—	—	—	1.2 (U)	—	—
CAMO-09-6159	MO-605016	0.00–0.50	SED	1.57	—	—	0.605 (U)	—	—	—	—	—	—	—	—	—	1.19 (U)	—	75.7
CAMO-09-6160	MO-605016	0.50–1.50	QBT3	0.512 (J)	—	—	—	10	0.23 (J)	—	—	—	—	—	—	—	1.28 (U)	—	—
CAMO-09-6161	MO-605017	0.00–0.50	SED	1.14 (U)	—	—	0.569 (U)	—	—	—	—	—	—	—	—	—	1.13 (U)	—	102
CAMO-09-6162	MO-605017	0.50–1.50	QBT4	1.29 (U)	—	—	—	10.7	0.273 (J)	—	—	—	—	—	—	—	1.27 (U)	—	—
CAMO-09-6163	MO-605018	0.00–0.50	SED	1.12 (U)	—	—	0.561 (U)	—	—	—	—	—	—	—	—	3.06	1.16 (U)	—	—
CAMO-09-6164	MO-605018	0.50–1.50	QBT4	1.21 (U)	—	—	—	15.7	—	—	—	—	—	—	—	—	1.2 (U)	—	—
CAMO-09-6165	MO-605019	0.00–0.50	SOIL	1.08 (U)	—	—	0.542 (U)	—	—	—	33.2	—	—	—	—	1.97	—	—	68
CAMO-09-6166	MO-605019	2.00–3.00	QBT3	1.1 (U)	—	—	—	—	—	—	6.68	—	—	—	—	—	1.08 (U)	—	—

Table 2.18-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Nitrate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**543**	**9.38**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**671**	**15.4**	**na**	**1.52**	**1**	**48.8**
QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**482**	**6.58**	**na**	**0.3**	**1**	**63.5**
CAMO-09-6167	MO-605020	0.00–0.50	SOIL	1.05 (U)	—	—	0.524 (U)	—	—	—	—	—	—	—	—	0.631 (J)	—	—	—
CAMO-09-6168	MO-605020	1.00–2.00	QBT3	1.11 (U)	—	54.1	—	8.89	—	—	—	—	—	553	—	—	1.11 (U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.18-3
Organic Chemicals Detected at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene
CAMO-09-6145	MO-605009	0.00-0.50	SED	0.858	NA[a]	1.67	0.559	11.7	12.9	24.9	8.61	—[b]	16.2	—	—	—	30.5	0.762
CAMO-09-6146	MO-605009	0.50-1.50	QBT4	—	—	—	0.015	0.0616	0.0714	0.134	0.0563	—	0.085	—	—	—	0.16	—
CAMO-09-6147	MO-605010	0.00-0.50	SED	1.23	NA	2.44	1.27	16.7	17.1	32.3	10.9	—	19.4	1.26 (J)	—	—	40.7	1.1
CAMO-09-6148	MO-605010	0.50-1.50	QBT4	—	—	0.00944 (J)	0.0055	0.0713	0.0958	0.195	0.0744	—	0.118	—	—	—	0.221	—
CAMO-09-6149	MO-605011	0.00-0.50	SOIL	—	NA	0.0074 (J)	0.0089	0.0365	0.0337 (J)	0.0638	0.0188 (J)	—	0.0363 (J)	—	—	—	0.0798	—
CAMO-09-6150	MO-605011	1.00-2.00	QBT3	—	—	—	0.0114	—	—	—	—	—	—	—	—	—	0.0129 (J)	—
CAMO-09-6151	MO-605012	0.00-0.50	SED	0.113	NA	0.225	NA	0.726	0.706	1.19	0.453	—	0.756	—	—	—	1.75	0.107
CAMO-09-6152	MO-605012	0.50-1.50	QBT4	—	—	—	NA	—	—	0.0201 (J)	—	—	0.0276 (J)	—	—	—	0.027 (J)	—
CAMO-09-6153	MO-605013	0.00-0.50	SED	—	NA	0.0104 (J)	NA	0.0455	0.0482	0.0818	0.0328 (J)	—	0.0536	—	—	—	0.109	—
CAMO-09-6154	MO-605013	1.00-2.00	QBT3	—	—	—	NA	—	—	0.0174 (J)	—	—	—	—	—	—	0.0262 (J)	—
CAMO-09-6155	MO-605014	0.00-0.50	SED	4.39	NA	7.87	NA	13.7	10.6	17.7	4.53 (J)	0.281 (J)	12.4	0.685 (J)	2.05 (J)	2.22	33.3	4.27
CAMO-09-6156	MO-605014	0.50-1.50	QBT4	—	—	—	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6157	MO-605015	0.00-0.50	SED	0.366	NA	0.688	NA	1.95	1.86	3.28	1.09	—	2.04	—	—	0.155 (J)	4.96	0.363
CAMO-09-6158	MO-605015	0.50-1.50	QBT3	0.0665	0.382	0.132	NA	0.213	0.196	0.307	0.114	—	0.2	—	—	—	0.54	0.0714
CAMO-09-6159	MO-605016	0.00-0.50	SED	0.024 (J)	NA	0.0467	NA	0.193	0.222	0.394	0.145	—	0.253	—	—	—	0.521	0.0188 (J)
CAMO-09-6160	MO-605016	0.50-1.50	QBT3	—	—	0.0221 (J)	NA	0.0488	0.0411 (J)	0.0705	0.0198 (J)	—	0.0479	—	—	—	0.118	—
CAMO-09-6161	MO-605017	0.00-0.50	SED	0.288	NA	0.573	NA	1.39	1.35	2.28	0.761	—	1.49	—	—	0.122 (J)	3.57	0.288
CAMO-09-6162	MO-605017	0.50-1.50	QBT4	—	—	—	NA	—	—	0.0238 (J)	—	—	—	—	—	—	0.0358 (J)	—
CAMO-09-6163	MO-605018	0.00-0.50	SED	0.021 (J)	NA	0.0249 (J)	NA	0.0988	0.0898	0.16	0.0493	—	0.0993	—	0.0174 (J)	—	0.206	—
CAMO-09-6164	MO-605018	0.50-1.50	QBT4	—	—	—	NA	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6165	MO-605019	0.00-0.50	SOIL	0.0295 (J)	NA	0.0471	NA	0.107	0.101	0.181	0.0624	—	0.118	—	0.0644	—	0.263	0.0201 (J)
CAMO-09-6166	MO-605019	2.00-3.00	QBT3	—	—	0.0221 (J)	NA	0.0269 (J)	0.018 (J)	0.0302 (J)	—	—	0.0227 (J)	—	—	—	0.0622	—
CAMO-09-6167	MO-605020	0.00-0.50	SOIL	—	NA	—	NA	0.0192 (J)	0.0158 (J)	0.0291 (J)	—	—	0.019 (J)	—	—	—	0.0423	—

Table 2.18-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-6145	MO-605009	0.00-0.50	SED	0.0000902	0.000181	0.0000374	0.00000709	0.0000765	0.00000194 (J)	0.00000333	0.00000306	0.0000352	0.0000153
CAMO-09-6146	MO-605009	0.50-1.50	QBT4	0.000000916 (J)	0.00000183 (J)	0.000000344 (J)	0.0000000529 (J)	0.000000671	—	—	—	0.000000125	0.000000142 (J)
CAMO-09-6147	MO-605010	0.00-0.50	SED	0.0000438	0.0000876	0.0000358	0.0000106	0.0000778	0.000000981 (J)	0.00000164 (J)	0.00000154 (J)	0.000018	0.0000226
CAMO-09-6148	MO-605010	0.50-1.50	QBT4	0.0000023 (J)	0.00000412 (J)	0.000000707 (J)	—	0.000000707	0.0000000671 (J)	0.0000000916 (J)	—	0.000000714	—
CAMO-09-6149	MO-605011	0.00-0.50	SOIL	0.0000416	0.0000826	0.00000527	0.00000048 (J)	0.0000187	0.000000405 (J)	0.00000122 (J)	0.000000959 (J)	0.00000933	0.000000364 (J)
CAMO-09-6150	MO-605011	1.00-2.00	QBT3	0.00000155 (J)	0.00000297	0.000000382 (J)	—	0.000000919	—	—	—	—	0.000000119 (J)
CAMO-09-6151	MO-605012	0.00-0.50	SED	0.0000389	0.0000807	0.00000916	0.00000179 (J)	0.0000222	0.000000778 (J)	0.00000176 (J)	0.0000014 (J)	0.0000164	0.00000452
CAMO-09-6152	MO-605012	0.50-1.50	QBT4	0.000000911 (J)	0.00000183 (J)	0.000000311 (J)	—	0.000000584	—	—	—	—	0.000000152 (J)
CAMO-09-6153	MO-605013	0.00-0.50	SED	0.00000373	0.00000782	0.00000103 (J)	0.000000262 (J)	0.00000249	—	—	—	0.000000948	0.000000439 (J)
CAMO-09-6154	MO-605013	1.00-2.00	QBT3	0.000484	0.000963	0.0000417	0.00000507	0.000146	0.00000204 (J)	0.0000133	0.00000575	0.0000722	0.00000173 (J)
CAMO-09-6155	MO-605014	0.00-0.50	SED	0.0000239	0.0000483	0.00000925	0.00000215 (J)	0.0000181	0.000000717 (J)	0.00000112 (J)	0.00000122 (J)	0.000011	0.000004
CAMO-09-6156	MO-605014	0.50-1.50	QBT4	0.0000041	0.00000879	0.00000202 (J)	0.000000789 (J)	0.00000424	—	0.000000451 (J)	—	0.00000183	0.00000107 (J)
CAMO-09-6157	MO-605015	0.00-0.50	SED	0.0000681	0.00014	0.0000222	0.00000467	0.0000502	0.00000135 (J)	0.00000264	0.00000218 (J)	0.0000274	0.0000106
CAMO-09-6158	MO-605015	0.50-1.50	QBT3	0.00000575	0.0000116	0.00000465	0.000002 (J)	0.0000116	0.000000154 (J)	0.000000246 (J)	0.000000202 (J)	0.00000219	0.00000352
CAMO-09-6159	MO-605016	0.00-0.50	SED	0.0000164	0.0000325	0.00000436	0.000000787 (J)	0.00001	0.000000316 (J)	—	0.000000425 (J)	0.00000269	0.00000173 (J)
CAMO-09-6160	MO-605016	0.50-1.50	QBT3	—	0.0000011	—	—	0.000000275	—	—	—	0.000000104	0.000000132 (J)
CAMO-09-6161	MO-605017	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6162	MO-605017	0.50-1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6163	MO-605018	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6164	MO-605018	0.50-1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6165	MO-605019	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6166	MO-605019	2.00-3.00	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6167	MO-605020	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2.18-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]
CAMO-09-6145	MO-605009	0.00-0.50	SED	0.00000408	0.000000922 (J)	0.00000513	0.0000922	8.12	NA	0.306 (J)	0.37 (J)	0.000577 (J)	0.0000592	0.000000897 (J)
CAMO-09-6146	MO-605009	0.50-1.50	QBT4	0.000000056 (J)	—	—	0.000000503	0.0514	—	—	—	0.00000617 (J)	0.000000446 (J)	—
CAMO-09-6147	MO-605010	0.00-0.50	SED	0.00000514	0.00000146 (J)	0.00000587	0.000108	10.4	NA	0.375 (J)	0.437 (J)	0.00031 (J)	0.0000736	0.000000457 (J)
CAMO-09-6148	MO-605010	0.50-1.50	QBT4	—	—	0.0000000797 (J)	0.000000883	0.0642	—	—	—	0.000014 (J)	0.00000111 (J)	—
CAMO-09-6149	MO-605011	0.00-0.50	SOIL	—	—	0.000000403 (J)	0.0000068	0.0186 (J)	NA	—	—	0.000462 (J)	0.0000183	—
CAMO-09-6150	MO-605011	1.00-2.00	QBT3	—	—	—	0.000000309	—	—	—	—	0.0000171 (J)	0.000000707 (J)	—
CAMO-09-6151	MO-605012	0.00-0.50	SED	0.00000189 (J)	0.000000526 (J)	0.00000175 (J)	0.0000273	0.435	NA	0.0126 (J)	0.023 (J)	0.000319 (J)	0.0000173	0.000000434 (J)
CAMO-09-6152	MO-605012	0.50-1.50	QBT4	0.0000000548 (J)	—	—	0.000000765	—	—	—	—	0.00000679 (J)	0.000000579 (J)	—
CAMO-09-6153	MO-605013	0.00-0.50	SED	—	—	0.000000154 (J)	0.0000021	0.03 (J)	NA	—	—	0.0000369 (J)	0.00000194 (J)	—
CAMO-09-6154	MO-605013	1.00-2.00	QBT3	0.00000176 (J)	—	0.00000335	0.0000533	—	—	—	—	0.0057 (J)	0.0000975	0.00000089 (J)
CAMO-09-6155	MO-605014	0.00-0.50	SED	0.00000145 (J)	—	0.00000167 (J)	0.0000252	4.55 (J)	NA	1.2	2.76	0.00017	0.0000148	—
CAMO-09-6156	MO-605014	0.50-1.50	QBT4	0.000000462 (J)	—	0.000000517 (J)	0.00000524	—	—	—	—	0.0000271	0.00000413 (J)	—
CAMO-09-6157	MO-605015	0.00-0.50	SED	0.0000034	0.000000861 (J)	0.0000037	0.0000655	1.08	NA	0.0724	0.157	0.000527 (J)	0.0000406	0.000000754 (J)
CAMO-09-6158	MO-605015	0.50-1.50	QBT3	0.000000846 (J)	0.000000303 (J)	0.000000829 (J)	0.000015	0.111	0.0767	0.0112 (J)	0.0216 (J)	0.0000456 (J)	0.0000122	—
CAMO-09-6159	MO-605016	0.00-0.50	SED	0.000000586 (J)	—	0.000000625 (J)	0.00000997	0.141	NA	—	—	0.000144 (J)	0.00000839	—
CAMO-09-6160	MO-605016	0.50-1.50	QBT3	—	—	—	0.000000132	0.0188 (J)	—	—	—	0.00000858 (J)	0.0000005 (J)	—
CAMO-09-6161	MO-605017	0.00-0.50	SED	NA	NA	NA	NA	0.75	NA	0.0532	0.118	NA	NA	NA
CAMO-09-6162	MO-605017	0.50-1.50	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6163	MO-605018	0.00-0.50	SED	NA	NA	NA	NA	0.047	NA	—	—	NA	NA	NA
CAMO-09-6164	MO-605018	0.50-1.50	QBT4	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6165	MO-605019	0.00-0.50	SOIL	NA	NA	NA	NA	0.0599	NA	—	—	NA	NA	NA
CAMO-09-6166	MO-605019	2.00-3.00	QBT3	NA	NA	NA	NA	—	—	—	—	NA	NA	NA
CAMO-09-6167	MO-605020	0.00-0.50	SOIL	NA	NA	NA	NA	—	NA	—	—	NA	NA	NA

Table 2.18-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
CAMO-09-6145	MO-605009	0.00-0.50	SED	0.00000553	0.00000196 (J)	0.000011	0.0000875	8.39	28.8	0.000000244 (J)	0.000000959	0.00000869	0.0000407	NA
CAMO-09-6146	MO-605009	0.50-1.50	QBT4	—	—	—	8.12E-08	0.028 (J)	0.13	—	—	—	0.000000116	—
CAMO-09-6147	MO-605010	0.00-0.50	SED	0.00000151	0.00000295	0.0000162	0.00012	11.3	34	0.000000238 (J)	0.00000118	0.0000126	0.0000574	NA
CAMO-09-6148	MO-605010	0.50-1.50	QBT4	0.000000104	—	—	0.000000128	0.0513	0.184	—	—	—	0.000000302	—
CAMO-09-6149	MO-605011	0.00-0.50	SOIL	—	—	0.000000202 (J)	0.00000124	0.0282 (J)	0.0705	—	—	—	0.000000124	NA
CAMO-09-6150	MO-605011	1.00-2.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6151	MO-605012	0.00-0.50	SED	0.00000239	0.00000165 (J)	0.00000689	0.0000503	1.01	1.64	0.000000127 (J)	0.000000726	0.0000126	0.0000805	NA
CAMO-09-6152	MO-605012	0.50-1.50	QBT4	—	—	0.000000125 (J)	0.000000523	0.0132 (J)	0.024 (J)	—	—	—	0.000000424	—
CAMO-09-6153	MO-605013	0.00-0.50	SED	—	—	—	0.000000234	0.045	0.0927	—	—	—	0.00000146	NA
CAMO-09-6154	MO-605013	1.00-2.00	QBT3	0.000003	0.000000202 (J)	0.000000447 (J)	0.00000826	0.0154 (J)	0.0257 (J)	0.000000219 (J)	0.000000219	—	0.00000182	—
CAMO-09-6155	MO-605014	0.00-0.50	SED	0.0000013	0.000000803 (J)	0.00000358	0.0000283	28.4	32	—	—	0.00000333	0.0000163	NA
CAMO-09-6156	MO-605014	0.50-1.50	QBT4	—	0.000000326 (J)	0.000000827 (J)	0.00000434	—	—	0.0000000891 (J)	8.91E-08	0.000000619	0.00000218	—
CAMO-09-6157	MO-605015	0.00-0.50	SED	0.00000321	0.00000224 (J)	0.0000101	0.0000755	3.05	4.61	—	—	0.0000123 (J)	0.0000722	NA
CAMO-09-6158	MO-605015	0.50-1.50	QBT3	—	0.000000405 (J)	0.0000021 (J)	0.0000181	0.387	0.417	—	—	0.0000013 (J)	0.0000091	0.00176
CAMO-09-6159	MO-605016	0.00-0.50	SED	0.000000288	—	0.00000166 (J)	0.0000128	0.214	0.435	—	—	0.00000201 (J)	0.0000113	NA
CAMO-09-6160	MO-605016	0.50-1.50	QBT3	—	—	—	—	0.082	0.0949	—	—	—	0.000000345	—
CAMO-09-6161	MO-605017	0.00-0.50	SED	NA	NA	NA	NA	2.38	3.71	NA	NA	NA	NA	NA
CAMO-09-6162	MO-605017	0.50-1.50	QBT4	NA	NA	NA	NA	0.0214 (J)	0.0302 (J)	NA	NA	NA	NA	—
CAMO-09-6163	MO-605018	0.00-0.50	SED	NA	NA	NA	NA	0.119	0.21	NA	NA	NA	NA	NA
CAMO-09-6164	MO-605018	0.50-1.50	QBT4	NA	NA	NA	NA	—	—	NA	NA	NA	NA	0.000896 (J)
CAMO-09-6165	MO-605019	0.00-0.50	SOIL	NA	NA	NA	NA	0.16	0.223	NA	NA	NA	NA	NA
CAMO-09-6166	MO-605019	2.00-3.00	QBT3	NA	NA	NA	NA	0.0585	0.0497	NA	NA	NA	NA	—
CAMO-09-6167	MO-605020	0.00-0.50	SOIL	NA	NA	NA	NA	0.0204 (J)	0.0384	NA	NA	NA	NA	NA

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 2.18-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-049(e)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137
QBT3 Background Value[a]				**na[b]**
CAMO-09-6158	MO-605015	0.50-1.50	QBT3	0.158

Note: Results are in pCi/g.

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

[b] na = Not available.

Table 2.19-1
Samples Collected and Analyses Requested at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-95-0001	03-02715	0.00–1.00	SOIL	—*	—	35	35	35	35	31	11	—	11	11	31
0103-95-0002	03-02715	1.67–2.33	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0003	03-02716	0.00–0.67	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0005	03-02717	0.00–0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0008	03-02718	0.00–1.00	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0007	03-02718	1.17–1.83	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0009	03-02719	0.00–0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0011	03-02720	0.00–0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
CAMO-09-6179	MO-605021	0.00–0.50	SED	09-2107	09-2105	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	—	09-2107
CAMO-09-6181	MO-605022	0.00–0.50	SED	09-2107	09-2105	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	—	09-2107
CAMO-09-6182	MO-605022	1.00–2.00	QBT4	09-2107	09-2105	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	09-2106	09-2107
CAMO-09-6183	MO-605023	0.00–0.50	SED	09-2107	—	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	—	09-2107
CAMO-09-6184	MO-605023	0.50–1.50	QBT4	09-2107	—	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	09-2106	09-2107
CAMO-09-6185	MO-605024	0.00–0.50	SED	09-2107	—	09-2107	09-2107	09-2107	09-2107	09-2107	09-2106	09-2107	09-2106	—	09-2107

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 2.19-2
Inorganic Chemicals above BVs at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Total Cyanide	Mercury	Nitrate	Selenium	Thallium	Zinc
SED Background Value[a]				**0.83**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**0.1**	**na[b]**	**0.3**	**0.73**	**60.2**
SOIL Background Value[a]				**0.83**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**0.1**	**na**	**1.52**	**0.73**	**48.8**
QBT4 Background Value[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**0.1**	**na**	**0.3**	**1.1**	**63.5**
0103-95-0001	03-02715	0.00–1.00	SOIL	—[c]	—	—	—	—	1.2 (U)	0.12 (U)	NA[d]	—	1.1 (U)	58.2
0103-95-0002	03-02715	1.67–2.33	SOIL	—	—	—	—	—	1.21 (U)	0.11 (U)	NA	—	1.1 (U)	64
0103-95-0003	03-02716	0.00–0.67	SOIL	—	—	—	—	—	1.23 (U)	0.12 (U)	NA	—	1.2 (U)	112
0103-95-0005	03-02717	0.00–0.50	SOIL	—	—	—	—	—	1.11 (U)	0.11 (U)	NA	—	1 (U)	65.4
0103-95-0008	03-02718	0.00–1.00	SOIL	—	—	—	—	—	1.35 (U)	0.12 (U)	NA	—	1.3 (U)	56.3
0103-95-0007	03-02718	1.17–1.83	SOIL	—	—	—	—	—	1.27 (U)	0.11 (U)	NA	—	1.2 (U)	59.2
0103-95-0009	03-02719	0.00–0.50	SOIL	—	—	—	—	—	1.19 (U)	0.12 (U)	NA	—	1.1 (U)	56.2
0103-95-0011	03-02720	0.00–0.50	SOIL	—	—	—	—	—	1.18 (U)	0.11 (U)	NA	—	1.1 (U)	—
CAMO-09-6179	MO-605021	0.00–0.50	SED	—	0.638 (U)	4890 (J)	11 (J)	12.3 (J)	—	—	0.929 (J)	1.22 (U)	—	114 (J-)
CAMO-09-6181	MO-605022	0.00–0.50	SED	0.881 (U)	0.585 (U)	—	—	—	—	—	0.925 (J)	1.19 (U)	—	97.5 (J-)
CAMO-09-6182	MO-605022	1.00–2.00	QBT4	1.15 (U)	—	—	13 (J)	—	—	—	0.755 (J)	1.12 (U)	—	75.8 (J-)
CAMO-09-6183	MO-605023	0.00–0.50	SED	1.1 (U)	0.549 (U)	—	—	—	—	—	2.11	1.08 (U)	—	74.3 (J-)
CAMO-09-6184	MO-605023	0.50–1.50	QBT4	1.14 (U)	—	—	18.7 (J)	—	—	—	1.13 (J)	1.14 (U)	—	—
CAMO-09-6185	MO-605024	0.00–0.50	SED	1.22 (U)	0.612 (U)	7570 (J)	—	—	—	—	2.18	1.2 (U)	—	106 (J-)

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.19-3
Organic Chemicals Detected at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Diethylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)
0103-95-0002	03-02715	1.67–2.33	SOIL	—[a]	—	—	—	0.0553	—	—	—	—	—	—	—	—	—	—	—	NA[b]	NA
0103-95-0003	03-02716	0.00–0.67	SOIL	—	—	—	—	0.0536	—	—	—	—	—	—	—	—	—	—	—	NA	NA
0103-95-0005	03-02717	0.00–0.50	SOIL	—	—	—	—	0.0562	—	—	0.1 (J)	—	0.13 (J)	—	—	0.16 (J)	0.69	0.32 (J)	—	NA	NA
0103-95-0009	03-02719	0.00–0.50	SOIL	—	—	—	—	0.0596	—	—	—	—	—	—	—	—	—	—	—	NA	NA
CAMO-09-6179	MO-605021	0.00–0.50	SED	0.0158 (J)	0.0444	0.0468	—	—	0.0959	0.101 (J)	0.168 (J)	0.0746 (J)	—	0.329 (J)	0.384 (J)	0.115	—	0.258	—	0.0000128	0.0000244
CAMO-09-6181	MO-605022	0.00–0.50	SED	0.0391 (J)	0.142	—	—	—	0.525	0.501	0.924	0.284	—	—	0.115 (J)	0.518	—	1.54	0.0441 (J)	0.0000236	0.0000445
CAMO-09-6182	MO-605022	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6183	MO-605023	0.00–0.50	SED	—	—	—	—	—	—	0.0136 (J)	0.0275 (J)	0.0172 (J)	—	—	—	0.0199 (J)	—	0.0346 (J)	—	NA	NA
CAMO-09-6184	MO-605023	0.50–1.50	QBT4	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA
CAMO-09-6185	MO-605024	0.00–0.50	SED	—	—	—	—	—	—	0.0169 (J)	0.0176 (J)	0.0135 (J)	—	—	—	—	—	0.0157 (J)	—	NA	NA

Table 2.19-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
0103-95-0002	03-02715	1.67–2.33	SOIL	NA	NA	NA	NA	—	NA	NA	NA	—	—	NA	NA	NA
0103-95-0003	03-02716	0.00–0.67	SOIL	NA	NA	NA	NA	—	NA	NA	NA	—	—	NA	NA	NA
0103-95-0005	03-02717	0.00–0.50	SOIL	NA	NA	NA	NA	—	NA	NA	NA	—	0.22 (J)	NA	NA	NA
0103-95-0009	03-02719	0.00–0.50	SOIL	NA	NA	NA	NA	—	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-6179	MO-605021	0.00–0.50	SED	0.0000022 (J)	0.00000442	0.00000311	0.00000184	0.0583 (J)	0.0000869 (J)	0.00000338 (J)	0.00000186	0.162	0.24 (J)	0.000000126 (J)	0.000000126	0.00000074
CAMO-09-6181	MO-605022	0.00–0.50	SED	0.0000039	0.0000123	0.00000234	0.00000217	0.284	0.000184 (J)	0.00000839	—	0.704	1.17 (J)	—	—	0.00000137
CAMO-09-6182	MO-605022	1.00–2.00	QBT4	—	—	—	—	—	0.00000269 (J)	—	—	—	—	—	—	—
CAMO-09-6183	MO-605023	0.00–0.50	SED	NA	NA	NA	NA	—	NA	NA	NA	—	0.0243 (J)	NA	NA	NA
CAMO-09-6184	MO-605023	0.50–1.50	QBT4	NA	NA	NA	NA	—	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-6185	MO-605024	0.00–0.50	SED	NA	NA	NA	NA	—	NA	NA	NA	—	0.0143 (J)	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 2.19-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 03-054(e)

Sample ID	Location ID	Depth (ft)	Media	Europium-152	Plutonium-238	Plutonium-239/240	Sodium-22
SOIL Background Value[a]				**na[b]**	**0.023[c]**	**0.054[c]**	**na**
0103-95-0002	03-02715	1.67–2.33	SOIL	—[d]	0.027	—	—
0103-95-0005	03-02717	0.00–0.50	SOIL	—	0.032	—	—
0103-95-0007	03-02718	1.17–1.83	SOIL	—	0.025	0.011	—
0103-95-0009	03-02719	0.00–0.50	SOIL	0.211	0.043	—	—
0103-95-0011	03-02720	0.00–0.50	SOIL	—	—	—	0.0681

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

Table 2.20-1
Samples Collected and Analyses Requested at AOC C-03-006

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0103-95-0001	03-02715	0.00-1.00	SOIL	—*	—	35	35	35	35	31	11	—	11	11	31
0103-95-0002	03-02715	1.67-2.33	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0003	03-02716	0.00-0.67	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0005	03-02717	0.00-0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0008	03-02718	0.00-1.00	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0007	03-02718	1.17-1.83	SOIL	—	—	35	35	35	35	31	11	—	11	11	31
0103-95-0009	03-02719	0.00-0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
0103-95-0011	03-02720	0.00-0.50	SOIL	—	—	35	35	35	35	31	11	—	11	—	31
CAMO-09-6080	MO-604990	0.00-0.50	FILL	09-2132	09-2130	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	—	09-2132
CAMO-09-6081	MO-604990	2.25-3.25	QBT4	09-2132	09-2130	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6082	MO-604991	0.00-0.50	FILL	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	—	09-2132
CAMO-09-6083	MO-604991	12.60-13.60	QBT4	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6084	MO-604992	0.75-1.75	FILL	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6085	MO-604992	2.00-3.00	QBT4	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6086	MO-604993	0.75-1.75	FILL	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6087	MO-604993	2.00-3.00	QBT4	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6088	MO-604994	0.75-1.75	FILL	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132
CAMO-09-6089	MO-604994	1.75-2.75	QBT4	09-2132	—	09-2133	09-2133	09-2133	09-2133	09-2132	09-2131	09-2132	09-2131	09-2131	09-2132

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 2.20-2
Inorganic Chemicals above BVs at AOC C-03-006

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Total Cyanide	Iron	Lead	Mercury	Nitrate	Selenium	Sodium	Thallium	Zinc
SED Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**0.82**	**13800**	**19.7**	**0.1**	**na[b]**	**0.3**	**1470**	**0.73**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21500**	**22.3**	**0.1**	**na**	**1.52**	**915**	**0.73**	**48.8**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**0.5**	**14500**	**11.2**	**0.1**	**na**	**0.3**	**2770**	**1.1**	**63.5**
0103-95-0001	03-02715	0.00-1.00	SOIL	—[c]	—	—	—	—	—	1.2(U)	—	—	0.12(U)	NA[d]	—	—	1.1(U)	58.2
0103-95-0002	03-02715	1.67-2.33	SOIL	—	—	—	—	—	—	1.21(U)	—	—	0.11(U)	NA	—	—	1.1(U)	64
0103-95-0003	03-02716	0.00-0.67	SOIL	—	—	—	—	—	—	1.23(U)	—	—	0.12(U)	NA	—	—	1.2(U)	112
0103-95-0005	03-02717	0.00-0.50	SOIL	—	—	—	—	—	—	1.11(U)	—	—	0.11(U)	NA	—	—	1(U)	65.4
0103-95-0008	03-02718	0.00-1.00	SOIL	—	—	—	—	—	—	1.35(U)	—	—	0.12(U)	NA	—	—	1.3(U)	56.3
0103-95-0007	03-02718	1.17-1.83	SOIL	—	—	—	—	—	—	1.27(U)	—	—	0.11(U)	NA	—	—	1.2(U)	59.2
0103-95-0009	03-02719	0.00-0.50	SOIL	—	—	—	—	—	—	1.19(U)	—	—	0.12(U)	NA	—	—	1.1(U)	56.2
0103-95-0011	03-02720	0.00-0.50	SOIL	—	—	—	—	—	—	1.18(U)	—	—	0.11(U)	NA	—	—	1.1(U)	—
CAMO-09-6080	MO-604990	0.00-0.50	FILL	—	—	0.578(U)	—	—	—	—	—	—	—	2.66(J-)	—	—	—	—
CAMO-09-6081	MO-604990	2.25-3.25	QBT4	1.13(U)	56.9(J)	—	—	22.5	—	—	—	—	—	0.76(J-)	1.13(U)	—	—	—
CAMO-09-6082	MO-604991	0.00-0.50	FILL	—	—	0.572(U)	6760(J)	—	16.6	—	—	23.9	—	2.26(J-)	—	—	—	54.1(J-)
CAMO-09-6083	MO-604991	12.60-13.60	QBT4	—	—	—	—	39.2	—	—	15800	—	—	5.85(J-)	1.15(U)	—	—	—
CAMO-09-6084	MO-604992	0.75-1.75	FILL	—	—	0.564(U)	—	—	—	—	—	—	—	0.674(J-)	—	—	—	77.8(J-)
CAMO-09-6085	MO-604992	2.00-3.00	QBT4	0.683(J)	47(J)	—	—	14.9	—	—	—	—	—	0.86(J-)	1.11(U)	—	—	—
CAMO-09-6086	MO-604993	0.75-1.75	FILL	—	—	0.544(U)	—	—	—	—	—	—	—	0.797(J-)	—	—	—	—
CAMO-09-6087	MO-604993	2.00-3.00	QBT4	1.19(U)	—	—	—	13	—	—	—	—	—	1.46(J-)	1.18(U)	—	—	—
CAMO-09-6088	MO-604994	0.75-1.75	FILL	0.862(J)	—	0.615(U)	—	—	—	—	—	—	—	1(J-)	—	1120(J)	—	—
CAMO-09-6089	MO-604994	1.75-2.75	QBT4	0.625(J)	—	—	—	—	—	—	—	—	—	0.909(J-)	1.18(U)	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 2.20-3
Organic Chemicals Detected at AOC C-03-006

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Diethylphthalate	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)
0103-95-0002	03-02715	1.67–2.33	SOIL	0.0553	—[a]	—	—	—	—	—	—	—	NA[b]	NA	NA	NA	NA
0103-95-0003	03-02716	0.00–0.67	SOIL	0.0536	—	—	—	—	—	—	—	—	NA	NA	NA	NA	NA
0103-95-0005	03-02717	0.00–0.50	SOIL	0.0562	—	—	0.1(J)	—	0.13(J)	0.16(J)	0.69	0.32(J)	NA	NA	NA	NA	NA
0103-95-0009	03-02719	0.00–0.50	SOIL	0.0596	—	—	—	—	—	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6080	MO-604990	0.00–0.50	FILL	—	0.0273(J)	0.0342(J)	0.0669	0.025(J)	—	0.0644	—	0.0583	0.0000579	0.000109	0.0000123	0.000000816(J)	0.0000293
CAMO-09-6081	MO-604990	2.25–3.25	QBT4	—	—	—	—	—	—	—	—	—	0.000000933(J)	0.00000178	0.000000214(J)	—	0.000000478
CAMO-09-6082	MO-604991	0.00–0.50	FILL	—	0.0204(J)	0.0243(J)	0.0528	0.0195(J)	—	0.0517	—	0.0421	NA	NA	NA	NA	NA

Table 2.20-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	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	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
0103-95-0002	03-02715	1.67–2.33	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
0103-95-0003	03-02716	0.00–0.67	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
0103-95-0005	03-02717	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
0103-95-0009	03-02719	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
CAMO-09-6080	MO-604990	0.00–0.50	FILL	0.0000013(J)	0.00000213(J)	0.00000242(J)	0.0000178	0.000000519(J)	0.000000599(J)	0.000000812(J)	0.0000142	0.0197(J)	0.000408(J)
CAMO-09-6081	MO-604990	2.25–3.25	QBT4	—	—	—	—	—	—	—	—	—	0.00000601(J)
CAMO-09-6082	MO-604991	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA

Table 2.20-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
0103-95-0002	03-02715	1.67–2.33	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA
0103-95-0003	03-02716	0.00–0.67	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA
0103-95-0005	03-02717	0.00–0.50	SOIL	NA	NA	NA	NA	NA	—	0.22(J)	NA	NA
0103-95-0009	03-02719	0.00–0.50	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA
CAMO-09-6080	MO-604990	0.00–0.50	FILL	0.0000326	0.000000646(J)	0.00000241	0.000000242(J)	0.00000425	0.018(J)	0.0605	0.00000112	0.00000265
CAMO-09-6081	MO-604990	2.25–3.25	QBT4	0.000000593(J)	—	—	—	—	—	—	—	—
CAMO-09-6082	MO-604991	0.00–0.50	FILL	NA	NA	NA	NA	NA	0.0145(J)	0.0457	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 2.20-4
Radionuclides Detected or Detected above BVs/FVs at AOC C-03-006

Sample ID	Location ID	Depth (ft)	Media	Europium-152	Plutonium-238	Plutonium-239/240	Sodium-22	Tritium
SOIL,FILL Background Value[a]				**na[b]**	**0.023[c]**	**0.054[c]**	**na**	**na**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**
0103-95-0002	03-02715	1.67–2.33	SOIL	—[d]	0.027	—	—	—
0103-95-0005	03-02717	0.00–0.50	SOIL	—	0.032	—	—	—
0103-95-0007	03-02718	1.17–1.83	SOIL	—	0.025	0.011	—	—
0103-95-0009	03-02719	0.00–0.50	SOIL	0.211	0.043	—	—	—
0103-95-0011	03-02720	0.00–0.50	SOIL	—	—	—	0.0681	—
CAMO-09-6080	MO-604990	0.00–0.50	FILL	—	0.0234	—	—	—
CAMO-09-6082	MO-604991	0.00–0.50	FILL	—	0.0894	0.127	—	—
CAMO-09-6083	MO-604991	12.60–13.60	QBT4	—	—	—	—	0.0666667

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

Table 3.2-1
Samples Collected and Analyses Requested at SWMU 35-016(g)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	TAL Metals	SVOCs
0435-97-0085	35-02386	0.00-1.00	QBT3	3143R	3143R	3142R	3142R	3141R
0435-97-0086	35-02387	0.00-0.50	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0087	35-02387	0.50-1.00	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0089	35-02388	0.00-0.50	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0090	35-02389	0.00-0.50	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0091	35-02390	0.00-1.00	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0092	35-02390	1.00-2.00	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0093	35-02390	2.00-3.00	QBT3	3143R	3143R	3142R	3142R	3141R
0435-97-0094	35-02390	3.00-4.00	QBT3	3143R	3143R	3142R	3142R	3141R
0435-97-0095	35-02391	0.00-0.50	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0096	35-02391	0.50-1.00	SED	3143R	3143R	3142R	3142R	3141R
CAMO-09-5977	MO-604933	0.00-0.50	SED	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5978	MO-604933	1.50-2.50	QBT4	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5979	MO-604934	0.00-0.50	SED	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5980	MO-604934	1.00-2.00	QBT4	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5981	MO-604935	0.00-0.50	SED	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5982	MO-604935	1.50-2.50	QBT4	09-1779	09-1779	09-1778	09-1779	09-1778
CAMO-09-5983	MO-604936	0.00-1.00	SED	09-1457	09-1457	09-1457	09-1457	09-1457
CAMO-09-5984	MO-604936	1.20-2.20	QBT4	09-1457	09-1457	09-1457	09-1457	09-1457
CAMO-09-5985	MO-604937	0.00-1.00	SED	09-1457	09-1457	09-1457	09-1457	09-1457
CAMO-09-5986	MO-604937	1.40-2.40	QBT4	09-1457	09-1457	09-1457	09-1457	09-1457

Note: Numbers in analyte columns are request numbers.

Table 3.2-2
Inorganic Chemicals above BVs at SWMU 35-016(g)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
SED Background Value[a]				**0.83**	**0.4**	**10.5**	**na[b]**	**4.73**	**11.2**	**19.7**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**60.2**
QBT3,QBT4 Background Value[a]				**0.5**	**1.63**	**7.14**	**na**	**3.14**	**4.66**	**11.2**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**63.5**
0435-97-0085	35-02386	0.00–1.00	QBT3	8.1 (U)	—[c]	9.3	—	—	5.2 (J)	—	—	—	0.36 (U)	—	—	84.2
0435-97-0086	35-02387	0.00–0.50	SED	17.4 (U)	1.7 (U)	42.6	2.5	—	45.9	—	0.13 (U)	—	0.73 (U)	2.2 (U)	—	325
0435-97-0087	35-02387	0.50–1.00	SED	9.2 (U)	0.88 (U)	12.1	—	—	—	—	—	—	0.37 (U)	1.2 (U)	—	64
0435-97-0089	35-02388	0.00–0.50	SED	7.5 (U)	0.72 (U)	—	—	—	—	—	—	—	—	—	—	61.8
0435-97-0090	35-02389	0.00–0.50	SED	7.3 (U)	0.7 (U)	—	—	—	—	—	—	—	—	—	—	—
0435-97-0091	35-02390	0.00–1.00	SED	6.5 (U)	0.62 (U)	—	0.98	—	—	—	—	—	—	—	—	—
0435-97-0092	35-02390	1.00–2.00	SED	7.2 (U)	0.69 (U)	—	—	—	—	—	—	—	—	—	—	—
0435-97-0093	35-02390	2.00–3.00	QBT3	7.1 (U)	—	11.5	1.3	3.2 (J)	—	—	—	7.4 (J)	0.31 (U)	—	—	—
0435-97-0094	35-02390	3.00–4.00	QBT3	6.3 (U)	—	—	—	—	—	—	—	7 (J)	0.31 (U)	—	—	—
0435-97-0095	35-02391	0.00–0.50	SED	7.4 (U)	0.71 (U)	—	5.9	—	—	20	—	—	0.46 (U)	—	—	—
0435-97-0096	35-02391	0.50–1.00	SED	9.6 (U)	0.92 (U)	—	4.5	—	—	—	—	—	0.38 (U)	1.2 (U)	1.1 (J)	—
CAMO-09-5977	MO-604933	0.00–0.50	SED	4.22	0.611 (U)	—	—	—	—	—	—	—	1.28 (U)	—	—	173
CAMO-09-5978	MO-604933	1.50–2.50	QBT4	1.13 (J)	—	26.3	—	—	—	11.6 (J)	—	—	1.19 (U)	—	—	—
CAMO-09-5979	MO-604934	0.00–0.50	SED	1.13 (U)	0.563 (U)	—	—	—	—	—	—	—	1.14 (U)	—	—	—
CAMO-09-5980	MO-604934	1.00–2.00	QBT4	1.19 (U)	—	—	—	—	—	—	—	—	1.17 (U)	—	—	—
CAMO-09-5981	MO-604935	0.00–0.50	SED	1.12 (U)	0.561 (U)	—	—	—	—	—	—	—	1.13 (U)	—	—	—
CAMO-09-5982	MO-604935	1.50–2.50	QBT4	1.06 (U)	—	18.1	—	—	—	—	—	—	1.05 (U)	—	—	—
CAMO-09-5983	MO-604936	0.00–1.00	SED	1.24 (U)	0.619 (U)	—	0.419 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-5984	MO-604936	1.20–2.20	QBT4	1.28 (U)	—	—	0.182 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-5985	MO-604937	0.00–1.00	SED	1.1 (U)	0.55 (U)	—	0.45 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-5986	MO-604937	1.40–2.40	QBT4	1.16 (U)	—	—	0.257 (J)	—	—	—	—	—	—	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 3.2-3
Organic Chemicals Detected at SWMU 35-016(g)

Sample ID	Location ID	Depth (ft)	Media	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Pyrene
0435-97-0087	35-02387	0.50–1.00	SED	—*	—	—	—	—	0.37	—	—	—
CAMO-09-5977	MO-604933	0.00–0.50	SED	0.0198 (J)	—	0.0346 (J)	0.0146 (J)	—	—	0.0196 (J)	0.0258 (J)	0.0286 (J)
CAMO-09-5981	MO-604935	0.00–0.50	SED	—	—	0.0161 (J)	—	0.323 (J)	—	—	0.0159 (J)	0.0154 (J)
CAMO-09-5983	MO-604936	0.00–1.00	SED	—	0.0157 (J)	0.0251 (J)	—	—	—	0.0155 (J)	0.0208 (J)	0.0233 (J)
CAMO-09-5985	MO-604937	0.00–1.00	SED	—	0.0212 (J)	0.0406 (J)	—	—	—	—	0.0221 (J)	0.0247 (J)
CAMO-09-5986	MO-604937	1.40–2.40	QBT4	—	—	—	—	0.847	—	—	—	—

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

* — = Not detected.

Table 3.2-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 35-016(g)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium
SED Background Value[a]				**0.9**	**0.093**
QBT3,QBT4 Background Value[a]				**na[b]**	**na**
0435-97-0085	35-02386	0.00–1.00	QBT3	—[c]	0.08
0435-97-0092	35-02390	1.00–2.00	SED	—	10.3
CAMO-09-5978	MO-604933	1.50–2.50	QBT4	0.0611	0.0617143
CAMO-09-5984	MO-604936	1.20–2.20	QBT4	0.123	0.0917013
CAMO-09-5986	MO-604937	1.40–2.40	QBT4	0.269	—

Note: Results are in pCi/g.

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

[b] na = Not available.

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

Table 3.3-1
Samples Collected and Analyses Requested at SWMU 35-016(h)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	TAL Metals	SVOCs
0435-97-0098	35-02392	0.00-1.00	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0099	35-02392	1.00-2.00	SED	3143R	3143R	3142R	3142R	3141R
0435-97-0101	35-02392	2.00-3.00	QBT3	3143R	3143R	3142R	3142R	3141R
CAMO-09-6739	MO-605133	0.00-0.50	SED	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6740	MO-605133	0.50-1.00	QBT4	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6741	MO-605134	0.00-0.50	SED	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6742	MO-605134	2.50-3.50	QBT4	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6743	MO-605135	0.00-0.50	FILL	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6744	MO-605135	3.00-3.50	QBT4	09-1811	09-1811	09-1811	09-1811	09-1811
CAMO-09-6745	MO-605136	0.00-1.00	SED	09-1458	09-1458	09-1458	09-1458	09-1458
CAMO-09-6746	MO-605136	1.00-2.00	QBT4	09-1458	09-1458	09-1458	09-1458	09-1458
CAMO-09-10366	MO-605515	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10367	MO-605515	0.50-1.50	QBT3	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10368	MO-605516	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10369	MO-605516	0.50-1.50	QBT3	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10370	MO-605517	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10371	MO-605517	2.00-3.00	QBT3	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10372	MO-605518	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10373	MO-605518	0.50-1.50	QBT3	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10374	MO-605519	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10375	MO-605519	1.50-2.50	QBT2	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10376	MO-605520	0.00-0.50	SED	09-2498	09-2498	09-2498	09-2498	09-2497
CAMO-09-10377	MO-605520	0.50-1.50	QBT2	09-2498	09-2498	09-2498	09-2498	09-2497

Note: Numbers in analyte columns are request numbers.

Table 3.3-2
Inorganic Chemicals above BVs at SWMU 35-016(h)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Copper	Nickel	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**11.2**	**9.38**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**15.4**	**1.52**	**48.8**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**6.58**	**0.3**	**63.5**
0435-97-0098	35-02392	0.00–1.00	SED	6.7 (U)	—[c]	—	0.65 (U)	—	—	—	—	—	—	—
0435-97-0099	35-02392	1.00–2.00	SED	6.8 (U)	—	—	0.65 (U)	—	—	1.3	—	—	—	—
0435-97-0101	35-02392	2.00–3.00	QBT3	6.6 (U)	—	—	—	—	17.2	—	—	10.6	—	—
CAMO-09-6739	MO-605133	0.00–0.50	SED	0.985 (U)	—	—	0.492 (U)	—	—	—	—	—	1 (U)	—
CAMO-09-6740	MO-605133	0.50–1.00	QBT4	1.11 (U)	—	—	—	—	7.93 (J)	—	—	—	1.1 (U)	—
CAMO-09-6741	MO-605134	0.00–0.50	SED	1.01 (U)	—	—	0.504 (U)	—	—	—	18	—	0.533 (J)	—
CAMO-09-6742	MO-605134	2.50–3.50	QBT4	1.01 (U)	—	1.25	—	—	—	—	—	7.99	0.802 (J)	—
CAMO-09-6743	MO-605135	0.00–0.50	FILL	1 (U)	—	—	0.501 (U)	—	—	—	34	—	—	—
CAMO-09-6744	MO-605135	3.00–3.50	QBT4	1.01 (U)	46.1	—	—	—	—	—	—	—	0.991 (U)	—
CAMO-09-6745	MO-605136	0.00–1.00	SED	1.1 (U)	—	—	0.549 (U)	—	11.4	—	—	—	—	—
CAMO-09-6746	MO-605136	1.00–2.00	QBT4	1.07 (U)	—	—	—	—	45	0.154 (J)	—	—	—	—
CAMO-09-10366	MO-605515	0.00–0.50	SED	1.07 (U)	—	—	0.536 (U)	—	—	0.154 (J)	—	—	1.07 (UJ)	—
CAMO-09-10367	MO-605515	0.50–1.50	QBT3	1.17 (U)	—	—	—	—	14.1	0.206 (J)	5.22	—	1.12 (UJ)	—
CAMO-09-10368	MO-605516	0.00–0.50	SED	1.02 (U)	—	—	0.511 (U)	—	—	—	—	—	1.04 (UJ)	—
CAMO-09-10369	MO-605516	0.50–1.50	QBT3	1.11 (U)	—	—	—	—	13.8	—	—	—	1.13 (UJ)	—
CAMO-09-10370	MO-605517	0.00–0.50	SED	1.03 (U)	—	—	0.452 (J)	—	—	—	15.1	—	1.02 (UJ)	126
CAMO-09-10371	MO-605517	2.00–3.00	QBT3	1.15 (U)	—	—	—	6770	11.9	—	7.62	—	1.16 (UJ)	—
CAMO-09-10372	MO-605518	0.00–0.50	SED	1.07 (U)	—	—	0.536 (U)	24300	—	—	11.5	—	1.09 (UJ)	—
CAMO-09-10373	MO-605518	0.50–1.50	QBT3	1.13 (U)	—	—	—	—	17.2	0.157 (J)	—	—	1.08 (UJ)	—
CAMO-09-10374	MO-605519	0.00–0.50	SED	1.02 (U)	—	—	0.509 (U)	—	—	—	—	—	0.99 (UJ)	—
CAMO-09-10375	MO-605519	1.50–2.50	QBT2	1.01 (U)	—	—	—	—	—	—	—	—	0.997 (UJ)	—
CAMO-09-10376	MO-605520	0.00–0.50	SED	1.01 (U)	—	—	0.506 (U)	—	—	—	—	—	1.05 (UJ)	—
CAMO-09-10377	MO-605520	0.50–1.50	QBT2	1.07 (U)	—	—	—	—	29.6	—	—	—	1.03 (UJ)	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 3.3-3
Organic Chemicals Detected at SWMU 35-016(h)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
CAMO-09-6741	MO-605134	0.00–0.50	SED	—*	—	—	0.0281 (J)	—	—	—	0.0241 (J)	0.084	—	0.0718	0.0601
CAMO-09-6743	MO-605135	0.00–0.50	FILL	—	0.0436	0.0215 (J)	0.101	—	—	—	0.116	0.422	—	0.0925	0.296
CAMO-09-10366	MO-605515	0.00–0.50	SED	0.013 (J)	0.0447	0.0581 (J)	0.0903 (J)	0.0389 (J)	0.0348 (J)	—	0.0734	0.106	0.0332 (J)	0.0721	0.119
CAMO-09-10367	MO-605515	0.50–1.50	QBT3	—	0.0165 (J)	0.0171 (J)	—	—	—	—	0.0153 (J)	0.0242 (J)	—	—	0.0234 (J)
CAMO-09-10368	MO-605516	0.00–0.50	SED	—	0.0586	0.0839	0.14	0.068	0.0607	—	0.0959	0.154	0.0558	0.0466	0.172
CAMO-09-10369	MO-605516	0.50–1.50	QBT3	—	—	—	0.0132 (J)	—	—	—	—	0.0113 (J)	—	—	—
CAMO-09-10370	MO-605517	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—	—	0.0119 (J)
CAMO-09-10372	MO-605518	0.00–0.50	SED	—	0.0654	0.106	0.175	0.0946	—	—	0.105	0.162	0.07	0.0603	0.192
CAMO-09-10375	MO-605519	1.50–2.50	QBT2	—	—	—	—	—	—	0.459 (J)	—	—	—	—	—
CAMO-09-10376	MO-605520	0.00–0.50	SED	—	0.0185 (J)	0.0156 (J)	0.0259 (J)	—	—	—	0.0145 (J)	0.0254 (J)	—	0.0116 (J)	0.0278 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 3.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 35-016(h)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Tritium	Uranium-235
SED Background Value[a]				**0.04**	**0.093**	**0.2**
SOIL,FILL Background Value[a]				**0.013[b]**	**na[c]**	**0.2**
QBT3,QBT4 Background Value[a]				**na**	**na**	**0.09**
0435-97-0101	35-02392	2.00–3.00	QBT3	—[d]	—	0.149
CAMO-09-6739	MO-605133	0.00–0.50	SED	0.462	—	—
CAMO-09-6740	MO-605133	0.50–1.00	QBT4	—	0.0230115	—
CAMO-09-6742	MO-605134	2.50–3.50	QBT4	—	0.00513697	—
CAMO-09-6743	MO-605135	0.00–0.50	FILL	—	0.00895984	—
CAMO-09-6744	MO-605135	3.00–3.50	QBT4	—	0.00876587	—
CAMO-09-10369	MO-605516	0.50–1.50	QBT3	—	0.0499091	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

Table 4.2-1
Samples Collected and Analyses Requested at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	AM_241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
AAA0951	42-01021	0.00–1.50	FILL	13189	—*	—	—	—	—	13189	—	—	13188	—	—	—	—	—
AAA0953	42-01021	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	—	—	13188	—	—	—	—	—
AAA0954	42-01022	0.00–2.60	FILL	13189-1	—	—	—	—	—	13189-1	—	—	13188	—	—	—	—	—
AAA0955	42-01022	3.00–6.00	SOIL	13189-1	—	—	—	—	—	13189-1	—	—	13188	—	—	—	—	—
AAA0956	42-01023	0.00–3.00	SOIL	13189-1	—	—	—	—	—	13189-1	—	—	13188	—	—	—	—	—
AAA0957	42-01023	3.00–4.75	SOIL	13189	—	—	—	—	—	13189	—	—	13188	—	—	—	—	—
AAA0969	42-01024	0.00–3.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0970	42-01024	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0960	42-01025	0.00–2.20	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0961	42-01025	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0967	42-01026	0.00–3.00	SOIL	13189	—	—	—	—	—	13189	13189	13189	—	—	—	—	—	—
AAA0968	42-01026	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0962	42-01027	0.00–3.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0963	42-01027	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	13189	13189	—	—	—	—	—	—
AAA0973	42-01028	10.00–15.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0974	42-01028	10.00–15.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0975	42-01028	15.00–20.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0976	42-01028	20.00–25.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0990	42-01028	25.00–28.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0977	42-01029	10.00–15.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0978	42-01029	15.00–20.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0979	42-01029	20.00–25.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0980	42-01030	10.00–15.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0981	42-01030	10.00–15.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0982	42-01030	15.00–20.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0983	42-01030	20.00–25.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0991	42-01030	25.00–28.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0984	42-01031	10.00–15.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0985	42-01031	17.00–22.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0986	42-01031	22.00–27.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0964	42-01032	0.00–5.00	FILL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0965	42-01032	5.00–10.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0966	42-01032	7.00–11.00	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—
AAA0989	42-01033	0.00–3.50	SOIL	13189	—	—	—	—	—	13189	—	—	—	—	—	—	—	—

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	AM_241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
AAA0992	42-01034	0.00–3.00	SOIL	13189	—	—	—	—	—	13189	13189	—	—	—	—	—	—	—
AAA0993	42-01034	3.00–6.00	SOIL	13189	—	—	—	—	—	13189	13189	—	—	—	—	—	—	—
AAA1691	42-01037	1.00–2.00	SOIL	—	—	—	—	—	—	—	—	—	13641	—	—	—	—	—
AAA1692	42-01039	0.00–1.00	SOIL	—	—	—	—	—	—	—	—	—	13641	—	—	—	—	—
AAA1693	42-01039	1.00–2.00	SOIL	—	—	—	—	—	—	—	—	—	13641	—	—	—	—	—
AAA1695	42-01039	2.00–3.00	SOIL	—	—	—	—	—	—	—	—	—	13641	—	—	—	—	—
CAMO-09-6330	MO-605049	0.00–0.50	SED	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	—	09-1574
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6334	MO-605049	22.50–24.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6336	MO-605050	0.00–0.50	SED	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	—	09-1574
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	—	09-1584
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6344	MO-605051	7.50–9.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	09-1583	09-1584
CAMO-09-6348	MO-605052	0.00–0.50	SED	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	—	09-1574
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6353	MO-605052	32.50–34.00	QBT4	09-1575	09-1574	09-1572	09-1575	09-1575	09-1573	09-1575	—	09-1575	09-1574	09-1573	09-1574	09-1573	09-1573	09-1574
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6357	MO-605053	20.00–21.50	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6358	MO-605053	30.00–31.50	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	AM_241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6360	MO-605054	0.00–0.50	FILL	09-1459	09-1459	09-1460	09-1459	09-1459	09-1459	09-1459	—	09-1459	09-1459	09-1459	09-1459	09-1459	—	09-1459
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	09-1459	09-1459	09-1460	09-1459	09-1459	09-1459	09-1459	—	09-1459	09-1459	09-1459	09-1459	09-1459	09-1459	09-1459
CAMO-09-6362	MO-605054	12.50–15.00	QBT4	09-1459	09-1459	09-1460	09-1459	09-1459	09-1459	09-1459	—	09-1459	09-1459	09-1459	09-1459	09-1459	09-1459	09-1459
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6366	MO-605055	0.00–0.50	FILL	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	—	09-1488
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6371	MO-605055	38.50–40.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6372	MO-605056	0.00–0.50	FILL	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	—	09-1519
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	09-1517	09-1519
CAMO-09-6374	MO-605056	13.50–15.00	QBT4	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	09-1517	09-1519
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	09-1517	09-1519
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	09-1517	09-1519
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	09-1517	09-1519
CAMO-09-6378	MO-605057	0.00–0.50	FILL	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	—	09-1488
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6382	MO-605057	28.50–30.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6383	MO-605057	38.50–40.00	QBT4	09-1489	09-1488	09-1486	09-1489	09-1489	09-1487	09-1489	—	09-1489	09-1488	09-1487	09-1488	09-1487	09-1487	09-1488
CAMO-09-6384	MO-605058	0.00–0.50	FILL	09-1520	09-1519	09-1518	09-1520	09-1520	09-1517	09-1520	—	09-1520	09-1519	09-1517	09-1519	09-1517	—	09-1519
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6390	MO-605059	0.00–0.50	SED	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	—	09-1601
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6392	MO-605059	8.00–9.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	09-1596	09-1596	09-1604	09-1596	09-1596	09-1596	09-1596	—	09-1596	09-1596	09-1596	09-1596	09-1596	09-1596	09-1596

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	AM_241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6395	MO-605059	33.00–34.50	QBT4	09-1596	09-1596	09-1604	09-1596	09-1596	09-1596	09-1596	—	09-1596	09-1596	09-1596	09-1596	09-1596	09-1596	09-1596
CAMO-09-6396	MO-605060	0.00–0.50	FILL	09-1756	09-1756	09-1755	09-1756	09-1756	09-1756	09-1756	—	09-1756	09-1756	09-1756	09-1756	09-1756	—	09-1756
CAMO-09-6397	MO-605060	1.7500–2.1000	QBT4	09-1756	09-1756	09-1755	09-1756	09-1756	09-1756	09-1756	—	09-1756	09-1756	09-1756	09-1756	09-1756	09-1756	09-1756
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	09-1781	09-1781	09-1780	09-1781	09-1781	09-1781	09-1781	—	09-1781	09-1781	09-1781	09-1781	09-1781	09-1781	09-1781
CAMO-09-6402	MO-605061	0.00–0.50	FILL	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	—	09-1527
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6408	MO-605062	0.00–0.50	FILL	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	—	09-1527
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	09-1528	09-1527	09-1526	09-1528	09-1528	09-1525	09-1528	—	09-1528	09-1527	09-1525	09-1527	09-1525	09-1525	09-1527
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6414	MO-605063	0.00–0.50	FILL	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	—	09-1619
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6416	MO-605063	7.50–9.00	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6417	MO-605063	12.50–14.00	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6419	MO-605063	32.50–34.00	QBT4	09-1620	09-1619	09-1617	09-1620	09-1620	09-1618	09-1620	—	09-1620	09-1619	09-1618	09-1619	09-1618	09-1618	09-1619
CAMO-09-6420	MO-605064	0.00–0.50	SED	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	—	09-1601
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6422	MO-605064	6.00–7.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6426	MO-605065	0.00–0.50	FILL	09-1585	09-1584	09-1582	09-1585	09-1585	09-1583	09-1585	—	09-1585	09-1584	09-1583	09-1584	09-1583	—	09-1584
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6430	MO-605065	22.50–24.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	09-1602	09-1601	09-1603	09-1602	09-1602	09-1600	09-1602	—	09-1602	09-1601	09-1600	09-1601	09-1600	09-1600	09-1601
CAMO-09-6432	MO-605066	0.00–0.50	FILL	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	—	09-1523

Table 4.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	AM_241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	09-1524	09-1523	09-1522	09-1524	09-1524	09-1521	09-1524	—	09-1524	09-1523	09-1521	09-1523	09-1521	09-1521	09-1523
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6439	MO-605067	30.00–32.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6441	MO-605067	50.00–52.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6443	MO-605068	30.00–31.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6445	MO-605068	50.50–51.50	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6446	MO-605069	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	—	09-1441
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6448	MO-605070	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	—	09-1441
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	09-1445	09-1444	09-1472	09-1445	09-1445	09-1443	09-1445	—	09-1445	09-1444	09-1443	09-1444	09-1443	09-1443	09-1444
CAMO-09-6450	MO-605071	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	—	09-1441
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6452	MO-605072	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6454	MO-605073	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6456	MO-605074	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6458	MO-605075	0.00–1.00	SED	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	09-1442	09-1441	09-1471	09-1442	09-1442	09-1440	09-1442	—	09-1442	09-1441	09-1440	09-1441	09-1440	09-1440	09-1441
CAMO-09-8852	MO-605288	0.00–0.50	FILL	09-1785	09-1784	09-1782	09-1785	09-1785	09-1783	09-1785	—	09-1785	09-1784	09-1783	09-1784	09-1783	—	09-1784
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	09-1785	09-1784	09-1782	09-1785	09-1785	09-1783	09-1785	—	09-1785	09-1784	09-1783	09-1784	09-1783	09-1783	09-1784
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	09-1785	09-1784	09-1782	09-1785	09-1785	09-1783	09-1785	—	09-1785	09-1784	09-1783	09-1784	09-1783	09-1783	09-1784

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 4.2-2
Inorganic Chemicals above BVs at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
AAA0957	42-01023	3.00–4.75	SOIL	NA[c]	NA	NA	NA	NA	NA	NA	28.1 (J-)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6330	MO-605049	0.00–0.50	SED	1.1 (U)	163	—[d]	0.551 (U)	—	—	—	—	—	—	—	—	1.12 (U)	—	—
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	0.986 (U)	—	—	—	—	17.6	—	—	—	—	—	—	0.986 (U)	—	—
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	1.05 (U)	—	—	—	2410	—	4.99	17.4	—	—	—	0.0049	1.07 (U)	—	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	1.02 (U)	—	—	—	—	—	—	—	—	—	—	0.000608 (J)	0.988 (U)	—	—
CAMO-09-6334	MO-605049	22.50–24.00	QBT4	0.987 (U)	—	—	—	—	—	—	—	—	—	—	0.000644 (J)	0.972 (U)	—	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	1.03 (U)	—	—	—	—	—	—	18.6	—	—	—	0.00108 (J)	1.04 (U)	—	—
CAMO-09-6336	MO-605050	0.00–0.50	SED	1.12 (U)	—	—	0.562 (U)	—	—	—	—	—	—	1.33	—	1.12 (U)	—	—
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—	0.991 (U)	—	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	0.975 (U)	—	—	—	—	—	—	—	—	—	—	—	0.996 (U)	—	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	1.01 (U)	—	—	—	—	—	—	—	—	—	—	—	1.03 (U)	—	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	0.973 (U)	—	—	—	—	—	—	—	—	—	—	—	1.01 (U)	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	1.04 (U)	—	—	—	—	—	—	—	—	—	—	—	1.02 (U)	—	—
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	1.14 (U)	—	—	0.569 (U)	—	—	—	—	—	—	1.72	0.00128 (J)	—	—	—
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	0.988 (U)	—	—	—	—	—	—	—	—	—	—	0.00271	1.01 (U)	—	—
CAMO-09-6344	MO-605051	7.50–9.00	QBT4	0.978 (U)	—	—	—	—	—	—	—	—	—	1.44	0.000636 (J)	0.991 (U)	—	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	0.979 (U)	—	—	—	—	—	—	—	—	—	0.936 (J)	0.00139 (J)	1.02 (U)	—	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.06 (U)	—	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6348	MO-605052	0.00–0.50	SED	1.14 (U)	—	—	0.568 (U)	—	—	—	—	—	—	2.36	—	1.13 (U)	—	—
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	0.998 (U)	—	—	—	—	—	—	—	—	—	—	—	1.02 (U)	—	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	0.986 (U)	—	—	—	—	10.7	—	—	—	—	—	—	0.983 (U)	—	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	0.97 (U)	—	—	—	—	—	—	—	—	—	—	—	0.991 (U)	—	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	0.974 (U)	—	—	—	—	—	—	—	—	—	—	—	1.02 (U)	—	—
CAMO-09-6353	MO-605052	32.50–34.00	QBT4	1 (U)	—	—	—	—	—	—	—	—	—	—	0.00108 (J)	1.04 (U)	—	—
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	1.05 (U)	—	—	—	—	20	—	—	—	—	—	—	1.07 (U)	—	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—	0.999 (U)	—	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	1.01 (U)	—	—	—	—	12.9	—	—	—	—	—	0.0118	1.01 (U)	—	—
CAMO-09-6357	MO-605053	20.00–21.50	QBT4	1.01 (U)	—	—	—	—	—	—	—	—	—	—	0.00175 (J)	1.03 (U)	—	—
CAMO-09-6358	MO-605053	30.00–31.50	QBT4	1.04 (U)	—	—	—	—	—	—	—	—	—	—	0.00746	1.01 (U)	—	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	1.03 (U)	—	—	0.515 (U)	—	—	—	—	—	—	1.09	0.000887 (J)	—	—	—

Table 4.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	1.12 (U)	59.7	—	—	2610	12.2	—	—	—	—	—	—	—	—	—
CAMO-09-6362	MO-605054	12.50–15.00	QBT4	1.03 (U)	—	—	—	—	—	—	—	—	—	0.996 (J)	—	—	—	—
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	1.12	—	1.05 (U)	—	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	1.08 (U)	—	—	—	—	—	—	—	—	—	0.968 (J)	—	1.04 (U)	—	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.11 (U)	—	—
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	—	—	0.55 (U)	—	—	—	—	—	—	1.24	—	—	—	—
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	3.6	—	1.04 (U)	—	—
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	1.03	—	1.03 (U)	—	—
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	1.08 (U)	—	—	—	—	—	—	—	—	—	2.18	—	1.07 (U)	—	—
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	1.36	—	1.11 (U)	—	—
CAMO-09-6371	MO-605055	38.50–40.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	1.09	—	1.03 (U)	—	—
CAMO-09-6372	MO-605056	0.00–0.50	FILL	1.16 (U)	—	—	0.579 (U)	—	—	—	—	—	—	1.18	—	—	—	—
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	1.07 (U)	—	—	—	—	14.7	—	—	—	—	4.19	0.00165 (J)	1.04 (U)	—	—
CAMO-09-6374	MO-605056	13.50–15.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	4.91	0.00165 (J)	1.08 (U)	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	2.4	—	1.05 (U)	—	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	0.997 (U)	—	—	—	—	—	—	—	—	—	2.15	0.000963 (J)	1.01 (U)	—	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	1.07 (U)	46.6	—	—	—	—	—	—	—	—	2.69	0.00101 (J)	1.1 (U)	—	—
CAMO-09-6378	MO-605057	0.00–0.50	FILL	1.08 (U)	—	—	0.54 (U)	—	—	—	—	—	—	1.84	—	—	—	—
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	4.99	0.000596 (J)	1.08 (U)	—	—
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	4.43	0.00112 (J)	1.08 (U)	—	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	1.04 (U)	—	—	—	—	—	—	—	—	—	2.15	—	1.04 (U)	—	—
CAMO-09-6382	MO-605057	28.50–30.00	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	1.14	—	1.1 (U)	—	—
CAMO-09-6383	MO-605057	38.50–40.00	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	1.24	—	1.05 (U)	—	—
CAMO-09-6384	MO-605058	0.00–0.50	FILL	1.05 (U)	—	—	0.526 (U)	—	—	—	—	—	—	—	0.000787 (J)	—	—	—
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	1.09 (U)	—	—	—	8840 (J)	—	—	—	—	—	2.36 (J-)	—	1.08 (U)	—	—
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	1.11 (U)	—	—	—	—	—	—	—	—	—	3.33	—	1.09 (U)	—	—
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	1.09 (U)	—	—	—	—	—	—	—	—	—	1.36 (J-)	—	1.11 (U)	—	—
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	1.39	—	1.07 (U)	—	—
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	0.902 (J-)	—	1.1 (U)	—	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	1.13 (U)	—	—	0.566 (U)	—	—	—	—	—	—	1.28	—	1.15 (U)	—	—
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	1.08 (U)	—	—	—	—	—	—	—	—	—	—	0.00252	1.11 (U)	—	—
CAMO-09-6392	MO-605059	8.00–9.50	QBT4	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	1.12 (U)	—	—

Table 4.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—	1.13 (U)	—	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	1.04 (U)	—	—	—	—	—	—	—	—	—	—	0.0085 (J+)	1.07 (U)	—	—
CAMO-09-6395	MO-605059	33.00–34.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	—	0.00738 (J+)	1.06 (U)	—	—
CAMO-09-6396	MO-605060	0.00–0.50	FILL	1.06 (U)	—	—	0.528 (U)	—	—	—	—	—	—	5.52	—	—	—	51.9 (J-)
CAMO-09-6397	MO-605060	1.7500–2.1000	QBT4	1.16 (U)	—	—	—	—	25.9 (J)	—	—	—	—	0.94 (J)	—	1.15 (U)	—	—
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	1.17 (U)	—	—	—	—	52.4 (J+)	—	—	—	—	—	—	1.13 (U)	—	—
CAMO-09-6402	MO-605061	0.00–0.50	FILL	1.05 (U)	—	—	0.527 (U)	—	—	—	—	—	—	1.08	—	—	—	—
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	1.08 (U)	—	—	—	—	—	8.92	57.7	0.189	—	4.36 (J-)	0.000578 (J)	1.11 (U)	1.27	234
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	1.14	—	1.09 (U)	—	—
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	1.09 (U)	—	—
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	1.12 (U)	—	—	—	—	—	—	—	—	—	0.849 (J-)	—	1.09 (U)	—	—
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	1.1 (U)	—	1.25	—	—	8.11	—	—	—	—	—	—	1.12 (U)	—	—
CAMO-09-6408	MO-605062	0.00–0.50	FILL	1.12 (U)	—	—	0.561 (U)	—	—	—	—	—	—	1.83 (J-)	—	—	—	—
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.06 (U)	—	—
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	—	0.00075 (J)	1.09 (U)	—	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	1.04 (U)	—	—	—	—	—	—	21.4	—	—	—	0.000699 (J)	1.04 (U)	—	—
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	1.09 (U)	—	—	—	—	—	—	—	—	—	1.25	—	1.08 (U)	—	—
CAMO-09-6414	MO-605063	0.00–0.50	FILL	1.13 (U)	—	—	0.565 (U)	—	—	—	—	—	—	1.32	—	—	—	158
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—	1.11 (U)	—	—
CAMO-09-6416	MO-605063	7.50–9.00	QBT4	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—	1.17 (U)	—	—
CAMO-09-6417	MO-605063	12.50–14.00	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	1.15 (U)	—	—	—	—	—	—	—	—	—	—	—	1.13 (U)	—	—
CAMO-09-6419	MO-605063	32.50–34.00	QBT4	1.14 (U)	—	—	—	—	—	—	—	—	—	1.62	—	1.12 (U)	—	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	1.09 (U)	—	—	0.547 (U)	—	—	—	—	—	—	—	—	1.08 (U)	—	93.5
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	1.06 (U)	50.1	—	—	—	9.63	—	—	—	—	—	0.00163 (J)	1.05 (U)	—	—
CAMO-09-6422	MO-605064	6.00–7.50	QBT4	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	1.07 (U)	—	—
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	1.12 (U)	—	—	0.559 (U)	—	—	—	—	—	—	1.96	—	—	—	62
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	1.13 (U)	—	—	—	—	—	—	—	—	—	—	—	1.15 (U)	—	—

Table 4.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	1.09 (U)	—	—	—	—	21.4	—	—	—	—	—	—	1.12 (U)	—	—
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	1.14 (U)	—	—	—	—	28.5	—	—	—	—	—	—	1.11 (U)	—	—
CAMO-09-6430	MO-605065	22.50–24.00	QBT4	1.09 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—	1.1 (U)	—	—
CAMO-09-6432	MO-605066	0.00–0.50	FILL	1.12 (U)	349	—	0.558 (U)	—	—	—	—	—	—	1.26	—	—	—	—
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.08 (U)	—	95.6
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.02 (U)	—	—
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—	1.07 (U)	—	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—	1.05 (U)	—	—
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	0.987 (U)	—	—	—	—	—	—	—	—	—	0.847 (J)	0.00144 (J)	1.01 (U)	—	—
CAMO-09-6439	MO-605067	30.00–32.50	QBT4	0.997 (U)	—	—	—	—	—	—	—	—	—	—	0.00107 (J)	1.01 (U)	—	—
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	1.07 (U)	—	1.23	—	—	—	—	—	—	—	—	0.000889 (J)	1.08 (U)	—	—
CAMO-09-6441	MO-605067	50.00–52.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	1.04 (U)	—	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	1.03 (U)	—	—	—	—	—	—	—	—	—	13.5	0.00334	1.02 (U)	—	—
CAMO-09-6443	MO-605068	30.00–31.50	QBT4	1.03 (U)	—	—	—	—	—	—	—	—	—	1.01	—	1.02 (U)	—	—
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	0.979 (U)	—	—	—	—	—	—	—	—	—	0.84 (J)	—	1.02 (U)	—	—
CAMO-09-6445	MO-605068	50.50–51.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	0.815 (J)	—	1.04 (U)	—	—
CAMO-09-6446	MO-605069	0.00–1.00	SED	1.08 (U)	—	—	0.541 (U)	—	—	—	—	—	—	0.892 (J)	—	1.06 (U)	—	—
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	1.04 (U)	—	—	—	—	31.9	—	—	—	—	—	—	1.04 (U)	—	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	1.09 (U)	—	—	0.545 (U)	—	—	—	—	—	—	1.93	—	1.12 (U)	—	61.4
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	1.17 (U)	—	—	—	—	—	—	—	—	—	0.833 (J)	—	1.14 (U)	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	1.07 (U)	—	—	0.537 (U)	—	—	—	—	—	—	0.969 (J)	0.00168 (J)	1.07 (U)	—	—
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	1.11 (U)	—	—	—	—	29	—	—	—	—	—	—	1.13 (U)	—	—
CAMO-09-6452	MO-605072	0.00–1.00	SED	1.14 (U)	—	—	0.568 (U)	—	—	—	—	—	—	—	—	1.17 (U)	—	—
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	1.26 (U)	—	—	—	—	—	—	—	—	—	—	—	1.25 (U)	—	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	1.2 (U)	—	—	0.602 (U)	—	—	—	—	—	—	—	0.000641 (J)	1.21 (U)	—	—
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	1.13 (U)	101	1.34	—	—	—	5.95	—	—	7.66	—	—	1.1 (U)	—	—
CAMO-09-6456	MO-605074	0.00–1.00	SED	1.16 (U)	—	—	0.578 (U)	—	—	—	—	—	—	1.14	—	1.15 (U)	—	—
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	1.06 (U)	—	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	1.14 (U)	—	—	0.568 (U)	—	—	—	—	—	—	1.45	—	1.13 (U)	—	—
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—	1.03 (U)	—	—

Table 4.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**11.2**	**19.7**	**0.1**	**9.38**	**na[b]**	**na**	**0.3**	**1**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
CAMO-09-8852	MO-605288	0.00–0.50	FILL	1.11 (U)	—	—	0.554 (U)	—	—	—	—	—	—	9.65	—	—	—	—
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	1.18 (U)	60.1 (J+)	—	—	—	28.4	6.15	14.6	—	—	—	—	1.16 (U)	—	—
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	1.21 (U)	—	—	—	—	31.4	—	—	—	—	10.8	—	1.16 (U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

[c] NA = Not analyzed.

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

Table 4.2-3
Organic Chemicals Detected at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene
CAMO-09-6330	MO-605049	0.00–0.50	SED	—[a]	NA[b]	—	—	—	—	0.0063	—	0.0184 (J)	0.0276 (J)	0.0124 (J)	—	0.0219 (J)	0.0445
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	—	—	—	0.0732 (J)	—	0.0257 (J)	0.0083	—	—	—	—	—	—	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6336	MO-605050	0.00–0.50	SED	0.0373 (J)	NA	0.0565	—	—	—	0.0216	0.104	0.0854	0.131	0.0516	—	0.115	0.293
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	—	0.00249 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	—	—	—	—	0.126	0.103	0.0358	—	—	—	—	—	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	—	NA	—	—	—	—	0.103	—	—	—	—	—	—	—
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6348	MO-605052	0.00–0.50	SED	—	NA	—	—	—	—	0.013	0.0281 (J)	0.0244 (J)	0.0382 (J)	0.0152 (J)	—	0.0285 (J)	0.0579
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	—	0.00273 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	0.118	NA	—	—	—	—	0.0042	—	—	—	—	—	—	—
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	—	—	—	—	—	—	0.0034 (J)	—	—	—	—	—	—	—
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	NA	—	—	—	—	0.0369	—	—	—	—	—	—	0.0131 (J)
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	—	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—	—
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6372	MO-605056	0.00–0.50	FILL	—	NA	—	—	—	—	0.0709	—	—	—	—	—	—	—
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6378	MO-605057	0.00–0.50	FILL	—	NA	—	—	—	—	0.0128	—	—	—	—	—	—	—
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	—	—	—	—	—	0.0073	0.0118	—	—	—	—	—	—	—
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6384	MO-605058	0.00–0.50	FILL	—	NA	—	—	—	—	0.0127	—	—	—	—	—	—	—
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	—	—	—	—	—	0.0126	0.0143	—	—	—	—	0.109 (J)	—	—
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	—	NA	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	—	0.00292 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6396	MO-605060	0.00–0.50	FILL	—	NA	—	—	—	—	0.0122	—	—	—	—	—	—	—
CAMO-09-6397	MO-605060	1.75–2.10	QBT4	—	—	—	—	—	—	0.0161	—	—	—	—	—	—	—
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	—	—	—	—	—	—	0.0131	—	—	—	—	—	—	—
CAMO-09-6402	MO-605061	0.00–0.50	FILL	—	NA	—	—	—	—	0.0209	—	—	—	—	—	—	—
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	—	—	—	—	—	0.0102 (J)	0.0136 (J)	—	0.0146 (J)	0.0305 (J)	0.0122 (J)	—	0.0214 (J)	0.0191 (J)
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	—	0.00353 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	—	0.00235 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6408	MO-605062	0.00–0.50	FILL	—	NA	—	—	—	0.054	0.075	—	—	0.0195 (J)	—	—	0.0145 (J)	0.0223 (J)
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	—	—	0.0237 (J)	—	—	—	0.0042	0.0779	0.0722	0.106	0.0563	—	0.0823	0.161
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	—	0.00255 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6414	MO-605063	0.00–0.50	FILL	—	NA	—	—	—	—	0.0046	—	0.0398	—	—	—	—	—
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	—	NA	—	—	—	—	0.0016 (J)	—	—	—	—	—	—	—
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	—	0.00632 (J-)	—	—	—	—	—	—	—	—	—	0.0736 (J)	—	—
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	—	—	—	—	—	0.0015 (J)	—	—	—	—	—	—	—	—
CAMO-09-6432	MO-605066	0.00–0.50	FILL	0.141	NA	—	—	—	—	0.0366	—	—	—	—	—	—	—
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	—	0.0131	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	—	0.00458 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	—	—	—	—	—	—	0.004	—	—	—	—	—	—	—
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6446	MO-605069	0.00–1.00	SED	—	NA	—	—	—	0.0262	0.0406	—	—	0.013 (J)	—	—	—	0.0115 (J)
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	—	—	—	—	—	0.0024 (J)	0.002 (J)	—	—	—	—	—	—	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	—	NA	—	—	—	0.0341	0.0442	—	—	—	—	—	—	—
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	—	—	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	—	NA	—	—	—	0.184	0.252	—	—	—	—	—	—	0.0172 (J)
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	—	—	—	—	—	0.0086	0.01	—	—	—	—	—	—	—
CAMO-09-6452	MO-605072	0.00 –1.00	SED	—	—	—	—	—	0.0374	0.0472	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	—	0.0382	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	—	—	—	—	—	—	0.0022 (J)	—	—	—	—	—	—	0.0174 (J)
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6456	MO-605074	0.00–1.00	SED	—	—	—	—	—	0.0045	0.0055	0.0175 (J)	0.0132 (J)	0.0238 (J)	—	—	0.0156 (J)	0.0301 (J)
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	—	—	0.00949 (J)	—	—	0.0109	0.0135	0.0296 (J)	0.0293 (J)	0.0489	0.021 (J)	—	0.0329 (J)	0.0614
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-8852	MO-605288	0.00–0.50	FILL	—	NA	—	—	—	—	0.0767	—	—	—	—	—	—	—
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	—	—	—	—	—	—	0.181	—	—	—	—	—	—	—
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	—	—	—	—	—	—	0.0093	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-6330	MO-605049	0.00–0.50	SED	—	0.00000384	0.00000715	0.0000006 (J)	—	0.00000149	—	0.000000172 (J)	—	0.00000108	—
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	—	—	0.000000141	—	—	—	—	—	—	—	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	—	0.000000138 (J)	0.000000322	—	—	—	—	—	—	—	—
CAMO-09-6336	MO-605050	0.00–0.50	SED	0.0314 (J)	0.00000607	0.0000115	0.00000106 (J)	0.000000228 (J)	0.00000283	—	0.000000324 (J)	0.000000227 (J)	0.00000348	0.000000257 (J)
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	—	0.00000079 (J)	0.00000161	0.000000211 (J)	—	0.000000428	—	—	—	—	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	—	—	—	0.0000000799 (J)	—	7.99E-08	—	—	—	—	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	—	—	—	0.000000249 (J)	—	0.000000249	—	—	—	—	—
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	—	0.00000641	0.0000139	0.00000172 (J)	0.000000626 (J)	0.00000473	—	0.000000239 (J)	0.000000179 (J)	0.00000202	0.000000628 (J)
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	—	—	0.000000111	—	—	—	—	—	—	—	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	—	0.0000000732 (J)	7.32E-08	—	—	—	—	—	—	—	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	—	—	0.000000114	—	—	—	—	—	—	—	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6348	MO-605052	0.00–0.50	SED	—	0.00000361	0.0000066	0.000000757 (J)	—	0.00000176	—	0.00000016 (J)	0.000000106 (J)	0.000000989	0.000000116 (J)
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	—	0.00000047 (J)	0.000000825	—	—	9.49E-08	—	—	—	—	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	—	0.000000202 (J)	0.00000045	—	—	—	—	—	—	—	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	—	0.000000189 (J)	0.000000485	—	—	—	—	—	—	—	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	—	0.000000166 (J)	0.000000166	—	—	—	—	—	—	—	—
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	—	0.000000171 (J)	0.000000383	—	—	—	—	—	—	—	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	—	0.0000216	0.0000371	0.00000191 (J)	—	0.00000191	—	—	—	0.00000107	—
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	0.0000105	0.0000198	0.00000148 (J)	0.000000199 (J)	0.00000395	—	0.000000462 (J)	0.000000255 (J)	0.00000264	0.000000242 (J)
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	—	—	0.000000102	—	—	—	—	—	—	—	—
CAMO-09-6372	MO-605056	0.00–0.50	FILL	—	0.00000691	0.0000131	0.00000152 (J)	0.000000515 (J)	0.00000437	—	0.000000271 (J)	0.000000206 (J)	0.00000207	0.000000563 (J)
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	—	0.000000241 (J)	0.000000241	—	—	—	—	—	—	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	—	—	—	0.000000275 (J)	—	0.000000275	—	—	—	—	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6378	MO-605057	0.00–0.50	FILL	—	0.00000515	0.00000949	0.000000701 (J)	—	0.00000175	—	0.000000208 (J)	0.000000159 (J)	0.00000131	0.000000102 (J)
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	—	0.00000143 (J)	0.00000314	0.000000736 (J)	—	0.00000129	—	—	—	0.00000022	—
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	—	—	0.000000181	—	—	—	—	—	—	—	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	—	0.000000306 (J)	0.000000306	—	—	—	—	—	—	—	—
CAMO-09-6384	MO-605058	0.00–0.50	FILL	—	0.00000871	0.0000206	0.0000011 (J)	—	0.00000266	—	0.000000387 (J)	—	0.00000251	—
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	—	0.000000469 (J)	—	0.000000378 (J)	—	0.000000664	—	—	—	0.000000106	0.000000103 (J)
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	—	0.0000000894 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	—	0.000000126 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	—	0.0000000806 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	—	0.0000000816 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	—	0.00000223 (J)	0.00000401	—	—	0.00000113 (J)	—	—	—	0.000000436	—
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	—	0.000000176 (J)	0.000000176	—	—	—	—	—	—	—	—
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	—	0.00000146 (J)	0.00000216	—	—	—	—	—	—	0.000000486	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6396	MO-605060	0.00–0.50	FILL	—	0.0000176	0.0000283	0.00000178 (J)	0.00000019 (J)	0.00000458	0.000000358 (J)	—	0.000000538 (J)	0.00000268	0.000000242 (J)
CAMO-09-6397	MO-605060	1.75–2.10	QBT4	—	0.00000162 (J)	0.00000162	0.000000319 (J)	0.000000146 (J)	0.000000464	—	—	—	—	—
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	—	—	0.000000613	0.0000000996 (J)	—	0.000000234	—	—	—	—	—
CAMO-09-6402	MO-605061	0.00–0.50	FILL	—	0.0000072	0.0000129	0.00000141 (J)	0.000000156 (J)	0.00000384	0.00000012 (J)	0.000000269 (J)	0.000000209 (J)	0.00000215	0.000000184 (J)
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	—	0.00000559	0.0000113	0.0000138	0.00000165 (J)	0.0000206	0.000000787 (J)	0.00000107 (J)	0.000000977 (J)	0.0000126	0.00000893

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	—	0.000000134 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	—	0.000000068 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	—	—	—	0.0000000554 (J)	—	5.54E-08	—	—	—	—	—
CAMO-09-6408	MO-605062	0.00–0.50	FILL	—	0.00000419	0.00000934	0.00000136 (J)	0.000000454 (J)	0.00000375	—	0.000000174 (J)	0.000000154 (J)	0.0000017	—
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	—	—	—	0.000000125 (J)	—	0.000000252	—	—	—	—	—
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6414	MO-605063	0.00–0.50	FILL	—	0.0000214	0.0000367	0.00000312	—	0.00000808	0.000000294 (J)	0.000000737 (J)	0.00000052 (J)	0.0000054	0.000000146 (J)
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	—	0.00000214 (J)	0.00000372	—	0.0000000413 (J)	0.000000984 (J)	—	—	—	0.000000338	—
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	—	0.000000248 (J)	0.000000424	—	—	—	—	—	—	—	—
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	—	—	0.000000153	—	—	—	—	—	—	—	—
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	—	0.00000973	0.000019	0.00000168 (J)	—	0.00000405	—	0.000000352 (J)	—	0.00000142	—
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	—	—	9.74E-08	—	—	—	—	—	—	—	—
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	—	—	0.000000108	—	—	—	—	—	—	—	—
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6432	MO-605066	0.00–0.50	FILL	—	0.00000366	0.00000737	0.000000765 (J)	0.000000229 (J)	0.00000203	—	0.000000171 (J)	—	0.00000113	—
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	—	0.000000137 (J)	0.000000137	—	—	—	—	—	—	—	—
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	—	—	0.000000202	—	—	—	—	—	—	—	—
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	—	0.00000147 (J)	0.00000147	0.000000469 (J)	—	0.000000469	—	—	—	—	—
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	—	0.0000109	0.0000205	0.00000216 (J)	—	0.00000326	—	—	—	0.00000264	—
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6446	MO-605069	0.00–1.00	SED	—	0.0000109	0.000021	0.00000193 (J)	—	0.00000477	—	—	—	0.0000027	0.00000049 (J)
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	—	—	0.000000612	—	—	—	—	—	—	—	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	—	0.0000074	0.000014	0.00000137 (J)	0.000000396 (J)	0.00000393	—	—	0.000000219 (J)	0.00000192	0.000000418 (J)
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	—	0.00000581	0.0000149	0.00000222 (J)	0.00000111 (J)	0.00000662	—	—	—	0.00000162	0.00000131 (J)
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	—	0.000000655 (J)	0.00000158	—	—	0.000000258	—	—	—	—	—
CAMO-09-6452	MO-605072	0.00 –1.00	SED	—	0.00000512	0.00000981	0.00000113 (J)	—	0.00000263	—	—	—	0.000000576	—
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	—	0.000000627 (J)	0.00000132	—	—	—	—	—	—	—	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	—	0.0000168	0.0000315	0.0000026	—	0.00000609	—	—	0.000000587 (J)	0.00000466	—
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	—	0.000000286 (J)	0.00000066	—	—	—	—	—	—	—	—
CAMO-09-6456	MO-605074	0.00–1.00	SED	—	0.00000507	0.0000101	0.000000935 (J)	—	0.00000199	—	—	—	0.00000152	0.000000243 (J)
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	—	0.00000858	0.0000166	0.00000126 (J)	—	0.0000029	—	—	0.000000284 (J)	0.00000217	0.000000206 (J)
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-8852	MO-605288	0.00–0.50	FILL	—	0.00000555	0.0000102	0.00000113 (J)	0.000000413 (J)	0.00000342	—	0.000000268 (J)	0.000000244 (J)	0.00000187	0.000000405 (J)
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	—	0.00000402	0.0000111	0.00000153 (J)	0.000000923 (J)	0.00000512	—	—	0.000000168 (J)	0.00000202	0.000000863 (J)
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	—	—	0.000000405	0.000000114 (J)	—	0.000000114	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6330	MO-605049	0.00–0.50	SED	—	—	—	0.000000285	—	NA	NA	—	—	0.0000299	0.00000148 (J)
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000355 (J)	—
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000324 (J)	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000238 (J)	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000082 (J)	—
CAMO-09-6336	MO-605050	0.00–0.50	SED	0.0000000967 (J)	—	0.000000126 (J)	0.00000152	0.0492	NA	NA	0.00831 (J)	0.022 (J)	0.0000417	0.00000291 (J)
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000616	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000184 (J)	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000377 (J)	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	—	—	0.000000201 (J)	0.00000249	—	NA	NA	—	—	0.0000456	0.00000554
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000479 (J)	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000025 (J)	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000033 (J)	—
CAMO-09-6348	MO-605052	0.00–0.50	SED	—	—	—	0.000000761	0.0129 (J)	NA	NA	—	—	0.0000261	0.00000179 (J)
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000259 (J)	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000383 (J)	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000667 (J)	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	—	—	—	—	—	—	—	—	—	0.0000011 (J)	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000388 (J)	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	0.00000026 (J)	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	—	—	—	0.00000291	—	NA	NA	—	—	0.000158 (J)	0.00000379 (J)
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000181 (J)	—
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000627 (J)	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	—	—	—	—	—	—	—	—	—	0.0000015 (J)	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000515 (J)	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	—	0.000000159 (J)	0.00000227	—	NA	NA	—	—	0.0000792	0.00000366 (J)
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000303 (J)	—
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000021 (J)	—
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000264 (J)	—
CAMO-09-6372	MO-605056	0.00–0.50	FILL	—	—	—	0.00000229	—	NA	NA	—	—	0.0000502	0.00000502 (J)
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000247 (J)	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000348 (J)	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000492 (J)	—
CAMO-09-6378	MO-605057	0.00–0.50	FILL	—	—	—	0.00000107	—	NA	NA	—	—	0.0000379	0.00000175 (J)
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	0.000000174 (J)	—	0.000000196 (J)	0.00000106	—	—	—	—	—	0.0000112	0.000000929 (J)
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000142 (J)	—
CAMO-09-6384	MO-605058	0.00–0.50	FILL	—	—	—	0.00000142	—	NA	NA	—	—	0.0000607	0.0000025 (J)
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	—	—	0.0000000701 (J)	0.000000309	—	—	—	—	—	0.00000279 (J)	0.000000625 (J)
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	—	—	—	—	—	—	0.00325 (J)	—	—	—	—
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	—	—	—	—	—	—	0.00239 (J)	—	—	—	—
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	—	—	—	—	—	—	0.00268 (J)	—	—	—	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	0.0000000777 (J)	—	0.0000000728 (J)	0.000000924 (J)	—	NA	NA	—	—	0.0000168	0.00000097 (J)
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000073 (J)	—
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	—	—	—	—	—	—	—	—	—	0.00000289 (J)	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6396	MO-605060	0.00–0.50	FILL	0.000000159 (J)	—	0.000000198 (J)	0.00000328	—	NA	NA	—	—	0.000119 (J)	0.00000269 (J)
CAMO-09-6397	MO-605060	1.75–2.10	QBT4	—	—	—	0.00000016	—	—	—	—	—	0.0000109 (J)	0.00000102 (J)
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	—	—	—	—	—	—	—	—	—	0.00000315 (J)	—
CAMO-09-6402	MO-605061	0.00–0.50	FILL	—	—	0.000000134 (J)	0.00000206	—	NA	NA	—	—	0.0000506 (J)	0.00000389 (J)
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	0.0000095	0.00000158 (J)	0.00000651	0.0000753	—	—	0.00241 (J)	—	—	0.0000161 (J)	0.0000063

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	—	—	—	—	—	—	0.00255 (J)	—	—	—	—
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	—	—	—	—	—	—	0.00241 (J)	—	—	—	—
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	—	—	—	—	—	—	0.00244 (J)	—	—	—	—
CAMO-09-6408	MO-605062	0.00–0.50	FILL	0.000000149 (J)	—	0.000000158 (J)	0.0000019	—	NA	NA	—	—	0.0000315 (J)	0.00000419 (J)
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	—	—	—	7.02E-08	0.0406	—	—	—	—	0.00000288 (J)	—
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	0.00000222 (J)	—
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000455 (J)	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000757 (J)	—
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000418 (J)	—
CAMO-09-6414	MO-605063	0.00–0.50	FILL	0.000000197 (J)	—	0.000000225 (J)	0.00000389	0.083	NA	NA	—	—	0.000194	0.00000786
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000255 (J)	—
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000279 (J)	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	0.000000076 (J)	—	0.0000000877 (J)	—	—	NA	NA	—	—	0.0000165	0.00000102 (J)
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	—	—	—	—	—	—	—	—	—	0.00000119 (J)	—
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000808 (J)	—
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000311 (J)	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000449 (J)	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	—	—	0.000000159 (J)	0.00000201	—	NA	NA	—	—	0.0000744	0.00000389 (J)
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000054 (J)	—
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000474 (J)	—
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000476 (J)	—
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000028 (J)	—
CAMO-09-6432	MO-605066	0.00–0.50	FILL	—	—	—	0.000000796	—	NA	NA	—	—	0.0000289	0.00000242 (J)
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000953 (J)	—
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000939 (J)	—
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000539 (J)	—
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000569 (J)	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000408 (J)	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	—	—	—	0.000000197	—	—	—	—	—	0.0000119	0.000000804 (J)
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000788 (J)	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	—	—	—	0.00000176	—	—	—	—	—	0.0000763	0.00000228 (J)
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000779 (J)	—
CAMO-09-6446	MO-605069	0.00–1.00	SED	0.000000311 (J)	—	—	0.00000335	—	NA	NA	—	—	0.0000758 (J)	0.00000575
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000215 (J)	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	—	—	—	0.00000207	—	NA	NA	—	—	0.0000532 (J)	0.00000431 (J)
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	0.000000277 (J)	—	0.000000306 (J)	0.00000451	—	NA	NA	—	—	0.0000484 (J)	0.00000962
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000414 (J)	0.000000654 (J)
CAMO-09-6452	MO-605072	0.00 –1.00	SED	—	—	—	0.00000124	—	—	—	—	—	0.0000344 (J)	0.00000317 (J)
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	—	—	—	—	—	0.103	—	—	—	0.0000032 (J)	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	—	—	0.000000275 (J)	0.00000291	—	—	—	—	—	0.000133 (J)	0.00000626
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	0.00000103 (J)	—
CAMO-09-6456	MO-605074	0.00–1.00	SED	—	—	—	0.00000154	—	—	—	—	—	0.0000344 (J)	0.00000188 (J)
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	0.000000591 (J)	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	0.000000144 (J)	—	—	0.00000168	0.155 (J)	—	—	—	—	0.0000709 (J)	0.0000024 (J)
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	0.000000955 (J)	—
CAMO-09-8852	MO-605288	0.00–0.50	FILL	0.000000147 (J)	—	0.000000132 (J)	0.00000201	—	NA	NA	—	—	0.0000423 (J)	0.00000361 (J)
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	0.00000022 (J)	—	0.000000159 (J)	0.00000267	—	—	—	—	—	0.0000274 (J)	0.00000637
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	—	—	—	—	—	—	—	—	—	0.00000153 (J)	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
CAMO-09-6330	MO-605049	0.00–0.50	SED	—	—	—	—	0.000000154	0.0285 (J)	0.0408	—	—	—	—
CAMO-09-6331	MO-605049	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6336	MO-605050	0.00–0.50	SED	—	0.000000235	—	0.00000017 (J)	0.00000114	0.245	0.269	—	—	—	0.000000304
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6342	MO-605051	0.00–0.50	SOIL	—	—	—	—	0.000000145	—	—	—	—	—	—
CAMO-09-6343	MO-605051	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6348	MO-605052	0.00–0.50	SED	—	—	—	—	0.000000251	0.0345 (J)	0.0553	—	—	—	—
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6354	MO-605053	0.00–1.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	—	—	—	—	0.0000005	—	—	—	—	—	0.000000105
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6363	MO-605054	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	—	—	—	0.000000901	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
CAMO-09-6367	MO-605055	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6368	MO-605055	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6369	MO-605055	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6370	MO-605055	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6372	MO-605056	0.00–0.50	FILL	—	—	0.000000184 (J)	0.000000269 (J)	0.00000189	—	—	—	—	—	0.00000042
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6378	MO-605057	0.00–0.50	FILL	—	—	—	—	0.000000219	—	—	—	—	—	—
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	—	—	0.000000191 (J)	0.00000028 (J)	0.00000213	—	—	—	—	—	0.000000993
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6384	MO-605058	0.00–0.50	FILL	—	—	—	—	0.000000583	—	—	—	—	—	—
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	—	—	0.0000000464 (J)	0.0000000819 (J)	0.00000052	—	—	—	—	—	0.000000368
CAMO-09-6386	MO-605058	13.50–15.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6387	MO-605058	18.50–20.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6388	MO-605058	28.50–30.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6389	MO-605058	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	—	—	—	—	0.000000628	—	—	—	—	—	0.000000252
CAMO-09-6391	MO-605059	3.00–5.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6393	MO-605059	13.00–14.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6396	MO-605060	0.00–0.50	FILL	—	—	—	—	0.000000892	—	—	—	—	—	—
CAMO-09-6397	MO-605060	1.75–2.10	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6398	MO-605060	2.50–3.2500	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6402	MO-605061	0.00–0.50	FILL	—	0.00000019	—	—	0.000000862	—	—	—	—	—	0.000000281
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	0.00000171 (J)	0.0000174	0.000011	0.0000121	0.000163	—	0.022 (J)	0.00000083	0.0000164	0.00000658	0.000185
CAMO-09-6404	MO-605061	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6405	MO-605061	17.50–19.00	QBT4	—	—	—	—	—	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
CAMO-09-6406	MO-605061	27.50–29.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6407	MO-605061	38.50–40.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6408	MO-605062	0.00–0.50	FILL	—	0.000000106	—	0.000000377 (J)	0.00000247	—	0.0225 (J)	—	—	—	0.00000123
CAMO-09-6409	MO-605062	5.00–6.50	QBT4	—	—	—	—	—	0.0893	0.148	—	—	—	—
CAMO-09-6410	MO-605062	10.00–11.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6411	MO-605062	15.00–16.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6414	MO-605063	0.00–0.50	FILL	—	0.000000349	—	—	0.000000696	—	—	—	—	—	0.000000271
CAMO-09-6415	MO-605063	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6418	MO-605063	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6423	MO-605064	11.00–12.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6424	MO-605064	21.00–22.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	—	—	—	—	0.000000326	—	—	—	—	—	0.000000231
CAMO-09-6427	MO-605065	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6429	MO-605065	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6431	MO-605065	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6432	MO-605066	0.00–0.50	FILL	—	—	—	—	0.000000316	—	—	—	—	—	—
CAMO-09-6433	MO-605066	2.50–4.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6434	MO-605066	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6435	MO-605066	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6436	MO-605066	22.50–24.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	—	—	—	—	0.00000059	—	—	—	—	—	—

Table 4.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6446	MO-605069	0.00–1.00	SED	—	0.000000305	0.000000145 (J)	—	0.00000161	—	0.0134 (J)	—	—	—	0.00000103
CAMO-09-6447	MO-605069	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	—	—	—	0.000000198 (J)	0.00000108	—	—	—	—	—	0.00000038
CAMO-09-6449	MO-605070	1.30–2.30	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	—	—	—	0.000000549 (J)	0.00000308	—	0.0166 (J)	—	—	—	0.000000969
CAMO-09-6451	MO-605071	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6452	MO-605072	0.00 –1.00	SED	—	—	—	—	0.000000941	—	—	—	—	—	0.000000422
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	—	0.000000166	—	—	0.000000805	—	0.0172 (J)	—	0.000000539	—	0.00000123
CAMO-09-6455	MO-605073	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6456	MO-605074	0.00–1.00	SED	—	—	—	—	0.00000118	0.0197 (J)	0.0272 (J)	—	0.000000214	—	0.0000011
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	—	—	—	0.000000163 (J)	0.00000124	0.0467	0.0589	—	0.00000036	—	—
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-8852	MO-605288	0.00–0.50	FILL	—	—	—	0.000000257 (J)	0.00000134	—	—	—	—	—	0.000000573
CAMO-09-8853	MO-605288	2.75–3.50	QBT4	—	—	—	0.000000339 (J)	0.00000201	—	—	—	—	—	0.00000151
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	—	—	—	—	0.000000117	—	—	—	—	—	—

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 4.2-4
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 42-001(a)-99

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[a]**	**0.023[b]**	**0.054[b]**	**na[c]**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
AAA0951	42-01021	0.00–1.50	FILL	—[d]	NA[e]	0.0739 (J)	—	NA	NA	NA	NA
AAA0953	42-01021	3.00–6.00	SOIL	—	NA	0.2 (J-)	—	NA	NA	NA	NA
AAA0957	42-01023	3.00–4.7500	SOIL	0.332 (J)	NA	1.75 (J)	2.42 (J)	NA	NA	NA	NA
AAA0970	42-01024	3.00–6.00	SOIL	0.38 (J)	NA	—	0.963 (J)	NA	NA	NA	NA
AAA0968	42-01026	3.00–6.00	SOIL	0.227 (J)	NA	—	—	NA	NA	NA	NA
AAA0963	42-01027	3.00–6.00	SOIL	—	NA	—	0.511	NA	—	—	—
AAA0974	42-01028	10.00–15.00	FILL	—	NA	—	0.666 (J-)	NA	NA	NA	NA
AAA0980	42-01030	10.00–15.00	FILL	—	NA	1.95 (J-)	10.3 (J-)	NA	NA	NA	NA
AAA0981	42-01030	10.00–15.00	SOIL	—	NA	—	1.46 (J-)	NA	NA	NA	NA
AAA0982	42-01030	15.00–20.00	SOIL	0.327	NA	—	—	NA	NA	NA	NA
AAA0983	42-01030	20.00–25.00	SOIL	0.358	NA	—	—	NA	NA	NA	NA
AAA0991	42-01030	25.00–28.00	SOIL	0.332	NA	—	—	NA	NA	NA	NA
AAA0984	42-01031	10.00–15.00	FILL	0.463	NA	—	—	NA	NA	NA	NA
AAA0985	42-01031	17.00–22.00	FILL	0.529	NA	—	—	NA	NA	NA	NA
AAA0986	42-01031	22.00–27.00	FILL	0.342	NA	—	—	NA	NA	NA	NA
AAA0992	42-01034	0.00–3.00	SOIL	0.933	NA	—	—	NA	NA	NA	NA
AAA0993	42-01034	3.00–6.00	SOIL	0.309	NA	—	—	NA	NA	NA	NA
CAMO-09-6332	MO-605049	7.50–9.00	QBT4	—	—	—	—	0.0538999	—	—	—
CAMO-09-6333	MO-605049	12.50–14.00	QBT4	—	—	—	—	0.0265782	—	—	—
CAMO-09-6334	MO-605049	22.50–24.00	QBT4	—	—	—	—	0.0200959	—	—	—
CAMO-09-6335	MO-605049	32.50–34.00	QBT4	—	—	—	—	0.0584383	—	—	—
CAMO-09-6337	MO-605050	2.50–4.00	QBT4	0.119	0.104	—	0.29	—	—	—	—
CAMO-09-6338	MO-605050	7.50–9.00	QBT4	—	—	—	—	0.00566867	—	—	—
CAMO-09-6339	MO-605050	12.50–14.00	QBT4	—	—	—	—	0.066416	—	—	—
CAMO-09-6340	MO-605050	22.50–24.00	QBT4	—	—	—	—	0.0063429	—	—	—
CAMO-09-6341	MO-605050	32.50–34.00	QBT4	—	—	—	0.168	0.0101206	—	—	—
CAMO-09-6344	MO-605051	7.50–9.00	QBT4	—	—	—	—	0.0061553	—	—	—
CAMO-09-6345	MO-605051	12.50–14.00	QBT4	—	—	—	—	0.00567509	—	—	—
CAMO-09-6346	MO-605051	22.50–24.00	QBT4	—	—	—	—	0.0276367	—	0.113	—
CAMO-09-6347	MO-605051	32.50–34.00	QBT4	—	—	—	—	0.0296689	—	—	—

Table 4.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
CAMO-09-6349	MO-605052	2.50–4.00	QBT4	—	—	—	0.0287	—	—	—	—
CAMO-09-6350	MO-605052	7.50–9.00	QBT4	—	—	—	—	0.0095563	—	—	—
CAMO-09-6351	MO-605052	12.50–14.00	QBT4	—	—	—	—	0.0122161	—	—	—
CAMO-09-6352	MO-605052	22.50–24.00	QBT4	—	—	—	—	0.00833672	—	—	—
CAMO-09-6353	MO-605052	32.50–34.00	QBT4	—	—	—	—	0.067936	—	—	—
CAMO-09-6355	MO-605053	5.00–6.50	QBT4	—	—	—	—	0.00621365	—	—	—
CAMO-09-6356	MO-605053	10.00–11.50	QBT4	—	—	—	—	0.0181954	—	—	—
CAMO-09-6357	MO-605053	20.00–21.50	QBT4	—	—	—	—	0.00896211	—	—	—
CAMO-09-6360	MO-605054	0.00–0.50	FILL	—	—	0.0607	—	0.011415	—	—	—
CAMO-09-6361	MO-605054	7.50–9.00	QBT4	—	—	—	—	0.0361609	—	—	—
CAMO-09-6362	MO-605054	12.50–15.00	QBT4	—	—	—	—	0.0212032	—	—	—
CAMO-09-6364	MO-605054	27.50–29.50	QBT4	—	—	—	—	0.0905775	—	—	—
CAMO-09-6365	MO-605054	37.50–40.00	QBT4	—	—	—	—	0.174938	—	—	—
CAMO-09-6366	MO-605055	0.00–0.50	FILL	—	—	0.0443	—	—	—	—	—
CAMO-09-6371	MO-605055	38.50–40.00	QBT4	—	—	—	—	0.0289008	—	—	—
CAMO-09-6373	MO-605056	8.50–10.00	QBT4	—	—	—	0.0289	—	—	—	—
CAMO-09-6375	MO-605056	18.50–20.00	QBT4	—	—	—	—	0.0214304	—	—	—
CAMO-09-6376	MO-605056	28.50–30.00	QBT4	—	—	—	—	0.0895556	—	—	—
CAMO-09-6377	MO-605056	38.50–40.00	QBT4	—	—	—	—	0.14539	—	—	—
CAMO-09-6379	MO-605057	8.50–10.00	QBT4	0.0536	0.325	—	0.236	—	—	—	—
CAMO-09-6380	MO-605057	13.50–15.00	QBT4	—	—	—	—	—	—	0.0916	—
CAMO-09-6381	MO-605057	18.50–20.00	QBT4	—	—	—	—	0.0135799	—	—	—
CAMO-09-6382	MO-605057	28.50–30.00	QBT4	—	—	—	—	0.0861512	—	—	—
CAMO-09-6383	MO-605057	38.50–40.00	QBT4	—	—	—	—	0.0828347	—	—	—
CAMO-09-6385	MO-605058	8.50–10.00	QBT4	—	—	—	0.192	0.0216949	—	0.105	—
CAMO-09-6390	MO-605059	0.00–0.50	SED	—	—	—	0.208	—	—	—	—
CAMO-09-6394	MO-605059	23.00–24.50	QBT4	—	—	—	—	0.0347609	—	—	—
CAMO-09-6395	MO-605059	33.00–34.50	QBT4	—	—	—	—	0.0518446	—	—	—
CAMO-09-6397	MO-605060	1.75–2.10	QBT4	—	—	—	0.03	—	—	—	—
CAMO-09-6403	MO-605061	7.50–9.00	QBT4	0.127	—	—	1.29	0.0284881	2.23	0.122	—
CAMO-09-6412	MO-605062	25.00–26.50	QBT4	—	—	—	—	0.0264894	—	—	—

Table 4.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
CAMO-09-6413	MO-605062	35.00–36.50	QBT4	—	—	—	—	0.0602222	—	—	—
CAMO-09-6420	MO-605064	0.00–0.50	SED	—	—	—	0.196	—	—	—	—
CAMO-09-6421	MO-605064	1.00–2.50	QBT4	—	—	—	0.0678	0.0137107	—	—	—
CAMO-09-6425	MO-605064	31.00–32.50	QBT4	—	—	—	—	0.0198287	—	—	—
CAMO-09-6426	MO-605065	0.00–0.50	FILL	—	—	—	0.119	—	—	—	—
CAMO-09-6428	MO-605065	7.50–9.00	QBT4	—	—	—	—	0.0285	—	—	—
CAMO-09-6437	MO-605066	32.50–34.00	QBT4	—	—	—	—	0.0369231	—	—	—
CAMO-09-6438	MO-605067	20.00–22.50	QBT4	—	—	—	—	0.0228021	—	—	—
CAMO-09-6439	MO-605067	30.00–32.50	QBT4	—	—	—	—	0.0426604	—	—	—
CAMO-09-6440	MO-605067	40.00–42.50	QBT4	—	—	—	—	0.0344207	—	—	—
CAMO-09-6441	MO-605067	50.00–52.50	QBT4	—	—	—	—	0.0663944	—	—	—
CAMO-09-6442	MO-605068	20.00–21.50	QBT4	—	—	—	—	0.0462111	—	—	—
CAMO-09-6443	MO-605068	30.00–31.50	QBT4	—	—	—	—	0.0933333	—	—	—
CAMO-09-6444	MO-605068	40.00–41.50	QBT4	—	—	—	—	0.0322862	—	—	—
CAMO-09-6445	MO-605068	50.50–51.50	QBT4	—	—	—	—	0.0742517	—	—	—
CAMO-09-6448	MO-605070	0.00–1.00	SED	—	—	—	0.128	—	—	—	—
CAMO-09-6450	MO-605071	0.00–1.00	SED	—	—	—	0.0708	—	—	—	—
CAMO-09-6452	MO-605072	0.00–1.00	SED	—	—	—	0.118	—	—	—	—
CAMO-09-6453	MO-605072	1.30–2.30	QBT4	—	—	—	0.0326	—	—	—	—
CAMO-09-6454	MO-605073	0.00–1.00	SED	—	—	—	0.105 (J+)	—	—	—	2.52
CAMO-09-6456	MO-605074	0.00–1.00	SED	0.0971	—	—	0.407	—	—	—	—
CAMO-09-6457	MO-605074	1.50–2.50	QBT4	—	—	—	0.181	—	—	—	—
CAMO-09-6458	MO-605075	0.00–1.00	SED	0.168	—	—	0.803	—	—	—	—
CAMO-09-6459	MO-605075	1.00–2.00	QBT4	0.0392	—	—	0.248	—	—	—	—
CAMO-09-8854	MO-605288	4.00–4.50	QBT4	—	—	—	0.0714	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

[e] NA = Not Analyzed

Table 5.2-1
Samples Collected and Analyses Requested at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA4494	48-02006	0.00–0.50	FILL	—*	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA4493	48-02006	0.50–1.50	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA4495	48-02006	1.50–3.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3769	48-02006	3.00–4.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3770	48-02006	4.00–5.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3771	48-02006	5.00–6.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3772	48-02006	6.00–7.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3773	48-02006	7.00–8.00	FILL	—	—	—	15290	—	—	15290	15290	15290	—	—	—	—	—	—	—
AAA3401	48-02010	4.00–5.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3402	48-02010	8.50–9.50	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3403	48-02010	14.00–15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3404	48-02012	4.00–5.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3405	48-02012	9.00–10.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3406	48-02012	14.00–15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3407	48-02014	4.00–5.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3408	48-02014	7.00–7.20	SOIL	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3409	48-02014	9.00–10.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA4473	48-02014	14.00–15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3493	48-02016	0.00–0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3495	48-02018	0.00–0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3497	48-02020	0.00–0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3717	48-02024	4.00–5.00	FILL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3718	48-02024	8.00–9.00	FILL	15213	—	—	15213	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3719	48-02024	14.00–15.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3720	48-02025	4.00–5.00	FILL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3721	48-02025	5.50–6.50	FILL	15213	—	—	15213	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3722	48-02025	7.50–8.50	FILL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4475	48-02025	9.00–10.00	QBT4	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4476	48-02025	13.00–14.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3723	48-02026	1.50–2.50	SOIL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3724	48-02026	6.00–7.4000	SOIL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4469	48-02026	14.00–15.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3545	48-02037	0.00–0.50	FILL	15333	—	—	15333	—	—	15333	15333	15333	—	—	—	—	—	—	—
AAA3546	48-02037	0.50–1.50	FILL	15333	—	—	—	—	—	15333	15333	15333	—	—	—	—	—	—	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA3547	48-02037	1.50–3.00	SOIL	15333	—	—	—	—	—	15333	15333	15333	—	—	—	—	—	—	—
AAA3512	48-02054	0.00–0.50	SED	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3514	48-02054	0.50–1.50	SED	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3515	48-02054	1.50–2.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3513	48-02055	0.00–0.50	SED	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3516	48-02055	0.50–1.50	SED	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3470	48-02055	1.50–2.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3471	48-02055	2.50–3.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3782	48-02057	0.00–0.50	SOIL	15333	—	—	—	—	—	15333	15333	15333	—	—	—	—	—	—	—
AAA3803	48-02067	0.00–1.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3804	48-02067	1.00–2.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3806	48-02068	0.00–1.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3810	48-02069	0.00–1.00	SOIL	16193	—	—	16193	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3811	48-02069	1.00–2.00	QBT4	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
0448-95-0001	48-02080	0.00–0.50	SOIL	—	—	—	—	—	—	225	—	225	224	—	—	—	—	—	—
0448-95-0005	48-02082	0.00–0.50	SOIL	—	—	—	—	—	—	—	—	—	224	—	—	—	—	—	—
0448-95-0068	48-02133	0.00–0.50	FILL	—	—	—	—	—	—	—	—	—	1050	—	—	—	1049	—	—
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	—	—	—	—	—	—	—	1050	—	—	—	1049	—	—
0448-97-0032	48-02135	0.00–1.00	FILL	—	—	—	2920	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0033	48-02135	1.00–2.00	FILL	—	—	—	2920	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0034	48-02135	2.00–3.25	FILL	—	—	—	2920	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0084	48-02136	0.00–0.50	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0085	48-02136	0.50–1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0009	48-02141	11.50–12.50	FILL	—	—	—	2906	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0011	48-02141	12.50–13.50	QBT4	—	—	—	2906	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0039	48-02142	4.66–5.12	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0040	48-02148	3.30–4.30	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0041	48-02148	4.66–5.16	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0001	48-02150	3.50–4.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0002	48-02150	8.50–9.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0003	48-02150	14.00–15.00	QBT4	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0004	48-02151	6.00–7.00	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0006	48-02151	13.50–14.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0007	48-02151	15.50–16.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
0448-97-0057	48-02152	0.00–1.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0058	48-02152	1.00–2.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0059	48-02153	0.00–1.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0060	48-02153	1.00–2.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0062	48-02154	0.00–0.83	SED	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0061	48-02154	0.83–1.67	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0045	48-02155	5.00–6.00	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0012	48-02156	17.50–18.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0013	48-02156	21.00–22.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0014	48-02156	24.00–25.00	QBT3	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0015	48-02157	3.50–4.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0016	48-02157	5.00–6.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0018	48-02157	9.00–10.00	SOIL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0019	48-02158	3.50–4.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0020	48-02158	5.50–6.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0021	48-02158	9.00–10.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0047	48-02159	0.50–1.50	SED	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0048	48-02159	3.83–5.00	QBT3	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0064	48-02163	0.00–1.00	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0065	48-02163	1.00–2.00	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0074	48-02164	0.00–1.00	SED	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0075	48-02164	1.00–2.00	QBT3	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0067	48-02165	0.00–1.00	SED	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0068	48-02165	1.00–2.00	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0070	48-02165	2.00–2.83	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0078	48-02166	0.00–1.00	SED	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0079	48-02166	1.00–2.00	QBT3	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0071	48-02167	0.00–1.00	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0072	48-02167	1.00–2.00	SOIL	—	—	—	2955	—	—	—	—	—	—	—	—	—	—	—	—

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
0448-97-0081	48-02168	0.00–0.83	SED	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0082	48-02168	0.83–1.67	SOIL	—	—	—	2977	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0105	48-02169	0.00–1.00	SED	—	—	—	3220R	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0107	48-02169	1.00–2.00	SOIL	—	—	—	3220R	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0108	48-02170	0.00–0.50	SED	—	—	—	3220R	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0109	48-02170	0.50–1.20	SOIL	—	—	—	3220R	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0115	48-02172	0.00–1.00	SOIL	—	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0117	48-02172	2.00–3.00	QBT2	—	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	09-1651	09-1649	09-1652	09-1652	—	09-1652	—	09-1652	09-1651	09-1650	09-1651	—	09-1650	—	09-1651
CAMO-09-5926	MO-604924	0.00–0.50	FILL	—	09-1651	—	09-1652	09-1652	—	09-1652	—	09-1652	09-1651	—	09-1651	—	09-1650	—	09-1651
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	09-1651	—	09-1652	09-1652	—	09-1652	—	09-1652	09-1651	—	09-1651	—	09-1650	—	09-1651
CAMO-09-5934	MO-604926	0.00–0.50	FILL	—	09-1683	—	09-1684	09-1684	—	09-1684	—	09-1684	09-1683	—	09-1683	—	09-1682	—	09-1683
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	09-1651	—	09-1652	09-1652	—	09-1652	—	09-1652	09-1651	—	09-1651	—	09-1650	—	09-1651
CAMO-09-5954	MO-604931	0.00–0.50	FILL	—	09-1683	—	09-1684	09-1684	—	09-1684	—	09-1684	09-1683	—	09-1683	—	09-1682	—	09-1683
CAMO-09-5958	MO-604932	0.00–0.50	FILL	—	09-1711	—	09-1712	09-1712	—	09-1712	—	09-1712	09-1711	—	09-1711	—	09-1710	—	09-1711
CAMO-09-5989	MO-604938	0.00–0.50	SED	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5990	MO-604939	0.00–0.50	SED	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5995	MO-604944	0.00–0.50	SED	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5996	MO-604945	0.00–0.50	SED	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-5997	MO-604946	0.00–0.50	SED	09-2004	09-2003	09-2001	09-2004	09-2004	09-2003	09-2004	09-2004	09-2004	09-2003	09-2002	09-2003	09-2004	09-2002	—	09-2003
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	09-1814	09-1817	09-1815	09-1815	—	09-1815	—	—	09-1814	09-1816	09-1814	—	09-1816	—	09-1814
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	09-1830	09-1828	09-1831	09-1831	—	09-1831	—	—	09-1830	09-1829	09-1830	—	09-1829	—	09-1830
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	09-1814	09-1817	09-1815	09-1815	—	09-1815	—	—	09-1814	09-1816	09-1814	—	09-1816	—	09-1814
CAMO-09-6566	MO-605100	0.00–0.50	SED	—	09-1901	09-1899	09-1902	09-1902	—	09-1902	—	—	09-1901	09-1900	09-1901	—	09-1900	—	09-1901
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	—	09-1814	—	09-1815	09-1815	-	09-1815	—	—	09-1814	—	09-1814	—	09-1816	—	09-1814
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	09-1830	—	09-1831	09-1831	-	09-1831	—	—	09-1830	—	09-1830	—	09-1829	—	09-1830
CAMO-09-6575	MO-605103	0.00–0.50	SED	—	09-1901	—	09-1902	09-1902	-	09-1902	—	—	09-1901	—	09-1901	—	09-1900	—	09-1901
CAMO-09-6578	MO-605104	0.00–0.50	SED	—	09-1901	—	09-1902	09-1902	-	09-1902	—	—	09-1901	—	09-1901	—	09-1900	—	09-1901

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6643	MO-605110	0.00–0.50	SED	—	09-1999	09-2019	09-1999	09-1999	09-1998	—	—	—	09-1999	09-1998	09-1999	—	09-1998	—	09-1999
CAMO-09-6646	MO-605111	0.00–0.50	SED	—	09-1999	09-2019	09-1999	09-1999	09-1998	—	—	—	09-1999	09-1998	09-1999	—	09-1998	—	09-1999
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	09-1971	09-1969	09-1971	09-1971	09-1971	—	—	—	09-1971	09-1970	09-1971	—	09-1970	—	09-1971
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	09-1971	09-1969	09-1971	09-1971	09-1971	—	—	—	09-1971	09-1970	09-1971	—	09-1970	—	09-1971
CAMO-09-6655	MO-605114	0.00–0.50	SED	—	09-1999	—	09-1999	09-1999	09-1998	—	—	—	09-1999	—	09-1999	—	09-1998	—	09-1999
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	09-1971	—	09-1971	09-1971	09-1971	—	—	—	09-1971	—	09-1971	—	09-1970	—	09-1971
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	09-1971	—	09-1971	09-1971	09-1971	—	—	—	09-1971	—	09-1971	—	09-1970	—	09-1971
CAMO-09-6664	MO-605117	0.00–0.50	SED	—	09-1971	—	09-1971	09-1971	09-1971	—	—	—	09-1971	—	09-1971	—	09-1970	—	09-1971
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6679	MO-605119	0.00–0.50	SED	—	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	—	09-1826
CAMO-09-6687	MO-605121	0.00–0.50	SED	—	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	—	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	—	09-1826
CAMO-09-6699	MO-605124	0.00–0.50	SED	—	09-2009	09-2007	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	09-2008	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6701	MO-605125	0.00–0.50	SED	—	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	—	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	09-1805	09-1806	09-1805	09-1805	09-1805	—	—	—	09-1805	09-1805	09-1805	—	09-1805	—	09-1805
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	09-1824	09-1823	09-1824	09-1824	09-1824	—	—	—	09-1824	09-1824	09-1824	—	09-1824	—	09-1824
CAMO-09-6727	MO-605131	0.00–0.50	FILL	—	09-2026	—	09-2026	09-2026	09-2026	—	—	—	09-2026	—	09-2026	—	09-2025	—	09-2026
CAMO-09-6730	MO-605132	0.00–0.50	SED	—	09-1805	—	09-1805	09-1805	09-1805	—	—	—	09-1805	—	09-1805	—	09-1805	—	09-1805
CAMO-09-6768	MO-605142	0.00–0.50	SED	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6773	MO-605143	0.00–0.50	FILL	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6778	MO-605144	0.00–0.50	SED	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	—	09-1837
CAMO-09-6783	MO-605145	0.00–0.50	SED	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6788	MO-605146	0.00–0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6793	MO-605147	0.00–0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6798	MO-605148	0.00–0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6803	MO-605149	0.00–0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6808	MO-605150	0.00–0.50	SED	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6813	MO-605151	0.00–0.50	SED	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	—	09-1996
CAMO-09-6823	MO-605153	0.00–0.50	SED	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6828	MO-605154	0.00–0.50	SED	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	—	09-1937

Table 5.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6833	MO-605155	0.00–0.50	SED	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6838	MO-605156	0.00–0.50	FILL	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	—	09-1996
CAMO-09-6843	MO-605157	0.00–0.50	SOIL	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6845	MO-605158	0.00–0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6847	MO-605159	0.00–0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6849	MO-605160	0.00–0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6876	MO-605161	0.00–0.50	SED	—	09-1934	09-1932	09-1934	09-1934	09-1933	—	—	—	09-1934	09-1933	09-1934	—	09-1933	—	09-1934
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	09-1934	09-1932	09-1934	09-1934	09-1933	—	—	—	09-1934	09-1933	09-1934	—	09-1933	—	09-1934
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	09-1934	09-1932	09-1934	09-1934	09-1933	—	—	—	09-1934	09-1933	09-1934	—	09-1933	—	09-1934
CAMO-09-6885	MO-605164	0.00–0.50	SED	—	09-1934	—	09-1934	09-1934	09-1933	—	—	—	09-1934	—	09-1934	—	09-1933	—	09-1934
CAMO-09-6888	MO-605165	0.00–0.50	SED	—	09-1934	—	09-1934	09-1934	09-1933	—	—	—	09-1934	—	09-1934	—	09-1933	—	09-1934
CAMO-09-6891	MO-605166	0.00–0.50	SED	—	09-1934	—	09-1934	09-1934	09-1933	—	—	—	09-1934	—	09-1934	—	09-1933	—	09-1934

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.2-2
Inorganic Chemicals above BVs at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Iron
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**13800**
SOIL, FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**21500**
QBT2, QBT3, QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**14500**
0448-95-0068	48-02133	0.00–0.50	FILL	0.88 (J)	—[c]	—	—	—	—	NA[d]	—	—	NA	—
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	—	—	—	—	NA	—	—	NA	—
0448-97-0084	48-02136	0.00–0.50	SOIL	5.8 (U)	—	—	0.58 (U)	—	—	NA	—	—	NA	—
0448-97-0085	48-02136	0.50–1.00	SOIL	5.49 (U)	—	—	0.549 (U)	—	—	NA	—	—	NA	—
0448-97-0037	48-02142	3.33–4.33	FILL	5.4 (U)	—	—	0.54 (U)	—	—	NA	—	—	NA	—
0448-97-0039	48-02142	4.66–5.12	FILL	5.54 (U)	—	—	0.554 (U)	—	—	NA	—	—	NA	—
0448-97-0040	48-02148	3.30–4.30	FILL	5.69 (U)	—	—	0.569 (U)	—	—	NA	—	—	NA	—
0448-97-0041	48-02148	4.66–5.16	FILL	5.79 (U)	—	—	0.579 (U)	—	—	NA	—	—	NA	—
0448-97-0043	48-02155	1.50–2.50	FILL	12 (UJ)	—	—	0.6 (U)	—	—	NA	—	—	NA	—
0448-97-0044	48-02155	3.67–4.67	FILL	12 (UJ)	—	—	0.59 (U)	—	26	NA	—	—	NA	—
0448-97-0045	48-02155	5.00–6.00	FILL	12 (UJ)	—	—	0.59 (U)	—	20	NA	—	—	NA	—
0448-97-0047	48-02159	0.50–1.50	SED	7.2 (U)	—	—	0.72 (U)	—	—	NA	—	—	NA	—
0448-97-0048	48-02159	3.83–5.00	QBT3	6.4 (U)	—	62.9	—	2480	26.5	NA	—	6.5	NA	—
0448-97-0052	48-02161	0.50–1.00	SED	7.3 (U)	—	—	0.73 (U)	—	—	NA	—	—	NA	—
0448-97-0053	48-02161	6.50–7.50	SOIL	6.1 (U)	—	—	0.61 (U)	—	75.9	NA	—	—	NA	—
0448-97-0054	48-02162	0.50–1.50	SED	5.9 (U)	—	—	0.59 (U)	—	45.3	NA	—	—	NA	—
0448-97-0056	48-02162	2.00–3.00	SOIL	6.2 (U)	—	—	0.62 (U)	—	61.6	NA	—	—	NA	—
0448-97-0112	48-02171	0.00–0.83	SOIL	3.7 (UJ)	—	—	—	—	—	NA	—	58.3	NA	—
0448-97-0113	48-02171	0.83–1.50	SOIL	3 (UJ)	—	—	—	—	—	NA	—	—	NA	—
0448-97-0115	48-02172	0.00–1.00	SOIL	2.7 (UJ)	—	—	—	—	453	NA	—	177	NA	—
0448-97-0116	48-02172	1.00–2.00	SOIL	2.8 (UJ)	—	—	—	—	151	NA	—	46.7	NA	—
0448-97-0117	48-02172	2.00–3.00	QBT2	2.4 (UJ)	2.8	—	—	—	29.6	NA	—	7.1	NA	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	—	—	0.615	—	—	NA	—	—	—	—
CAMO-09-5926	MO-604924	0.00–0.50	FILL	0.994 (U)	—	—	0.497 (U)	—	—	NA	—	—	—	—
CAMO-09-5930	MO-604925	0.00–0.50	FILL	0.984 (U)	—	—	0.492 (U)	—	—	NA	—	15.1	—	—
CAMO-09-5934	MO-604926	0.00–0.50	FILL	1.02 (U)	—	—	0.51 (U)	—	—	NA	—	—	—	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	1 (U)	—	—	0.5 (U)	—	—	NA	—	24.2	—	—
CAMO-09-5954	MO-604931	0.00–0.50	FILL	1.01 (U)	—	—	0.505 (U)	—	—	NA	—	—	—	—
CAMO-09-5958	MO-604932	0.00–0.50	FILL	1.01 (UJ)	—	—	0.507 (U)	—	—	NA	—	—	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Iron
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**13800**
SOIL, FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**21500**
QBT2, QBT3, QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**14500**
CAMO-09-5989	MO-604938	0.00–0.50	SED	0.971 (U)	—	—	0.485 (U)	—	—	0.16 (J)	—	—	—	—
CAMO-09-5990	MO-604939	0.00–0.50	SED	0.996 (U)	—	—	—	—	—	—	—	—	—	—
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	1.04 (U)	—	—	0.521 (U)	—	—	—	—	—	—	—
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	—	—	0.512 (U)	—	—	0.169 (J)	—	—	—	—
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	0.991 (U)	—	—	0.495 (U)	—	—	0.242 (J)	—	—	6.75	—
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	—	0.507 (U)	—	—	0.245 (J)	—	—	—	—
CAMO-09-5995	MO-604944	0.00–0.50	SED	1.01 (U)	—	—	0.506 (U)	—	—	0.201 (J)	—	—	—	—
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	—	171 (J+)	0.496 (U)	—	13.4	—	5.72	—	—	15000
CAMO-09-5997	MO-604946	0.00–0.50	SED	1.01 (U)	—	—	0.504 (U)	—	—	0.2 (J)	—	—	—	—
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	1.11 (U)	—	—	0.553 (U)	—	—	NA	—	—	—	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	1.05 (U)	—	—	0.526 (U)	—	—	NA	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	1.1 (U)	—	—	0.551 (U)	—	—	NA	—	—	—	—
CAMO-09-6566	MO-605100	0.00–0.50	SED	1.03 (U)	—	—	0.514 (U)	—	—	NA	—	—	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	1.02 (U)	—	—	—	—	—	NA	—	23.5	—	—
CAMO-09-6572	MO-605102	0.00–0.50	SED	0.976 (U)	—	—	0.488 (U)	—	—	NA	—	—	—	—
CAMO-09-6575	MO-605103	0.00–0.50	SED	1.05 (U)	—	—	0.525 (U)	—	—	NA	—	—	—	—
CAMO-09-6578	MO-605104	0.00–0.50	SED	1.04 (U)	—	—	0.52 (U)	—	—	NA	—	—	—	—
CAMO-09-6643	MO-605110	0.00–0.50	SED	1.04 (U)	—	—	0.519 (U)	—	—	—	—	17.3	—	—
CAMO-09-6646	MO-605111	0.00–0.50	SED	1.09 (U)	—	—	0.543 (U)	—	—	—	—	20.5	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	1.21 (U)	—	—	0.605 (U)	—	—	—	—	—	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	1.02 (U)	—	—	0.51 (U)	—	—	—	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	1.11 (U)	—	—	0.554 (U)	—	12.3	—	—	32.6	—	—
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	1.14 (U)	—	—	0.571 (U)	—	—	—	—	—	—	—
CAMO-09-6661	MO-605116	0.00–0.50	SED	1.07 (U)	—	—	0.536 (U)	—	—	—	—	—	—	—
CAMO-09-6664	MO-605117	0.00–0.50	SED	0.96 (U)	—	—	0.48 (U)	—	—	—	—	—	—	—
CAMO-09-6675	MO-605118	0.00–0.50	SED	1.04 (U)	—	—	0.521 (U)	—	—	—	—	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	1.01 (U)	—	—	0.505 (U)	—	—	—	—	40.7	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	1.03 (U)	—	—	0.516 (U)	—	—	—	—	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	1.02 (U)	—	—	0.51 (U)	—	—	—	—	48.1	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	1.18 (U)	—	—	—	—	22.8	—	—	66.6	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Iron
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**13800**
SOIL, FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**21500**
QBT2, QBT3, QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**14500**
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	0.97 (U)	—	—	0.485 (U)	—	60.4 (J-)	0.965 (J)	—	20.8	—	—
CAMO-09-6699	MO-605124	0.00–0.50	SED	1 (U)	—	—	0.5 (U)	—	104	1.64 (J)	—	21.8	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	1.13 (U)	4.15	—	—	—	789	8.61	—	72.1	—	—
CAMO-09-6703	MO-605126	0.00–0.50	SED	1.11 (U)	—	—	0.553 (U)	—	29.6	—	—	15	—	—
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	1.04 (U)	—	—	0.521 (U)	—	314	1.31 (J)	—	62.1	—	—
CAMO-09-6721	MO-605129	0.00–0.50	SED	1.09 (U)	—	—	0.547 (U)	—	—	—	—	—	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.984 (U)	—	—	0.492 (U)	—	—	—	—	—	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	1.07 (U)	—	—	0.534 (U)	—	—	—	—	—	—	—
CAMO-09-6730	MO-605132	0.00–0.50	SED	1.05 (U)	—	—	0.524 (U)	—	—	—	—	—	—	—
CAMO-09-6768	MO-605142	0.00–0.50	SED	1.01 (U)	—	—	0.505 (U)	—	—	0.151 (J)	—	—	—	—
CAMO-09-6773	MO-605143	0.00–0.50	FILL	1.06 (U)	—	—	0.528 (U)	—	—	—	—	—	—	—
CAMO-09-6778	MO-605144	0.00–0.50	SED	0.986 (U)	—	—	0.493 (U)	—	—	—	—	—	—	—
CAMO-09-6783	MO-605145	0.00–0.50	SED	0.961 (U)	—	—	0.48 (U)	—	—	—	—	—	—	—
CAMO-09-6788	MO-605146	0.00–0.50	SED	0.983 (U)	—	—	0.491 (U)	—	—	—	—	—	—	—
CAMO-09-6793	MO-605147	0.00–0.50	SED	1 (U)	—	—	0.501 (U)	—	—	—	—	16.3	—	—
CAMO-09-6798	MO-605148	0.00–0.50	SED	1 (U)	—	—	0.5 (U)	—	—	0.187 (J)	—	—	—	—
CAMO-09-6803	MO-605149	0.00–0.50	SED	1 (U)	—	—	0.5 (U)	—	—	—	—	—	—	—
CAMO-09-6808	MO-605150	0.00–0.50	SED	1.02 (U)	—	—	0.512 (U)	—	—	—	—	—	—	—
CAMO-09-6813	MO-605151	0.00–0.50	SED	1.01 (U)	—	—	0.503 (U)	—	—	—	—	—	—	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	0.97 (U)	—	46.8	—	—	—	—	—	—	—	—
CAMO-09-6823	MO-605153	0.00–0.50	SED	0.981 (U)	—	—	0.49 (U)	—	—	—	—	21.7	—	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	1 (U)	—	—	0.502 (U)	—	—	—	—	—	—	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	0.981 (U)	—	—	0.491 (U)	—	—	—	—	—	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	0.969 (U)	—	—	0.485 (U)	—	—	—	—	—	—	—
CAMO-09-6843	MO-605157	0.00–0.50	SOIL	1.03 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—
CAMO-09-6845	MO-605158	0.00–0.50	SED	1.12 (U)	—	—	0.562 (U)	—	—	—	—	—	—	—
CAMO-09-6847	MO-605159	0.00–0.50	SED	0.995 (U)	—	—	0.498 (U)	—	—	—	—	—	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	1.01 (U)	—	—	0.506 (U)	—	—	—	—	—	—	—
CAMO-09-6876	MO-605161	0.00–0.50	SED	1.02 (U)	—	—	0.509 (U)	—	—	—	—	—	—	—
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.992 (U)	—	—	0.496 (U)	—	—	—	—	—	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Iron
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**13800**
SOIL, FILL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**21500**
QBT2, QBT3, QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**14500**
CAMO-09-6882	MO-605163	0.00–0.50	SED	1.01 (U)	—	—	0.505 (U)	—	—	—	—	—	—	22400
CAMO-09-6885	MO-605164	0.00–0.50	SED	1.04 (U)	—	—	0.518 (U)	—	—	—	—	—	—	—
CAMO-09-6888	MO-605165	0.00–0.50	SED	1.01 (U)	—	—	0.507 (U)	—	—	—	—	—	—	14900
CAMO-09-6891	MO-605166	0.00–0.50	SED	1 (U)	—	—	0.502 (U)	—	—	—	—	—	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]				**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
SOIL, FILL Background Value[a]				**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
QBT2, QBT3, QBT4 Background Value[a]				**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
0448-95-0068	48-02133	0.00–0.50	FILL	—	—	22.4	—	NA	NA	—	—	—	—	—
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	0.6	—	NA	NA	—	—	—	—	—
0448-97-0084	48-02136	0.00–0.50	SOIL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0085	48-02136	0.50–1.00	SOIL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	FILL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0039	48-02142	4.66–5.12	FILL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	FILL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0041	48-02148	4.66–5.16	FILL	—	—	—	—	NA	NA	—	—	—	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	—	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	—	—	74
0448-97-0045	48-02155	5.00–6.00	FILL	—	—	0.12 (U)	—	NA	NA	—	2.4 (U)	—	—	—
0448-97-0047	48-02159	0.50–1.50	SED	—	—	—	—	NA	NA	0.36 (UJ)	—	—	—	—
0448-97-0048	48-02159	3.83–5.00	QBT3	—	—	—	14.1	NA	NA	0.32 (UJ)	—	—	—	—
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	—	NA	NA	0.37 (UJ)	—	—	—	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	33.2	NA	NA	—	—	—	—	—
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	20.9	NA	NA	—	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	30.9	NA	NA	—	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	0.13 (J)	—	NA	NA	—	—	1.3 (U)	—	80.8
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	—	NA	NA	—	—	1.1 (U)	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	27.5	—	0.2	—	NA	NA	—	—	0.96 (U)	—	66.8
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	—	NA	NA	—	—	1 (U)	—	58.4
0448-97-0117	48-02172	2.00–3.00	QBT2	—	—	—	—	NA	NA	0.56 (U)	—	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	—	2.03	—	8.53 (J+)	0.103	—	—	—	—	50
CAMO-09-5926	MO-604924	0.00–0.50	FILL	—	—	1.53	—	4.87 (J+)	0.00304	—	—	—	—	49.1
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	—	1.99	—	3.1 (J+)	0.00223	—	—	—	—	—
CAMO-09-5934	MO-604926	0.00–0.50	FILL	—	—	27.6	—	10.1	1.78	—	—	—	—	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	—	7.42	—	0.882 (J+)	0.033	—	—	—	—	—
CAMO-09-5954	MO-604931	0.00–0.50	FILL	—	—	—	—	0.791 (J)	0.0151	—	—	—	—	—
CAMO-09-5958	MO-604932	0.00–0.50	FILL	—	—	—	—	1.55	0.0134	—	—	—	—	—
CAMO-09-5989	MO-604938	0.00–0.50	SED	—	—	—	—	0.602 (J)	0.000934 (J)	0.98 (UJ)	—	—	—	—
CAMO-09-5990	MO-604939	0.00–0.50	SED	25.3	—	—	—	0.566 (J)	0.00425	0.986 (UJ)	—	—	—	61.3
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	—	—	—	—	0.8 (J)	0.00126 (J)	—	—	—	—	55.1
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	—	—	—	1.29 (J)	0.00122 (J)	—	—	—	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]				**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
SOIL, FILL Background Value[a]				**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
QBT2, QBT3, QBT4 Background Value[a]				**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	22.9	—	—	—	0.591 (J)	—	—	—	—	—	—
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	—	—	0.664 (J)	—	—	—	—	—	—
CAMO-09-5995	MO-604944	0.00–0.50	SED	—	—	—	—	0.726 (J)	—	0.99 (UJ)	—	—	—	—
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	—	—	—	0.635 (J)	—	1 (UJ)	—	—	28.5	—
CAMO-09-5997	MO-604946	0.00–0.50	SED	—	—	—	—	0.57 (J)	0.00051 (J)	0.988 (UJ)	—	—	—	65.2
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	—	—	—	—	0.00217 (J)	—	—	—	—	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	—	—	—	2.21	0.00062 (J)	—	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	—	—	—	4	0.00233	—	—	—	—	—
CAMO-09-6566	MO-605100	0.00–0.50	SED	—	—	—	—	—	0.000788 (J)	1.04 (U)	—	—	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	—	—	—	—	0.936 (J)	0.00086 (J)	—	—	—	—	78
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	—	—	—	1.83	—	0.959 (UJ)	—	—	—	—
CAMO-09-6575	MO-605103	0.00–0.50	SED	—	—	—	—	1.32	0.00223	1.03 (U)	—	—	—	—
CAMO-09-6578	MO-605104	0.00–0.50	SED	—	—	—	—	3.73	0.000744 (J)	1.02 (U)	—	—	—	—
CAMO-09-6643	MO-605110	0.00–0.50	SED	—	—	—	—	—	—	1.01 (U)	—	—	—	106
CAMO-09-6646	MO-605111	0.00–0.50	SED	—	—	—	—	—	—	1.07 (U)	—	—	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	—	—	—	5.88	0.00103 (J)	1.2 (U)	—	—	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	1.12	0.000636 (J)	0.997 (U)	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	—	—	—	—	—	—	1.07 (U)	—	—	—	104
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	—	—	—	1.81	0.00241	—	—	—	—	55.3
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	—	—	—	—	0.000821 (J)	1.1 (U)	—	—	—	—
CAMO-09-6664	MO-605117	0.00–0.50	SED	—	—	—	—	1.21	0.00109 (J)	0.978 (U)	—	—	—	—
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	—	—	—	1.68	—	1.02 (U)	—	—	—	64.7
CAMO-09-6679	MO-605119	0.00–0.50	SED	—	—	—	—	—	0.000965 (J)	0.981 (U)	—	—	—	75.1
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	—	—	—	2.31 (J+)	0.00758	1.04 (UJ)	—	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	23.8	—	—	—	2.52	0.00153 (J)	0.989 (U)	—	—	—	91.8
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	34.9	—	0.142	—	2.76	0.00451	—	—	—	—	140
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	—	—	—	—	0.00114 (J)	—	—	—	—	—
CAMO-09-6699	MO-605124	0.00–0.50	SED	—	—	—	—	—	0.00402	1.01 (UJ)	—	—	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	31.2	—	—	—	0.852 (J)	0.0132	1.14 (UJ)	—	—	27.4	71.8
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	—	—	—	—	0.00371	1.07 (UJ)	—	—	—	—
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	23.5	1340	—	—	—	0.00121 (J)	—	—	—	—	61.3
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	—	—	—	0.864 (J)	0.000586 (J)	1.11 (U)	—	—	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	—	—	—	—	0.000518 (J)	0.988 (UJ)	—	—	—	—

Table 5.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]				**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
SOIL, FILL Background Value[a]				**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
QBT2, QBT3, QBT4 Background Value[a]				**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**1.1**	**17**	**63.5**
CAMO-09-6727	MO-605131	0.00–0.50	FILL	—	—	—	—	1.01 (J)	—	—	—	—	—	391
CAMO-09-6730	MO-605132	0.00–0.50	SED	—	—	—	—	1.44	—	1.03 (U)	—	—	—	—
CAMO-09-6768	MO-605142	0.00–0.50	SED	—	—	—	—	—	0.156	1 (U)	—	—	—	—
CAMO-09-6773	MO-605143	0.00–0.50	FILL	—	—	—	—	1.14 (J-)	0.0156	—	—	—	—	—
CAMO-09-6778	MO-605144	0.00–0.50	SED	—	—	—	—	—	0.00515	0.986 (U)	—	—	—	—
CAMO-09-6783	MO-605145	0.00–0.50	SED	—	—	—	—	—	0.0267	0.97 (U)	—	—	—	—
CAMO-09-6788	MO-605146	0.00–0.50	SED	—	—	—	—	—	0.0213	1.02 (UJ)	—	—	—	—
CAMO-09-6793	MO-605147	0.00–0.50	SED	52.8 (J)	—	—	—	—	0.0151	0.964 (UJ)	—	—	—	70.5
CAMO-09-6798	MO-605148	0.00–0.50	SED	—	—	—	—	0.731 (J-)	0.427	0.998 (UJ)	—	—	—	—
CAMO-09-6803	MO-605149	0.00–0.50	SED	—	—	—	—	—	0.011	0.983 (UJ)	—	—	—	—
CAMO-09-6808	MO-605150	0.00–0.50	SED	—	—	—	—	6.88 (J-)	0.00632	1.03 (U)	—	—	—	—
CAMO-09-6813	MO-605151	0.00–0.50	SED	—	—	—	—	—	0.000785 (J)	0.965 (U)	—	—	—	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	—	—	—	—	0.137	0.985 (U)	—	—	—	—
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	—	—	—	—	0.0259	0.958 (U)	—	—	—	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	—	—	—	—	—	0.0259	0.978 (U)	—	—	—	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	—	—	—	—	0.0285	1.02 (U)	—	—	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	—	—	—	0.897 (J)	0.0315	—	—	—	—	—
CAMO-09-6843	MO-605157	0.00–0.50	SOIL	—	—	—	—	—	0.0019 (J)	—	—	—	—	—
CAMO-09-6845	MO-605158	0.00–0.50	SED	—	—	—	—	1.21	0.00145 (J)	1.13 (U)	—	—	—	—
CAMO-09-6847	MO-605159	0.00–0.50	SED	—	—	—	—	2.41	—	1.03 (U)	—	—	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	—	—	—	2.08	0.00154 (J)	1.01 (U)	—	—	—	—
CAMO-09-6876	MO-605161	0.00–0.50	SED	—	—	—	—	1.46	0.000673 (J)	1.02 (UJ)	—	—	—	—
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	—	—	—	0.944 (J)	—	1.03 (UJ)	—	—	—	—
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	—	—	—	—	—	0.989 (UJ)	1.01	—	—	125
CAMO-09-6885	MO-605164	0.00–0.50	SED	—	—	—	—	—	—	1.01 (U)	—	—	—	—
CAMO-09-6888	MO-605165	0.00–0.50	SED	—	—	—	—	—	—	1 (U)	—	—	—	85.7
CAMO-09-6891	MO-605166	0.00–0.50	SED	—	—	—	—	0.98 (J)	0.000582 (J)	1.01 (UJ)	—	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 5.2-3
Organic Chemicals Detected at AOC 48-001

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	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Carbazole
0448-95-0068	48-02133	0.00–0.50	FILL	—[a]	NA[b]	—	NA	NA	NA	—	—	—	—	—	—	—	NA	—	—
0448-95-0070	48-02134	0.00–0.50	FILL	—	NA	—	NA	NA	NA	0.12 (J)	0.12 (J)	0.13 (J)	—	—	—	—	NA	—	—
0448-97-0037	48-02142	3.33–4.33	FILL	—	0.006 (J)	—	NA	NA	NA	—	—	—	—	—	—	0.18 (J)	—	—	—
0448-97-0039	48-02142	4.66–5.12	FILL	—	0.014 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	FILL	—	0.01 (J)	—	NA	NA	NA	—	—	—	—	—	—	0.092 (J)	—	—	—
0448-97-0041	48-02148	4.66–5.16	FILL	—	0.018 (J)	—	NA	NA	NA	—	—	—	—	—	—	0.23 (J)	—	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	NA
0448-97-0044	48-02155	3.67–4.67	FILL	—	0.041	—	NA	NA	NA	—	—	—	—	—	—	110	—	20	NA
0448-97-0045	48-02155	5.00–6.00	FILL	—	0.016 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	NA
0448-97-0047	48-02159	0.50–1.50	SED	—	—	—	NA	NA	NA	0.086 (J)	0.11 (J)	0.12 (J)	—	0.058 (J)	—	—	—	—	—
0448-97-0052	48-02161	0.50–1.00	SED	0.061 (J)	—	0.13 (J)	NA	NA	NA	0.53	0.51	0.66	—	0.28 (J)	—	—	—	—	0.12 (J)
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	NA	NA	NA	0.064 (J)	0.069 (J)	0.088 (J)	—	—	—	—	—	—	—
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	—	NA	NA	NA	0.17 (J)	0.19 (J)	0.35 (J)	—	NA	—	—	—	—	—
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	NA	NA	NA	—	—	—	—	NA	—	—	0.089 (J+)	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	—	—	—	NA	NA	NA	0.31 (J)	0.34 (J)	0.62 (J)	—	NA	—	—	—	—	—
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	NA	NA	NA	0.15 (J)	—	—	—	NA	—	—	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	NA	0.479 (J)	—	—	—	6.96	8.78	13	4.62	—	—	—	NA	—	NA
CAMO-09-5926	MO-604924	0.00–0.50	FILL	0.299	NA	0.503	NA	NA	NA	2.75	3.37	4.89	1.92	—	—	0.34 (J)	NA	—	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	NA	0.209 (J)	NA	NA	NA	2.05	2.56	3.66	1.32	—	—	—	NA	—	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	2.03	NA	3.27	NA	NA	NA	10.1	9.81	16.5	3.45	—	—	—	NA	—	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	0.0122 (J)	NA	0.0293 (J)	NA	NA	NA	0.724	1.09	1.59	0.578	—	—	—	NA	—	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	0.0906	NA	0.143	NA	NA	NA	0.767	1.04	1.6	0.544	—	—	—	NA	—	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	0.129	NA	0.247	NA	NA	NA	2.03	2.53	4.02	1.16	—	—	—	NA	—	NA
CAMO-09-5989	MO-604938	0.00–0.50	SED	—	NA	0.0113 (J)	—	0.0675	0.0424	0.0519	0.0411	0.0799	0.0146 (J)	—	—	—	NA	—	NA
CAMO-09-5990	MO-604939	0.00–0.50	SED	—	NA	0.0078 (J)	—	0.0071	0.0048	0.051	0.0594 (J)	0.113 (J)	0.0238 (J)	—	—	—	NA	—	NA
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	0.0154 (J)	NA	0.0249 (J)	—	—	—	0.143	0.167 (J)	0.316 (J)	0.0777 (J)	—	—	—	NA	—	NA
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	NA	—	—	0.0026 (J)	0.0037	—	—	0.0118 (J)	—	—	—	—	NA	—	NA
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	—	NA	—	—	—	—	—	0.0214 (J)	0.0439 (J)	—	—	—	—	NA	—	NA
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	NA	—	—	—	—	—	—	—	—	—	—	—	NA	—	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Carbazole
CAMO-09-5995	MO-604944	0.00–0.50	SED	0.0873	NA	0.134	—	0.0148 (J)	—	0.231	0.208	0.348	0.095	—	—	—	NA	—	NA
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	NA	0.0108 (J)	—	0.0162	0.0085	0.0511	0.0609	0.103	0.0395	—	—	—	NA	—	NA
CAMO-09-5997	MO-604946	0.00–0.50	SED	—	NA	—	—	—	—	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.0143 (J)	NA	0.0227 (J)	—	0.0087	0.0053	0.0544	0.0601	0.0946	0.0354 (J)	—	0.375 (J)	—	NA	—	NA
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	NA	—	0.0032 (J)	0.0038	0.0023 (J)	0.0189 (J)	0.015 (J)	0.0314 (J)	—	—	—	—	NA	—	NA
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	NA	0.0166 (J)	—	0.0133	0.0065	0.0786	0.0663	0.116	0.0346 (J)	—	—	—	NA	—	NA
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.0193 (J)	NA	0.0249 (J)	—	0.012 (J)	0.0087 (J)	—	0.0779	0.118	0.0518	—	—	—	NA	—	NA
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	0.03 (J)	NA	0.0402	NA	NA	NA	0.179	0.2	0.339	0.109	—	—	—	NA	—	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0143 (J)	0.0233 (J)	—	—	—	—	NA	—	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0154 (J)	0.0281 (J)	0.0114 (J)	—	—	—	NA	—	NA
CAMO-09-6643	MO-605110	0.00–0.50	SED	—	NA	0.806 (J)	—	0.021 (J)	—	2.2	1.59	3.06	0.803 (J)	—	—	—	NA	—	NA
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.0248 (J)	NA	0.0404	—	0.0086 (J)	—	0.11	0.0975	0.161	0.0581	—	—	—	NA	—	NA
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	NA	—	—	0.0098 (J)	0.0069	0.036 (J)	0.0335 (J)	0.0587	0.0228 (J)	—	—	—	NA	—	NA
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	NA	—	—	—	—	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6655	MO-605114	0.00–0.50	SED	0.154	NA	0.314	NA	NA	NA	0.888	0.743	1.56	0.383	—	—	—	NA	—	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	NA	0.0113 (J)	NA	NA	NA	0.0442	0.0411	0.075	0.0284 (J)	—	—	—	NA	—	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	NA	—	NA	NA	NA	0.0161 (J)	0.0127 (J)	0.021 (J)	—	—	—	—	NA	—	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.0429	NA	0.0811	—	0.0061 (J)	—	0.257	0.236	0.337	0.106	0.126	—	—	NA	—	NA
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.0347	NA	0.0795	—	0.0196	0.009	0.478	0.571	0.853	0.344	0.297	—	—	NA	—	NA
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	NA	—	NA	NA	NA	0.0188 (J)	0.0164 (J)	0.0315 (J)	—	—	—	—	NA	—	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	0.121	NA	0.265	NA	NA	NA	1.04	1.02	1.55	0.572	0.685	—	—	NA	—	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	0.046	NA	0.101	NA	NA	NA	0.647	0.708	1.06	0.461	0.482	0.702 (J)	—	NA	—	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	NA	0.0141 (J)	NA	NA	NA	0.0598	0.0591	0.101	0.0348	—	—	—	NA	—	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.0214 (J)	NA	0.0382	—	0.0161	0.0129	0.146	0.162	0.286	0.0907	—	—	—	NA	—	NA
CAMO-09-6701	MO-605125	0.00–0.50	SED	0.124	NA	0.171	NA	NA	NA	0.396	0.429	0.697	0.235	—	—	—	NA	—	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	NA	0.0226 (J)	NA	NA	NA	—	0.0493	0.0834	0.0357 (J)	—	—	—	NA	—	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	0.13	NA	0.17	NA	NA	NA	0.281	0.329	0.507	0.191	—	—	—	NA	—	NA
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	NA	—	—	0.0045	0.0024 (J)	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.0201 (J)	NA	0.0256 (J)	—	0.0087 (J)	0.0069 (J)	0.0788	0.0893	0.153	0.0709	—	—	—	NA	—	NA
CAMO-09-6727	MO-605131	0.00–0.50	FILL	0.0241 (J)	NA	0.0446	NA	NA	NA	0.195	0.202	0.344	0.108	—	—	—	NA	—	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	—	NA	0.00943 (J)	NA	NA	NA	0.0155 (J)	0.0103 (J)	0.019 (J)	—	—	—	—	NA	—	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	0.0103 (J)	—	—	—	0.408	NA	—	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butanone[2-]	Butylbenzylphthalate	Carbazole
CAMO-09-6783	MO-605145	0.00–0.50	SED	—	NA	—	NA	NA	NA	0.0227 (J)	0.0232 (J)	0.0291 (J)	0.0142 (J)	—	—	—	NA	—	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0171 (J)	0.0302 (J)	—	—	—	—	NA	—	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0192 (J)	0.034	0.0119 (J)	—	—	—	NA	—	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0119 (J)	0.0217 (J)	—	—	—	—	NA	—	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	0.0103 (J)	—	—	—	—	NA	—	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	0.0116 (J)	—	—	—	—	NA	—	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	NA	—	NA	NA	NA	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	NA	—	—	0.0061	0.0063	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6828	MO-605154	0.00–0.50	SED	0.0225 (J)	NA	—	—	0.0141 (J)	0.0094	—	—	—	—	—	—	—	NA	—	NA
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	NA	0.00704 (J)	—	—	0.0037	0.0133 (J)	—	0.0172 (J)	—	—	—	—	NA	—	NA
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	NA	—	—	0.0162	0.019	0.0156 (J)	0.0129 (J)	0.0238 (J)	—	—	—	—	NA	—	NA
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	0.0109 (J)	—	—	—	—	NA	—	NA
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.039	NA	0.0492	—	0.0082	0.0041	0.189	0.213	0.291	0.133	—	—	—	NA	—	NA
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	NA	0.0149 (J)	—	0.0038	0.0018 (J)	0.0559	0.0645	0.0811	0.0389	0.0452	—	—	NA	—	NA
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	NA	0.0142 (J)	—	0.0056	0.0022 (J)	0.0661	0.0815	0.11	0.0546	—	—	—	NA	—	NA
CAMO-09-6885	MO-605164	0.00–0.50	SED	0.0669	NA	0.105	NA	NA	NA	0.164	0.187	0.255	0.1	0.102	—	—	NA	—	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0342	0.0617	0.0233 (J)	—	—	—	NA	—	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	—	NA	0.0173 (J)	NA	NA	NA	0.104	0.138	0.197	0.0834	0.0904	—	—	NA	—	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
0448-95-0068	48-02133	0.00–0.50	FILL	—	—	—	—	—	0.15 (J)	—	NA	NA	NA
0448-95-0070	48-02134	0.00–0.50	FILL	0.12 (J)	—	—	—	—	0.26 (J)	—	NA	NA	NA
0448-97-0037	48-02142	3.33–4.33	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0039	48-02142	4.66–5.12	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0040	48-02148	3.30–4.30	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0041	48-02148	4.66–5.16	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0044	48-02155	3.67–4.67	FILL	—	9.6 (J)	14 (J)	—	—	—	—	NA	NA	NA
0448-97-0045	48-02155	5.00–6.00	FILL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0047	48-02159	0.50–1.50	SED	0.12 (J)	—	—	—	—	0.17 (J)	—	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	0.59	—	—	—	—	1.2	0.053 (J)	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	0.082 (J)	—	—	—	—	0.15 (J)	—	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	0.2 (J)	—	—	—	—	0.16 (J)	—	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	—	—	—	—	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	0.38 (J)	—	—	—	—	0.32 (J)	—	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	0.16 (J)	—	—	—	—	0.13 (J)	—	NA	NA	NA
CAMO-09-5914	MO-604921	0.00–0.50	FILL	9.33	—	—	0.475 (J)	—	9.8	—	0.0000807	0.000163	0.000014
CAMO-09-5926	MO-604924	0.00–0.50	FILL	3.5	—	—	—	—	5.16	0.2	NA	NA	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	3	—	—	—	—	3.29	—	NA	NA	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	10.8	—	—	—	0.779 (J)	21.1	1.5	NA	NA	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	1.06	—	—	—	—	0.836	—	NA	NA	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	1.07	—	—	—	—	1.48	0.0686	NA	NA	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	2.3	—	—	—	—	3.24	0.0919	NA	NA	NA
CAMO-09-5989	MO-604938	0.00–0.50	SED	0.049	—	—	—	—	0.0892	—	0.0000108	0.0000212	0.000002 (J)
CAMO-09-5990	MO-604939	0.00–0.50	SED	0.0601	—	—	—	—	0.103	—	0.0000507	0.0000981	0.00000835
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	0.17	—	—	—	—	0.252	0.0108 (J)	0.00358	0.00619	0.000729
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	—	—	—	—	—	—	0.00000649	0.0000129	0.00000137 (J)

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	0.0211 (J)	—	—	—	—	0.0292 (J)	—	0.0000297	0.0000553	0.00000653
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	—	—	—	—	—	0.00000339	0.0000062	—
CAMO-09-5995	MO-604944	0.00–0.50	SED	0.22	—	—	—	—	0.477	0.0717	0.000166	0.000279	0.0000235
CAMO-09-5996	MO-604945	0.00–0.50	SED	0.0657	—	—	—	—	0.0929	—	0.0000513	0.00011	0.00000741
CAMO-09-5997	MO-604946	0.00–0.50	SED	—	—	—	—	—	—	—	0.0000582	0.000108	0.0000068
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.068	—	—	—	—	0.14	0.0126 (J)	0.0000257	0.0000527	0.00000352
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	0.0157 (J)	—	—	—	—	0.032 (J)	—	0.00000799	0.0000147	0.00000102 (J)
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	0.0707	—	—	—	—	0.174	—	0.0000228	0.0000444	0.0000037
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.082	—	—	—	—	0.195	0.0132 (J)	0.000018	0.000034	0.00000376
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	0.234	—	—	—	—	0.452	0.0201 (J)	NA	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	—	—	—	—	0.0123 (J)	—	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	0.0189 (J)	—	—	—	—	0.034 (J)	—	NA	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	0.0177 (J)	—	—	—	—	0.032 (J)	—	NA	NA	NA
CAMO-09-6643	MO-605110	0.00–0.50	SED	1.83	—	—	—	—	3.97	—	0.0000777	0.000152	0.00000929
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.102	—	—	—	—	0.22	0.0153 (J)	0.0000162	0.0000308	0.00000248 (J)
CAMO-09-6649	MO-605112	0.00–0.50	SED	0.0366 (J)	—	—	—	—	0.0679	—	0.0000397	0.0000833	0.00000456
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	—	—	—	0.00000179 (J)	0.00000179	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	0.869	—	—	—	—	1.67	0.133 (J)	NA	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	0.0417	—	—	—	—	0.0885	—	NA	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	0.0132 (J)	—	—	—	—	0.0248 (J)	—	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.271	—	—	—	—	0.677	0.0476	0.000032	0.0000552	0.00000662
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.691	—	—	—	—	1.14	0.0273 (J)	0.000384	0.00063	0.0000608
CAMO-09-6683	MO-605120	0.00–0.50	SED	0.0191 (J)	—	—	—	—	0.0341 (J)	—	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	1.14	—	—	—	—	2.58	0.116	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	0.779	—	—	—	—	1.49	0.036 (J)	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	0.0627	—	—	—	—	0.113	—	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.183	—	—	0.0271 (J)	—	0.301	0.0186 (J)	0.000254	0.000493	0.0000451
CAMO-09-6701	MO-605125	0.00–0.50	SED	0.438	—	—	0.0717	—	0.885	0.101	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	—	—	—	—	0.106	—	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	0.327	—	—	—	—	0.779	0.0939	NA	NA	NA
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	—	—	—	—	0.0128 (J)	—	0.000014	0.0000247	0.00000234 (J)
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.0951	—	—	—	—	0.183	0.0111 (J)	0.000013	0.0000261	0.00000213 (J)
CAMO-09-6727	MO-605131	0.00–0.50	FILL	0.234	—	—	—	—	0.462	0.0183 (J)	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	0.0106 (J)	—	—	—	—	0.0227 (J)	—	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	—	—	—	—	—	0.0194 (J)	—	NA	NA	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	0.023 (J)	—	—	—	—	0.0436	—	NA	NA	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	0.0209 (J)	—	—	—	—	0.0385	—	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	0.0224 (J)	—	—	—	—	0.0432	—	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	0.014 (J)	—	—	—	—	0.0263 (J)	—	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	—	—	—	—	—	0.0177 (J)	—	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	—	—	—	—	—	0.0137 (J)	—	NA	NA	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	—	—	—	—	0.0126 (J)	—	NA	NA	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	—	—	—	—	—	—	0.00000663	0.0000109	0.00000109 (J)
CAMO-09-6828	MO-605154	0.00–0.50	SED	—	—	—	—	—	—	—	0.00000485	0.00000878	0.000000884 (J)
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	—	—	—	—	0.0175 (J)	—	0.00000364	0.00000721	0.00000063 (J)
CAMO-09-6838	MO-605156	0.00–0.50	FILL	0.0151 (J)	—	—	—	—	0.0274 (J)	—	0.0000046	0.00000981	0.000000799 (J)
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	—	—	—	—	0.0127 (J)	—	NA	NA	NA
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.235	—	—	—	—	0.497	0.032 (J)	0.0000916	0.000161	0.0000145
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.0717	—	—	—	—	0.141	—	0.000024	0.0000426	0.00000374
CAMO-09-6882	MO-605163	0.00–0.50	SED	0.0927	—	—	—	—	0.176	—	0.0000234	0.0000428	0.00000356
CAMO-09-6885	MO-605164	0.00–0.50	SED	0.193	—	—	—	—	0.558	0.0732	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	0.0363	—	—	—	—	0.0651	—	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	0.158	—	—	—	—	0.282	—	NA	NA	NA

Table 5.2-3 (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-]
0448-95-0068	48-02133	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-95-0070	48-02134	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0037	48-02142	3.33–4.33	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0039	48-02142	4.66–5.12	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0040	48-02148	3.30–4.30	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0041	48-02148	4.66–5.16	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0043	48-02155	1.50–2.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0044	48-02155	3.67–4.67	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0045	48-02155	5.00–6.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0047	48-02159	0.50–1.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	0.0000384	0.00000174 (J)	0.00000284	0.00000245 (J)	0.0000248	—	—	—	—
CAMO-09-5926	MO-604924	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5989	MO-604938	0.00–0.50	SED	—	0.00000408	—	0.0000005 (J)	—	0.00000255	0.000000452 (J)	0.00000028 (J)	—	0.000000392 (J)
CAMO-09-5990	MO-604939	0.00–0.50	SED	0.000000893 (J)	0.0000209	0.000000978 (J)	0.00000167 (J)	0.00000157 (J)	0.00000973	—	0.000000613 (J)	—	0.000000855 (J)
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	0.0000353	0.00146	0.0000724	0.000128	0.000172	0.000847	0.0000235	0.0000449	0.00000292	0.0000642
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	0.00000319	—	—	—	—	—	—	—	—

Table 5.2-3 (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-]
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	—	0.0000165	—	—	—	0.00000189	—	—	—	0.000000641 (J)
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	0.00000173	—	—	—	—	—	—	—	—
CAMO-09-5995	MO-604944	0.00–0.50	SED	0.00000265	0.0000619	0.00000356	0.00000766	0.00000549	0.000038	0.00000158 (J)	0.00000123 (J)	—	—
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	0.000021	0.000000899 (J)	—	—	0.0000111	—	—	—	—
CAMO-09-5997	MO-604946	0.00–0.50	SED	0.000000717 (J)	0.0000213	0.00000139 (J)	0.00000199 (J)	0.00000229 (J)	0.0000149	0.000000421 (J)	0.000000406 (J)	—	0.000000691 (J)
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	0.0000109	0.000000464 (J)	0.000000894 (J)	0.000000816 (J)	0.00000637	0.000000324 (J)	0.000000223 (J)	—	0.000000284 (J)
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	0.00000213	—	—	0.000000309 (J)	0.00000269	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	0.0000108	0.000000355 (J)	0.00000081 (J)	0.000000631 (J)	0.00000576	0.000000231 (J)	0.000000162 (J)	—	0.000000242 (J)
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.000000258 (J)	0.0000102	—	0.000000801 (J)	0.000000579 (J)	0.00000454	0.000000247 (J)	0.000000214 (J)	—	0.000000258 (J)
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6643	MO-605110	0.00–0.50	SED	0.000000804 (J)	0.0000251	—	0.00000254	—	0.0000178	0.000000653 (J)	0.00000063 (J)	—	0.000000842 (J)
CAMO-09-6646	MO-605111	0.00–0.50	SED	—	0.0000065	—	—	—	0.00000323	—	—	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	0.000000385 (J)	0.0000138	0.000000687 (J)	0.00000149 (J)	0.00000111 (J)	0.0000146	0.000000342 (J)	—	—	0.000000422 (J)
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	0.000000399	—	—	—	—	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	0.0000149	0.000000791 (J)	0.00000108 (J)	0.00000136 (J)	0.0000102	0.000000402 (J)	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.0000049	0.000174	0.00000636	0.0000116	0.0000118	0.00008	0.00000276	0.00000312	—	0.0000046
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.00000443	0.000157	0.00000287	0.0000082	0.0000051	0.0000656	0.00000195 (J)	0.00000197 (J)	0.000000526 (J)	0.00000286
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.2-3 (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-]
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	0.00000682	—	—	—	0.00000188	—	—	—	0.000000108 (J)
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	0.00000595	—	0.000000435 (J)	0.000000281 (J)	0.00000275	—	—	—	0.000000131 (J)
CAMO-09-6727	MO-605131	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	0.00000257	—	0.000000295 (J)	—	0.00000101	0.000000167 (J)	0.000000126 (J)	—	0.000000151 (J)
CAMO-09-6828	MO-605154	0.00–0.50	SED	0.000000141 (J)	0.00000231	—	—	—	0.000000491	0.00000016 (J)	0.000000108 (J)	—	0.000000137 (J)
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	0.00000151	—	0.000000177 (J)	0.000000164 (J)	0.00000134	—	—	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	0.00000184	—	0.000000236 (J)	—	0.00000169	—	—	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.00000118 (J)	0.0000376	0.00000205 (J)	0.0000039	0.00000356	0.0000265	0.000000858 (J)	0.000000729 (J)	—	0.000000949 (J)
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	0.00000912	0.000000475 (J)	0.00000107 (J)	0.000000914 (J)	0.00000634	—	—	—	0.000000301 (J)
CAMO-09-6882	MO-605163	0.00–0.50	SED	0.000000341 (J)	0.00000921	0.000000574 (J)	0.00000103 (J)	0.000000997 (J)	0.00000718	0.000000234 (J)	0.000000207 (J)	—	—
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)
0448-95-0068	48-02133	0.00–0.50	FILL	NA	—	NA	NA	—	—	NA	NA	NA	NA
0448-95-0070	48-02134	0.00–0.50	FILL	NA	—	NA	NA	—	—	NA	NA	NA	NA
0448-97-0037	48-02142	3.33–4.33	FILL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0039	48-02142	4.66–5.12	FILL	NA	—	—	0.002 (J)	—	—	NA	NA	NA	NA
0448-97-0040	48-02148	3.30–4.30	FILL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0041	48-02148	4.66–5.16	FILL	NA	—	—	0.004 (J)	—	—	NA	NA	NA	NA
0448-97-0043	48-02155	1.50–2.50	FILL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0044	48-02155	3.67–4.67	FILL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0045	48-02155	5.00–6.00	FILL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0047	48-02159	0.50–1.50	SED	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	NA	—	—	0.004 (J)	—	—	NA	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	NA	—	0.067 (J+)	—	—	—	NA	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	NA	—	—	—	—	—	NA	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	NA	—	—	—	—	—	NA	NA	NA	NA
CAMO-09-5914	MO-604921	0.00–0.50	FILL	0.000014	3.91	NA	NA	—	—	0.000805	0.0000458	0.000000663 (J)	0.00000377
CAMO-09-5926	MO-604924	0.00–0.50	FILL	NA	1.63	NA	NA	—	0.057 (J)	NA	NA	NA	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	NA	1.13	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	NA	3.34	NA	NA	0.323 (J)	0.952	NA	NA	NA	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	NA	0.488	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	NA	0.498	NA	NA	0.0145 (J)	0.0354	NA	NA	NA	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	NA	1.09	NA	NA	0.0133 (J)	0.0331 (J)	NA	NA	NA	NA
CAMO-09-5989	MO-604938	0.00–0.50	SED	0.0000031	0.0168 (J)	NA	NA	—	—	0.00011 (J)	0.00000374 (J)	—	—
CAMO-09-5990	MO-604939	0.00–0.50	SED	0.00000842	0.026 (J)	NA	NA	—	—	0.000437 (J)	0.0000237	—	0.000000694
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	0.000981	0.06 (J)	NA	NA	—	—	0.0241 (J)	0.00102	0.0000286	0.000147
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	0.00000147	—	NA	NA	—	—	0.0000452 (J)	0.00000291 (J)	—	—

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	0.00000367	—	NA	NA	—	—	0.000252 (J)	0.0000204	—	—
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	NA	NA	—	—	0.0000257 (J)	0.00000235 (J)	—	—
CAMO-09-5995	MO-604944	0.00–0.50	SED	0.0000274	0.0899	NA	NA	0.0311 (J)	0.106	0.00125 (J)	0.0000568	0.00000196 (J)	0.00000385
CAMO-09-5996	MO-604945	0.00–0.50	SED	0.00000661	0.0394	NA	NA	—	—	0.0005 (J)	0.0000208	0.000000484 (J)	0.00000117
CAMO-09-5997	MO-604946	0.00–0.50	SED	0.00000766	—	NA	NA	—	—	0.00061 (J)	0.0000323	0.000000508 (J)	0.000000886
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.00000454	0.028 (J)	NA	NA	—	—	0.000282 (J)	0.0000118	0.000000339 (J)	0.000000339
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	0.000000954	—	NA	NA	—	—	0.000056 (J)	0.00000237 (J)	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	0.00000404	0.033 (J)	NA	NA	—	—	0.000206 (J)	0.0000114	0.000000238 (J)	0.000000458
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.00000416	0.041	NA	NA	—	—	0.000146 (J)	0.0000101	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	NA	0.0987	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6643	MO-605110	0.00–0.50	SED	0.0000124	0.678 (J)	NA	NA	—	—	0.000678 (J)	0.0000233	—	0.000000996
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.00000136	0.0504	NA	NA	—	—	0.000143 (J)	0.00000665	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	0.00000667	0.0175 (J)	NA	NA	—	—	0.000368 (J)	0.000015	0.000000282 (J)	0.00000186
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	NA	NA	—	—	0.0000181 (J)	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	NA	0.406	NA	NA	—	0.0896 (J)	NA	NA	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	NA	0.0272 (J)	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.00000982	0.166	NA	NA	0.0121 (J)	0.05	0.000278 (J)	0.0000128	0.000000339 (J)	0.00000121
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.0000802	0.348	NA	NA	—	—	0.00346 (J)	0.000185	0.00000189 (J)	0.0000077
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	0.539	NA	NA	0.0136 (J)	0.0295 (J)	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	0.463	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	0.0284 (J)	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.0000657	0.0769	NA	NA	—	0.016 (J)	0.00197	0.000111	0.000000978 (J)	0.00000774
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	0.208	NA	NA	0.0261 (J)	0.0709	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	0.0337 (J)	NA	NA	—	—	NA	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	0.173	NA	NA	0.0191 (J)	0.0512	NA	NA	NA	NA
CAMO-09-6721	MO-605129	0.00–0.50	SED	0.00000209	—	NA	NA	—	—	0.00013 (J)	0.00000778	0.000000183 (J)	0.000000183
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.00000185	0.0549	NA	NA	—	—	0.000106 (J)	0.00000554	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	NA	0.0931	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	NA	0.0117 (J)	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	NA	0.0127 (J)	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	0.00000123	—	NA	NA	—	—	0.0000489 (J)	0.00000293 (J)	—	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	0.00000143 (J)	—	NA	NA	—	—	0.0000412 (J)	0.00000172 (J)	—	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	—	NA	NA	—	—	0.0000306 (J)	0.00000131 (J)	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	0.00000102	—	NA	NA	—	—	0.0000308	0.0000015 (J)	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	NA	—	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.0000181	0.124	NA	NA	—	0.0249 (J)	0.000926 (J)	0.0000502	0.00000101 (J)	0.00000209
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.00000346	0.0332 (J)	NA	NA	—	—	0.000201 (J)	0.0000125	0.000000292 (J)	0.000000292
CAMO-09-6882	MO-605163	0.00–0.50	SED	0.00000413	0.0464	NA	NA	—	—	0.000192 (J)	0.0000112	—	0.000000193
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	0.09	NA	NA	0.015 (J)	0.0606	NA	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	0.0202 (J)	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	0.0754	NA	NA	—	—	NA	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
0448-95-0068	48-02133	0.00–0.50	FILL	NA	NA	NA	0.13 (J)	0.16 (J)	NA	NA	NA	NA	NA	NA	NA
0448-95-0070	48-02134	0.00–0.50	FILL	NA	NA	NA	0.22 (J)	0.31 (J)	NA	NA	NA	NA	NA	NA	NA
0448-97-0037	48-02142	3.33–4.33	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0039	48-02142	4.66–5.12	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0040	48-02148	3.30–4.30	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0041	48-02148	4.66–5.16	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	NA	NA	NA	—	0.047 (J)	NA	NA	NA	NA	—	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0045	48-02155	5.00–6.00	FILL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0047	48-02159	0.50–1.50	SED	NA	NA	NA	0.07 (J)	0.17 (J)	NA	NA	NA	NA	0.004 (J)	0.014	—
0448-97-0052	48-02161	0.50–1.00	SED	NA	NA	NA	0.6	1	NA	NA	NA	NA	—	0.004 (J)	—
0448-97-0053	48-02161	6.50–7.50	SOIL	NA	NA	NA	0.078 (J)	0.12 (J)	NA	NA	NA	NA	—	0.005 (J)	—
0448-97-0054	48-02162	0.50–1.50	SED	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	NA	NA	NA	—	—	NA	NA	NA	NA	—	0.004 (J)	—
0448-97-0112	48-02171	0.00–0.83	SOIL	NA	NA	NA	—	0.61 (J)	NA	NA	NA	NA	—	—	—
0448-97-0113	48-02171	0.83–1.50	SOIL	NA	NA	NA	—	—	NA	NA	NA	NA	—	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	NA	NA	NA	0.31 (J)	1.5 (J)	NA	NA	NA	NA	—	—	0.004 (J)
0448-97-0116	48-02172	1.00–2.00	SOIL	NA	NA	NA	0.21 (J)	0.71 (J)	NA	NA	NA	NA	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	—	0.00000627	2.74	12.4	0.000000897	0.0000021	—	0.00000431	NA	NA	NA
CAMO-09-5926	MO-604924	0.00–0.50	FILL	NA	NA	NA	2.79	6.05	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	NA	NA	NA	1.27	3.98	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	NA	NA	NA	16	24.1	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	NA	NA	NA	0.192	1.23	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	NA	NA	NA	0.79	1.76	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	NA	NA	NA	1.4	3.78	NA	NA	NA	NA	NA	NA	NA
CAMO-09-5989	MO-604938	0.00–0.50	SED	—	0.000000566 (J)	0.00000219	0.0538	0.097	—	—	0.00000102 (J)	0.00000333	NA	NA	NA
CAMO-09-5990	MO-604939	0.00–0.50	SED	—	—	0.00000209	0.0504	0.12	—	0.000000364	—	0.000000632	NA	NA	NA
CAMO-09-5991	MO-604940	0.00–0.50	SOIL	0.0000041	0.00000733	0.000268	0.128	0.345	0.00000257 (J)	0.0000141	—	0.0000402	NA	NA	NA
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	—	—	0.00000309	—	—	—	—	—	0.0000011	NA	NA	NA
CAMO-09-5993	MO-604942	0.00–0.50	SOIL	—	—	0.00000103	0.0144 (J)	0.044	—	0.000000619	—	0.00000131	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-5995	MO-604944	0.00–0.50	SED	—	—	0.00000615	0.434	0.472	0.000000398 (J)	0.000000822	—	0.000000289	NA	NA	NA
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	0.00000037 (J)	0.00000304	0.0467	0.122	—	0.00000166	0.000000651 (J)	0.00000172	NA	NA	NA
CAMO-09-5997	MO-604946	0.00–0.50	SED	—	—	0.00000156	—	—	—	—	—	0.00000101	NA	NA	NA
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	—	0.000000557	0.0935	0.131	—	—	—	—	NA	NA	NA
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	—	—	0.0165 (J)	0.0319 (J)	—	—	—	0.00000023	NA	NA	NA
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	0.000000112 (J)	0.00000118	0.0848	0.144	—	0.000000124	—	0.000000633	NA	NA	NA
CAMO-09-6566	MO-605100	0.00–0.50	SED	—	—	0.00000125	0.116	0.166	—	—	—	0.000000573	NA	NA	NA
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	NA	NA	NA	0.242	0.444	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	NA	NA	NA	—	0.0106 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	NA	NA	NA	0.0254 (J)	0.028 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	NA	NA	NA	0.0145 (J)	0.0278 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6643	MO-605110	0.00–0.50	SED	—	0.00000102 (J)	0.00000832	3.01	3.66	—	—	0.00000199	0.00000871	NA	NA	NA
CAMO-09-6646	MO-605111	0.00–0.50	SED	—	—	0.000000808	0.162	0.208	—	—	—	0.000000922	NA	NA	NA
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	—	0.00000124	0.0398 (J)	0.0667	—	—	—	0.00000216	NA	NA	NA
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-6655	MO-605114	0.00–0.50	SED	NA	NA	NA	1.16	1.71	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	NA	NA	NA	0.0556	0.0861	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	NA	NA	NA	0.0146 (J)	0.0235 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	—	0.00000382	0.41	0.468	—	—	—	0.000000682	NA	NA	NA
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.000000627 (J)	0.00000166 (J)	0.0000252	0.427	1.02	—	0.000000825	0.00000167	0.0000121	NA	NA	NA
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	NA	NA	0.0167 (J)	0.0337 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	NA	NA	1.37	2.1	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	NA	NA	0.524	1.27	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	NA	NA	0.0622	0.118	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	—	0.000000822 (J)	0.0000187	0.165	0.371	—	0.000000794	0.000000612	0.00000636	NA	NA	NA
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	NA	NA	0.702	1.06	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	NA	NA	0.0527	0.11	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	NA	NA	0.654	0.834	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	—	0.000000279	—	—	—	—	—	0.000000271	NA	NA	NA

Table 5.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	—	0.000000765	0.111	0.188	—	—	—	0.000000386	NA	NA	NA
CAMO-09-6727	MO-605131	0.00–0.50	FILL	NA	NA	NA	0.241	0.465	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	NA	NA	NA	—	0.0221 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	NA	NA	NA	—	0.0167 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	NA	NA	NA	0.022 (J)	0.0432	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	NA	NA	NA	0.0152 (J)	0.0358	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	NA	NA	NA	0.017 (J)	0.037	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	NA	NA	NA	0.0101 (J)	0.0246 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	NA	NA	NA	—	0.018 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	NA	NA	NA	—	0.0124 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	NA	NA	NA	—	0.0126 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	—	0.000000112	—	—	—	—	—	0.000000273	NA	NA	NA
CAMO-09-6828	MO-605154	0.00–0.50	SED	—	0.00000017 (J)	0.000000297	—	—	—	—	—	0.00000043	NA	NA	NA
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	—	—	—	0.016 (J)	—	—	—	—	NA	NA	NA
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	0.000000177 (J)	0.00000134	0.0107 (J)	0.0258 (J)	—	0.000000426	—	0.00000116	NA	NA	NA
CAMO-09-6849	MO-605160	0.00–0.50	SED	NA	NA	NA	—	0.0137 (J)	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6876	MO-605161	0.00–0.50	SED	—	—	0.00000335	0.275	0.412	0.000000186 (J)	0.000000186	—	0.00000233	NA	NA	NA
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	—	0.000000862	0.0753	0.129	—	—	—	0.000000122	NA	NA	NA
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	—	—	0.0767	0.16	—	—	—	0.000000414	NA	NA	NA
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	NA	NA	0.489	0.475	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	NA	NA	0.024 (J)	0.0601	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	NA	NA	0.119	0.273	NA	NA	NA	NA	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.2-4
Radionuclides Detected or Detected above BVs/FVs at AOC 48-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-227	Thorium-230	Tritium	Uranium-234	Uranium-235	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**1.04**	**na[b]**	**2.29**	**0.093**	**2.59**	**0.2**	**0.2**	**2.29**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**na**	**2.29**	**na**	**2.59**	**0.2**	**0.2**	**2.29**
QBT3, QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**na**	**1.98**	**0.09**	**0.09**	**1.93**
AAA4494	48-02006	0.00–0.50	FILL	—[d]	NA[e]	—	—	NA	NA	3.88(J-)	NA	—	NA	—	—
AAA4495	48-02006	1.50–3.00	FILL	—	—	—	—	NA	NA	4.19(J-)	NA	—	NA	—	—
AAA3770	48-02006	4.00–5.00	FILL	—	—	—	—	NA	NA	3.89(J-)	NA	—	NA	—	—
AAA3407	48-02014	4.00–5.00	QBT3	—	NA	—	0.045(J-)	NA	NA	—	NA	—	NA	—	—
AAA3408	48-02014	7.00–7.20	SOIL	—	NA	0.092(J-)	—	NA	NA	—	NA	—	NA	—	—
AAA3409	48-02014	9.00–10.00	QBT3	—	NA	0.277(J-)	—	NA	NA	—	NA	—	NA	—	—
AAA3497	48-02020	0.00–0.50	SOIL	1.16	—	0.162	6.4	NA	NA	—	NA	—	NA	—	—
AAA3717	48-02024	4.00–5.00	FILL	—	NA	—	—	NA	NA	3.85(J)	NA	—	NA	—	—
AAA3721	48-02025	5.50–6.50	FILL	—	—	—	—	NA	NA	3.11(J)	NA	—	NA	—	—
AAA4476	48-02025	13.00–14.00	QBT3	—	NA	—	—	NA	NA	2.07(J)	NA	—	NA	—	—
AAA3723	48-02026	1.50–2.50	SOIL	—	NA	5.19(J)	—	NA	NA	—	NA	—	NA	—	—
AAA3724	48-02026	6.00–7.40	SOIL	5.27(J-)	NA	223(J)	11.9	NA	NA	—	NA	—	NA	—	—
AAA4469	48-02026	14.00–15.00	QBT3	—	NA	—	—	NA	NA	—	NA	2.04	NA	—	—
AAA3512	48-02054	0.00–0.50	SED	0.545	—	—	2.08	NA	NA	—	NA	—	NA	—	—
AAA3514	48-02054	0.50–1.50	SED	0.292	NA	—	1.74	NA	NA	—	NA	3.02	NA	—	2.93(J+)
AAA3515	48-02054	1.50–2.50	SOIL	0.601	NA	—	0.935	NA	NA	2.35(J+)	NA	—	NA	—	—
AAA3513	48-02055	0.00–0.50	SED	0.213	—	—	0.339	NA	NA	—	NA	—	NA	—	—
AAA3516	48-02055	0.50–1.50	SED	0.291	NA	—	3.15	NA	NA	—	NA	—	NA	—	—
AAA3470	48-02055	1.50–2.50	SOIL	0.713	NA	—	1.07	NA	NA	—	NA	6.63(J+)	NA	—	5.64(J+)
AAA3471	48-02055	2.50–3.50	SOIL	0.337	NA	—	—	NA	NA	—	NA	—	NA	—	—
AAA3806	48-02068	0.00–1.00	SOIL	—	NA	0.0348(J-)	—	NA	NA	—	NA	—	NA	—	—
0448-95-0001	48-02080	0.00–0.50	SOIL	NA	NA	0.5	0.07	NA	NA	NA	NA	—	NA	—	—
0448-97-0001	48-02150	3.50–4.50	FILL	—	—	NA	NA	0.46	NA	—	NA	—	NA	—	—
0448-97-0002	48-02150	8.50–9.50	FILL	—	—	NA	NA	0.5	NA	—	NA	—	NA	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	0.028	—	NA	—	NA	—	NA	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	—	0.023	0.042	—	NA	—	NA	—	NA	—	—
0448-97-0045	48-02155	5.00–6.00	FILL	—	0.118	0.059	0.059	—	NA	—	NA	—	NA	—	—
0448-97-0015	48-02157	3.50–4.50	FILL	—	—	4.64	0.218	—	NA	—	NA	—	NA	—	—
0448-97-0016	48-02157	5.00–6.00	FILL	—	—	21.847	1.135	0.43	NA	—	NA	—	NA	—	—
0448-97-0018	48-02157	9.00–10.00	SOIL	—	—	1.205	0.052	—	NA	—	NA	—	NA	—	—
0448-97-0019	48-02158	3.50–4.50	FILL	—	—	2.766	0.171	—	NA	—	NA	—	NA	—	—

Table 5.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-227	Thorium-230	Tritium	Uranium-234	Uranium-235	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**1.04**	**na[b]**	**2.29**	**0.093**	**2.59**	**0.2**	**0.2**	**2.29**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**na**	**2.29**	**na**	**2.59**	**0.2**	**0.2**	**2.29**
QBT3, QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**na**	**1.98**	**0.09**	**0.09**	**1.93**
0448-97-0020	48-02158	5.50–6.50	FILL	4.511	—	110.02	5.311	2.9	NA	—	NA	—	NA	—	—
0448-97-0021	48-02158	9.00–10.00	FILL	—	—	0.671	0.036	—	NA	—	NA	—	NA	—	—
0448-97-0048	48-02159	3.83–5.00	QBT3	—	—	—	—	—	0.085	—	NA	—	NA	—	—
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	—	—	0.046	—	NA	—	NA	—	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	—	—	0.053	—	NA	—	NA	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	—	—	0.068	—	NA	—	NA	—	—
0448-97-0075	48-02164	1.00–2.00	QBT3	—	—	NA	NA	NA	NA	NA	NA	NA	0.1033	NA	NA
0448-97-0079	48-02166	1.00–2.00	QBT3	—	—	NA	NA	NA	NA	NA	NA	NA	0.119	NA	NA
0448-97-0109	48-02170	0.50–1.20	SOIL	—	0.144	NA	NA	NA	NA	NA	NA	NA	—	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	—	0.754	—	—	—	NA	—	NA	—	NA	—	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	—	—	—	NA	NA	NA	0.00432777	—	NA	—	—
CAMO-09-5989	MO-604938	0.00–0.50	SED	0.0728	—	—	0.184	—	NA	—	—	—	NA	—	—
CAMO-09-5990	MO-604939	0.00–0.50	SED	—	2.02	—	0.089	—	NA	—	—	—	NA	0.248	3.21
CAMO-09-5992	MO-604941	0.00–0.50	SOIL	0.0559	—	—	0.0811	—	NA	—	0.0186157	—	NA	—	—
CAMO-09-5994	MO-604943	0.00–0.50	SOIL	—	—	—	—	—	NA	—	0.00904527	—	NA	—	—
CAMO-09-5996	MO-604945	0.00–0.50	SED	—	1.28	—	—	—	NA	—	—	—	NA	—	—
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	—	—	—	NA	NA	NA	0.0596577	NA	—	NA	NA
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	—	—	—	NA	NA	NA	0.0677143	NA	—	NA	NA
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	—	—	—	—	NA	NA	NA	0.0469456	NA	—	NA	NA
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	—	—	—	—	NA	—	0.100233	—	NA	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	—	—	—	0.0736	—	NA	—	0.0406975	3.17	NA	—	3.11
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	—	—	—	—	NA	—	0.0164926	—	NA	—	—
CAMO-09-6783	MO-605145	0.00–0.50	SED	—	2.09	—	0.0847	—	NA	—	—	—	NA	—	2.37
CAMO-09-6793	MO-605147	0.00–0.50	SED	—	—	—	—	—	NA	—	334	—	NA	—	—
CAMO-09-6803	MO-605149	0.00–0.50	SED	0.161	—	—	0.33	—	NA	—	—	—	NA	—	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	0.0845	—	—	—	NA	—	0.00486617	—	NA	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	1.08	—	—	—	NA	—	—	—	NA	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A. Uranium-235/236 column shows results for ISO_U analytical suite. Uranium-235 column shows results for Gamma Spectroscopy analytical suite--NA for samples with ISO_U result.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

[e] NA = Not Analyzed.

Table 5.3-1
Samples Collected and Analyses Requested at SWMUs 48-002(a) and 48-002(b)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
AAA4494	48-02006	0.00–0.50	FILL	—*	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA4493	48-02006	0.50–1.50	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA4495	48-02006	1.50–3.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA3769	48-02006	3.00–4.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA3770	48-02006	4.00–5.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA3771	48-02006	5.00–6.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA3772	48-02006	6.00–7.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
AAA3773	48-02006	7.00–8.00	FILL	—	—	15290	—	15290	15290	15290	—	—	—	—	—	—
0448-95-0068	48-02133	0.00–0.50	FILL	—	—	—	—	—	—	—	1050	—	—	1049	—	—
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	—	—	—	—	—	1050	—	—	1049	—	—
CAMO-09-5910	MO-604920	2.50–4.00	QBT4	09-1634	09-1632	09-1635	09-1635	09-1635	—	09-1635	09-1634	09-1633	09-1634	09-1633	09-1633	09-1634
CAMO-09-5911	MO-604920	7.50–9.00	QBT4	09-1634	09-1632	09-1635	09-1635	09-1635	—	09-1635	09-1634	09-1633	09-1634	09-1633	09-1633	09-1634
CAMO-09-5912	MO-604920	12.50–13.50	QBT4	09-1634	09-1632	09-1635	09-1635	09-1635	—	09-1635	09-1634	09-1633	09-1634	09-1633	09-1633	09-1634
CAMO-09-5914	MO-604921	0.00–0.50	FILL	09-1651	09-1649	09-1652	09-1652	09-1652	—	09-1652	09-1651	09-1650	09-1651	09-1650	—	09-1651
CAMO-09-5915	MO-604921	2.50–3.50	QBT4	09-1651	09-1649	09-1652	09-1652	09-1652	—	09-1652	09-1651	09-1650	09-1651	09-1650	09-1650	09-1651
CAMO-09-5916	MO-604921	7.50–8.50	QBT4	09-1651	09-1649	09-1652	09-1652	09-1652	—	09-1652	09-1651	09-1650	09-1651	09-1650	09-1650	09-1651
CAMO-09-5917	MO-604921	12.50–13.50	QBT4	09-1651	09-1649	09-1652	09-1652	09-1652	—	09-1652	09-1651	09-1650	09-1651	09-1650	09-1650	09-1651
CAMO-09-5918	MO-604922	2.50–3.50	QBT4	09-1711	09-1709	09-1712	09-1712	09-1712	—	09-1712	09-1711	09-1710	09-1711	09-1710	09-1710	09-1711
CAMO-09-5919	MO-604922	7.50–8.50	QBT4	09-1711	09-1709	09-1712	09-1712	09-1712	—	09-1712	09-1711	09-1710	09-1711	09-1710	09-1710	09-1711
CAMO-09-5920	MO-604922	12.50–14.00	QBT4	09-1711	09-1709	09-1712	09-1712	09-1712	—	09-1712	09-1711	09-1710	09-1711	09-1710	09-1710	09-1711
CAMO-09-5922	MO-604923	2.50–3.50	QBT4	09-1634	—	09-1635	09-1635	09-1635	—	09-1635	09-1634	—	09-1634	09-1633	09-1633	09-1634
CAMO-09-5923	MO-604923	7.50–8.50	QBT4	09-1634	—	09-1635	09-1635	09-1635	—	09-1635	09-1634	—	09-1634	09-1633	09-1633	09-1634
CAMO-09-5924	MO-604923	12.50–13.50	QBT4	09-1634	—	09-1635	09-1635	09-1635	—	09-1635	09-1634	—	09-1634	09-1633	09-1633	09-1634
CAMO-09-5926	MO-604924	0.00–0.50	FILL	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	—	09-1651
CAMO-09-5927	MO-604924	2.50–3.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5928	MO-604924	7.50–8.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5929	MO-604924	12.50–14.00	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5930	MO-604925	0.00–0.50	FILL	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	—	09-1651
CAMO-09-5931	MO-604925	2.50–3.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5932	MO-604925	7.50–8.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5933	MO-604925	12.50–13.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5934	MO-604926	0.00–0.50	FILL	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	—	09-1683
CAMO-09-5935	MO-604926	2.50–3.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5936	MO-604926	7.50–8.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683

Table 5.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
CAMO-09-5937	MO-604926	12.50–14.00	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5938	MO-604927	0.00–0.50	FILL	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	—	09-1651
CAMO-09-5939	MO-604927	2.50–3.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5940	MO-604927	7.50–8.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5941	MO-604927	12.50–13.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5942	MO-604928	2.50–3.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5943	MO-604928	7.50–8.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5944	MO-604928	12.50–13.50	QBT4	09-1651	—	09-1652	09-1652	09-1652	—	09-1652	09-1651	—	09-1651	09-1650	09-1650	09-1651
CAMO-09-5946	MO-604929	2.50–3.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5947	MO-604929	7.50–8.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5948	MO-604929	12.50–14.00	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5950	MO-604930	2.50–3.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5951	MO-604930	7.50–8.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5952	MO-604930	12.50–13.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5954	MO-604931	0.00–0.50	FILL	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	—	09-1683
CAMO-09-5955	MO-604931	2.50–3.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5956	MO-604931	7.50–8.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5957	MO-604931	12.50–13.50	QBT4	09-1683	—	09-1684	09-1684	09-1684	—	09-1684	09-1683	—	09-1683	09-1682	09-1682	09-1683
CAMO-09-5958	MO-604932	0.00–0.50	FILL	09-1711	—	09-1712	09-1712	09-1712	—	09-1712	09-1711	—	09-1711	09-1710	—	09-1711
CAMO-09-5959	MO-604932	2.50–3.50	QBT4	09-1711	—	09-1712	09-1712	09-1712	—	09-1712	09-1711	—	09-1711	09-1710	09-1710	09-1711
CAMO-09-5960	MO-604932	7.50–8.50	QBT4	09-1711	—	09-1712	09-1712	09-1712	—	09-1712	09-1711	—	09-1711	09-1710	09-1710	09-1711
CAMO-09-5961	MO-604932	12.50–13.50	QBT4	09-1711	—	09-1712	09-1712	09-1712	—	09-1712	09-1711	—	09-1711	09-1710	09-1710	09-1711

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.3-2
Inorganic Chemicals above BVs at SWMUs 48-002(a) and 48-002(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Copper	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SOIL,FILL Background Value[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**14.7**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**4.66**	**0.1**	**6.58**	**na**	**na**	**0.3**	**63.5**
0448-95-0068	48-02133	0.00-0.50	FILL	—[c]	0.88 (J)	—	—	—	—	—	22.4	—	NA[d]	NA	—	—
0448-95-0070	48-02134	0.00-0.50	FILL	—	—	—	—	—	—	—	0.6	—	NA	NA	—	—
CAMO-09-5910	MO-604920	2.50-4.00	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	0.952 (J)	0.000877 (J)	1.06 (U)	—
CAMO-09-5911	MO-604920	7.50-9.00	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	—	0.0012 (J)	1.06 (U)	—
CAMO-09-5912	MO-604920	12.50-13.50	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	—	0.00112 (J)	1.02 (U)	—
CAMO-09-5914	MO-604921	0.00-0.50	FILL	—	—	—	—	0.615	—	—	2.03	—	8.53 (J+)	0.103	—	50
CAMO-09-5915	MO-604921	2.50-3.50	QBT4	—	1.09 (U)	—	—	—	—	—	—	—	0.989 (J+)	0.0107	1.12 (U)	—
CAMO-09-5916	MO-604921	7.50-8.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	—	0.00543	1.07 (U)	—
CAMO-09-5917	MO-604921	12.50-13.50	QBT4	—	1.05 (U)	—	—	—	—	—	—	—	—	0.00134 (J)	1.07 (U)	—
CAMO-09-5918	MO-604922	2.50-3.50	QBT4	—	1.09 (UJ)	—	—	—	—	—	—	—	0.994 (J)	0.0023	1.05 (UJ)	—
CAMO-09-5919	MO-604922	7.50-8.50	QBT4	—	1.06 (UJ)	—	—	—	—	—	—	—	0.845 (J)	0.0022	1.06 (UJ)	—
CAMO-09-5920	MO-604922	12.50-14.00	QBT4	—	1.09 (UJ)	—	—	—	—	—	—	—	—	0.00255	1.04 (UJ)	—
CAMO-09-5922	MO-604923	2.50-3.50	QBT4	—	1.05 (U)	—	—	—	—	—	—	—	0.858 (J)	0.000821 (J)	1.04 (U)	—
CAMO-09-5923	MO-604923	7.50-8.50	QBT4	—	1.04 (U)	—	—	—	—	—	—	—	—	0.00105 (J)	1.05 (U)	—
CAMO-09-5924	MO-604923	12.50-13.50	QBT4	—	1.02 (U)	—	—	—	—	—	—	—	0.879 (J)	0.00101 (J)	1.06 (U)	—
CAMO-09-5926	MO-604924	0.00-0.50	FILL	—	0.994 (U)	—	—	0.497 (U)	—	—	1.53	—	4.87 (J+)	0.00304	—	49.1
CAMO-09-5927	MO-604924	2.50-3.50	QBT4	—	1.09 (U)	—	—	—	2360 (J-)	—	—	—	0.679 (J+)	0.0776	1.1 (U)	—
CAMO-09-5928	MO-604924	7.50-8.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	0.78 (J+)	0.012	1.07 (U)	—
CAMO-09-5929	MO-604924	12.50-14.00	QBT4	—	1.04 (U)	—	—	—	—	—	—	—	0.763 (J+)	0.00334	1.04 (U)	—
CAMO-09-5930	MO-604925	0.00-0.50	FILL	—	0.984 (U)	—	—	0.492 (U)	—	15.1	1.99	—	3.1 (J+)	0.00223	—	—
CAMO-09-5931	MO-604925	2.50-3.50	QBT4	—	1.09 (U)	—	—	—	—	—	—	—	—	0.00211 (J)	1.06 (U)	—
CAMO-09-5932	MO-604925	7.50-8.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	0.731 (J+)	0.00339	1.06 (U)	—
CAMO-09-5933	MO-604925	12.50-13.50	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	0.892 (J+)	0.00478	1.06 (U)	—
CAMO-09-5934	MO-604926	0.00-0.50	FILL	—	1.02 (U)	—	—	0.51 (U)	—	—	27.6	—	10.1	1.78	—	—
CAMO-09-5935	MO-604926	2.50-3.50	QBT4	—	1.07 (U)	—	—	—	—	—	—	—	1.17	0.575	1.07 (U)	—
CAMO-09-5936	MO-604926	7.50-8.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	—	0.00648	1.05 (U)	—
CAMO-09-5937	MO-604926	12.50-14.00	QBT4	—	1.1 (U)	—	—	—	—	—	—	—	0.927 (J)	0.0305	1.08 (U)	—
CAMO-09-5938	MO-604927	0.00-0.50	FILL	—	1 (U)	—	—	0.5 (U)	—	24.2	7.42	—	0.882 (J+)	0.033	—	—
CAMO-09-5939	MO-604927	2.50-3.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	—	0.01	1.1 (U)	—
CAMO-09-5940	MO-604927	7.50-8.50	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	—	0.00696	1.03 (U)	—
CAMO-09-5941	MO-604927	12.50-13.50	QBT4	—	1.09 (U)	—	—	—	—	—	—	—	—	0.00754	1.13 (U)	—
CAMO-09-5942	MO-604928	2.50-3.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	0.788 (J+)	0.0111	1.05 (U)	—

Table 5.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Barium	Beryllium	Cadmium	Calcium	Copper	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SOIL,FILL Background Value[a]				**29200**	**0.83**	**295**	**1.83**	**0.4**	**6120**	**14.7**	**0.1**	**15.4**	**a[b]**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**46**	**1.21**	**1.63**	**2200**	**4.66**	**0.1**	**6.58**	**na**	**na**	**0.3**	**63.5**
CAMO-09-5943	MO-604928	7.50-8.50	QBT4	—	1.06 (U)	—	—	—	—	—	—	—	—	0.000979 (J)	1.07 (U)	—
CAMO-09-5944	MO-604928	12.50-13.50	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	1 (J+)	0.00346	1.09 (U)	—
CAMO-09-5946	MO-604929	2.50-3.50	QBT4	—	1.12 (U)	—	—	—	—	—	—	—	—	0.00427	1.11 (U)	—
CAMO-09-5947	MO-604929	7.50-8.50	QBT4	—	1.11 (U)	—	—	—	—	—	—	—	0.896 (J)	0.00128 (J)	1.12 (U)	—
CAMO-09-5948	MO-604929	12.50-14.00	QBT4	—	1.08 (U)	—	—	—	—	—	—	—	—	0.001 (J)	1.08 (U)	—
CAMO-09-5950	MO-604930	2.50-3.50	QBT4	—	1.12 (U)	146	—	—	—	—	—	—	0.884 (J)	0.00371	1.1 (U)	—
CAMO-09-5951	MO-604930	7.50-8.50	QBT4	—	1.15 (U)	53.1	—	—	—	—	—	—	0.969 (J)	0.0522	1.14 (U)	—
CAMO-09-5952	MO-604930	12.50-13.50	QBT4	7720 (J+)	1.19 (U)	—	1.45	—	2550	4.96	—	8.56	0.862 (J)	0.0172	1.15 (U)	—
CAMO-09-5954	MO-604931	0.00-0.50	FILL	—	1.01 (U)	—	—	0.505 (U)	—	—	—	—	0.791 (J)	0.0151	—	—
CAMO-09-5955	MO-604931	2.50-3.50	QBT4	—	1.03 (U)	—	—	—	—	—	—	—	—	0.00242	1.06 (U)	—
CAMO-09-5956	MO-604931	7.50-8.50	QBT4	—	1.03 (U)	—	—	—	—	—	—	—	—	0.00444	1.03 (U)	—
CAMO-09-5957	MO-604931	12.50-13.50	QBT4	—	1.04 (U)	—	—	—	—	—	—	—	—	0.000884 (J)	1.04 (U)	—
CAMO-09-5958	MO-604932	0.00-0.50	FILL	—	1.01 (UJ)	—	—	0.507 (U)	—	—	—	—	1.55	0.0134	—	—
CAMO-09-5959	MO-604932	2.50-3.50	QBT4	—	1.12 (UJ)	—	1.47	—	—	—	—	—	—	0.0126	1.11 (UJ)	—
CAMO-09-5960	MO-604932	7.50-8.50	QBT4	—	1.05 (UJ)	—	—	—	—	—	—	—	—	0.0231	1.05 (UJ)	—
CAMO-09-5961	MO-604932	12.50-13.50	QBT4	—	1.05 (UJ)	—	—	—	—	—	—	—	—	0.038	1.05 (UJ)	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 5.3-3
Organic Chemicals Detected at SWMUs 48-002(a) and 48-002(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Carbon Disulfide	Chloro-3-methylphenol[4-]	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene
0448-95-0068	48-02133	0.00–0.50	FILL	—[a]	—	—	—	—	—	—	—	NA[b]	—	—	—	—	0.15(J)
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	0.12(J)	0.12(J)	0.13(J)	—	—	—	NA	—	0.12(J)	—	—	0.26(J)
CAMO-09-5911	MO-604920	7.50–9.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5912	MO-604920	12.50–13.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	0.479(J)	6.96	8.78	13	4.62	—	—	NA	—	9.33	0.475(J)	—	9.8
CAMO-09-5915	MO-604921	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5916	MO-604921	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5917	MO-604921	12.50–13.50	QBT4	—	—	—	—	—	—	0.277(J)	—	—	—	—	—	—	—
CAMO-09-5919	MO-604922	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5920	MO-604922	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5922	MO-604923	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5923	MO-604923	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	0.00292(J)	—	—	—	—	—
CAMO-09-5926	MO-604924	0.00–0.50	FILL	0.299	0.503	2.75	3.37	4.89	1.92	—	0.34(J)	NA	—	3.5	—	—	5.16
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	0.209(J)	2.05	2.56	3.66	1.32	—	—	NA	—	3	—	—	3.29
CAMO-09-5934	MO-604926	0.00–0.50	FILL	2.03	3.27	10.1	9.81	16.5	3.45	—	—	NA	—	10.8	—	0.779(J)	21.1
CAMO-09-5936	MO-604926	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	—	0.045(J)	—	—	—	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	0.0122(J)	0.0293(J)	0.724	1.09	1.59	0.578	—	—	NA	—	1.06	—	—	0.836
CAMO-09-5942	MO-604928	2.50–3.50	QBT4	0.0216(J)	0.0341(J)	0.0769	0.0723	0.103	0.0445	—	—	—	—	0.0868	—	—	0.167
CAMO-09-5954	MO-604931	0.00–0.50	FILL	0.0906	0.143	0.767	1.04	1.6	0.544	—	—	NA	—	1.07	—	—	1.48
CAMO-09-5958	MO-604932	0.00–0.50	FILL	0.129	0.247	2.03	2.53	4.02	1.16	—	—	NA	—	2.3	—	—	3.24

Table 5.3-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	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)	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropylbenzene
0448-95-0068	48-02133	0.00–0.50	FILL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
0448-95-0070	48-02134	0.00–0.50	FILL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
CAMO-09-5911	MO-604920	7.50–9.00	QBT4	—	0.000000109(J)	0.000000109	—	—	—	—	—	—	—	—	—
CAMO-09-5912	MO-604920	12.50–13.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	0.0000807	0.000163	0.000014	0.0000384	0.00000174(J)	0.00000284	0.00000245(J)	0.0000248	0.000014	3.91	NA
CAMO-09-5915	MO-604921	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5916	MO-604921	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5917	MO-604921	12.50–13.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5919	MO-604922	7.50–8.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5920	MO-604922	12.50–14.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-5922	MO-604923	2.50–3.50	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	0.000525(J)
CAMO-09-5923	MO-604923	7.50–8.50	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-5926	MO-604924	0.00–0.50	FILL	0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.63	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.13	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.34	NA
CAMO-09-5936	MO-604926	7.50–8.50	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.488	NA
CAMO-09-5942	MO-604928	2.50–3.50	QBT4	0.0174(J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0387	—
CAMO-09-5954	MO-604931	0.00–0.50	FILL	0.0686	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.498	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	0.0919	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.09	NA

Table 5.3-3 (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-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
0448-95-0068	48-02133	0.00–0.50	FILL	—	—	NA	NA	NA	NA	NA	0.13(J)	0.16(J)	NA	NA	NA
0448-95-0070	48-02134	0.00–0.50	FILL	—	—	NA	NA	NA	NA	NA	0.22(J)	0.31(J)	NA	NA	NA
CAMO-09-5911	MO-604920	7.50–9.00	QBT4	—	—	0.000000387(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5912	MO-604920	12.50–13.50	QBT4	—	—	0.000000308(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5914	MO-604921	0.00–0.50	FILL	—	—	0.000805	0.0000458	0.000000663(J)	0.00000377	0.00000627	2.74	12.4	0.000000897	0.0000021	0.00000431
CAMO-09-5915	MO-604921	2.50–3.50	QBT4	—	—	0.00000033(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5916	MO-604921	7.50–8.50	QBT4	—	—	0.000000181(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5917	MO-604921	12.50–13.50	QBT4	—	—	0.000000638(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5919	MO-604922	7.50–8.50	QBT4	—	—	0.000000214(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5920	MO-604922	12.50–14.00	QBT4	—	—	0.000000327(J)	—	—	—	—	—	—	—	—	—
CAMO-09-5922	MO-604923	2.50–3.50	QBT4	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-5923	MO-604923	7.50–8.50	QBT4	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-5926	MO-604924	0.00–0.50	FILL	—	0.057(J)	NA	NA	NA	NA	NA	2.79	6.05	NA	NA	NA
CAMO-09-5930	MO-604925	0.00–0.50	FILL	—	—	NA	NA	NA	NA	NA	1.27	3.98	NA	NA	NA
CAMO-09-5934	MO-604926	0.00–0.50	FILL	0.323(J)	0.952	NA	NA	NA	NA	NA	16	24.1	NA	NA	NA
CAMO-09-5936	MO-604926	7.50–8.50	QBT4	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	—	NA	NA	NA	NA	NA	0.192	1.23	NA	NA	NA
CAMO-09-5942	MO-604928	2.50–3.50	QBT4	0.00727(J)	0.0214(J)	NA	NA	NA	NA	NA	0.149	0.176	NA	NA	NA
CAMO-09-5954	MO-604931	0.00–0.50	FILL	0.0145(J)	0.0354	NA	NA	NA	NA	NA	0.79	1.76	NA	NA	NA
CAMO-09-5958	MO-604932	0.00–0.50	FILL	0.0133(J)	0.0331(J)	NA	NA	NA	NA	NA	1.4	3.78	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMUs 48-002(a) and 48-002(b)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Thorium-230	Tritium	Uranium-235/236
FILL Background Value[a]				**0.054[b]**	**2.29**	**na[c]**	**0.2**
QBT4 Background Value[a]				**na**	**1.98**	**na**	**0.09**
AAA4494	48-02006	0.00–0.50	FILL	—[d]	3.88(J-)	NA[e]	—
AAA4495	48-02006	1.50–3.00	FILL	—	4.19(J-)	NA	—
AAA3770	48-02006	4.00–5.00	FILL	—	3.89(J-)	NA	—
CAMO-09-5920	MO-604922	12.50–14.00	QBT4	—	NA	—	0.116
CAMO-09-5922	MO-604923	2.50–3.50	QBT4	—	NA	0.0546125	—
CAMO-09-5924	MO-604923	12.50–13.50	QBT4	—	NA	0.0152489	—
CAMO-09-5927	MO-604924	2.50–3.50	QBT4	—	NA	0.0342274	—
CAMO-09-5929	MO-604924	12.50–14.00	QBT4	—	NA	0.0422486	—
CAMO-09-5938	MO-604927	0.00–0.50	FILL	—	NA	0.00432777	—
CAMO-09-5940	MO-604927	7.50–8.50	QBT4	—	NA	0.0296008	—
CAMO-09-5950	MO-604930	2.50–3.50	QBT4	0.0564	NA	—	—
CAMO-09-5952	MO-604930	12.50–13.50	QBT4	0.0245	NA	—	—
CAMO-09-5956	MO-604931	7.50–8.50	QBT4	0.0266	NA	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil and tuff samples collected from 0–1 ft only.
[c] na = Not available.
[d] — = Not detected or not detected above BV/FV.
[e] NA = Not Analyzed

Table 5.5-1
Samples Collected and Analyses Requested at AOC 48-002(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Total Cyanide
AAA3545	48-02037	0.00-0.50	FILL	15333	—*	—	15333	—	15333	15333	15333	—	—	—	—
AAA3546	48-02037	0.50-1.50	FILL	15333	—	—	—	—	15333	15333	15333	—	—	—	—
AAA3547	48-02037	1.50-3.00	SOIL	15333	—	—	—	—	15333	15333	15333	—	—	—	—
AAA3782	48-02057	0.00-0.50	SOIL	15333	—	—	—	—	15333	15333	15333	—	—	—	—
0448-97-0032	48-02135	0.00-1.00	FILL	—	—	—	2920	—	—	—	—	—	—	—	—
0448-97-0033	48-02135	1.00-2.00	FILL	—	—	—	2920	—	—	—	—	—	—	—	—
0448-97-0034	48-02135	2.00-3.25	FILL	—	—	—	2920	—	—	—	—	—	—	—	—
CAMO-09-6749	MO-605137	1.00-2.50	SOIL	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6750	MO-605137	2.50-3.50	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6751	MO-605137	7.50-10.00	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6752	MO-605138	1.00-2.50	SOIL	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6753	MO-605138	3.50-5.00	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6754	MO-605138	9.00-10.50	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6755	MO-605139	1.00-2.50	SOIL	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6756	MO-605139	3.50-5.00	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6757	MO-605139	9.00-10.50	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6758	MO-605140	1.00-2.50	SOIL	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6759	MO-605140	2.50-4.00	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6760	MO-605140	8.00-10.00	QBT4	09-1736	09-1735	09-1734	09-1735	09-1736	09-1736	09-1736	09-1736	09-1735	—	09-1735	09-1735
CAMO-09-6761	MO-605141	1.00-2.50	FILL	09-1758	09-1758	09-1757	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758
CAMO-09-6762	MO-605141	2.50-4.00	QBT4	09-1758	09-1758	09-1757	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758
CAMO-09-6763	MO-605141	7.50-10.00	QBT4	09-1758	09-1758	09-1757	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758	09-1758

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.5-2
Inorganic Chemicals above BVs at AOC 48-002(e)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Total Cyanide	Lead	Nitrate	Perchlorate	Selenium
SOIL,FILL Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**0.5**	**22.3**	**na[b]**	**na**	**1.52**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**0.5**	**11.2**	**na**	**na**	**0.3**
CAMO-09-6749	MO-605137	1.00–2.50	SOIL	1.18 (U)	—[c]	0.591 (U)	—	—	—	—	1.55	—	—
CAMO-09-6750	MO-605137	2.50–3.50	QBT4	1.07 (U)	60.7	—	—	—	—	—	1.4	0.00198 (J)	1.09 (U)
CAMO-09-6751	MO-605137	7.50–10.00	QBT4	1.06 (U)	—	—	—	—	—	15	1.29	0.00176 (J)	1.06 (U)
CAMO-09-6752	MO-605138	1.00–2.50	SOIL	1.15 (U)	—	0.575 (U)	—	—	—	—	1.17 (J)	—	—
CAMO-09-6753	MO-605138	3.50–5.00	QBT4	1.12 (U)	—	—	—	—	—	—	1.41	0.0034	1.11 (U)
CAMO-09-6754	MO-605138	9.00–10.50	QBT4	1.09 (U)	—	—	—	—	—	—	1.3	0.00108 (J)	1.06 (U)
CAMO-09-6755	MO-605139	1.00–2.50	SOIL	1.24 (U)	—	0.62 (U)	—	—	1.01	—	—	—	—
CAMO-09-6756	MO-605139	3.50–5.00	QBT4	1.09 (U)	52.8	—	—	7.92 (J)	—	—	—	0.00362	1.1 (U)
CAMO-09-6757	MO-605139	9.00–10.50	QBT4	1.07 (U)	—	—	—	—	—	—	1.05 (J)	0.00137 (J)	1.1 (U)
CAMO-09-6758	MO-605140	1.00–2.50	SOIL	1.17 (U)	—	0.585 (U)	—	—	—	—	1.15 (J)	0.00181 (J)	—
CAMO-09-6759	MO-605140	2.50–4.00	QBT4	1.12 (U)	—	—	—	—	—	—	1.11 (J)	0.00562	1.15 (U)
CAMO-09-6760	MO-605140	8.00–10.00	QBT4	1.06 (U)	—	—	—	—	—	—	1.16	0.00255	1.09 (U)
CAMO-09-6761	MO-605141	1.00–2.50	FILL	1.07 (U)	—	0.537 (U)	—	—	—	—	—	0.00366	—
CAMO-09-6762	MO-605141	2.50–4.00	QBT4	1.09 (U)	63.5	—	8480	—	—	—	—	0.00255	1.11 (U)
CAMO-09-6763	MO-605141	7.50–10.00	QBT4	1.07 (U)	—	—	—	—	—	—	—	0.00216 (J)	1.07 (U)

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 5.5-3
Organic Chemicals Detected at AOC 48-002(e)

Sample ID	Location ID	Depth(ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins(Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans(Total)	Hexachlorodibenzodioxins(Total)	Hexachlorodibenzofurans(Total)	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans(Totals)	Tetrachlorodibenzofurans(Totals)
CAMO-09-6749	MO-605137	1.00–2.50	SOIL	0.000000182(J)	0.000000182	—*	—	—	—	0.00000189(J)	—	—	—
CAMO-09-6750	MO-605137	2.50–3.50	QBT4	—	—	—	—	—	—	0.000000351(J)	—	—	—
CAMO-09-6751	MO-605137	7.50–10.00	QBT4	—	—	—	—	—	—	0.00000043(J)	—	—	—
CAMO-09-6752	MO-605138	1.00–2.50	SOIL	—	—	—	—	—	—	0.00000198(J)	—	—	0.000000113
CAMO-09-6753	MO-605138	3.50–5.00	QBT4	—	—	—	—	—	—	0.000000386(J)	—	—	—
CAMO-09-6754	MO-605138	9.00–10.50	QBT4	—	—	—	—	—	—	0.000000358(J)	—	—	—
CAMO-09-6755	MO-605139	1.00–2.50	SOIL	—	—	—	—	—	—	—	—	—	0.000000106
CAMO-09-6756	MO-605139	3.50–5.00	QBT4	—	—	—	—	—	—	0.0000013(J)	—	—	—
CAMO-09-6757	MO-605139	9.00–10.50	QBT4	—	0.000000261	—	—	—	—	0.00000189(J)	—	—	—
CAMO-09-6758	MO-605140	1.00–2.50	SOIL	0.0000025	0.00000528	0.000000456(J)	0.0000013	0.00000046	0.000000496	0.0000258	0.00000113(J)	0.000000244	0.000000606
CAMO-09-6759	MO-605140	2.50–4.00	QBT4	—	—	—	—	—	—	0.000000437(J)	—	—	—
CAMO-09-6761	MO-605141	1.00–2.50	FILL	0.000000415(J)	0.000000776	—	—	—	—	—	0.000000207(J)	—	—
CAMO-09-6762	MO-605141	2.50–4.00	QBT4	—	—	—	—	—	—	0.000000383(J)	—	—	—
CAMO-09-6763	MO-605141	7.50–10.00	QBT4	—	—	—	—	—	—	0.000000334(J)	—	—	—

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

* — = Not detected.

Table 5.5-4
Radionuclides Detected or Detected above BVs/FVs at AOC48-002(e)

Sample ID	Location ID	Depth(ft)	Media	Uranium-235/236
QBT4 Background Value*				**0.09**
CAMO-09-6750	MO-605137	2.50-3.50	QBT4	0.0946

Note: Results are in pCi/g.

* BVs/FVs are from LANL 1998, 059730.

Table 5.6-1
Samples Collected and Analyses Requested at SWMU 48-003

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA3401	48-02010	4.00-5.00	QBT3	—*	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3402	48-02010	8.50-9.50	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3403	48-02010	14.00-15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3404	48-02012	4.00-5.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3405	48-02012	9.00-10.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3406	48-02012	14.00-15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3407	48-02014	4.00-5.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3408	48-02014	7.00-7.20	SOIL	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3409	48-02014	9.00-10.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA4473	48-02014	14.00-15.00	QBT3	—	—	—	15162	—	—	15162	15162	15162	—	—	—	—	—	—	—
AAA3493	48-02016	0.00-0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3494	48-02017	0.00-0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3495	48-02018	0.00-0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3496	48-02019	0.00-0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3497	48-02020	0.00-0.50	SOIL	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3512	48-02054	0.00-0.50	SED	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3514	48-02054	0.50-1.50	SED	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3515	48-02054	1.50-2.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3513	48-02055	0.00-0.50	SED	15128	—	—	15128	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3516	48-02055	0.50-1.50	SED	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3470	48-02055	1.50-2.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
AAA3471	48-02055	2.50-3.50	SOIL	15128	—	—	—	—	—	15128	15128	15128	—	—	—	—	—	—	—
0448-97-0084	48-02136	0.00-0.50	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0085	48-02136	0.50-1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0087	48-02137	0.00-1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0089	48-02137	1.00-2.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0091	48-02138	0.00-0.50	SED	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0092	48-02138	0.50-1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0094	48-02139	0.00-1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0096	48-02139	1.00-2.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0098	48-02140	0.00-1.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
0448-97-0099	48-02140	1.00-2.00	SOIL	—	—	—	2997	—	—	2997	2997	2997	2996	—	—	2997	2995	—	—
CAMO-09-6768	MO-605142	0.00-0.50	SED	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6769	MO-605142	1.00-2.50	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937

Table 5.6-1 (continued)

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6770	MO-605142	6.00-7.50	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6771	MO-605142	11.00-12.50	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6772	MO-605142	16.00-17.50	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6773	MO-605143	0.00-0.50	FILL	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6774	MO-605143	5.00-7.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6775	MO-605143	10.00-12.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6776	MO-605143	15.00-17.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6777	MO-605143	20.00-22.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6778	MO-605144	0.00-0.50	SED	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	—	09-1837
CAMO-09-6779	MO-605144	0.50-2.00	QBT4	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	09-1836	09-1837
CAMO-09-6780	MO-605144	5.50-7.00	QBT4	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	09-1836	09-1837
CAMO-09-6781	MO-605144	10.50-12.00	QBT4	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	09-1836	09-1837
CAMO-09-6782	MO-605144	15.50-17.00	QBT4	09-1838	09-1837	—	09-1838	09-1838	09-1837	09-1838	09-1838	09-1838	09-1837	—	09-1837	09-1838	09-1836	09-1836	09-1837
CAMO-09-6783	MO-605145	0.00-0.50	SED	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6784	MO-605145	0.50-2.00	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6785	MO-605145	5.50-7.00	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6786	MO-605145	10.50-12.00	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6787	MO-605145	15.50-17.00	QBT4	09-1938	09-1937	—	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	—	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6788	MO-605146	0.00-0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6789	MO-605146	0.50-2.00	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6790	MO-605146	5.50-7.00	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6791	MO-605146	10.50-12.00	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6792	MO-605146	15.50-17.00	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6793	MO-605147	0.00-0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6794	MO-605147	0.50-2.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6795	MO-605147	5.50-7.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6796	MO-605147	10.50-12.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6797	MO-605147	15.50-17.50	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6798	MO-605148	0.00-0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6799	MO-605148	0.50-2.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6800	MO-605148	5.50-7.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6801	MO-605148	10.50-12.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6802	MO-605148	15.50-17.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6803	MO-605149	0.00-0.50	SED	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	—	09-1897
CAMO-09-6804	MO-605149	0.50-2.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897

Table 5.6-1 (continued)

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6805	MO-605149	5.50-7.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6806	MO-605149	10.50-12.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6807	MO-605149	15.50-17.00	QBT4	09-1898	09-1897	—	09-1898	09-1898	09-1897	09-1898	09-1898	09-1898	09-1897	—	09-1897	09-1898	09-1896	09-1896	09-1897
CAMO-09-6808	MO-605150	0.00-0.50	SED	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6809	MO-605150	2.50-4.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6810	MO-605150	7.50-9.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6811	MO-605150	12.50-14.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6812	MO-605150	17.50-19.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6813	MO-605151	0.00-0.50	SED	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	—	09-1973
CAMO-09-6814	MO-605151	0.50-2.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6815	MO-605151	5.50-7.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6816	MO-605151	10.50-12.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6817	MO-605151	15.50-17.00	QBT4	09-1974	09-1973	—	09-1974	09-1974	09-1973	09-1974	09-1974	09-1974	09-1973	—	09-1973	09-1974	09-1972	09-1972	09-1973
CAMO-09-6818	MO-605152	0.00-0.50	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	—	09-1996
CAMO-09-6819	MO-605152	0.50-2.00	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6820	MO-605152	5.50-7.00	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6821	MO-605152	10.50-12.50	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6822	MO-605152	15.50-17.00	QBT4	09-1997	09-1996	—	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	—	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6823	MO-605153	0.00-0.50	SED	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6824	MO-605153	0.50-2.00	QBT4	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6825	MO-605153	5.50-7.00	QBT4	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6826	MO-605153	10.50-12.00	QBT4	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6827	MO-605153	15.50-17.00	QBT4	09-1921	09-1920	09-1918	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	09-1919	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6828	MO-605154	0.00-0.50	SED	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6829	MO-605154	0.50-2.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6830	MO-605154	5.50-7.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6831	MO-605154	10.50-12.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6832	MO-605154	15.50-17.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6833	MO-605155	0.00-0.50	SED	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	—	09-1937
CAMO-09-6834	MO-605155	0.50-2.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6835	MO-605155	5.50-7.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6836	MO-605155	10.50-12.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6837	MO-605155	15.50-17.00	QBT4	09-1938	09-1937	09-1935	09-1938	09-1938	09-1937	09-1938	09-1938	09-1938	09-1937	09-1936	09-1937	09-1938	09-1936	09-1936	09-1937
CAMO-09-6838	MO-605156	0.00-0.50	FILL	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	—	09-1996
CAMO-09-6839	MO-605156	5.00-6.50	QBT4	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	09-1995	09-1996

Table 5.6-1 (continued)

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6840	MO-605156	10.00-11.50	QBT4	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6841	MO-605156	15.00-16.50	QBT4	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6842	MO-605156	20.00-21.50	QBT4	09-1997	09-1996	09-2020	09-1997	09-1997	09-1996	09-1997	09-1997	09-1997	09-1996	09-1995	09-1996	09-1997	09-1995	09-1995	09-1996
CAMO-09-6843	MO-605157	0.00-0.50	SOIL	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6844	MO-605157	0.50-1.50	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6845	MO-605158	0.00-0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6846	MO-605158	1.00-2.00	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6847	MO-605159	0.00-0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6848	MO-605159	1.50-2.50	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920
CAMO-09-6849	MO-605160	0.00-0.50	SED	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	—	09-1920
CAMO-09-6850	MO-605160	0.50-1.50	QBT4	09-1921	09-1920	—	09-1921	09-1921	09-1920	09-1921	09-1921	09-1921	09-1920	—	09-1920	09-1921	09-1919	09-1919	09-1920

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.6-2
Inorganic Chemicals above BVs at SWMU 48-003

Sample ID	Location ID	Depth(ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Lead	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**22.3**	**15.4**	**na**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**na**	**0.3**	**63.5**
0448-97-0084	48-02136	0.00–0.50	SOIL	5.8(U)	—[c]	—	0.58(U)	—	—	NA[d]	—	—	NA	—	—	NA	NA	—	—
0448-97-0085	48-02136	0.50–1.00	SOIL	5.49(U)	—	—	0.549(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0087	48-02137	0.00–1.00	SOIL	6.17(U)	—	—	0.617(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0089	48-02137	1.00–2.00	SOIL	5.51(U)	—	—	0.551(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0091	48-02138	0.00–0.50	SED	6.67(U)	—	—	0.667(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0092	48-02138	0.50–1.00	SOIL	6.04(U)	—	—	0.604(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0094	48-02139	0.00–1.00	SOIL	5.9(U)	—	—	0.59(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0096	48-02139	1.00–2.00	SOIL	5.5(U)	—	—	0.55(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0098	48-02140	0.00–1.00	SOIL	5.39(U)	—	—	0.539(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
0448-97-0099	48-02140	1.00–2.00	SOIL	5.7(U)	—	—	0.57(U)	—	—	NA	—	—	NA	—	—	NA	NA	—	—
CAMO-09-6768	MO-605142	0.00–0.50	SED	1.01(U)	—	—	0.505(U)	—	—	0.151(J)	—	—	—	—	—	—	0.156	1(U)	—
CAMO-09-6769	MO-605142	1.00–2.50	QBT4	1.12(U)	—	—	—	—	10.1	—	—	—	—	—	—	—	0.0103	1.11(U)	—
CAMO-09-6770	MO-605142	6.00–7.50	QBT4	1.05(U)	—	—	—	—	—	0.164(J)	—	—	—	—	—	2.67(J-)	0.079	1.09(U)	—
CAMO-09-6771	MO-605142	11.00–12.50	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—	—	—	3.68(J-)	0.00539	1.07(U)	—
CAMO-09-6772	MO-605142	16.00–17.50	QBT4	1(U)	—	—	—	—	—	—	—	—	—	—	—	2.09(J-)	0.0011(J)	1.02(U)	—
CAMO-09-6773	MO-605143	0.00–0.50	FILL	1.06(U)	—	—	0.528(U)	—	—	—	—	—	—	—	—	1.14(J-)	0.0156	—	—
CAMO-09-6774	MO-605143	5.00–7.00	QBT4	1.12(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00284	1.12(U)	—
CAMO-09-6775	MO-605143	10.00–12.00	QBT4	1.09(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00259	1.06(U)	—
CAMO-09-6776	MO-605143	15.00–17.00	QBT4	1.1(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00235	1.1(U)	—
CAMO-09-6777	MO-605143	20.00–22.00	QBT4	1.1(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0012(J)	1.06(U)	—
CAMO-09-6778	MO-605144	0.00–0.50	SED	0.986(U)	—	—	0.493(U)	—	—	—	—	—	—	—	—	—	0.00515	0.986(U)	—
CAMO-09-6779	MO-605144	0.50–2.00	QBT4	0.995(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0573	1.03(U)	—
CAMO-09-6780	MO-605144	5.50–7.00	QBT4	0.994(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00123(J)	1.01(U)	—
CAMO-09-6781	MO-605144	10.50–12.00	QBT4	1.02(U)	—	—	—	—	—	—	—	—	0.613	—	—	—	0.000934(J)	1.01(U)	—
CAMO-09-6782	MO-605144	15.50–17.00	QBT4	1.02(U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.02(U)	91
CAMO-09-6783	MO-605145	0.00–0.50	SED	0.961(U)	—	—	0.48(U)	—	—	—	—	—	—	—	—	—	0.0267	0.97(U)	—
CAMO-09-6784	MO-605145	0.50–2.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0104	1.05(U)	—
CAMO-09-6785	MO-605145	5.50–7.00	QBT4	1.04(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00936	1.06(U)	—
CAMO-09-6786	MO-605145	10.50–12.00	QBT4	0.998(U)	—	—	—	—	—	0.154(J)	—	—	—	—	—	—	0.0122	1(U)	—

Table 5.6-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Lead	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**22.3**	**15.4**	**na**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**na**	**0.3**	**63.5**
CAMO-09-6787	MO-605145	15.50–17.00	QBT4	1.04(U)	—	—	—	—	—	0.152(J)	—	—	—	—	—	—	0.00154(J)	1(U)	—
CAMO-09-6788	MO-605146	0.00–0.50	SED	0.983(U)	—	—	0.491(U)	—	—	—	—	—	—	—	—	—	0.0213	1.02(UJ)	—
CAMO-09-6789	MO-605146	0.50–2.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00355	1.1(U)	—
CAMO-09-6790	MO-605146	5.50–7.00	QBT4	1.09(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00261	1.08(U)	—
CAMO-09-6791	MO-605146	10.50–12.00	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00394	1.07(U)	—
CAMO-09-6792	MO-605146	15.50–17.00	QBT4	1.03(U)	—	—	—	—	14.6	—	—	—	—	—	—	—	0.00258	1.04(U)	—
CAMO-09-6793	MO-605147	0.00–0.50	SED	1(U)	—	—	0.501(U)	—	—	—	—	16.3	—	52.8(J)	—	—	0.0151	0.964(UJ)	70.5
CAMO-09-6794	MO-605147	0.50–2.00	QBT4	1.1(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00366	1.08(UJ)	—
CAMO-09-6795	MO-605147	5.50–7.00	QBT4	1.13(U)	—	—	—	—	—	0.173(J)	—	—	—	—	—	—	0.00645	1.15(UJ)	—
CAMO-09-6796	MO-605147	10.50–12.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00987	1.02(UJ)	—
CAMO-09-6797	MO-605147	15.50–17.50	QBT4	1.05(U)	—	—	—	—	—	0.201(J)	—	—	—	—	—	—	0.0102	1.04(UJ)	—
CAMO-09-6798	MO-605148	0.00–0.50	SED	1(U)	—	—	0.5(U)	—	—	0.187(J)	—	—	—	—	—	0.731(J-)	0.427	0.998(UJ)	—
CAMO-09-6799	MO-605148	0.50–2.00	QBT4	1.04(U)	—	—	—	—	—	0.153(J)	—	—	—	—	—	—	0.0131	1.05(UJ)	—
CAMO-09-6800	MO-605148	5.50–7.00	QBT4	1(U)	—	—	—	—	28.9	—	—	—	—	—	—	—	0.0312	1.02(UJ)	—
CAMO-09-6801	MO-605148	10.50–12.00	QBT4	1.01(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00233	1.04(UJ)	—
CAMO-09-6802	MO-605148	15.50–17.00	QBT4	1.03(U)	—	—	—	—	—	—	—	—	—	13.9(J)	—	—	0.00172(J)	1.05(UJ)	—
CAMO-09-6803	MO-605149	0.00–0.50	SED	1(U)	—	—	0.5(U)	—	—	—	—	—	—	—	—	—	0.011	0.983(UJ)	—
CAMO-09-6804	MO-605149	0.50–2.00	QBT4	1(U)	—	—	—	—	—	0.306(J)	—	—	—	—	—	—	0.0131	1.04(UJ)	—
CAMO-09-6805	MO-605149	5.50–7.00	QBT4	1.03(U)	—	—	—	—	—	0.151(J)	—	—	—	—	—	—	0.000958(J)	1(UJ)	—
CAMO-09-6806	MO-605149	10.50–12.00	QBT4	1.02(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0017(J)	0.991(UJ)	—
CAMO-09-6807	MO-605149	15.50–17.00	QBT4	1.02(U)	—	—	—	—	—	0.154(J)	—	—	—	—	—	—	—	1.03(UJ)	—
CAMO-09-6808	MO-605150	0.00–0.50	SED	1.02(U)	—	—	0.512(U)	—	—	—	—	—	—	—	—	6.88(J-)	0.00632	1.03(U)	—
CAMO-09-6809	MO-605150	2.50–4.00	QBT4	1.04(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00372	1.07(U)	—
CAMO-09-6810	MO-605150	7.50–9.00	QBT4	1.09(U)	—	—	—	—	7.23	—	—	—	—	—	—	—	0.00336	1.09(U)	—
CAMO-09-6811	MO-605150	12.50–14.00	QBT4	1.03(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00209(J)	1.07(U)	—
CAMO-09-6812	MO-605150	17.50–19.00	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—	—	—	1.31(J-)	0.00366	1.06(U)	—
CAMO-09-6813	MO-605151	0.00–0.50	SED	1.01(U)	—	—	0.503(U)	—	—	—	—	—	—	—	—	—	0.000785(J)	0.965(U)	—
CAMO-09-6814	MO-605151	0.50–2.00	QBT4	1.03(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0952	1.05(U)	—
CAMO-09-6815	MO-605151	5.50–7.00	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0146	1.05(U)	—
CAMO-09-6816	MO-605151	10.50–12.00	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0252	1.08(U)	—

Table 5.6-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Lead	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**22.3**	**15.4**	**na**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**na**	**0.3**	**63.5**
CAMO-09-6817	MO-605151	15.50–17.00	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0183	1.04(U)	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	0.97(U)	46.8	—	—	—	—	—	—	—	—	—	—	—	0.137	0.985(U)	—
CAMO-09-6819	MO-605152	0.50–2.00	QBT4	1.09(U)	—	1.33	—	—	—	—	—	—	—	—	—	—	0.0229	1.1(U)	—
CAMO-09-6820	MO-605152	5.50–7.00	QBT4	1.18(U)	73.3	1.4	—	3240	—	—	—	5.02	—	—	—	—	0.104	1.15(U)	—
CAMO-09-6821	MO-605152	10.50–12.50	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0714	1.07(U)	—
CAMO-09-6822	MO-605152	15.50–17.00	QBT4	1.04(U)	—	—	—	—	—	0.198(J)	—	—	—	—	—	—	0.0632	1.03(U)	—
CAMO-09-6823	MO-605153	0.00–0.50	SED	0.981(U)	—	—	0.49(U)	—	—	—	—	21.7	—	—	—	—	0.0259	0.958(U)	—
CAMO-09-6824	MO-605153	0.50–2.00	QBT4	1.07(U)	—	—	—	—	11.3	—	—	—	—	—	—	—	0.0514	1.12(U)	—
CAMO-09-6825	MO-605153	5.50–7.00	QBT4	1.1(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0294	1.13(U)	—
CAMO-09-6826	MO-605153	10.50–12.00	QBT4	1.15(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0456	1.15(U)	—
CAMO-09-6827	MO-605153	15.50–17.00	QBT4	1.05(U)	—	—	—	—	7.33	—	—	—	—	—	—	—	0.0198	1.06(U)	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	1(U)	—	—	0.502(U)	—	—	—	—	—	—	—	—	—	0.0259	0.978(U)	—
CAMO-09-6829	MO-605154	0.50–2.00	QBT4	1.03(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0521	1.07(U)	—
CAMO-09-6830	MO-605154	5.50–7.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0345	1.06(U)	—
CAMO-09-6831	MO-605154	10.50–12.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0445	1.07(U)	—
CAMO-09-6832	MO-605154	15.50–17.00	QBT4	1.02(U)	—	—	—	—	—	0.154(J)	—	—	—	—	—	—	0.00955	1.04(U)	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	0.981(U)	—	—	0.491(U)	—	—	—	—	—	—	—	—	—	0.0285	1.02(U)	—
CAMO-09-6834	MO-605155	0.50–2.00	QBT4	1.09(U)	—	—	—	—	—	0.168(J)	—	—	—	—	—	—	0.0224	1.09(U)	—
CAMO-09-6835	MO-605155	5.50–7.00	QBT4	1.12(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0501	1.12(U)	—
CAMO-09-6836	MO-605155	10.50–12.00	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0187	1.04(U)	—
CAMO-09-6837	MO-605155	15.50–17.00	QBT4	1.09(U)	—	—	—	—	—	0.161(J)	—	—	—	—	—	—	0.0419	1.09(U)	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	0.969(U)	—	—	0.485(U)	—	—	—	—	—	—	—	—	0.897(J)	0.0315	—	—
CAMO-09-6839	MO-605156	5.00–6.50	QBT4	1.04(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0116	1.09(U)	—
CAMO-09-6840	MO-605156	10.00–11.50	QBT4	1.12(U)	—	—	—	—	—	—	—	—	—	—	—	1.01(J)	0.0112	1.11(U)	—
CAMO-09-6841	MO-605156	15.00–16.50	QBT4	1.08(U)	—	—	—	—	—	—	—	—	—	—	—	2.77	0.0278	1.06(U)	—
CAMO-09-6842	MO-605156	20.00–21.50	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—	—	—	2.54	0.0116	1.03(U)	—
CAMO-09-6843	MO-605157	0.00–0.50	SOIL	1.03(U)	—	—	0.514(U)	—	—	—	—	—	—	—	—	—	0.0019(J)	—	—
CAMO-09-6844	MO-605157	0.50–1.50	QBT4	1.13(U)	253	—	—	—	—	—	3.51	5.59	—	—	6.59(J)	—	0.00839	1.09(U)	—
CAMO-09-6845	MO-605158	0.00–0.50	SED	1.12(U)	—	—	0.562(U)	—	—	—	—	—	—	—	—	1.21	0.00145(J)	1.13(U)	—
CAMO-09-6846	MO-605158	1.00–2.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00261	1.11(U)	—

Table 5.6-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Total Cyanide	Lead	Nickel	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**na[b]**	**4.73**	**11.2**	**0.82**	**19.7**	**9.38**	**na**	**na**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**	**22.3**	**15.4**	**na**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**0.5**	**11.2**	**6.58**	**na**	**na**	**0.3**	**63.5**
CAMO-09-6847	MO-605159	0.00–0.50	SED	0.995(U)	—	—	0.498(U)	—	—	—	—	—	—	—	—	2.41	—	1.03(U)	—
CAMO-09-6848	MO-605159	1.50–2.50	QBT4	1.09(U)	—	—	—	—	—	—	—	—	—	—	—	2.89	0.000979(J)	1.08(U)	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	1.01(U)	—	—	0.506(U)	—	—	—	—	—	—	—	—	2.08	0.00154(J)	1.01(U)	—
CAMO-09-6850	MO-605160	0.50–1.50	QBT4	1.07(U)	—	—	—	—	16.3	—	—	—	—	—	—	1.4	0.0012(J)	1.06(U)	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 5.6-3
Organic Chemicals Detected at SWMU 48-003

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	BenzoicAcid	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]
0448-97-0087	48-02137	0.00–1.00	SOIL	—[a]	NA[b]	—	NA	NA	—	—	—	—	0.18(J)	—	—	—	NA
0448-97-0089	48-02137	1.00–2.00	SOIL	—	NA	—	NA	NA	—	—	—	—	—	0.092(J)	—	—	NA
0448-97-0091	48-02138	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	0.13(J)	—	—	—	NA
0448-97-0096	48-02139	1.00–2.00	SOIL	—	NA	—	NA	NA	—	—	—	—	—	0.082(J)	—	—	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	—	NA	0.00943(J)	NA	NA	0.0155(J)	0.0103(J)	0.019(J)	—	—	—	0.0106(J)	0.0227(J)	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.0103(J)	—	—	0.408	—	0.0194(J)	NA
CAMO-09-6779	MO-605144	0.50–2.00	QBT4	—	—	0.00711(J)	NA	NA	—	0.0251(J)	0.0334(J)	0.0198(J)	—	—	0.0187(J)	0.0586	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	—	NA	—	NA	NA	0.0227(J)	0.0232(J)	0.0291(J)	0.0142(J)	—	—	0.023(J)	0.0436	NA
CAMO-09-6786	MO-605145	10.50–12.00	QBT4	—	0.00479(J)	—	NA	NA	—	—	—	—	—	—	—	—	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	—	NA	—	NA	NA	—	0.0171(J)	0.0302(J)	—	—	—	0.0209(J)	0.0385	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	—	NA	—	NA	NA	—	0.0192(J)	0.034	0.0119(J)	—	—	0.0224(J)	0.0432	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	—	NA	—	NA	NA	—	0.0119(J)	0.0217(J)	—	—	—	0.014(J)	0.0263(J)	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.0103(J)	—	—	—	—	0.0177(J)	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.0116(J)	—	—	—	—	0.0137(J)	NA
CAMO-09-6814	MO-605151	0.50–2.00	QBT4	—	—	—	NA	NA	—	—	—	—	—	—	—	0.0111(J)	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	NA	—	NA	NA	—	—	—	—	—	—	—	0.0126(J)	NA
CAMO-09-6820	MO-605152	5.50–7.00	QBT4	—	0.00385(J)	—	NA	NA	—	—	—	—	—	—	—	—	NA
CAMO-09-6822	MO-605152	15.50–17.00	QBT4	—	0.00244(J)	—	NA	NA	—	—	—	—	—	—	—	—	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	NA	—	0.0061	0.0063	—	—	—	—	—	—	—	—	0.00000663
CAMO-09-6824	MO-605153	0.50–2.00	QBT4	—	—	—	0.0382	0.0225	—	—	—	—	—	—	—	—	0.00000225(J)
CAMO-09-6828	MO-605154	0.00–0.50	SED	0.0225(J)	NA	—	0.0141(J)	0.0094	—	—	—	—	—	—	—	—	0.00000485
CAMO-09-6829	MO-605154	0.50–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000955(J)
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	NA	0.00704(J)	—	0.0037	0.0133(J)	—	0.0172(J)	—	—	—	—	0.0175(J)	0.00000364
CAMO-09-6834	MO-605155	0.50–2.00	QBT4	—	—	—	—	0.0022(J)	—	—	—	—	—	—	—	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	NA	—	0.0162	0.019	0.0156(J)	0.0129(J)	0.0238(J)	—	—	—	0.0151(J)	0.0274(J)	0.0000046
CAMO-09-6839	MO-605156	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6846	MO-605158	1.00–2.00	QBT4	—	0.059(J)	—	NA	NA	—	—	—	—	—	—	—	—	NA
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.0109(J)	—	—	—	—	0.0127(J)	NA

Table 5.6-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Heptachlorodibenzodioxins (Total)	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-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)
0448-97-0087	48-02137	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0089	48-02137	1.00–2.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0091	48-02138	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0096	48-02139	1.00–2.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6779	MO-605144	0.50–2.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6783	MO-605145	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6786	MO-605145	10.50–12.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6788	MO-605146	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6814	MO-605151	0.50–2.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6820	MO-605152	5.50–7.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6822	MO-605152	15.50–17.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6823	MO-605153	0.00–0.50	SED	0.0000109	0.00000109 (J)	—	0.00000257	0.000000295 (J)	—	0.00000101	0.000000167 (J)	0.000000126 (J)	0.000000151 (J)	0.00000123
CAMO-09-6824	MO-605153	0.50–2.00	QBT4	0.00000433	—	—	—	—	—	—	—	—	—	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	0.00000878	0.000000884 (J)	0.000000141 (J)	0.00000231	—	—	0.000000491	0.00000016 (J)	0.000000108 (J)	0.000000137 (J)	0.00000143 (J)
CAMO-09-6829	MO-605154	0.50–2.00	QBT4	0.00000182	0.000000177 (J)	—	0.000000177	—	—	—	—	—	—	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	0.00000721	0.00000063 (J)	—	0.00000151	0.000000177 (J)	0.000000164 (J)	0.00000134	—	—	—	—
CAMO-09-6834	MO-605155	0.50–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	0.00000981	0.000000799 (J)	—	0.00000184	0.000000236 (J)	—	0.00000169	—	—	—	0.00000102
CAMO-09-6839	MO-605156	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6846	MO-605158	1.00–2.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6849	MO-605160	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.6-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Toluene
0448-97-0087	48-02137	0.00–1.00	SOIL	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
0448-97-0089	48-02137	1.00–2.00	SOIL	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
0448-97-0091	48-02138	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
0448-97-0096	48-02139	1.00–2.00	SOIL	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA
CAMO-09-6768	MO-605142	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	0.0221 (J)	NA	NA	NA
CAMO-09-6778	MO-605144	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	0.0167 (J)	NA	NA	NA
CAMO-09-6779	MO-605144	0.50–2.00	QBT4	0.0154 (J)	—	NA	NA	NA	NA	0.0333 (J)	0.0548	NA	NA	—
CAMO-09-6783	MO-605145	0.00–0.50	SED	0.0117 (J)	NA	NA	NA	NA	NA	0.022 (J)	0.0432	NA	NA	NA
CAMO-09-6786	MO-605145	10.50–12.00	QBT4	—	—	NA	NA	NA	NA	—	—	NA	NA	—
CAMO-09-6788	MO-605146	0.00–0.50	SED	—	NA	NA	NA	NA	NA	0.0152 (J)	0.0358	NA	NA	NA
CAMO-09-6793	MO-605147	0.00–0.50	SED	0.0127 (J)	NA	NA	NA	NA	NA	0.017 (J)	0.037	NA	NA	NA
CAMO-09-6798	MO-605148	0.00–0.50	SED	—	NA	NA	NA	NA	NA	0.0101 (J)	0.0246 (J)	NA	NA	NA
CAMO-09-6803	MO-605149	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	0.018 (J)	NA	NA	NA
CAMO-09-6808	MO-605150	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	0.0124 (J)	NA	NA	NA
CAMO-09-6814	MO-605151	0.50–2.00	QBT4	—	—	NA	NA	NA	NA	—	—	NA	NA	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	NA	NA	NA	NA	NA	—	0.0126 (J)	NA	NA	NA
CAMO-09-6820	MO-605152	5.50–7.00	QBT4	—	—	NA	NA	NA	NA	—	—	NA	NA	—
CAMO-09-6822	MO-605152	15.50–17.00	QBT4	—	—	NA	NA	NA	NA	—	—	NA	NA	—
CAMO-09-6823	MO-605153	0.00–0.50	SED	—	NA	0.0000489 (J)	0.00000293 (J)	—	0.000000112	—	—	—	0.000000273	NA
CAMO-09-6824	MO-605153	0.50–2.00	QBT4	—	—	0.0000176 (J)	0.00000108 (J)	—	—	—	—	—	0.000000206	—
CAMO-09-6828	MO-605154	0.00–0.50	SED	—	NA	0.0000412 (J)	0.00000172 (J)	0.00000017 (J)	0.000000297	—	—	—	0.00000043	NA
CAMO-09-6829	MO-605154	0.50–2.00	QBT4	—	—	0.00000691 (J)	0.000000429 (J)	—	—	—	—	—	—	—
CAMO-09-6833	MO-605155	0.00–0.50	SED	—	NA	0.0000306 (J)	0.00000131 (J)	—	—	—	0.016 (J)	—	—	NA
CAMO-09-6834	MO-605155	0.50–2.00	QBT4	—	—	0.0000023 (J)	—	—	—	—	—	—	6.45E-08	—
CAMO-09-6838	MO-605156	0.00–0.50	FILL	—	NA	0.0000308	0.0000015 (J)	0.000000177 (J)	0.00000134	0.0107 (J)	0.0258 (J)	0.000000426	0.00000116	NA
CAMO-09-6839	MO-605156	5.00–6.50	QBT4	—	—	0.000000838 (J)	—	—	—	—	—	—	—	—

Table 5.6-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Toluene
CAMO-09-6846	MO-605158	1.00–2.00	QBT4	—	0.0127	NA	NA	NA	NA	—	—	NA	NA	0.00261
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	NA	NA	NA	NA	NA	—	0.0137 (J)	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.6-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 48-003

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-230	Tritium	Uranium-234	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.29**	**0.093**	**2.59**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.29**	**na**	**2.59**	**2.29**
QBT3,QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**na**	**1.98**	**1.93**
AAA3407	48-02014	4.00–5.00	QBT3	—[d]	NA[e]	NA	—	0.045(J-)	NA	—	NA	—	—
AAA3408	48-02014	7.00–7.20	SOIL	—	NA	NA	0.092(J-)	—	NA	—	NA	—	—
AAA3409	48-02014	9.00–10.00	QBT3	—	NA	NA	0.277(J-)	—	NA	—	NA	—	—
AAA3496	48-02019	0.00–0.50	SOIL	0.153	2.549	—	—	0.941	NA	—	NA	3.48	3.97(J+)
AAA3497	48-02020	0.00–0.50	SOIL	1.16	—	—	0.162	6.4	NA	—	NA	—	—
AAA3512	48-02054	0.00–0.50	SED	0.545	—	—	—	2.08	NA	—	NA	—	—
AAA3514	48-02054	0.50–1.50	SED	0.292	NA	NA	—	1.74	NA	—	NA	3.02	2.93(J+)
AAA3515	48-02054	1.50–2.50	SOIL	0.601	NA	NA	—	0.935	NA	2.35(J+)	NA	—	—
AAA3513	48-02055	0.00–0.50	SED	0.213	—	—	—	0.339	NA	—	NA	—	—
AAA3516	48-02055	0.50–1.50	SED	0.291	NA	NA	—	3.15	NA	—	NA	—	—
AAA3470	48-02055	1.50–2.50	SOIL	0.713	NA	NA	—	1.07	NA	—	NA	6.63(J+)	5.64(J+)
AAA3471	48-02055	2.50–3.50	SOIL	0.337	NA	NA	—	—	NA	—	NA	—	—
0448-97-0085	48-02136	0.50–1.00	SOIL	—	—	—	—	—	0.308	—	NA	—	—
0448-97-0098	48-02140	0.00–1.00	SOIL	—	—	0.0795	—	—	—	—	NA	—	—
0448-97-0099	48-02140	1.00–2.00	SOIL	—	0.3036	—	—	0.0225	0.834	—	NA	—	—
CAMO-09-6769	MO-605142	1.00–2.50	QBT4	—	—	—	—	0.0357	—	—	—	—	—
CAMO-09-6770	MO-605142	6.00–7.50	QBT4	—	—	—	—	—	—	—	0.0328566	—	—
CAMO-09-6771	MO-605142	11.00–12.50	QBT4	—	—	—	—	—	—	—	0.108133	—	—
CAMO-09-6772	MO-605142	16.00–17.50	QBT4	—	—	—	—	—	—	—	0.0397985	—	—
CAMO-09-6774	MO-605143	5.00–7.00	QBT4	—	—	—	—	0.0233	—	—	—	—	—
CAMO-09-6775	MO-605143	10.00–12.00	QBT4	—	—	—	—	0.0198	—	—	—	—	—
CAMO-09-6783	MO-605145	0.00–0.50	SED	—	2.09	—	—	0.0847	—	—	—	—	2.37
CAMO-09-6785	MO-605145	5.50–7.00	QBT4	—	—	—	—	—	—	—	0.13238	—	—
CAMO-09-6786	MO-605145	10.50–12.00	QBT4	—	—	—	—	—	—	—	0.0369832	—	—
CAMO-09-6787	MO-605145	15.50–17.00	QBT4	—	—	—	—	—	—	—	0.0387713	—	—
CAMO-09-6793	MO-605147	0.00–0.50	SED	—	—	—	—	—	—	—	334	—	—
CAMO-09-6801	MO-605148	10.50–12.00	QBT4	—	—	—	—	—	—	—	0.0122582	—	—
CAMO-09-6802	MO-605148	15.50–17.00	QBT4	—	—	—	—	—	—	—	0.0148457	—	—

Table 5.6-4 (continued)

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-230	Tritium	Uranium-234	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.29**	**0.093**	**2.59**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.29**	**na**	**2.59**	**2.29**
QBT3,QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.98**	**na**	**1.98**	**1.93**
CAMO-09-6803	MO-605149	0.00–0.50	SED	0.161	—	—	—	0.33	—	—	—	—	—
CAMO-09-6804	MO-605149	0.50–2.00	QBT4	—	—	—	—	0.0344	—	—	—	—	—
CAMO-09-6805	MO-605149	5.50–7.00	QBT4	—	—	—	—	—	—	—	0.00575026	—	—
CAMO-09-6806	MO-605149	10.50–12.00	QBT4	—	—	—	—	—	—	—	0.00973144	—	—
CAMO-09-6815	MO-605151	5.50–7.00	QBT4	—	—	—	—	0.0187	—	—	—	—	—
CAMO-09-6818	MO-605152	0.00–0.50	QBT4	—	0.0845	—	—	—	—	—	0.00486617	—	—
CAMO-09-6821	MO-605152	10.50–12.50	QBT4	—	—	—	—	—	—	—	0.0284791	—	—
CAMO-09-6824	MO-605153	0.50–2.00	QBT4	—	0.0743	—	—	0.0389	—	—	—	—	—
CAMO-09-6829	MO-605154	0.50–2.00	QBT4	—	—	—	—	0.0316	—	—	—	—	—
CAMO-09-6836	MO-605155	10.50–12.00	QBT4	—	—	—	—	0.0229	—	—	—	—	—
CAMO-09-6841	MO-605156	15.00–16.50	QBT4	—	—	—	—	—	—	—	0.0230749	—	—
CAMO-09-6842	MO-605156	20.00–21.50	QBT4	—	—	—	—	—	—	—	0.027972	—	—
CAMO-09-6848	MO-605159	1.50–2.50	QBT4	—	0.261	—	—	—	—	—	—	—	—
CAMO-09-6849	MO-605160	0.00–0.50	SED	—	1.08	—	—	—	—	—	—	—	—
CAMO-09-6850	MO-605160	0.50–1.50	QBT4	—	0.318	—	—	0.0298	—	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

[e] NA=Not analyzed.

Table 5.8-1
Samples Collected and Analyses Requested at SWMU 48-005

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA3717	48-02024	4.00–5.00	FILL	15213	—*	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3718	48-02024	8.00–9.00	FILL	15213	—	—	15213	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3719	48-02024	14.00–15.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3720	48-02025	4.00–5.00	FILL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3721	48-02025	5.50–6.50	FILL	15213	—	—	15213	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3722	48-02025	7.50–8.50	FILL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4475	48-02025	9.00–10.00	QBT4	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4476	48-02025	13.00–14.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3723	48-02026	1.50–2.50	SOIL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3724	48-02026	6.00–7.40	SOIL	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA4469	48-02026	14.00–15.00	QBT3	15213	—	—	—	—	—	15213	15213	15213	—	—	—	—	—	—	—
AAA3803	48-02067	0.00–1.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3804	48-02067	1.00–2.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3806	48-02068	0.00–1.00	SOIL	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3810	48-02069	0.00–1.00	SOIL	16193	—	—	16193	—	—	16193	16193	16193	—	—	—	—	16178	—	—
AAA3811	48-02069	1.00–2.00	QBT4	16193	—	—	—	—	—	16193	16193	16193	—	—	—	—	16178	—	—
0448-97-0009	48-02141	11.50–12.50	FILL	—	—	—	2906	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0011	48-02141	12.50–13.50	QBT4	—	—	—	2906	—	—	—	—	—	—	—	—	—	—	—	—
0448-97-0037	48-02142	3.33–4.33	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0039	48-02142	4.66–5.12	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0040	48-02148	3.30–4.30	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0041	48-02148	4.66–5.16	FILL	—	—	—	2981	—	—	2981	2981	2981	2980	—	—	2981	2979	2979	—
0448-97-0001	48-02150	3.50–4.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0002	48-02150	8.50–9.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0003	48-02150	14.00–15.00	QBT4	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0004	48-02151	6.00–7.00	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0006	48-02151	13.50–14.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0007	48-02151	15.50–16.50	FILL	—	—	—	2906	—	—	—	2906	2906	—	—	—	2906	—	—	—
0448-97-0057	48-02152	0.00–1.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0058	48-02152	1.00–2.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0059	48-02153	0.00–1.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0060	48-02153	1.00–2.00	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0062	48-02154	0.00–0.83	SED	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—
0448-97-0061	48-02154	0.83–1.67	SOIL	—	—	—	2977	—	—	—	2977	2977	—	—	—	2977	—	—	—

Table 5.8-1 (continued)

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0045	48-02155	5.00–6.00	FILL	—	—	—	2919	—	—	2919	2919	2919	2918	—	—	2919	2917	2917	—
0448-97-0012	48-02156	17.50–18.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0013	48-02156	21.00–22.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0014	48-02156	24.00–25.00	QBT3	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0015	48-02157	3.50–4.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0016	48-02157	5.00–6.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0018	48-02157	9.00–10.00	SOIL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0019	48-02158	3.50–4.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0020	48-02158	5.50–6.50	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
0448-97-0021	48-02158	9.00–10.00	FILL	—	—	—	2906	—	—	2906	2906	2906	—	—	—	2906	—	—	—
CAMO-09-6718	MO-605128	1.50–2.50	FILL	—	09-2026	09-2024	09-2026	09-2026	09-2026	—	—	—	09-2026	09-2025	09-2026	—	09-2025	—	09-2026
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	—	09-2026	09-2024	09-2026	09-2026	09-2026	—	—	—	09-2026	09-2025	09-2026	—	09-2025	09-2025	09-2026
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	—	09-2026	09-2024	09-2026	09-2026	09-2026	—	—	—	09-2026	09-2025	09-2026	—	09-2025	09-2025	09-2026
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	09-1805	09-1806	09-1805	09-1805	09-1805	—	—	—	09-1805	09-1805	09-1805	—	09-1805	—	09-1805
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	—	09-1805	09-1806	09-1805	09-1805	09-1805	—	—	—	09-1805	09-1805	09-1805	—	09-1805	09-1805	09-1805
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	—	09-1805	09-1806	09-1805	09-1805	09-1805	—	—	—	09-1805	09-1805	09-1805	—	09-1805	09-1805	09-1805
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	09-1824	09-1823	09-1824	09-1824	09-1824	—	—	—	09-1824	09-1824	09-1824	—	09-1824	—	09-1824
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	—	09-1824	09-1823	09-1824	09-1824	09-1824	—	—	—	09-1824	09-1824	09-1824	—	09-1824	09-1824	09-1824
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	—	09-1904	09-1903	09-1904	09-1904	09-1904	—	—	—	09-1904	09-1904	09-1904	—	09-1904	09-1904	09-1904
CAMO-09-6727	MO-605131	0.00–0.50	FILL	—	09-2026	—	09-2026	09-2026	09-2026	—	—	—	09-2026	—	09-2026	—	09-2025	—	09-2026
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	—	09-2026	—	09-2026	09-2026	09-2026	—	—	—	09-2026	—	09-2026	—	09-2025	09-2025	09-2026
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	—	09-2026	—	09-2026	09-2026	09-2026	—	—	—	09-2026	—	09-2026	—	09-2025	09-2025	09-2026
CAMO-09-6730	MO-605132	0.00–0.50	SED	—	09-1805	—	09-1805	09-1805	09-1805	—	—	—	09-1805	—	09-1805	—	09-1805	—	09-1805
CAMO-09-6731	MO-605132	2.00–3.00	QBT4	—	09-1805	—	09-1805	09-1805	09-1805	—	—	—	09-1805	—	09-1805	—	09-1805	09-1805	09-1805
CAMO-09-6732	MO-605132	5.00–6.00	QBT4	—	09-1805	—	09-1805	09-1805	09-1805	—	—	—	09-1805	—	09-1805	—	09-1805	09-1805	09-1805

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.8-2
Inorganic Chemicals above BVs at SWMU 48-005

Sample ID	Location ID	Depth(ft)	Media	Antimony	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
FILL Background Value[a]				**0.83**	**295**	**0.4**	**19.3**	**8.64**	**14.7**	**22.3**	**671**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
SED Background Value[a]				**0.83**	**127**	**0.4**	**10.5**	**4.73**	**11.2**	**19.7**	**543**	**0.1**	**na**	**na**	**0.3**	**1**	**60.2**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**7.14**	**3.14**	**4.66**	**11.2**	**482**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
0448-97-0037	48-02142	3.33–4.33	FILL	5.4(U)	—[c]	0.54(U)	—	—	—	—	—	—	NA[d]	NA	—	—	—
0448-97-0039	48-02142	4.66–5.12	FILL	5.54(U)	—	0.554(U)	—	—	—	—	—	—	NA	NA	—	—	—
0448-97-0040	48-02148	3.30–4.30	FILL	5.69(U)	—	0.569(U)	—	—	—	—	—	—	NA	NA	—	—	—
0448-97-0041	48-02148	4.66–5.16	FILL	5.79(U)	—	0.579(U)	—	—	—	—	—	—	NA	NA	—	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	12(UJ)	—	0.6(U)	—	—	—	—	—	0.12(U)	NA	NA	—	2.4(U)	—
0448-97-0044	48-02155	3.67–4.67	FILL	12(UJ)	—	0.59(U)	26	—	—	—	—	0.12(U)	NA	NA	—	2.4(U)	74
0448-97-0045	48-02155	5.00–6.00	FILL	12(UJ)	—	0.59(U)	20	—	—	—	—	0.12(U)	NA	NA	—	2.4(U)	—
CAMO-09-6718	MO-605128	1.50–2.50	FILL	1.15(U)	—	0.577(U)	—	—	—	—	—	—	1.08	—	—	—	—
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	1.13(U)	47.9(J-)	—	—	—	—	—	—	—	1.29	—	1.16(U)	—	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	1.15(U)	81.4(J-)	—	—	3.41	7.69	13.6(J)	—	—	1.29	—	1.2(U)	—	—
CAMO-09-6721	MO-605129	0.00–0.50	SED	1.09(U)	—	0.547(U)	—	—	—	—	—	—	0.864(J)	0.000586(J)	1.11(U)	—	—
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	1.13(U)	—	—	—	—	—	—	—	—	—	—	1.14(U)	—	—
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	1.08(U)	—	—	—	—	—	—	—	—	—	0.0018(J)	1.1(U)	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.984(U)	—	0.492(U)	—	—	—	—	—	—	—	0.000518(J)	0.988(UJ)	—	—
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	1.04(U)	58.3(J-)	—	18.4(J-)	—	—	—	528(J)	—	—	0.000629(J)	1.05(UJ)	—	—
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	1.02(U)	—	—	17.4(J)	—	—	—	—	—	—	0.000613(J)	0.995(U)	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	1.07(U)	—	0.534(U)	—	—	—	—	—	—	1.01(J)	—	—	—	391
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	1.12(U)	—	—	18.8	—	—	—	—	—	—	—	1.09(U)	—	—
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	1.13(U)	—	—	27.7	—	—	—	—	—	—	—	1.07(U)	—	—
CAMO-09-6730	MO-605132	0.00–0.50	SED	1.05(U)	—	0.524(U)	—	—	—	—	—	—	1.44	—	1.03(U)	—	—
CAMO-09-6731	MO-605132	2.00–3.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—	0.00076(J)	1.07(U)	—	—
CAMO-09-6732	MO-605132	5.00–6.00	QBT4	1.06(U)	—	—	9.53	—	—	—	—	—	—	—	1.01(U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 5.8-3
Organic Chemicals Detected at SWMU 48-005

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	Bis(2-ethylhexyl)phthalate
0448-97-0037	48-02142	3.33–4.33	FILL	—[a]	0.006(J)	—	NA[b]	NA	NA	—	—	—	—	0.18(J)
0448-97-0039	48-02142	4.66–5.12	FILL	—	0.014(J)	—	NA	NA	NA	—	—	—	—	—
0448-97-0040	48-02148	3.30–4.30	FILL	—	0.01(J)	—	NA	NA	NA	—	—	—	—	0.092(J)
0448-97-0041	48-02148	4.66–5.16	FILL	—	0.018(J)	—	NA	NA	NA	—	—	—	—	0.23(J)
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	NA	NA	NA	—	—	—	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	0.041	—	NA	NA	NA	—	—	—	—	110
0448-97-0045	48-02155	5.00–6.00	FILL	—	0.016(J)	—	NA	NA	NA	—	—	—	—	—
CAMO-09-6718	MO-605128	1.50–2.50	FILL	—	NA	—	—	—	—	—	—	—	—	—
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	—	0.0039(J)	—	—	—	—	—	—	—	—	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	—	—	—	—	0.0029(J)	—	—	—	—	—	—
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	NA	—	—	0.0045	0.0024(J)	—	—	—	—	—
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	—	—	—	0.0028(J)	0.0026(J)	—	—	—	—	—	—
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.0201(J)	NA	0.0256(J)	—	0.0087(J)	0.0069(J)	0.0788	0.0893	0.153	0.0709	—
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	—	—	—	—	0.0028(J)	—	—	—	—	—	—
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	—	0.00251(J)	—	—	0.0018(J)	0.0013(J)	—	—	—	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	0.0241(J)	NA	0.0446	NA	NA	NA	0.195	0.202	0.344	0.108	—
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	—	—	—	NA	NA	NA	—	0.0204(J)	0.0325(J)	0.0118(J)	—
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	—	—	—	NA	NA	NA	—	—	—	—	—

Table 5.8-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Butylbenzylphthalate	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins(Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
0448-97-0037	48-02142	3.33–4.33	FILL	—	—	—	—	—	—	NA	NA	NA
0448-97-0039	48-02142	4.66–5.12	FILL	—	—	—	—	—	—	NA	NA	NA
0448-97-0040	48-02148	3.30–4.30	FILL	—	—	—	—	—	—	NA	NA	NA
0448-97-0041	48-02148	4.66–5.16	FILL	—	—	—	—	—	—	NA	NA	NA
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	—	—	—	NA	NA	NA
0448-97-0044	48-02155	3.67–4.67	FILL	20	—	9.6(J)	14(J)	—	—	NA	NA	NA
0448-97-0045	48-02155	5.00–6.00	FILL	—	—	—	—	—	—	NA	NA	NA
CAMO-09-6718	MO-605128	1.50–2.50	FILL	—	—	—	—	—	—	0.000000886(J)	0.0000023	—
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	—	—	—	—	—	—	0.000000637(J)	0.00000184	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	—	—	—	—	—	—	0.00000186(J)	0.00000587	0.000000502(J)
CAMO-09-6721	MO-605129	0.00–0.50	SED	—	—	—	—	0.0128(J)	—	0.000014	0.0000247	0.00000234(J)
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	—	—	—	—	—	—	0.000000705(J)	0.00000124	—
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	—	—	—	—	—	—	0.000000615(J)	0.00000116	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	—	0.0951	—	—	0.183	0.0111(J)	0.000013	0.0000261	0.00000213(J)
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	—	—	—	—	—	—	0.00000129(J)	0.00000335	0.000000269(J)
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	—	—	—	—	—	—	0.0000019(J)	0.00000383	0.0000004(J)
CAMO-09-6727	MO-605131	0.00–0.50	FILL	—	0.234	—	—	0.462	0.0183(J)	NA	NA	NA
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	—	0.0196(J)	—	—	0.0469	—	NA	NA	NA
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	—	—	—	—	0.0135(J)	—	NA	NA	NA

Table 5.8-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Heptachlorodibenzofurans(Total)	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins(Total)	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans(Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	MethyleneChloride
0448-97-0037	48-02142	3.33–4.33	FILL	NA	NA	NA	NA	NA	NA	—	—	—
0448-97-0039	48-02142	4.66–5.12	FILL	NA	NA	NA	NA	NA	NA	—	—	0.002(J)
0448-97-0040	48-02148	3.30–4.30	FILL	NA	NA	NA	NA	NA	NA	—	—	—
0448-97-0041	48-02148	4.66–5.16	FILL	NA	NA	NA	NA	NA	NA	—	—	0.004(J)
0448-97-0043	48-02155	1.50–2.50	FILL	NA	NA	NA	NA	NA	NA	—	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	NA	NA	NA	NA	NA	NA	—	—	—
0448-97-0045	48-02155	5.00–6.00	FILL	NA	NA	NA	NA	NA	NA	—	—	—
CAMO-09-6718	MO-605128	1.50–2.50	FILL	—	—	—	—	—	8.19E-08	—	NA	NA
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	0.00000017	—	—	—	—	7.85E-08	—	—	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	0.00000128	—	—	0.000000309	—	0.000000598	—	—	—
CAMO-09-6721	MO-605129	0.00–0.50	SED	0.00000682	—	—	0.00000188	0.000000108(J)	0.00000209	—	NA	NA
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	0.000000195	—	—	—	—	—	—	—	—
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.00000595	0.000000435(J)	0.000000281(J)	0.00000275	0.000000131(J)	0.00000185	0.0549	NA	NA
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	0.000000986	—	—	—	—	0.000000119	—	0.00475	—
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	0.00000104	—	—	0.00000017	—	0.000000198	—	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	NA	NA	NA	NA	NA	NA	0.0931	NA	NA
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	NA	NA	NA	NA	NA	NA	—	—	—
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	NA	NA	NA	NA	NA	NA	—	—	—

Table 5.8-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	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)	Pentachlorodibenzofurans(Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans(Totals)	Toluene
0448-97-0037	48-02142	3.33–4.33	FILL	NA	NA	NA	NA	NA	—	—	NA	—
0448-97-0039	48-02142	4.66–5.12	FILL	NA	NA	NA	NA	NA	—	—	NA	—
0448-97-0040	48-02148	3.30–4.30	FILL	NA	NA	NA	NA	NA	—	—	NA	—
0448-97-0041	48-02148	4.66–5.16	FILL	NA	NA	NA	NA	NA	—	—	NA	—
0448-97-0043	48-02155	1.50–2.50	FILL	NA	NA	NA	NA	NA	—	0.047(J)	NA	—
0448-97-0044	48-02155	3.67–4.67	FILL	NA	NA	NA	NA	NA	—	—	NA	—
0448-97-0045	48-02155	5.00–6.00	FILL	NA	NA	NA	NA	NA	—	—	NA	—
CAMO-09-6718	MO-605128	1.50–2.50	FILL	0.00000538	—	—	—	—	—	—	—	NA
CAMO-09-6719	MO-605128	4.00–5.00	QBT4	0.0000058	—	—	—	0.000000148	—	—	—	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	0.0000148	0.000000839(J)	—	—	0.000000299	—	—	—	—
CAMO-09-6721	MO-605129	0.00–0.50	SED	0.00013(J)	0.00000778	0.000000183(J)	0.000000183	0.000000279	—	—	0.000000271	NA
CAMO-09-6722	MO-605129	1.25–2.50	QBT4	0.00000663(J)	0.000000461(J)	—	—	—	—	—	—	—
CAMO-09-6723	MO-605129	3.25–4.25	QBT4	0.00000564(J)	—	—	—	—	—	—	—	—
CAMO-09-6724	MO-605130	0.00–0.50	SED	0.000106(J)	0.00000554	—	—	0.000000765	0.111	0.188	0.000000386	NA
CAMO-09-6725	MO-605130	1.50–2.50	QBT4	0.0000106(J)	0.000000781(J)	—	—	—	—	—	—	—
CAMO-09-6726	MO-605130	3.00–4.00	QBT4	0.000016(J)	0.00000101(J)	—	—	—	—	—	—	—
CAMO-09-6727	MO-605131	0.00–0.50	FILL	NA	NA	NA	NA	NA	0.241	0.465	NA	NA
CAMO-09-6728	MO-605131	1.00–2.00	QBT4	NA	NA	NA	NA	NA	0.0316(J)	0.043	NA	0.000369(J)
CAMO-09-6729	MO-605131	3.00–4.50	QBT4	NA	NA	NA	NA	NA	—	0.0135(J)	NA	—

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.8-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 48-005

Sample ID	Location ID	Depth(ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-230	Uranium-234
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**1.31**	**2.29**	**2.59**
QBT3,QBT4 Background Value[a]				**na[c]**	**na**	**na**	**na**	**na**	**1.98**	**1.98**
AAA3717	48-02024	4.00–5.00	FILL	—[d]	NA[e]	—	—	NA	3.85(J)	—
AAA3721	48-02025	5.50–6.50	FILL	—	—	—	—	NA	3.11(J)	—
AAA4476	48-02025	13.00–14.00	QBT3	—	NA	—	—	NA	2.07(J)	—
AAA3723	48-02026	1.50–2.50	SOIL	—	NA	5.19(J)	—	NA	—	—
AAA3724	48-02026	6.00–7.40	SOIL	5.27(J-)	NA	223(J)	11.9	NA	—	—
AAA4469	48-02026	14.00–15.00	QBT3	—	NA	—	—	NA	—	2.04
AAA3806	48-02068	0.00–1.00	SOIL	—	NA	0.0348(J-)	—	NA	—	—
0448-97-0001	48-02150	3.50–4.50	FILL	—	—	NA	NA	0.46	—	—
0448-97-0002	48-02150	8.50–9.50	FILL	—	—	NA	NA	0.5	—	—
0448-97-0043	48-02155	1.50–2.50	FILL	—	—	—	0.028	—	—	—
0448-97-0044	48-02155	3.67–4.67	FILL	—	—	0.023	0.042	—	—	—
0448-97-0045	48-02155	5.00–6.00	FILL	—	0.118	0.059	0.059	—	—	—
0448-97-0015	48-02157	3.50–4.50	FILL	—	—	4.64	0.218	—	—	—
0448-97-0016	48-02157	5.00–6.00	FILL	—	—	21.847	1.135	0.43	—	—
0448-97-0018	48-02157	9.00–10.00	SOIL	—	—	1.205	0.052	—	—	—
0448-97-0019	48-02158	3.50–4.50	FILL	—	—	2.766	0.171	—	—	—
0448-97-0020	48-02158	5.50–6.50	FILL	4.511	—	110.02	5.311	2.9	—	—
0448-97-0021	48-02158	9.00–10.00	FILL	—	—	0.671	0.036	—	—	—
CAMO-09-6720	MO-605128	6.00–7.00	QBT4	—	0.121	NA	NA	NA	NA	NA

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

[e] NA=Not analyzed

Table 5.9-1
Samples Collected and Analyses Requested at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth(ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
0448-95-0001	48-02080	0.00-0.50	SOIL	—*	—	—	—	—	225	—	225	224	—	—	—	—	—	—
0448-95-0005	48-02082	0.00-0.50	SOIL	—	—	—	—	—	—	—	—	224	—	—	—	—	—	—
0448-97-0047	48-02159	0.50-1.50	SED	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0048	48-02159	3.83-5.00	QBT3	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0052	48-02161	0.50-1.00	SED	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0053	48-02161	6.50-7.50	SOIL	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0054	48-02162	0.50-1.50	SED	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0056	48-02162	2.00-3.00	SOIL	—	—	2945	—	—	2945	2945	2945	2944	—	—	2945	2943	2943	—
0448-97-0112	48-02171	0.00-0.83	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0113	48-02171	0.83-1.50	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0115	48-02172	0.00-1.00	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0116	48-02172	1.00-2.00	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0117	48-02172	2.00-3.00	QBT2	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0118	48-02173	0.00-1.00	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0120	48-02173	1.00-2.00	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
0448-97-0121	48-02173	2.00-3.00	SOIL	—	—	3259R	—	—	3259R	3259R	3259R	3258R	—	—	3259R	3257R	3257R	—
CAMO-09-6675	MO-605118	0.00-0.50	SED	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6676	MO-605118	5.00-6.50	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6677	MO-605118	15.00-16.50	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6678	MO-605118	20.00-21.50	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6679	MO-605119	0.00-0.50	SED	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6680	MO-605119	0.50-2.00	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6681	MO-605119	10.50-12.00	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6682	MO-605119	15.50-17.00	QBT4	09-1808	09-1810	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	09-1807	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6683	MO-605120	0.00-0.50	SED	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	—	09-1826
CAMO-09-6684	MO-605120	1.00-2.50	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6685	MO-605120	11.00-12.50	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6686	MO-605120	16.00-17.50	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6687	MO-605121	0.00-0.50	SED	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6688	MO-605121	2.50-4.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6689	MO-605121	12.50-14.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6690	MO-605121	17.50-19.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6691	MO-605122	0.00-0.50	SOIL	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	—	09-1808
CAMO-09-6692	MO-605122	2.50-4.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808

Table 5.9-1 (continued)

Sample ID	Location ID	Depth(ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	Isotopic Plutonium	Isotopic Thorium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-6693	MO-605122	12.50-14.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6694	MO-605122	17.50-19.00	QBT4	09-1808	—	09-1809	09-1809	09-1808	09-1809	09-1809	09-1809	09-1808	—	09-1808	09-1809	09-1807	09-1807	09-1808
CAMO-09-6695	MO-605123	0.00-0.50	SOIL	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	—	09-1826
CAMO-09-6696	MO-605123	0.50-2.00	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6697	MO-605123	10.50-12.00	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6698	MO-605123	15.50-17.00	QBT4	09-1826	—	09-1827	09-1827	09-1826	09-1827	09-1827	09-1827	09-1826	—	09-1826	09-1827	09-1825	09-1825	09-1826
CAMO-09-6699	MO-605124	0.00-0.50	SED	09-2009	09-2007	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	09-2008	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6700	MO-605124	0.50-1.50	QBT4	09-2009	09-2007	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	09-2008	09-2009	09-2010	09-2008	09-2008	09-2009
CAMO-09-6701	MO-605125	0.00-0.50	SED	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6702	MO-605125	2.50-3.50	QBT4	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	09-2008	09-2009
CAMO-09-6703	MO-605126	0.00-0.50	SED	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6704	MO-605126	2.50-3.50	QBT4	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	09-2008	09-2009
CAMO-09-6705	MO-605127	0.00-0.50	SOIL	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	—	09-2009
CAMO-09-6706	MO-605127	3.00-4.00	QBT4	09-2009	—	09-2010	09-2010	09-2009	09-2010	09-2010	09-2010	09-2009	—	09-2009	09-2010	09-2008	09-2008	09-2009

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.9-2
Inorganic Chemicals above BVs at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth(ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Copper	Total Cyanide	Lead
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**11.2**	**0.82**	**19.7**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**0.5**	**11.2**
0448-97-0047	48-02159	0.50–1.50	SED	7.2(U)	—[c]	—	0.72(U)	—	—	NA[d]	—	NA	—
0448-97-0048	48-02159	3.83–5.00	QBT3	6.4(U)	—	62.9	—	2480	26.5	NA	6.5	NA	—
0448-97-0052	48-02161	0.50–1.00	SED	7.3(U)	—	—	0.73(U)	—	—	NA	—	NA	—
0448-97-0053	48-02161	6.50–7.50	SOIL	6.1(U)	—	—	0.61(U)	—	75.9	NA	—	NA	—
0448-97-0054	48-02162	0.50–1.50	SED	5.9(U)	—	—	0.59(U)	—	45.3	NA	—	NA	—
0448-97-0056	48-02162	2.00–3.00	SOIL	6.2(U)	—	—	0.62(U)	—	61.6	NA	—	NA	—
0448-97-0112	48-02171	0.00–0.83	SOIL	3.7(UJ)	—	—	—	—	—	NA	58.3	NA	—
0448-97-0113	48-02171	0.83–1.50	SOIL	3(UJ)	—	—	—	—	—	NA	—	NA	—
0448-97-0115	48-02172	0.00–1.00	SOIL	2.7(UJ)	—	—	—	—	453	NA	177	NA	27.5
0448-97-0116	48-02172	1.00–2.00	SOIL	2.8(UJ)	—	—	—	—	151	NA	46.7	NA	—
0448-97-0117	48-02172	2.00–3.00	QBT2	2.4(UJ)	2.8	—	—	—	29.6	NA	7.1	NA	—
0448-97-0118	48-02173	0.00–1.00	SOIL	2.5(UJ)	—	—	—	—	250	NA	80.9	NA	—
0448-97-0120	48-02173	1.00–2.00	SOIL	2.7(UJ)	9.9	—	—	—	1080	NA	98.5	NA	—
0448-97-0121	48-02173	2.00–3.00	SOIL	2.5(UJ)	—	—	—	—	336	NA	39.6	NA	—
CAMO-09-6675	MO-605118	0.00–0.50	SED	1.04(U)	—	—	0.521(U)	—	—	—	—	—	—
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	1.21(U)	—	—	—	—	9.07	—	—	—	—
CAMO-09-6677	MO-605118	15.00–16.50	QBT4	1.11(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6678	MO-605118	20.00–21.50	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	1.01(U)	—	—	0.505(U)	—	—	—	40.7	—	—
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	1.09(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6681	MO-605119	10.50–12.00	QBT4	1.04(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	1.03(U)	—	—	0.516(U)	—	—	—	—	—	—
CAMO-09-6684	MO-605120	1.00–2.50	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6685	MO-605120	11.00–12.50	QBT4	1.02(U)	—	—	—	—	22(J-)	—	—	—	—
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	1.02(U)	—	—	0.51(U)	—	—	—	48.1	—	23.8
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	1.07(U)	—	—	—	—	—	—	—	—	—

Table 5.9-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Chromium hexavalent ion	Copper	Total Cyanide	Lead
SED Background Value[a]				**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na[b]**	**11.2**	**0.82**	**19.7**
SOIL Background Value[a]				**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**0.5**	**11.2**
CAMO-09-6689	MO-605121	12.50–14.00	QBT4	1.09(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6690	MO-605121	17.50–19.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	1.18(U)	—	—	—	—	22.8	—	66.6	—	34.9
CAMO-09-6692	MO-605122	2.50–4.00	QBT4	1.08(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6693	MO-605122	12.50–14.00	QBT4	1.05(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6694	MO-605122	17.50–19.00	QBT4	1.06(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	0.97(U)	—	—	0.485(U)	—	60.4(J-)	0.965(J)	20.8	—	—
CAMO-09-6696	MO-605123	0.50–2.00	QBT4	1.02(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6697	MO-605123	10.50–12.00	QBT4	1.02(U)	—	—	—	—	—	—	—	—	—
CAMO-09-6698	MO-605123	15.50–17.00	QBT4	1.02(U)	—	—	—	—	—	—	—	12.9	—
CAMO-09-6699	MO-605124	0.00–0.50	SED	1(U)	—	—	0.5(U)	—	104	1.64(J)	21.8	—	—
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	1.01(U)	—	—	—	—	67.6	0.241(J)	15.3	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	1.13(U)	4.15	—	—	—	789	8.61	72.1	—	31.2
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	1.15(U)	—	—	—	—	153	2.23(J)	9.36	—	—
CAMO-09-6703	MO-605126	0.00–0.50	SED	1.11(U)	—	—	0.553(U)	—	29.6	—	15	—	—
CAMO-09-6704	MO-605126	2.50–3.50	QBT4	1.16(U)	—	—	—	—	7.88	—	5.52	—	—
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	1.04(U)	—	—	0.521(U)	—	314	1.31(J)	62.1	—	23.5
CAMO-09-6706	MO-605127	3.00–4.00	QBT4	1.11(U)	—	—	—	—	8.62	0.362(J)	—	—	—

Table 5.9-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
SED Background Value[a]				**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**	**60.2**
SOIL Background Value[a]				**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
QBT2,QBT3,QBT4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1.1**	**17**	**63.5**
0448-97-0047	48-02159	0.50–1.50	SED	—	—	—	NA	NA	0.36(UJ)	—	—	—
0448-97-0048	48-02159	3.83–5.00	QBT3	—	—	14.1	NA	NA	0.32(UJ)	—	—	—
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	NA	NA	0.37(UJ)	—	—	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	33.2	NA	NA	—	—	—	—
0448-97-0054	48-02162	0.50–1.50	SED	—	—	20.9	NA	NA	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	30.9	NA	NA	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	SOIL	—	0.13(J)	—	NA	NA	—	1.3(U)	—	80.8
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	NA	NA	—	1.1(U)	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	—	0.2	—	NA	NA	—	0.96(U)	—	66.8
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	NA	NA	—	1(U)	—	58.4
0448-97-0117	48-02172	2.00–3.00	QBT2	—	—	—	NA	NA	0.56(U)	—	—	—
0448-97-0118	48-02173	0.00–1.00	SOIL	—	—	—	NA	NA	—	0.88(U)	—	55.6
0448-97-0120	48-02173	1.00–2.00	SOIL	—	—	—	NA	NA	—	0.97(U)	—	86.1
0448-97-0121	48-02173	2.00–3.00	SOIL	—	—	—	NA	NA	—	0.91(U)	—	51.2
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	—	—	1.68	—	1.02(U)	—	—	64.7
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	—	—	—	—	—	1.18(U)	—	—	—
CAMO-09-6677	MO-605118	15.00–16.50	QBT4	—	—	—	—	—	1.07(U)	—	—	—
CAMO-09-6678	MO-605118	20.00–21.50	QBT4	—	—	—	—	—	1.07(U)	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	—	—	—	—	0.000965(J)	0.981(U)	—	—	75.1
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	—	—	—	—	—	1.1(U)	—	—	—
CAMO-09-6681	MO-605119	10.50–12.00	QBT4	—	—	—	—	0.000906(J)	1.07(U)	—	—	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	—	—	—	—	—	1.09(U)	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	—	—	2.31(J+)	0.00758	1.04(UJ)	—	—	—
CAMO-09-6684	MO-605120	1.00–2.50	QBT4	—	—	—	—	0.0187	1.08(UJ)	—	—	—
CAMO-09-6685	MO-605120	11.00–12.50	QBT4	—	—	—	—	0.0062	1.03(UJ)	—	—	—
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	—	—	—	—	0.00264	1.06(UJ)	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	—	—	—	2.52	0.00153(J)	0.989(U)	—	—	91.8
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	—	—	—	—	0.0013(J)	1.08(U)	—	—	—
CAMO-09-6689	MO-605121	12.50–14.00	QBT4	—	—	—	0.888(J)	—	1.06(U)	—	—	—
CAMO-09-6690	MO-605121	17.50–19.00	QBT4	—	—	—	—	—	1.08(U)	—	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	—	0.142	—	2.76	0.00451	—	—	—	140
CAMO-09-6692	MO-605122	2.50–4.00	QBT4	—	—	—	—	—	1.06(U)	—	—	—
CAMO-09-6693	MO-605122	12.50–14.00	QBT4	—	—	—	—	—	1.03(U)	—	—	—

Table 5.9-2 (continued)

Sample ID	Location ID	Depth(ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
SED Background Value[a]				**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**	**60.2**
SOIL Background Value[a]				**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
QBT2,QBT3,QBT4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1.1**	**17**	**63.5**
CAMO-09-6694	MO-605122	17.50–19.00	QBT4	—	—	—	—	—	1.04(U)	—	—	—
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	—	—	—	0.00114(J)	—	—	—	—
CAMO-09-6696	MO-605123	0.50–2.00	QBT4	—	—	—	—	—	1.02(UJ)	—	—	—
CAMO-09-6697	MO-605123	10.50–12.00	QBT4	—	—	—	—	—	1.06(UJ)	—	—	—
CAMO-09-6698	MO-605123	15.50–17.00	QBT4	—	—	—	—	—	1.04(UJ)	—	—	—
CAMO-09-6699	MO-605124	0.00–0.50	SED	—	—	—	—	0.00402	1.01(UJ)	—	—	—
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	—	—	—	—	0.00916	0.698(J-)	—	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	—	—	—	0.852(J)	0.0132	1.14(UJ)	—	27.4	71.8
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	—	—	—	—	0.00544	1.14(UJ)	—	—	—
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	—	—	—	0.00371	1.07(UJ)	—	—	—
CAMO-09-6704	MO-605126	2.50–3.50	QBT4	—	—	—	—	0.00593	1.14(UJ)	—	—	—
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	1340	—	—	—	0.00121(J)	—	—	—	61.3
CAMO-09-6706	MO-605127	3.00–4.00	QBT4	—	—	—	0.639(J)	0.000939(J)	1.11(UJ)	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 5.9-3
Organic Chemicals Detected at Consolidated Unit 48-007(a)-00

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	BenzoicAcid	Bis(2-ethylhexyl)phthalate
0448-97-0047	48-02159	0.50–1.50	SED	—[a]	—	—	NA[b]	NA	0.086(J)	0.11(J)	0.12(J)	—	0.058(J)	—	—
0448-97-0052	48-02161	0.50–1.00	SED	0.061(J)	—	0.13(J)	NA	NA	0.53	0.51	0.66	—	0.28(J)	—	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	NA	NA	0.064(J)	0.069(J)	0.088(J)	—	—	—	—
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	NA	NA	—	—	—	—	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	NA	NA	—	—	—	—	—	—	—
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	—	NA	NA	0.17(J)	0.19(J)	0.35(J)	—	NA	—	—
0448-97-0113	48-02171	0.83–1.50	SOIL	—	—	—	NA	NA	—	—	—	—	NA	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	—	—	—	NA	NA	0.31(J)	0.34(J)	0.62(J)	—	NA	—	—
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	NA	NA	0.15(J)	—	—	—	NA	—	—
0448-97-0118	48-02173	0.00–1.00	SOIL	—	—	—	NA	NA	0.21(J)	0.17(J)	0.28(J)	—	NA	—	—
0448-97-0120	48-02173	1.00–2.00	SOIL	—	—	—	NA	NA	0.15(J)	—	—	—	NA	—	0.091(J)
0448-97-0121	48-02173	2.00–3.00	SOIL	—	—	—	NA	NA	—	—	—	—	NA	—	0.19(J)
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.0429	NA	0.0811	0.0061(J)	—	0.257	0.236	0.337	0.106	0.126	—	—
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.0347	NA	0.0795	0.0196	0.009	0.478	0.571	0.853	0.344	0.297	—	—
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	NA	—	NA	NA	0.0188(J)	0.0164(J)	0.0315(J)	—	—	—	—
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	—	0.00527(J)	—	NA	NA	—	—	—	—	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	0.121	NA	0.265	NA	NA	1.04	1.02	1.55	0.572	0.685	—	—
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	—	0.00795	—	NA	NA	—	—	—	—	—	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	0.046	NA	0.101	NA	NA	0.647	0.708	1.06	0.461	0.482	0.702(J)	—
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	NA	0.0141(J)	NA	NA	0.0598	0.0591	0.101	0.0348	—	—	—
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.0214(J)	NA	0.0382	0.0161	0.0129	0.146	0.162	0.286	0.0907	—	—	—
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	0.0114(J)	—	0.0259(J)	0.0129	0.0107	0.108	0.128	0.231	0.0869	—	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	0.124	NA	0.171	NA	NA	0.396	0.429	0.697	0.235	—	—	—
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	—	—	0.00885(J)	NA	NA	0.0278(J)	0.0226(J)	0.0337(J)	—	—	—	—
CAMO-09-6703	MO-605126	0.00–0.50	SED	—	NA	0.0226(J)	NA	NA	—	0.0493	0.0834	0.0357(J)	—	—	—
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	0.13	NA	0.17	NA	NA	0.281	0.329	0.507	0.191	—	—	—

Table 5.9-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Butanone[2-]	Carbazole	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins(Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]
0448-97-0047	48-02159	0.50–1.50	SED	—	—	0.12(J)	—	0.17(J)	—	NA	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	—	0.12(J)	0.59	—	1.2	0.053(J)	NA	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	0.082(J)	—	0.15(J)	—	NA	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	—	—	—	—	—	—	NA	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	—	—	—	NA	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	0.2(J)	—	0.16(J)	—	NA	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	0.089(J+)	—	—	—	—	—	NA	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	—	—	0.38(J)	—	0.32(J)	—	NA	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	0.16(J)	—	0.13(J)	—	NA	NA	NA	NA
0448-97-0118	48-02173	0.00–1.00	SOIL	—	—	0.23(J)	—	0.19(J)	—	NA	NA	NA	NA
0448-97-0120	48-02173	1.00–2.00	SOIL	—	—	0.16(J)	—	0.17(J)	—	NA	NA	NA	NA
0448-97-0121	48-02173	2.00–3.00	SOIL	—	—	—	—	—	—	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	NA	NA	0.271	—	0.677	0.0476	0.000032	0.0000552	0.00000662	—
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	—	NA	—	—	—	—	0.00000339	0.0000058	0.000000409(J)	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	NA	NA	0.691	—	1.14	0.0273(J)	0.000384	0.00063	0.0000608	0.0000049
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	—	NA	—	—	—	—	0.00000123(J)	0.00000218	0.000000224(J)	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	—	NA	—	—	—	—	0.000000842(J)	0.00000153	0.00000016(J)	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	NA	0.0191(J)	—	0.0341(J)	—	NA	NA	NA	NA
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	—	NA	—	—	—	—	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	NA	1.14	—	2.58	0.116	NA	NA	NA	NA
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	—	NA	—	—	—	—	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	NA	0.779	—	1.49	0.036(J)	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	NA	0.0627	—	0.113	—	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	NA	NA	0.183	0.0271(J)	0.301	0.0186(J)	0.000254	0.000493	0.0000451	0.00000443
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	—	NA	0.153	0.0267(J)	0.245	—	0.000202	0.000387	0.000036	0.00000328
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	NA	0.438	0.0717	0.885	0.101	NA	NA	NA	NA
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	—	NA	0.0207(J)	—	0.0527	—	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	NA	—	—	0.106	—	NA	NA	NA	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	NA	0.327	—	0.779	0.0939	NA	NA	NA	NA

Table 5.9-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	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-]	Hexachlorodibenzofurans(Total)
0448-97-0047	48-02159	0.50–1.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0118	48-02173	0.00–1.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0120	48-02173	1.00–2.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0448-97-0121	48-02173	2.00–3.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.0000149	0.000000791(J)	0.00000108(J)	0.00000136(J)	0.0000102	0.000000402(J)	—	—	—	0.00000982
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	0.00000137	—	—	—	0.000000743	—	—	—	—	0.000000414
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.000174	0.00000636	0.0000116	0.0000118	0.00008	0.00000276	0.00000312	—	0.0000046	0.0000802
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	0.000000504	—	—	—	—	—	—	—	—	0.000000172
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	0.000000439	—	—	—	—	—	—	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.000157	0.00000287	0.0000082	0.0000051	0.0000656	0.00000195(J)	0.00000197(J)	0.000000526(J)	0.00000286	0.0000657
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	0.000119	0.00000278	0.00000652	0.00000449	0.0000528	0.0000016(J)	0.0000016(J)	—	0.00000238(J)	0.0000547
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.9-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	MethyleneChloride	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-]
0448-97-0047	48-02159	0.50–1.50	SED	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0054	48-02162	0.50–1.50	SED	—	—	0.004(J)	—	—	NA	NA	NA	NA	NA
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0112	48-02171	0.00–0.83	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0113	48-02171	0.83–1.50	SOIL	—	0.067(J+)	—	—	—	NA	NA	NA	NA	NA
0448-97-0115	48-02172	0.00–1.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0116	48-02172	1.00–2.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0118	48-02173	0.00–1.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0120	48-02173	1.00–2.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
0448-97-0121	48-02173	2.00–3.00	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6675	MO-605118	0.00–0.50	SED	0.166	NA	NA	0.0121(J)	0.05	0.000278(J)	0.0000128	0.000000339(J)	0.00000121	—
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	—	—	—	—	—	0.0000196(J)	0.0000011(J)	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.348	NA	NA	—	—	0.00346(J)	0.000185	0.00000189(J)	0.0000077	0.000000627(J)
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	—	—	—	—	—	0.00000845(J)	0.000000655(J)	—	—	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	—	—	—	—	—	0.00000643(J)	0.000000445(J)	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	NA	NA	—	—	NA	NA	NA	NA	NA
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	—	—	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6687	MO-605121	0.00–0.50	SED	0.539	NA	NA	0.0136(J)	0.0295(J)	NA	NA	NA	NA	NA
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	—	—	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	0.463	NA	NA	—	—	NA	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	0.0284(J)	NA	NA	—	—	NA	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.0769	NA	NA	—	0.016(J)	0.00197	0.000111	0.000000978(J)	0.00000774	—
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	0.0756	—	—	—	—	0.0016	0.0000882	0.000000843(J)	0.00000587	0.000000276(J)
CAMO-09-6701	MO-605125	0.00–0.50	SED	0.208	NA	NA	0.0261(J)	0.0709	NA	NA	NA	NA	NA
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	—	—	—	—	—	NA	NA	NA	NA	NA
CAMO-09-6703	MO-605126	0.00–0.50	SED	0.0337(J)	NA	NA	—	—	NA	NA	NA	NA	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	0.173	NA	NA	0.0191(J)	0.0512	NA	NA	NA	NA	NA

Table 5.9-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans(Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins(Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans(Totals)	Toluene	Trichlorofluoromethane	Trimethylbenzene[1,2,4-]
0448-97-0047	48-02159	0.50–1.50	SED	NA	NA	0.07(J)	0.17(J)	NA	NA	NA	0.004(J)	0.014	—
0448-97-0052	48-02161	0.50–1.00	SED	NA	NA	0.6	1	NA	NA	NA	—	0.004(J)	—
0448-97-0053	48-02161	6.50–7.50	SOIL	NA	NA	0.078(J)	0.12(J)	NA	NA	NA	—	0.005(J)	—
0448-97-0054	48-02162	0.50–1.50	SED	NA	NA	—	—	NA	NA	NA	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	NA	NA	—	—	NA	NA	NA	—	0.004(J)	—
0448-97-0112	48-02171	0.00–0.83	SOIL	NA	NA	—	0.61(J)	NA	NA	NA	—	—	—
0448-97-0113	48-02171	0.83–1.50	SOIL	NA	NA	—	—	NA	NA	NA	—	—	—
0448-97-0115	48-02172	0.00–1.00	SOIL	NA	NA	0.31(J)	1.5(J)	NA	NA	NA	—	—	0.004(J)
0448-97-0116	48-02172	1.00–2.00	SOIL	NA	NA	0.21(J)	0.71(J)	NA	NA	NA	—	—	—
0448-97-0118	48-02173	0.00–1.00	SOIL	NA	NA	0.23(J)	0.76(J)	NA	NA	NA	—	—	—
0448-97-0120	48-02173	1.00–2.00	SOIL	NA	NA	0.26(J)	0.71(J)	NA	NA	NA	0.004(J)	—	—
0448-97-0121	48-02173	2.00–3.00	SOIL	NA	NA	—	—	NA	NA	NA	—	—	—
CAMO-09-6675	MO-605118	0.00–0.50	SED	—	0.00000382	0.41	0.468	—	—	6.82E-07	NA	NA	NA
CAMO-09-6676	MO-605118	5.00–6.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6679	MO-605119	0.00–0.50	SED	0.00000166(J)	0.0000252	0.427	1.02	8.25E-07	0.00000167	0.0000121	NA	NA	NA
CAMO-09-6680	MO-605119	0.50–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6682	MO-605119	15.50–17.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	NA	NA	0.0167(J)	0.0337(J)	NA	NA	NA	NA	NA	NA
CAMO-09-6686	MO-605120	16.00–17.50	QBT4	NA	NA	—	—	NA	NA	NA	—	—	—
CAMO-09-6687	MO-605121	0.00–0.50	SED	NA	NA	1.37	2.1	NA	NA	NA	NA	NA	NA
CAMO-09-6688	MO-605121	2.50–4.00	QBT4	NA	NA	—	—	NA	NA	NA	—	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	NA	NA	0.524	1.27	NA	NA	NA	NA	NA	NA
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	NA	NA	0.0622	0.118	NA	NA	NA	NA	NA	NA
CAMO-09-6699	MO-605124	0.00–0.50	SED	0.000000822(J)	0.0000187	0.165	0.371	7.94E-07	6.12E-07	0.00000636	NA	NA	NA
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	0.000000752(J)	0.0000163	0.117	0.285	3.73E-07	5.26E-07	0.00000485	0.000369(J)	—	—
CAMO-09-6701	MO-605125	0.00–0.50	SED	NA	NA	0.702	1.06	NA	NA	NA	NA	NA	NA
CAMO-09-6702	MO-605125	2.50–3.50	QBT4	NA	NA	0.0382(J)	0.0525	NA	NA	NA	—	—	—
CAMO-09-6703	MO-605126	0.00–0.50	SED	NA	NA	0.0527	0.11	NA	NA	NA	NA	NA	NA
CAMO-09-6705	MO-605127	0.00–0.50	SOIL	NA	NA	0.654	0.834	NA	NA	NA	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.9-4
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 48-007(a)-00

Sample ID	Location ID	Depth(ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Thorium-227	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.9**	**0.006**	**0.068**	**na[b]**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**1.65[c]**	**0.023[c]**	**0.054[c]**	**na**	**na**	**2.59**	**0.2**	**2.29**
QBT3,QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
0448-95-0001	48-02080	0.00–0.50	SOIL	NA[d]	0.5	0.07	NA	NA	—[e]	—	—
0448-97-0048	48-02159	3.83–5.00	QBT3	—	—	—	0.085	NA	—	—	—
0448-97-0052	48-02161	0.50–1.00	SED	—	—	—	0.046	NA	—	—	—
0448-97-0053	48-02161	6.50–7.50	SOIL	—	—	—	0.053	NA	—	—	—
0448-97-0056	48-02162	2.00–3.00	SOIL	—	—	—	0.068	NA	—	—	—
0448-97-0116	48-02172	1.00–2.00	SOIL	0.754	—	—	NA	NA	—	—	—
0448-97-0120	48-02173	1.00–2.00	SOIL	0.614	—	0.448	NA	NA	—	—	—
CAMO-09-6683	MO-605120	0.00–0.50	SED	—	—	—	NA	0.100233	—	—	—
CAMO-09-6689	MO-605121	12.50–14.00	QBT4	—	—	—	NA	0.0170203	—	—	—
CAMO-09-6691	MO-605122	0.00–0.50	SOIL	—	—	0.0736	NA	0.0406975	3.17	—	3.11
CAMO-09-6695	MO-605123	0.00–0.50	SOIL	—	—	—	NA	0.0164926	—	—	—
CAMO-09-6700	MO-605124	0.50–1.50	QBT4	0.134	—	—	NA	—	—	0.0902	—
CAMO-09-6706	MO-605127	3.00–4.00	QBT4	—	—	—	NA	—	2.18	0.236	2.46

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

[d] NA = Not analyzed.

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

Table 5.10-1
Samples Collected and Analyses Requested at SWMU 48-007(b)

Sample ID	Location ID	Depth(ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0448-97-0071	48-02167	0.00–1.00	SOIL	—*	—	2955	—	—	—	—	—	—	—	—
0448-97-0072	48-02167	1.00–2.00	SOIL	—	—	2955	—	—	—	—	—	—	—	—
0448-97-0081	48-02168	0.00–0.83	SED	—	—	2977	—	—	—	—	—	—	—	—
0448-97-0082	48-02168	0.83–1.67	SOIL	—	—	2977	—	—	—	—	—	—	—	—
CAMO-09-6643	MO-605110	0.00–0.50	SED	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	—	09-1999
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	09-1998	09-1999
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	09-1998	09-1999
CAMO-09-6646	MO-605111	0.00–0.50	SED	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	—	09-1999
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	09-1998	09-1999
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	09-1999	09-2019	09-1999	09-1999	09-1998	09-1999	09-1998	09-1999	09-1998	09-1998	09-1999
CAMO-09-6649	MO-605112	0.00–0.50	SED	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	—	09-1971
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	09-1970	09-1971
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	09-1970	09-1971
CAMO-09-6652	MO-605113	0.00–0.50	SED	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	—	09-1971
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	09-1970	09-1971
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	09-1971	09-1969	09-1971	09-1971	09-1971	09-1971	09-1970	09-1971	09-1970	09-1970	09-1971
CAMO-09-6655	MO-605114	0.00–0.50	SED	09-1999	—	09-1999	09-1999	09-1998	09-1999	—	09-1999	09-1998	—	09-1999
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	09-1999	—	09-1999	09-1999	09-1998	09-1999	—	09-1999	09-1998	09-1998	09-1999
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	09-1999	—	09-1999	09-1999	09-1998	09-1999	—	09-1999	09-1998	09-1998	09-1999
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	—	09-1971
CAMO-09-6659	MO-605115	1.00–2.00	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971
CAMO-09-6660	MO-605115	3.00–4.00	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971
CAMO-09-6661	MO-605116	0.00–0.50	SED	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	—	09-1971
CAMO-09-6662	MO-605116	0.50–1.50	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971
CAMO-09-6663	MO-605116	2.50–3.50	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971
CAMO-09-6664	MO-605117	0.00–0.50	SED	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	—	09-1971
CAMO-09-6665	MO-605117	1.00–2.00	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971
CAMO-09-6666	MO-605117	3.00–4.00	QBT4	09-1971	—	09-1971	09-1971	09-1971	09-1971	—	09-1971	09-1970	09-1970	09-1971

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.10-2
Inorganic Chemicals above BVs at SWMU 48-007(b)

SampleID	LocationID	Depth(ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Chromium hexavalent ion	Cobalt	Copper	Iron	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na[b]**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**19.7**	**60.2**
SOIL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
QBT4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
CAMO-09-6643	MO-605110	0.00–0.50	SED	—[c]	1.04(U)	—	—	0.519(U)	—	—	—	17.3	—	—	—	—	—	—	1.01(U)	—	106
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	—	1.09(U)	—	—	—	—	—	—	9.12	—	—	—	—	—	—	1.08(U)	—	—
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	—	1.06(U)	—	—	—	22.1	—	—	5.61	—	—	—	—	—	—	1.06(U)	—	—
CAMO-09-6646	MO-605111	0.00–0.50	SED	—	1.09(U)	—	—	0.543(U)	—	—	—	20.5	—	—	—	—	—	—	1.07(U)	—	—
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	9130	0.565(J)	3.96	63.7	—	8.5	—	—	6.99	—	—	—	—	—	—	1.17(U)	19.7	—
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	12100	0.504(J)	3	126	—	10.8	—	5.08	6.21	14700	—	1850	8.2	—	0.00224(J)	1.14(U)	24	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	1.21(U)	—	—	0.605(U)	—	—	—	—	—	—	—	—	5.88	0.00103(J)	1.2(U)	—	—
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	—	1.14(U)	—	—	—	—	—	—	4.71	—	—	—	—	—	0.000861(J)	1.17(U)	—	—
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	—	1.16(U)	—	—	—	—	0.172(J)	—	—	—	—	—	—	—	0.00066(J)	1.13(U)	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	1.02(U)	—	—	0.51(U)	—	—	—	—	—	—	—	—	1.12	0.000636(J)	0.997(U)	—	—
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	—	1.15(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00134(J)	1.15(U)	—	—
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	—	1.1(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00105(J)	1.11(U)	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	—	1.11(U)	—	—	0.554(U)	12.3	—	—	32.6	—	—	—	—	—	—	1.07(U)	—	104
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	—	1.06(U)	—	—	—	16.8	—	—	11.5	—	—	—	—	—	—	1.07(U)	—	—
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	—	1.1(U)	—	—	—	40.6	—	—	9.43	—	25.1	—	—	—	—	1.09(U)	—	—
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	1.14(U)	—	—	0.571(U)	—	—	—	—	—	—	—	—	1.81	0.00241	—	—	55.3
CAMO-09-6659	MO-605115	1.00–2.00	QBT4	—	1.17(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.0034	1.13(U)	—	—
CAMO-09-6660	MO-605115	3.00–4.00	QBT4	—	1.17(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00133(J)	1.18(U)	—	—
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	1.07(U)	—	—	0.536(U)	—	—	—	—	—	—	—	—	—	0.000821(J)	1.1(U)	—	—
CAMO-09-6662	MO-605116	0.50–1.50	QBT4	—	1.12(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00139(J)	1.1(U)	—	—
CAMO-09-6663	MO-605116	2.50–3.50	QBT4	—	1.14(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00286	1.15(U)	—	—
CAMO-09-6664	MO-605117	0.00–0.50	SED	—	0.96(U)	—	—	0.48(U)	—	—	—	—	—	—	—	—	1.21	0.00109(J)	0.978(U)	—	—
CAMO-09-6665	MO-605117	1.00–2.00	QBT4	—	1.05(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00154(J)	1.07(U)	—	—
CAMO-09-6666	MO-605117	3.00–4.00	QBT4	—	1.06(U)	—	—	—	—	—	—	—	—	—	—	—	—	0.00438	1.06(U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 5.10-3
Organic Chemicals Detected at SWMU 48-007(b)

Sample ID	Location ID	Depth(ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene
CAMO-09-6643	MO-605110	0.00–0.50	SED	—[a]	0.806(J)	0.021(J)	—	2.2	1.59	3.06	0.803(J)	1.83	3.97
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	0.0243(J)	0.0461	—	—	0.132	0.129	0.223	0.0766	0.144	0.279
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	0.0506	0.1	—	—	0.252	0.23	0.398	0.119	0.231	0.497
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.0248(J)	0.0404	0.0086(J)	—	0.11	0.0975	0.161	0.0581	0.102	0.22
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	—	0.0098(J)	0.0069	0.036(J)	0.0335(J)	0.0587	0.0228(J)	0.0366(J)	0.0679
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	0.154	0.314	NA[b]	NA	0.888	0.743	1.56	0.383	0.869	1.67
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	0.0222(J)	0.0316(J)	NA	NA	0.149	0.146	0.357	0.0751	0.195	0.275
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	0.0223(J)	0.0391	NA	NA	0.157	0.143	0.325	0.0711	0.164	0.286
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	0.0113(J)	NA	NA	0.0442	0.0411	0.075	0.0284(J)	0.0417	0.0885
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	—	NA	NA	0.0161(J)	0.0127(J)	0.021(J)	—	0.0132(J)	0.0248(J)

Table 5.10-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins(Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans(Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]
CAMO-09-6643	MO-605110	0.00–0.50	SED	—	0.0000777	0.000152	0.00000929	0.000000804(J)	0.0000251	—	0.00000254	—
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	0.0199(J)	0.0000254	0.0000495	0.00000216(J)	—	0.00000611	—	—	—
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	0.0455	0.0000113	0.000022	—	—	0.00000207	—	—	—
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.0153(J)	0.0000162	0.0000308	0.00000248(J)	—	0.0000065	—	—	—
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	—	0.0000397	0.0000833	0.00000456	0.000000385(J)	0.0000138	0.000000687(J)	0.00000149(J)	0.00000111(J)
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	—	0.00000188(J)	0.00000188	0.000000272(J)	—	0.000000725	—	—	—
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	—	0.00000112(J)	0.00000265	—	—	0.000000294	—	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	0.00000179(J)	0.00000179	—	—	0.000000399	—	—	—
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	—	—	0.00000142	0.000000214(J)	—	0.00000053	—	—	—
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	0.133(J)	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	0.0163(J)	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	0.0177(J)	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.10-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	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	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]
CAMO-09-6643	MO-605110	0.00–0.50	SED	0.0000178	0.000000653(J)	0.00000063(J)	0.000000842(J)	0.0000124	0.678(J)	—	—	0.000678(J)
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	0.00000327	—	—	—	0.00000048	0.071	—	0.0147(J)	0.00022(J)
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	0.00000237	—	—	—	0.00000132	0.109	0.014(J)	0.036(J)	0.0000926(J)
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.00000323	—	—	—	0.00000136	0.0504	—	—	0.000143(J)
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	0.00000706(J)
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	0.00000293(J)
CAMO-09-6649	MO-605112	0.00–0.50	SED	0.0000146	0.000000342(J)	—	0.000000422(J)	0.00000667	0.0175(J)	—	—	0.000368(J)
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	—	—	—	—	0.000000147	—	—	—	0.0000138(J)
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	0.00000869(J)
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	—	—	—	—	0.0000181(J)
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	—	—	—	—	—	—	—	—	0.0000113(J)
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	0.00000202(J)
CAMO-09-6655	MO-605114	0.00–0.50	SED	NA	NA	NA	NA	NA	0.406	—	0.0896(J)	NA
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	NA	NA	NA	NA	NA	0.0767	—	—	NA
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	NA	NA	NA	NA	NA	0.0642	—	0.0124(J)	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	NA	NA	NA	NA	NA	0.0272(J)	—	—	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	NA	NA	NA	NA	NA	—	—	—	NA

Table 5.10-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins(Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans(Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans(Totals)
CAMO-09-6643	MO-605110	0.00–0.50	SED	0.0000233	—	0.000000996	0.00000102(J)	0.00000832	3.01	3.66	0.00000199	0.00000871
CAMO-09-6644	MO-605110	0.50–1.50	QBT4	0.00000692	—	—	—	—	0.174	0.256	—	0.00000057
CAMO-09-6645	MO-605110	2.50–3.50	QBT4	0.00000396(J)	—	—	—	0.00000025	0.366	0.467	—	0.000000602
CAMO-09-6646	MO-605111	0.00–0.50	SED	0.00000665	—	—	—	0.000000808	0.162	0.208	—	0.000000922
CAMO-09-6647	MO-605111	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6648	MO-605111	3.00–4.00	QBT4	0.000000176(J)	—	—	—	—	—	—	—	—
CAMO-09-6649	MO-605112	0.00–0.50	SED	0.000015	0.000000282(J)	0.00000186	—	0.00000124	0.0398(J)	0.0667	—	0.00000216
CAMO-09-6650	MO-605112	1.00–2.00	QBT4	0.000000541(J)	—	—	—	—	—	—	—	—
CAMO-09-6651	MO-605112	3.00–4.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6652	MO-605113	0.00–0.50	SED	—	—	—	—	—	—	—	—	—
CAMO-09-6653	MO-605113	1.25–2.25	QBT4	0.000000468(J)	—	—	—	—	—	—	—	—
CAMO-09-6654	MO-605113	3.25–4.25	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6655	MO-605114	0.00–0.50	SED	NA	NA	NA	NA	NA	1.16	1.71	NA	NA
CAMO-09-6656	MO-605114	0.50–1.50	QBT4	NA	NA	NA	NA	NA	0.151	0.306	NA	NA
CAMO-09-6657	MO-605114	2.50–3.50	QBT4	NA	NA	NA	NA	NA	0.166	0.294	NA	NA
CAMO-09-6658	MO-605115	0.00–0.50	SOIL	NA	NA	NA	NA	NA	0.0556	0.0861	NA	NA
CAMO-09-6661	MO-605116	0.00–0.50	SED	NA	NA	NA	NA	NA	0.0146(J)	0.0235(J)	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.10-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(b)

Sample ID	Location ID	Depth(ft)	Media	Cesium-137
SOIL Background Value[a]				**1.65[b]**
QBT4 Background Value[a]				**na[c]**
CAMO-09-6645	MO-605110	2.50-3.50	QBT4	0.0522
CAMO-09-6653	MO-605113	1.25-2.25	QBT4	0.0997
CAMO-09-6656	MO-605114	0.50-1.50	QBT4	0.0478
CAMO-09-6657	MO-605114	2.50-3.50	QBT4	0.0293
CAMO-09-6662	MO-605116	0.50-1.50	QBT4	0.0683

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

Table 5.11-1
Samples Collected and Analyses Requested at SWMU 48-007(c)

Sample ID	Location ID	Depth(ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Chromium Hexavalent Ion	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0448-97-0067	48-02165	0.00–1.00	SED	—*	—	2955	—	—	—	—	—	—	—	—
0448-97-0068	48-02165	1.00–2.00	SOIL	—	—	2955	—	—	—	—	—	—	—	—
0448-97-0070	48-02165	2.00–2.83	SOIL	—	—	2955	—	—	—	—	—	—	—	—
0448-97-0078	48-02166	0.00–1.00	SED	—	—	2977	—	—	—	—	—	—	—	—
0448-97-0079	48-02166	1.00–2.00	QBT3	—	—	2977	—	—	—	—	—	—	—	—
0448-97-0105	48-02169	0.00–1.00	SED	—	—	3220R	—	—	—	—	—	—	—	—
0448-97-0107	48-02169	1.00–2.00	SOIL	—	—	3220R	—	—	—	—	—	—	—	—
0448-97-0108	48-02170	0.00–0.50	SED	—	—	3220R	—	—	—	—	—	—	—	—
0448-97-0109	48-02170	0.50–1.20	SOIL	—	—	3220R	—	—	—	—	—	—	—	—
CAMO-09-6876	MO-605161	0.00–0.50	SED	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	—	09-1934
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6879	MO-605162	0.00–0.50	SED	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	—	09-1934
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6882	MO-605163	0.00–0.50	SED	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	—	09-1934
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	09-1934	09-1932	09-1934	09-1934	09-1933	09-1934	09-1933	09-1934	09-1933	09-1933	09-1934
CAMO-09-6885	MO-605164	0.00–0.50	SED	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	—	09-1934
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934
CAMO-09-6888	MO-605165	0.00–0.50	SED	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	—	09-1934
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934
CAMO-09-6891	MO-605166	0.00–0.50	SED	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	—	09-1934
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	09-1934	—	09-1934	09-1934	09-1933	09-1934	—	09-1934	09-1933	09-1933	09-1934

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.11-2
Inorganic Chemicals above BVs at SWMU 48-007(c)

Sample ID	Location ID	Depth(ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Nitrate	Perchlorate	Selenium	Silver	Zinc
SED Background Value[a]				**0.83**	**0.4**	**4420**	**10.5**	**11.2**	**13800**	**19.7**	**na[b]**	**na**	**0.3**	**1**	**60.2**
QBT4 Background Value[a]				**0.5**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**na**	**na**	**0.3**	**1**	**63.5**
CAMO-09-6876	MO-605161	0.00–0.50	SED	1.02(U)	0.509(U)	—[c]	—	—	—	—	1.46	0.000673(J)	1.02(UJ)	—	—
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	1.14(U)	—	9520(J)	8.05	9.99	—	—	—	—	1.17(UJ)	—	—
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	1.21(U)	—	—	8.05	6.09	—	—	—	—	1.15(UJ)	—	—
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.992(U)	0.496(U)	—	—	—	—	—	0.944(J)	—	1.03(UJ)	—	—
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	1.06(U)	—	—	—	—	—	—	—	0.000786(J)	1.05(UJ)	—	—
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	1.08(U)	—	—	—	—	—	—	—	—	1.09(UJ)	—	—
CAMO-09-6882	MO-605163	0.00–0.50	SED	1.01(U)	0.505(U)	—	—	—	22400	—	—	—	0.989(UJ)	1.01	125
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	1.03(U)	—	—	14.2	—	—	—	—	0.000655(J)	1.03(UJ)	—	—
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	1.02(U)	—	—	24.3	—	—	—	—	—	1.03(UJ)	—	—
CAMO-09-6885	MO-605164	0.00–0.50	SED	1.04(U)	0.518(U)	—	—	—	—	—	—	—	1.01(U)	—	—
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	1.13(U)	—	—	—	—	—	—	—	—	1.13(U)	—	—
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	1.16(U)	—	—	18.7	—	—	—	—	—	1.14(U)	—	—
CAMO-09-6888	MO-605165	0.00–0.50	SED	1.01(U)	0.507(U)	—	—	—	14900	—	—	—	1(U)	—	85.7
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	1.02(U)	—	—	—	—	—	—	—	0.00121(J)	1.04(U)	—	—
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	1.03(U)	—	—	11.2	4.71	—	28.6	—	0.00112(J)	1.05(U)	—	—
CAMO-09-6891	MO-605166	0.00–0.50	SED	1(U)	0.502(U)	—	—	—	—	—	0.98(J)	0.000582(J)	1.01(UJ)	—	—
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	1.07(U)	—	—	—	—	—	—	—	0.000593(J)	1.1(U)	—	—
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	1.06(U)	—	—	7.87	—	—	—	—	—	1.05(U)	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 5.11-3
Organic Chemicals Detected at SWMU 48-007(c)

Sample ID	Location ID	Depth(ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Fluorene
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.039	0.0492	0.0082	0.0041	0.189	0.213	0.291	0.133	—[a]	0.235	0.497	0.032(J)
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	0.0223(J)	0.0441	0.0185	0.0074	0.173	0.207	0.375	0.155	—	0.232	0.447	0.0191(J)
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	—	—	0.0025(J)	—	—	—	0.0226(J)	—	—	0.0127(J)	0.0237(J)	—
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	0.0149(J)	0.0038	0.0018(J)	0.0559	0.0645	0.0811	0.0389	0.0452	0.0717	0.141	—
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	—	—	0.0019(J)	—	—	—	0.0111(J)	—	—	—	0.0158(J)	—
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	0.0142(J)	0.0056	0.0022(J)	0.0661	0.0815	0.11	0.0546	—	0.0927	0.176	—
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	—	—	—	—	—	0.0125(J)	0.0154(J)	—	—	0.0123(J)	0.0247(J)	—
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6885	MO-605164	0.00–0.50	SED	0.0669	0.105	NA[b]	NA	0.164	0.187	0.255	0.1	0.102	0.193	0.558	0.0732
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	—	—	NA	NA	—	0.0121(J)	0.0253(J)	—	—	0.0133(J)	0.0224(J)	—
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	—	—	NA	NA	—	—	—	—	—	—	0.0145(J)	—
CAMO-09-6888	MO-605165	0.00–0.50	SED	—	—	NA	NA	—	0.0342	0.0617	0.0233(J)	—	0.0363	0.0651	—
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	—	—	NA	NA	—	0.0137(J)	0.0267(J)	—	—	0.0146(J)	0.0255(J)	—
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	—	—	NA	NA	—	—	0.0139(J)	—	—	—	0.0159(J)	—
CAMO-09-6891	MO-605166	0.00–0.50	SED	—	0.0173(J)	NA	NA	0.104	0.138	0.197	0.0834	0.0904	0.158	0.282	—
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	—	—	NA	NA	—	0.0199(J)	0.0404	0.0113(J)	—	0.0212(J)	0.0347(J)	—
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	—	—	NA	NA	—	0.0184(J)	0.0305(J)	—	0.0123(J)	0.0243(J)	0.0372	—

Table 5.11-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins(Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans(Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins(Total)
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.0000916	0.000161	0.0000145	0.00000118(J)	0.0000376	0.00000205(J)	0.0000039	0.00000356	0.0000265
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	0.0000762	0.000132	0.0000127	0.00000122(J)	0.0000337	0.00000148(J)	—	0.00000285	0.0000179
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	0.0000114	0.0000196	0.00000175(J)	—	0.00000434	—	0.000000524(J)	0.000000467(J)	0.00000294
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.000024	0.0000426	0.00000374	—	0.00000912	0.000000475(J)	0.00000107(J)	0.000000914(J)	0.00000634
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	0.00000697	0.0000116	0.00000133(J)	—	0.00000285	—	0.000000294(J)	0.000000292(J)	0.00000156
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	0.00000315	0.00000525	0.000000559(J)	—	0.00000129	—	—	—	—
CAMO-09-6882	MO-605163	0.00–0.50	SED	0.0000234	0.0000428	0.00000356	0.000000341(J)	0.00000921	0.000000574(J)	0.00000103(J)	0.000000997(J)	0.00000718
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	0.00000737	0.0000129	0.00000127(J)	—	0.00000301	—	0.000000458(J)	0.000000269(J)	0.0000021
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	0.00000327	0.00000327	0.000000588(J)	—	0.00000137	—	—	—	0.00000072
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.11-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	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	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.000000858 (J)	0.000000729 (J)	0.000000949 (J)	0.0000181	0.124	—	0.0249 (J)	0.000926 (J)	0.0000502
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	0.000000737 (J)	0.000000662 (J)	0.00000096 (J)	0.0000156	0.14	—	—	0.000699 (J)	0.0000437
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	0.00000015 (J)	0.000000154 (J)	0.000000125 (J)	0.00000236	—	—	—	0.0000875 (J)	0.00000636
CAMO-09-6879	MO-605162	0.00–0.50	SED	—	—	0.000000301 (J)	0.00000346	0.0332 (J)	—	—	0.000201 (J)	0.0000125
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	—	—	—	0.00000071	—	—	—	0.0000624 (J)	0.00000433 (J)
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	—	—	—	0.000000221	—	—	—	0.0000278 (J)	0.00000208 (J)
CAMO-09-6882	MO-605163	0.00–0.50	SED	0.000000234 (J)	0.000000207 (J)	—	0.00000413	0.0464	—	—	0.000192 (J)	0.0000112
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	—	—	—	0.000000209	—	—	—	0.0000563 (J)	0.00000385 (J)
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	—	—	—	0.000000348	—	—	—	0.0000263 (J)	0.00000201 (J)
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	NA	NA	NA	0.09	0.015 (J)	0.0606	NA	NA
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	NA	NA	NA	NA	—	—	—	NA	NA
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	NA	NA	NA	NA	—	—	—	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	NA	NA	NA	0.0202 (J)	—	—	NA	NA
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	NA	NA	NA	NA	—	—	—	NA	NA
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	NA	NA	NA	NA	—	—	—	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	NA	NA	NA	0.0754	—	—	NA	NA
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	NA	NA	NA	NA	—	—	—	NA	NA
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	NA	NA	NA	NA	—	—	—	NA	NA

Table 5.11-3 (continued)

Sample ID	Location ID	Depth(ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)
CAMO-09-6876	MO-605161	0.00–0.50	SED	0.00000101 (J)	0.00000209	—	0.00000335	0.275	0.412	0.000000186 (J)	0.000000186	0.00000233
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	—	0.000000188	0.000000178 (J)	0.00000341	0.214	0.41	0.000000226 (J)	0.00000058	0.00000127
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	—	—	—	0.000000411	—	0.0202 (J)	—	—	0.000000172
CAMO-09-6879	MO-605162	0.00–0.50	SED	0.000000292 (J)	0.000000292	—	0.000000862	0.0753	0.129	—	—	0.000000122
CAMO-09-6880	MO-605162	1.50–2.50	QBT4	—	—	—	—	—	0.0141 (J)	—	—	—
CAMO-09-6881	MO-605162	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6882	MO-605163	0.00–0.50	SED	—	0.000000193	—	—	0.0767	0.16	—	—	0.000000414
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	—	—	—	—	—	0.0206 (J)	—	—	0.000000084
CAMO-09-6884	MO-605163	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6885	MO-605164	0.00–0.50	SED	NA	NA	NA	NA	0.489	0.475	NA	NA	NA
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	NA	NA	NA	NA	—	0.0221 (J)	NA	NA	NA
CAMO-09-6887	MO-605164	2.50–3.50	QBT4	NA	NA	NA	NA	—	0.015 (J)	NA	NA	NA
CAMO-09-6888	MO-605165	0.00–0.50	SED	NA	NA	NA	NA	0.024 (J)	0.0601	NA	NA	NA
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	NA	NA	NA	NA	—	0.0237 (J)	NA	NA	NA
CAMO-09-6890	MO-605165	2.50–3.50	QBT4	NA	NA	NA	NA	—	0.014 (J)	NA	NA	NA
CAMO-09-6891	MO-605166	0.00–0.50	SED	NA	NA	NA	NA	0.119	0.273	NA	NA	NA
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	NA	NA	NA	NA	0.0127 (J)	0.0356 (J)	NA	NA	NA
CAMO-09-6893	MO-605166	2.70–3.70	QBT4	NA	NA	NA	NA	0.0138 (J)	0.0365 (J)	NA	NA	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 5.11-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Uranium-235
SOIL Background Value[a]				**1.65[b]**	**0.2**
QBT3, QBT4 Background Value[a]				**na[c]**	**0.09**
0448-97-0079	48-02166	1.00–2.00	QBT3	—[d]	0.119
0448-97-0109	48-02170	0.50–1.20	SOIL	0.144	—
CAMO-09-6877	MO-605161	0.50–1.50	QBT4	0.805	—
CAMO-09-6878	MO-605161	2.50–3.50	QBT4	0.232	—
CAMO-09-6883	MO-605163	0.50–1.50	QBT4	0.101	—
CAMO-09-6886	MO-605164	0.50–1.50	QBT4	0.12	—
CAMO-09-6889	MO-605165	0.50–1.50	QBT4	0.133	—
CAMO-09-6892	MO-605166	0.70–1.70	QBT4	0.0938	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

Table 5.12-1
Samples Collected and Analyses Requested at SWMU 48-007(f)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total Cyanide
0448-97-0064	48-02163	0.00–1.00	SOIL	—*	—	2955	—	—	—	—	—	—	—	—
0448-97-0065	48-02163	1.00–2.00	SOIL	—	—	2955	—	—	—	—	—	—	—	—
0448-97-0074	48-02164	0.00–1.00	SED	—	—	2977	—	—	—	—	—	—	—	—
0448-97-0075	48-02164	1.00–2.00	QBT3	—	—	2977	—	—	—	—	—	—	—	—
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	09-1814	09-1817	09-1815	09-1815	09-1815	09-1814	09-1816	09-1814	09-1816	—	09-1814
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	09-1814	09-1817	09-1815	09-1815	09-1815	09-1814	09-1816	09-1814	09-1816	09-1816	09-1814
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	09-1814	09-1817	09-1815	09-1815	09-1815	09-1814	09-1816	09-1814	09-1816	09-1816	09-1814
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	09-1830	09-1828	09-1831	09-1831	09-1831	09-1830	09-1829	09-1830	09-1829	—	09-1830
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	09-1830	09-1828	09-1831	09-1831	09-1831	09-1830	09-1829	09-1830	09-1829	09-1829	09-1830
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	09-1830	09-1828	09-1831	09-1831	09-1831	09-1830	09-1829	09-1830	09-1829	09-1829	09-1830
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	09-1814	09-1817	09-1815	09-1815	09-1815	09-1814	09-1816	09-1814	09-1816	—	09-1814
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	09-1814	09-1817	09-1815	09-1815	09-1815	09-1814	09-1816	09-1814	09-1816	09-1816	09-1814
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	09-1830	09-1828	09-1831	09-1831	09-1831	09-1830	09-1829	09-1830	09-1829	09-1829	09-1830
CAMO-09-6566	MO-605100	0.00–0.50	SED	09-1901	09-1899	09-1902	09-1902	09-1902	09-1901	09-1900	09-1901	09-1900	—	09-1901
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	09-1901	09-1899	09-1902	09-1902	09-1902	09-1901	09-1900	09-1901	09-1900	09-1900	09-1901
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	09-1901	09-1899	09-1902	09-1902	09-1902	09-1901	09-1900	09-1901	09-1900	09-1900	09-1901
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	09-1814	—	09-1815	09-1815	09-1815	09-1814	—	09-1814	09-1816	—	09-1814
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	09-1814	—	09-1815	09-1815	09-1815	09-1814	—	09-1814	09-1816	09-1816	09-1814
CAMO-09-6571	MO-605101	3.00–3.50	QBT4	09-1814	—	09-1815	09-1815	09-1815	09-1814	—	09-1814	09-1816	09-1816	09-1814
CAMO-09-6572	MO-605102	0.00–0.50	SED	09-1830	—	09-1831	09-1831	09-1831	09-1830	—	09-1830	09-1829	—	09-1830
CAMO-09-6573	MO-605102	1.30–2.30	QBT4	09-1830	—	09-1831	09-1831	09-1831	09-1830	—	09-1830	09-1829	09-1829	09-1830
CAMO-09-6574	MO-605102	3.30–4.30	QBT4	09-1830	—	09-1831	09-1831	09-1831	09-1830	—	09-1830	09-1829	09-1829	09-1830
CAMO-09-6575	MO-605103	0.00–0.50	SED	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	—	09-1901
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	09-1900	09-1901
CAMO-09-6577	MO-605103	2.75–3.50	QBT4	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	09-1900	09-1901
CAMO-09-6578	MO-605104	0.00–0.50	SED	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	—	09-1901
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	09-1900	09-1901
CAMO-09-6580	MO-605104	3.25–4.00	QBT4	09-1901	—	09-1902	09-1902	09-1902	09-1901	—	09-1901	09-1900	09-1900	09-1901

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.12-2
Inorganic Chemicals above BVs at SWMU 48-007(f)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Copper	Manganese	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**127**	**0.4**	**10.5**	**11.2**	**543**	**na[b]**	**na**	**0.3**	**60.2**
SOIL Background Value[a]				**0.83**	**295**	**0.4**	**19.3**	**14.7**	**671**	**na**	**na**	**1.52**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**7.14**	**4.66**	**482**	**na**	**na**	**0.3**	**63.5**
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	1.11 (U)	—[c]	0.553 (U)	—	—	—	—	0.00217 (J)	—	—
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	1.11 (U)	—	—	19	—	—	—	0.00332	1.14 (U)	—
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	1.09 (U)	60.8 (J+)	—	37.6	—	542	—	0.00171 (J)	1.15 (U)	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	1.05 (U)	—	0.526 (U)	—	—	—	2.21	0.00062 (J)	—	—
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	1.1 (U)	—	—	—	—	—	—	0.00422	1.06 (UJ)	—
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	1.05 (U)	—	—	—	—	—	—	—	1.04 (UJ)	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	1.1 (U)	—	0.551 (U)	—	—	—	4	0.00233	—	—
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	1.01 (U)	—	—	26.7	—	—	1.23	0.00173 (J)	1.04 (U)	—
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	1 (U)	—	—	31.5 (J-)	—	—	—	0.000995 (J)	1 (UJ)	—
CAMO-09-6566	MO-605100	0.00–0.50	SED	1.03 (U)	—	0.514 (U)	—	—	—	—	0.000788 (J)	1.04 (U)	—
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	1.07 (U)	—	—	10.3 (J)	—	—	—	0.000947 (J)	1.09 (U)	—
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	1.02 (U)	—	—	11.3 (J)	—	—	—	0.00116 (J)	1.03 (U)	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	1.02 (U)	—	—	—	23.5	—	0.936 (J)	0.00086 (J)	—	78
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	1.07 (U)	48 (J+)	—	—	—	—	—	0.00114 (J)	1.12 (U)	—
CAMO-09-6571	MO-605101	3.00–3.50	QBT4	1.1 (U)	—	—	24	—	—	—	0.00076 (J)	1.11 (U)	—
CAMO-09-6572	MO-605102	0.00–0.50	SED	0.976 (U)	—	0.488 (U)	—	—	—	1.83	—	0.959 (UJ)	—
CAMO-09-6573	MO-605102	1.30–2.30	QBT4	1.03 (U)	—	—	—	—	—	—	0.000876 (J)	1.07 (UJ)	—
CAMO-09-6574	MO-605102	3.30–4.30	QBT4	1.06 (U)	—	—	—	—	—	—	—	1.06 (UJ)	—
CAMO-09-6575	MO-605103	0.00–0.50	SED	1.05 (U)	—	0.525 (U)	—	—	—	1.32	0.00223	1.03 (U)	—
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	1.08 (U)	—	—	7.83 (J)	—	—	—	0.000972 (J)	1.06 (U)	—
CAMO-09-6577	MO-605103	2.75–3.50	QBT4	1.07 (U)	—	—	11.4 (J)	—	633	—	0.000879 (J)	1.06 (U)	—
CAMO-09-6578	MO-605104	0.00–0.50	SED	1.04 (U)	—	0.52 (U)	—	—	—	3.73	0.000744 (J)	1.02 (U)	—
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	1.05 (U)	—	—	19.8 (J)	—	—	—	0.000792 (J)	1.08 (U)	—
CAMO-09-6580	MO-605104	3.25–4.00	QBT4	0.991 (U)	—	—	13.9 (J)	—	—	—	—	1.01 (U)	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 5.12-3
Organic Chemicals Detected at SWMU 48-007(f)

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	Benzoic Acid	Chrysene	Fluoranthene
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.0143 (J)	NA[a]	0.0227 (J)	—[b]	0.0087	0.0053	0.0544	0.0601	0.0946	0.0354 (J)	0.375 (J)	0.068	0.14
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	—	—	—	—	0.0031 (J)	—	—	—	—	—	—	—	0.0117 (J)
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	NA	—	0.0032 (J)	0.0038	0.0023 (J)	0.0189 (J)	0.015 (J)	0.0314 (J)	—	—	0.0157 (J)	0.032 (J)
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	NA	0.0166 (J)	—	0.0133	0.0065	0.0786	0.0663	0.116	0.0346 (J)	—	0.0707	0.174
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	—	—	—	—	0.0017 (J)	—	—	—	0.016 (J)	—	—	—	0.0181 (J)
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	—	—	—	—	0.0023 (J)	—	—	—	—	—	—	—	—
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.0193 (J)	NA	0.0249 (J)	—	0.012 (J)	0.0087 (J)	—	0.0779	0.118	0.0518	—	0.082	0.195
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	0.03 (J)	NA	0.0402	NA	NA	NA	0.179	0.2	0.339	0.109	—	0.234	0.452
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	—	—	—	NA	NA	NA	—	0.0119 (J)	0.0184 (J)	—	—	0.0122 (J)	0.0252 (J)
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	—	—	—	—	—	0.0123 (J)
CAMO-09-6575	MO-605103	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0143 (J)	0.0233 (J)	—	—	0.0189 (J)	0.034 (J)
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	—	—	—	NA	NA	NA	—	—	—	—	—	—	—
CAMO-09-6578	MO-605104	0.00–0.50	SED	—	NA	—	NA	NA	NA	—	0.0154 (J)	0.0281 (J)	0.0114 (J)	—	0.0177 (J)	0.032 (J)
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	—	0.11	—	NA	NA	NA	—	0.0111 (J)	—	—	—	—	0.0169 (J)
CAMO-09-6580	MO-605104	3.2500–4.00	QBT4	—	0.00404 (J)	—	NA	NA	NA	—	—	—	—	—	—	—

Table 5.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.0126 (J)	0.0000257	0.0000527	0.00000352	—	0.0000109	0.000000464 (J)	0.000000894 (J)	0.000000816 (J)
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	—	0.00000131 (J)	0.00000274	0.000000297 (J)	—	0.000000711	—	—	—
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	—	0.000000105 (J)	0.000000105	—	—	—	—	—	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	0.00000799	0.0000147	0.00000102 (J)	—	0.00000213	—	—	0.000000309 (J)
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	—	0.0000059	0.0000102	0.000000907 (J)	—	0.00000239	—	—	—
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	—	0.00000122 (J)	0.0000022	—	—	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	0.0000228	0.0000444	0.0000037	—	0.0000108	0.000000355 (J)	0.00000081 (J)	0.000000631 (J)
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	—	0.00000758	0.0000139	0.0000012 (J)	—	0.00000346	—	—	0.000000213 (J)
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	—	—	0.00000178	0.000000416 (J)	—	0.00000106	—	—	—
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.0132 (J)	0.000018	0.000034	0.00000376	0.000000258 (J)	0.0000102	—	0.000000801 (J)	0.000000579 (J)
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	—	0.00000198 (J)	0.00000349	—	—	0.000000592	—	—	—
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	0.0201 (J)	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6580	MO-605104	3.2500–4.00	QBT4	—	NA	NA	NA	NA	NA	NA	NA	NA

Table 5.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.00000637	0.000000324 (J)	0.000000223 (J)	0.000000284 (J)	0.00000454	0.028 (J)	NA	0.000282 (J)	0.0000118
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	—	—	—	—	0.000000097	—	—	0.00000923 (J)	0.000000606 (J)
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	—	—	—	—	—	—	—	0.00000081 (J)	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	0.00000269	—	—	—	0.000000954	—	NA	0.000056 (J)	0.00000237 (J)
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	0.000000657	—	—	—	0.000000553	—	—	0.0000491 (J)	0.00000277 (J)
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	—	—	—	—	—	—	—	0.0000131 (J)	0.000000753 (J)
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	0.00000576	0.000000231 (J)	0.000000162 (J)	0.000000242 (J)	0.00000404	0.033 (J)	NA	0.000206 (J)	0.0000114
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	0.00000128	—	—	—	0.000000907	—	—	0.0000666 (J)	0.00000338 (J)
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	—	—	—	—	0.000000153	—	—	0.0000203 (J)	0.00000132 (J)
CAMO-09-6566	MO-605100	0.00–0.50	SED	0.00000454	0.000000247 (J)	0.000000214 (J)	0.000000258 (J)	0.00000416	0.041	NA	0.000146 (J)	0.0000101
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	—	—	—	—	0.000000158	—	—	0.0000164 (J)	0.00000112 (J)
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	—	—	—	—	—	—	—	0.00000252 (J)	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	NA	NA	NA	NA	NA	0.0987	NA	NA	NA
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	NA	NA	NA	NA	NA	—	—	NA	NA
CAMO-09-6572	MO-605102	0.00–0.50	SED	NA	NA	NA	NA	NA	—	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	NA	NA	NA	NA	NA	—	NA	NA	NA
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	NA	NA	NA	NA	NA	—	—	NA	NA
CAMO-09-6578	MO-605104	0.00–0.50	SED	NA	NA	NA	NA	NA	—	NA	NA	NA
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	NA	NA	NA	NA	NA	—	0.0119	NA	NA
CAMO-09-6580	MO-605104	3.2500–4.00	QBT4	NA	NA	NA	NA	NA	—	—	NA	NA

Table 5.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Toluene
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	0.000000339 (J)	0.000000339	—	0.000000557	0.0935	0.131	—	—	NA
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6559	MO-605097	3.00–3.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6560	MO-605098	0.00–0.50	SOIL	—	—	—	—	0.0165 (J)	0.0319 (J)	—	0.00000023	NA
CAMO-09-6561	MO-605098	1.50–2.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6562	MO-605098	3.50–4.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	0.000000238 (J)	0.000000458	0.000000112 (J)	0.00000118	0.0848	0.144	0.000000124	0.000000633	NA
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	—	—	—	—	—	0.0178 (J)	—	—	—
CAMO-09-6565	MO-605099	2.50–3.00	QBT4	—	—	—	—	—	0.0119 (J)	—	—	0.000583 (J)
CAMO-09-6566	MO-605100	0.00–0.50	SED	—	—	—	0.00000125	0.116	0.166	—	0.000000573	NA
CAMO-09-6567	MO-605100	0.50–1.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6568	MO-605100	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	NA	NA	NA	NA	0.242	0.444	NA	NA	NA
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	NA	NA	NA	NA	0.0138 (J)	0.0244 (J)	NA	NA	—
CAMO-09-6572	MO-605102	0.00–0.50	SED	NA	NA	NA	NA	—	0.0106 (J)	NA	NA	NA
CAMO-09-6575	MO-605103	0.00–0.50	SED	NA	NA	NA	NA	0.0254 (J)	0.028 (J)	NA	NA	NA
CAMO-09-6576	MO-605103	0.75–1.75	QBT4	NA	NA	NA	NA	—	—	NA	NA	0.000336 (J)
CAMO-09-6578	MO-605104	0.00–0.50	SED	NA	NA	NA	NA	0.0145 (J)	0.0278 (J)	NA	NA	NA
CAMO-09-6579	MO-605104	1.25–2.25	QBT4	NA	NA	NA	NA	—	0.0162 (J)	NA	NA	0.000674 (J)
CAMO-09-6580	MO-605104	3.2500–4.00	QBT4	NA	NA	NA	NA	—	—	NA	NA	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 5.12-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 48-007(f)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-235
SOIL Background Value[a]				**1.65[b]**	**0.054[b]**	**na[c]**	**0.2**
QBT3,QBT4 Background Value[a]				**na**	**na**	**na**	**0.09**
0448-97-0075	48-02164	1.00–2.00	QBT3	—[d]	NA[e]	NA	0.1033
CAMO-09-6557	MO-605097	0.00–0.50	SOIL	—	—	0.0596577	—
CAMO-09-6558	MO-605097	1.00–2.00	QBT4	0.0636	—	—	—
CAMO-09-6563	MO-605099	0.00–0.50	SOIL	—	—	0.0677143	—
CAMO-09-6564	MO-605099	0.50–1.50	QBT4	—	—	0.011343	—
CAMO-09-6569	MO-605101	0.00–0.50	SOIL	—	—	0.0469456	—
CAMO-09-6570	MO-605101	1.00–2.00	QBT4	0.0917	—	0.0282626	—
CAMO-09-6577	MO-605103	2.75–3.50	QBT4	—	0.019	—	—

Note: Results are in pCi/g.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

[e] NA = Not analyzed.

Table 5.13-1
Samples Collected and Analyses Requested at AOC 48-011

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	TAL Metals	PCBs	Perchlorate	SVOCs	VOCs	Total CyanideTotal Cyanide
CAMO-09-9737	MO-605351	65.00-66.50	QBT3	09-2090	09-2088	09-2090	09-2090	09-2090	09-2089	09-2090	09-2089	09-2089	09-2090
CAMO-09-9738	MO-605351	75.00-76.50	QBT3	09-2090	09-2088	09-2090	09-2090	09-2090	09-2089	09-2090	09-2089	09-2089	09-2090
CAMO-09-9739	MO-605351	85.00-86.50	QBT3	09-2090	09-2088	09-2090	09-2090	09-2090	09-2089	09-2090	09-2089	09-2089	09-2090
CAMO-09-9740	MO-605351	100.00-101.50	QBT2	09-2090	09-2088	09-2090	09-2090	09-2090	09-2089	09-2090	09-2089	09-2089	09-2090

Note: Numbers in analyte columns are request numbers.

Table 5.13-2
Inorganic Chemicals above BVs at AOC 48-011

Sample ID	Location ID	Depth (ft)	Media	Antimony	Nitrate	Perchlorate	Selenium
QBT2,QBT3 Background Value[a]				**0.5**	**na[b]**	**na**	**0.3**
CAMO-09-9737	MO-605351	65.00–66.50	QBT3	1.09 (U)	0.979 (J-)	0.00591	1.09 (U)
CAMO-09-9738	MO-605351	75.00–76.50	QBT3	1.02 (U)	0.824 (J-)	0.00451	1.05 (U)
CAMO-09-9739	MO-605351	85.00–86.50	QBT3	1.07 (U)	—[c]	0.0052	1.07 (U)
CAMO-09-9740	MO-605351	100.00–101.50	QBT2	1.03 (U)	0.847 (J-)	0.0058	1.06 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.

Table 5.13-3
Organic Chemicals Detected at AOC 48-011

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Benzoic Acid	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Trichloroethane[1,1,2-]
CAMO-09-9737	MO-605351	65.00–66.50	QBT3	—*	—	—	0.000000134 (J)	0.000000134	0.000000949 (J)	—
CAMO-09-9738	MO-605351	75.00–76.50	QBT3	—	—	—	—	—	0.000000708 (J)	0.000424 (J)
CAMO-09-9739	MO-605351	85.00–86.50	QBT3	0.0018 (J)	—	0.00000013	—	—	0.000000212 (J)	—
CAMO-09-9740	MO-605351	100.00–101.50	QBT2	—	0.261 (J)	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
* — = Not detected.

Table 5.14-1
Samples Collected and Analyses Requested at AOC 48-012

Sample ID	Location ID	Depth (ft)	Media	PCBs	SVOCs	TPH-DRO	VOCs
RE48-02-49520	48-02-21182	6.00–6.00	SOIL	—*	1243S	—	1243S
RE48-02-49521	48-02-21183	7.33–7.33	SOIL	—	1244S	—	1243S
RE48-02-49522	48-02-21184	7.00–7.00	SOIL	—	1243S	—	1243S
RE48-02-49523	48-02-21185	7.00–7.00	SOIL	—	1243S	—	1243S
RE48-02-49524	48-02-21186	6.50–6.50	SOIL	—	1243S	—	1243S
RE48-02-49525	48-02-21187	6.00–6.00	SOIL	—	1243S	—	1243S
RE48-02-49526	48-02-21188	6.00–6.00	SOIL	—	1243S	—	1243S
RE48-02-49527	48-02-21189	7.00–7.00	SOIL	—	1243S	—	1243S
RE48-02-49528	48-02-21190	7.00–7.00	SOIL	—	1243S	—	1243S
RE48-02-49529	48-02-21191	7.00–7.00	SOIL	—	1243S	—	1243S
CAMO-09-6537	MO-605089	7.50–8.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6538	MO-605089	17.50–18.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6539	MO-605089	22.50–23.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6540	MO-605090	6.00–7.00	QBT4	09-1713	09-1713	09-1713	09-1713
CAMO-09-6541	MO-605090	16.00–17.00	QBT4	09-1713	09-1713	09-1713	09-1713
CAMO-09-6542	MO-605090	21.00–22.00	QBT4	09-1713	09-1713	09-1713	09-1713
CAMO-09-6543	MO-605091	7.50–8.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6544	MO-605091	17.50–18.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6545	MO-605091	22.50–23.50	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6546	MO-605092	4.00–5.00	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6547	MO-605092	14.00–15.00	QBT4	09-1715	09-1715	09-1715	09-1715
CAMO-09-6548	MO-605092	19.00–20.00	QBT4	09-1715	09-1715	09-1715	09-1715

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 5.14-2
Organic Chemicals Detected at AOC 48-012

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dimethylphenol[2,4-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Methylphenol[2-]	Methylphenol[4-]	Naphthalene	Phenanthrene	Pyrene
RE48-02-49520	48-02-21182	6.00–6.00	SOIL	—*	—	—	—	—	—	—	—	—	—	0.0658049	—	—	—	—	—	—	0.0587544	0.0599295
RE48-02-49521	48-02-21183	7.33–7.33	SOIL	10.6718	11.0441	17.3727	10.5477	12.3	3.22637	11.7886	9.6791	5.33591	0.310228	26.0591	9.30683	1.01755	3.7	0.198546	0.442	13.65	37.2273	34.7455
RE48-02-49523	48-02-21185	7.00–7.00	SOIL	—	—	—	—	—	—	—	—	—	—	0.0434783	—	—	—	—	—	—	—	0.0445931
RE48-02-49524	48-02-21186	6.50–6.50	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.134529	—	—
RE48-02-49525	48-02-21187	6.00–6.00	SOIL	—	0.0433735	0.118072	—	0.113	—	0.0783133	—	—	—	0.180723	—	—	—	—	—	—	0.156627	0.228916
RE48-02-49529	48-02-21191	7.00–7.00	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0645527	—	—

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

* — = Not detected.

Table 6.6-1
Samples Collected and Analyses Requested at AOC 50-002(d)

Sample ID	Location ID	Depth (ft)	Media	Gamma Spectroscopy	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	SVOCs
CAMO-09-10581	MO-605535	0.00–0.00	n/a*	09-2545	09-2545	09-2545	09-2545	09-2545	09-2545
CAMO-09-10582	MO-605536	0.00–0.00	n/a	09-2545	09-2545	09-2545	09-2545	09-2545	09-2545
CAMO-09-10583	MO-605537	0.00–0.00	n/a	09-2545	09-2545	09-2545	09-2545	09-2545	09-2545
CAMO-09-10584	MO-605538	0.00–0.00	n/a	09-2545	09-2545	09-2545	09-2545	09-2545	09-2545

Note: Numbers in analyte columns are request numbers.

* n/a = Not applicable (swipe samples).

Table 6.6-2
Inorganic Chemicals above BVs at AOC 50-002(d)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Sodium	Vanadium	Zinc
Background Value				**na**[a]	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
CAMO-09-10581	MO-605535	0.00-0.00	n/a[b]	286	2.49	0.149 (J)	4	0.0465 (J)	0.219 (J)	332	2.04	—[c]	874	1.85 (J)	102	25.5	1.06	117	98	0.843 (J)	37.1
CAMO-09-10582	MO-605536	0.00-0.00	n/a	796	1.73 (J)	0.196 (J)	9.22	0.0556	1.09	790	4.71	0.539 (J)	2150	5.48	239	59.5	1.44	242	87.5	2.3	82.5
CAMO-09-10583	MO-605537	0.00-0.00	n/a	496	1.66 (J)	0.177 (J)	7.13	0.0468 (J)	0.583 (J)	664	3.53	0.419 (J)	1320	2.96	163	50	1.38	159	93.8	1.5	60.6
CAMO-09-10584	MO-605538	0.00-0.00	n/a	214	1.68 (J)	—	3.25	0.0288 (J)	—	323	2.4	—	697	1.48 (J)	77.6	16.5	0.666	88.3	88.9	0.606 (J)	22.9

Notes: Results are in ug/FILTER. Data qualifiers are presented in Appendix A.
[a] na = Not available.
[b] n/a = Not applicable (swipe samples).
[c] — = Not detected.

Table 6.6-3
Organic Chemicals Detected at AOC 50-002(d)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
CAMO-09-10581	MO-605535	0.00–0.00	n/a[a]	—[b]	—	0.0916 (J)	1.25	3.19	6.02	0.915 (J)	2.08	3.48	—	1.6	—	—	1.34	3.03
CAMO-09-10582	MO-605536	0.00–0.00	n/a	—	0.208 (J)	0.0918 (J)	2.95	4.98	9.29	2.24	4.28	6.77	—	2.7	—	—	2.32	6.64
CAMO-09-10583	MO-605537	0.00–0.00	n/a	1.64	3.17	0.103	23.1	24.8	33.3	17.4	28.3	46.7	1.46	15	0.624 (J)	0.96 (J)	23.4	46.5
CAMO-09-10584	MO-605538	0.00–0.00	n/a	—	0.307 (J)	0.177	3.27	5.26	9.69	2.44	4.9	7.78	—	2.86	—	—	3.07	7.01

Notes: Results are in ug/FILTER. Data qualifiers are presented in Appendix A.
[a] n/a = Not applicable (swipe samples).
[b] — = Not detected.

Table 6.8-1
Samples Collected and Analyses Requested at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAC0213	50-03001	2.00–5.00	FILL	—*	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
MD50-04-52698	50-03001	5.00–9.00	QBT3	1941S	—	1942S	1942S	1942S	1942S	1941S	—	—	—	—	—	—
AAC0212	50-03001	5.70–6.00	QBT3	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
AAC0214	50-03002	1.00–5.00	FILL	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
AAC0215	50-03002	5.30–5.80	QBT3	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
MD50-03-52047	50-03002	15.00–20.00	QBT3	1901S	—	1902S	1902S	1902S	1902S	1901S	—	—	—	—	—	—
AAC0216	50-03003	1.00–3.00	FILL	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
AAC0217	50-03003	3.00–4.00	QBT3	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
MD50-03-52048	50-03003	10.00–15.00	QBT3	1901S	—	1902S	1902S	1902S	1902S	1901S	—	—	—	—	—	—
AAC0270	50-03004	5.00–6.30	FILL	—	—	20195	20195	—	20195	20190	—	—	—	—	—	—
AAC0271	50-03004	6.30–7.30	QBT3	—	—	20195	20195	—	20195	20190	—	—	—	—	—	—
AAC0260	50-03005	5.30–6.30	FILL	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0261	50-03005	6.30–7.30	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
MD50-03-52050	50-03008	10.00–15.00	QBT3	1901S	—	1902S	1902S	1902S	1902S	1901S	—	—	—	—	—	—
AAC0274	50-03008	11.40–12.40	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0275	50-03008	12.40–16.00	QBT3	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0278	50-03009	5.00–6.00	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0279	50-03009	6.00–9.50	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0294	50-03009	12.30–13.50	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
MD50-03-52052	50-03009	18.00–22.00	FILL	1792S	—	1793S	1793S	1793S	1793S	1792S	—	—	—	—	—	—
MD50-03-52051	50-03009	26.00–28.00	QBT3	1792S	—	1793S	1793S	1793S	1793S	1792S	—	—	—	—	—	—
AAC0262	50-03012	7.00–8.00	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0263	50-03012	8.00–11.00	QBT3	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0264	50-03014	6.50–7.50	FILL	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0265	50-03014	7.50–8.50	QBT3	—	—	19915	19915	19915	19915	19910	—	—	—	—	—	—
AAC0266	50-03016	10.00–11.00	FILL	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0267	50-03016	11.00–12.30	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0292	50-03016	12.50–13.60	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0268	50-03017	7.00–10.50	FILL	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0269	50-03017	10.50–11.50	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0291	50-03017	12.50–14.50	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0249	50-03018	6.00–7.00	FILL	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0250	50-03018	7.00–9.50	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0290	50-03018	10.50–12.50	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAC0252	50-03020	5.00–6.00	FILL	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0253	50-03020	6.00–7.00	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0293	50-03020	7.00–9.50	QBT3	—	—	19776	19776	19776	19776	19774	—	—	—	—	—	—
AAC0220	50-03021	7.00–9.00	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0221	50-03021	9.40–10.00	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0223	50-03022	7.00–12.00	FILL	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
AAC0224	50-03022	14.50–16.00	QBT3	—	—	19658	19658	19658	19658	19677	—	—	—	—	—	—
AAC0231	50-03023	5.50–6.50	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0227	50-03024	4.50–5.50	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0228	50-03024	6.00–7.00	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0254	50-03025	5.00–6.10	FILL	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0255	50-03025	6.10–7.00	QBT3	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0256	50-03026	6.00–7.00	FILL	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0257	50-03026	7.00–8.00	QBT3	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0210	50-03027	2.00–2.50	FILL	—	—	19670	19670	19670	19670	19506	—	—	—	—	—	—
AAC0211	50-03027	5.50–6.00	QBT3	—	—	19670	19670	19670	19670	19506	—	—	—	—	—	—
AAC0258	50-03028	0.80–1.50	FILL	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0259	50-03028	1.50–3.00	QBT3	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAB6106	50-03028	10.30–13.00	QBT3	—	—	19722	19722	19722	19722	19720	—	—	—	—	—	—
AAC0229	50-03030	1.00–1.50	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0230	50-03030	5.50–6.50	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0225	50-03031	1.50–2.50	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0232	50-03031	5.00–6.00	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0233	50-03032	0.75–2.00	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0235	50-03032	3.80–5.00	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0234	50-03032	5.50–6.50	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0236	50-03033	7.00–8.00	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0237	50-03033	8.00–9.00	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0238	50-03034	7.90–8.90	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0239	50-03034	9.00–10.00	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0240	50-03035	6.75–7.85	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0241	50-03035	8.00–9.00	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0242	50-03036	8.50–9.50	FILL	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0243	50-03036	9.50–10.00	QBT3	—	—	19657	19657	19657	19657	19679	—	—	—	—	—	—
AAC0244	50-03037	6.00–7.00	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAC0245	50-03037	7.00–8.50	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0247	50-03038	8.50–9.50	FILL	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAC0248	50-03038	9.50–10.50	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAB6105	50-03038	10.30–13.00	QBT3	—	—	19671	19671	19671	19671	19678	—	—	—	—	—	—
AAA2459	50-05031	0.00–0.50	SOIL	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	09-2506	09-2505	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	—	09-2506	—	09-2506
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	09-2506	09-2505	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	—	09-2506	09-2506	09-2506
CAMO-09-6605	MO-605106	6.00–7.00	QBT3	09-2506	09-2505	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	—	09-2506	09-2506	09-2506
CAMO-09-6621	MO-605108	0.50–1.00	FILL	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	—	09-2075
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6623	MO-605108	17.50–19.00	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6626	MO-605109	0.00–0.50	FILL	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	—	09-2315
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	09-2314	09-2315
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	09-2314	09-2315
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	09-2314	09-2315
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	09-2314	09-2315
CAMO-09-9941	MO-605457	3.50–5.00	FILL	09-2516	09-2514	09-2517	09-2517	09-2517	09-2517	09-2516	—	09-2516	—	09-2515	09-2515	09-2516
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	09-2516	09-2514	09-2517	09-2517	09-2517	09-2517	09-2516	—	09-2516	—	09-2515	09-2515	09-2516
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	09-2516	09-2514	09-2517	09-2517	09-2517	09-2517	09-2516	—	09-2516	—	09-2515	09-2515	09-2516
CAMO-09-9944	MO-605458	2.50–3.50	FILL	09-2427	09-2426	09-2427	09-2427	09-2427	09-2427	09-2427	—	09-2427	—	09-2427	09-2427	09-2427
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	09-2427	09-2426	09-2427	09-2427	09-2427	09-2427	09-2427	—	09-2427	—	09-2427	09-2427	09-2427
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	09-2510	09-2509	09-2510	09-2510	09-2510	09-2510	09-2510	—	09-2510	—	09-2510	09-2510	09-2510
CAMO-09-9947	MO-605459	2.00–3.00	FILL	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9950	MO-605460	3.50–4.50	FILL	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9956	MO-605462	9.00–10.00	FILL	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	—	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9959	MO-605463	7.00–8.00	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9960	MO-605463	8.00–9.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9962	MO-605464	4.00–5.00	FILL	09-2542	09-2540	09-2541	09-2541	09-2541	09-2541	09-2542	—	09-2542	—	09-2541	09-2541	09-2542
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	09-2542	09-2540	09-2541	09-2541	09-2541	09-2541	09-2542	—	09-2542	—	09-2541	09-2541	09-2542
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	09-2542	09-2540	09-2541	09-2541	09-2541	09-2541	09-2542	—	09-2542	—	09-2541	09-2541	09-2542
CAMO-09-9968	MO-605466	6.00–7.00	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9971	MO-605467	4.00–5.00	FILL	09-2312	09-2311	09-2312	09-2312	09-2312	09-2312	09-2312	—	09-2312	—	09-2312	09-2312	09-2312
CAMO-09-9972	MO-605467	5.00–6.00	QBT3	09-2312	09-2311	09-2312	09-2312	09-2312	09-2312	09-2312	—	09-2312	—	09-2312	09-2312	09-2312
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	09-2312	09-2311	09-2312	09-2312	09-2312	09-2312	09-2312	—	09-2312	—	09-2312	09-2312	09-2312
CAMO-09-9974	MO-605468	4.00–5.00	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9977	MO-605469	8.00–9.00	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9979	MO-605469	14.00–15.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9980	MO-605470	2.50–3.50	FILL	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9983	MO-605471	8.00–9.00	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	—	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9986	MO-605472	7.00–8.00	FILL	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	09-2242	09-2244	09-2243	09-2243	09-2243	09-2243	09-2242	—	09-2242	—	09-2241	09-2241	09-2242
CAMO-09-9989	MO-605473	2.00–3.00	SED	09-2516	09-2514	09-2517	09-2517	09-2517	09-2517	09-2516	09-2515	09-2516	—	09-2515	09-2515	09-2516
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	09-2525	09-2523	09-2526	09-2526	09-2526	09-2526	09-2525	09-2524	09-2525	—	09-2524	09-2524	09-2525
CAMO-09-9995	MO-605475	4.00–5.00	FILL	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	09-2269	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	09-2269	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	09-2269	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9998	MO-605476	16.50–17.50	FILL	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	09-2330	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	09-2330	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	09-2331	09-2329	09-2332	09-2332	09-2332	09-2332	09-2331	09-2330	09-2331	—	09-2330	09-2330	09-2331
CAMO-09-10001	MO-605477	4.00–5.00	FILL	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10004	MO-605478	7.50–8.50	FILL	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10005	MO-605478	8.50–9.50	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10007	MO-605479	7.00–8.00	FILL	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-10009	MO-605479	13.00–14.00	QBT3	09-2288	09-2298	09-2289	09-2289	09-2289	09-2289	09-2288	09-2287	09-2288	—	09-2287	09-2287	09-2288
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	09-2006	09-2005	09-2006	09-2006	09-2006	09-2006	09-2006	09-2006	09-2006	—	09-2006	09-2006	09-2006
CAMO-09-6602	MO-605625	20.00–21.50	QBT3	09-2006	09-2005	09-2006	09-2006	09-2006	09-2006	09-2006	09-2006	09-2006	—	09-2006	09-2006	09-2006
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6609	MO-605626	20.00–22.50	QBT3	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	09-2074	09-2075
CAMO-09-6610	MO-605627	10.00–11.00	QBT3	09-2394	09-2393	09-2394	09-2394	09-2394	09-2394	09-2394	—	09-2394	—	09-2394	09-2394	09-2394
CAMO-09-6611	MO-605627	15.00–16.00	QBT3	09-2394	09-2393	09-2394	09-2394	09-2394	09-2394	09-2394	—	09-2394	—	09-2394	09-2394	09-2394
CAMO-09-6612	MO-605627	20.00–21.00	QBT3	09-2394	09-2393	09-2394	09-2394	09-2394	09-2394	09-2394	—	09-2394	—	09-2394	09-2394	09-2394
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	09-2536	09-2537	09-2536	09-2536	09-2536	09-2536	09-2536	—	09-2536	—	09-2536	09-2536	09-2536
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	09-2536	09-2537	09-2536	09-2536	09-2536	09-2536	09-2536	—	09-2536	—	09-2536	09-2536	09-2536
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	09-2536	09-2537	09-2536	09-2536	09-2536	09-2536	09-2536	—	09-2536	—	09-2536	09-2536	09-2536

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.8-2
Inorganic Chemicals above BVs at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide	Iron	Lead
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
AAC0213	50-03001	2.00–5.00	FILL	—[c]	4.5 (U)	—	—	—	—	—	—	—	—	NA[d]	—	—
MD50-04-52698	50-03001	5.00–9.00	QBT3	—	1.03 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0212	50-03001	5.70–6.00	QBT3	—	4.5 (U)	—	—	—	—	—	19.7 (J-)	—	—	NA	—	—
AAC0214	50-03002	1.00–5.00	FILL	—	4.8 (U)	—	—	—	0.61 (J)	—	—	—	—	NA	—	—
AAC0215	50-03002	5.30–5.80	QBT3	—	4.8 (U)	—	—	—	—	—	—	—	—	NA	—	—
MD50-03-52047	50-03002	15.00–20.00	QBT3	—	—	2.83	—	—	—	—	—	—	—	NA	—	—
AAC0216	50-03003	1.00–3.00	FILL	—	4.6 (U)	—	—	—	0.5 (J)	—	—	—	—	NA	—	—
AAC0217	50-03003	3.00–4.00	QBT3	—	4.6 (U)	—	49.4	—	—	—	—	—	—	NA	—	—
MD50-03-52048	50-03003	10.00–15.00	QBT3	—	—	—	—	—	—	—	—	—	—	NA	—	—
AAC0270	50-03004	5.00–6.30	FILL	—	4.6 (U)	—	—	—	0.63 (J)	12900	—	—	—	NA	—	—
AAC0271	50-03004	6.30–7.30	QBT3	—	4.8 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0260	50-03005	5.30–6.30	FILL	—	4.9 (UJ)	—	—	—	0.5 (J)	—	—	—	—	NA	—	—
AAC0261	50-03005	6.30–7.30	QBT3	—	4.7 (UJ)	6.5 (J-)	—	—	—	—	—	—	—	NA	—	—
MD50-03-52050	50-03008	10.00–15.00	QBT3	7540	—	—	77.6	—	—	—	—	—	—	NA	—	—
AAC0274	50-03008	11.40–12.40	FILL	—	5 (U)	—	—	—	0.41 (U)	—	—	—	—	NA	—	—
AAC0275	50-03008	12.40–16.00	QBT3	—	4.7 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0278	50-03009	5.00–6.00	FILL	—	4.7 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0279	50-03009	6.00–9.50	FILL	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0294	50-03009	12.30–13.50	FILL	32300	6.7 (U)	—	—	4.7	1.8	17200	—	—	16.9	NA	—	—
MD50-03-52052	50-03009	18.00–22.00	FILL	—	—	—	—	—	0.552 (U)	—	—	—	—	NA	—	—
AAC0262	50-03012	7.00–8.00	FILL	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0263	50-03012	8.00–11.00	QBT3	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0264	50-03014	6.50–7.50	FILL	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0265	50-03014	7.50–8.50	QBT3	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0266	50-03016	10.00–11.00	FILL	—	4.7 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0267	50-03016	11.00–12.30	QBT3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0292	50-03016	12.50–13.60	QBT3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0268	50-03017	7.00–10.50	FILL	—	4.7 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0269	50-03017	10.50–11.50	QBT3	—	4.7 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0291	50-03017	12.50–14.50	QBT3	—	4.8 (UJ)	—	—	1.5	—	3190 (J-)	—	—	—	NA	—	—
AAC0249	50-03018	6.00–7.00	FILL	—	4.8 (UJ)	—	—	—	0.51 (J)	—	—	—	—	NA	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide	Iron	Lead
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
AAC0250	50-03018	7.00–9.50	QBT3	—	4.8 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0290	50-03018	10.50–12.50	QBT3	—	4.9 (UJ)	—	50.2	—	—	5930 (J-)	—	—	—	NA	—	—
AAC0252	50-03020	5.00–6.00	FILL	—	4.9 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0253	50-03020	6.00–7.00	QBT3	—	4.9 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0293	50-03020	7.00–9.50	QBT3	—	4.8 (UJ)	—	51.1	—	—	5050 (J-)	—	—	—	NA	—	—
AAC0220	50-03021	7.00–9.00	FILL	—	4.7 (UJ)	—	—	—	0.65 (J)	—	—	—	—	NA	—	—
AAC0221	50-03021	9.40–10.00	QBT3	—	4.6 (UJ)	—	74.9	—	—	5110	—	—	—	NA	—	—
AAC0223	50-03022	7.00–12.00	FILL	—	4.8 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0224	50-03022	14.50–16.00	QBT3	—	4.7 (U)	—	50.4	—	—	—	—	—	—	NA	—	—
AAC0231	50-03023	5.50–6.50	FILL	—	4.6 (U)	—	—	—	0.46 (J)	—	—	—	—	NA	—	—
AAC0227	50-03024	4.50–5.50	FILL	—	4.5 (U)	—	—	—	0.53 (J)	—	—	—	—	NA	—	—
AAC0228	50-03024	6.00–7.00	QBT3	—	4.8 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0254	50-03025	5.00–6.1000	FILL	—	4.8 (UJ)	—	—	—	0.73 (J)	—	—	—	—	NA	—	—
AAC0255	50-03025	6.10–7.00	QBT3	—	4.6 (UJ)	—	67.2	—	—	—	—	—	—	NA	—	—
AAC0256	50-03026	6.00–7.00	FILL	—	5 (UJ)	—	—	—	0.47 (J)	—	—	—	—	NA	—	—
AAC0257	50-03026	7.00–8.00	QBT3	—	5 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0210	50-03027	2.00–2.50	FILL	—	4.8 (U)	—	—	—	0.94 (J)	—	—	—	—	NA	—	—
AAC0211	50-03027	5.50–6.00	QBT3	—	4.6 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0258	50-03028	0.80–1.50	FILL	—	5.3 (UJ)	—	—	—	0.58 (J)	—	—	—	—	NA	—	—
AAC0259	50-03028	1.50–3.00	QBT3	—	6 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAB6106	50-03028	10.30–13.00	QBT3	8180	5 (UJ)	—	—	2.1	—	—	—	—	—	NA	—	—
AAC0229	50-03030	1.00–1.50	FILL	—	5.1 (UJ)	—	—	—	1.2 (J)	—	—	—	—	NA	—	—
AAC0230	50-03030	5.50–6.50	QBT3	—	5 (UJ)	—	—	—	—	—	—	—	—	NA	—	70.1 (J+)
AAC0225	50-03031	1.50–2.50	FILL	—	5.1 (UJ)	—	—	—	0.97 (J)	—	—	—	—	NA	—	—
AAC0232	50-03031	5.00–6.00	QBT3	—	5.8 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0233	50-03032	0.75–2.00	FILL	—	5.1 (UJ)	—	—	—	1 (J)	—	—	—	—	NA	—	—
AAC0235	50-03032	3.80–5.00	FILL	—	8.6 (J-)	—	—	—	1.6	—	—	—	—	NA	—	—
AAC0234	50-03032	5.50–6.50	QBT3	—	5.4 (UJ)	—	51.2 (J)	—	—	—	—	—	—	NA	—	—
AAC0236	50-03033	7.00–8.00	FILL	—	4.7 (UJ)	—	—	—	0.85 (J)	—	—	—	—	NA	—	—
AAC0237	50-03033	8.00–9.00	QBT3	—	4.5 (UJ)	—	—	—	—	—	—	—	—	NA	—	23.7 (J+)
AAC0238	50-03034	7.90–8.90	FILL	—	4.9 (U)	—	—	—	0.73 (J)	—	—	—	—	NA	—	—
AAC0239	50-03034	9.00–10.00	QBT3	—	4.5 (U)	—	—	—	—	—	—	—	—	NA	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide	Iron	Lead
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
AAC0240	50-03035	6.75–7.85	FILL	—	4.9 (U)	—	—	—	1 (J)	—	—	—	—	NA	—	—
AAC0241	50-03035	8.00–9.00	QBT3	—	4.8 (U)	—	—	—	—	—	—	—	—	NA	—	14.1
AAC0242	50-03036	8.50–9.50	FILL	—	5 (UJ)	—	—	—	0.71 (J)	—	—	—	—	NA	—	—
AAC0243	50-03036	9.50–10.00	QBT3	—	4.9 (UJ)	—	—	—	—	—	—	—	—	NA	—	—
AAC0244	50-03037	6.00–7.00	FILL	—	4.7 (U)	—	—	—	1.1 (J)	—	—	—	—	NA	—	—
AAC0245	50-03037	7.00–8.50	QBT3	—	4.7 (U)	—	—	—	—	—	—	—	—	NA	—	—
AAC0247	50-03038	8.50–9.50	FILL	—	4.6 (U)	—	—	—	0.75 (J)	—	—	—	—	NA	—	—
AAC0248	50-03038	9.50–10.50	QBT3	7510 (J)	4.8 (U)	—	48.8	—	—	2770	—	—	—	NA	—	—
AAB6105	50-03038	10.30–13.00	QBT3	17600	5.1 (U)	—	95.7	1.4	—	6650	9.9 (J)	—	6.1	NA	—	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	1.07 (U)	—	—	—	0.533 (U)	—	—	—	—	—	—	—
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	1.09 (U)	—	—	—	—	—	14	—	—	—	—	—
CAMO-09-6605	MO-605106	6.00–7.00	QBT3	—	1.07 (U)	—	—	—	—	—	22	—	—	—	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	1.12 (U)	—	—	—	0.561 (U)	—	—	—	—	—	—	—
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6623	MO-605108	17.50–19.00	QBT3	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	1.08 (U)	—	—	1.36	—	—	—	—	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	1.11 (U)	—	—	—	0.555 (U)	—	—	—	—	—	—	—
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	1.11 (U)	—	81.9	—	—	—	—	—	4.74	—	—	—
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	1.09 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	1.04 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	—	1.09 (U)	—	—	—	0.545 (U)	—	—	—	—	—	—	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	1.1 (U)	—	—	—	—	—	21.3	—	—	—	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	—	1.14 (U)	—	—	—	—	—	18.8	—	—	—	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	—	1.12 (U)	—	—	—	0.558 (U)	—	—	—	—	—	—	—
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	1.12 (U)	—	—	—	—	—	29 (J)	—	—	—	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	1.18 (U)	—	96.1 (J-)	—	—	—	15.9	6.95 (J)	12.7	—	16800 (J)	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	—	1.06 (UJ)	—	—	—	0.531 (U)	—	—	—	—	—	—	—
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	1.06 (UJ)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	—	1.07 (U)	—	—	—	0.535 (U)	—	20	—	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide	Iron	Lead
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	—	1.11 (U)	—	—	—	—	—	27	—	—	—	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	1.1 (U)	—	—	—	—	—	103	—	—	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	—	1.15 (U)	—	—	—	0.573 (U)	—	—	—	—	—	—	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	1.09 (U)	—	—	—	—	—	25	—	—	—	—	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	1.11 (U)	—	—	—	—	—	30.8	—	—	—	—	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	1.14 (U)	—	—	—	0.57 (U)	—	—	—	—	1.39 (J+)	—	—
CAMO-09-9960	MO-605463	8.00–9.00	QBT3	—	1.07 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	—	1.18 (U)	—	—	—	0.591 (U)	—	—	—	—	3.97	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	13400	1.15 (U)	3.03	66.9	1.45	—	—	13.8	—	7.53	—	—	11.8
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	1.15 (U)	—	—	—	—	4250	25.5	—	—	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	1.18 (U)	—	—	—	0.588 (U)	—	—	—	—	—	—	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	1.1 (U)	—	49.8	—	—	—	—	—	—	—	—	—
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	1.08 (U)	—	—	—	—	—	7.18 (J-)	—	—	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	1.11 (U)	—	—	—	0.555 (U)	—	—	—	—	—	—	—
CAMO-09-9972	MO-605467	5.00–6.00	QBT3	—	1.04 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	1.17 (U)	—	—	—	0.586 (U)	—	—	—	—	—	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	1.2 (U)	—	—	—	0.6 (U)	—	—	—	—	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9979	MO-605469	14.00–15.00	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	1.12 (U)	—	—	—	0.559 (U)	—	—	—	—	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	1.2 (U)	—	—	—	0.601 (U)	—	—	—	—	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	1.09 (U)	—	—	—	0.547 (U)	—	—	—	—	—	—	24.5
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	1.07 (U)	—	—	—	—	—	—	—	—	—	—	14.9
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	0.986 (U)	—	—	—	—	—	—	—	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Total Cyanide	Iron	Lead
SED Background Value[a]				**15400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**0.82**	**13800**	**19.7**
SOIL,FILL Background Value[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**
QBT3 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**
CAMO-09-9989	MO-605473	2.00–3.00	SED	—	1.14 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	9610	1.24 (U)	—	114	—	—	—	10.6	4.17	7.82	—	—	15.1
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	1.12 (UJ)	—	—	—	0.559 (U)	—	—	—	—	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	1.11 (UJ)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	—	1.15 (UJ)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9998	MO-605476	16.50–17.50	FILL	—	1.14 (U)	—	—	—	0.568 (U)	—	—	—	—	—	—	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	1.1 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	1.13 (U)	—	—	1.31	—	—	—	—	—	—	—	—
CAMO-09-10001	MO-605477	4.00–5.00	FILL	—	1.13 (U)	—	—	—	0.564 (U)	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	1.09 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	1.08 (U)	—	—	—	0.538 (U)	—	—	—	—	—	—	—
CAMO-09-10005	MO-605478	8.50–9.50	QBT3	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—	11.4
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	1.01 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	1.14 (U)	—	—	—	0.572 (U)	—	—	—	—	—	—	—
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10009	MO-605479	13.00–14.00	QBT3	—	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	1.08 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6602	MO-605625	20.00–21.50	QBT3	—	1.11 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	1.13 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6609	MO-605626	20.00–22.50	QBT3	—	1.05 (U)	—	56.2	—	—	—	—	—	—	—	—	—
CAMO-09-6610	MO-605627	10.00–11.00	QBT3	—	1.01 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6611	MO-605627	15.00–16.00	QBT3	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6612	MO-605627	20.00–21.00	QBT3	—	1.05 (U)	—	—	—	—	—	9.42	—	—	—	—	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	1.09 (U)	—	—	—	—	—	19.1	—	—	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	1.09 (U)	—	—	—	—	—	27.3	—	—	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	1.07 (U)	—	—	—	—	—	29.3	—	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]							**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**2690**	**0.3**	**1**
SOIL,FILL Background Value[a]							**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**
QBT3 Background Value[a]							**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**
AAC0213	50-03001	2.00–5.00	FILL	—	—	0.12 (U)	—	NA	NA	—	—	—	—	—	—
MD50-04-52698	50-03001	5.00–9.00	QBT3	—	—	—	—	NA	—	—	0.518 (U)	—	—	—	—
AAC0212	50-03001	5.70–6.00	QBT3	—	—	0.12 (U)	10.3	NA	NA	—	0.53 (U)	—	—	—	—
AAC0214	50-03002	1.00–5.00	FILL	—	—	0.16 (U)	—	NA	NA	—	—	—	—	—	—
AAC0215	50-03002	5.30–5.80	QBT3	—	—	0.14 (U)	—	NA	NA	—	0.57 (U)	—	—	—	—
MD50-03-52047	50-03002	15.00–20.00	QBT3	—	—	—	—	NA	—	—	0.528 (U)	—	—	—	—
AAC0216	50-03003	1.00–3.00	FILL	—	—	0.25 (U)	—	NA	NA	—	—	—	—	—	—
AAC0217	50-03003	3.00–4.00	QBT3	—	—	0.14 (U)	—	NA	NA	—	0.55 (U)	—	—	—	—
MD50-03-52048	50-03003	10.00–15.00	QBT3	—	—	—	—	NA	—	—	0.545 (U)	—	—	—	—
AAC0270	50-03004	5.00–6.30	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0271	50-03004	6.30–7.30	QBT3	—	—	—	—	NA	NA	—	0.57 (U)	—	—	—	—
AAC0260	50-03005	5.30–6.30	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0261	50-03005	6.30–7.30	QBT3	—	—	—	—	NA	NA	—	0.55 (U)	—	—	—	—
MD50-03-52050	50-03008	10.00–15.00	QBT3	—	—	—	—	NA	—	—	0.554 (U)	—	—	—	—
AAC0274	50-03008	11.40–12.40	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0275	50-03008	12.40–16.00	QBT3	—	—	—	—	NA	NA	—	0.55 (U)	—	—	—	—
AAC0278	50-03009	5.00–6.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0279	50-03009	6.00–9.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0294	50-03009	12.30–13.50	FILL	7700	—	—	16.2	NA	NA	4270	—	1.2 (U)	—	—	64.5
MD50-03-52052	50-03009	18.00–22.00	FILL	—	—	0.146	—	NA	—	—	—	—	—	—	—
AAC0262	50-03012	7.00–8.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0263	50-03012	8.00–11.00	QBT3	—	—	—	—	NA	NA	—	0.55 (U)	—	—	—	—
AAC0264	50-03014	6.50–7.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0265	50-03014	7.50–8.50	QBT3	—	—	—	—	NA	NA	—	0.7 (U)	—	—	—	—
AAC0266	50-03016	10.00–11.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0267	50-03016	11.00–12.30	QBT3	—	—	—	—	NA	NA	—	0.56 (U)	—	—	—	—
AAC0292	50-03016	12.50–13.60	QBT3	—	—	—	—	NA	NA	—	0.56 (U)	—	—	—	—
AAC0268	50-03017	7.00–10.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0269	50-03017	10.50–11.50	QBT3	—	—	—	—	NA	NA	—	0.56 (U)	—	—	—	—
AAC0291	50-03017	12.50–14.50	QBT3	—	—	—	—	NA	NA	—	0.57 (U)	—	—	—	—
AAC0249	50-03018	6.00–7.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0250	50-03018	7.00–9.50	QBT3	—	—	—	—	NA	NA	—	0.58 (U)	—	—	—	—
AAC0290	50-03018	10.50–12.50	QBT3	—	—	—	—	NA	NA	—	0.58 (U)	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]							**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**2690**	**0.3**	**1**
SOIL,FILL Background Value[a]							**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**
QBT3 Background Value[a]							**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**
AAC0252	50-03020	5.00–6.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0253	50-03020	6.00–7.00	QBT3	—	—	—	—	NA	NA	—	0.58 (U)	—	—	—	—
AAC0293	50-03020	7.00–9.50	QBT3	—	—	—	—	NA	NA	—	0.57 (U)	—	—	—	—
AAC0220	50-03021	7.00–9.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0221	50-03021	9.40–10.00	QBT3	—	—	—	—	NA	NA	—	0.55 (U)	—	—	—	—
AAC0223	50-03022	7.00–12.00	FILL	—	—	0.14 (U)	—	NA	NA	—	—	—	—	—	—
AAC0224	50-03022	14.50–16.00	QBT3	—	—	0.19 (U)	—	NA	NA	—	0.56 (U)	—	—	—	—
AAC0231	50-03023	5.50–6.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0227	50-03024	4.50–5.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0228	50-03024	6.00–7.00	QBT3	—	—	—	6.8 (J)	NA	NA	—	0.58 (U)	—	—	—	—
AAC0254	50-03025	5.00–6.1000	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0255	50-03025	6.10–7.00	QBT3	—	—	—	—	NA	NA	—	0.55 (UJ)	—	—	—	—
AAC0256	50-03026	6.00–7.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0257	50-03026	7.00–8.00	QBT3	—	—	—	—	NA	NA	—	0.59 (UJ)	—	—	—	—
AAC0210	50-03027	2.00–2.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0211	50-03027	5.50–6.00	QBT3	—	—	—	—	NA	NA	—	0.55 (U)	—	—	—	—
AAC0258	50-03028	0.80–1.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0259	50-03028	1.50–3.00	QBT3	—	—	—	—	NA	NA	—	0.71 (UJ)	1.1 (UJ)	—	—	—
AAB6106	50-03028	10.30–13.00	QBT3	1960	—	—	8.9 (J)	NA	NA	—	0.59 (UJ)	—	—	—	—
AAC0229	50-03030	1.00–1.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0230	50-03030	5.50–6.50	QBT3	—	—	—	—	NA	NA	—	0.6 (U)	—	—	—	—
AAC0225	50-03031	1.50–2.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0232	50-03031	5.00–6.00	QBT3	—	—	—	—	NA	NA	—	0.69 (U)	—	—	—	—
AAC0233	50-03032	0.75–2.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0235	50-03032	3.80–5.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0234	50-03032	5.50–6.50	QBT3	—	—	—	—	NA	NA	—	0.64 (U)	—	—	—	—
AAC0236	50-03033	7.00–8.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0237	50-03033	8.00–9.00	QBT3	—	—	—	—	NA	NA	—	0.54 (U)	—	—	—	—
AAC0238	50-03034	7.90–8.90	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0239	50-03034	9.00–10.00	QBT3	—	—	—	—	NA	NA	—	0.53 (U)	—	—	—	—
AAC0240	50-03035	6.75–7.85	FILL	—	—	—	—	NA	NA	—	—	—	0.92 (J)	—	—
AAC0241	50-03035	8.00–9.00	QBT3	—	—	—	—	NA	NA	—	0.57 (U)	—	—	—	—
AAC0242	50-03036	8.50–9.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]							**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**2690**	**0.3**	**1**
SOIL,FILL Background Value[a]							**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**
QBT3 Background Value[a]							**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**
AAC0243	50-03036	9.50–10.00	QBT3	—	—	—	—	NA	NA	—	0.58 (U)	—	—	—	—
AAC0244	50-03037	6.00–7.00	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0245	50-03037	7.00–8.50	QBT3	—	—	—	—	NA	NA	—	0.56 (U)	—	—	—	—
AAC0247	50-03038	8.50–9.50	FILL	—	—	—	—	NA	NA	—	—	—	—	—	—
AAC0248	50-03038	9.50–10.50	QBT3	—	—	—	—	NA	NA	—	0.57 (U)	—	—	—	—
AAB6105	50-03038	10.30–13.00	QBT3	2670 (U)	—	—	7.9 (J)	NA	NA	—	0.61 (U)	—	—	—	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	—	—	1.28	0.000655 (J)	—	—	—	—	—	—
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	—	—	—	—	0.00112 (J)	—	1.06 (U)	—	—	—	—
CAMO-09-6605	MO-605106	6.00–7.00	QBT3	—	—	—	—	—	—	—	1.02 (U)	—	—	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	—	1.46	—	—	—	—	—	—	—
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	—	—	6.52	—	—	1.1 (U)	—	—	—	—
CAMO-09-6623	MO-605108	17.50–19.00	QBT3	—	—	—	—	5.68	—	—	1.03 (U)	—	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	—	—	5.81	0.0023	—	1.06 (U)	—	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	—	—	4.24	—	—	1.12 (U)	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	—	—	—	2.08	—	—	—	—	—	—	—
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	—	—	—	6.43	—	—	1.09 (U)	—	—	—	—
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	—	—	—	0.512 (J)	—	—	1.06 (U)	—	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	—	—	—	0.553 (J)	—	—	1.09 (U)	—	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	—	—	—	0.581 (J)	—	—	1.09 (U)	—	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	—	—	—	—	—	0.000905 (J)	—	—	—	—	—	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	—	—	—	—	—	—	1.09 (U)	—	—	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	—	—	—	—	—	—	—	1.13 (U)	—	—	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	—	—	—	—	2.98	0.000776 (J)	—	—	—	—	—	50.9 (J+)
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	—	—	—	3.3	—	—	1.1 (U)	—	—	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	790 (J)	—	—	1.78	—	—	1.22 (U)	—	—	—	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	—	—	—	—	4.14 (J-)	—	—	—	—	—	—	—
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	—	—	—	—	5.67 (J-)	—	—	1.05 (U)	—	—	—	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	—	—	6.52 (J-)	—	—	1.03 (U)	—	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	—	—	—	—	3.17	—	—	—	—	—	—	—
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	—	—	—	—	2.04	—	—	1.1 (U)	—	—	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	—	—	1.98	—	—	1.1 (U)	—	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	—	—	—	—	12.8	—	—	—	—	—	—	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	—	—	—	6.76	—	—	1.1 (U)	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]							**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**2690**	**0.3**	**1**
SOIL,FILL Background Value[a]							**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**
QBT3 Background Value[a]							**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	—	—	—	6.38	—	—	1.08 (U)	—	—	—	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	—	—	15.4 (J-)	—	—	—	—	—	—	—
CAMO-09-9960	MO-605463	8.00–9.00	QBT3	—	—	—	—	8.85 (J-)	—	—	1.09 (U)	—	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	—	—	7.89 (J-)	—	—	1.05 (U)	—	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	—	—	—	—	0.944 (J)	—	—	—	—	—	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	2410 (J+)	—	—	9.38 (J+)	1.79	—	—	1.14 (UJ)	—	—	—	—
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	—	—	—	1.82	—	—	1.14 (UJ)	—	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	—	—	—	1.43 (J-)	—	—	—	—	—	—	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	—	—	1.53 (J-)	—	—	1.1 (U)	—	—	—	—
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	—	—	—	1.47 (J-)	—	—	1.1 (U)	—	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	—	—	—	1.22	—	—	—	—	—	—	—
CAMO-09-9972	MO-605467	5.00–6.00	QBT3	—	—	—	—	0.968 (J)	—	—	1.07 (UJ)	—	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	—	—	—	0.924 (J)	—	—	1.12 (UJ)	—	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	—	—	—	0.977 (J-)	—	—	—	—	—	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	—	—	—	—	0.83 (J-)	—	—	1.09 (U)	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	—	—	—	—	0.827 (J-)	—	—	1.1 (U)	—	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	—	—	—	1.64 (J-)	—	—	—	—	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	—	—	—	0.971 (J-)	—	—	1.07 (U)	—	—	—	—
CAMO-09-9979	MO-605469	14.00–15.00	QBT3	—	—	—	6.87	1.12 (J-)	0.000844 (J)	—	1.05 (U)	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	—	—	—	1.12 (J)	—	—	—	—	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	—	—	—	1.07 (U)	—	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	—	—	—	—	—	—	1.09 (U)	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	—	—	—	1.11 (J-)	—	—	—	—	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	—	—	—	—	1.06 (J-)	—	—	1.14 (U)	—	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	—	—	—	0.91 (J-)	—	—	1.09 (U)	—	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	—	—	—	3.58	0.00172 (J)	—	—	—	—	—	66.4
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	—	—	1.58	0.00117 (J)	—	1.07 (U)	—	—	—	64.5
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	—	—	—	—	—	1 (U)	—	—	—	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	—	—	—	—	—	—	—	1.18 (U)	—	—	—	—
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	—	—	—	—	—	1.21 (U)	—	—	17.2	—
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	—	—	—	1.4 (J-)	—	—	—	—	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	1.8 (J-)	—	—	1.09 (U)	—	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	—	—	—	—	1.6 (J-)	—	—	1.16 (U)	—	—	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc
SED Background Value[a]							**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**2690**	**0.3**	**1**
SOIL,FILL Background Value[a]							**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**
QBT3 Background Value[a]							**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**
CAMO-09-9998	MO-605476	16.50–17.50	FILL	—	—	—	—	24.8 (J-)	0.00112 (J)	—	—	—	—	—	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	—	—	—	14 (J-)	0.000728 (J)	—	1.08 (U)	—	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	—	—	—	12.4 (J-)	0.00075 (J)	—	1.09 (U)	—	—	—	—
CAMO-09-10001	MO-605477	4.00–5.00	FILL	—	—	—	—	1.05 (J)	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	—	—	—	0.873 (J)	—	—	1.09 (U)	—	—	—	—
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	—	—	—	0.69 (J)	—	—	1.06 (U)	—	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	—	—	—	29.1	0.00266	—	—	—	—	—	—
CAMO-09-10005	MO-605478	8.50–9.50	QBT3	—	—	—	—	8.97	0.00108 (J)	—	1.03 (U)	—	—	—	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	1.74	—	—	1.02 (U)	—	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	—	—	—	1.59	—	—	—	—	—	—	—
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	—	—	—	0.848 (J)	—	—	1.11 (U)	—	—	—	—
CAMO-09-10009	MO-605479	13.00–14.00	QBT3	—	—	—	—	0.525 (J)	—	—	1.08 (U)	—	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	—	—	—	0.907 (J)	—	—	1.11 (U)	—	—	—	—
CAMO-09-6602	MO-605625	20.00–21.50	QBT3	—	—	—	—	0.925 (J)	—	—	1.12 (U)	—	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	—	—	—	4.25	—	—	1.13 (U)	—	—	—	—
CAMO-09-6609	MO-605626	20.00–22.50	QBT3	—	582	—	—	4.02	—	—	1.09 (U)	—	—	—	78
CAMO-09-6610	MO-605627	10.00–11.00	QBT3	—	—	—	—	1.91 (J-)	—	—	1.06 (U)	—	—	—	—
CAMO-09-6611	MO-605627	15.00–16.00	QBT3	—	—	—	—	1.45 (J-)	—	—	1.03 (U)	—	—	—	—
CAMO-09-6612	MO-605627	20.00–21.00	QBT3	—	—	—	—	1.86 (J-)	—	—	1.03 (U)	—	—	—	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	—	—	—	—	—	1.1 (U)	—	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	—	—	—	0.000576 (J)	—	1.09 (U)	—	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	—	—	—	0.00101 (J)	—	1.08 (U)	—	—	—	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 6.8-3
Organic Chemicals Detected at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	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	Chrysene	Di-n-butylphthalate	Dichloroethene[1,1-]
CAMO-09-6603	MO-605106	0.00–0.50	FILL	NA[a]	—[b]	—	—	0.0104 (J)	—	0.038	0.083	0.0247 (J)	—	0.0492	—	NA
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	0.205	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	NA	—	NAa	NA	NA	—	0.0181 (J)	0.0277 (J)	0.0133 (J)	—	0.0178 (J)	—	NA
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	NA	0.011 (J)	NA	NA	NA	0.0359 (J)	0.0414	0.0608	0.0283 (J)	—	0.0379	—	NA
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	0.0174 (J)	NA	NA	NA	0.164	0.25	0.433	0.188	—	0.239	—	—
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	—	—	NA	NA	NA	0.0125 (J)	—	—	—	—	—	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	—	0.016 (J)	NA	NA	NA	0.0389	0.0413	0.0656	0.0354 (J)	—	0.0441	—	—
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	—	—	NA	NA	NA	0.0217 (J)	0.017 (J)	0.0218 (J)	0.015 (J)	—	0.0161 (J)	—	—
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	—	—	NA	NA	NA	0.0399	0.0344 (J)	0.0443	0.0158 (J)	0.0219 (J)	0.0355 (J)	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	—	—	NA	NA	NA	—	—	0.0132 (J)	—	—	—	—	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	0.0124 (J)	NA	NA	NA	0.0352 (J)	0.0402	0.0463	0.0306 (J)	0.0211 (J)	0.0353 (J)	0.0755 (J)	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	—	—	NA	NA	NA	—	0.013 (J)	0.022 (J)	—	—	0.0145 (J)	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Chrysene	Di-n-butylphthalate	Dichloroethene[1,1-]
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	0.00274 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	0.00287 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	0.00276 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	0.00331 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	0.00201 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	0.00707	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	—	—	—	—	0.0644	0.0348 (J)	0.0408	0.0658	0.031 (J)	0.0231 (J)	0.0491	—	0.000502 (J)
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	—	—	0.0058	—	—	—	—	—	—	—	—
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	0.00639	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-9998	MO-605476	16.50–17.50	FILL	—	—	—	—	0.42	—	0.0135 (J)	0.0184 (J)	—	—	—	—	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	—	—	0.0024 (J)	0.0013 (J)	—	—	—	—	—	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	0.00198 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	—	—	0.0027 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	—	0.32	0.42	0.194	—	—	—	—	—	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Chrysene	Di-n-butylphthalate	Dichloroethene[1,1-]
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)
CAMO-09-6603	MO-605106	0.00–0.50	FILL	0.0693	0.0000176	0.0000344	0.00000161 (J)	—	0.00000376	0.000000305 (J)	—	—	0.0000027
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	0.0139 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	0.085	0.00000567	0.00001	0.000000987 (J)	—	0.00000313	—	0.000000174 (J)	—	0.000000784
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	0.475	0.0000024 (J)	0.00000425 (J)	0.000000412 (J)	0.0000000822 (J)	0.00000123	—	0.0000000839 (J)	—	0.000000469
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	—	0.00000284	0.00000539	0.000000462 (J)	—	0.00000116	—	—	—	0.000000447
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	0.00000529	0.00000926	0.000000935 (J)	—	0.00000271	—	—	—	0.000000812
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	0.0175 (J)	0.00000635	0.0000109	0.00000108 (J)	—	0.00000283	—	—	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	0.131	0.0000185	0.0000341	0.00000339	0.000000465 (J)	0.0000102	—	—	—	0.00000274
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	0.00000219 (J)	0.00000394	0.000000409 (J)	—	0.00000125	—	—	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	0.00000122 (J)	0.00000257	—	—	—	—	—	—	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	—	0.00000243 (J)	0.00000544	0.000000638 (J)	0.000000236 (J)	0.00000198	—	—	—	0.000000269
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	0.000000111	—	—	—	—	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	0.0423	0.0000125	0.0000218	0.0000015 (J)	—	0.00000517	—	—	—	0.00000193
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	0.0383	0.00000151 (J)	0.00000285	—	—	—	—	—	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	0.0256 (J)	0.00000344	0.00000755	0.000000756 (J)	—	0.00000181	—	—	—	0.00000052
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	0.000000968 (J)	0.000000968	—	—	—	—	—	—	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	0.078	0.00000229 (J)	0.00000229	—	—	—	—	—	—	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	0.000000379	—	—	—	—	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	0.0366 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	—	—	—	—	0.000000028	—	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	0.0000000802 (J)	—	—	—	—	—	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	0.000000944 (J)	0.00000163	0.000000367 (J)	—	0.0000009	—	—	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	—	0.000000107	—	—	—	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	0.000000119	—	—	—	—	—	—	—
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	9.12E-08	—	—	—	—	—	—	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	0.08	0.0000121	0.0000228	0.00000234 (J)	0.000000266 (J)	0.00000662	—	—	0.000000398 (J)	0.00000251
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	0.000000102 (J)	0.000000294	—	—	—	—	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9998	MO-605476	16.50–17.50	FILL	0.0233 (J)	0.00000102 (J)	0.00000186	0.000000564 (J)	—	0.00000176	—	—	—	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	0.00000138 (J)	0.00000138	—	—	—	—	—	—	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	0.000000745 (J)	0.000000745	—	—	—	—	—	—	—
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	—	0.000000419	0.0223 (J)	NA	0.000244	0.00000565	—	—
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	—	—	—	—	0.0752	0.00000504	—	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	—	—	NA	0.0000106 (J)	—	—	—
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	—	—	—	—	0.00000241 (J)	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	—	—	—	—	0.00000074 (J)	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	—	—	—	—	0.00000111 (J)	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	0.000000203 (J)	0.000000106 (J)	0.00000013 (J)	0.00000176	0.0231 (J)	NA	0.0000685 (J)	0.00000359 (J)	—	0.000000193 (J)
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	—	—	0.000000231	0.17	—	0.0000209 (J)	0.00000143 (J)	—	—
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	—	—	—	—	—	0.00000023 (J)	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	—	—	—	—	—	0.000000256 (J)	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	—	—	—	—	—	0.000000184 (J)	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	—	—	—	0.000000275	—	—	0.0000226	0.00000127 (J)	—	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	—	—	0.00000092	—	—	0.0000527	0.00000346 (J)	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	—	—	—	0.00000111	—	—	0.0000556	0.00000338 (J)	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	0.00000063 (J)	—	—	0.00000422	0.0276 (J)	—	0.000213	0.0000114	—	0.000000576 (J)
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	—	—	0.000000423	—	—	0.0000221	0.0000016 (J)	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	—	—	0.000000212	—	—	0.00000885	0.000000662 (J)	—	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	—	—	0.000000104 (J)	0.000000506	—	—	0.000023 (J)	0.00000245 (J)	—	0.000000247 (J)
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	—	—	—	—	0.000000379 (J)	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	—	—	—	0.00000129	—	—	0.000136	0.00000679	—	—
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	—	—	—	—	0.0167 (J)	—	0.0000153	0.00000069 (J)	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	—	—	—	—	0.00000322 (J)	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	0.000000281 (J)	—	—	0.000000738	—	—	0.0000243	0.00000218 (J)	—	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	—	—	—	—	—	0.00000837	0.000000383 (J)	—	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	—	—	—	0.0259 (J)	—	0.0000201	0.00000069 (J)	—	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	—	—	—	—	0.00000286 (J)	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	—	—	—	—	0.000000428 (J)	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	—	—	—	0.000000173	—	—	0.00000518	—	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	—	—	—	—	—	—	0.00000378 (J)	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	—	—	—	—	—	0.00000298 (J)	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	—	—	—	—	—	0.00000143 (J)	—	—	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	—	—	—	—	0.000000794 (J)	—	—	—
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	—	—	—	—	—	0.000000807 (J)	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	—	—	—	—	—	0.00000142 (J)	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	—	—	—	—	—	0.000000664 (J)	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	—	—	0.000000217	—	—	0.00000773	0.00000126 (J)	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	—	—	—	—	—	—	0.000000536 (J)	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	—	—	—	—	—	0.00000155 (J)	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	—	—	—	—	—	0.00000126 (J)	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	—	—	0.000000188 (J)	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	—	—	—	—	—	0.00000113 (J)	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	—	—	—	—	—	—	0.000000931 (J)	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	—	—	—	—	—	0.000000497 (J)	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	—	—	—	—	—	0.000000533 (J)	—	—	—
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	—	—	—	—	0.000000554 (J)	—	—	—
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	0.000000657 (J)	0.000000321 (J)	0.0000005 (J)	0.00000666	0.0251 (J)	—	0.000117	0.00000685	0.000000236 (J)	0.00000124 (J)
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	—	—	—	—	0.00000148 (J)	—	—	—
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	—	—	—	—	—	0.00000117 (J)	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	—	—	0.000000632 (J)	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	—	—	—	—	—	—	0.000000748 (J)	—	—	—
CAMO-09-9998	MO-605476	16.50–17.50	FILL	0.000000271 (J)	0.000000101 (J)	—	0.000000883	—	—	0.0000139	0.00000165 (J)	—	0.000000253 (J)
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	—	—	—	—	—	0.000000613 (J)	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	—	—	—	—	—	0.00000133 (J)	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Isopropyltoluene[4-]	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	—	—	—	—	—	0.000000492 (J)	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	—	—	—	—	—	0.00000766	0.00000044 (J)	—	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	—	—	0.000000413 (J)	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	—	—	—	—	—	0.00000825	—	—	—
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	—	—	—	—	—	0.000000649 (J)	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	—	—	—	—	—	0.00000104 (J)	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	—	—	—	—	—	0.00000228 (J)	—	—	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	—	—	—	—	0.00000233 (J)	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	—	—	—	—	0.0000024 (J)	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	—	—	—	—	0.00000278 (J)	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichloroethene	Trimethylbenzene[1,2,4-]	Xylene[1,3-]+Xylene[1,4-]
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	0.0661	—	—	—	NA	NA	NA	NA
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	—	—	—	—	—	0.00247	—	—	0.000547 (J)
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	0.0214 (J)	—	—	—	NA	NA	NA	NA
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	0.00000103	0.0247 (J)	0.0593 (J)	—	—	0.000000452	NA	NA	NA	NA
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	0.135	0.3 (J)	—	—	—	—	—	—	—
CAMO-09-6628	MO-605109	13.50–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6629	MO-605109	18.50–20.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6630	MO-605109	23.50–25.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	0.000000152	—	—	—	—	0.000000168	0.000512 (J)	—	—	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	0.000000187	—	—	—	—	—	—	—	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	0.000000199	—	0.0176 (J)	—	—	0.000000217	—	—	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	0.00000298	0.0842	0.111	—	—	0.00000124	—	—	—	—
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	0.000000357	—	—	—	—	0.000000121	—	0.000689 (J)	—	—
CAMO-09-9947	MO-605459	2.00–3.00	FILL	0.00000109	—	—	—	—	0.000000406	—	—	—	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	0.000000583	0.0298 (J)	0.041	—	—	0.000000216	—	—	—	—
CAMO-09-9951	MO-605460	4.50–5.50	QBT3	—	0.0125 (J)	0.0404	—	—	—	—	—	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	0.000000538	0.0141 (J)	0.0246 (J)	—	—	0.000000282	0.000434 (J)	—	—	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	0.0433	0.0801	—	—	—	—	—	—	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9962	MO-605464	4.00–5.00	FILL	—	0.029 (J)	0.0339 (J)	—	—	—	—	—	—	—
CAMO-09-9963	MO-605464	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9964	MO-605464	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9968	MO-605466	6.00–7.00	FILL	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichloroethene	Trimethylbenzene[1,2,4-]	Xylene[1,3-]+Xylene[1,4-]
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9971	MO-605467	4.00–5.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9973	MO-605467	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9975	MO-605468	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9976	MO-605468	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9977	MO-605469	8.00–9.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9980	MO-605470	2.50–3.50	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9982	MO-605470	8.50–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9983	MO-605471	8.00–9.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9984	MO-605471	9.00–10.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9985	MO-605471	14.00–15.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	0.00000982	0.0234 (J)	0.0701	—	0.000000688	0.00000507	—	—	0.000574 (J)	—
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9995	MO-605475	4.00–5.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9997	MO-605475	10.00–12.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-9998	MO-605476	16.50–17.50	FILL	0.000000833	—	0.0186 (J)	—	—	0.000000379	—	—	—	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10002	MO-605477	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10003	MO-605477	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	—	—	9.48E-08	—	—	—	—	—	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-10007	MO-605479	7.00–8.00	FILL	—	—	—	—	—	—	—	—	—	—

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trichloroethene	Trimethylbenzene[1,2,4-]	Xylene[1,3-]+Xylene[1,4-]
CAMO-09-10008	MO-605479	8.00–9.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6601	MO-605625	15.00–17.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6608	MO-605626	15.00–16.50	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	—	—	—	—	—	—	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	—	—	—	—	—	—	—	—

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 6.8-4
Radionuclides Detected or Detected above BVs/FVs at Consolidated Unit 50-004(a)-00

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	0.2
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	0.2
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	0.09
AAC0213	50-03001	2.00–5.00	FILL	—[d]	—	—	3.074	—	—
MD50-04-52698	50-03001	5.00–9.00	QBT3	—	—	—	0.0869	0.0215	0.132
AAC0212	50-03001	5.70–6.00	QBT3	—	—	—	0.178	—	—
AAC0214	50-03002	1.00–5.00	FILL	—	0.074	0.054	0.64	—	0.38
AAC0215	50-03002	5.30–5.80	QBT3	—	—	—	0.241	—	—
MD50-03-52047	50-03002	15.00–20.00	QBT3	—	—	—	0.0618	0.327	—
AAC0216	50-03003	1.00–3.00	FILL	0.142 (J)	—	0.047	1.149	0.0689727 (J)	—
AAC0217	50-03003	3.00–4.00	QBT3	—	—	—	0.448	—	—
MD50-03-52048	50-03003	10.00–15.00	QBT3	—	—	—	0.0648	—	—
AAC0260	50-03005	5.30–6.30	FILL	—	—	0.018	—	0.292999	—
AAC0261	50-03005	6.30–7.30	QBT3	—	—	—	0.038	0.198726	—
MD50-03-52050	50-03008	10.00–15.00	QBT3	—	0.318	0.0384	0.294	0.523	0.0902
AAC0274	50-03008	11.40–12.40	FILL	—	—	0.002	0.131	—	—
AAC0275	50-03008	12.40–16.00	QBT3	—	—	—	0.011	—	—
AAC0278	50-03009	5.00–6.00	FILL	—	0.051 (J)	—	0.122	—	—
AAC0279	50-03009	6.00–9.50	FILL	0.488	0.28 (J)	—	0.036	—	—
AAC0262	50-03012	7.00–8.00	FILL	—	0.139 (J)	—	0.038	—	—
AAC0264	50-03014	6.50–7.50	FILL	—	0.165 (J)	—	0.525	—	—
AAC0265	50-03014	7.50–8.50	QBT3	—	—	—	0.036	—	—
AAC0266	50-03016	10.00–11.00	FILL	—	—	—	0.101	0.349551	—
AAC0267	50-03016	11.00–12.30	QBT3	—	—	—	0.016	0.289777	—
AAC0292	50-03016	12.50–13.60	QBT3	—	—	—	—	0.254607	—
AAC0268	50-03017	7.00–10.50	FILL	0.135	0.625	0.079	0.403	—	—
AAC0269	50-03017	10.50–11.50	QBT3	—	—	0.011	—	—	—
AAC0291	50-03017	12.50–14.50	QBT3	—	—	0.014	0.014	—	—
AAC0249	50-03018	6.00–7.00	FILL	—	0.275	—	0.146	0.152749	—
AAC0250	50-03018	7.00–9.50	QBT3	—	0.472	—	—	0.238216	—
AAC0290	50-03018	10.50–12.50	QBT3	—	—	—	—	0.595814	—
AAC0252	50-03020	5.00–6.00	FILL	—	—	—	0.016	—	—
AAC0253	50-03020	6.00–7.00	QBT3	—	—	—	0.14	—	—
AAC0293	50-03020	7.00–9.50	QBT3	—	—	—	0.005	—	—

Table 6.8-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	0.2
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	0.2
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	0.09
AAC0220	50-03021	7.00–9.00	FILL	—	—	—	0.126	0.16567	—
AAC0221	50-03021	9.40–10.00	QBT3	—	—	0.063	0.527	0.106003	—
AAC0223	50-03022	7.00–12.00	FILL	—	—	—	0.164	0.181429 (J)	—
AAC0224	50-03022	14.50–16.00	QBT3	—	—	—	0.705	0.117836 (J)	—
AAC0227	50-03024	4.50–5.50	FILL	—	—	—	0.135	—	—
AAC0228	50-03024	6.00–7.00	QBT3	—	—	—	0.108	—	—
AAC0254	50-03025	5.00–6.10	FILL	—	—	—	—	0.196849	—
AAC0255	50-03025	6.10–7.00	QBT3	—	—	—	—	0.194391	—
AAC0256	50-03026	6.00–7.00	FILL	—	—	—	—	0.221625	—
AAC0257	50-03026	7.00–8.00	QBT3	—	—	—	0.016	0.269649	—
AAC0210	50-03027	2.00–2.50	FILL	—	—	—	0.009	0.0802998 (J)	—
AAC0211	50-03027	5.50–6.00	QBT3	—	—	0.027 (J)	0.09	0.0360326 (J)	—
AAC0258	50-03028	0.80–1.50	FILL	—	—	0.002	0.059	—	—
AAC0229	50-03030	1.00–1.50	FILL	—	—	—	0.05	0.839952	—
AAC0230	50-03030	5.50–6.50	QBT3	—	—	—	—	1.30074	—
AAC0225	50-03031	1.50–2.50	FILL	—	—	—	—	0.457002	—
AAC0232	50-03031	5.00–6.00	QBT3	—	—	—	—	2.59649	—
AAC0233	50-03032	0.75–2.00	FILL	—	—	—	0.117	0.198675	—
AAC0235	50-03032	3.80–5.00	FILL	—	—	—	0.061	0.168	—
AAC0234	50-03032	5.50–6.50	QBT3	—	—	—	—	0.524619	—
AAC0236	50-03033	7.00–8.00	FILL	—	—	—	—	1.09751	—
AAC0237	50-03033	8.00–9.00	QBT3	—	—	—	0.007	0.679888	—
AAC0238	50-03034	7.90–8.90	FILL	—	—	—	0.047	—	—
AAC0240	50-03035	6.75–7.85	FILL	—	—	—	0.018	—	—
AAC0242	50-03036	8.50–9.50	FILL	—	—	—	—	0.58988	—
AAC0243	50-03036	9.50–10.00	QBT3	—	—	—	—	0.372581	—
AAC0244	50-03037	6.00–7.00	FILL	—	—	—	0.014	—	—
AAC0247	50-03038	8.50–9.50	FILL	—	—	—	0.036	—	—
AAA2459	50-05031	0.00–0.50	SOIL	—	—	—	0.691	0.112789 (J)	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	0.0525	1.25	—	—
CAMO-09-6604	MO-605106	1.00–2.00	QBT3	—	—	—	0.211	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	0.136	—	—

Table 6.8-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	0.2
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	0.2
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	0.09
CAMO-09-6622	MO-605108	12.50–14.00	QBT3	—	—	—	—	0.113588	—
CAMO-09-6623	MO-605108	17.50–19.00	QBT3	—	—	—	—	0.081539	—
CAMO-09-6624	MO-605108	22.50–24.00	QBT3	—	—	—	—	0.0808593	—
CAMO-09-6625	MO-605108	27.50–29.00	QBT3	—	—	—	—	0.200948	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	—	0.0254	0.176	0.0407411	—
CAMO-09-6627	MO-605109	8.50–9.50	QBT3	—	—	—	—	0.110749	—
CAMO-09-9941	MO-605457	3.50–5.00	FILL	0.382	—	0.0424	3.49	0.0296637	—
CAMO-09-9942	MO-605457	5.00–6.00	QBT3	—	—	0.13	0.483	—	—
CAMO-09-9943	MO-605457	10.00–11.00	QBT3	—	—	0.0283	0.406	—	—
CAMO-09-9944	MO-605458	2.50–3.50	FILL	—	—	0.0405	0.708	0.0409091	—
CAMO-09-9945	MO-605458	3.50–4.50	QBT3	—	—	0.0699	7.04	—	—
CAMO-09-9946	MO-605458	8.50–9.50	QBT3	—	—	—	0.627	—	—
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	—	—	—	—	0.022027	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	—	—	0.0387303	—
CAMO-09-9950	MO-605460	3.50–4.50	FILL	—	—	—	0.134	—	—
CAMO-09-9952	MO-605460	9.50–10.50	QBT3	—	—	—	—	0.0306429	—
CAMO-09-9956	MO-605462	9.00–10.00	FILL	—	—	—	—	0.0367683	—
CAMO-09-9957	MO-605462	10.00–11.00	QBT3	—	—	—	—	0.0503315	—
CAMO-09-9958	MO-605462	15.00–16.00	QBT3	—	—	—	0.0265	0.0401895	—
CAMO-09-9959	MO-605463	7.00–8.00	FILL	—	—	—	0.0385	0.0352204	—
CAMO-09-9960	MO-605463	8.00–9.00	QBT3	—	—	—	—	0.0446813	—
CAMO-09-9961	MO-605463	13.00–14.50	QBT3	—	—	—	—	0.048752	—
CAMO-09-9969	MO-605466	7.00–8.00	QBT3	—	—	—	—	—	0.0908
CAMO-09-9970	MO-605466	12.00–13.00	QBT3	—	—	—	—	0.023641	—
CAMO-09-9974	MO-605468	4.00–5.00	FILL	0.433	—	0.0821	2.73	—	—
CAMO-09-9978	MO-605469	9.00–10.00	QBT3	—	—	—	—	0.0293994	—
CAMO-09-9981	MO-605470	3.50–5.00	QBT3	—	—	—	—	0.0134146	—
CAMO-09-9986	MO-605472	7.00–8.00	FILL	—	—	—	—	1.3	—
CAMO-09-9987	MO-605472	8.00–9.50	QBT3	—	—	—	—	1.18582	—
CAMO-09-9988	MO-605472	13.00–14.00	QBT3	—	—	—	—	0.0779311	—
CAMO-09-9989	MO-605473	2.00–3.00	SED	1.52	1.25	7.75	3.13	—	—
CAMO-09-9990	MO-605473	3.00–4.00	QBT3	—	—	1.58	0.38	—	—

Table 6.8-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-235/236
SED Background Value[a]				**0.04**	**0.9**	**0.006**	**0.068**	**0.093**	0.2
SOIL,FILL Background Value[a]				**0.013[b]**	**1.65[b]**	**0.023[b]**	**0.054[b]**	**na[c]**	0.2
QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	0.09
CAMO-09-9996	MO-605475	5.00–6.00	QBT3	—	—	—	—	—	0.0903
CAMO-09-9998	MO-605476	16.50–17.50	FILL	1.06	—	0.0874	2.29	0.100495	—
CAMO-09-9999	MO-605476	17.50–18.50	QBT3	3.1	—	0.251	7.51	0.0595178	—
CAMO-09-10000	MO-605476	22.50–23.50	QBT3	—	—	0.0698	1.94	0.0726818	—
CAMO-09-10004	MO-605478	7.50–8.50	FILL	—	—	—	0.204	0.257288	—
CAMO-09-10005	MO-605478	8.50–9.50	QBT3	—	—	—	—	0.28093	—
CAMO-09-10006	MO-605478	13.50–14.50	QBT3	—	—	—	—	0.330534	—
CAMO-09-6609	MO-605626	20.00–22.50	QBT3	—	—	—	—	0.0257357	—
CAMO-09-6610	MO-605627	10.00–11.00	QBT3	—	—	—	—	0.0436596	—
CAMO-09-6611	MO-605627	15.00–16.00	QBT3	—	—	—	—	0.0511665	—
CAMO-09-6612	MO-605627	20.00–21.00	QBT3	—	—	—	—	0.0929715	—
CAMO-09-6613	MO-605628	5.00–6.00	QBT3	—	—	—	0.0912	—	—
CAMO-09-6614	MO-605628	7.00–8.00	QBT3	—	—	—	0.0376	—	—
CAMO-09-6615	MO-605628	10.00–11.00	QBT3	—	—	—	0.147	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] FV applies to soil and tuff samples collected from 0–1 ft only.

[c] na = Not available.

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

Table 6.9-1
Samples Collected and Analyses Requested at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PAHs	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2519	50-06500	0.00–0.50	SOIL	—*	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2520	50-06501	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2521	50-06502	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2721	50-06502	3.00–4.00	SOIL	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2522	50-06503	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2715	50-06503	1.50–2.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2720	50-06503	3.00–4.00	SOIL	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2523	50-06504	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2524	50-06505	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2525	50-06506	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2716	50-06506	1.50–2.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2722	50-06506	3.00–4.00	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2526	50-06507	0.00–0.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2717	50-06507	1.50–2.50	SOIL	—	—	—	14750	14750	14750	14750	—	—	14749	—	—	14750	14749	—	—
AAA2527	50-06508	0.00–0.50	SED	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2688	50-06508	1.50–2.50	SED	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2723	50-06508	3.00–4.00	SED	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2528	50-06509	0.00–0.50	SED	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2529	50-06510	0.00–0.50	SED	—	—	—	14750	14750	14750	14750	—	—	—	—	—	14750	14749	—	—
AAA2530	50-06511	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2709	50-06511	1.50–2.50	SOIL	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2532	50-06513	0.00–0.50	SOIL	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA3240	50-06514	1.50–2.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3241	50-06514	3.00–4.00	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA2534	50-06515	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2535	50-06516	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2536	50-06517	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2711	50-06517	3.00–4.00	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2537	50-06518	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2708	50-06518	1.50–2.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2714	50-06518	3.00–4.00	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2538	50-06519	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2539	50-06520	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
CAMO-05-61156	50-06520	0.00–0.9843	SED	—	3449S	—	3449S	—	3449S	—	3449S	3448S	3448S	3448S	3448S	3449S	3448S	—	3449S

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PAHs	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2710	50-06520	1.50–2.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2713	50-06520	3.00–4.00	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2540	50-06521	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2637	50-06522	0.00–0.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2707	50-06522	1.50–2.50	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2712	50-06522	3.00–4.00	SED	—	—	—	14717	14717	14717	14717	14715	—	—	—	—	14717	14716	—	—
AAA2638	50-06523	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2639	50-06524	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2640	50-06525	0.00–0.50	SOIL	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2641	50-06526	0.00–0.50	SOIL	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2642	50-06527	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2643	50-06528	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2682	50-06528	1.50–2.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2685	50-06528	3.00–4.00	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2644	50-06529	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2683	50-06529	1.50–2.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2684	50-06529	3.00–4.00	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2645	50-06530	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2646	50-06531	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2705	50-06531	1.50–2.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2706	50-06531	3.00–4.00	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2647	50-06532	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2648	50-06533	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2681	50-06533	1.50–2.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2686	50-06533	3.00–4.00	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2649	50-06534	0.00–0.50	SED	—	—	—	14704	14704	14704	14704	14702	—	—	—	—	14704	14703	—	—
AAA2650	50-06535	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2659	50-06535	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2660	50-06535	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2651	50-06536	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2661	50-06536	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2662	50-06536	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2652	50-06537	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2663	50-06537	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2664	50-06537	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PAHs	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2653	50-06538	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2665	50-06538	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2666	50-06538	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2654	50-06539	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2667	50-06539	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2668	50-06539	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2655	50-06540	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2669	50-06540	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2670	50-06540	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2656	50-06541	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2671	50-06541	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2672	50-06541	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2657	50-06542	0.00–0.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2673	50-06542	1.50–2.50	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2674	50-06542	3.00–4.00	SED	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2658	50-06543	0.00–0.50	SOIL	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2675	50-06543	1.50–2.50	SOIL	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA2676	50-06543	3.00–4.00	SOIL	—	—	—	14673	14673	14673	14673	14671	—	—	—	—	14673	14672	—	—
AAA3229	50-06550	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3228	50-06551	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3218	50-06551	1.50–2.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3212	50-06551	3.00–4.00	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3219	50-06552	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3216	50-06552	3.00–4.00	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3215	50-06553	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3205	50-06554	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3210	50-06554	1.50–2.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3209	50-06554	3.00–4.00	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3203	50-06555	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3213	50-06556	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3217	50-06556	1.50–2.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3223	50-06557	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3224	50-06557	1.50–2.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3208	50-06557	3.00–4.00	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3225	50-06558	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PAHs	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA3201	50-06558	1.50–2.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3202	50-06558	3.00–4.00	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3211	50-06559	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3206	50-06560	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3207	50-06561	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3214	50-06562	0.00–0.50	SOIL	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3200	50-06563	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3204	50-06564	0.00–0.50	SED	14981	—	—	14981	14981	14981	14981	—	—	14979	—	—	14981	14979	14979	—
AAA3221	50-06565	0.00–0.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3220	50-06565	1.50–2.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3226	50-06565	3.00–4.00	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3230	50-06566	0.00–0.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3231	50-06566	1.50–2.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3232	50-06566	3.00–4.00	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3233	50-06567	0.00–0.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3234	50-06567	1.50–2.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3235	50-06567	3.00–4.00	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3236	50-06568	0.00–0.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3237	50-06568	1.50–2.50	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
AAA3238	50-06568	3.00–4.00	SED	15114	—	—	15114	15114	15114	15114	—	—	—	—	—	15114	—	—	—
CAMO-09-6496	MO-605076	0.00–0.50	SED	09-2030	09-2029	09-2027	09-2030	09-2030	09-2030	09-2030	09-2029	—	09-2028	09-2029	—	09-2030	09-2028	—	09-2029
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	09-2030	09-2029	09-2027	09-2030	09-2030	09-2030	09-2030	09-2029	—	09-2028	09-2029	—	09-2030	09-2028	09-2028	09-2029
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	09-2030	09-2029	09-2027	09-2030	09-2030	09-2030	09-2030	09-2029	—	09-2028	09-2029	—	09-2030	09-2028	09-2028	09-2029
CAMO-09-6499	MO-605077	0.00–0.50	SED	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	—	09-2045	09-2046	—	09-2047	09-2045	—	09-2046
CAMO-09-6500	MO-605077	0.50–1.50	QBT4	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	—	09-2045	09-2046	—	09-2047	09-2045	09-2045	09-2046
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	—	09-2045	09-2046	—	09-2047	09-2045	09-2045	09-2046
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	—	09-2045	09-2046	—	09-2047	09-2045	09-2045	09-2046
CAMO-09-6503	MO-605078	2.00–3.00	QBT4	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	—	09-2045	09-2046	—	09-2047	09-2045	09-2045	09-2046

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.9-2
Inorganic Chemicals above BVs at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Fluoride	Lead	Nickel	Nitrate	Selenium	Silver	Thallium	Total Phosphorus	Zinc
SED Background Value[a]				**0.83**	**127**	**0.4**	**10.5**	**na[b]**	**19.7**	**9.38**	**na**	**0.3**	**1**	**0.73**	**na**	**60.2**
SOIL Background Value[a]				**0.83**	**295**	**0.4**	**19.3**	**na**	**22.3**	**15.4**	**na**	**1.52**	**1**	**0.73**	**na**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**7.14**	**na**	**11.2**	**6.58**	**na**	**0.3**	**1**	**1.1**	**na**	**63.5**
AAA2530	50-06511	0.00–0.50	SED	11.2 (UJ)	—[c]	0.8 (U)	—	NA[d]	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2709	50-06511	1.50–2.50	SOIL	11.2 (UJ)	—	0.84 (J)	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
AAA2532	50-06513	0.00–0.50	SOIL	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
AAA2534	50-06515	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2535	50-06516	0.00–0.50	SED	11.2 (UJ)	—	0.91 (J)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (UJ)	NA	NA
AAA2536	50-06517	0.00–0.50	SED	11.2 (U)	—	1	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2711	50-06517	3.00–4.00	SED	11.2 (UJ)	—	0.87 (J)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2537	50-06518	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2708	50-06518	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2714	50-06518	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2538	50-06519	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2539	50-06520	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
CAMO-05-61156	50-06520	0.00–0.9843	SED	—	—	0.496 (U)	—	—	—	—	—	1.49 (U)	—	—	93.3	—
AAA2710	50-06520	1.50–2.50	SED	11.2 (UJ)	—	0.98 (J)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2713	50-06520	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2540	50-06521	0.00–0.50	SED	11.2 (UJ)	—	1.4	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2637	50-06522	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2707	50-06522	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2712	50-06522	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2638	50-06523	0.00–0.50	SED	11.2 (UJ)	—	1	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2639	50-06524	0.00–0.50	SED	11.2 (UJ)	—	1	—	NA	—	—	NA	3 (U)	1.4 (U)	1 (U)	NA	NA
AAA2640	50-06525	0.00–0.50	SOIL	11.2 (UJ)	—	1.7	—	NA	—	—	NA	3 (U)	1.4 (U)	1 (U)	NA	NA
AAA2641	50-06526	0.00–0.50	SOIL	11.2 (UJ)	—	1	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
AAA2642	50-06527	0.00–0.50	SED	11.2 (UJ)	—	1.1	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2643	50-06528	0.00–0.50	SED	11.2 (UJ)	—	1.2	—	NA	—	11.4	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2682	50-06528	1.50–2.50	SED	11.2 (UJ)	—	1.3	—	NA	39.1	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2685	50-06528	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2644	50-06529	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2683	50-06529	1.50–2.50	SED	11.2 (UJ)	—	1.1	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2684	50-06529	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2645	50-06530	0.00–0.50	SED	11.2 (UJ)	—	0.84 (J)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Fluoride	Lead	Nickel	Nitrate	Selenium	Silver	Thallium	Total Phosphorus	Zinc
SED Background Value[a]				**0.83**	**127**	**0.4**	**10.5**	**na[b]**	**19.7**	**9.38**	**na**	**0.3**	**1**	**0.73**	**na**	**60.2**
SOIL Background Value[a]				**0.83**	**295**	**0.4**	**19.3**	**na**	**22.3**	**15.4**	**na**	**1.52**	**1**	**0.73**	**na**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**7.14**	**na**	**11.2**	**6.58**	**na**	**0.3**	**1**	**1.1**	**na**	**63.5**
AAA2646	50-06531	0.00–0.50	SED	11.2 (UJ)	—	0.83 (J)	—	NA	20.4	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2705	50-06531	1.50–2.50	SED	11.2 (UJ)	—	1.3	—	NA	—	9.7	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2706	50-06531	3.00–4.00	SED	11.2 (UJ)	—	1.3	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2647	50-06532	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2648	50-06533	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.62 (J)	1.4 (U)	1 (U)	NA	NA
AAA2681	50-06533	1.50–2.50	SED	11.2 (UJ)	129	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2686	50-06533	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2649	50-06534	0.00–0.50	SED	11.2 (UJ)	—	1.2	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2650	50-06535	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2659	50-06535	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2660	50-06535	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2651	50-06536	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2661	50-06536	1.50–2.50	SED	11.2 (UJ)	—	0.92 (J)	—	NA	30.4 (J-)	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2662	50-06536	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2652	50-06537	0.00–0.50	SED	11.2 (UJ)	—	0.92 (J)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2663	50-06537	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2664	50-06537	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2653	50-06538	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2665	50-06538	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2666	50-06538	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	3 (U)	1.4 (U)	1 (U)	NA	NA
AAA2654	50-06539	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2667	50-06539	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	23.8 (J-)	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2668	50-06539	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2655	50-06540	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2669	50-06540	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2670	50-06540	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2656	50-06541	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	58.9	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2671	50-06541	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2672	50-06541	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2657	50-06542	0.00–0.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2673	50-06542	1.50–2.50	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA
AAA2674	50-06542	3.00–4.00	SED	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	0.6 (U)	1.4 (U)	1 (U)	NA	NA

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Chromium	Fluoride	Lead	Nickel	Nitrate	Selenium	Silver	Thallium	Total Phosphorus	Zinc
SED Background Value[a]				**0.83**	**127**	**0.4**	**10.5**	**na[b]**	**19.7**	**9.38**	**na**	**0.3**	**1**	**0.73**	**na**	**60.2**
SOIL Background Value[a]				**0.83**	**295**	**0.4**	**19.3**	**na**	**22.3**	**15.4**	**na**	**1.52**	**1**	**0.73**	**na**	**48.8**
QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**7.14**	**na**	**11.2**	**6.58**	**na**	**0.3**	**1**	**1.1**	**na**	**63.5**
AAA2658	50-06543	0.00–0.50	SOIL	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
AAA2675	50-06543	1.50–2.50	SOIL	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
AAA2676	50-06543	3.00–4.00	SOIL	11.2 (UJ)	—	0.8 (U)	—	NA	—	—	NA	—	1.4 (U)	1 (U)	NA	NA
CAMO-09-6496	MO-605076	0.00–0.50	SED	1.05 (U)	—	0.524 (U)	—	0.517 (J)	—	—	1.62	1.08 (U)	—	—	NA	81.5
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	1.09 (U)	—	—	26.7	1.12	11.8	—	0.902 (J)	1.11 (U)	—	—	NA	—
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	1.04 (U)	—	—	37	0.695 (J)	—	—	0.567 (J)	1.03 (U)	—	—	NA	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	1.21 (U)	—	0.605 (U)	—	0.5 (J)	—	—	—	1.17 (U)	—	—	NA	—
CAMO-09-6500	MO-605077	0.50–1.50	QBT4	1.11 (U)	—	—	24	1.16	—	—	0.57 (J)	1.08 (U)	—	—	NA	—
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	1.11 (U)	—	—	33.7	0.961 (J)	—	—	0.584 (J)	1.09 (U)	—	—	NA	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	1.19 (U)	—	—	18.3	0.651 (J)	—	—	0.703 (J)	1.2 (U)	—	—	NA	—
CAMO-09-6503	MO-605078	2.00–3.00	QBT4	1.15 (U)	—	—	33.6	1.2	—	—	0.517 (J)	1.16 (U)	—	—	NA	—

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

[d] NA = Not analyzed.

Table 6.9-3
Organic Chemicals Detected at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
AAA2519	50-06500	0.00–0.50	SOIL	—[a]	NA[b]	—	NA	NA	—	—	—	—	—
AAA2520	50-06501	0.00–0.50	SOIL	—	NA	—	—	0.056	—	—	—	—	—
AAA2721	50-06502	3.00–4.00	SOIL	—	NA	—	NA	NA	—	—	—	—	—
AAA2522	50-06503	0.00–0.50	SOIL	—	NA	—	NA	NA	—	—	—	—	—
AAA2523	50-06504	0.00–0.50	SOIL	—	NA	—	—	0.12	0.065 (J)	0.053 (J)	—	—	—
AAA2716	50-06506	1.50–2.50	SOIL	—	NA	—	—	—	—	—	—	—	—
AAA2527	50-06508	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2723	50-06508	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2528	50-06509	0.00–0.50	SED	0.041 (J)	NA	0.04 (J)	NA	NA	0.44	0.67	0.87	0.25 (J)	0.27 (J)
AAA2529	50-06510	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.048 (J)	—	—
AAA2530	50-06511	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2709	50-06511	1.50–2.50	SOIL	—	NA	—	NA	NA	—	—	—	—	—
AAA2532	50-06513	0.00–0.50	SOIL	—	NA	—	NA	NA	—	—	—	—	—
AAA2534	50-06515	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2535	50-06516	0.00–0.50	SED	—	NA	—	NA	NA	0.08 (J)	0.11 (J)	0.089 (J)	0.092 (J)	0.086 (J)
AAA2536	50-06517	0.00–0.50	SED	—	NA	—	NA	NA	0.1 (J)	0.081 (J)	0.1 (J)	—	0.079 (J)
AAA2711	50-06517	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2537	50-06518	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2708	50-06518	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2714	50-06518	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2538	50-06519	0.00–0.50	SED	—	NA	—	NA	NA	0.15 (J)	0.19 (J)	0.18 (J)	—	0.13 (J)
AAA2539	50-06520	0.00–0.50	SED	—	NA	—	NA	NA	0.13 (J)	0.13 (J)	0.16 (J)	0.13 (J)	0.1 (J)
CAMO-05-61156	50-06520	0.00–0.9843	SED	0.0213 (J)	NA	0.0816	0.0124 (J)	0.0479	0.482	0.735	0.224	0.374	—
AAA2710	50-06520	1.50–2.50	SED	—	NA	—	NA	NA	0.038 (J)	—	—	—	—
AAA2713	50-06520	3.00–4.00	SED	0.51	NA	0.9	NA	NA	0.68	0.53	0.44	0.3 (J)	0.53
AAA2540	50-06521	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2637	50-06522	0.00–0.50	SED	—	NA	0.072 (J)	NA	NA	0.37	0.41	0.38	0.37	0.36
AAA2707	50-06522	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2712	50-06522	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2638	50-06523	0.00–0.50	SED	—	NA	—	NA	NA	0.26 (J)	0.34 (J)	0.4 (J)	—	0.29 (J)
AAA2639	50-06524	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2640	50-06525	0.00–0.50	SOIL	—	NA	—	NA	NA	—	—	—	—	—
AAA2641	50-06526	0.00–0.50	SOIL	—	NA	—	NA	NA	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
AAA2643	50-06528	0.00–0.50	SED	—	NA	—	NA	NA	0.2 (J)	0.27 (J)	0.3 (J)	—	0.27 (J)
AAA2685	50-06528	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2644	50-06529	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2683	50-06529	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2684	50-06529	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2645	50-06530	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2646	50-06531	0.00–0.50	SED	0.049 (J)	NA	0.078 (J)	NA	NA	0.5	0.55	0.59	0.17 (J)	0.53
AAA2705	50-06531	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2647	50-06532	0.00–0.50	SED	0.13 (J)	NA	0.18 (J)	NA	NA	1.1	1.2	1.1	0.66	1.13
AAA2648	50-06533	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2681	50-06533	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2649	50-06534	0.00–0.50	SED	—	NA	—	NA	NA	0.22 (J)	0.29 (J)	0.26 (J)	0.18 (J)	0.26 (J)
AAA2650	50-06535	0.00–0.50	SED	—	NA	—	NA	NA	0.22 (J)	0.29 (J)	0.41 (J)	0.093 (J)	0.13 (J)
AAA2661	50-06536	1.50–2.50	SED	0.089 (J)	NA	—	NA	NA	0.46	0.6	0.66	0.26 (J)	0.26 (J)
AAA2662	50-06536	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2653	50-06538	0.00–0.50	SED	—	NA	—	NA	NA	0.061 (J)	0.094 (J)	0.13 (J)	—	0.046 (J)
AAA2654	50-06539	0.00–0.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2668	50-06539	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2655	50-06540	0.00–0.50	SED	—	NA	—	NA	NA	0.1 (J)	0.15 (J)	0.22 (J)	—	—
AAA2672	50-06541	3.00–4.00	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA2657	50-06542	0.00–0.50	SED	—	NA	—	NA	NA	—	—	0.088 (J)	—	—
AAA2673	50-06542	1.50–2.50	SED	—	NA	—	NA	NA	—	—	—	—	—
AAA3228	50-06551	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3219	50-06552	0.00–0.50	SED	—	—	—	—	0.78 (J)	—	—	—	—	—
AAA3216	50-06552	3.00–4.00	SED	—	—	—	—	0.12 (J-)	—	—	—	—	—
AAA3215	50-06553	0.00–0.50	SED	—	—	—	—	0.082 (J-)	—	—	—	—	—
AAA3205	50-06554	0.00–0.50	SED	—	0.034 (J)	—	—	0.23 (J)	—	—	—	—	—
AAA3203	50-06555	0.00–0.50	SED	—	—	—	—	0.33	—	—	—	—	—
AAA3213	50-06556	0.00–0.50	SED	—	—	—	—	0.76	—	—	—	—	—
AAA3217	50-06556	1.50–2.50	SED	—	—	—	—	0.182 (J-)	—	—	—	—	—
AAA3223	50-06557	0.00–0.50	SED	—	—	—	—	0.2 (J)	—	—	—	—	—
AAA3208	50-06557	3.00–4.00	SED	—	0.007 (J)	—	—	—	—	—	—	—	—
AAA3225	50-06558	0.00–0.50	SED	—	0.011	—	—	—	—	—	—	—	—
AAA3211	50-06559	0.00–0.50	SED	—	0.027 (J)	—	—	0.74	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
AAA3206	50-06560	0.00–0.50	SED	—	—	—	—	0.11 (J-)	—	—	—	—	—
AAA3207	50-06561	0.00–0.50	SED	—	0.003 (J)	—	—	1.37	—	—	—	—	—
AAA3214	50-06562	0.00–0.50	SOIL	—	0.019	—	—	—	—	—	—	—	—
AAA3200	50-06563	0.00–0.50	SED	—	—	—	—	0.12 (J)	—	—	—	—	—
AAA3204	50-06564	0.00–0.50	SED	—	0.015	—	—	—	—	—	—	—	—
CAMO-09-6496	MO-605076	0.00–0.50	SED	—	NA	0.0132 (J)	—	0.0192	0.137	0.167	0.298	0.107	—
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	—	—	—	—	—	—	0.0571	0.109	0.0349 (J)	—
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	—	—	—	—	—	—	0.0193 (J)	0.0371	—	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	—	NA	—	—	—	0.0571	0.0543	0.111	0.0343 (J)	—
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	—	—	—	0.0059	0.0014 (J)	—	—	—	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	—	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Fluoranthene
AAA2519	50-06500	0.00–0.50	SOIL	—	0.1 (J)	—	NA	—	—	—	—	—	—
AAA2520	50-06501	0.00–0.50	SOIL	—	—	—	NA	—	—	—	—	—	—
AAA2721	50-06502	3.00–4.00	SOIL	0.046 (J)	—	—	NA	—	—	—	—	—	—
AAA2522	50-06503	0.00–0.50	SOIL	—	0.051 (J)	—	NA	—	—	—	—	—	—
AAA2523	50-06504	0.00–0.50	SOIL	—	—	—	NA	0.085 (J)	—	—	—	—	0.15 (J)
AAA2716	50-06506	1.50–2.50	SOIL	0.068 (J)	—	—	NA	—	—	—	—	—	—
AAA2527	50-06508	0.00–0.50	SED	0.13 (J)	—	—	NA	0.11 (J)	—	—	—	—	0.15 (J)
AAA2723	50-06508	3.00–4.00	SED	0.066 (J)	—	—	NA	—	—	—	—	—	—
AAA2528	50-06509	0.00–0.50	SED	—	—	—	NA	0.72	—	—	—	—	1
AAA2529	50-06510	0.00–0.50	SED	—	—	—	NA	0.059 (J)	—	—	—	—	0.089 (J)
AAA2530	50-06511	0.00–0.50	SED	—	0.51	—	NA	—	0.79 (J)	—	—	—	—
AAA2709	50-06511	1.50–2.50	SOIL	—	0.16 (J)	—	NA	—	1.3 (J)	—	—	—	—
AAA2532	50-06513	0.00–0.50	SOIL	—	0.073 (J)	—	NA	—	1.8 (J)	—	—	—	—
AAA2534	50-06515	0.00–0.50	SED	—	0.14 (J)	—	NA	—	2.5 (J)	—	—	—	—
AAA2535	50-06516	0.00–0.50	SED	—	0.081 (J)	—	NA	0.11 (J)	0.85 (J)	—	—	—	0.2 (J)
AAA2536	50-06517	0.00–0.50	SED	—	0.097 (J)	—	NA	0.19 (J)	0.46 (J)	—	—	—	0.33 (J)
AAA2711	50-06517	3.00–4.00	SED	—	0.1 (J)	—	NA	—	0.58 (J)	—	—	—	—
AAA2537	50-06518	0.00–0.50	SED	—	0.2 (J)	—	NA	—	0.42 (J)	—	—	—	—
AAA2708	50-06518	1.50–2.50	SED	—	0.24 (J)	—	NA	—	0.28 (J)	—	—	—	—
AAA2714	50-06518	3.00–4.00	SED	—	0.1 (J-)	—	NA	—	—	—	—	—	—
AAA2538	50-06519	0.00–0.50	SED	0.044 (J)	0.058 (J)	—	NA	0.2 (J)	2.6 (J)	—	—	—	0.36 (J)
AAA2539	50-06520	0.00–0.50	SED	—	0.041 (J)	—	NA	0.17 (J)	2.4 (J)	—	—	—	0.31 (J)
CAMO-05-61156	50-06520	0.00–0.9843	SED	—	—	—	NA	0.629	—	—	—	—	1.06
AAA2710	50-06520	1.50–2.50	SED	—	0.041 (J)	—	NA	0.04 (J)	3 (J)	—	—	—	0.068 (J)
AAA2713	50-06520	3.00–4.00	SED	—	0.059 (J)	—	NA	0.72	2.7 (J)	0.17 (J)	0.26 (J)	—	2.4
AAA2540	50-06521	0.00–0.50	SED	—	0.07 (J)	—	NA	—	2.5 (J)	—	—	—	—
AAA2637	50-06522	0.00–0.50	SED	—	0.072 (J)	—	NA	0.49	—	0.16 (J)	—	—	1
AAA2707	50-06522	1.50–2.50	SED	—	0.12 (J)	—	NA	—	0.44 (J)	—	—	—	—
AAA2712	50-06522	3.00–4.00	SED	—	0.14 (J)	—	NA	—	0.33 (J)	—	—	—	—
AAA2638	50-06523	0.00–0.50	SED	—	0.1 (J)	—	NA	0.34 (J)	—	—	—	—	0.61
AAA2639	50-06524	0.00–0.50	SED	—	0.11 (J)	—	NA	—	—	—	—	—	—
AAA2640	50-06525	0.00–0.50	SOIL	—	0.064 (J)	—	NA	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Fluoranthene
AAA2641	50-06526	0.00–0.50	SOIL	—	0.066 (J)	—	NA	—	—	—	—	—	—
AAA2643	50-06528	0.00–0.50	SED	—	0.12 (J)	—	NA	0.27 (J)	—	—	—	—	0.45
AAA2685	50-06528	3.00–4.00	SED	—	0.06 (J)	—	NA	—	—	—	—	—	—
AAA2644	50-06529	0.00–0.50	SED	—	0.12 (J)	—	NA	—	—	—	—	—	—
AAA2683	50-06529	1.50–2.50	SED	—	0.064 (J)	—	NA	—	—	—	—	—	—
AAA2684	50-06529	3.00–4.00	SED	—	0.045 (J)	—	NA	—	—	—	—	—	—
AAA2645	50-06530	0.00–0.50	SED	—	—	—	NA	—	—	—	—	—	—
AAA2646	50-06531	0.00–0.50	SED	—	0.16 (J)	0.51	NA	0.6	—	—	—	—	1.1
AAA2705	50-06531	1.50–2.50	SED	—	0.056 (J)	0.093 (J)	NA	—	—	—	—	—	0.052 (J)
AAA2647	50-06532	0.00–0.50	SED	—	0.085 (J)	—	NA	1.4	—	0.18 (J)	—	—	1.9
AAA2648	50-06533	0.00–0.50	SED	—	0.062 (J)	—	NA	—	—	—	—	—	—
AAA2681	50-06533	1.50–2.50	SED	—	0.086 (J)	—	NA	—	—	—	—	—	—
AAA2649	50-06534	0.00–0.50	SED	—	0.084 (J)	0.17 (J)	NA	0.31 (J)	—	—	—	—	0.35 (J)
AAA2650	50-06535	0.00–0.50	SED	—	—	—	NA	0.3 (J)	—	—	—	—	0.48
AAA2661	50-06536	1.50–2.50	SED	—	—	—	NA	0.54	—	—	—	—	1
AAA2662	50-06536	3.00–4.00	SED	—	—	—	NA	—	—	—	—	—	0.06 (J)
AAA2653	50-06538	0.00–0.50	SED	—	—	—	NA	0.094 (J)	—	—	—	—	0.13 (J)
AAA2654	50-06539	0.00–0.50	SED	0.14 (J)	—	—	NA	—	—	—	—	—	—
AAA2668	50-06539	3.00–4.00	SED	—	—	—	NA	—	—	—	—	—	0.075 (J)
AAA2655	50-06540	0.00–0.50	SED	—	—	—	NA	0.15 (J)	—	—	—	—	0.25 (J)
AAA2672	50-06541	3.00–4.00	SED	—	—	—	NA	—	—	—	—	0.1 (J)	—
AAA2657	50-06542	0.00–0.50	SED	—	—	—	NA	0.077 (J)	—	—	—	—	0.21 (J)
AAA2673	50-06542	1.50–2.50	SED	—	0.058 (J)	—	NA	—	—	—	—	—	—
AAA3228	50-06551	0.00–0.50	SED	—	—	—	0.002 (J)	—	—	—	—	—	—
AAA3219	50-06552	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3216	50-06552	3.00–4.00	SED	—	—	—	—	—	—	—	—	—	—
AAA3215	50-06553	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3205	50-06554	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3203	50-06555	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3213	50-06556	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3217	50-06556	1.50–2.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3223	50-06557	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3208	50-06557	3.00–4.00	SED	—	—	—	—	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbon Tetrachloride	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Fluoranthene
AAA3225	50-06558	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3211	50-06559	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3206	50-06560	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3207	50-06561	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3214	50-06562	0.00–0.50	SOIL	—	—	—	—	—	—	—	—	—	—
AAA3200	50-06563	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
AAA3204	50-06564	0.00–0.50	SED	—	—	—	—	—	—	—	—	—	—
CAMO-09-6496	MO-605076	0.00–0.50	SED	—	—	—	NA	0.205	—	—	—	—	0.296
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	—	—	—	—	0.0705	—	—	—	—	0.107
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	—	—	—	—	0.0246 (J)	—	—	—	—	0.0343 (J)
CAMO-09-6499	MO-605077	0.00–0.50	SED	—	—	—	NA	0.0721	—	—	—	—	0.112
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	—	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]
AAA2519	50-06500	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2520	50-06501	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2721	50-06502	3.00–4.00	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2522	50-06503	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2523	50-06504	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2716	50-06506	1.50–2.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2527	50-06508	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2723	50-06508	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2528	50-06509	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.23 (J)	NA
AAA2529	50-06510	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2530	50-06511	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2709	50-06511	1.50–2.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2532	50-06513	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2534	50-06515	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2535	50-06516	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.088 (J)	NA
AAA2536	50-06517	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2711	50-06517	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2537	50-06518	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2708	50-06518	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2714	50-06518	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2538	50-06519	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2539	50-06520	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.11 (J)	NA
CAMO-05-61156	50-06520	0.00–0.9843	SED	—	NA	NA	NA	NA	NA	NA	NA	0.101	NA
AAA2710	50-06520	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2713	50-06520	3.00–4.00	SED	0.47	NA	NA	NA	NA	NA	NA	NA	0.33 (J)	NA
AAA2540	50-06521	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2637	50-06522	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.31 (J)	NA
AAA2707	50-06522	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2712	50-06522	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]
AAA2638	50-06523	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2639	50-06524	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2640	50-06525	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2641	50-06526	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2643	50-06528	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2685	50-06528	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2644	50-06529	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2683	50-06529	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2684	50-06529	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2645	50-06530	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2646	50-06531	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.2 (J)	NA
AAA2705	50-06531	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2647	50-06532	0.00–0.50	SED	0.08 (J)	NA	NA	NA	NA	NA	NA	NA	0.66	NA
AAA2648	50-06533	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2681	50-06533	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2649	50-06534	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.17 (J)	NA
AAA2650	50-06535	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.098 (J)	NA
AAA2661	50-06536	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.29 (J)	NA
AAA2662	50-06536	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2653	50-06538	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2654	50-06539	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2668	50-06539	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2655	50-06540	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2672	50-06541	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2657	50-06542	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	NA	0.036 (J)	NA
AAA2673	50-06542	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA3228	50-06551	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3219	50-06552	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3216	50-06552	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofurans (Total)	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methyl-2-pentanone[4-]
AAA3215	50-06553	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3205	50-06554	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3203	50-06555	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3213	50-06556	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3217	50-06556	1.50–2.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3223	50-06557	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3208	50-06557	3.00–4.00	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3225	50-06558	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3211	50-06559	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3206	50-06560	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3207	50-06561	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3214	50-06562	0.00–0.50	SOIL	—	NA	NA	NA	NA	NA	NA	—	—	—
AAA3200	50-06563	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	0.014	—	—
AAA3204	50-06564	0.00–0.50	SED	—	NA	NA	NA	NA	NA	NA	—	—	0.008 (J)
CAMO-09-6496	MO-605076	0.00–0.50	SED	—	0.00000718	0.0000174	—	0.00000146	0.00000192	0.00000136	NA	0.0889	NA
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	—	0.00000194 (J)	0.00000461	0.000000354 (J)	0.000000807	0.000000487	0.000000552	—	0.0318 (J)	—
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	—	—	0.000000432	—	—	—	—	—	0.0123 (J)	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	—	0.00000626	0.0000144	0.000000746 (J)	0.00000202	0.000000734	0.000000992	NA	0.0311 (J)	NA
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	—	—	—	—	—	—	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Toluene
AAA2519	50-06500	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2520	50-06501	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2721	50-06502	3.00–4.00	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2522	50-06503	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2523	50-06504	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	0.084 (J)	0.17 (J)	NA	NA
AAA2716	50-06506	1.50–2.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2527	50-06508	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.058 (J)	0.23 (J)	NA	NA
AAA2723	50-06508	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2528	50-06509	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.35 (J)	1.2	NA	NA
AAA2529	50-06510	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	0.088 (J)	NA	NA
AAA2530	50-06511	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2709	50-06511	1.50–2.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2532	50-06513	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2534	50-06515	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2535	50-06516	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.11 (J)	0.18 (J)	NA	NA
AAA2536	50-06517	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	0.29 (J)	NA	NA
AAA2711	50-06517	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2537	50-06518	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2708	50-06518	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2714	50-06518	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2538	50-06519	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.17 (J)	0.3 (J)	NA	NA
AAA2539	50-06520	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.16 (J)	0.25 (J)	NA	NA
CAMO-05-61156	50-06520	0.00–0.9843	SED	NA	—	—	NA	NA	NA	0.735	1.25	NA	NA
AAA2710	50-06520	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	0.071 (J)	NA	NA
AAA2713	50-06520	3.00–4.00	SED	NA	0.081 (J)	0.18 (J)	NA	NA	NA	3.1	2	NA	NA
AAA2540	50-06521	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2637	50-06522	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.39	0.75	NA	NA
AAA2707	50-06522	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2712	50-06522	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Toluene
AAA2638	50-06523	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.2 (J)	0.45	NA	NA
AAA2639	50-06524	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2640	50-06525	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2641	50-06526	0.00–0.50	SOIL	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2643	50-06528	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.14 (J)	0.39 (J)	NA	NA
AAA2685	50-06528	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2644	50-06529	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2683	50-06529	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2684	50-06529	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2645	50-06530	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	0.042 (J)	NA	NA
AAA2646	50-06531	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.44	0.88	NA	NA
AAA2705	50-06531	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	0.041 (J)	NA	NA
AAA2647	50-06532	0.00–0.50	SED	NA	—	—	NA	NA	NA	1.1	2.4	NA	NA
AAA2648	50-06533	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2681	50-06533	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2649	50-06534	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.17 (J)	0.53	NA	NA
AAA2650	50-06535	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	0.54	NA	NA
AAA2661	50-06536	1.50–2.50	SED	NA	—	—	NA	NA	NA	0.5	1.2	NA	NA
AAA2662	50-06536	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	0.057 (J)	NA	NA
AAA2653	50-06538	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	0.14 (J)	NA	NA
AAA2654	50-06539	0.00–0.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2668	50-06539	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	0.069 (J)	NA	NA
AAA2655	50-06540	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.1 (J)	0.25 (J)	NA	NA
AAA2672	50-06541	3.00–4.00	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA2657	50-06542	0.00–0.50	SED	NA	—	—	NA	NA	NA	0.12 (J)	0.23 (J)	NA	NA
AAA2673	50-06542	1.50–2.50	SED	NA	—	—	NA	NA	NA	—	—	NA	NA
AAA3228	50-06551	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.009 (J)
AAA3219	50-06552	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.003 (J)
AAA3216	50-06552	3.00–4.00	SED	—	—	—	NA	NA	NA	—	—	NA	—

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)	Toluene
AAA3215	50-06553	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.005 (J)
AAA3205	50-06554	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	—
AAA3203	50-06555	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	—
AAA3213	50-06556	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.022 (J)
AAA3217	50-06556	1.50–2.50	SED	—	—	—	NA	NA	NA	—	—	NA	—
AAA3223	50-06557	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.006 (J)
AAA3208	50-06557	3.00–4.00	SED	—	NA	—	NA	NA	NA	—	—	NA	—
AAA3225	50-06558	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	—
AAA3211	50-06559	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.016 (J)
AAA3206	50-06560	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	—
AAA3207	50-06561	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.007 (J)
AAA3214	50-06562	0.00–0.50	SOIL	—	—	—	NA	NA	NA	—	—	NA	0.008 (J)
AAA3200	50-06563	0.00–0.50	SED	0.002 (J)	—	—	NA	NA	NA	—	—	NA	0.005 (J)
AAA3204	50-06564	0.00–0.50	SED	—	—	—	NA	NA	NA	—	—	NA	0.002 (J)
CAMO-09-6496	MO-605076	0.00–0.50	SED	NA	—	—	0.0000561	0.00000256 (J)	0.00000125	0.116	0.309	0.000000401	NA
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	—	—	—	0.0000152	0.000000839 (J)	0.00000185	0.0453	0.115	0.000000182	—
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	—	—	—	0.00000266 (J)	—	—	0.0111 (J)	0.0309 (J)	—	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	NA	—	—	0.0000498	0.00000215 (J)	0.00000118	0.0428	0.12	—	NA
CAMO-09-6501	MO-605077	2.50–3.50	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	0.00000112 (J)	—	—	—	—	—	—

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 6.9-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA2519	50-06500	0.00–0.50	SOIL	—[d]	—	—	—	—	—	—	0.0725718	—	—	—
AAA2520	50-06501	0.00–0.50	SOIL	—	—	—	—	0.058	—	—	0.0389636	—	—	—
AAA2521	50-06502	0.00–0.50	SOIL	—	—	—	—	—	—	—	0.0268951	—	—	—
AAA2721	50-06502	3.00–4.00	SOIL	—	—	—	—	1.445	—	—	0.0952941	—	—	—
AAA2522	50-06503	0.00–0.50	SOIL	—	—	—	0.067	0.19	—	—	0.0518993	—	—	—
AAA2715	50-06503	1.50–2.50	SOIL	—	—	—	—	—	—	—	0.0968944	—	—	—
AAA2720	50-06503	3.00–4.00	SOIL	—	—	—	—	0.013	—	—	0.198588	—	—	—
AAA2523	50-06504	0.00–0.50	SOIL	—	—	—	1.144	3.83	—	—	0.117003	—	—	—
AAA2524	50-06505	0.00–0.50	SOIL	—	—	—	—	—	—	—	0.0198783	—	—	—
AAA2525	50-06506	0.00–0.50	SOIL	—	—	—	0.066	—	—	—	0.0322176	—	—	—
AAA2716	50-06506	1.50–2.50	SOIL	—	—	—	0.272	0.281	—	—	0.0878302	—	—	—
AAA2722	50-06506	3.00–4.00	SOIL	—	—	—	—	0.04	—	—	0.140681	—	—	—
AAA2526	50-06507	0.00–0.50	SOIL	—	—	—	0.611	0.536	—	—	0.109977	—	—	—
AAA2717	50-06507	1.50–2.50	SOIL	—	—	—	0.087	0.048	—	—	0.0848128	—	—	—
AAA2527	50-06508	0.00–0.50	SED	—	—	—	1.674	0.746	—	—	0.176544	—	—	—
AAA2688	50-06508	1.50–2.50	SED	—	—	—	1.734	1.067	—	—	0.41933	—	—	—
AAA2723	50-06508	3.00–4.00	SED	—	—	—	6.018	2.207	2.11 (J-)	—	0.555167	—	—	—
AAA2528	50-06509	0.00–0.50	SED	—	—	—	0.14	—	—	—	—	—	—	—
AAA2529	50-06510	0.00–0.50	SED	—	—	—	2.953	2.419	1.17 (J-)	—	0.732329	—	—	2.72
AAA2530	50-06511	0.00–0.50	SED	—	—	—	—	0.356	—	—	—	—	—	—
AAA2709	50-06511	1.50–2.50	SOIL	—	—	—	—	0.042	—	—	0.030712 (J)	—	—	—
AAA2532	50-06513	0.00–0.50	SOIL	—	1.7296	—	0.08 (J-)	3.99	—	3.4093	0.0677778 (J)	—	—	2.703
AAA3240	50-06514	1.50–2.50	SED	0.142 (J-)	—	—	2.276 (J-)	0.408 (J-)	—	6.5209	—	—	—	—
AAA3241	50-06514	3.00–4.00	SED	0.079 (J-)	—	—	1.522 (J-)	0.244 (J-)	—	—	—	—	—	—
AAA2534	50-06515	0.00–0.50	SED	—	—	—	1.257	0.231	—	—	—	—	—	—
AAA2535	50-06516	0.00–0.50	SED	—	2.1782	—	15.068	3.674	—	—	0.187723 (J)	—	—	—
AAA2536	50-06517	0.00–0.50	SED	—	—	—	8.741	2.144	—	—	0.261569 (J)	—	—	2.53
AAA2711	50-06517	3.00–4.00	SED	—	—	—	0.602	0.111	—	—	—	—	—	—
AAA2537	50-06518	0.00–0.50	SED	—	0.9085	—	8.163	1.453	—	—	—	—	—	—
AAA2708	50-06518	1.50–2.50	SED	—	—	—	1.651	0.496	—	—	—	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA2714	50-06518	3.00–4.00	SED	—	—	—	2.574	0.742	—	—	—	—	—	—
AAA2538	50-06519	0.00–0.50	SED	—	1.2458	—	7.486	1.825	—	4.3572	0.10779 (J)	—	—	—
AAA2539	50-06520	0.00–0.50	SED	—	—	—	4.462	0.746 (J-)	—	—	—	—	—	—
CAMO-05-61156	50-06520	0.00–0.9843	SED	0.0918	—	—	5.84	0.991	—	NA[e]	NA	NA	NA	NA
AAA2710	50-06520	1.50–2.50	SED	—	—	—	2.687	1.215	—	—	—	—	—	—
AAA2713	50-06520	3.00–4.00	SED	—	—	—	0.421	0.109	—	—	—	—	—	—
AAA2540	50-06521	0.00–0.50	SED	—	—	—	0.654	0.165	—	—	—	—	—	—
AAA2637	50-06522	0.00–0.50	SED	—	—	—	3.679	0.734	—	3.6826	—	—	—	—
AAA2707	50-06522	1.50–2.50	SED	—	—	—	1.163	0.286	—	3.2452	—	—	—	—
AAA2712	50-06522	3.00–4.00	SED	—	—	—	0.171	—	—	—	—	—	—	—
AAA2638	50-06523	0.00–0.50	SED	—	1.3383	—	5.913	—	—	—	0.206667 (J)	—	—	—
AAA2639	50-06524	0.00–0.50	SED	—	—	—	0.658	—	—	—	—	—	—	—
AAA2640	50-06525	0.00–0.50	SOIL	—	—	—	0.034	—	—	—	0.0852941 (J)	—	0.255	3.006
AAA2641	50-06526	0.00–0.50	SOIL	—	—	—	0.034	—	—	—	0.0397453 (J)	—	—	2.525
AAA2642	50-06527	0.00–0.50	SED	—	—	—	0.315	—	—	—	—	—	—	—
AAA2643	50-06528	0.00–0.50	SED	—	—	—	1.822	—	—	—	—	—	—	—
AAA2682	50-06528	1.50–2.50	SED	—	1.2311	—	7.051	1.91	—	—	0.101184 (J)	—	—	—
AAA2685	50-06528	3.00–4.00	SED	—	—	—	0.481	0.116	—	—	—	—	—	—
AAA2644	50-06529	0.00–0.50	SED	—	—	—	0.051	9.258 (J)	—	—	—	—	—	2.747
AAA2683	50-06529	1.50–2.50	SED	—	—	—	0.046	—	—	2.7417	—	—	—	—
AAA2684	50-06529	3.00–4.00	SED	—	—	—	0.06	—	—	—	—	—	—	—
AAA2645	50-06530	0.00–0.50	SED	—	—	—	4.746	—	—	—	—	—	—	—
AAA2646	50-06531	0.00–0.50	SED	—	—	—	2.746	—	—	—	—	—	—	—
AAA2705	50-06531	1.50–2.50	SED	—	—	—	0.316	—	—	3.3542	—	—	—	—
AAA2706	50-06531	3.00–4.00	SED	—	—	—	0.068	—	—	—	—	—	—	—
AAA2647	50-06532	0.00–0.50	SED	—	—	—	16.811	—	—	—	0.138478 (J)	—	—	—
AAA2648	50-06533	0.00–0.50	SED	—	—	—	0.304	0.225	—	—	—	—	—	—
AAA2681	50-06533	1.50–2.50	SED	—	—	—	0.265	2.263	—	—	—	—	—	—
AAA2686	50-06533	3.00–4.00	SED	—	—	—	0.314	0.233	—	—	—	—	—	—
AAA2649	50-06534	0.00–0.50	SED	—	—	—	1.495	—	—	2.8553	—	—	—	—
AAA2650	50-06535	0.00–0.50	SED	—	0.9021	—	5.441	—	—	—	0.197858	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA2659	50-06535	1.50–2.50	SED	—	1.5605	—	8.22	—	—	—	—	—	—	—
AAA2660	50-06535	3.00–4.00	SED	—	—	—	0.993	—	—	3.8579	0.0972222	—	—	—
AAA2651	50-06536	0.00–0.50	SED	—	1.145	—	0.494	—	—	3.7154	—	—	—	—
AAA2661	50-06536	1.50–2.50	SED	—	1.6626	—	10.739	—	—	—	0.110331	—	—	—
AAA2662	50-06536	3.00–4.00	SED	—	3.1869	—	12.033	—	—	—	0.303422	—	—	—
AAA2652	50-06537	0.00–0.50	SED	—	1.3146	—	0.269	6.947	—	—	0.105752	—	—	2.506
AAA2664	50-06537	3.00–4.00	SED	—	—	—	—	—	—	—	0.0935499	—	—	—
AAA2653	50-06538	0.00–0.50	SED	—	—	—	2.114	—	—	—	0.112951	—	—	—
AAA2665	50-06538	1.50–2.50	SED	—	—	—	—	—	—	5.2531	—	—	—	—
AAA2666	50-06538	3.00–4.00	SED	—	—	—	—	—	—	3.1251	—	—	—	—
AAA2654	50-06539	0.00–0.50	SED	—	—	—	0.622	—	—	—	—	—	—	—
AAA2667	50-06539	1.50–2.50	SED	—	—	—	0.765	—	—	—	—	—	—	—
AAA2668	50-06539	3.00–4.00	SED	—	—	—	0.494	—	—	—	—	—	—	—
AAA2655	50-06540	0.00–0.50	SED	—	—	—	4.066	—	—	—	0.138958	—	—	—
AAA2669	50-06540	1.50–2.50	SED	—	—	—	1.236	—	—	—	0.111194	—	—	—
AAA2670	50-06540	3.00–4.00	SED	—	—	—	0.093	—	—	—	—	—	—	—
AAA2656	50-06541	0.00–0.50	SED	—	—	—	0.314	—	—	2.9589	—	—	—	—
AAA2671	50-06541	1.50–2.50	SED	—	—	—	0.035	—	—	2.838	—	—	—	—
AAA2672	50-06541	3.00–4.00	SED	—	—	—	0.065	0.069	—	2.8117	—	—	—	—
AAA2657	50-06542	0.00–0.50	SED	—	—	—	0.465	0.219	—	—	—	—	—	—
AAA2673	50-06542	1.50–2.50	SED	—	—	—	1.066	0.313	—	—	—	—	—	—
AAA2674	50-06542	3.00–4.00	SED	—	—	—	0.259	0.122	—	—	—	—	—	—
AAA2658	50-06543	0.00–0.50	SOIL	—	—	—	—	0.436	—	—	0.0761825	—	—	2.692
AAA2675	50-06543	1.50–2.50	SOIL	—	—	—	—	0.04	—	3.2795	0.062895	—	—	—
AAA2676	50-06543	3.00–4.00	SOIL	—	—	—	—	—	—	—	0.102129	—	—	—
AAA3229	50-06550	0.00–0.50	SED	0.1134 (J-)	—	—	1.125	0.376 (J)	—	2.5914	—	—	—	—
AAA3228	50-06551	0.00–0.50	SED	0.102 (J-)	—	—	1.09	0.463 (J)	—	—	0.0955794	—	—	—
AAA3218	50-06551	1.50–2.50	SED	0.123 (J-)	—	—	0.232	0.242 (J)	—	—	—	—	—	—
AAA3212	50-06551	3.00–4.00	SED	—	—	—	0.191	—	—	—	—	—	—	—
AAA3219	50-06552	0.00–0.50	SED	2.526 (J-)	2.8439	—	25.988	8.414 (J)	—	—	—	—	—	—
AAA3216	50-06552	3.00–4.00	SED	0.679 (J-)	—	—	7.198	1.579 (J)	—	5.0725	0.12455	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA3215	50-06553	0.00–0.50	SED	0.358	—	—	5.069	1.152	—	—	—	—	—	—
AAA3205	50-06554	0.00–0.50	SED	0.261	1.8215	—	1.065	2.653	—	—	0.183539	—	—	3.049
AAA3210	50-06554	1.50–2.50	SED	—	—	—	—	—	—	2.6951	—	—	—	—
AAA3203	50-06555	0.00–0.50	SED	1.36	—	—	4.066	5.142	—	—	0.160422	2.735	—	3.028
AAA3213	50-06556	0.00–0.50	SED	2.844	3.585	1.2991	2.561	6.909	—	—	0.435891	—	—	—
AAA3217	50-06556	1.50–2.50	SED	0.863	1.5807	—	6.464	2.694	—	2.9535	0.0965746	—	—	—
AAA3223	50-06557	0.00–0.50	SED	0.347	1.4207	—	4.76	1.424	—	—	0.201501	—	—	—
AAA3224	50-06557	1.50–2.50	SED	0.062	—	—	0.797	—	—	—	—	—	—	—
AAA3208	50-06557	3.00–4.00	SED	—	—	—	1.741	—	—	—	—	—	—	—
AAA3225	50-06558	0.00–0.50	SED	0.168	—	—	2.446	—	—	—	—	—	—	—
AAA3201	50-06558	1.50–2.50	SED	0.077	—	—	0.729	—	—	—	—	—	—	—
AAA3202	50-06558	3.00–4.00	SED	0.302	—	—	4.461	1.367	—	—	0.128379	—	—	—
AAA3211	50-06559	0.00–0.50	SED	0.258	—	—	2.502	1.198	—	—	0.211776	—	—	—
AAA3206	50-06560	0.00–0.50	SED	1.086	—	—	16.94	4.512	—	—	1.22294	—	—	2.96
AAA3207	50-06561	0.00–0.50	SED	4.172	—	—	67.817	12.815	3.11	—	1.26403	—	—	—
AAA3214	50-06562	0.00–0.50	SOIL	0.052	—	—	—	—	—	—	0.0234309	—	—	—
AAA3200	50-06563	0.00–0.50	SED	3.219	—	—	31.711	19.51	—	—	—	—	—	—
AAA3204	50-06564	0.00–0.50	SED	0.054	—	—	0.533	—	—	—	—	—	—	—
AAA3221	50-06565	0.00–0.50	SED	0.685 (J-)	—	—	1.669 (J-)	2.194 (J-)	—	—	—	—	—	—
AAA3220	50-06565	1.50–2.50	SED	1.834 (J-)	2.07	—	16.447 (J-)	6.798 (J-)	—	—	0.323151	—	—	—
AAA3226	50-06565	3.00–4.00	SED	1.128 (J-)	2.2445	—	13.638 (J-)	3.533 (J-)	—	—	0.374233	—	—	—
AAA3230	50-06566	0.00–0.50	SED	1.644 (J-)	0.9107	—	37.383 (J-)	4.176 (J-)	—	—	—	—	—	—
AAA3231	50-06566	1.50–2.50	SED	1.607 (J-)	—	—	23.306 (J-)	5.649 (J-)	—	—	—	—	—	—
AAA3232	50-06566	3.00–4.00	SED	0.786 (J-)	—	—	12.894 (J-)	2.986 (J-)	—	4.1124	—	—	—	—
AAA3233	50-06567	0.00–0.50	SED	0.135 (J-)	—	—	1.822 (J-)	0.514 (J-)	—	—	—	—	—	—
AAA3234	50-06567	1.50–2.50	SED	0.641 (J-)	—	—	11.603 (J-)	2.546 (J-)	—	—	0.136925	—	—	—
AAA3235	50-06567	3.00–4.00	SED	0.307 (J-)	—	—	4.868 (J-)	1.428 (J-)	—	—	—	—	—	—
AAA3236	50-06568	0.00–0.50	SED	1.432 (J-)	—	—	17.71 (J-)	5.195 (J-)	1.24 (J-)	—	0.099319	—	—	—
AAA3237	50-06568	1.50–2.50	SED	1.043 (J-)	1.7569	—	33.873 (J-)	3.577 (J-)	—	—	0.468177	—	—	—
AAA3238	50-06568	3.00–4.00	SED	0.425 (J-)	1.2493	—	4.618 (J-)	2.235 (J-)	1.33 (J-)	—	0.143086	—	—	—

Table 6.9-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
CAMO-09-6496	MO-605076	0.00–0.50	SED	0.0719	—	—	—	0.929 (J-)	—	NA	—	—	—	—
CAMO-09-6497	MO-605076	0.50–1.50	QBT4	—	—	—	—	0.162	—	NA	—	—	—	—
CAMO-09-6498	MO-605076	2.50–3.50	QBT4	—	—	—	—	0.199	—	NA	—	—	—	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	0.108	—	—	0.0458	0.428	—	NA	—	—	—	—
CAMO-09-6500	MO-605077	0.50–1.50	QBT4	—	—	—	0.0272	—	—	NA	—	—	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	0.0832	0.12	—	1.27	0.213	—	NA	—	—	—	—
CAMO-09-6503	MO-605078	2.00–3.00	QBT4	0.0346	—	—	—	0.109	1.24	NA	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

[e] NA = Not analyzed.

Table 6.10-1
Samples Collected and Analyses Requested at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2439	50-05001	0.00–0.50	SOIL	—*	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2440	50-05002	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2441	50-05003	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2442	50-05004	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2443	50-05005	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2444	50-05006	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2445	50-05007	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2446	50-05008	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2447	50-05009	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2448	50-05020	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2449	50-05021	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2450	50-05022	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2451	50-05023	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2452	50-05024	0.00–0.50	SED	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2453	50-05025	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2454	50-05026	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2455	50-05027	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2456	50-05028	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2457	50-05029	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2458	50-05030	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2459	50-05031	0.00–0.50	SOIL	—	—	—	14634	14634	14634	14634	—	—	—	14634	14633	—	—
AAA2460	50-05041	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2461	50-05042	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2462	50-05043	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2463	50-05044	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2464	50-05045	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2465	50-05046	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2466	50-05047	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2467	50-05048	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2468	50-05060	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2469	50-05061	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2470	50-05062	0.00–0.50	SOIL	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2471	50-05063	0.00–0.50	FILL	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2472	50-05064	0.00–0.50	SED	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—

Table 6.10-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2473	50-05065	0.00–0.50	SED	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2474	50-05066	0.00–0.50	SED	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2475	50-05067	0.00–0.50	SOIL	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2476	50-05068	0.00–0.50	SOIL	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2477	50-05069	0.00–0.50	SOIL	—	—	—	14600	14600	14600	14600	—	—	—	—	—	—	—
AAA2478	50-05070	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2479	50-05080	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2480	50-05081	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2481	50-05082	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2482	50-05083	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2483	50-05084	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2484	50-05085	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2485	50-05086	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2486	50-05087	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2487	50-05088	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2488	50-05089	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
AAA2489	50-05090	0.00–0.50	SOIL	—	—	—	14644	14644	14644	14644	—	—	—	—	14643	—	—
CAMO-09-6496	MO-605076	0.00–0.50	SED	09-2030	09-2029	09-2027	09-2030	09-2030	09-2030	09-2030	09-2029	09-2028	09-2029	09-2030	09-2028	—	09-2029
CAMO-09-6499	MO-605077	0.00–0.50	SED	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	09-2045	09-2046	09-2047	09-2045	—	09-2046
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	09-2047	09-2046	09-2044	09-2047	09-2047	09-2047	09-2047	09-2046	09-2045	09-2046	09-2047	09-2045	09-2045	09-2046
CAMO-09-6512	MO-605083	0.00–0.50	SED	—	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6515	MO-605084	0.00–0.50	SED	—	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6518	MO-605085	0.00–0.50	SED	—	09-2500	09-2503	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	—	09-2500
CAMO-09-6521	MO-605086	0.00–0.50	SED	—	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6524	MO-605087	0.00–0.50	SED	—	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6527	MO-605088	0.00–0.50	SED	—	09-2500	—	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	—	09-2500
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	09-2506	09-2505	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	09-2506	—	09-2506	—	09-2506
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	09-2075	09-2082	09-2076	09-2076	09-2076	09-2076	09-2075	—	09-2075	—	09-2074	—	09-2075
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	09-2315	09-2313	09-2316	09-2316	09-2316	09-2316	09-2315	—	09-2315	—	09-2314	—	09-2315
CAMO-09-10143	MO-605506	0.00–0.50	SED	—	09-2404	—	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	—	09-2404

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.10-2
Inorganic Chemicals above BVs at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Chromium	Fluoride	Nitrate	Perchlorate	Selenium	Zinc
SED Background Value[a]				**0.83**	**0.4**	**10.5**	**na[b]**	**na**	**na**	**0.3**	**60.2**
SOIL,FILL Background Value[a]				**0.83**	**0.4**	**19.3**	**na**	**na**	**na**	**1.52**	**48.8**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**1.63**	**7.14**	**na**	**na**	**na**	**0.3**	**63.5**
CAMO-09-6496	MO-605076	0.00-0.50	SED	1.05 (U)	0.524 (U)	—[c]	0.517 (J)	1.62	—	1.08 (U)	81.5
CAMO-09-6499	MO-605077	0.00-0.50	SED	1.21 (U)	0.605 (U)	—	0.5 (J)	—	—	1.17 (U)	—
CAMO-09-6502	MO-605078	0.00-1.00	QBT4	1.19 (U)	—	18.3	0.651 (J)	0.703 (J)	—	1.2 (U)	—
CAMO-09-6512	MO-605083	0.00-0.50	SED	1.09 (U)	0.544 (U)	—	NA[d]	1.45	—	1.09 (U)	—
CAMO-09-6515	MO-605084	0.00-0.50	SED	—	0.53 (U)	—	NA	—	0.00474	1.07 (U)	—
CAMO-09-6518	MO-605085	0.00-0.50	SED	1.16 (U)	0.58 (U)	—	NA	1.31 (J-)	0.00142 (J)	1.17 (U)	—
CAMO-09-6521	MO-605086	0.00-0.50	SED	1.08 (U)	0.54 (U)	—	NA	1.38	—	1.09 (U)	—
CAMO-09-6524	MO-605087	0.00-0.50	SED	1.09 (U)	0.544 (U)	—	NA	0.725 (J)	—	1.1 (U)	—
CAMO-09-6527	MO-605088	0.00-0.50	SED	1.06 (U)	0.529 (U)	—	NA	—	0.00258	1.05 (U)	—
CAMO-09-6603	MO-605106	0.00-0.50	FILL	1.07 (U)	0.533 (U)	—	NA	1.28	0.000655 (J)	—	—
CAMO-09-6621	MO-605108	0.50-1.00	FILL	1.12 (U)	0.561 (U)	—	NA	1.46	—	—	—
CAMO-09-6626	MO-605109	0.00-0.50	FILL	1.11 (U)	0.555 (U)	—	NA	2.08	—	—	—
CAMO-09-10143	MO-605506	0.00-0.50	SED	1.09 (U)	0.547 (U)	—	NA	—	—	1.1 (U)	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] na = Not available.
[c] — = Not detected or not detected above BV.
[d] NA = Not analyzed.

Table 6.10-3
Organic Chemicals Detected at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Diethylphthalate	Fluoranthene	Fluorene
AAA2440	50-05002	0.00–0.50	SOIL	—[a]	—	NA[b]	NA	0.79	0.98	0.93	1	0.53	—	0.91	—	—	—	1.5	—
AAA2441	50-05003	0.00–0.50	SOIL	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	0.75	—
AAA2445	50-05007	0.00–0.50	SED	—	—	NA	NA	1.2	1.3	1.4	1.2	1	—	1.5	—	0.55	—	2.8	—
AAA2447	50-05009	0.00–0.50	SOIL	—	—	NA	NA	0.61	0.7	0.66	0.5	0.43	—	0.68	—	—	—	2.1	—
AAA2460	50-05041	0.00–0.50	SOIL	—	—	NA	NA	0.29 (J)	0.36	0.34 (J)	0.28 (J)	0.32 (J)	—	0.37	—	—	—	0.7	—
AAA2461	50-05042	0.00–0.50	SOIL	0.26 (J)	0.41	NA	NA	0.67	0.71	0.57	0.58	0.51	—	0.74	1.8	0.31 (J)	—	1.9	0.23 (J)
AAA2463	50-05044	0.00–0.50	SOIL	—	—	NA	NA	—	—	—	—	—	0.7 (J)	—	—	—	—	—	—
AAA2465	50-05046	0.00–0.50	SOIL	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	0.22 (J)	—
AAA2466	50-05047	0.00–0.50	SOIL	0.15 (J)	0.21 (J)	NA	NA	0.3 (J)	0.32 (J)	0.24 (J)	—	0.23 (J)	—	0.31 (J)	—	—	—	0.89	—
AAA2467	50-05048	0.00–0.50	SOIL	—	—	NA	NA	—	0.12 (J)	—	—	—	—	—	—	—	—	0.33 (J)	—
AAA2469	50-05061	0.00–0.50	SOIL	0.14 (J)	0.3 (J)	NA	NA	1.8	2.4	2.2	1.4	1.4	—	2.9	—	0.69	—	4.1	—
AAA2484	50-05085	0.00–0.50	SOIL	—	—	NA	NA	0.45	0.63	0.5	0.36 (J)	0.42	0.69 (J)	0.67	—	0.3 (J)	—	0.95	—
AAA2486	50-05087	0.00–0.50	SOIL	—	—	NA	NA	—	—	—	—	—	—	—	—	—	0.21 (J)	—	—
CAMO-09-6496	MO-605076	0.00–0.50	SED	—	0.0132 (J)	—	0.0192	0.137	0.167	0.298	0.107	—	—	0.205	—	—	—	0.296	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	—	—	—	—	0.0571	0.0543	0.111	0.0343 (J)	—	—	0.0721	—	—	—	0.112	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6512	MO-605083	0.00–0.50	SED	—	—	—	0.0072	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6515	MO-605084	0.00–0.50	SED	—	—	0.0027 (J-)	0.0024 (J-)	—	—	—	—	—	—	—	—	—	—	0.0214 (J)	—
CAMO-09-6518	MO-605085	0.00–0.50	SED	—	0.0441	—	—	0.17	0.21	0.316	0.125	0.11	—	0.215	—	—	—	0.45	—
CAMO-09-6524	MO-605087	0.00–0.50	SED	—	—	—	0.0018 (J)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	—	0.0104 (J)	—	0.038	0.083	0.0247 (J)	—	—	0.0492	—	—	—	0.0693	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	NA	NA	—	0.0181 (J)	0.0277 (J)	0.0133 (J)	—	—	0.0178 (J)	—	—	—	0.0139 (J)	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	0.011 (J)	NA	NA	0.0359 (J)	0.0414	0.0608	0.0283 (J)	—	—	0.0379	—	—	—	0.085	—
CAMO-09-10143	MO-605506	0.00–0.50	SED	—	—	—	0.0038	—	—	0.0129 (J)	—	—	—	—	—	—	—	0.0141 (J)	—

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	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-]
AAA2440	50-05002	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2441	50-05003	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2445	50-05007	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2447	50-05009	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2460	50-05041	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2461	50-05042	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2463	50-05044	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2465	50-05046	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2466	50-05047	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2467	50-05048	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2469	50-05061	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2484	50-05085	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2486	50-05087	0.00–0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6496	MO-605076	0.00–0.50	SED	0.00000718	0.0000174	—	0.00000146	—	—	—	0.00000192	—	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	0.00000626	0.0000144	0.000000746 (J)	0.00000202	—	—	—	0.000000734	—	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	—	—	—	—	—	—	—
CAMO-09-6512	MO-605083	0.00–0.50	SED	0.0000031	0.00000595	0.00000054 (J)	0.00000133	—	—	—	0.000000235	—	—
CAMO-09-6515	MO-605084	0.00–0.50	SED	0.0000124	0.000022	—	0.00000226	0.000000228 (J)	0.00000054 (J)	0.000000378 (J)	0.00000347	0.000000165 (J)	—
CAMO-09-6518	MO-605085	0.00–0.50	SED	0.00000937	0.0000222	0.00000131 (J)	0.00000341	—	0.0000004 (J)	—	0.00000259	—	—
CAMO-09-6524	MO-605087	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CAMO-09-6603	MO-605106	0.00–0.50	FILL	0.0000176	0.0000344	0.00000161 (J)	0.00000376	0.000000305 (J)	—	—	0.0000027	—	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	—	—	—	—	—	—	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	0.00000567	0.00001	0.000000987 (J)	0.00000313	—	0.000000174 (J)	—	0.000000784	0.000000203 (J)	0.000000106 (J)
CAMO-09-10143	MO-605506	0.00–0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofurans (Totals)
AAA2440	50-05002	0.00–0.50	SOIL	NA	NA	0.76	NA	NA	NA	NA	0.67	2.1	NA
AAA2441	50-05003	0.00–0.50	SOIL	NA	NA	—	NA	NA	NA	NA	0.64	0.74	NA
AAA2445	50-05007	0.00–0.50	SED	NA	NA	1.1	NA	NA	NA	NA	1	2.1	NA
AAA2447	50-05009	0.00–0.50	SOIL	NA	NA	0.55	NA	NA	NA	NA	1.8	1.8	NA
AAA2460	50-05041	0.00–0.50	SOIL	NA	NA	0.27 (J)	NA	NA	NA	NA	0.38	0.74	NA
AAA2461	50-05042	0.00–0.50	SOIL	NA	NA	0.54	NA	NA	NA	NA	1.8	2	NA
AAA2463	50-05044	0.00–0.50	SOIL	NA	NA	—	NA	NA	NA	NA	—	—	NA
AAA2465	50-05046	0.00–0.50	SOIL	NA	NA	—	NA	NA	NA	NA	—	0.28 (J)	NA
AAA2466	50-05047	0.00–0.50	SOIL	NA	NA	0.2 (J)	NA	NA	NA	NA	0.91	0.93	NA
AAA2467	50-05048	0.00–0.50	SOIL	NA	NA	—	NA	NA	NA	NA	0.28 (J)	0.32 (J)	NA
AAA2469	50-05061	0.00–0.50	SOIL	NA	NA	1.6	NA	NA	NA	NA	2.1	4.8	NA
AAA2484	50-05085	0.00–0.50	SOIL	NA	NA	0.38 (J)	NA	NA	NA	NA	0.63	1.1	NA
AAA2486	50-05087	0.00–0.50	SOIL	NA	NA	—	NA	NA	NA	NA	—	—	NA
CAMO-09-6496	MO-605076	0.00–0.50	SED	—	0.00000136	0.0889	0.0000561	0.00000256 (J)	—	0.00000125	0.116	0.309	0.000000401
CAMO-09-6499	MO-605077	0.00–0.50	SED	—	0.000000992	0.0311 (J)	0.0000498	0.00000215 (J)	—	0.00000118	0.0428	0.12	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	—	—	—	0.00000112 (J)	—	—	—	—	—	—
CAMO-09-6512	MO-605083	0.00–0.50	SED	—	0.000000327	—	0.0000224 (J)	0.0000014 (J)	—	8.84E-08	—	—	—
CAMO-09-6515	MO-605084	0.00–0.50	SED	—	0.000000506	—	0.0000938 (J)	0.0000049 (J)	—	0.000000339	0.0492	—	0.000000165
CAMO-09-6518	MO-605085	0.00–0.50	SED	—	0.00000148	0.11	0.0000652	0.00000351 (J)	—	0.000000504	0.217	0.421	0.000000185
CAMO-09-6524	MO-605087	0.00–0.50	SED	NA	NA	—	NA	NA	NA	NA	—	—	NA
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	0.000000419	0.0223 (J)	0.000244	0.00000565	—	—	—	0.0661	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	0.0000106 (J)	—	—	—	—	0.0214 (J)	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	0.00000013 (J)	0.00000176	0.0231 (J)	0.0000685 (J)	0.00000359 (J)	0.000000193 (J)	0.00000103	0.0247 (J)	0.0593 (J)	0.000000452
CAMO-09-10143	MO-605506	0.00–0.50	SED	NA	NA	—	NA	NA	NA	NA	—	—	NA

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

[a] — = Not detected.

[b] NA = Not analyzed.

Table 6.10-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Thorium-232	Tritium
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**2.33**	**0.093**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**2.33**	**na**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**2.52**	**na**
AAA2439	50-05001	0.00–0.50	SOIL	—[d]	—	—	—	—	—	0.0347594
AAA2440	50-05002	0.00–0.50	SOIL	—	—	—	—	—	—	0.0225806
AAA2441	50-05003	0.00–0.50	SOIL	—	—	—	—	0.072	—	0.157466
AAA2442	50-05004	0.00–0.50	SOIL	—	—	—	—	0.069	—	0.0682313
AAA2443	50-05005	0.00–0.50	SED	—	—	—	0.013	0.07	—	—
AAA2444	50-05006	0.00–0.50	SED	—	—	—	0.016	—	—	—
AAA2445	50-05007	0.00–0.50	SED	—	—	—	0.023	0.086	—	—
AAA2447	50-05009	0.00–0.50	SOIL	—	—	—	0.09	0.206	—	0.32346
AAA2448	50-05020	0.00–0.50	SOIL	—	—	—	0.089	0.171	—	0.0596104
AAA2449	50-05021	0.00–0.50	SOIL	—	—	—	—	—	—	0.0472197
AAA2450	50-05022	0.00–0.50	SOIL	—	—	—	—	—	—	0.0316009
AAA2452	50-05024	0.00–0.50	SED	—	—	1.5192	0.021	—	—	—
AAA2453	50-05025	0.00–0.50	SOIL	—	—	—	—	—	—	0.0420304
AAA2454	50-05026	0.00–0.50	SOIL	—	—	—	—	—	—	0.0296703
AAA2455	50-05027	0.00–0.50	SOIL	—	—	—	—	—	4.0285	0.0318646
AAA2456	50-05028	0.00–0.50	SOIL	—	—	—	—	—	—	0.0488889
AAA2457	50-05029	0.00–0.50	SOIL	—	—	—	—	—	—	0.056875
AAA2458	50-05030	0.00–0.50	SOIL	—	—	—	—	0.066	—	0.0363687
AAA2459	50-05031	0.00–0.50	SOIL	—	—	—	—	0.691	—	0.112789 (J)
AAA2460	50-05041	0.00–0.50	SOIL	—	—	—	0.025	0.055	—	0.0402769 (J)
AAA2461	50-05042	0.00–0.50	SOIL	—	—	—	—	0.456	—	0.0774208 (J)
AAA2462	50-05043	0.00–0.50	SOIL	—	—	—	0.033	0.121	—	0.0394643 (J)
AAA2463	50-05044	0.00–0.50	SOIL	—	—	—	—	0.094	—	0.0259871 (J)
AAA2464	50-05045	0.00–0.50	SOIL	—	—	—	0.033	0.791	—	0.0231447 (J)
AAA2465	50-05046	0.00–0.50	SOIL	—	—	—	—	—	—	0.0289474 (J)
AAA2466	50-05047	0.00–0.50	SOIL	—	—	—	—	0.285	—	0.0423118 (J)
AAA2467	50-05048	0.00–0.50	SOIL	—	—	—	0.127	0.744	—	—
AAA2468	50-05060	0.00–0.50	SOIL	—	—	—	—	—	—	0.0259871 (J)
AAA2469	50-05061	0.00–0.50	SOIL	—	—	—	0.052	1.606	—	0.0546978 (J)
AAA2470	50-05062	0.00–0.50	SOIL	—	—	—	—	0.097 (J)	—	—

Table 6.10-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Thorium-232	Tritium
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**2.33**	**0.093**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**2.33**	**na**
QBT4 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**2.52**	**na**
AAA2471	50-05063	0.00–0.50	FILL	—	—	—	—	—	—	0.00877301
AAA2472	50-05064	0.00–0.50	SED	—	—	—	—	0.124 (J)	—	0.249653
AAA2473	50-05065	0.00–0.50	SED	—	—	—	0.039	0.979	—	—
AAA2474	50-05066	0.00–0.50	SED	—	—	—	0.017	0.251 (J)	—	—
AAA2475	50-05067	0.00–0.50	SOIL	—	—	—	—	—	—	0.0359124
AAA2476	50-05068	0.00–0.50	SOIL	—	—	—	0.028	0.763	—	0.0289474
AAA2477	50-05069	0.00–0.50	SOIL	—	—	—	—	0.13 (J)	—	0.039106
AAA2478	50-05070	0.00–0.50	SOIL	—	—	—	—	0.316 (J)	—	0.047046 (J)
AAA2479	50-05080	0.00–0.50	SOIL	—	—	—	—	—	—	0.0531818 (J)
AAA2480	50-05081	0.00–0.50	SOIL	—	—	—	—	—	—	0.0357386 (J)
AAA2481	50-05082	0.00–0.50	SOIL	—	—	—	—	0.162 (J)	—	0.0750342 (J)
AAA2482	50-05083	0.00–0.50	SOIL	—	—	—	—	0.187 (J)	—	0.0498244 (J)
AAA2483	50-05084	0.00–0.50	SOIL	—	—	—	—	0.076 (J)	—	0.0626786 (J)
AAA2484	50-05085	0.00–0.50	SOIL	—	—	—	—	—	—	0.112065 (J)
AAA2485	50-05086	0.00–0.50	SOIL	—	—	—	—	1.395 (J)	—	0.053341 (J)
AAA2486	50-05087	0.00–0.50	SOIL	—	—	—	—	0.435 (J)	—	0.0662005 (J)
AAA2487	50-05088	0.00–0.50	SOIL	—	—	—	—	—	—	0.0889282 (J)
AAA2488	50-05089	0.00–0.50	SOIL	—	—	—	—	—	—	0.0519774 (J)
AAA2489	50-05090	0.00–0.50	SOIL	—	—	—	—	0.126 (J)	—	0.109869 (J)
CAMO-09-6496	MO-605076	0.00–0.50	SED	0.0719	—	—	—	0.929 (J-)	NA[e]	—
CAMO-09-6499	MO-605077	0.00–0.50	SED	0.108	—	—	0.0458	0.428	NA	—
CAMO-09-6502	MO-605078	0.00–1.00	QBT4	0.0832	0.12	—	1.27	0.213	NA	—
CAMO-09-6518	MO-605085	0.00–0.50	SED	10	4.16	—	2.7	14.8	NA	—
CAMO-09-6603	MO-605106	0.00–0.50	FILL	—	—	—	0.0525	1.25	NA	—
CAMO-09-6621	MO-605108	0.50–1.00	FILL	—	—	—	—	0.136	NA	—
CAMO-09-6626	MO-605109	0.00–0.50	FILL	—	—	—	0.0254	0.176	NA	0.0407411

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

[e] NA = Not analyzed.

Table 6.11-1
Samples Collected and Analyses Requested at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2492	50-06000	0.00–0.50	SED	—*	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2493	50-06001	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	14813	—	14818	14813	—	—
AAA2494	50-06002	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	—	—	14818	—	—	—
AAA2750	50-06002	1.50–2.50	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2752	50-06002	3.00–4.00	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2495	50-06003	0.00–0.50	SOIL	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2496	50-06004	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2497	50-06005	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2753	50-06005	3.00–4.00	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2498	50-06006	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	14813	—	14818	—	—	—
AAA2499	50-06007	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	14813	—	14818	14813	—	—
AAA2749	50-06007	1.50–2.50	SED	—	—	14818	14818	14818	14818	—	14813	—	14818	14813	—	—
AAA2500	50-06008	0.00–0.50	SED	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2748	50-06008	1.50–2.50	SOIL	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2751	50-06008	3.00–4.00	SOIL	—	—	14818	14818	14818	14818	—	—	—	14818	14813	—	—
AAA2501	50-06009	0.00–0.50	SOIL	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2739	50-06009	3.00–4.00	SOIL	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2502	50-06010	0.00–0.50	SED	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2503	50-06011	0.00–0.50	SOIL	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2504	50-06012	0.00–0.50	SOIL	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2743	50-06012	1.50–2.50	SOIL	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2505	50-06013	0.00–0.50	SED	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2506	50-06014	0.00–0.50	SED	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2725	50-06014	1.50–2.50	SED	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2507	50-06015	0.00–0.50	SOIL	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2747	50-06015	3.00–4.00	SOIL	—	—	14797	14797	14797	14797	—	—	—	14797	14788	—	—
AAA2508	50-06016	0.00–0.50	SED	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2744	50-06016	1.50–2.50	SED	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2509	50-06017	0.00–0.50	SOIL	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2735	50-06017	3.00–4.00	SOIL	—	—	14797	14797	14797	14797	—	14788	—	14797	14788	—	—
AAA2510	50-06018	0.00–0.50	SED	—	—	14763	14763	14763	14763	—	14762	—	14763	14762	—	—
AAA2728	50-06018	1.50–2.50	SED	—	—	14763	14763	14763	14763	—	14762	—	14763	14762	—	—
AAA2736	50-06018	3.00–4.00	SED	—	—	14763	14763	14763	14763	—	14762	—	14763	14762	—	—
AAA2511	50-06019	0.00–0.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
AAA2726	50-06019	1.50–2.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2733	50-06019	3.00–4.00	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2512	50-06020	0.00–0.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2732	50-06020	1.50–2.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2740	50-06020	3.00–4.00	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2513	50-06021	0.00–0.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2727	50-06021	1.50–2.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2738	50-06021	3.00–4.00	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2514	50-06022	0.00–0.50	SED	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2731	50-06022	1.50–2.50	SED	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2741	50-06022	3.00–4.00	SED	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2515	50-06023	0.00–0.50	SOIL	—	—	14763	14763	14763	14763	—	14762	—	14763	14762	—	—
AAA2729	50-06023	1.50–2.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2734	50-06023	3.00–4.00	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2516	50-06024	0.00–0.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2724	50-06024	1.50–2.50	SOIL	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
AAA2517	50-06025	0.00–0.50	SED	—	—	14763	14763	14763	14763	—	14762	—	14763	14762	—	—
AAA2518	50-06026	0.00–0.50	SED	—	—	14763	14763	14763	14763	—	—	—	14763	14762	—	—
CAMO-09-6512	MO-605083	0.00–0.50	SED	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6513	MO-605083	0.50–1.50	QBT2	09-2397	09-2395	09-2398	09-2398	09-2398	09-2398	09-2397	09-2396	09-2397	09-2398	09-2396	09-2396	09-2397
CAMO-09-6514	MO-605083	5.50–7.00	QBT2	09-2397	09-2395	09-2398	09-2398	09-2398	09-2398	09-2397	09-2396	09-2397	09-2398	09-2396	09-2396	09-2397
CAMO-09-6515	MO-605084	0.00–0.50	SED	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6516	MO-605084	1.50–2.50	QBT2	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	09-2372	09-2373
CAMO-09-6517	MO-605084	6.50–7.50	QBT2	09-2373	09-2371	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	09-2372	09-2373
CAMO-09-6518	MO-605085	0.00–0.50	SED	09-2500	09-2503	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	—	09-2500
CAMO-09-6519	MO-605085	1.50–2.50	QBT2	09-2500	09-2503	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	09-2499	09-2500
CAMO-09-6521	MO-605086	0.00–0.50	SED	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6522	MO-605086	1.00–2.00	QBT2	09-2397	—	09-2398	09-2398	09-2398	09-2398	09-2397	09-2396	09-2397	09-2398	09-2396	09-2396	09-2397
CAMO-09-6523	MO-605086	6.00–7.00	QBT2	09-2397	—	09-2398	09-2398	09-2398	09-2398	09-2397	09-2396	09-2397	09-2398	09-2396	09-2396	09-2397
CAMO-09-6524	MO-605087	0.00–0.50	SED	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	—	09-2373
CAMO-09-6525	MO-605087	0.50–1.50	QBT2	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	09-2372	09-2373
CAMO-09-6526	MO-605087	5.50–6.50	QBT2	09-2373	—	09-2374	09-2374	09-2374	09-2374	09-2373	09-2372	09-2373	09-2374	09-2372	09-2372	09-2373
CAMO-09-6527	MO-605088	0.00–0.50	SED	09-2500	—	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	—	09-2500
CAMO-09-6528	MO-605088	1.50–2.50	QBT2	09-2500	—	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	09-2499	09-2500
CAMO-09-6529	MO-605088	3.50–4.00	QBT2	09-2500	—	09-2501	09-2501	09-2501	09-2501	09-2500	09-2499	09-2500	09-2501	09-2499	09-2499	09-2500

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Anions	Dioxins/Furans	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Total Cyanide
CAMO-09-9947	MO-605459	2.00–3.00	FILL	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	09-2270	09-2268	09-2271	09-2271	09-2271	09-2271	09-2270	—	09-2270	—	09-2269	09-2269	09-2270
CAMO-09-10137	MO-605503	9.00–10.00	QBT3	09-2348	09-2346	09-2349	09-2349	09-2349	09-2349	09-2348	09-2347	09-2348	09-2349	09-2347	09-2347	09-2348
CAMO-09-10138	MO-605503	14.00–15.00	QBT3	09-2348	09-2346	09-2349	09-2349	09-2349	09-2349	09-2348	09-2347	09-2348	09-2349	09-2347	09-2347	09-2348
CAMO-09-10139	MO-605504	9.00–10.00	QBT3	09-2348	09-2346	09-2349	09-2349	09-2349	09-2349	09-2348	09-2347	09-2348	09-2349	09-2347	09-2347	09-2348
CAMO-09-10140	MO-605504	14.00–15.00	QBT3	09-2348	09-2346	09-2349	09-2349	09-2349	09-2349	09-2348	09-2347	09-2348	09-2349	09-2347	09-2347	09-2348
CAMO-09-10141	MO-605505	9.00–10.00	QBT3	09-2404	09-2402	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	09-2403	09-2404
CAMO-09-10142	MO-605505	14.00–15.00	QBT3	09-2404	09-2402	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	09-2403	09-2404
CAMO-09-10143	MO-605506	0.00–0.50	SED	09-2404	—	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	—	09-2404
CAMO-09-10144	MO-605506	5.50–6.50	QBT3	09-2404	—	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	09-2403	09-2404
CAMO-09-10145	MO-605507	9.00–10.00	QBT3	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424
CAMO-09-10146	MO-605507	14.00–15.00	QBT3	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424
CAMO-09-10147	MO-605508	8.50–9.50	QBT3	09-2369	—	09-2370	09-2370	09-2370	09-2370	09-2369	09-2368	09-2369	09-2370	09-2368	09-2368	09-2369
CAMO-09-10148	MO-605508	13.50–15.00	QBT3	09-2369	—	09-2370	09-2370	09-2370	09-2370	09-2369	09-2368	09-2369	09-2370	09-2368	09-2368	09-2369
CAMO-09-10149	MO-605509	8.00–9.00	QBT3	09-2369	—	09-2370	09-2370	09-2370	09-2370	09-2369	09-2368	09-2369	09-2370	09-2368	09-2368	09-2369
CAMO-09-10150	MO-605509	13.00–14.00	QBT3	09-2369	—	09-2370	09-2370	09-2370	09-2370	09-2369	09-2368	09-2369	09-2370	09-2368	09-2368	09-2369
CAMO-09-10153	MO-605511	9.00–10.00	QBT3	09-2404	—	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	09-2403	09-2404
CAMO-09-10154	MO-605511	14.00–15.00	QBT3	09-2404	—	09-2405	09-2405	09-2405	09-2405	09-2404	09-2403	09-2404	09-2405	09-2403	09-2403	09-2404
CAMO-09-10155	MO-605512	8.00–9.00	QBT3	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424
CAMO-09-10156	MO-605512	13.00–14.00	QBT3	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424
CAMO-09-10157	MO-605513	8.00–10.00	FILL	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424
CAMO-09-10158	MO-605513	13.00–14.00	QBT3	09-2424	—	09-2425	09-2425	09-2425	09-2425	09-2424	09-2423	09-2424	09-2425	09-2423	09-2423	09-2424

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.11-2
Inorganic Chemicals above BVs at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Mercury	Nitrate	Perchlorate	Selenium
SED Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**0.1**	**na[b]**	**na**	**0.3**
SOIL,FILL Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**na**	**na**	**1.52**
QBT2,QBT3,QBT4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**0.1**	**na**	**na**	**0.3**
CAMO-09-6512	MO-605083	0.00–0.50	SED	1.09 (U)	—[c]	0.544 (U)	—	—	—	—	—	—	1.45	—	1.09 (U)
CAMO-09-6513	MO-605083	0.50–1.50	QBT2	1.14 (U)	—	—	—	—	—	—	—	—	1.62 (J-)	—	1.09 (U)
CAMO-09-6514	MO-605083	5.50–7.00	QBT2	1.04 (U)	—	—	—	—	—	—	—	—	—	—	1.06 (U)
CAMO-09-6515	MO-605084	0.00–0.50	SED	—	—	0.53 (U)	—	—	—	—	—	—	—	0.00474	1.07 (U)
CAMO-09-6516	MO-605084	1.50–2.50	QBT2	1.04 (U)	—	—	—	—	—	—	—	—	—	0.00855	0.994 (U)
CAMO-09-6517	MO-605084	6.50–7.50	QBT2	1.01 (U)	—	—	—	—	—	—	—	—	—	—	0.991 (U)
CAMO-09-6518	MO-605085	0.00–0.50	SED	1.16 (U)	—	0.58 (U)	—	—	—	—	—	—	1.31 (J-)	0.00142 (J)	1.17 (U)
CAMO-09-6519	MO-605085	1.50–2.50	QBT2	1.26 (U)	—	—	—	14.5	—	10.6	—	0.127 (J)	42 (J-)	0.895	1.26 (U)
CAMO-09-6521	MO-605086	0.00–0.50	SED	1.08 (U)	—	0.54 (U)	—	—	—	—	—	—	1.38	—	1.09 (U)
CAMO-09-6522	MO-605086	1.00–2.00	QBT2	1.06 (U)	—	—	—	—	—	—	—	—	1.3 (J-)	—	1.09 (U)
CAMO-09-6523	MO-605086	6.00–7.00	QBT2	1.05 (U)	—	—	—	—	—	—	—	—	—	—	0.616 (J)
CAMO-09-6524	MO-605087	0.00–0.50	SED	1.09 (U)	—	0.544 (U)	—	—	—	—	—	—	0.725 (J)	—	1.1 (U)
CAMO-09-6525	MO-605087	0.50–1.50	QBT2	1.02 (U)	—	—	—	9.47	—	—	—	—	0.512 (J)	0.000766 (J)	1.02 (U)
CAMO-09-6526	MO-605087	5.50–6.50	QBT2	1.02 (U)	—	—	—	—	—	—	—	—	—	0.00164 (J)	1.02 (U)
CAMO-09-6527	MO-605088	0.00–0.50	SED	1.06 (U)	—	0.529 (U)	—	—	—	—	—	—	—	0.00258	1.05 (U)
CAMO-09-6528	MO-605088	1.50–2.50	QBT2	—	87.4	—	4220 (J-)	14.6	3.3	11.2	11.5	—	—	0.472	1.05 (U)
CAMO-09-6529	MO-605088	3.50–4.00	QBT2	1.03 (U)	46.4	—	6650 (J-)	8.89	—	16.1	—	—	—	0.607	1.03 (U)
CAMO-09-9947	MO-605459	2.00–3.00	FILL	1.06 (UJ)	—	0.531 (U)	—	—	—	—	—	—	4.14 (J-)	—	—
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	—	—	—	—	—	—	—	—	—	5.67 (J-)	—	1.05 (U)
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	1.06 (UJ)	—	—	—	—	—	—	—	—	6.52 (J-)	—	1.03 (U)
CAMO-09-10137	MO-605503	9.00–10.00	QBT3	1.02 (U)	—	—	—	—	—	—	—	—	—	0.000827 (J)	1.02 (U)
CAMO-09-10138	MO-605503	14.00–15.00	QBT3	1.01 (U)	—	—	—	—	—	—	—	—	—	—	1.02 (U)
CAMO-09-10139	MO-605504	9.00–10.00	QBT3	1.03 (U)	—	—	—	—	—	—	—	—	0.536 (J)	—	1.05 (U)
CAMO-09-10140	MO-605504	14.00–15.00	QBT3	1.03 (U)	—	—	—	—	—	—	—	—	1.08	—	1.02 (U)
CAMO-09-10141	MO-605505	9.00–10.00	QBT3	1.05 (U)	—	—	—	—	—	—	—	—	—	—	1.02 (U)
CAMO-09-10142	MO-605505	14.00–15.00	QBT3	1.06 (U)	—	—	—	—	—	—	—	—	—	—	1.05 (U)
CAMO-09-10143	MO-605506	0.00–0.50	SED	1.09 (U)	—	0.547 (U)	—	—	—	—	—	—	—	—	1.1 (U)
CAMO-09-10144	MO-605506	5.50–6.50	QBT3	0.991 (U)	—	—	—	16	—	—	—	—	—	0.000578 (J)	1 (U)
CAMO-09-10145	MO-605507	9.00–10.00	QBT3	1.04 (U)	—	—	—	—	—	—	—	—	—	—	1.02 (U)
CAMO-09-10146	MO-605507	14.00–15.00	QBT3	1.03 (U)	—	—	—	—	—	—	—	—	—	—	1.05 (U)
CAMO-09-10147	MO-605508	8.50–9.50	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.07 (U)
CAMO-09-10148	MO-605508	13.50–15.00	QBT3	1.06 (U)	—	—	—	—	—	—	—	—	—	—	1.06 (U)

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Mercury	Nitrate	Perchlorate	Selenium
SED Background Value				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**0.1**	**na**	**na**	**0.3**
SOIL,FILL Background Value				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**0.1**	**na**	**na**	**1.52**
QBT2,QBT3,QBT4 Background Value				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**0.1**	**na**	**na**	**0.3**
CAMO-09-10149	MO-605509	8.00–9.00	QBT3	1.07 (U)	—	—	—	—	—	—	—	—	—	0.000568 (J)	1.05 (U)
CAMO-09-10150	MO-605509	13.00–14.00	QBT3	1.09 (U)	—	—	—	—	—	—	—	—	—	—	1.09 (U)
CAMO-09-10153	MO-605511	9.00–10.00	QBT3	1.05 (U)	—	—	—	—	—	—	—	—	—	—	1.06 (U)
CAMO-09-10154	MO-605511	14.00–15.00	QBT3	1.45 (U)	—	—	—	—	—	—	—	—	—	—	1.44 (U)
CAMO-09-10155	MO-605512	8.00–9.00	QBT3	1.05 (U)	—	—	—	—	—	—	—	—	2.7	—	1.06 (U)
CAMO-09-10156	MO-605512	13.00–14.00	QBT3	1.09 (U)	—	—	—	—	—	—	—	—	2.27	—	1.08 (U)
CAMO-09-10157	MO-605513	8.00–10.00	FILL	1.1 (U)	—	0.548 (U)	—	—	—	—	26.8	—	8.63	—	—
CAMO-09-10158	MO-605513	13.00–14.00	QBT3	1.1 (U)	—	—	—	—	—	—	—	—	8.12	—	1.13 (U)

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

[a] BVs are from LANL 1998, 059730.

[b] na = Not available.

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

Table 6.11-3
Organic Chemicals Detected at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	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	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
AAA2753	50-06005	3.00-4.00	SED	NA[a]	—[b]	NA	NA	NA	—	—	—	—	—	5.7	—	—	—	NA	NA	NA
AAA2498	50-06006	0.00-0.50	SED	NA	NA	—	—	0.021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2503	50-06011	0.00-0.50	SOIL	NA	—	—	—	0.053	—	—	—	—	—	—	—	—	—	NA	NA	NA
AAA2509	50-06017	0.00-0.50	SOIL	NA	—	—	—	0.02	—	—	—	—	—	—	—	—	—	NA	NA	NA
AAA2736	50-06018	3.00-4.00	SED	NA	—	—	—	—	—	—	—	—	—	0.061 (J)	—	—	—	NA	NA	NA
AAA2740	50-06020	3.00-4.00	SOIL	NA	—	NA	NA	NA	—	—	—	—	—	0.21 (J)	—	—	—	NA	NA	NA
AAA2513	50-06021	0.00-0.50	SOIL	NA	—	NA	NA	NA	—	—	—	—	—	0.039 (J)	—	—	—	NA	NA	NA
AAA2731	50-06022	1.50-2.50	SED	NA	—	NA	NA	NA	—	—	—	—	—	0.044 (J)	—	—	—	NA	NA	NA
AAA2741	50-06022	3.00-4.00	SED	NA	—	NA	NA	NA	—	—	—	—	—	—	0.046 (J)	—	—	NA	NA	NA
AAA2515	50-06023	0.00-0.50	SOIL	NA	—	—	—	—	0.12 (J)	0.12 (J)	0.16 (J)	—	—	0.083 (J)	—	0.18 (J)	0.17 (J)	NA	NA	NA
AAA2729	50-06023	1.50-2.50	SOIL	NA	—	NA	NA	NA	0.058 (J)	0.06 (J)	0.077 (J)	—	—	0.053 (J)	0.041 (J)	0.076 (J)	0.13 (J)	NA	NA	NA
AAA2724	50-06024	1.50-2.50	SOIL	NA	—	NA	NA	NA	—	—	—	—	—	0.13 (J)	—	—	—	NA	NA	NA
AAA2518	50-06026	0.00-0.50	SED	NA	—	NA	NA	NA	—	—	—	—	—	0.17 (J)	—	—	—	NA	NA	NA
CAMO-09-6512	MO-605083	0.00-0.50	SED	NA	—	—	—	0.0072	—	—	—	—	—	—	—	—	—	0.0000031	0.00000595	0.00000054 (J)
CAMO-09-6513	MO-605083	0.50-1.50	QBT2	—	—	—	—	0.0149	—	—	—	—	—	—	—	—	—	0.000000938 (J)	0.00000234	—
CAMO-09-6514	MO-605083	5.50-7.00	QBT2	—	—	—	—	0.0159	—	—	—	—	—	—	—	—	—	0.000000895 (J)	0.00000281	—
CAMO-09-6515	MO-605084	0.00-0.50	SED	NA	—	—	0.0027 (J-)	0.0024 (J-)	—	—	—	—	—	—	—	—	0.0214 (J)	0.0000124	0.000022	—
CAMO-09-6516	MO-605084	1.50-2.50	QBT2	0.0152	—	—	0.0019 (J)	0.0016 (J)	—	—	—	—	—	—	—	—	—	0.000000827 (J)	0.00000191	0.000000235 (J)
CAMO-09-6517	MO-605084	6.50-7.50	QBT2	—	—	—	0.0015 (J)	0.0013 (J-)	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6518	MO-605085	0.00-0.50	SED	NA	0.0441	—	—	—	0.17	0.21	0.316	0.125	0.11	—	—	0.215	0.45	0.00000937	0.0000222	0.00000131 (J)
CAMO-09-6519	MO-605085	1.50-2.50	QBT2	0.0202	—	—	0.0119	0.0079	—	—	—	—	—	—	—	—	—	0.00000569	0.000011	0.000000849 (J)
CAMO-09-6524	MO-605087	0.00-0.50	SED	NA	—	—	—	0.0018 (J)	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-6528	MO-605088	1.50-2.50	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0153 (J)	NA	NA	NA
CAMO-09-6529	MO-605088	3.50-4.00	QBT2	—	—	—	0.0047	0.0039	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-9947	MO-605459	2.00-3.00	FILL	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	0.00000243 (J)	0.00000544	0.000000638 (J)
CAMO-09-9949	MO-605459	8.00-9.00	QBT3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	0.000000111	—
CAMO-09-10137	MO-605503	9.00-10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10138	MO-605503	14.00-15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
CAMO-09-10140	MO-605504	14.00-15.00	QBT3	—	—	0.0066	0.0029 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10141	MO-605505	9.00-10.00	QBT3	0.00242 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10143	MO-605506	0.00-0.50	SED	NA	—	—	—	0.0038	—	—	0.0129 (J)	—	—	—	—	—	0.0141 (J)	NA	NA	NA
CAMO-09-10149	MO-605509	8.00-9.00	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-10153	MO-605511	9.00-10.00	QBT3	0.00182 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-10154	MO-605511	14.00-15.00	QBT3	0.00285 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	NA
CAMO-09-10157	MO-605513	8.00-10.00	FILL	—	—	—	0.169	0.204	—	—	0.0119 (J)	—	—	—	—	—	0.0162 (J)	NA	NA	NA

Table 6.11-3 (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[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]
AAA2753	50-06005	3.00-4.00	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2498	50-06006	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2503	50-06011	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2509	50-06017	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2736	50-06018	3.00-4.00	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2740	50-06020	3.00-4.00	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2513	50-06021	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2731	50-06022	1.50-2.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2741	50-06022	3.00-4.00	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2515	50-06023	0.00-0.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2729	50-06023	1.50-2.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2724	50-06024	1.50-2.50	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
AAA2518	50-06026	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
CAMO-09-6512	MO-605083	0.00-0.50	SED	—	0.00000133	—	—	—	0.000000235	—	—	0.000000327	—	NA
CAMO-09-6513	MO-605083	0.50-1.50	QBT2	—	0.000000341	—	—	—	—	—	—	—	—	—
CAMO-09-6514	MO-605083	5.50-7.00	QBT2	—	0.000000383	—	—	—	—	—	—	—	—	—
CAMO-09-6515	MO-605084	0.00-0.50	SED	—	0.00000226	0.000000228 (J)	0.00000054 (J)	0.000000378 (J)	0.00000347	0.000000165 (J)	—	0.000000506	—	NA
CAMO-09-6516	MO-605084	1.50-2.50	QBT2	—	0.00000045	—	—	—	—	—	—	0.000000217	—	0.0405
CAMO-09-6517	MO-605084	6.50-7.50	QBT2	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-6518	MO-605085	0.00-0.50	SED	—	0.00000341	—	0.0000004 (J)	—	0.00000259	—	—	0.00000148	0.11	NA
CAMO-09-6519	MO-605085	1.50-2.50	QBT2	—	0.00000258	—	0.00000047 (J)	—	0.00000126	—	—	0.00000115	—	0.135
CAMO-09-6524	MO-605087	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
CAMO-09-6528	MO-605088	1.50-2.50	QBT2	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-6529	MO-605088	3.50-4.00	QBT2	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-9947	MO-605459	2.00-3.00	FILL	0.000000236 (J)	0.00000198	—	—	—	0.000000269	—	0.000000104 (J)	0.000000506	—	—
CAMO-09-9949	MO-605459	8.00-9.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10137	MO-605503	9.00-10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10138	MO-605503	14.00-15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10140	MO-605504	14.00-15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—

Table 6.11-3 (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[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]
CAMO-09-10141	MO-605505	9.00-10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10143	MO-605506	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA
CAMO-09-10149	MO-605509	8.00-9.00	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-10153	MO-605511	9.00-10.00	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-10154	MO-605511	14.00-15.00	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—
CAMO-09-10157	MO-605513	8.00-10.00	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Toluene	Xylene[1,3-]+Xylene[1,4-]
AAA2753	50-06005	3.00-4.00	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2498	50-06006	0.00-0.50	SED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AAA2503	50-06011	0.00-0.50	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2509	50-06017	0.00-0.50	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2736	50-06018	3.00-4.00	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2740	50-06020	3.00-4.00	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2513	50-06021	0.00-0.50	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2731	50-06022	1.50-2.50	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2741	50-06022	3.00-4.00	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2515	50-06023	0.00-0.50	SOIL	NA	NA	NA	NA	NA	0.05 (J)	0.18 (J)	NA	NA	NA	NA
AAA2729	50-06023	1.50-2.50	SOIL	NA	NA	NA	NA	NA	0.13 (J)	0.11 (J)	NA	NA	NA	NA
AAA2724	50-06024	1.50-2.50	SOIL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
AAA2518	50-06026	0.00-0.50	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6512	MO-605083	0.00-0.50	SED	0.0000224 (J)	0.0000014 (J)	—	—	8.84E-08	—	—	—	—	NA	NA
CAMO-09-6513	MO-605083	0.50-1.50	QBT2	0.0000057	0.00000105 (J)	—	—	—	—	—	—	—	—	—
CAMO-09-6514	MO-605083	5.50-7.00	QBT2	0.00000733	—	—	—	—	—	—	—	—	—	—
CAMO-09-6515	MO-605084	0.00-0.50	SED	0.0000938 (J)	0.0000049 (J)	—	—	0.000000339	0.0492	—	—	0.000000165	NA	NA
CAMO-09-6516	MO-605084	1.50-2.50	QBT2	0.00000622 (J)	—	8.95E-08	—	—	—	—	0.000000939	0.000000111	0.0048	—
CAMO-09-6517	MO-605084	6.50-7.50	QBT2	0.000000348 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-6518	MO-605085	0.00-0.50	SED	0.0000652	0.00000351 (J)	—	—	0.000000504	0.217	0.421	—	0.000000185	NA	NA
CAMO-09-6519	MO-605085	1.50-2.50	QBT2	0.0000409	0.00000198 (J)	—	—	0.000000518	—	—	—	0.00000118	0.00314	—
CAMO-09-6524	MO-605087	0.00-0.50	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-6528	MO-605088	1.50-2.50	QBT2	NA	NA	NA	NA	NA	—	0.0152 (J)	NA	NA	—	—
CAMO-09-6529	MO-605088	3.50-4.00	QBT2	NA	NA	NA	NA	NA	—	—	NA	NA	—	—
CAMO-09-9947	MO-605459	2.00-3.00	FILL	0.000023 (J)	0.00000245 (J)	—	0.000000247 (J)	0.00000109	—	—	—	0.000000406	—	—
CAMO-09-9949	MO-605459	8.00-9.00	QBT3	0.000000379 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-10137	MO-605503	9.00-10.00	QBT3	0.000000523 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-10138	MO-605503	14.00-15.00	QBT3	0.000000501 (J)	—	—	—	—	—	—	—	—	—	—
CAMO-09-10140	MO-605504	14.00-15.00	QBT3	—	—	—	—	—	—	—	—	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofurans (Totals)	Toluene	Xylene[1,3-]+Xylene[1,4-]
CAMO-09-10141	MO-605505	9.00-10.00	QBT3	—	—	—	—	—	—	—	—	—	—	—
CAMO-09-10143	MO-605506	0.00-0.50	SED	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA
CAMO-09-10149	MO-605509	8.00-9.00	QBT3	NA	NA	NA	NA	NA	—	0.0135 (J)	NA	NA	—	—
CAMO-09-10153	MO-605511	9.00-10.00	QBT3	NA	NA	NA	NA	NA	—	—	NA	NA	—	—
CAMO-09-10154	MO-605511	14.00-15.00	QBT3	NA	NA	NA	NA	NA	—	—	NA	NA	—	—
CAMO-09-10157	MO-605513	8.00-10.00	FILL	NA	NA	NA	NA	NA	—	—	NA	NA	0.000527 (J)	0.000345 (J)

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

[a] NA = Not analyzed.

[b] — = Not detected.

Table 6.11-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 50-006(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT2,QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA2492	50-06000	0.00–0.50	SED	7.22	3.48	—[d]	1.96	4.803	—	—	4.54412	—	—	—
AAA2493	50-06001	0.00–0.50	SED	14.33	5.71	1.82	4.414	11.681	—	—	60.1452	—	—	—
AAA2494	50-06002	0.00–0.50	SED	—	5.44	0.93	1.913	3.971	1.83 (J-)	—	4.86053	—	—	—
AAA2750	50-06002	1.50–2.50	SED	71.003	67.27	—	12.421 (J-)	47.816 (J-)	18.3 (J-)	—	29.0266	—	—	—
AAA2752	50-06002	3.00–4.00	SED	18.57	187.49	—	13.804 (J-)	20.667 (J-)	8.43 (J-)	4.13	55.1652	3.056	—	—
AAA2495	50-06003	0.00–0.50	SOIL	—	2.96	—	0.078	0.444	—	—	0.130732	5.022	0.315	6.068
AAA2496	50-06004	0.00–0.50	SED	—	—	—	—	—	—	—	0.24878	—	—	—
AAA2753	50-06005	3.00–4.00	SED	—	—	—	—	—	—	—	0.15045	—	—	—
AAA2498	50-06006	0.00–0.50	SED	16.53	19.13	1.47	3.084	13.231	—	—	0.841396	—	—	—
AAA2499	50-06007	0.00–0.50	SED	9.24	13.25	2.66	2.855	11.014	—	—	98.2163	—	—	—
AAA2749	50-06007	1.50–2.50	SED	18.03	29.37	5.22	6.666	19.235	—	—	105.024	—	—	—
AAA2500	50-06008	0.00–0.50	SED	—	3.56	—	0.597	0.802	1.38 (J-)	—	0.614441	3.556	—	4.189
AAA2748	50-06008	1.50–2.50	SOIL	—	—	—	—	—	—	—	0.195789	—	—	—
AAA2751	50-06008	3.00–4.00	SOIL	—	—	—	0.354	0.308	2.48 (J-)	—	19.6619	—	—	—
AAA2501	50-06009	0.00–0.50	SOIL	—	4.76	—	0.24	0.927	—	—	0.5675	5.608	0.258	7.125
AAA2739	50-06009	3.00–4.00	SOIL	—	—	—	0.026	—	—	—	0.139449	—	—	—
AAA2502	50-06010	0.00–0.50	SED	—	77.9	2.7	4.093	10.43	1.49 (J-)	—	2.30942	—	—	—
AAA2503	50-06011	0.00–0.50	SOIL	—	11.7	—	0.865	1.519	—	—	0.638798	3.918	—	5.086
AAA2504	50-06012	0.00–0.50	SOIL	—	—	0.93	0.668	1.375	—	—	0.274141	—	—	—
AAA2743	50-06012	1.50–2.50	SOIL	—	18.6	0.76	0.337	0.904	0.94 (J-)	—	0.405655	—	—	—
AAA2505	50-06013	0.00–0.50	SED	24.2	—	2.24	3.669	19.732	1.17 (J-)	—	10.1544	—	—	—
AAA2725	50-06014	1.50–2.50	SED	—	—	—	0.014	—	—	—	—	—	—	—
AAA2507	50-06015	0.00–0.50	SOIL	—	7.58	—	0.439	1.252	5.14 (J-)	—	1.12062	5.48	0.243	6.785
AAA2747	50-06015	3.00–4.00	SOIL	—	3.43	—	0.236	0.166	—	—	0.322532	—	—	—
AAA2508	50-06016	0.00–0.50	SED	6.64	28.3	1.98	2.727	5.106	—	—	10.7807	—	—	—
AAA2744	50-06016	1.50–2.50	SED	—	32.3	3.01	2.401	3.947	2.33 (J-)	—	15.4203	—	—	—
AAA2509	50-06017	0.00–0.50	SOIL	—	2.89	—	0.05	0.311	1.48 (J-)	3.22	0.685947	3.79	—	4.48
AAA2735	50-06017	3.00–4.00	SOIL	—	—	—	—	0.021	—	—	1.32579	—	—	—
AAA2510	50-06018	0.00–0.50	SED	19.081	31.563	3.2158	4.186	16.134	1.71 (J-)	—	30.363	—	—	—
AAA2728	50-06018	1.50–2.50	SED	18.257	34.082	2.0415	2.793	15.596	1.87 (J-)	—	31.5869	—	—	—
AAA2736	50-06018	3.00–4.00	SED	10.531	37.286	—	3.096	7.339	3.1 (J-)	—	31.9323	—	—	—

Table 6.11-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT2,QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
AAA2511	50-06019	0.00–0.50	SOIL	—	—	—	0.03	0.155	—	3.0139	0.226402	—	—	—
AAA2726	50-06019	1.50–2.50	SOIL	—	1.0177	—	0.185	0.512	—	—	6.76928	—	—	—
AAA2733	50-06019	3.00–4.00	SOIL	—	—	—	0.031	0.064	—	3.103	11.8875	—	—	—
AAA2512	50-06020	0.00–0.50	SOIL	—	—	—	—	0.154	1.37 (J-)	—	0.383333	2.991	—	3.254
AAA2732	50-06020	1.50–2.50	SOIL	—	—	—	—	0.157	—	—	0.426308	—	—	—
AAA2740	50-06020	3.00–4.00	SOIL	—	—	—	—	0.025	—	—	0.890964	—	—	—
AAA2513	50-06021	0.00–0.50	SOIL	18.221	67.685	2.4397	5.909	17.555	3.01 (J-)	—	0.608994	—	—	—
AAA2727	50-06021	1.50–2.50	SOIL	—	203.02	—	8.522	4.294	4.44 (J-)	—	0.451745	—	—	—
AAA2738	50-06021	3.00–4.00	SOIL	—	113.99	—	9.513	6.075	3.95 (J-)	—	0.71633	—	—	—
AAA2514	50-06022	0.00–0.50	SED	—	14.258	1.1791	1.107	2.965	—	—	3.63246	—	—	—
AAA2731	50-06022	1.50–2.50	SED	9.4383	62.148	0.7825	2.508	13.376	2.62 (J-)	—	7.15375	—	—	—
AAA2741	50-06022	3.00–4.00	SED	—	373.11	—	11.358	10.59	4.03 (J-)	—	5.83167	—	—	—
AAA2515	50-06023	0.00–0.50	SOIL	—	50.146	1.1045	7.372	4.889	2.75 (J-)	3.0552	0.642176	—	—	—
AAA2729	50-06023	1.50–2.50	SOIL	—	7.6197	—	0.809	0.351	3.63 (J-)	—	2.00912	—	—	—
AAA2734	50-06023	3.00–4.00	SOIL	—	50.176	0.8782	0.189	0.824	4.82 (J-)	—	2.0652	—	—	—
AAA2516	50-06024	0.00–0.50	SOIL	—	6.0491	—	1.295	5.702	—	—	0.554994	—	—	—
AAA2724	50-06024	1.50–2.50	SOIL	14.979	20.945	—	4.235	10.71	—	—	1.59349	—	—	—
AAA2517	50-06025	0.00–0.50	SED	7.6766	43.533	2.39	3.556	7.881	1.48 (J-)	—	4.52138	—	—	—
AAA2518	50-06026	0.00–0.50	SED	9.014	32.945	1.1217	4.18	13.214	1.48 (J-)	4.3764	3.27567	—	—	2.349
CAMO-09-6516	MO-605084	1.50–2.50	QBT2	—	0.285	—	0.0268	0.174	—	NA[e]	—	—	—	—
CAMO-09-6517	MO-605084	6.50–7.50	QBT2	—	—	—	—	—	—	NA	0.00499491	—	—	—
CAMO-09-6518	MO-605085	0.00–0.50	SED	10	4.16	—	2.7	14.8	—	NA	—	—	—	—
CAMO-09-6519	MO-605085	1.50–2.50	QBT2	8.9	73.3	—	6.5	5.81	—	NA	0.257899	—	—	—
CAMO-09-6523	MO-605086	6.00–7.00	QBT2	—	—	—	—	—	—	NA	0.0243579	—	—	—
CAMO-09-6528	MO-605088	1.50–2.50	QBT2	111	18.6	—	19.4	136	3.69	NA	0.0190085	2.54	—	—
CAMO-09-6529	MO-605088	3.50–4.00	QBT2	235	89	—	31.8	114	10	NA	0.718707	—	—	—
CAMO-09-9948	MO-605459	3.00–4.00	QBT3	—	—	—	—	—	NA	NA	0.022027	—	—	—
CAMO-09-9949	MO-605459	8.00–9.00	QBT3	—	—	—	—	—	NA	NA	0.0387303	—	—	—
CAMO-09-10137	MO-605503	9.00–10.00	QBT3	—	—	—	—	—	—	NA	0.0131234	—	—	—
CAMO-09-10138	MO-605503	14.00–15.00	QBT3	—	—	—	—	—	—	NA	0.0113902	—	—	—
CAMO-09-10139	MO-605504	9.00–10.00	QBT3	—	—	—	—	—	—	NA	0.0219907	—	—	—
CAMO-09-10140	MO-605504	14.00–15.00	QBT3	—	—	—	—	—	—	NA	0.0239072	—	—	—

Table 6.11-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-238	Plutonium-239/240	Strontium-90	Thorium-232	Tritium	Uranium-234	Uranium-235/236	Uranium-238
SED Background Value[a]				**0.04**	**0.9**	**na[b]**	**0.006**	**0.068**	**1.04**	**2.33**	**0.093**	**2.59**	**0.2**	**2.29**
SOIL, FILL Background Value[a]				**0.013[c]**	**1.65[c]**	**na**	**0.023[c]**	**0.054[c]**	**1.31[c]**	**2.33**	**na**	**2.59**	**0.2**	**2.29**
QBT2,QBT3 Background Value[a]				**na**	**na**	**na**	**na**	**na**	**na**	**2.52**	**na**	**1.98**	**0.09**	**1.93**
CAMO-09-10141	MO-605505	9.00–10.00	QBT3	—	—	—	—	—	—	NA	0.0295732	—	—	—
CAMO-09-10142	MO-605505	14.00–15.00	QBT3	—	—	—	—	—	—	NA	0.0234171	—	—	—
CAMO-09-10144	MO-605506	5.50–6.50	QBT3	—	—	—	—	—	—	NA	0.00585001	—	—	—
CAMO-09-10146	MO-605507	14.00–15.00	QBT3	—	—	—	—	—	—	NA	0.0385048	—	—	—
CAMO-09-10147	MO-605508	8.50–9.50	QBT3	—	—	—	—	—	—	NA	0.0878603	—	—	—
CAMO-09-10148	MO-605508	13.50–15.00	QBT3	—	—	—	—	—	—	NA	0.0736597	—	—	—
CAMO-09-10150	MO-605509	13.00–14.00	QBT3	—	—	—	—	—	—	NA	0.034894	—	—	—
CAMO-09-10154	MO-605511	14.00–15.00	QBT3	—	—	—	—	—	—	NA	—	—	0.12	—
CAMO-09-10155	MO-605512	8.00–9.00	QBT3	—	—	—	—	—	—	NA	0.0346079	—	—	—
CAMO-09-10156	MO-605512	13.00–14.00	QBT3	—	—	—	—	—	—	NA	0.0321596	—	—	—
CAMO-09-10157	MO-605513	8.00–10.00	FILL	—	0.299	—	0.0828	0.134	—	NA	—	—	—	—
CAMO-09-10158	MO-605513	13.00–14.00	QBT3	—	—	—	—	—	—	NA	0.0391041	—	—	—

Notes: Results are in pCi/g. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] FV applies to soil and tuff samples collected from 0–1 ft only.

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

[e] NA = Not analyzed.

Table 6.16-1
Samples Collected and Analyses Requested at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Gamma Spectroscopy	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Strontium-90	SVOCs	TPH-DRO	VOCs
AAC0276	50-03011	7.00–8.00	FILL	—*	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0277	50-03011	8.00–9.00	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0285	50-03042	6.60–7.50	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0296	50-03042	8.00–9.00	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0287	50-03043	6.00–7.00	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0295	50-03043	7.80–8.50	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
AAC0289	50-03044	7.30–8.80	QBT3	—	20195	20195	20195	20195	20190	—	—	—	—	—	—	—
MD50-04-55783	50-23548	52.50–55.00	QBT2	2407S	2407S	2407S	2407S	2407S	2406S	—	2406S	—	—	—	—	2405S
MD50-04-55784	50-23548	57.50–60.00	QBT2	2407S	2407S	2407S	2407S	2407S	2406S	—	2406S	—	—	—	—	2405S
MD50-04-55785	50-23549	50.00–52.50	QBT2	2407S	2407S	2407S	2407S	2407S	2406S	—	2406S	—	—	—	—	2405S
MD50-04-55786	50-23549	57.50–60.00	QBT2	2407S	2407S	2407S	2407S	2407S	2406S	—	2406S	—	—	—	—	2405S
MD50-06-66603	50-24235	70.00–71.00	QBT3	—	4475S	—	4475S	4475S	4475S	4475S	—	4475S	4475S	4475S	4475S	—
MD50-06-66604	50-24235	90.00–91.50	QBT3	—	4475S	—	4475S	4475S	4475S	4475S	—	4475S	4475S	4475S	4475S	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 6.16-2
Inorganic Chemicals above BVs at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Chromium	Lead	Selenium
SOIL,FILL Background Value[a]				**0.83**	**8.17**	**19.3**	**22.3**	**1.52**
QBT2,QBT3 Background Value[a]				**0.5**	**2.79**	**7.14**	**11.2**	**0.3**
AAC0276	50-03011	7.00–8.00	FILL	4.6 (U)	—[b]	—	—	—
AAC0277	50-03011	8.00–9.00	QBT3	4.4 (U)	—	—	—	0.53 (U)
AAC0285	50-03042	6.60–7.50	QBT3	4.6 (U)	—	—	—	0.55 (U)
AAC0296	50-03042	8.00–9.00	QBT3	4.5 (U)	—	—	—	0.57 (J)
AAC0287	50-03043	6.00–7.00	QBT3	4.6 (U)	—	—	—	0.55 (U)
AAC0295	50-03043	7.80–8.50	QBT3	4.5 (U)	—	—	—	0.53 (U)
AAC0289	50-03044	7.30–8.80	QBT3	4.7 (U)	—	—	—	0.56 (U)
MD50-04-55783	50-23548	52.50–55.00	QBT2	—	—	—	—	0.551 (U)
MD50-04-55784	50-23548	57.50–60.00	QBT2	—	—	—	—	0.332 (J)
MD50-04-55786	50-23549	57.50–60.00	QBT2	—	—	—	—	0.533 (U)
MD50-06-66603	50-24235	70.00–71.00	QBT3	NA[c]	3 (U)	8.2 (J+)	20.7 (J+)	2.5 (U)
MD50-06-66604	50-24235	90.00–91.50	QBT3	NA	3 (U)	—	—	2.5 (U)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] BVs are from LANL 1998, 059730.
[b] — = Not detected or not detected above BV.
[c] NA = Not analyzed.

Table 6.16-3
Organic Chemicals Detected at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone
MD50-04-55783	50-23548	52.50–55.00	QBT2	0.0191
MD50-04-55784	50-23548	57.50–60.00	QBT2	0.0143
MD50-04-55785	50-23549	50.00–52.50	QBT2	0.0252
MD50-04-55786	50-23549	57.50–60.0	QBT2	0.0332

Note: Results are in mg/kg.

Table 6.16-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 50-011(a)

Sample ID	Location ID	Depth (ft)	Media	Plutonium-238	Plutonium-239/240	Tritium
SOIL,FILL Background Value[a]				**0.023[b]**	**0.054[b]**	**na[c]**
QBT2,QBT3 Background Value[a]				**na**	**na**	**na**
AAC0276	50-03011	7.00–8.00	FILL	0.03	0.06	1.41531
AAC0277	50-03011	8.00–9.00	QBT3	NA[d]	—[e]	0.751485
AAC0285	50-03042	6.60–7.50	QBT3	—	—	0.455858
AAC0296	50-03042	8.00–9.00	QBT3	NA	0.02	0.293784
AAC0287	50-03043	6.00–7.00	QBT3	0.007	0.02	0.853374
AAC0295	50-03043	7.80–8.50	QBT3	0.011	—	0.299712
AAC0289	50-03044	7.30–8.80	QBT3	—	—	1.31588
MD50-04-55783	50-23548	52.50–55.00	QBT2	—	—	0.0821
MD50-04-55784	50-23548	57.50–60.00	QBT2	—	—	0.048
MD50-04-55785	50-23549	50.00–52.50	QBT2	0.0326	0.0506	—
MD50-04-55786	50-23549	57.50–60.00	QBT2	—	—	0.0351
MD50-06-66603	50-24235	70.00–71.00	QBT3	—	—	NA
MD50-06-66604	50-24235	90.00–91.50	QBT3	—	—	NA

Note: Results are in pCi/g.
[a] BVs/FVs are from LANL 1998, 059730.
[b] FV applies to soil and tuff samples collected from 0–1 ft only.
[c] na = Not available.
[d] NA = Not analyzed.
[e] — = Not detected or not detected above BV/FV.

Table 9.0-1
Summary of Investigation Results and Recommendations

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
TA-03					
	AOC 03-003(e)	Storage area	No	n/a*	Delayed investigation
	AOC 03-003(i)	Storage area (transformer)	No	n/a	Delayed investigation
	AOC 03-004(c)	Storage area	No	n/a	Additional extent sampling
	AOC 03-004(d)	Storage area	No	n/a	Additional extent sampling
	AOC 03-007	Decommissioned firing site	No	n/a	Additional extent sampling
	AOC 03-014(w)	Floor drain	No	n/a	Delayed investigation
	AOC 03-014(x)	Floor drain	No	n/a	Delayed investigation
	AOC 03-026(a)	Sump	No	n/a	Delayed investigation
	SWMU 03-026(c)	Aboveground holding tanks	No	n/a	Delayed investigation
	SWMU 03-031	Radioactive liquid waste system	No	n/a	Delayed investigation
	SWMU 03-034(a)	Pumphouse, associated radioactive liquid waste tanks	Yes	No	No further action
	SWMU 03-034(b)	Active industrial waste sump and tank	No	n/a	Delayed investigation
	AOC 03-041	Unloading station	Yes	n/a	No further action
Consolidated Unit 03-045(h)-00	SWMU 03-045(h)	Former NPDES-permitted outfall	No	n/a	Additional extent sampling
	SWMU 03-049(a)	NPDES-permitted outfall			
Consolidated Unit 03-049(b)-00	SWMU 03-049(b)	Discharge area	No	n/a	Additional extent sampling
	AOC C-03-014	Equipment storage area			
	SWMU 03-049(e)	Outfall from roof drains	No	n/a	Additional extent sampling
	SWMU 03-054(e)	Outfall	No	n/a	Additional extent sampling
	AOC C-03-006	Unintentional overflow	No	n/a	Additional extent sampling

Table 9.0-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
TA-35					
	SWMU 35-016(g)	Drain and outfall	No	n/a	Additional extent sampling
	SWMU 35-016(h)	Stormdrains and outfalls	No	n/a	Additional extent sampling
TA-42					
Consolidated Unit 42-001(a)-00	SWMU 42-001(a)	Former incinerator building	No	n/a	Additional extent sampling
	SWMU 42-001(b)	Former location of ash storage tank			
	SWMU 42-001(c)	Former location of ash storage tank			
	AOC 42-002(a)	Former location of indoor storage and decontamination area			
	SWMU 42-002(b)	Former location of the outdoor decontamination area			
	SWMU 42-003	Former septic system			
TA-48					
	AOC 48-001	Air exhaust system	No	n/a	Additional extent sampling
	SWMU 48-002(a)	Former container storage area	No	n/a	Additional extent sampling
	SWMU 48-002(b)	Former container storage area	No	n/a	Additional extent sampling
	AOC 48-002(e)	Former container storage area	Yes	No	No further action
	SWMU 48-003	Former septic system	No	n/a	Additional extent sampling
Consolidated Unit 48-004(a)-99	SWMU 48-004(a)	Sumps	No	n/a	Delayed investigation
	SWMU 48-004(b)	Tanks			
	SWMU 48-004(c)	Tanks			
	SWMU 48-005	Segments of inactive radioactive liquid waste lines and associated outfall	No	n/a	Additional extent sampling/delayed investigation
Consolidated Unit 48-007(a)-00	SWMU 48-007(a)	Former NPDES-permitted outfall	Yes	No	No further action
	SWMU 48-007(d)	Former NPDES-permitted outfall			
	SWMU 48-010	Surface impoundment			
	SWMU 48-007(b)	Former NPDES-permitted outfall	No	n/a	Additional extent sampling

Table 9.0-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
	SWMU 48-007(c)	Former NPDES-permitted outfall	No	n/a	Additional extent sampling
	SWMU 48-007(f)	Former NPDES-permitted outfall	No	n/a	Additional extent sampling
	AOC 48-011	Shaft containing sodium iodide radiation detector	No	n/a	No further action
	AOC 48-012	Soil contamination	Yes	No	No further action
TA-50					
	SWMU 50-001(a)	TA-50 radioactive liquid waste treatment facility (RLWTF, building 50-1)	No	n/a	Delayed investigation
	AOC 50-001(b)	Active underground drain line system transferring liquid waste to the RLWTF	No	n/a	Delayed investigation
	SWMU 50-002(a)	Underground reinforced concrete vault	No	n/a	Delayed investigation
Consolidated Unit 50-002(b)-00	SWMU 50-002(b)	Waste tank (structure 50-67) and associated inlet and outlet lines	No	n/a	Delayed investigation
	SWMU 50-002(c)	Waste tank (structure 50-68) and associated inlet and outlet lines			
	AOC 50-002(d)	Decommissioned aboveground 5000-gal. stainless-steel tank (structure 50-5)	No	n/a	Additional sampling/delayed investigation
	AOC 50-003(a)	Former RCRA interim status unit	No	n/a	n/a—Closed under RCRA permit
Consolidated Unit 50-004(a)-00	SWMU 50-004(a)	Location of former underground radioactive liquid waste and industrial waste lines	No	n/a	Additional extent sampling
	SWMU 50-004(b)	Location of former underground vault (structure 50-3)			
	SWMU 50-004(c)	Thirteen industrial waste lines and three associated manholes			
	SWMU 50-006(a)	Accidental operational releases from sump	No	n/a	Additional extent sampling
	SWMU 50-006(c)	Surface soil contamination	Yes	No	No further action

Table 9.0-1 (continued)

Consolidated Unit	SWMU/AOC	Brief Description	Extent Defined?	Potential Unacceptable Risk?	Recommendation
	SWMU 50-006(d)	A TA-50 drain line (structure 50-64) and associated NPDES-permitted outfall (051)	No	n/a	Additional extent sampling
	AOC 50-007	Former incinerator complex	No	n/a	n/a—Closed under RCRA permit
	AOC 50-008	Former volume reduction facility, current waste characterization, reduction, and repackaging facility (WCRRF)	No	n/a	n/a—Active permitted storage unit
	SWMU 50-009	Material disposal area (MDA C)	No	n/a	Separate investigation
	AOC 50-010	Former vehicle decontamination bay	No	n/a	Delayed investigation
	SWMU 50-011(a)	Former septic system	Yes	No	No further action
	AOC 50-011(b)	Two sanitary wastewater lift stations (structures 50-91 and 50-92) and associated piping	No	n/a	Delayed investigation
TA-55					
	SWMU 55-008	Sumps, tanks, and pumps in the Plutonium building (55-4)	No	n/a	Delayed investigation

*n/a = Not applicable.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
%RSD	percent relative standard deviation
AES	atomic emission spectroscopy
AOC	area of concern
AK	acceptable knowledge
ALARA	as low as reasonably achievable
AR	air rotary
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factors
bgs	below ground surface
BH	borehole
BMP	best management practice
BV	background value
CCB	continuing calibration blank
CCV	continuing calibration verification
CFR	Code of Federal Regulations
CMR	Chemistry and Metallurgy Research
COC	chain of custody
Consent Order	Compliance Order on Consent
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
CRDL	contract-required detection limit
CSM	conceptual site model
CST	Chemical Sciences and Technology (a former Laboratory division)
CVAA	cold vapor atomic absorption
CWDR	chemical waste disposal request
D&D	decontamination and decommissioning
DER	duplicate error ratio
DGPS	differential global-positioning system
DOE	Department of Energy [U.S.]
DOT	Department of Transportation [U.S.]
dpm	disintegrations per minute
DRO	diesel range organics
DU	depleted uranium
EC	expedited cleanup

EDL	estimated detection limit
EDTA	ethylenediaminetetraacetic acid
Eh	oxidation/reduction potential
EM	electromagnetic
EP	Environmental Programs [Directorate]
EPA	Environmental Protection Agency [U.S.]
EPC	exposure point concentration
EQL	estimated quantitation limits
ER	Environmental Restoration
ER ID	Environmental Remediation and Surveillance Program identification number
ESL	ecological screening level
eV	electron-volt
FD	field duplicate
FV	fallout value
GC	gas chromatography
GCMS	gas chromatography/mass spectrometry
GFAA	graphite furnace atomic absorption
GPM	gallons per minute
GPR	ground-penetrating radar
GPS	global-positioning system
GRO	gasoline range organics
HDPE	high-density polyethylene
HE	high explosive
HEPA	high-efficiency particulate air
HI	hazard index
HIR	historical investigation report
HPLC	high-performance liquid chromatography
HQ	hazard quotient
HR	home range
HRL	health research laboratory
HSA	hollow-stem auger
HSWA	Hazardous and Solid Waste Amendments
HWFP	Hazardous Waste Facility Permit
IA	interim action
ICB	initial calibration blank
ICPES	inductively coupled plasma emission spectroscopy
ICPMS	inductively coupled plasma mass spectroscopy
ICS	interference check sample

ICV	initial calibration verification
I.D.	inside diameter
ID	identification
IDL	instrument detection limit
IDW	Investigation-derived waste
IS	internal standard
K_d	soil-water partition coefficient
K_{oc}	organic-carbon partition coefficient
K_{ow}	octanol-water partition coefficient
LAAO	Los Alamos Area Office (changed to LASO on December 2002)
LAL	lower acceptance limit
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LASL	Los Alamos Scientific Laboratory
LCS	laboratory control sample
LLW	low level waste
LOAEL	lowest observed adverse effect level
MCL	maximum contaminant level
MDA	material disposal area
MDC	minimum detectable concentration
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
MSW	Municipal Solid Waste
NMED	New Mexico Environment Department
NMEID	New Mexico Environmental Improvement Division (now NMED)
NMHWA	New Mexico Hazardous Waste Act
NMSA	New Mexico Statues Annotated
NOAEL	no-observed-adverse-effect level
NOD	notice of disapproval
NOI	notice of intent
NPDES	national pollutant discharge elimination system
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment

ppmv	part(s) per million by volume
PQL	practical quantitation limit
PRG	preliminary remediation goal
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
QP	quality procedure
RAIS	Risk Assessment Information System
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDA	recommended daily allowance
RER	relative error ratio
RESRAD	residual radioactivity model
RfD	reference dose
RFI	Resource Conservation and Recovery Act Facility Investigation
RL	reporting limit
RLW	radioactive liquid waste
RLWTF	Radioactive Liquid Waste Treatment Facility
RPD	relative percent difference
RPF	Records Processing Facility
RRF	relative response factor
RSD	relative standard deviation
SAL	screening action level
SAP	sampling and analysis plan
SCDM	Superfund Chemical Data Matrix
SCL	sample collection log
SF	slope factor
SMO	sample management office
SOP	standard operating procedure
SOW	statement of work
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
SWPPP	storm water pollution prevention plan
SWSC	Sanitary Wastewater Systems Consolidation (Plant)
TA	technical area
TAL	target analyte list
TCLP	toxicity characteristic leaching procedure

T&E	threatened and endangered
TEF	toxic equivalency factor
TPH	total petroleum hydrocarbon
TPU	total propagated uncertainty
TRU	transuranic
TRV	toxicity reference value
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal (facility)
UAL	upper acceptance level
UCL	upper confidence limit
ULR	unassigned land release
UST	underground storage tanks
VCA	voluntary corrective action
VCP	vitrified clay pipe
VOC	volatile organic compound
WCRRF	Waste Characterization, Reduction, and Repackaging Facility
WCSF	waste characterization strategy form
WPF	waste profile form
WQCC	Water Quality Control Commission
WWTP	wastewater treatment plant

A-2.0 METRIC CONVERSION TABLE

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

A-3.0 DATA QUALIFIER DEFINITIONS

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

Appendix B

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes field methods used during the 2009 investigation of Upper Mortandad Canyon Aggregate Area at Los Alamos National Laboratory (LANL or Laboratory). Table B-1.0-1 provides a brief summary of methods, and the following sections provide more detailed descriptions of the field methods. All activities were conducted in accordance subcontractor procedures that are 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.shtml.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted. All drilling was conducted for the purpose of collecting investigation samples.

B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the investigation activities. Field screening for volatile organic compounds (VOCs) and radioactivity was performed on each sample. The field-screening results are presented in Table 4.5-1 of the investigation report.

B-3.1 Field Screening for VOCs

Field screening for VOCs was conducted for all samples, except as noted in section B-9.0. Screening was conducted using a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7 electron-volt (eV) lamp. Screening was performed in accordance with the manufacturer's specifications and SOP-06.33, Headspace Vapor Screening with a Photoionization Detector. Screening was performed on each sample collected, and screening measurements were recorded on the field sample collection log/chain of custody (SCL/COC) forms. The SCL/COCs are provided on DVD in Appendix F. The screening results are presented in Table 4.5-1 of the investigation report.

B-3.2 Field Screening for Radioactivity

During sampling of soil, fill, tuff, or sediment, each sample was screened for radioactivity immediately as it was collected, targeting alpha and beta/gamma emitters. Screening was conducted by a Laboratory radiation control technician (RCT) using an Eberline E-600 radiation meter with an SHP-380AB alpha and beta/gamma scintillation detector. The Eberline E-600 with attachment SHP-380AB consists of a dual phosphor plate covered by two mylar windows housed in a light-excluding metal body. The phosphor plate is a plastic scintillator for the detection of beta and gamma emissions and is thinly coated with zinc sulfide for the detection of alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute (dpm). The screening results are presented in Table 4.5-1 of the investigation report.

B-4.0 FIELD INSTRUMENT CALIBRATION

All instruments were calibrated before use. Calibration of the MiniRAE 2000 PID was conducted at least daily by the site crew. Calibration of the Eberline E-600 was conducted by the RCT. All calibrations were performed according to the manufacturers' specifications and requirements.

B-4.1 MiniRAE 2000 Instrument Calibration

The MiniRAE 2000 PID was calibrated both to ambient air and a standard reference gas (100 ppm isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Calibration with the standard reference gas determined a second point of the sensor calibration curve. Each calibration was within 3% of 100 ppm isobutylene, qualifying the instrument for use.

The following calibration information was recorded daily on operational calibration logs:

- instrument identification (ID) number
- final span settings
- date and time
- concentration and type of calibration gas used (isobutylene at 100 ppm)
- name of the personnel performing the calibration

All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration.

B-4.2 Eberline E-600 Instrument Calibration

The Eberline E-600 was calibrated daily by the RCT before local background levels for radioactivity were measured. The instrument was calibrated using plutonium-239 and chloride-36 sources for alpha and beta emissions, respectively. The following five checks were performed as part of the calibration procedures:

- calibration date
- physical damage
- battery
- response to a source of radioactivity
- background

All calibrations performed for the Eberline E-600 met the manufacturer's specifications, the requirements of SOP-5006, and the applicable radiation detection instrument manual.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used for collecting surface and subsurface samples, including soil, fill, tuff, and sediment samples, according to the investigation work plan (LANL 2007, 098954), its revisions (LANL 2008, 100750), and the New Mexico Environment Department (NMED)'s approval with modifications (NMED 2008, 101110).

B-5.1 Surface Sampling Methods

Surface samples were collected within Technical Area 03 (TA-03), TA-35, former TA-42, TA-48, and TA-50 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 was used to collect material in approximately 6-in. increments. A stainless-steel scoop and bowl were used to homogenize the samples, which were 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 transporting to the Sample Management Office (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 (see section B-5.7) immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Drilling and Sampling Equipment.

B-5.2 Borehole Logging

Continuous boring logs were completed for boreholes drilled with a hollow-stem auger (HSA) drill rig. During drilling, all boreholes were continuously cored and logged in 2.5-ft intervals in accordance with an approved subcontractor procedure technically equivalent to SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials. Information recorded on field boring logs included footage and percent recovery, lithology and depths of lithologic contacts, depth of samples collected, core descriptions, and other relevant observations. The borehole logs are presented on DVD in Appendix D.

B-5.3 Subsurface Tuff Sampling Methods

Subsurface samples were collected using 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. Borehole samples were collected in a stainless-steel split-spoon core-barrel sampler that retrieved core in 2.5-ft intervals. The samples collected, listed by borehole and depth, are provided in tables for each site in the main text section of this investigation report.

Core retrieved from the subsurface was field screened for VOCs and radioactivity and was visually inspected and logged. Following inspection, the 2.5-ft core section to be sampled was removed from the core barrel and placed in a stainless-steel bowl and homogenized. The material was crushed, if necessary, with a decontaminated rock hammer and stainless-steel spoon to allow core material to fit into sample containers.

Samples for VOC analysis were collected immediately to minimize the loss of subsurface VOCs during the sample collection process. After collection of the VOC samples, a stainless-steel scoop and bowl were used to homogenize the samples for the remaining analytical suites, which were then transferred to sterile sample collection jars or bags for transport to the SMO. The sample collection tools were decontaminated (see section B-5.7) immediately before each sample was collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment.

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. QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as a regular investigation sample and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples.

Field rinsate blanks were collected to evaluate field decontamination procedures. Rinsate blanks were collected by rinsing sampling equipment (i.e., auger buckets, sampling bowls and spoons), after 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 inorganic chemicals (target analyte list [TAL] metals, perchlorate, and total cyanide) and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks also were collected at a frequency of one per day when samples were being collected for VOCs. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process.

B-5.5 Sample Documentation and Handling

Field personnel completed an SCL/COC form for each sample. Sample containers were sealed with signed custody seals and placed in coolers at approximately 4°C. Samples were handled in accordance with approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5056, Sample Containers and Preservation. Samples were transported to the SMO for processing and shipment to off-site contract analytical laboratories. The SMO personnel reviewed and approved the SCL/COC forms and accepted custody of the samples.

B-5.6 Borehole Abandonment

All boreholes were abandoned in accordance with 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. Pavement was patched as necessary depending on existing site conditions. All cuttings were managed as investigation-derived waste (IDW) as described in Appendix E.

B-5.7 Decontamination of Sampling Equipment

The split-spoon core 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. Decontamination of the drilling equipment was conducted before mobilization of the drill rig to another borehole to avoid cross-contamination between samples and borehole locations. Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. Decontamination activities were performed in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment. Field rinsate blank samples were collected in accordance with an approved procedure technically equivalent to SOP-5059, Field Quality Control Samples.

B-6.0 GEODETIC SURVEYING

Geodetic surveys of all sample 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 1.4-1 of the investigation report.

B-7.0 INVESTIGATION-DERIVED WASTE STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with an approved subcontractor procedure technically equivalent to SOP-5022, Characterization and Management of Environmental Restoration (ER) Project Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved waste characterization strategy form and the IDW management appendix of the approved investigation work plan (LANL 2008, 100750). Details of IDW management for the Upper Mortandad Canyon Aggregate Area investigation are presented in Appendix E.

B-8.0 DEVIATIONS FROM WORK PLAN

Numerous proposed sampling locations identified in the approved investigation work plan (LANL 2008, 100750; NMED 2008, 101110) were moved as a result of site conditions encountered during the fieldwork activities. These locations were moved because they were sited on top or next to underground utilities, sample refusal occurred, or inaccessible. When locations were moved, the new locations were sited as close as possible to the original locations. Deviations to specific sampling locations are described in Table B-8.0-1. Additional deviations to the work plan scope are discussed below.

Consolidated Unit 42-001(a)-99: Proposed samples were not collected at 15 of 45 sampling locations (1a-29 through 1a-45) at former TA-42. At the time the work plan was developed, the Laboratory was planning to construct a security perimeter barrier around TA-55, including the site at former TA-42. A grid sampling approach was developed in the work plan since it was assumed future access to former TA-42 would not be possible. Subsequent to the work plan being approved, the Laboratory decided to postpone installing the security perimeter barrier. The total number of samples was reduced after it was determined that access to the site would be possible in the future. The lateral extent of the proposed sampling was not modified. If additional sampling is required in the future, access to the site will not be an issue.

SWMU 48-003: Before field work activities started, additional information regarding the known locations of the structures associated with SWMU 48-003 were identified. The proposed sampling locations were revised to more accurately reflect the actual position of the former septic system and associated filter bed. After further evaluation, sampling at four locations was not conducted because it was determined the samples were not located near or down gradient from the former septic system.

Consolidated Unit 50-004(a)-00: NMED requested sampling locations 4a-30 through 4a-33 not be sampled because drilling in these locations would have violated TA-50's documented safety analysis. In addition, samples could not be collected from locations 4a-6, 4a-12, 4a-15, 4a-17, and 4a-19 because of the high density of utilities located in these areas, and no alternative locations were available.

SWMU 50-006(d): NMED requested location 6d-13 not be sampled because it is surrounded by utilities, and no alternative locations were available.

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), February 2008. "Investigation Work Plan for Upper Mortandad Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-1272, Los Alamos, New Mexico. (LANL 2008, 100750)

NMED (New Mexico Environment Department), March 24, 2008. "Approval with Modifications, Investigation Work Plan for Upper Mortandad Canyon Aggregate Area," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 101110)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method is typically used to collect shallow (i.e., approximately 0-12 in.) soil or sediment samples. The spade-and-scoop method involves digging a hole to the desired depth, as prescribed in the work plan, and collecting a discrete grab sample. The sample is typically placed in a clean stainless-steel bowl for transfer into various sample containers.
Hand Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10–15 ft but 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 which can be advanced to the desired sample depth. When the desired depth was reached, the auger was decontaminated before advancing the hole through the sample depth. The sample material was transferred from the auger bucket to a stainless-steel sampling bowl before filling the various required sample containers.
Split-Spoon Core-Barrel Sampling	In this method, a stainless-steel core barrel (typically 4-in. I.D., 2.5 ft long) is advanced using a powered drilling rig. The core barrel extracts a continuous length of soil and/or rock that can be examined as a unit. The split-spoon core barrel is a cylindrical barrel split lengthwise so the two halves can be separated to expose the core sample. Once extracted, the section of core was screened for radioactivity and organic vapors, and described in a geologic log. A portion of the core was then collected as a discrete sample from the desired depth.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing to ensure the sample containers and the containers used for transport were free of external contamination. Field team members packaged all samples to minimize the possibility of breakage during transportation. After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged for shipping the samples to analytical laboratories.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs, COC forms, and sample container labels. SCLs were completed at the time of sample collection and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. COC forms were completed and signed to verify that the samples were not left unattended.
Field Quality Control Samples	Field quality control samples were collected as follows: *Field Duplicates*: at a frequency 10%; collected at the same time as a regular sample and submitted for the same analyses *Equipment Rinsate Blank*: at a frequency of 10%; collected by rinsing sampling equipment with deionized water, which is collected in a sample container and submitted for laboratory analysis *Trip Blanks*: required for all field events that included the collection of samples for VOC analysis. Trip blanks containers of certified clean sand that were opened and kept with the other sample containers during the sampling process
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination included the use of a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.

Table B-1.0-1 (continued)

Method	Summary
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample were printed on the SCL provided by the SMO (size and type of container, e.g., glass, amber glass, and 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 Horizontal Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standard for A/E/C/ and Facility Management. All coordinates were expressed as State Plain Coordinate System 83, NM Central, U.S. feet. All elevation data were reported relative to the National Geodetic Vertical Datum of 1983.
Management of Environmental Restoration Project Waste, Waste Characterization	IDW is managed, characterized, and stored in accordance with an approved waste characterization strategy form that documents site history, field activities, and characterization approach for each waste stream managed. 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 controlled 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
Standard Operating Procedures Used for the
Investigation Activities at Upper Mortandad Canyon Aggregate Area

SOP-5018, Integrated Fieldwork Planning and Authorization
SOP-5022, Characterization and Management of Environmental Restoration (ER) Project Waste
SOP-5028, Coordinating and Evaluating Geodetic Surveys
SOP-5034, Monitor Well and RFI Borehole Abandonment
SOP-5055, General Instructions for Field Investigations
SOP-5056, Sample Containers and Preservation
SOP-5057, Handling, Packaging, and Transporting Field Samples
SOP-5058 Sample Control and Field Documentation
SOP-5059 Field Quality Control Samples
SOP-5061, Field Decontamination of Equipment
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
06.33, Headspace Vapor Screening with a Photoionization Detector
SOP-5181, Notebook Documentation for Environmental Restoration Technical Activities
EP-DIR-QAP-0001, Quality Assurance Plan for the Environmental Programs

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.

Table B-8.0-1
Sampling Deviations from Work Plan

Site ID	Location ID in Work Plan	Sample Location ID	Description of Deviation
TA-03			
SWMU 03-004(c)	4c-1	MO-605042	Proposed location too close to building counterpoise grounding system. Moved approximately 11 ft north.
	4c-4	MO-605044	Proposed location too close to building counterpoise grounding system. Moved approximately 17 ft south.
	4c-6	MO-605046	Proposed location too close to underground utilities. Moved approximately 9 ft north.
	4c-7	MO-605048	Proposed location too close to underground utilities. Moved approximately 15 ft northeast.
AOC 03-004(d)	4d-1	MO-605035	Proposed location too close to underground utilities. Moved approximately 20 ft west.
	4d-3	MO-605036	Proposed location too close to underground utilities. Moved approximately 22 ft south.
	4d-6	MO-605038	Proposed location too close to underground utilities. Moved approximately 9 ft east.
AOC C-03-006	6-1	MO-604990	Proposed location too close to underground utilities. Moved approximately 14 ft west.
	6-4	MO-604993	Proposed location too close to underground utilities. Moved approximately 10 ft west.
	6-5	MO-604994	Proposed location too close to underground utilities. Moved approximately 10 ft west.
AOC 03-007	7-2	MO-604995	The sample at the 5 ft below the soil/tuff interface was not collected because the hand auger met with refusal at 5 ft.
SWMU 03-034(a)	34a-1	MO-604916	Proposed location on top of underground tank. Moved approximately 12 ft north.
	34a-2	MO-604917	Proposed location too close to underground utilities. Moved approximately 8 ft east.
	34a-3	MO-604919	Proposed location on top of underground tank. Moved approximately 25 ft south.
	34a-4	MO-604918	Proposed location too close to underground utilities. Moved approximately 18 ft southwest.
SWMU 03-045(h)	45h-8	MO-604952	Proposed location too close to underground water line. Moved approximately 12 ft west.
Consolidated Unit 03-049(b)-00	49b-1	MO-605031	Proposed location too close to underground utilities. Moved approximately 20 ft south.
	49b-7	MO-605030	Proposed location too close to underground utilities. Moved approximately 10 ft west.
	49b-8	MO-605032	Proposed location too close to underground utilities. Moved approximately 10 ft southeast.
SWMU 03-054(e)	54e-1	MO-605021	The sample at the soil/tuff interface was not collected because the hand auger met with refusal.
	54e-2	MO-605024	The sample at the soil/tuff interface was not collected because the hand auger met with refusal.

Table B-8.0-1 (continued)

Site ID	Location ID in Work Plan	Sample Location ID	Description of Deviation
TA-42			
Consolidated Unit 42-001(a)-99	1a-9	MO-605288	The samples at 10ft, 20ft, and 30ft intervals below soil/tuff interface were not sampled because of refusal at 4.5 ft bgs.
	1a-13	MO-605060	The samples at 10ft, 20ft, and 30ft intervals below soil/tuff interface were not sampled because of refusal at 3.25 ft bgs.
TA-48			
SWMU 48-011	11-1	MO-605351	Correct location of SWMU identified in field. Proposed location moved to 13 ft northwest of SWMU. An additional sampling interval was added at 100 ft bgs.
AOC 48-012	12-3	MO-605091	Proposed location adjacent to active underground radioactive liquid waste line. Moved approximately 13 ft northwest.
	12-4	MO-605092	Proposed location adjacent to underground water line. Moved approximately 16 ft southwest.
TA-50			
SWMU 50-006(a)	6a-3	MO-605078	Sample not collected at 5ft interval below soil/tuff interface because refusal occurred at 3.0 ft bgs.
Consolidated Unit 50-004(a)-00	4a-6	—*	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
	4a-8	MO-605109	Proposed location within excavated trench associated with TA-50 facility construction project. Moved approximately 9 ft north.
	4a-12	—	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
	4a-13	MO-605459	Proposed location combined with proposed location for SWMU 50-006(d), 6d-18 and moved to a point equidistant between the proposed locations.
	4a-15	—	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
	4a-17	—	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
	4a-19	—	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
SWMU 50-006(d)	6d-13	—*	Proposed location sited within utility corridor. No alternative location was available within 30 ft of proposed location. No samples were collected.
	6d-18	MO-605459	Proposed location combined with proposed location for Consolidated Unit 50-004(a)-00, 4a-13 and moved to a point equidistant between the proposed locations.

*— = Sample not collected.

Appendix C

Supporting Information for Delaying Site Investigations
(on DVD included with this document)

Appendix D

Borehole Logs
(on DVD included with this document)

Appendix E

Investigation-Derived Waste Storage and Disposal

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 Upper Mortandad Canyon Aggregate Area at Technical Area (TA)-03, TA-35, former TA-42, TA-48 and TA-50 of Los Alamos National Laboratory (LANL or the Laboratory).

All IDW generated during the field investigation was managed in accordance with standard operating procedure (SOP) EP-ERSS-5022, Characterization and Management of Environmental Restoration (ER) Project 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 (DOE) orders, and Laboratory implementation requirements.

Consistent with Laboratory procedures, a waste characterization strategy form (WCSF) was prepared to address characterization approaches, on-site management, and final disposition options for wastes. Analytical data and information on wastes generated during from previous investigations and/or acceptable knowledge (AK) 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.

Wastes were staged in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements were based on the type of IDW and its classification. Container and storage requirements were detailed in the WCSF and approved before waste was generated.

Investigation activities were conducted in a manner that 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 of Upper Mortandad Canyon Aggregate Area are described below and summarized in Table E-2.0-1. The waste numbers correspond with those identified in the WCSF. Waste types 4 (decontamination fluids) and 5 (New Mexico special waste) were not generated.

- Waste #1: Municipal Solid Waste. Municipal Solid Waste (MSW) consists of noncontact trash and debris and empty sample preservation containers. The MSW was determined to be nonhazardous, nonradioactive municipal solid waste. It was stored in plastic-lined trash cans and disposed of at the Los Alamos County landfill.
- WCSF Waste #2: Drill cuttings. This waste stream includes soil and tuff cuttings from boreholes. Approximately 35 yd^3 of cuttings were stored in lined 55-gal. drums and one 20 yd^3 rolloff container within appropriate waste-staging areas. All containers were directly sampled. The cuttings will be land-applied if they meet the criteria of the NMED-approved Notice of Intent (NOI) Decision Tree, Land Application of IDW Solids from Construction of Wells and Boreholes and the Radiological Decision Tree (SOP ENV-RCRA-QP-011.1). Cuttings that cannot be land-applied

are expected to be low-level waste (LLW) or industrial waste that will be disposed of at an authorized off-site disposal facility.

- WCSF Waste #3: Contact waste. This waste stream includes spent personal protective equipment (PPE), material used in dry decontamination of sampling equipment (e.g., paper towels) and plastic bags. These wastes were containerized at the point of generation and were characterized based on AK of the waste materials, the methods of generation, and analytical data for the media with which they came into contact. These wastes were managed as mixed, hazardous, low level, or nonhazardous, depending on the contaminants expected at the solid waste management unit or area of concern from which they were generated. Approximately 0.75 yd^3 of contact waste was generated and will be disposed of at an authorized off-site disposal facility.
- WCSF Waste #6: Returned American Radiation Services (Rad-Van) samples. This waste stream consists of returned soil and tuff samples (including ziplock bag and sample labels) from Rad-Van. Approximately 0.25 yd^3 was generated and is stored in a lined 55-gal. drum within a radioactive storage area. The drum was directly sampled and is expected to be characterized as LLW or industrial waste. All returned samples will be disposed of at an authorized treatment, storage, and disposal (TSD) facility or land-applied if they meet the criteria of the NMED approved NOI Decision Tree, Land Application of IDW Solids from Construction of Wells and Boreholes and the Radiological Decision Tree (SOP ENV-RCRA-QP-011.1).
- WCSF Waste #7: Debris. This waste stream includes concrete and asphalt debris from cutting access holes for sampling. Approximately 0.75 yd^3 of concrete and asphalt was generated and collected at the point of generation. These wastes were characterized based on acceptable knowledge of processes associated with the debris or from site characterization sampling. They were determined to be industrial waste or LLW waste and will be disposed of at an authorized TSDF.

Table E-2.0-1
Summary of IDW Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
Drill Cuttings	LLW, industrial	35 yd^3	Direct sampling	Rolloff container, 55-gal. drums	Intended path: Land application or authorized off-site disposal facility
Contact Waste	Industrial, hazardous, or LLW	0.75 yd^3	AK and analytical results of site characterization	55-, 30-, or 5–gal. drums	Authorized off-site disposal facility
Municipal Solid	MSW	2 yd^3	AK	Plastic bags	Off-site municipal landfill
Concrete, Asphalt, Debris	LLW, industrial	0.75 yd^3	AK from drill cuttings	55-gal. drums	Authorized off-site disposal facility
Returned Rad-Van Samples	LLW, industrial	0.25 yd^3	Direct sampling	55-gal. drum	Intended path: Land application or authorized off-site disposal facility

Attachment E-1

Waste Characterization Strategy Form
(on DVD included with this document)

Appendix F

Sample Collection Logs
(on DVD included with this document)

Appendix G

Analytical Program

G-1.0 INTRODUCTION

This appendix presents the analytical methods used and the review of the data quality of the sampling results for the Upper Mortandad Canyon Aggregate Area investigation at Los Alamos National Laboratory (the Laboratory).

The analytical program for this investigation includes submission of samples to approved contract laboratories, with specific requirements for analytical methods, data quality, and reporting. Quality assurance (QA), quality control (QC), and data validation procedures were implemented in accordance with the requirements of the Quality Assurance Project Plan Requirements for Sampling and Analysis (LANL 1996, 054609), and the analytical services statement of work (SOW) for contract laboratories (LANL 2000, 071233). The results of the QA/QC activities were used to estimate accuracy, bias, and precision of the analytical measurements. QC samples included preparation blanks, blank spikes, matrix spikes (MSs), and laboratory control samples (LCSs) to assess accuracy and bias. Internal standards (ISs), external standards, surrogates, and tracers were also used to assess accuracy.

The type and frequency of QC analyses are described in the analytical service SOW (LANL 2000, 071233), along with the applicable analytical methods. Other QC factors such as sample preservation and holding times were also assessed in accordance with the requirements outlined in standard operating procedure (SOP) 5056, Sample Containers and Preservation. Evaluating these QC indicators allows estimates to be made of the accuracy, bias, and precision of the analytical suites. A focused data validation was also performed for all the data packages (also referred to as request numbers).

The following SOPs were used for data validation:

- SOP-5161, Routine Validation of Volatile Organic Compound (VOC) Analytical Data
- SOP-5162, Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data
- SOP-5163, Routine Validation of Organochlorine Pesticide (PEST) and Polychlorinated Biphenyl (PCB) 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-5169, Routine Validation of Dioxin Furan Analytical Data (EPA Method 1618 and SW-846 EPA Method 8290)
- 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)

The focused validation included a more detailed review of the data generated by the analytical laboratory. The analytical data and instrument printouts used during focused validation and the validation reports are provided in Appendix H.

Analytical data were reviewed and evaluated based on U.S. Environmental Protection Agency (EPA) National Functional Guidelines for inorganic and organic chemical data review where applicable (EPA 1994, 048639; EPA 1999, 066649). As a result of the data validation and assessment efforts, qualifiers

may be assigned to the analytical records as appropriate. The data qualifiers used in the data validation procedures are defined in Appendix A.

Summaries of the analytical methods for inorganic chemicals, radionuclides, and organic chemicals are provided in Tables G-2.0-1, G-3.0-1, and G-4.0-1.

G-2.0 INORGANIC CHEMICAL ANALYSIS SUMMARY

A total of 1115 samples (plus 207 field duplicates) collected within the Upper Mortandad Canyon Aggregate Area were analyzed for inorganic chemicals. A total of 1109 samples (plus 206 field duplicates) were analyzed for target analyte list (TAL) metals; 766 samples (plus 164 field duplicates) were analyzed for perchlorate; 309 samples (plus 53 field duplicates) were analyzed for hexavalent chromium; 808 samples (plus 167 field duplicates) were analyzed for total cyanide; and 762 samples (plus 83 field duplicates) were analyzed for nitrate. The analytical methods used for inorganic chemicals are listed in Table G-2.0-1.

G-2.1 Inorganic Chemical QA/QC Summary

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. The validation of inorganic chemical data can result in the rejection of the data or the assignment of various qualifiers to individual sample results (see Appendix A for data qualifier definitions).

LCSs, preparation blanks, MS samples, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed to assess accuracy and precision of inorganic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 2000, 071233) and described briefly below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. The analytical results for the samples were qualified according to National Functional Guidelines (EPA 1994, 048639) if the individual LCS recovery indicated a bias in the measurement of individual analytes. LCS control limits of less than 30% and greater than 150% are prohibited (LANL 2000, 071233).

Preparation blanks are used as a measurement of bias and potential cross-contamination. All target analytes should be below the contract-required detection limit (CRDL) in the preparation blank.

The accuracy of inorganic chemical analyses is also assessed using MS samples. An MS sample is designed to provide information about the effect of each sample matrix on the sample preparation procedures and analytical technique. The spike sample recoveries should be within the acceptance range of 75%–125% (LANL 2000, 071233).

Analyzing laboratory duplicate samples assesses the precision of inorganic chemical analyses. The relative percent differences (RPDs) between the sample and the duplicate should be ±35% for samples with concentrations greater than or equal to 5 times the reporting limit (RL); for samples with concentrations less than 5 times the RL, the RPD is the RL (LANL 2000, 071233).

Calibration verification establishes a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. Calibration verification has two aspects: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual

calibration standards used to perform the calibration. The continuing calibration ensures the initial calibration is still holding and correct as the instrument is used to process samples. The continuing calibration also serves to determine that analyte identification criteria such as retention times and spectral matching are being met.

All procedures were followed as required by the analytical service SOW (LANL 2000, 071233) and applicable corresponding EPA SW-846 methodologies.

One anion result, 2 hexavalent chromium results, and 1831 TAL metal results were qualified as estimated (J) because the sample result was reported as detected between the instrument detection limit (IDL) and the estimated detection limit (EDL).

A total of 119 anion results, 53 hexavalent chromium results, 1869 TAL metal results, 175 perchlorate results, and 73 total cyanide results were qualified as estimated (J) because the result was less than the practical quantitation limit (PQL) but greater than the method detection limit (MDL).

G-2.1.1 Maintenance of Chain of Custody

Sample collection log/chain-of-custody forms (SCL/COCs) forms were maintained properly for all samples (Appendix F).

G-2.1.2 Sample Documentation

Samples were properly documented on SCL/COCs in the field (Appendix F).

G-2.1.3 Sample Dilutions

No qualifiers were assigned to inorganic chemical analysis results because of sample dilution problems.

G-2.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

G-2.1.5 Holding Times

One TAL metal result was qualified as estimated and biased low (J-) because the holding time was less than or equal to 2 times the applicable holding time requirement.

Ten TAL metal results were qualified as estimated not detected (UJ) because the holding time was less than or equal to 2 times the applicable holding time requirement.

G-2.1.6 Initial and Continuing Calibration Verifications

Ten anion results, 26 hexavalent chromium results, 267 TAL metal results, and 7 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 (ICB)/continuing calibration blank (CCB).

G-2.1.7 Interference Check Sample and/or Serial Dilutions

Twelve TAL metal results were qualified as estimated (J) because the serial dilution sample RPD exceeded criteria.

G-2.1.8 Laboratory Duplicates

Four TAL metal results were qualified as estimated (J) because the duplicate sample RPD was greater than the advisory limit.

A total of 553 TAL metal results were qualified as estimated (J) because the sample and the duplicate sample results were greater than or equal to 5 times the RL and the duplicate RPD was greater than 35%.

Fifty-two TAL metal results were qualified as estimated (J) because the duplicate results exceeded the RPD requirements.

Eight TAL metal results were qualified as estimated (J) because the duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons.

Seven TAL metal results were qualified as estimated not detected (UJ) because the sample and the duplicate sample results were greater than or equal to 5 times the RL, and the duplicate RPD was greater than 35%.

Four TAL metal results were qualified as estimated not detected (UJ) because the duplicate results exceeded the RPD requirements.

G-2.1.9 Method and Preparation Blanks

Six anion results, 2 hexavalent chromium results, 3 total cyanide results, and 264 TAL metal results were qualified as estimated (J) because the sample result was greater than the estimated detection limit (EDL) but less than or equal to 5 times the concentration of the related analyte in the blank.

Sixteen anion results, 26 hexavalent chromium results, 247 TAL metal results, and 8 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 method blank.

Ten anion results, 5 hexavalent chromium results, 460 TAL metal results, and 4 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 trip blank, equipment blank, or rinsate.

Sixty-four TAL metal results were qualified as not detected (U) because the sample result was greater than the EDL but less than or equal to 5 times the concentration of the related analyte in the blank.

Eight TAL metal results were qualified as estimated (J) because the IS area count for the quantitating IS was greater than 125% in relation to the metals initial calibration blank.

G-2.1.10 Matrix Spikes

A total of 184 TAL metal results were qualified as estimated and biased low (J-) because the analyte was recovered below the lower acceptance limit (LAL) but greater than 30% in the associated spike sample.

A total so 108 anion results, 485 TAL metal results, and 2 total cyanide results were qualified as estimated and biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

Twenty anion results, 1586 TAL metal results, and 3 total cyanide results were qualified as estimated and biased high (J+) because the associated MS recovery was greater than the upper acceptance limit (UAL).

Ninety-nine anion results, 219 TAL metal results, and 29 total cyanide results were qualified as estimated not detected (UJ) because the associated MS recovery was less than the LAL but greater than 10%.

Forty-two anion results, 33 TAL metal results, and 35 total cyanide results were qualified as estimated not detected (UJ) because the associated MS recovery was greater than the UAL.

A total of 139 TAL metal results were qualified as estimated and biased low (J-) because the associated MS recovery was greater than the UAL.

Eighty-one TAL metal results were qualified as estimated and biased high (J+) because the analyte was recovered above 150% in the associated spike sample.

A total of 116 TAL metal results were qualified as estimated and biased high (J+) because the analyte was recovered above the UAL but less than 150% of the associated spike sample.

Four TAL metal results were qualified as estimated and biased high (J+) because the associated MS recovery was less than the LAL but greater than 10%.

Eleven TAL metal results were qualified as estimated not detected (UJ) because the spike percent recovery (%R) value was greater than 30% and less than the LAL (75%).

A total of 282 TAL metal results, and 8 total cyanide results were qualified as estimated not detected (UJ) because the analyte was recovered below the LAL but greater than 30% in the associated spike sample.

Five perchlorate results were qualified as estimated and biased high (J+) because the MS/ matrix spike duplicate (MSD) %R was greater than 125%.

Four perchlorate results were qualified as estimated not detected (UJ) because the analyte was recovered above 150% in the associated spike sample.

G-2.1.11 Laboratory Control Sample Recoveries

No qualifiers were assigned to inorganic chemical analysis results because of LCS problems.

G-2.1.12 Rejected Results

One TAL metal result was rejected because quality deficiencies were identified in the reported data.

Thirty-one TAL metal results were rejected because the spike %R value was less than 30%.

Seventy-six TAL metal results were rejected because the associated MS recovery was less than 10%.

Two perchlorate results were rejected because ion abundance ratios did not meet specifications.

Thirteen TAL metal results were rejected because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

G-3.0 ORGANIC CHEMICAL ANALYSIS SUMMARY

A total of 1172 samples (plus 201 field duplicates) collected within the Upper Mortandad Canyon Aggregate Area were analyzed for organic chemicals. A total of 677 samples (plus 144 field duplicates) were analyzed for volatile organic chemicals (VOCs);1102 samples (plus 113 field duplicates) were analyzed for semivolatile organic chemicals (SVOCs); 517 samples (plus 89 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 47 samples (plus 4 field duplicates) were analyzed for polycyclic aromatic hydrocarbons (PAHs); 458 samples (plus 47 field duplicates) were analyzed for dioxins and furans; 34 samples (plus 3 field duplicates) were analyzed for pesticides; 62 samples (plus 5 field duplicates) were analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO); and 174 samples (plus 18 field duplicates) were analyzed for explosives compounds. The analytical methods used for organic chemicals are listed in Table G-3.0-1.

G-3.1 Organic Chemical QA/QC Summary

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. The validation of organic chemical data can result in the rejection of the data or the assignment of various qualifiers to individual sample results (see Appendix A for data qualifier definitions).

Calibration verifications, instrument-performance checks, LCSs, method blanks, MS samples, surrogates, and 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 2000, 071233) and described briefly in the paragraphs below.

Calibration verification establishes a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. Calibration verification has two aspects: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and correct as the instrument is used to process samples. Continuing calibration also serves to determine that analyte identification criteria such as retention times and spectral matching are being met.

Instrument performance check is the analysis of a chemical of known relative mass abundance that indicates how well a mass spectrometer is calibrated

The LCS is a sample of a known matrix spiked with compounds that are representative of the target analytes and serves as a monitor of overall performance on a controlled sample. The LCS is the primary demonstration, on a daily basis, of the ability to analyze samples with good qualitative and quantitative accuracy. The analytical results for the samples were qualified according to National Functional Guidelines (EPA 1999, 066649) if the individual LCS recoveries were not within method-specific acceptance criteria. The LCS recoveries should fall within the control limits of 75%–125% (LANL 2000, 071233).

A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. Method blanks are used to assess the potential for sample contamination during extraction and analysis. All target analytes should be below the CRDL in the method blank (LANL 2000, 071233).

The accuracy of organic chemical analyses is also assessed using MS samples, which are aliquots of the submitted samples spiked with a known concentration of the target analyte(s). MS samples are used to measure the ability to recover prescribed analytes from a native sample matrix. Spiking typically occurs before sample preparation and analysis. The spike sample recoveries should be within the acceptance range calculated by the laboratory using the procedure given in SW-846 Method 8000B and the QC acceptance criteria found within the specific SW-846 method (LANL 2000, 071233).

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but is not normally found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges of the specific SW-846 method (LANL 2000, 071233).

Internal standards 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 internal standards should be within the acceptance range calculated by the laboratory using the procedure given in SW-846 Method 8000B and the QC acceptance criteria found within the specific SW-846 method (LANL 2000, 071233).

All QC procedures were followed as required in the analytical service SOW (LANL 2000, 071233) and applicable corresponding EPA SW-846 methodologies.

Thirty dioxin/furan results were qualified as estimated (J) because the instrument performance sample did not pass method acceptance criteria.

A total of 1055 dioxin/furan results, 9 polycyclic aromatic hydrocarbon results, 75 PCB results, 1257 SVOC results, 9 TPH-DRO results, and 105 VOC results were qualified as estimated (J) because the result was less the PQL but greater than the MDL.

Fifty-three explosive compounds results were qualified as estimated not detected (UJ) because the CRDL check standard sample did not pass method acceptance criteria.

One VOC result was qualified as estimated (J) because the project chemist identified quality deficiencies in the reported data that required further qualification.

G-3.1.1 Maintenance of Chain of Custody

SCL/COC forms were maintained properly for all samples analyzed for organic chemicals (Appendix F).

G-3.1.2 Sample Documentation

Samples were properly documented on SCL/COCs in the field (Appendix F).

G-3.1.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. No qualifiers were applied to any organic chemical results because of dilutions.

G-3.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

G-3.1.5 Holding Times

Four PCB results were qualified as estimated and biased low (J-) because the holding time was less than or equal to 2 times the applicable holding time requirement.

Fifty-eight PCB results were qualified as estimated not detected (UJ) because the holding time was less than or equal to 2 times the applicable requirement.

Sixty-five SVOC results were qualified as estimated not detected (UJ) because the holding time was less than or equal to 2 times the applicable holding time requirement.

Five VOC results were qualified as estimated and biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the applicable holding time requirement.

A total of 165 VOC results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the applicable holding time requirement.

G-3.1.6 Initial and Continuing Calibration Verifications

Nine anion results were qualified as estimated (J) because the initial calibration verification (ICV) and/or continuing calibration verification (CCV) were recovered outside the method-specific limits.

A total of 236 explosives compounds results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with a relative response factor (RRF) of less than 0.05 in the initial calibration and/or CCV.

Twelve PCB results and 15 pesticide results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceeded the percent relative standard deviation (%RSD) criteria and/or the associated multipoint calibration correlation coefficient is less than 0.995.

Four pesticide results were qualified as estimated (J) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient is less than 0.995.

Twenty-two SVOC results were qualified as estimated (J) because the associated %RSD/percent difference (%D) exceeded the criteria in the initial or continuing calibration standards.

A total of 2643 SVOC results were qualified as estimated not detected (UJ) because the analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient is less than 0.995.

One VOC result was qualified as estimated (J) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

Thirty-two SVOC results were qualified as estimated (J) because the IS area count for the quantitating IS was outside the 50-100% window in relation to the previous continuing calibration.

Nineteen SVOC and seven VOC results were qualified as estimated (J) because the quantitating IS area count was less than 10% of the expected value.

A total of 422 VOC results were qualified as estimated not detected (UJ) because the quantitating IS area count was less than 10% of the expected value.

A total of 187 dioxin/furan results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method specific limits.

Fifty-four explosives compounds results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method limits.

Two PCB results and 30 SVOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method specific limits.

A total of 3952 SVOC results and 3226 VOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

Fourteen VOC results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

Thirty-one SVOC results were qualified as estimated (J) because the IS area count for the quantitating IS was less than 50% but greater than 10% for organics window relation to the previous continuing calibration.

One SVOC result was qualified as estimated not detected (UJ) because the IS area count for the quantitating IS was outside the 50–100% window in relation to the previous continuing calibration.

Sixty-seven SVOC results and 124 VOC results were qualified as estimated not detected (UJ) because the IS area count for the quantitating IS was less than 50% but greater than 10% for organics window relation to the previous continuing calibration.

Four VOC results were qualified as estimated (J) because the IS area count for the quantitating IS was outside the 50-100% window in relation to the previous continuing calibration.

Three VOC results were qualified as estimated (J) because the IS area count for the quantitating IS was less than 50% but greater than 10% for organics window relation to the previous continuing calibration.

A total of 233 VOC results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with an initial calibration curve that exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

A total of 1024 SVOC results were qualified as estimated not detected (UJ) because the associated IS area counts were less than 50% but greater than 10% when compared to the area counts in the applicable continuing calibration standard.

G-3.1.7 Analyte Identification

Sixty-seven dioxin/furan results were qualified as not detected (U) because 2,3,7,8-TCDF was detected in a sample and the result was not confirmed on a second column with successful analysis of the gas chromatography (GC) column performance mix.

Four pesticide results were qualified as not detected (U) because the analyte was not confirmed on a second dissimilar column.

A total of 218 PAH results and eight SVOC results were qualified as not detected (U) because the associated mass spectrum did not meet method specifications.

Eighteen VOC results were qualified as not detected (U) because MS did not meet specifications.

G-3.1.8 Method and Preparation Blanks

Seventeen dioxin/furan results were qualified as estimated and biased high (J+) because the affected analytes were identified in the method blank, but the sample results were greater than 5 times the concentration of the related analyte in the method blank.

Thirty-two 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.

Six PCB results were qualified as estimated (J) because the analyte were identified in the method blank but the sample results were greater than 5 times the concentration of the related analyte in the method blank.

Six PCB 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.

One SVOC result was qualified as estimated (J) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

Fifteen SVOC results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times.

Fifty-eight SVOC 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.

One TPH-DRO result was qualified as estimated and biased high (J+) because the analyte was identified in the method blank, but was greater than 5 times.

Five TPH-DRO results were qualified as not detected (U) because the result was less than or equal to 5 times the concentration of the related analyte in the method blank.

Ten VOC results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times.

A total of 119 VOC results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

Twenty-five VOC results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.

G-3.1.9 Surrogate Recoveries and Internal Standard Responses

Thirteen PAH results and 1 TPH-DRO result were qualified as estimated and biased high (J+) because the surrogate recovery was less than 10%.

Five PCB results were qualified as estimated and biased low (J-) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

Ten PCB results were qualified as estimated not detected (UJ) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

One SVOC results were qualified as estimated and biased low (J-) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

Fifty-two SVOC results were qualified as estimated not detected (UJ) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

Sixty-three SVOC results were qualified as estimated not detected (UJ) because at least one surrogate was greater than the UAL and one surrogate was less than the LAL.

Two VOC results were qualified as estimated and biased low (J-) because the surrogate was less than the LAL but greater than or equal to 10% R.

Four VOC results were qualified as estimated and biased high (J+) because the surrogate was less than 10%R.

One dioxin/furan result was qualified as estimated and biased low (J-) because the fortification sample %R was less than 40% but greater than 10%.

A total of 118 VOC results were qualified as estimated not detected (UJ) because the surrogate recovery was less than the LAL but greater than or equal to 10%.

A total of 205 dioxin/furan results were qualified as estimated not detected (UJ) because the instrument performance sample did not pass method acceptance criteria.

G-3.1.10 Laboratory Control Sample Recoveries

Forty-seven explosives compounds results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

One PCB result was qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

Two pesticide results were qualified as estimated not detected (UJ) because the LCS documentation was missing.

Sixty-four SVOC results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

Twelve SVOC results were qualified as estimated not detected (UJ) because the LCS documentation was missing.

Three VOC results were qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

Six VOC results were qualified as estimated not detected (UJ) because the LCS documentation was missing.

G-3.1.11 Matrix Spikes

Sixty explosives compounds results were qualified as estimated not detected (UJ) because the MS/MSD %R was greater than 10% but less than 70%.

Fifty-seven explosive compounds results were qualified as estimated not detected (UJ) because the MS/MSD %R was greater than 30%.

Seventeen TPH-DRO results were qualified as estimated not detected (UJ) because the MS/MSD %R was greater than or equal to 10% but less than 70%.

One TPH-DRO result was qualified as estimated not detected (UJ) because the MS/MSD %R was greater than 30%.

G-3.1.12 Rejected Results

Three dioxin/furan results were rejected because the IS retention time and qualitative criteria for target compound identification were not met.

A total of 140 SVOC results were rejected because the LCS %R was less than 10%.

A total of 1574 SVOC results were rejected because the instrument performance sample did not pass method acceptance criteria.

Seven SVOC results were rejected because the quantitating IS area count was less than 10% of the expected value.

Sixty-nine SVOC results were rejected because the extraction holding time was exceeded by greater than 2 times.

Two VOC results were rejected because the affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.

G-4.0 RADIOCHEMICAL ANALYSIS SUMMARY

A total of 1348 samples (plus 142 field duplicates) collected within the Upper Mortandad Canyon Aggregate Area were analyzed for radionuclides. A total of 357 samples (plus 35 field duplicates) were analyzed for americium-241; 1241 samples (plus 135 field duplicates) were analyzed for gamma-emitting radionuclides; 1117 samples (plus 105 field duplicates) were analyzed for tritium; 1084 samples (plus 108 field duplicates) were analyzed for isotopic plutonium; 313 samples (plus 46 field duplicates) were analyzed for isotopic thorium; 1123 samples (plus 119 field duplicates) were analyzed for isotopic uranium; and 453 samples (plus 44 field duplicates) were analyzed for strontium-90. The analytical methods used for radionuclides are listed in Table G-4.0-1.

G-4.1 Radionuclide QA/QC Summary

The precision and bias of radiochemical analyses performed at off-site fixed laboratories were assessed using MS samples, LCSs, method blanks, duplicates, and tracers. The analytical services SOW (LANL 2000, 071233) specifies that spike sample recoveries should be within ±25% of the certified value. LCSs were analyzed to assess the accuracy of radionuclide analyses. The LCSs serve as a monitor of the overall performance of each step during the analysis, including the radiochemical separation preparation. The analytical services SOW (LANL 2000, 071233) specifies that LCS recoveries should be within ±20% of the certified value. The analytical services SOW (LANL 2000, 071233) specify that the method blanks are used to assess instrument background. The analytical services SOW (LANL 2000, 071233) specifies that duplicate determinations shall agree when the 95% confidence level uncertainties are considered; that is, the replicate error ratio shall be less than 1. The analytical services SOW (LANL 2000, 071233) specifies tracer results shall be 50% to 105%, and the concentration of the tracer material shall result in a maximum of 10% uncertainty in a 95% confidence level in the measured recovery.

Radionuclides with reported values less than the minimum detectable concentration (MDC) were qualified as not detected (U) per SOP-5166, Routine Validation of Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Data.

Each radionuclide result was also compared with the corresponding 1 sigma total propagated uncertainty (TPU). If the result was not greater than 3 times the TPU, the radionuclide was qualified as not detected (U).

One isotopic plutonium result was qualified as estimated (J) because the relative error ratio (RER) was greater than 4.

Six isotopic plutonium results were qualified as estimated and biased low (J-) because the project chemist identified quality deficiencies in the reported data that require further qualification.

Eighteen americium-241 results, 1306 gamma emitting radionuclides results, 44 tritium results, 221 isotopic plutonium results, 4 isotopic thorium results, 280 isotopic uranium results, and 172 strontium-90 results were qualified as not detected (U) because the associated sample concentration was less than 3 times the 1-sigma total propagated uncertainty.

G-4.1.1 Maintenance of Chain of Custody

SCL/COC forms were properly maintained for all samples (Appendix F).

G-4.1.2 Sample Documentation

All samples were properly documented on SCL/COCs in the field (Appendix F).

G-4.1.3 Sample Dilutions

No qualifiers were assigned because of sample dilutions of any samples analyzed for radionuclides.

G-4.1.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

G-4.1.5 Holding Times

Twenty americium-241 results, 42 isotopic plutonium results, 130 isotopic thorium results, 104 isotopic uranium results, 29 strontium-90 results were qualified as estimated and biased low (J-) because the holding time was greater than 1 and less than or equal to 2 times the applicable holding time requirement.

Eleven americium-241 results, 2 tritium results, 96 isotopic plutonium results, 6 isotopic thorium results, 38 isotopic uranium results, and 6 strontium-90 results were qualified as estimated not detected (UJ) because the holding time was less than or equal to 2 times the applicable holding time requirement.

G-4.1.6 Analyte Identification

Certain gamma spectroscopy analytes are subject to spectral interference from energies of other radionuclides. When this interference occurs, it is not possible to reliably measure these radionuclides. Radionuclide results assigned qualifiers because of spectral interference were rejected (see section G-4.1.12.

G-4.1.7 Method and Preparation Blanks

Fifty-eight isotopic plutonium results, 61 isotopic thorium results, and 22 isotopic uranium results were qualified as not detected (U) because the analytes were identified in the method blank but the sample results were greater than 5 times the concentration of the related analyte in the method blank.

G-4.1.8 Matrix Spikes

Two americium-241 results were qualified as estimated and biased low (J-) because the required MS information was missing.

One isotopic plutonium result, 3 isotopic thorium results, and 64 isotopic uranium results were qualified as estimated and biased high (J+) because the associated MS recovery was less than 10%.

G-4.1.9 Carrier and Tracer Recoveries

Fourteen isotopic plutonium results, and 41 isotopic uranium results were qualified as estimated not detected (UJ) because the tracer recovery was less than the LAL but greater than or equal to 10%.

Five americium-241 results, 26 isotopic plutonium results, four isotopic thorium results, and two isotopic uranium results were qualified as estimated not detected (UJ) because the associated tracer recovery was less than 30% but greater than 10% and the result was a nondetect.

Seven isotopic plutonium results and 10 isotopic thorium results were qualified as estimated and biased low (J-) because the tracer %R value was 10-30% inclusive and the sample result was less than the MDA.

Two isotopic plutonium results, six isotopic thorium results, and 106 isotopic uranium results were qualified as estimated and biased low (J-) because the tracer recovery was less than the LAL but greater than or equal to 10%.

One isotopic plutonium result and four isotopic uranium results were qualified as estimated and biased high (J+) because the associated tracer yield was greater than 105%.

Three isotopic plutonium results, four isotopic thorium results, and six isotopic uranium results were qualified as estimated and biased high (J+) because the tracer %R value was greater than the UAL.

G-4.1.10 Laboratory Control Sample Recoveries

Twenty americium-241 results were qualified as estimated not detected (UJ) because the associated LCS recovery was less than the LAL but greater than 10%.

G-4.1.11 Laboratory and Field Duplicates

Two americium-241 results, one tritium result, and four isotopic plutonium results were qualified as estimated not detected (UJ) because the duplicate information was missing.

Two americium-241 results, 1 gamma-emitting radionuclides result, 55 tritium results, and 4 isotopic plutonium results were qualified as estimated (J) because the duplicate information was missing.

One americium-241 result, 4 gamma emitting radionuclides results, 27 isotopic plutonium results, 16 isotopic thorium results, and 7 isotopic uranium results were qualified as estimated (J) because the duplicate and sample results had a duplicate error ratio (DER) greater than 2.0.

G-4.1.12 Rejected Results

Seven americium-241 results, six isotopic thorium results, and six isotopic uranium results were rejected (R) because the tracer %R value was 10% to 30% inclusive, and the sample result was greater than the MDC.

Two americium-241 results, 741 gamma emitting radionuclides results, 3 isotopic plutonium results, 2 isotopic thorium results, and 111 isotopic uranium results were rejected (R) because spectral interferences prevent positive identification of the analytes.

Two americium-241 results, 21 tritium results, 31 isotopic plutonium results, and 1 isotopic uranium result were rejected (R) because the RER was greater than 4.

Three americium-241 results and six isotopic plutonium results were rejected (R) because the holding time was greater than twice the method acceptable holding time.

One gamma-emitting radionuclides result was rejected (R) because the project chemist identified quality deficiencies in the reported data that require further qualification.

Ten gamma emitting radionuclides results were rejected (R) because the sample result was less than or equal to 5 times the concentration of the related analyte in the method blank.

G-5.0 REFERENCES

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

Copies of the master reference set are maintained at the 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), 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)

Table G-2.0-1
Analytical Methods for Inorganic Chemical Analyses

Analytical Method	Analytical Description	Analytical Suite
EPA Method 300.0	Ion chromatography	Anions
SW-846: 8321A	High-performance liquid chromatography (HPLC)/mass spectrometry	Anions, perchlorate
SW-846:6850	HPLC/mass spectrometry	Perchlorate
SW-846: 6010/6010A/6010B	Inductively coupled plasma emission spectroscopy (ICPES)—atomic emission spectroscopy (AES)	Aluminum, antimony, arsenic, barium, beryllium, boron, calcium, cadmium, cobalt, chromium, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, potassium, selenium, silicon, sodium, silver, thallium, titanium, uranium, vanadium, and zinc. (TAL metals)
SW-846:6020	Inductively coupled plasma mass spectroscopy (ICPMS)	TAL metals
EPA SW-746:7421	Colorimetric method	Lead
EPA SW-746:7470, 7470A	Cold vapor atomic absorption (CVAA)	Mercury
EPA SW-746:7740	Graphite furnace atomic absorption (GFAA)	Selenium
EPA SW-746:7841	GFAA	Thallium
SW-846:7060	GFAA	Arsenic
SW-846:9010A	Distillation/ultraviolet spectrophotometry	Cyanide (total)
SW-846:9012A	Colorimetric method	Cyanide (total)
SW-846:7471A	GFAA	Mercury

Table G-3.0-1
Analytical Methods for Organic Chemical Analysis

Analytical Method	Analytical Description	Target Compound List
EPA SW-846:8321A_MOD	Explosives	Explosives compounds (LANL 2000, 071233)
EPA SW-846:8270C	Gas chromatography(GC)/mass spectrometry	SVOCs: Analytical service SOW (LANL 2000, 071233).
EPA Method 3540—Extraction EPA SW-846:8270—Analysis	GC/ mass spectrometry	SVOCs: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8260, 8260B—Analysis	GC/ mass spectrometry	VOCs: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8081, 8081A	GC	Pesticides
SW-846:8290—Analysis	High-resolution GC/high-resolution	Dioxins, furans: Analytical service SOW (LANL 2000, 071233).
EPA SW-846:8015M_EXTRACTABLE	GC/flame ionization detector	TPH-DRO
EPA Method 3540—Extraction EPA SW-846:8082—Analysis	GC	PCBs

Table G-4.0-1
Analytical Methods for Radiochemical Analyses

Analytical Method	Analytical Description	Target Compound List
HASL-300: Am-241	Alpha spectroscopy	Americium-241
EPA Method 901.1 Generic: Gamma Spec	Gamma Spectroscopy	Americium-241, cesium-137, cesium-134, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
EPA Method 906.0	Liquid scintillation	Tritium
HASL-300: ISOPU	Alpha spectroscopy, gas-flow proportional counting	Isotopic Plutonium
HASL-300: ISOU	Alpha spectroscopy, gas-flow proportional counting	Isotopic Uranium
EPA Method 905.0 ASTM:D5811-95M	Gas-flow proportional counting	Strontium-90

Appendix H

Analytical Suites and Results and Analytical Reports
(on DVDs included with this document)

Appendix I

Data Review and Assessment

I-1.0 INTRODUCTION

Data discussed in this appendix are the analytical results from samples collected during the investigations of the solid waste management units (SWMUs), areas of concern (AOCs), and consolidated units in the Upper Mortandad Canyon Aggregate Area. Samples were shipped through the Sample Management Office (SMO) to off-site contract laboratories for analyses and are accompanied by full chain-of-custody and quality documentation. The resulting data are decision-level data used in determining nature and extent, calculating exposure point concentrations, and conducting risk-screening assessments. Data collected in 2009 were combined with data collected previously where available and where the previous data met current data quality requirements. Sample collection logs and chain-of-custody forms are also provided in Appendix F of this report. Complete data sets for all sites investigated are provided on the DVDs included in Appendix H.

Analytical methods used and data quality assessments, including assignment of data qualifiers, are discussed in Appendix G. The data qualifiers used are defined in Appendix A.

I-1.1 Overview of Analytical Data

A total of 40 sites were sampled in 2009 and all resulting data were decision-level. Two additional sites were not sampled in 2009 but were sampled previously and are evaluated in this report. The data review described in this appendix includes all decision-quality data available for each site from previous sampling and/or the 2009 investigation.

I-1.2 Identification of Chemicals of Potential Concern

The purpose of the data review is to identify chemicals of potential concern (COPCs) for each site (SWMU, AOC, or consolidated unit) in the Upper Mortandad Canyon Aggregate Area. Inorganic COPCs are identified by comparing site data with background values (BVs) and maximum concentrations in a background data set (LANL 1998, 059730). Organic chemicals have no BVs and are identified as COPCs based on detection status. Radionuclides are identified as COPCs based on background comparisons if a BV or a fallout value (FV) is available, or based on detection status if no BV or FV is available.

Sample media encountered in this investigation include soil (all soil horizons, designated by the media code ALLH or SOIL); fill material (media code FILL); alluvial sediment (media code SED), and Bandelier Tuff (media codes Qbt1g, Qbt2, Qbt3, and Qbt4). Because no separate BVs are available for fill material, fill samples are evaluated by comparison to soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples with soil samples in sample counts and comparisons to background. Fill samples are not discussed separately from soil.

Background data are generally available for soil, sediment, and tuff (LANL 1998, 059730). However, some analytes (e.g., nitrate, perchlorate, and hexavalent chromium) have no BVs. A BV may be either a calculated value from the background data set (upper tolerance limit or the 95% upper confidence bound on the 95th quantile) or a detection limit (DL). When a BV is based on a DL, there is no corresponding background data set for that analyte/media combination.

For inorganic chemicals, data are evaluated by sample media to facilitate the comparison with media-specific background data. To identify inorganic COPCs, the first step is to compare the sample result with the BV. If sampling results are above the BV and sufficient data are available (10 or more sampling results), statistical tests are used to compare the site sample data with the background data set for the appropriate media. If statistical tests cannot be performed because of insufficient data or a high

percentage of nondetects (see section I-1.2.1) the sampling results are compared only to the greater of the BV or the maximum background concentration of the chemical in the appropriate media. If any sampling results are above the BV or maximum background concentration, the chemical is identified as a COPC. The same evaluation is performed using sample DLs when an inorganic chemical is not detected but has DLs above the BV. If no BV is available, detected inorganic chemicals are identified as COPCs.

Four inorganic chemicals, calcium, magnesium, potassium, and sodium, receive additional consideration if they are detected above their BVs. These inorganic chemicals are essential nutrients that are common in the natural environment. For this reason, they are not identified as COPCs if they are detected above background infrequently or slightly above background concentrations (generally less than 2–3 times the maximum background concentration), particularly if they are not likely to have been associated with historical Los Alamos National Laboratory (LANL or the Laboratory) activities at the site.

Radionuclides are identified as COPCs based on comparisons to BVs for naturally occurring radionuclides or to FVs for fallout radionuclides. Isotopic thorium, uranium-235/236 and uranium-238 are naturally occurring radionuclides. Americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, and tritium are fallout radionuclides. FVs apply only to surface samples (0–1 ft below ground surface [bgs]), so fallout radionuclides detected below 1 ft bgs are identified as COPCs.

The FV for tritium in surface soil (LANL 1998, 059730) is in units of picocuries per milliliter (pCi/mL). Use of this FV requires using sample percent moisture to convert sample tritium data from picocuries per gram (pCi/g) (as provided by analytical laboratories) to the corresponding values in units of pCi/mL. Because sample percent moisture historically has been determined using a variety of methods, often undocumented, the Laboratory has adopted the conservative approach of identifying tritium in soil as a COPC based on detection status.

The FVs for fallout radionuclides in tuff (LANL 1998, 059730) are nominal detection limits (DLs), not measured concentrations from tuff samples. The FVs are not used for tuff samples, and fallout radionuclides in tuff are identified as COPCs based on detection status.

Chemicals are COPCs for an entire site if they are identified as COPCs for any medium sampled at the site. The identification of COPCs for each site is discussed in the following sections.

I-1.2.1 Overview of Statistical Methods

A variety of statistical methods may be applied to each of the data sets, but generally include distributional comparisons and box plots comparing site data to background data. In cases where no background data are available, only a few (fewer than 10) samples were analyzed for a specific constituent, or more than 80 percent of the site samples and background samples are nondetects, statistical tests are not applicable. In such cases, COPC identification is based on detection status, direct comparison to the BV or FV (if one is available), and subsequent comparison to the maximum background concentration if it is greater than the BV or FV. If no BV or FV is available, the constituent is identified as a COPC if it was detected in any samples at the site.

Comparisons between site (SWMU, AOC or consolidated unit) data sets and the Laboratory background data sets, are performed using statistical methods. For background comparisons, these methods begin with a simple comparison of site-specific data to media-specific BVs or FVs (LANL 1998, 059730). BV/FV comparisons are followed, when appropriate, by statistical tests that evaluate potential differences between the distributions. These tests are used for testing hypotheses about data from two potentially different distributions, e.g., a test of the hypothesis that site concentrations are elevated above background levels.

Nonparametric tests that are most commonly performed include the two-sample Wilcoxon Rank Sum test (Wilcoxon test), the Gehan test (modification of the Wilcoxon test), and the quantile test (Gehan 1965, 055611; Gilbert and Simpson 1990, 055612). The Gehan test is best suited for assessing complete shifts in distributions, and accounts for nondetected concentrations at multiple DLs in a statistically robust manner. If there are no nondetected concentrations in the data, the Gehan test is equivalent to the Wilcoxon test. The quantile test is better suited for assessing shifts of a subset of the data. Between the two tests (Gehan and quantile), most types of differences between distributions can be identified. Occasionally, if the differences between two distributions appear to occur far into the tails, the slippage test might be performed. This test evaluates the potential for some of the site data to be greater than the maximum concentration in the background data set if, in fact, the site data and background data came from the same distribution. Observed significance levels (p-values) are obtained from the Gehan, quantile, or slippage tests. If a p-value is less than a specified probability, e.g., 0.05 (a nominal significance level), then there is some reason to suspect that there is a difference between the distributions. If the p-value is greater than 0.05, no difference is indicated. The standard set of tests is run whenever the detection rate for both the site data set and the Laboratory background data set is greater than 50%; if there are fewer than 50% detections in either set, then the Gehan test is not applicable. If all sample data are nondetects, statistical tests are not performed.

Paired tests are used to test whether site data are different than background. Specifically, the Gehan test (or the Wilcoxon Rank Sum test if all sampling results are detects) is the preferred initial test. If the result of the Gehan test indicates ($p > 0.05$) that the site data are not significantly different than background, the quantile test is performed. Site data must pass (i.e., $p > 0.05$) both tests to be eliminated as a COPC. If the p-value from either the Gehan (or Wilcoxon) or the quantile test is less than 0.05, the constituent is identified as a COPC for the specific medium tested. If the Gehan test is not applicable because either the site or background data set includes more than 50 percent nondetects, the quantile test is performed first. If the p-value from the quantile test is > 0.05, the slippage test is performed next. Again, the p-value from both tests must be > 0.05 for the constituent to be eliminated as a COPC. If the p-value from the first test is > 0.05, indicating the site data are different than background, the second test need not be performed, and the constituent is identified as a COPC.

Box plots provide a visual representation of the data and may identify the presence of outliers or other anomalous data that might affect statistical results and interpretations. The plots allow a visual comparison between site and background concentration distributions. The plots are generally used in conjunction with the statistical tests (distributional comparisons) described above. A box plot consists of a box, a line across the box, whiskers (lines extended beyond the box and terminated with a short perpendicular line), and points outside the whiskers. The box area of the plot is the region between the 25th percentile and the 75th percentile of the data, the interquartile range or middle half of the data. The horizontal line within the box represents the median (50th percentile) of the data. The whiskers give an interval of 1.5 times the interquartile range, outside of which data may be evaluated for their potential to be outliers. The concentrations of individual samples are plotted as points overlaying the box plot. When a data set contains both detected and nondetected concentrations reported as detection limits (DLs), the detected concentrations are plotted as Xs, and the nondetected concentrations are plotted as Os.

I-2.0 COPCs FOR SITES AT TA-03

I-2.1 AOC 03-003(e)

AOC 03-003(e) is proposed for delayed investigation. Section 2.2 of the investigation report presents the details for this site.

I-2.2 AOC 03-003(i)

AOC 03-003(i) is proposed for delayed investigation. Section 2.3 of the investigation report presents the details for this site.

I-2.3 AOC 03-004(c)

A total of 26 samples (12 soil and 14 tuff) were collected in 1997 and 2009 from 12 locations at AOC 03-004(c). Table 2.4-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.4-1 shows the sampling locations.

I-2.3.1 Inorganic Chemicals at AOC 03-004(c)

Twenty-six samples were analyzed for target analyte list (TAL) metals. Twenty-one samples were also analyzed for nitrate, perchlorate, and total cyanide. Table 2.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.4-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 2.4-2.

I-2.3.1.1 Inorganic Chemicals in Soil

Twelve soil samples were analyzed for TAL metals. Seven samples were analyzed for nitrate, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.02–7.1 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in all 12 soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.47–0.59 mg/kg) above the BV (0.4 mg/kg) in all 12 soil samples. None of the DLs exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in 1 of 12 soil samples, with a maximum concentration of 13900 mg/kg. The sample result did not exceed the maximum background concentration of calcium in soil (14000 mg/kg). Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.3-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for calcium in soil is presented in Figure I-2.3-1. Calcium is identified as a COPC in soil.

Nitrate was detected in three samples and has no BV. Nitrate is identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had DLs (1.7–2.1 mg/kg) above the BV in 4 of 12 soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

I-2.3.1.2 Inorganic Chemicals in Tuff

Fourteen tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration in tuff (8370 mg/kg) in 2 of 14 tuff samples, with concentrations of 21700 and 20200 mg/kg. Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-2.3-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure I-2.3-2. Aluminum is not identified as a COPC in tuff.

Antimony was detected above the BV (0.5 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 0.755 mg/kg, and had DLs (1.04–1.28 mg/kg) above the BV in the other 13 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). The box plot for antimony in tuff is presented in Figure I-2.3-3. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 2 of 10 tuff samples, with concentrations of 52.3 and 121 mg/kg. Both sampling results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for barium in tuff is presented in Figure I-2.3-4. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 2 of 14 tuff samples, with sample concentrations of 1.25 and 3.17 mg/kg. One sample result exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.3-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.3-5. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 2 of 14 tuff samples, with concentrations of 4070 and 4990 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for calcium in tuff is presented in Figure I-2.3-6. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum tuff background concentration (13 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 48.2 mg/kg. This sample result also exceeded . Chromium also had DLs (7.33–11.8 mg/kg) above the BV in 7 tuff samples, but did not exceed the maximum background concentration. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-2.3-7. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 4.83 mg/kg. Results were compared only to the BV because it is equal to the maximum tuff background concentration. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.3-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different

than background. The box plot for cobalt in tuff is presented in Figure I-2.3-8. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum tuff background concentration (6.2 mg/kg) in 2 of 14 tuff samples, with concentrations of 8.22 and 16.6 mg/kg. Both sampling results also exceeded the . Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-2.3-9. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14500 mg/kg) in 2 of 14 tuff samples, with concentrations of 14700 and 17200 mg/kg. Neither of the results exceeded the maximum background concentration of iron in tuff (19500 mg/kg). Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-2.3-10. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum tuff background concentration (15.5 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 17.8 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.3-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-2.3-11. Lead is not identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) and above the maximum tuff background concentration (2820 mg/kg) in 2 of 14 tuff samples, with sample concentrations of 2870 and 4090 mg/kg. Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for magnesium in tuff is presented in Figure I-2.3-12. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 599 mg/kg. The sample result did not exceed the maximum background concentration of manganese in tuff (752 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for manganese in tuff is presented in Figure I-2.3-13. Manganese is identified as a COPC in tuff.

Nickel was not detected, but had one DL (12.9 mg/kg) above the BV (6.58 mg/kg) in the 14 tuff samples. The DL also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in at least one tuff sample and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had DLs (1.07–1.28 mg/kg) above the BV (0.3 mg/kg) in all 14 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 1 of 14 tuff samples, with a maximum sample concentration of 19.4 mg/kg. The sampling result did not exceed the maximum background concentration (21 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-2.3-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-2.3-14. Vanadium is identified as a COPC in tuff.

I-2.3.2 Organic Chemicals at AOC 03-004(c)

Twenty-six samples were analyzed for SVOCs. Sixteen samples were also analyzed for VOCs, and six samples were analyzed for dioxins/furans and PCBs. Table 2.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.4-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.4-3.

I-2.3.2.1 Organic Chemicals in Soil

Twelve soil samples were analyzed for SVOCs, and two samples were analyzed for dioxins/furans, PCBs, and VOCs.

The following organic chemicals were detected in soil samples at AOC 03-004(c) and are identified as COPCs in soil: benzo(b)fluoranthene; benzo(k)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofuran; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; toluene; and trichloroethene.

I-2.3.2.2 Organic Chemicals in Tuff

Fourteen tuff samples were analyzed for SVOCs and VOCs, and four samples were also analyzed for dioxins/furans and PCBs.

The following organic chemicals were detected in tuff samples at AOC 03-004(c) and are identified as COPCs in tuff: acetone; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofuran; and 1,2,3,4,6,7,8,9-octachlorodibenzodioxin.

I-2.3.3 Radionuclides at AOC 03-004(c)

Twenty-one samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 2.4-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.4-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.4-4.

I-2.3.3.1 Radionuclides in Soil

Seven soil samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Tritium was detected in one of seven soil samples with a maximum concentration of 0.043 pCi/g, and has no soil FV. Tritium is identified as a COPC in soil.

I-2.3.3.2 Radionuclides in Tuff

Fourteen tuff samples were collected at AOC 03-004(c). All 14 tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Tritium was detected in 4 of 14 tuff samples with a maximum concentration of 0.22 pCi/g. Tritium has no FV for tuff and is identified as a COPC in tuff.

I-2.3.4 Summary of COPCs at AOC 03-004(c)

The inorganic chemicals identified as COPCs at AOC 03-004(c) are antimony, barium, calcium, chromium, copper, iron, magnesium, manganese, nickel, nitrate, perchlorate, selenium, silver, and vanadium.

The organic chemicals identified as COPCs at AOC 03-004(c) are acetone; benzo(b)fluoranthene; benzo(k)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofuran; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; toluene; and trichloroethene.

The radionuclide identified as a COPC at AOC 03-004(c) is tritium.

I-2.3.5 Nature and Extent of Contamination at AOC 03-004(c)

I-2.3.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected above the BV in only one sample at location MO-605047, which is located at the source. Antimony was not detected but had a DL above the BV in the deeper sample at this location. Antimony was not detected but had DLs above the BV at all other locations away from the source. The lateral and vertical extent of antimony are defined.

Barium was detected above the BV at locations MO-605047 and MO-605048. The vertical extent is defined at both locations because concentrations decrease with depth. However, the lateral extent for barium is not defined because the highest concentration of barium (121 mg/kg) was detected at the farthest downslope location (location MO-605048).

Calcium was detected above the BV at locations 03-03303, MO-605047, and MO-605048. A single depth was sampled at location 03-03303, but the vertical extent of calcium is defined by samples from greater depths at location MO-605047. The lateral extent of calcium at location 03-03303 is also defined because concentrations decrease in samples at surrounding locations. The vertical extent of calcium is defined at locations MO-605047 and MO-605048 because concentrations decrease with depth. The lateral extent of calcium is also defined because concentrations decrease from the source (location MO-605047) to the farthest downslope location (location MO-605048).

Chromium was detected above the BV in the deepest sample at location MO-605048. The vertical extent of chromium is not defined at this location. The lateral extent for chromium is also not defined because

the highest concentration of chromium (48.2 mg/kg) was detected at the farthest downslope location (MO-605048).

Copper was detected above the BV at locations MO-605047 and MO-605048. The vertical extent of copper is defined at both locations because concentrations decrease with depth. However, the lateral extent for copper is not defined because the highest concentration of copper (16.6 mg/kg) was detected at the farthest downslope location (MO-605048).

Iron was detected above the BV at locations MO-605043 and MO-605047. The vertical extent of iron is defined because concentrations decrease with depth. The lateral extent is also defined because concentrations decreased with distance from both locations.

Magnesium was detected above the BV at locations MO-605047 and MO-605048. The vertical extent of magnesium is defined at both locations because concentrations decrease with depth. The lateral extent is also defined because concentrations decrease in the farthest downslope location (MO-605048).

Manganese was detected above the BV in only one sample at location MO-605048. The vertical extent of manganese is defined because concentrations decrease with depth at this location. However, the lateral extent of manganese is not defined because the highest concentration of manganese was detected at the farthest downslope location (location MO-605048).

Nickel, selenium, and silver were not detected above BVs at the site. The lateral and vertical extent are defined for nickel, selenium, and silver.

Nitrate was detected in multiple samples at the site, with a maximum concentration of 2.37 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent are defined for nitrate.

Perchlorate was detected in only one sample at location MO-605043. The vertical extent is defined at this location because concentrations decrease to nondetect at this location. The lateral extent is also defined because perchlorate was not detected with distance from location MO-605043.

Vanadium was detected above the BV in only one sample at location MO-605047. The vertical extent is defined at this location because concentrations decrease with depth. The lateral extent is also defined because vanadium concentrations decreased with distance from location MO-605047.

I-2.3.5.2 Nature and Extent of Organic COPCs

Acetone was detected in only one sample at location MO-605047. The vertical extent is defined at this location because concentrations decrease with depth. The lateral extent is also defined because acetone was not detected at any other locations.

Five polycyclic aromatic hydrocarbons (PAHs) [benzo(b)fluoranthene; benzo(k)fluoranthene; fluoranthene; phenanthrene; and pyrene] were detected only in a 1997 surface sample at location 03-03303. A single depth was sampled at location 03-03303, but the vertical extent of these PAHs is defined by samples in deeper depths at location MO-605047. The lateral extent of the PAHs is also defined because they were not detected with distance from those locations.

Four dioxin/furan congeners were detected at locations MO-605047 and MO-605048. The vertical extent of these dioxins/furans is defined because concentrations decrease with depth. The lateral extent is also defined because concentrations decrease or remain at very low concentrations from location MO-605047 to the farthest downslope location from the source (location MO-605048).

Toluene and trichloroethene were detected in only one sample at location MO-605046. The vertical extent of toluene and trichloroethene is defined at this location because concentrations decrease with depth. The lateral extent of toluene and trichloroethene is also defined because they were not detected with distance from location MO-605046.

I-2.3.5.3 Nature and Extent of Radionuclide COPCs

Tritium was detected at locations MO-605043 and MO-605047. The vertical extent of tritium is defined at location MO-605043 because concentrations decrease with depth. Concentrations increased slightly with depth at location MO-605047, but the vertical extent is defined by a deeper sample at location MO-605043. The lateral extent of tritium is also defined because tritium was not detected with distance from both locations.

I-2.3.5.4 Summary of Nature and Extent for AOC 03-004(c)

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral extent of barium, chromium, copper, and manganese; and the vertical extent of chromium at location MO-605048.

The lateral and vertical extent of all organic, and radionuclide COPCs are defined.

I-2.4 AOC 03-004(d)

A total of 37 samples (23 soil and 14 tuff) were collected in 1997 and 2009 from 14 locations at AOC 03-004(d). Table 2.5-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.5-1 shows the sampling locations.

I-2.4.1 Inorganic Chemicals at AOC 03-004(d)

Twenty-one samples from AOC 03-004(d) were analyzed for nitrate, perchlorate, and total cyanide. Thirty samples were analyzed for TAL metals. Table 2.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 2.5-2.

I-2.4.1.1 Inorganic Chemicals in Soil

Twenty-three soil samples were collected at AOC 03-004(d). Seven samples were analyzed for nitrate, perchlorate, and total cyanide. Sixteen soil samples were analyzed for TAL metals.

Antimony was detected above the BV (0.83 mg/kg) in 2 of 16 soil samples, with a maximum concentration of 1.44 mg/kg. Antimony also had DLs (1.12–8.2 mg/kg) above the BV in another 13 soil samples. Detected concentrations and DLs exceeded the maximum soil background concentration (1 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. The box plot for antimony in soil is presented in Figure I-2.4-1. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in 3 of 16 soil samples, with a maximum concentration of 0.92 mg/kg. Cadmium also had DLs (0.554–0.71 mg/kg) above the BV in the other 13 soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg).

Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for cadmium in soil is presented in Figure I-2.4-2. Cadmium is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in 2 of 16 soil samples, with concentrations of 7840 and 11700 mg/kg. Neither of the results exceeded the maximum background concentration of calcium in soil (14000 mg/kg). Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.4-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in soil is presented in Figure I-2.4-3. Calcium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in 2 of 16 soil samples, with concentrations of 22.4 and 33 mg/kg. Neither of the results exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in soil is presented in Figure I-2.4-4. Chromium is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 2 of 16 soil samples, with concentrations of 25.7 and 56.6 mg/kg. One sample result exceeded the maximum background concentration of lead in soil (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in soil is presented in Figure I-2.4-5. Lead is identified as a COPC in soil.

Nitrate was detected in seven soil samples and has no BV. Nitrate is identified as a COPC in soil.

Silver was detected above the BV (1 mg/kg) in 1 of 16 soil samples, with a maximum concentration of 1.3 mg/kg. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Thallium was not detected, but had DLs (1.8–2.1 mg/kg) above the BV (0.73 mg/kg) and above the maximum soil background concentration (1 mg/kg) in 5 of 16 soil samples. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in 5 of 16 soil samples, with a maximum concentration of 211 mg/kg. One sample result also exceeded the maximum soil background concentration (75.5 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-2.4-6. Zinc is identified as a COPC in soil.

I-2.4.1.2 Inorganic Chemicals in Tuff

Fourteen tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was detected above the BV (0.5 mg/kg) in 5 of 14 tuff samples, with a maximum concentration of 0.742 mg/kg, and had DLs (1.07–1.22 mg/kg) above the BV in seven other tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum

background concentration of antimony in tuff (0.4 mg/kg). The box plot for antimony in tuff is presented in Figure I-2.4-7. Antimony is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 14 tuff samples, with a maximum sample concentration of 2.14 mg/kg. The sample result also exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.4-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.4-8. Beryllium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 2 of 14 tuff samples, with concentrations of 9.81 and 25.5 mg/kg. One sample result also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.4-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-2.4-9. Chromium is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 1 of 14 tuff samples, with a maximum concentration of 6.66 mg/kg. The sample result did not exceed the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-2.4-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for nickel in tuff is presented in Figure I-2.4-10. Nickel is not identified as a COPC in tuff.

Nitrate was detected in multiple tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 4 of 14 tuff samples, with a maximum concentration of 0.764 mg/kg. Selenium also had DLs (1.07–1.18 mg/kg) above the BV in the other 10 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure I-2.4-11. Selenium is identified as a COPC in tuff.

I-2.4.2 Organic Chemicals at AOC 03-004(d)

Six samples from AOC 03-004(d) were analyzed for dioxins/furans and PCBs. Thirty samples were analyzed for SVOCs. Sixteen samples were analyzed for VOCs. Table 2.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.5-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.5-3.

I-2.4.2.1 Organic Chemicals in Soil

Twenty-three soil samples were collected at AOC 03-004(d). Two soil samples were analyzed for dioxins/furans and PCBs. Sixteen soil samples were analyzed for SVOCs. Two soil samples were analyzed for VOCs.

The following organic chemicals were detected in at least one soil sample at AOC 03-004(d) and are identified as COPCs in soil: anthracene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; carbazole; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-2.4.2.2 Organic Chemicals in Tuff

Fourteen tuff samples were collected at AOC 03-004(d). Four tuff samples were analyzed for dioxins/furans and PCBs. Fourteen tuff samples were analyzed for SVOCs and VOCs.

The following organic chemicals were detected in at least one tuff sample at AOC 03-004(d) and are identified as COPCs in tuff: Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzoic acid; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; pyrene; and total tetrachlorodibenzofurans.

I-2.4.3 Radionuclides at AOC 03-004(d)

Twenty-eight samples from AOC 03-004(d) were analyzed for gamma-emitting radionuclides. Twenty-one samples were analyzed for tritium. Twenty-eight samples were analyzed for isotopic plutonium and isotopic uranium. Table 2.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.5-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.5-4.

I-2.4.3.1 Radionuclides in Soil

Twenty-three soil samples were collected at AOC 03-004(d). Fourteen soil samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Seven were analyzed for tritium.

Plutonium-238 was detected in 5 of 14 soil samples from depths where the FV does not apply, with a maximum concentration of 0.11 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV in 4 of 14 soil samples, and was also detected in 2 samples from depths for which the FV does not apply, with a maximum concentration of 0.089 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

I-2.4.3.2 Radionuclides in Tuff

Fourteen tuff samples were collected at AOC 03-004(d). Fourteen tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Cesium-137 was detected in 1 of 14 tuff samples with a maximum concentration of 0.069 pCi/g, and has no tuff FV. Cesium-137 is identified as a COPC in tuff.

Tritium was detected in 2 of 14 tuff samples with concentrations of 0.051 and 0.13 pCi/g, and has no tuff FV. Tritium is identified as a COPC in tuff.

I-2.4.4 Summary of COPCs at AOC 03-004(d)

The inorganic chemicals identified as COPCs at AOC 03-004(d) are antimony, chromium, lead, nitrate, selenium, silver, thallium, and zinc.

The organic chemicals identified as COPCs at AOC 03-004(d) are anthracene; Aroclor-1254; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; carbazole; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at AOC 03-004(d) are cesium-137, plutonium-238, plutonium-239/240, and tritium.

I-2.4.5 Nature and Extent of Contamination at AOC 03-004(d)

I-2.4.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected above the BV at locations MO-605036, MO-605037, MO-605038, and MO-605039. The vertical extent is defined at locations MO-605036 and MO-605037 because concentrations decrease with depth. Concentrations remain essentially the same with depth at locations MO-605038 and MO-605039, and these concentrations are less than twice the tuff BV and less than the soil BV. Antimony was not detected or detected slightly above the BV at the two locations farthest away from the source (MO-605038 and MO-605041). The lateral and vertical extent of antimony are defined.

Chromium was detected above the BV at locations 03-03294 and MO-605041. The vertical extent of chromium is defined at both locations because concentrations decrease with depth. However, lateral extent is not defined because higher concentrations of chromium were detected in tuff at one of the farthest downslope locations from the source (location MO-605041).

Lead was detected above the BV at locations 03-03294 and MO-605036. The vertical extent of lead is defined at both locations because concentrations decrease with depth. The lateral extent is also defined because lead was not detected above the BV at the two locations farthest away from the source (MO-605038 and MO-605041).

Nitrate was detected in multiple simples at the site, with a maximum concentration of 1.31 mg/kg. These concentrations are likely naturally occurring and are not indicative of contamination from the source. The lateral and vertical extent are defined for nitrate.

Selenium was detected above the BV at locations MO-605035, MO-605038, and MO-605039. The vertical extent of selenium is defined at these locations because concentrations decrease with depth. Locations MO-605038 and MO-605041 are farthest away from the source. Selenium was not detected

above the BV at location MO-605041 and was detected at a concentration less than the estimated detection limit (EDL) in the deepest sample at location MO-605038. The lateral extent is also defined for selenium.

Silver was detected above the BV in only one sample at location 03-03294. The vertical extent of silver is defined at this location because concentrations decrease with depth. The lateral extent is also defined because silver was not detected above BV at the two locations farthest away from the source (locations MO-605038 and MO-605041).

Zinc was detected above the BV at locations 03-03294, 03-03296, MO-605036, MO-605038, and MO-605040. The vertical extent of zinc is defined at these locations because concentrations decrease with depth. The lateral extent is also defined because zinc was not detected or was detected within the range of background concentrations at the two locations farthest away from the source (locations MO-605038 and MO-605041).

I-2.4.5.2 Nature and Extent of Organic COPCs

Anthracene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, indeno(1,2,3-cd)pyrene, phenanthrene were detected only at location 03-03296. The vertical extent is defined for these organic chemicals at this location because concentrations decrease with depth. The lateral extent is also defined because they were not detected at any other locations.

Aroclor-1254 was detected only at location MO-605040. The vertical extent of Aroclor-1254 is defined at this location because concentrations decrease with depth. The lateral extent is also defined because Aroclor-1254 was not detected at any other locations.

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and chrysene were detected at locations 03-03296 and MO-605041. The vertical extent is defined for these organic chemicals because concentrations decrease with depth. These organic chemicals were detected in a tuff sample at location MO-605041, one of the farthest locations from the source. But the concentrations are all less than the estimated quantitation limits (EQLs). The lateral extent is also defined for these organic chemicals.

Benzoic acid was detected only at location MO-605041. The vertical extent of benzoic acid is defined because concentrations decrease with depth. The lateral extent is also defined because the concentrations of benzoic acid at location MO-605041 are less than EQLs.

Fluoranthene was detected at locations 03-03296, MO-605038, and MO-605041. The vertical extent of fluoranthene is defined because concentrations decrease with depth. The concentrations are less than EQLs at locations MO-605038 and MO-605041, and are also lower than the concentrations at location 03-03296. The lateral extent is defined for fluoranthene.

Five dioxin/furan congeners were detected at location MO-605040, and four congeners were also detected at location MO-605041. The vertical extent of the dioxin/furan congeners is defined at location MO-605040 because concentrations decrease to nondetect with depth. Concentrations at location MO-605041 do not show a consistent trend with depth, but are either unchanged or increase slightly. The vertical extent is defined for dioxin/furan congeners. The lateral extent is also defined because concentrations in general decrease location MO-605040 to location MO-605041.

Pyrene was detected at locations 03-03296, 03-03298, 03-03299, MO-605038, and MO-605041. The vertical extent of pyrene is defined at locations 03-03296, MO-605038, and MO-605041 because concentrations decrease to nondetect with depth. A single depth was sampled at locations 03-03298 and

03-03299, but the vertical extent is defined by samples in deeper depths at location MO-605041 and MO-605039, respectively. Pyrene was detected in tuff samples at locations MO-605038 and MO-605041, the two farthest locations, but the concentrations are less than EQLs and less than the concentrations at the other three locations. The lateral extent is also defined for pyrene.

I-2.4.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected at location MO-605041. The vertical extent of cesium-137 is defined because concentrations decrease with depth. The lateral extent of cesium-137 is defined because the concentration at location MO-605041 is less than at other locations.

Plutonium-238 was detected at locations 03-03294, 03-03296, 03-03298, MO-605036, and MO-605039. The vertical extent of plutonium-238 is defined at locations 03-03294, 03-03296, MO-605036, and MO-605039 because concentrations decrease with depth. A single depth was sampled at location 03-03298, but the vertical extent is defined by samples in deeper depths at location MO-605041. The lateral extent of plutonium-238 is also defined because it was not detected at locations MO-605038 and MO-605041, the two farthest locations.

Plutonium-239/240 was detected at locations 03-03294, 03-03295, 03-03296, 03-03298, and MO-605039. The vertical extent of plutonium-239/240 is defined at locations 03-03294, 03-03296, and MO-605039 because concentrations decrease with depth. A single depth was sampled at locations 03-03295 and 03-03298/, but the vertical extent is defined by samples in deeper depths at location MO-605040 and MO-605041, respectively. The lateral extent of plutonium-239/240 is also defined because it was not detected at locations MO-605038 and MO-605041, the two farthest locations.

Tritium was detected at locations MO-605035 and MO-605038. The vertical extent of tritium is defined at these two locations because concentrations decrease with depth. The lateral extent is also defined because concentrations decrease with distance from location MO-605035 to location MO-605041.

I-2.4.5.4 Summary of Nature and Extent for AOC 03-004(d)

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral extent of chromium.

The lateral and vertical extent of all organic COPCs are defined.

The lateral and vertical extent of all radionuclide COPCs are defined.

I-2.5 AOC 03-007

A total of 45 samples (11 soil, 30 tuff, and 4 sediment) were collected in 1997 and 2009 from 18 locations at AOC 03-007. Table 2.6-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.6-1 shows the sampling locations.

I-2.5.1 Inorganic Chemicals at AOC 03-007

Forty-one samples from AOC 03-007 were analyzed for nitrate, perchlorate, and total cyanide. Forty-five samples were analyzed for TAL metals. Table 2.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.6-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 2.6-1.

I-2.5.1.1 Inorganic Chemicals in Soil

Eleven soil samples were collected at AOC 03-007. Seven soil samples were analyzed for nitrate, perchlorate, and total cyanide. Eleven soil samples were analyzed for TAL metals.

Antimony was not detected, but had DLs (1.13–6.3 mg/kg) above the BV (0.83 mg/kg) in all 11 soil samples. All DLs also exceeded the maximum background concentration of antimony in soil (1 mg/kg). Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in 1 of 11 soil samples, with a maximum concentration of 0.88 mg/kg, and had DLs (0.46–0.633 mg/kg) above the BV in nine soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for cadmium in soil is presented in Figure I-2.5-1. Cadmium is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 1 of 11 soil samples, with a maximum concentration of 23.7 mg/kg. The sample result did not exceed the maximum background concentration of lead in soil (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.5-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in soil is presented in Figure I-2.5-2. Lead is identified as a COPC in soil.

Nitrate was detected in 4 of 11 soil samples and has no BVs. Nitrate is identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had DLs (1.6–1.8 mg/kg) above the BV in 4 of 11 soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in 2 of 11 soil samples, with concentrations of 51.2 and 64.6 mg/kg. Neither of the sampling results exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.5-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-2.5-3. Zinc is identified as a COPC in soil.

I-2.5.1.2 Inorganic Chemicals in Tuff

Thirty tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Aluminum was detected above the BV (7340 mg/kg) in 14 of 30 tuff samples, with a maximum concentration of 18200 mg/kg. Thirteen of the 14 results also exceeded the maximum background concentration of aluminum in tuff (8370 mg/kg). Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for aluminum in tuff is presented in Figure I-2.5-4. Aluminum is identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.504–1.19 mg/kg) above the BV in 29 of 30 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). The box plot for antimony in tuff is presented in Figure I-2.5-5. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 11 of 30 tuff samples, with a maximum concentration of 4.12 mg/kg. None of the results exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for arsenic in tuff is presented in Figure I-2.5-6. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 18 of 30 tuff samples, with a maximum concentration of 382 mg/kg. All 18 results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Barium is interpreted as being substantially different than background, and no further evaluation is necessary. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 6 of 30 tuff samples, with a maximum sample concentration of 2.54 mg/kg. Four of the six results also exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.5-7. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 15 of 30 tuff samples, with a maximum concentration of 9850 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for calcium in tuff is presented in Figure I-2.5-8. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 24 of 30 tuff samples, with a maximum concentration of 33.5 mg/kg. Fourteen of the 24 sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-2.5-9. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 12 of 30 tuff samples, with a maximum concentration of 18.8 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cobalt in tuff is presented in Figure I-2.5-10. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 16 of 30 tuff samples, with a maximum concentration of 14 mg/kg. Twelve of the 16 results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.5-2. The result of the

Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-2.5-11. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14500 mg/kg) in 9 of 30 tuff samples, with a maximum concentration of 21200 mg/kg. One sample result also exceeded the maximum background concentration of iron in tuff (19500 mg/kg). Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-2.5-12. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 15 of 30 tuff samples, with a maximum concentration of 18.2 mg/kg. Three of the 15 sampling results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-2.5-13. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 13 of 30 tuff samples, with a maximum sample concentration of 3830 mg/kg. Two of the 13 results also exceeded the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for magnesium in tuff is presented in Figure I-2.5-14. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 6 of 30 tuff samples, with a maximum concentration of 1750 mg/kg. Three of the six sample result also exceeded the maximum background concentration of manganese in tuff (752 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.5-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in tuff is presented in Figure I-2.5-15. Manganese is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 16 of 30 tuff samples, with a maximum concentration of 22.7 mg/kg. All 16 sample result also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-2.5-16. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 3 of 30 tuff samples, with a maximum concentration of 0.808 mg/kg, and had DLs (0.994–1.14 mg/kg) above the BV in 17 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure I-2.5-17. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 2 of 30 tuff samples, with concentrations of 2.15 and 3.75 mg/kg. Both sampling results also exceeded the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-2.5-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for silver in tuff is presented in Figure I-2.5-18. Silver is not identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 13 of 30 tuff samples, with a maximum concentration of 44.6 mg/kg. Eleven of the 13 sampling results also exceeded the maximum background concentration (21 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-2.5-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-2.5-19. Vanadium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration (65.6 mg/kg) in 1 of 30 tuff samples, with a maximum concentration of 70.8 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.5-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for zinc in tuff is presented in Figure I-2.5-20. Zinc is not identified as a COPC in tuff.

I-2.5.1.3 Inorganic Chemicals in Sediment

Four sediment samples were collected at AOC 03-007. All four sediment samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected but had DLs (1.1–1.26 mg/kg) above the BV (0.83 mg/kg) in all four sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.549–0.628 mg/kg) above the BV (0.4 mg/kg) in all four sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in two of four sediment samples, with sample concentrations of 12.5 and 16.7 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of chromium in sediment (9.2 mg/kg). Chromium is identified as a COPC in sediment.

Nitrate was detected in all four sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected but had DLs (1.09–1.21 mg/kg) above the BV (0.3 mg/kg) in all four sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

I-2.5.2 Organic Chemicals at AOC 03-007

Forty-one samples from AOC 03-007 were analyzed for dioxins/furans and SVOCs. Forty-five samples were analyzed for explosive compounds. Seven samples were analyzed for PCBs. Thirty-two samples were analyzed for VOCs. Table 2.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.6-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 2.6-2.

I-2.5.2.1 Organic Chemicals in Soil

Eleven soil samples were collected at AOC 03-007. Seven soil samples were analyzed for dioxins and furans. Eleven soil samples were analyzed for explosive compounds and SVOCs. Two samples were analyzed for PCBs. Two samples were analyzed for VOCs.

The following organic chemicals were detected in soil samples at AOC 03-007 and are identified as COPCs in soil: acenaphthene; acenaphthylene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; 4-chloro-3-methylphenol; 2-chloronaphthalene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.5.2.2 Organic Chemicals in Tuff

Thirty tuff samples were analyzed for dioxins/furans, explosive compounds, SVOCs, and VOCs, and five tuff samples were analyzed for PCBs.

The following organic chemicals were detected in tuff samples at AOC 03-007 and are identified as COPCs in tuff: acetone; benzo(b)fluoranthene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; tetrachloroethene; and toluene.

I-2.5.2.3 Organic Chemicals in Sediment

Four sediment samples were analyzed for dioxins/furans, explosive compounds, and SVOCs.

The following organic chemicals were detected in sediment samples at AOC 03-007 and are identified as COPCs in sediment: anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.5.3 Radionuclides at AOC 03-007

Forty-two samples from AOC 03-007 were analyzed for gamma-emitting radionuclides. Forty-one samples were analyzed for tritium, isotopic plutonium, and isotopic uranium. Forty-five samples were analyzed for isotopic thorium. Table 2.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.6-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.6-2.

I-2.5.3.1 Radionuclides in Soil

Eleven soil samples were analyzed for isotopic thorium, eight samples were analyzed for gamma-emitting radionuclides, and seven samples were analyzed for tritium, isotopic plutonium, and isotopic uranium.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) and above the maximum soil background concentration (0.055 pCi/g) in one of seven surface soil samples, with a sample concentration of 0.0669 pCi/g. The box plot for plutonium-239/240 in surface soil is presented in Figure I-2.5-22. Plutonium-239/240 is identified as a COPC in soil.

I-2.5.3.2 Radionuclides in Tuff

Thirty tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic thorium, and isotopic uranium.

Cesium-137 was detected in 1 of 30 tuff samples at a concentration of 0.075 pCi/g. Cesium-137 has no FV for tuff and is identified as a COPC in tuff.

Tritium was detected in 16 of 30 tuff samples with a maximum concentration of 0.192 pCi/g. Tritium has no FV for tuff and is identified as a COPC in tuff.

I-2.5.3.3 Radionuclides in Sediment

Four sediment samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic thorium, and isotopic uranium.

No radionuclides were detected in sediment samples from AOC 03-007.

I-2.5.4 Summary of COPCs at AOC 03-007

The inorganic chemicals identified as COPCs at AOC 03-007 are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

The organic chemicals identified as COPCs at AOC 03-007 are acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; 4-chloro-3-methylphenol; 2-chloronaphthalene; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; tetrachloroethene; toluene; and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at AOC 03-007 are cesium-137, plutonium-239/240, and tritium.

I-2.5.5 Nature and Extent of Contamination at AOC 03-007

I-2.5.5.1 Nature and Extent of Inorganic COPCs

Aluminum was detected above the BV at nine locations. Concentrations decreased with depth at seven of the nine locations, and remained essentially the same at location MO-604997 and MO-605005. Aluminum was not detected above the BV at similar depths at location MO-604996, which is close to location MO-604997. Aluminum was not detected above the BV at drainage locations downslope from location MO-605005. The lateral and vertical extent of aluminum are defined.

Arsenic was detected above the BV at seven locations. Concentrations decreased with depth at four of the seven locations, remained essentially the same at location MO-604997, and was at concentrations within the range of background at locations MO-605004 and MO-605005. Arsenic was not detected above the BV at similar depths at location MO-604996, which is close to location MO-604997. Arsenic was not detected above the BV in the drainage samples downslope from locations MO-605004 and MO-605005. The lateral and vertical extent of arsenic are defined.

Barium was detected above the BV at 11 locations. Concentrations decreased with depth at 8 of 11 locations, remained essentially the same at location MO-605005, and increased with depth at locations MO-604995 and MO-604997. Barium was not detected above the BV at similar depths at locations MO-604996, MO-604998, and MO-605169, which are close to locations MO-604995 and MO-604997. Barium was not detected above the BV in the drainage samples downslope from location MO-605005. The lateral and vertical extent of barium are defined.

Beryllium was detected above the BV at five locations. Concentrations decreased with depth at three of five locations, and were similar to or less than the maximum background concentration at locations MO-604995 and MO-604997. Beryllium was not detected above the BV at similar depths at locations MO-604996, MO-604998, and MO-605169, which are close to locations MO-604995 and MO-604997. Beryllium was not detected above the BV at locations to the east and south of the site (locations MO-605170, MO-604999, MO-605000, and MO-605001) and was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of beryllium are defined.

Cadmium was detected above the BV only in a 1997 sample at location 03-03313. A single depth was sampled at location 03-03313, but the vertical extent of cadmium is defined by deeper samples at nearby locations. Cadmium was not detected above the BV in any tuff sample. The lateral and vertical extent of cadmium are defined.

Calcium was detected above the BV at nine locations. Concentrations decreased with depth at eight of nine locations, and increased with depth at location MO-604997. Calcium was not detected above the BV at similar depths at nearby locations MO-604995 and MO-604996. Calcium was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of calcium are defined.

Chromium was detected above the BV at all 14 locations sampled at the site. Concentrations decreased with depth at 10 of 14 locations, remained essentially the same (less than or slightly above the maximum background concentration) at locations MO-604997 and MO-604998, and increased with depth at locations MO-605007 and MO-605008. Highest concentration of chromium (33.5 mg/kg) was detected in the deepest sample at the farthest downslope location in the drainage (MO-605008). The lateral and vertical extent of chromium are not defined.

Cobalt was detected above the BV at eight locations. Concentrations decreased with depth at six of eight locations, and increased slightly with depth at locations MO-604997 and MO-605005. Cobalt was not detected above the BV at similar depths at nearby location MO-604996. Cobalt was not detected above the BV in the drainage samples downslope from location MO-605005. The lateral and vertical extent of cobalt are defined.

Copper was detected above the BV at 10 locations. Concentrations decreased with depth at all 10 locations. Copper was not detected above the BV in the drainage samples downslope from location MO-605005. The lateral and vertical extent of copper are defined.

Iron was detected above the BV at seven locations. Concentrations decreased with depth at six of the seven locations, and were less than the maximum background concentration at location MO-604997. Iron was not detected above the BV at similar depths at nearby locations MO-604995 and MO-604996. Iron was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of iron are defined.

Lead was detected above the BV at 10 locations. Concentrations decreased with depth at 8 of the 10 locations, and increased with depth at locations MO-604995 and MO-604997. These concentrations are less than the maximum background concentration (15.5 mg/kg). Lead was detected above the BV at three of the five locations in the drainage, at concentrations all less than the maximum background concentration. The lateral and vertical extent of lead are defined.

Magnesium was detected above the BV at eight locations. Concentrations decreased with depth at seven of the eight locations, and increased with depth at location MO-604997. Magnesium was not detected

above the BV at similar depths at nearby locations MO-604995 and MO-604996. Magnesium was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of magnesium are defined.

Nickel was detected above the BV at eight locations. Concentrations decreased with depth at five of the eight locations, and increased with depth at locations MO-604995, MO-604997, and MO-604999. Nickel was not detected above the BV at similar depths at nearby locations MO-604996, MO-604998, MO-605000, and MO-605170. Nickel was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of nickel are defined.

Nitrate was detected at 11 of the 14 locations sampled. The detected concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at seven locations, all on the mesa top, with a maximum concentration of 0.0115 mg/kg. Concentrations decreased with depth or were detected below the estimated detection limit (EDL) at depth. Perchlorate was not detected in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of perchlorate are defined.

Selenium was detected above the BV at locations MO-604998 and MO-605170. Concentrations decreased with depth at these two locations. Selenium was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of selenium are defined.

Silver was detected above the BV only in the deepest samples at locations MO-605000 and MO-605169. Silver was not detected above the BV at similar depths at locations MO-604999 and MO-604995. Silver was not detected above the BV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of silver are defined.

Vanadium was detected above the BV at nine locations. Concentrations decreased with depth at six of the nine locations, remained essentially the same (less than the maximum background concentration) at locations MO-605004 and MO-605005, and increased slightly with depth at location MO-604997. Vanadium was not detected above the BV at similar depths at nearby locations MO-604995 and MO-604996. Vanadium was not detected above the BV in samples farthest downslope in the drainage (locations MO-605006, MO-605007, and MO-605008). The lateral and vertical extent of vanadium are defined.

I-2.5.5.2 Nature and Extent of Organic COPCs

Fourteen PAHs [acenaphthene; acenaphthylene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were all detected in surface samples (0–1 ft bgs) at several locations. In addition, benzo(b)fluoranthene, fluoranthene, and pyrene were detected in tuff samples at locations MO-605007 and MO-605008 and phenanthrene was detected in the tuff sample at location MO-605007. All concentrations decreased with depth at all locations. Concentrations of these PAHs decreased from the mesa top and down the drainage. They were either not detected or were detected below the EQL (less than 0.04 mg/kg) at the farthest downslope location MO-605008, and were at concentrations lower than at locations upslope in the drainage. The lateral and vertical extent are defined for these PAHs.

Acetone was detected in the deepest samples at locations MO-604998, MO-605169, and MO-605170. Concentrations are below the EQLs. Acetone was not detected in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of acetone are defined.

Aroclor-1260 was detected in the surface sample (0–0.5 ft bgs) at location MO-605169, and Aroclor-1254 and Aroclor-1260 were detected in the surface sample at location MO-605170. Concentrations decreased with depth at these locations. Aroclor-1254 and Aroclor-1260 were not detected in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

Benzoic acid; 4-chloro-3-methylphenol; 2-chloronaphthalene; di-n-butylphthalate; 2-methylnaphthalene; naphthalene; and 1,2,4-trimethylbenzene were detected in only one sample at the site. Concentrations for all but 1,2,4-trimethylbenzene decreased with depth. The concentration of 1,2,4-trimethylbenzene in the deepest sample at location MO-605169 is below the EQL. These organic chemicals were not detected in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of these organic chemicals are defined.

Sixteen dioxin/furan congeners were detected at multiple locations. Concentrations decreased with depth at all locations and decreased with distance down the drainage. The lateral and vertical extent of dioxin/furan congeners are defined.

Tetrachloroethene was detected in the deeper samples at locations MO-605004 and MO-605005. Concentrations are at low levels (0.00238 and 0.000844 mg/kg, respectively). Tetrachloroethene was not detected in the other drainage samples (locations MO-605006 through MO-605008). The lateral and vertical extent of tetrachloroethene are defined.

Toluene was detected in the deeper samples at locations MO-605004, MO-605005, and MO-605008. All concentrations are less than the EQLs and decreased down the drainage. The lateral and vertical extent of toluene are defined.

I-2.5.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at AOC 03-007 are cesium-137, plutonium-239/240, and tritium. Sample results are presented in Table 2.6-4 and Figure 2.6-2.

Cesium-137 was detected at location MO-605008. The vertical extent is defined at location MO-605008 because concentrations decreased with depth at this location. Because cesium-137 was detected only once at the site and at a low concentration (0.075 pCi/g in tuff at location MO-605008), the lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the FV in only one sample at location MO-605001, and the concentration decreased with depth. Plutonium-239/240 was not detected or detected above FV in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected at nine locations. Concentrations decreased slightly with depth at four locations, and increased slightly with depth at all other locations. Tritium was not detected in the drainage samples (locations MO-605004 through MO-605008). The lateral and vertical extent of tritium are defined.

I-2.5.5.4 Summary of Nature and Extent for AOC 03-007

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral and vertical extent of chromium.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-2.6 AOC 03-014(w)

AOC 03-014(w) is proposed for delayed investigation. Section 2.7 of the investigation report presents the details for this site.

I-2.7 AOC 03-014(x)

AOC 03-014(x) is proposed for delayed investigation. Section 2.8 of the investigation report presents the details for this site.

I-2.8 AOC 03-026(a)

AOC 03-026(a) is proposed for delayed investigation. Section 2.9 of the investigation report presents the details for this site.

I-2.9 SWMU 03-026(c)

SWMU 03-026(c) is proposed for delayed investigation. Section 2.10 of the investigation report presents the details for this site.

I-2.10 SWMU 03-031

SWMU 03-031 is proposed for delayed investigation. Section 2.11 of the investigation report presents the details for this site.

I-2.11 SWMU 03-034(a)

A total of 12 tuff samples were collected in 2009 from four locations at SWMU 03-034(a). Table 2.12-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.12-1 shows the sampling locations.

I-2.11.1 Inorganic Chemicals at SWMU 03-034(a)

Twelve samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide. Table 2.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.12-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 2.12-2.

I-2.11.1.1 Inorganic Chemicals in Tuff

Twelve tuff samples from SWMU 03-034(a) were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (0.89–1.18 mg/kg) above the BV (0.5 mg/kg) in all 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 12 tuff samples, with a maximum concentration of 1.76 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.11-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.11-1. Beryllium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 1 of 12 tuff samples, with a maximum concentration of 7.57 mg/kg. The sample result did not exceed the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.11-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-2.11-2. Chromium is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 12 tuff samples, with a maximum concentration of 0.569 mg/kg. Results were compared only to the BV because a background dataset for total cyanide in tuff is not available. The sample result is less than 20% above the tuff BV. Because total cyanide is detected slightly and infrequently above background (1 of 12 samples), it is not identified as a COPC in tuff.

Selenium was not detected, but had DLs (1.1–1.18 mg/kg) above the BV (0.3 mg/kg) in all 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-2.11.2 Organic Chemicals at SWMU 03-034(a)

Three samples were analyzed for dioxins/furans and PCBs. Twelve samples were analyzed for SVOCs and VOCs. Table 2.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.12-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.12-3.

I-2.11.2.1 Organic Chemicals in Tuff

Three tuff samples were analyzed for dioxins and furans, and PCBs. Twelve samples were analyzed for SVOCs and VOCs.

Benzoic Acid, total heptachlorodibenzodioxins, and methylene chloride were detected in tuff samples and are identified as COPCs in tuff.

I-2.11.3 Radionuclides at SWMU 03-034(a)

Twelve samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 2.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.12-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.12-4.

I-2.11.3.1 Radionuclides in Tuff

Twelve tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Tritium was detected in 2 of 12 tuff samples at concentrations of 0.032 and 0.0449 pCi/g. Tritium is identified as a COPC in tuff.

I-2.11.4 Summary of COPCs at SWMU 03-034(a)

The inorganic chemicals identified as COPCs at SWMU 03-034(a) are antimony, chromium, and selenium.

The organic chemicals identified as COPCs at SWMU 03-034(a) are benzoic acid, total heptachlorodibenzodioxins, and methylene chloride.

The radionuclide identified as a COPC at SWMU 03-034(a) is tritium.

I-2.11.5 Nature and Extent of Contamination at SWMU 03-034(a)

I-2.11.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV only in the deepest sample at location MO-604918. The concentration (7.57 mg/kg) is less than the maximum background concentration of chromium in tuff (13 mg/kg). The lateral and vertical extent of chromium are defined.

I-2.11.5.2 Nature and Extent of Organic COPCs

Benzoic acid was detected at locations MO-604918 and MO-604919. Methylene chloride was detected at locations MO-604916 and MO-604917. Concentrations do not change with depth and are less than or equivalent to the EQLs. The lateral and vertical extent are defined for benzoic acid and methylene chloride.

I-2.11.5.3 Nature and Extent of Radionuclide COPCs

Tritium was detected at location MO-604916. Concentrations did not change substantially with depth and are at low levels (0.032 and 0.045 pCi/g). Because tritium was detected infrequently and at no other locations, and concentrations are low, the lateral and vertical extent of tritium are defined.

I-2.11.5.4 Summary of Nature and Extent for SWMU 03-034(a)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 03-034(a).

I-2.12 SWMU 03-034(b)

SWMU 03-034(b) is proposed for delayed investigation. Section 2.13 of the investigation report presents the details for this site.

I-2.13 AOC 03-041

Twelve samples (3 soil and 9 tuff) were collected in 2009 from three locations at AOC 03-041. Table 2.14-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.14-1 shows the sampling locations.

I-2.13.1 Inorganic Chemicals at AOC 03-041

Twelve samples from AOC 03-041 were analyzed for TAL metals, total cyanide, nitrate, and perchlorate. Table 2.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.14-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 2.14-2.

I-2.13.1.1 Inorganic Chemicals in Soil

Three soil samples were collected at AOC 03-041 and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected above the BV but had a DL above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in one of three soil samples, with a maximum DL of 1.09 mg/kg. The box plot for antimony in soil is presented in Figure I-2.13-1. Antimony is identified as a COPC in soil.

Cadmium was not detected but had DLs (0.535–0.553 mg/kg) above the BV (0.4 mg/kg) in all three soil samples. No DLs exceeded the maximum soil background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-2.13-2. Cadmium is not identified as a COPC in soil.

Nitrate was detected in all three soil samples and has no BV. Nitrate is identified as a COPC in soil.

I-2.13.1.2 Inorganic Chemicals in Tuff

Nine tuff samples were collected at AOC 03-041 and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was detected above the BV (0.5 mg/kg) in two of nine tuff samples, with a maximum sample concentration of 0.586 mg/kg, and had DLs (0.999–1.08 mg/kg) above the BV in five of nine tuff samples. Because the BV exceeds the maximum tuff background concentration (0.4 mg/kg), site sampling results are compared to the BV only. Antimony is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in one of nine tuff samples, with a maximum sample concentration of 1.44 mg/kg, which is below the maximum tuff background concentration (1.8 mg/kg). The box plot for beryllium in tuff is presented in Figure I-2.13-3. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in one of nine tuff samples, with a maximum sample concentration of

4250 mg/kg. The box plot for calcium in tuff is presented in Figure I-2.13-4. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in one of nine tuff samples, with a maximum sample concentration of 7.45 mg/kg, which is below the maximum tuff background concentration (13 mg/kg). The box plot for chromium in tuff is presented in Figure I-2.13-5. Chromium is not identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) and above the maximum tuff background concentration (19,500 mg/kg) in one of nine tuff samples, with a maximum sample concentration of 22,200 mg/kg. The box plot for iron in tuff is presented in Figure I-2.13-6. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum tuff background concentration (15.5 mg/kg) in two of nine tuff samples, with a maximum sample concentration of 20.6 mg/kg. The box plot for lead in tuff is presented in Figure I-2.13-7. Lead is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in one of nine tuff samples, with a maximum sample concentration of 487 mg/kg, which is below the maximum tuff background concentration (752 mg/kg). The box plot for manganese in tuff is presented in Figure I-2.13-8. Manganese is not identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no tuff BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected but had DLs (0.991–1.17 mg/kg) above the BV (0.3 mg/kg) in all nine tuff samples. Because the BV for selenium in tuff exceeds the maximum tuff background concentration (0.105 mg/kg), the site sampling results are compared to the BV only. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in one of nine tuff samples, with a maximum sample concentration of 1.18 mg/kg, which is below the maximum tuff background concentration (1.9 mg/kg). The box plot for silver in tuff is presented in Figure I-2.13-9. Silver is not identified as a COPC in tuff.

I-2.13.2 Organic Chemicals at AOC 03-041

Twelve samples from AOC 03-041 were analyzed for SVOCs and dioxins/furans. Four samples were analyzed for PCBs. Nine samples were analyzed for VOCs. Table 2.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.14-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.14-3.

I-2.13.2.1 Organic Chemicals in Soil

Three soil samples collected at AOC 03-041 were analyzed for SVOCs and dioxins/furans. One sample was analyzed for PCBs.

The following organic chemicals were detected in one or more soil samples and are identified as COPCs in soil: Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans;

1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-2.13.2.2 Organic Chemicals in Tuff

Nine tuff samples collected at AOC 03-041 were analyzed for SVOCs, VOCs, and dioxins/furans; three tuff samples were analyzed for PCBs.

The following organic chemicals were detected in one tuff sample and are identified as COPCs in tuff: 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; and total pentachlorodibenzodioxins.

I-2.13.3 Radionuclides at AOC 03-041

Twelve samples from AOC 03-041 were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 2.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.14-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 2.14-4.

I-2.13.3.1 Radionuclides in Soil

Three soil samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

No radionuclides were detected or detected above BVs/FVs in any of the soil samples. No radionuclides are identified as COPCs in soil.

I-2.13.3.2 Radionuclides in Tuff

Nine tuff samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

Tritium was detected in five tuff samples and is identified as a COPC in tuff.

I-2.13.4 Summary of COPCs at AOC 03-041

The inorganic chemicals identified as COPCs at AOC 03-041 are antimony, calcium, iron, lead, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at AOC 03-041 are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins;

1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans.

The radionuclide identified as a COPC at AOC 03-041 is tritium.

I-2.13.5 Nature and Extent of Contamination at AOC 03-041

I-2.13.5.1 Nature and Extent of Inorganic COPCs

Antimony was not detected in the deepest samples at any locations, but the DLs increased or did not change substantially with depth at two locations (MO-604987 and MO-604989). Detected concentrations and DLs decreased or did not change substantially downslope. The lateral and vertical extent of antimony are defined.

Calcium was detected above the BV at only one location (MO-604988), on the upslope side of the site. The concentration decreased with depth, and decreased downslope. The lateral and vertical extent of calcium are defined.

Iron was detected above the BV at only one location (MO-604987), on the downslope side of the site. The concentration decreased with depth, and iron was not detected above the BV at location MO-604989, which is also on the downslope side of the site. The lateral and vertical extent of iron are defined.

Lead was detected above the BV at two locations (MO-604987 and MO-604989), both on the downslope side of the site. Lead was detected above the BV only in the deepest samples at those locations, at concentrations slightly above the maximum background concentration (15.5 mg/kg). The concentration decreased downslope from location MO-604987 to location MO-604989. The lateral and vertical extent of lead are defined.

Nitrate was detected at all three sampling locations. The concentrations decreased downslope, and all nitrate concentrations are likely naturally-occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at low concentrations in one sample at all three sampling locations. The concentration decreased with depth at all three locations, and decreased downslope. The lateral and vertical extent of perchlorate are defined.

I-2.13.5.2 Nature and Extent of Organic COPCs

Aroclor-1254 and Aroclor-1260 were detected at low concentrations (0.0054 and 0.0072 mg/kg, respectively) in one sample, at location MO-604989, and decreased with depth. PCBs were not detected at any other locations. The lateral and vertical extent of PCBs are defined.

PAHs were detected at low concentrations (less than 0.05 mg/kg) in one or two samples, and concentrations decreased with depth. Only one PAH, fluoranthene, was detected on the downslope side

of the site at location MO-604987, and its concentration decreased with depth and downslope. The lateral and vertical extent of PAHs are defined.

Dioxin/furan congeners were detected at low concentrations (generally less than 1×10^{-6} mg/kg). Concentrations of all dioxin/furan congeners decreased with depth. All deeper concentrations of 1,2,3,4,6,7,8,9-octachlordibenzodioxin are at or below the EQL. The lateral and vertical extent of dioxin/furan congeners are defined.

I-2.13.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide identified as a COPC at AOC 03-041 is tritium.

Tritium was detected at locations MO-604987 and MO-604989 on the downslope side of the site. Concentrations of tritium decreased with depth. The concentration of tritium decreased slightly with depth at location MO-604989. Concentrations decreased from locations MO-604987 and MO-604989 downslope based on samples collected from SWMU 03-045(h) (Figure 2.15-3). The lateral and vertical extent of tritium are defined.

I-2.13.5.4 Summary of Nature and Extent for AOC 03-041

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

I-2.14 SWMU 03-045(h)

A total of 22 (9 soil, 11 tuff, and 2 sediment) samples were collected in 2009 from 11 locations at SWMU y03-045(h). Table 2.15-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.15-1 shows the sampling locations.

I-2.14.1 Inorganic Chemicals at SWMU 03-045(h)

Twenty-two samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide. Table 2.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.15-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 2.15-2.

I-2.14.1.1 Inorganic Chemicals in Soil

Nine soil samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was detected above the BV (0.83 mg/kg) in one of nine soil samples, with a maximum concentration of 0.93 mg/kg. This concentration did not exceed the maximum background concentration of antimony in soil (1 mg/kg). Antimony also had DLs (1.12–1.19 mg/kg) above the BV and above the maximum background concentration in six soil samples. The box plot for antimony in soil is presented in Figure I-2.14-1. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.526–0.596 mg/kg) above the BV (0.4 mg/kg) in all nine soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in one of nine soil samples, with a maximum concentration of 30.1 mg/kg. This result did not exceed the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure I-2.14-2. Chromium is not identified as a COPC in soil.

Hexavalent chromium, nitrate, and perchlorate were detected in at least one soil sample and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in soil.

Lead was detected above the BV (22.3 mg/kg) in two of nine soil samples, with sample concentrations of 23.2 and 23.8 mg/kg. Neither of the sampling results exceeded the maximum background concentration of lead in soil (28 mg/kg). The box plot for lead in soil is presented in Figure I-2.14-3. Lead is not identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in one of nine soil samples, with a maximum concentration of 53 mg/kg. This sample result did not exceed the maximum background concentration for zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure I-2.14-4. Zinc is not identified as a COPC in soil.

I-2.14.1.2 Inorganic Chemicals in Tuff

Eleven tuff samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum background concentration of aluminum in tuff (8370 mg/kg) in 5 of 11 tuff samples, with a maximum concentration of 14500 mg/kg. Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for aluminum in tuff is presented in Figure I-2.14-5. Aluminum is identified as a COPC in tuff.

Antimony was detected above the BV (0.5 mg/kg) in 2 of 11 tuff samples, with sample concentrations of 0.503 and 0.679 mg/kg, and had DLs (1.07–1.23 mg/kg) above the BV in six tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). The box plot for antimony in tuff is presented in Figure I-2.14-6. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 11 tuff samples, with a maximum concentration equal to the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for arsenic in tuff is presented in Figure I-2.14-7. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 7 of 11 tuff samples, with a maximum sample concentration of 146 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for barium in tuff is presented in Figure I-2.14-8. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 1.4 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.14-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.14-9. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 3 of 11 tuff samples, with a maximum concentration of 4560 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for calcium in tuff is presented in Figure I-2.14-10. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 10 of 11 tuff samples, with a maximum concentration of 25 mg/kg. Three of the ten sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-2.14-11. Chromium is identified as a COPC in tuff.

Hexavalent chromium, nitrate, and perchlorate were detected in tuff samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 3 of 11 tuff samples, with a maximum concentration of 9.15 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cobalt in tuff is presented in Figure I-2.14-12. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 6 of 11 tuff samples, with a maximum concentration of 10.5 mg/kg. Two sampling results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-2.14-13. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14500 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 15000 mg/kg. The sample result did not exceed the maximum background concentration of iron in tuff (19500 mg/kg). Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-2.14-14. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 5 of 11 tuff samples, with a maximum sample concentration of 14 mg/kg. None of the sampling results exceeded the maximum background concentration (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.14-1. The result

of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-2.14-15. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 5 of 11 tuff samples, with a maximum sample concentration of 2570 mg/kg. None of the results exceeded the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for magnesium in tuff is presented in Figure I-2.14-16. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 743 mg/kg. The sample result did not exceed the maximum background concentration of manganese in tuff (752 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for manganese in tuff is presented in Figure I-2.14-17. Manganese is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 2 of 11 tuff samples, with sample concentrations of 7.02 and 11.4 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-2.14-18. Nickel is identified as a COPC in tuff.

Selenium was not detected, but had DLs (1.04–1.22 mg/kg) above the BV (0.3 mg/kg) in all 11 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 2 of 11 tuff samples, with sample concentrations of 20.7 and 21.4 mg/kg. One sample result also exceeded the maximum background concentration (21 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-2.14-19. Vanadium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration (65.6 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 88.2 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.14-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in tuff is presented in Figure I-2.14-20. Zinc is identified as a COPC in tuff.

I-2.14.1.3 Inorganic Chemicals in Sediment

Two sediment samples collected at SWMU 03-045(h) were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was detected above the BV (0.83 mg/kg) in one of the two sediment samples, with a maximum concentration of 0.995 mg/kg. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antinomy is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.578 and 0.591 mg/kg) above the BV (0.4 mg/kg) in the two sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Nitrate was detected in one of the two sediment samples and has no BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected, but had DLs (1.16 and 1.19 mg/kg) above the BV (0.3 mg/kg) in the two sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in one of two sediment samples, with a maximum concentration of 102 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of zinc in sediment (56.2 mg/kg). Zinc is identified as a COPC in sediment.

I-2.14.2 Organic Chemicals at SWMU 03-045(h)

Six samples from SWMU 03-045(h) were analyzed for dioxins and furans and PCBs. Twenty-two samples were analyzed for SVOCs. Eleven samples were analyzed for VOCs. Table 2.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.15-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 2.15-1.

I-2.14.2.1 Organic Chemicals in Soil

Two soil samples were analyzed for dioxins and furans and PCBs. Nine soil samples collected were analyzed for SVOCs.

The following organic chemicals were detected in at least one soil sample at SWMU 03-045(h) and are identified as COPCs in soil: acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.14.2.2 Organic Chemicals in Tuff

Three tuff samples were analyzed for dioxins and furans and PCBs. Eleven tuff samples collected were analyzed for SVOCs and VOCs.

The following organic chemicals were detected in at least one tuff sample at SWMU 03-045(h) and are identified as COPCs in tuff: acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; and pyrene.

I-2.14.2.3 Organic Chemicals in Sediment

One sediment sample was analyzed for dioxins and furans and PCBs. Two sediment samples collected were analyzed for SVOCs.

The following organic chemicals were detected in at least one sediment sample at SWMU 03-045(h) and are identified as COPCs in sediment: anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-2.14.3 Radionuclides at SWMU 03-045(h)

Twenty-two samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium. Table 2.15-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.15-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.15-3.

I-2.14.3.1 Radionuclides in Soil

Nine soil samples collected were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium.

Tritium was detected in one of nine soil samples with a maximum concentration of 0.055 pCi/g. Tritium is identified as a COPC in soil.

I-2.14.3.2 Radionuclides in Tuff

Eleven tuff samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium.

Cesium-137 was detected in 1 of 11 tuff samples at a concentration of 0.111 pCi/g. Cesium-137 is identified as a COPC in tuff.

I-2.14.3.3 Radionuclides in Sediment

Two sediment samples collected at SWMU 03-045(h) were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs in sediment samples.

I-2.14.4 Summary of COPCs at SWMU 03-045(h)

The inorganic chemicals identified as COPCs at SWMU 03-045(h) are aluminum, antimony, arsenic, barium, cadmium, calcium, chromium, hexavalent chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The organic chemicals identified as COPCs at SWMU 03-045(h) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 03-045(h) are cesium-137 and tritium.

I-2.14.5 Nature and Extent of Contamination at SWMU 03-045(h)

I-2.14.5.1 Nature and Extent of Inorganic COPCs

Aluminum was detected above the BV at five locations. Concentrations increased with depth at all five locations. However, all concentrations are less than twice the maximum background concentration (8370 mg/kg). Aluminum was not detected above the BV in the samples at the farthest downslope location MO-604948. The lateral and vertical extent of aluminum are defined.

Antimony was detected above the BV at locations MO-604947, MO-604976, and MO-604948. Concentrations decreased with depth or remained essentially the same with depth at these locations. Antimony was not detected above the BV at any other locations. Antimony was detected above the BV in the surface sediment sample at the farthest downslope location MO-604948, with a concentration of 0.995 mg/kg, the highest detected concentration at the site. The lateral extent of antimony is not defined, but the vertical extent is defined.

Arsenic was detected above the BV only in the deeper sample at location MO-604971. The concentration of the deeper sample (5 mg/kg) is equivalent to the maximum background concentration. Arsenic was not detected above the BV at any other locations, including the locations downslope from location MO-604971. The lateral and vertical extent of arsenic are defined.

Barium was detected above the BV at seven locations. Concentrations decreased with depth at location MO-604976, remained essentially the same at locations MO-604971 and MO-604973, and increased with depth at the other five locations. Concentrations of barium did not decrease substantially along the canyon slope, and barium was detected above the BV in the deeper sample at the farthest downslope location MO-604948, with concentrations increasing with depth at this location. The lateral and vertical extent of barium are not defined.

Calcium was detected above the BV at locations MO-604952, MO-604971, and MO-604973. Concentrations are less than twice the maximum background concentration. Calcium was not detected above the BV in the samples at farther downslope locations. The lateral and vertical extent of calcium are defined.

Chromium was detected above the BV at 10 locations. Concentrations decreased with depth at location MO-604947. Concentrations above the BV at nine locations are in the range of 7.53–25 mg/kg, and are less than twice the maximum background concentration of 13 mg/kg. Chromium was not detected above the BV in the samples farthest downslope, at location MO-604948. The lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected at four locations, and decreased with depth at location MO-604952. Hexavalent chromium was not detected at locations farther downslope. The lateral and vertical extent of hexavalent chromium are defined.

Cobalt was detected above the BV at locations MO-604948, MO-604952, and MO-604974. Concentrations increased with depth at all three locations. The highest site concentration (9.15 mg/kg) was detected at location MO-604948, the location farthest downslope. The lateral and vertical extent of cobalt are not defined.

Copper was detected above the BV at six locations. Concentrations decreased with depth at location MO-604976, and increased slightly with depth or remained essentially the same at the other five locations. Concentrations above the BV at these five locations are in the range of 5.19–10.5 mg/kg, and are less than twice the maximum background concentration of 6.2 mg/kg. Although copper was detected above the BV in the deeper sample at location MO-604948, the concentration is less than the maximum background concentration. The lateral and vertical extent of copper are defined.

Iron was detected above the BV only in the deeper sample at location MO-604971. Concentrations decreased slightly with depth at this location and the concentration of the deeper sample (15000 mg/kg) is less than the maximum background concentration of 19,500 mg/kg. Iron was not detected above the BV at all other locations, including the locations downslope from location MO-604971. The lateral and vertical extent of iron are defined.

Lead was detected above the BV at seven locations. Concentrations decreased with depth at five locations, and increased slightly with depth at locations MO-604948 and MO-604952. Concentrations in the deeper samples at these two locations are 13.4 and 14 mg/kg, less than the maximum background concentration of 15.5 mg/kg. The lateral and vertical extent of lead are defined.

Magnesium was detected above the BV at five locations. Concentrations are all less than the maximum background concentration of 2820 mg/kg. Magnesium was not detected above the BV in the samples at the farthest downslope location (MO-604948). The lateral and vertical extent of magnesium are defined.

Manganese was detected above the BV only in the deeper sample at location MO-604976. The concentration of the deeper sample (743 mg/kg) is less than the maximum background concentration of 752 mg/kg. Manganese was not detected above the BV at any other locations, including the locations downslope from location MO-604976. The lateral and vertical extent of manganese are defined.

Nickel was detected above the BV at locations MO-604952 and MO-604971. Concentrations in the deeper samples at these locations are 11.4 and 7.02 mg/kg, respectively, both less than twice or equivalent to the maximum background concentration of 7 mg/kg. Nickel was not detected above the BV at any other locations, including the locations downslope from location MO-604971. The lateral and vertical extent of nickel are defined.

Nitrate was detected in multiple simples at the site, with a maximum concentration of 1.93 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected in one sample each at three locations, with concentrations all less than the EDLs. Perchlorate was not detected in samples at the farthest downslope location MO-604948. The lateral and vertical extent of perchlorate are defined.

Vanadium was detected above the BV at locations MO-604952 and MO-604971. Concentrations in the deeper samples at these locations are 21.4 and 20.7 mg/kg, respectively, and are equivalent to the maximum background concentration of 21 mg/kg. Vanadium was not detected above the BV at all other locations, including the locations downslope from location MO-604971. The lateral and vertical extent of vanadium are defined.

Zinc was detected above the BV at locations MO-604970, MO-604973, and MO-604976. Concentrations decreased with depth at locations MO-604970 and MO-604973, and increased with depth at location MO-604976. The concentration in the deeper sample at location MO-604976 is 88.2 mg/kg, which is less than twice the maximum background concentration of 65.6 mg/kg. Zinc was not detected in samples at the farther downslope locations MO-604977 and MO-604948. The lateral and vertical extent of zinc are defined.

I-2.14.5.2 Nature and Extent of Organic COPCs

Thirteen PAHs [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were detected at various locations. Concentrations decreased with depth at most locations, except where detected only in the deeper sample at location MO-604947, and concentrations remained essentially the same at location MO-604971. Concentrations decreased down the drainage and decreased with depth at locations downslope from MO-604971. The lateral and vertical extent of PAHs are defined.

Acetone was detected only in one sample, at location MO-604972, with a concentration of 0.0319 mg/kg. Because acetone was detected infrequently and was not detected in the samples at the farther downslope locations from location MO-604972, the lateral and vertical extent of acetone are defined.

PCBs were analyzed for the samples collected at locations MO-604947, MO-604948, and MO-604952. Aroclor-1254 was detected at locations MO-604947 and MO-604952. Aroclor-1260 was detected at all

three locations. Concentrations decreased with depth at all three locations. Aroclor-1254 was not detected in the samples at the farthest downslope location MO-604948. Aroclor-1260 was detected in the surface sample at this location, with a concentration of 0.0032 mg/kg. This concentration is similar to the EQL of 0.0033 mg/kg. The lateral and vertical extent are defined for Aroclor-1254 and Aroclor-1260.

Benzoic acid was detected in one sample each at locations MO-604948, MO-604970, and MO-604972, and decreased with depth. All three concentrations are less than the EQLs. The lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected only in the deeper sample at location MO-604970, with a concentration of 0.0889 mg/kg. This concentration is less than the EQL of 0.41 mg/kg. Bis(2-ethylhexyl)phthalate was not detected at locations downslope from location MO-604970. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dioxin/furan congeners were analyzed for the samples collected at locations MO-604947, MO-604948, and MO-604952. Seven dioxin/furan congeners were detected at two or three of the locations. Concentrations decreased with depth at all three locations. Concentrations did not change substantially down the drainage, but all concentrations are at the EQLs. The lateral and vertical extent of dioxins/furans are defined.

I-2.14.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at SWMU 03-045(h) are cesium-137 and tritium. Sample results are presented in Table 2.15-4 and Figure 2.15-3.

Cesium-137 was detected only in the deeper sample at location MO-604974, with a concentration of 0.111 pCi/g. Cesium-137 was not detected or detected above the FV at any other locations, including locations farther downslope . The lateral and vertical extent of cesium-137 are defined.

Tritium was detected only in the surface sample at location MO-604973, with a concentration of approximately 0.055 pCi/g. Tritium was not detected or detected above the FV in the samples at farther downslope locations. The lateral and vertical extent of tritium are defined.

I-2.14.5.4 Summary of Nature and Extent for SWMU 03-045(h)

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral and vertical extent of barium and cobalt and the lateral extent of antimony.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-2.15 SWMU 03-049(a)

A total of 32 (6 soil, 12 tuff, and 14 sediment) samples were collected in 1997 and 2009 from 20 locations at SWMU 03-049(a). Table 2.16-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.15-1 shows the sampling locations.

I-2.15.1 Inorganic Chemicals at SWMU 03-049(a)

Twenty-four samples were analyzed for nitrate and perchlorate. Thirty-two samples were analyzed for hexavalent chromium, TAL metals, and total cyanide. Table 2.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.16-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 2.16-1.

I-2.15.1.1 Inorganic Chemicals in Soil

Six soil samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.14–1.37 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in all six soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected above the BV (0.4 mg/kg), but had DLs (0.554–0.629 mg/kg) above the BV in five of six soil samples. None of the DLs exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-2.15-1. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in two soil samples, with concentrations of 193 and 329 mg/kg. Both results exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure I-2.15-2. Chromium is identified as a COPC in soil.

Hexavalent chromium, nitrate, and perchlorate were detected in at least soil sample and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in one of six soil samples, with a maximum concentration of 37.3 mg/kg. The box plot for copper in soil is presented in Figure I-2.15-3. Copper is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) and above the maximum background concentration of lead in soil (28 mg/kg) in one of six soil samples, with a maximum concentration of 33.6 mg/kg. The box plot for lead in soil is presented in Figure I-2.15-4. Lead is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in five of six soil samples, with a maximum concentration of 128 mg/kg. One sample result also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure I-2.15-5. Zinc is identified as a COPC in soil.

I-2.15.1.2 Inorganic Chemicals in Tuff

Twelve tuff samples were collected at SWMU 03-049(a). All 12 tuff samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (0.837–2.81 mg/kg) above the BV (0.5 mg/kg) in 11 of 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 1.4 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.15-1. The

results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.15-6. Beryllium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 11 of 12 tuff samples, with a maximum concentration of 241 mg/kg. Eight of the 11 sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Chromium is interpreted as being substantially different than background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Hexavalent chromium, nitrate, and perchlorate were detected in at least one tuff sample and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in tuff.

Copper was detected above the BV (4.66 mg/kg) in 9 of 12 tuff samples, with a maximum concentration of 52.7 mg/kg. Eight of the nine results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.15-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-2.15-7. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 2 of 12 tuff samples, with concentrations of 23.4 and 31.7 mg/kg. Both sampling results also exceeded the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.15-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-2.15-8. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 3 of 12 tuff samples, with a maximum concentration of 17.4 mg/kg. All three sampling results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-2.15-1. The result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-2.15-9. Nickel is identified as a COPC in tuff.

Selenium was not detected, but had DLs (0.998–1.19 mg/kg) above the BV (0.3 mg/kg) in all 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 1 of 12 tuff samples, with a maximum concentration of 1.68 mg/kg. This sample result did not exceed the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Because the sample result did not exceed the maximum background concentration, silver is not identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration of zinc in tuff (65.6 mg/kg) in 4 of 12 tuff samples, with a maximum concentration of 259 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.15-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in tuff is presented in Figure I-2.15-10. Zinc is identified as a COPC in tuff.

I-2.15.1.3 Inorganic Chemicals in Sediment

Six sediment samples were analyzed for nitrate and perchlorate. Fourteen sediment samples were analyzed for hexavalent chromium, TAL metals, and total cyanide.

Antimony was not detected, but had DLs (0.95–4.18 mg/kg) above the BV (0.83 mg/kg) in all 14 sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Arsenic was detected above the BV (3.98 mg/kg) in 2 of 14 sediment samples, with concentrations of 4.02 and 6 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in sediment is presented in Figure I-2.15-11. Arsenic is not identified as a COPC in sediment.

Barium was detected above the BV (127 mg/kg) and above the maximum background concentration of barium in sediment (also 127 mg/kg) in 2 of 14 sediment samples, with concentrations of 152 and 171 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in sediment is presented in Figure I-2.15-12. Barium is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) in 3 of 14 sediment samples, with a maximum concentration of 1.1 mg/kg. Cadmium also had a DL (0.615 mg/kg) above the BV. Statistical tests were performed to determine if the site sampling results for cadmium are different than background. The statistical test results are presented in Table I-2.15-2. The result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for cadmium in sediment is presented in Figure I-2.15-13. Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) in 5 of 14 sediment samples, with a maximum concentration of 7890 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in sediment is presented in Figure I-2.15-14. Calcium is not identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in 13 of 14 sediment samples, with a maximum sample concentration of 465 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of chromium in sediment (9.2 mg/kg). Chromium is interpreted as being substantially different than background, and no further evaluation is necessary. Chromium is identified as a COPC in sediment.

Hexavalent chromium, nitrate, and perchlorate were detected in at least one sediment sample and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in sediment.

Cobalt was detected above the BV (4.73 mg/kg) in 2 of 14 sediment samples, with concentrations of 10.2 and 14.7 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different

than background. The box plot for cobalt in sediment is presented in Figure I-2.15-15. Cobalt is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in all 14 sediment samples, with a maximum concentration of 663 mg/kg. Copper is interpreted as being substantially different than background. No further evaluation is necessary. Copper is identified as a COPC in sediment.

Iron was detected above the BV (13800 mg/kg) in 4 of 14 sediment samples, with a maximum sample concentration of 19200 mg/kg. Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for iron in sediment is presented in Figure I-2.15-16. Iron is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 11 of 14 sediment samples, with a maximum concentration of 156 mg/kg. Nine of the 11 results also exceeded the maximum background concentration (25.6 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.15-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in sediment is presented in Figure I-2.15-17. Lead is identified as a COPC in sediment.

Manganese was detected above the BV (543 mg/kg) in 2 of 14 sediment samples, with concentrations of 1110 and 1140 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in sediment is presented in Figure I-2.15-18. Manganese is not identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) in 12 of 14 sediment samples, with a maximum concentration of 58.4 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-2.15-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in sediment is presented in Figure I-2.15-19. Nickel is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 14 sediment samples, with a maximum concentration of 0.862 mg/kg. Selenium also had DLs (0.75–2.6 mg/kg) above the BV in 13 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. The box plot for selenium in sediment is presented in Figure I-2.15-20. Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) in 2 of 14 sediment samples, with concentrations of 1.1 and 1.48 mg/kg. Silver also had one DL (1.2 mg/kg) above the BV. Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-2.15-2. The result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for silver in sediment is presented in Figure I-2.15-21. Silver is identified as a COPC in sediment.

Thallium was detected above the BV (0.73 mg/kg) in 1 of 14 sediment samples, with a maximum concentration of 1.8 mg/kg. Thallium also had DLs (0.75–2.1 mg/kg) above the BV in five sediment samples. Results were compared only to the BV because a background dataset for thallium in sediment is not available. Thallium is identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) in 3 of 14 sediment samples, with a maximum sample concentration of 34.8 mg/kg. All three results also exceeded the maximum background concentration (20 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-2.15-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for vanadium in sediment is presented in Figure I-2.15-22. Vanadium is not identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 12 of 14 sediment samples, with a maximum concentration of 564 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of zinc in sediment (56.2 mg/kg). Zinc is interpreted as being substantially different than background, and no further evaluation is necessary. Zinc is identified as a COPC in sediment.

I-2.15.2 Organic Chemicals at SWMU 03-049(a)

Six samples from SWMU 03-049(a) were analyzed for dioxins and furans. Seven samples were analyzed for PCBs. Twenty-four were analyzed for SVOCs. Fourteen were analyzed for VOCs. Table 2.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.16-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 2.16-2.

I-2.15.2.1 Organic Chemicals in Soil

Six soil samples were analyzed for SVOCs, two samples were analyzed for dioxins and furans, and three samples were analyzed for PCBs.

The following organic chemicals were detected in at least one soil sample at SWMU 03-049(a) and are identified as COPCs in soil: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.15.2.2 Organic Chemicals in Tuff

Twelve tuff samples were analyzed for SVOCs and VOCs, and three tuff samples were analyzed for dioxins/furans and PCBs.

The following organic chemicals were detected in at least one tuff sample at SWMU 03-049(a) and are identified as COPCs in tuff: acetone; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; dibenz(a,h)anthracene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; and toluene.

I-2.15.2.3 Organic Chemicals in Sediment

Fourteen sediment samples were collected at SWMU 03-049(a). One sediment sample was analyzed for dioxins/furans and PCBs, six samples were analyzed for SVOCs, and two samples were analyzed for VOCs.

The following organic chemicals were detected in at least one sediment sample at SWMU 03-049(a) and are identified as COPCs in sediment:

acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.15.3 Radionuclides at SWMU 03-049(a)

Twenty-four samples from SWMU 03-049(a) were analyzed for gamma-emitting radionuclides and tritium. Thirty-two samples were analyzed for isotopic uranium. Table 2.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.16-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.16-1.

I-2.15.3.1 Radionuclides in Soil

Six soil samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium.

Cesium-137 was detected above the FV (1.65 pCi/g) in one surface soil sample, at a concentration of 3.09 pCi/g. This result also exceeded the maximum fallout concentration of cesium-137 in soil (1.7 pCi/g). The box plot for cesium-137 in soil is presented in Figure I-2.15-23. Cesium-137 is identified as a COPC in soil.

Tritium was detected in one of six soil samples, at a concentration of 0.072 pCi/g. Tritium has no FV for soil and is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in one of six soil samples, with a maximum sample concentration of 2.73 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in soil is not available. This sample result is less than 20% above the BV. Because uranium-234 is detected slightly and infrequently above background (one of six samples), it is not identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in one of six soil samples, with a maximum sample concentration of 4.02 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in soil is not available. Uranium-238 is identified as a COPC in soil.

I-2.15.3.2 Radionuclides in Tuff

Twelve tuff samples were collected at SWMU 03-049(a). Twelve tuff samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium.

Cesium-137 was detected in 2 of 12 tuff samples with a maximum concentration of 0.288 pCi/g. Cesium-137 has no FV for tuff and is identified as a COPC in tuff.

Tritium was detected in 5 of 12 tuff samples with a maximum concentration of 0.083 pCi/g. Tritium has no FV for tuff and is identified as a COPC in tuff.

I-2.15.3.3 Radionuclides in Sediment

Fourteen sediment samples were analyzed for isotopic uranium, and six sediment samples were analyzed for gamma-emitting radionuclides and tritium.

Cesium-137 was detected above the FV (0.90 pCi/g) in one of six sediment samples, at a concentration of 0.908 pCi/g. This sample result did not exceed the maximum fallout concentration of cesium-137 in sediment (1.28 pCi/g). The box plot for cesium-137 in sediment is presented in Figure I-2.15-24. Cesium-137 is not identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in one of six sediment samples, at a concentration of 0.121 pCi/g. Results were compared to only FV because the FV is greater than the maximum fallout concentration of tritium in sediment (0.0856 pCi/g). The box plot for tritium in sediment is presented in Figure I-2.15-25. Tritium is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) in 4 of 14 sediment samples, with a maximum concentration of 3.84 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-234 are different than background. The statistical test results are presented in Table I-2.15-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-234 in sediment is presented in Figure I-2.15-26. Uranium-234 is not identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) in 1 of 14 sediment samples, with a maximum concentration of 0.233 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-235/236 are different than background. The statistical test results are presented in Table I-2.15-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-235/236 in sediment is presented in Figure I-2.15-27. Uranium-235/236 is not identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) in 6 of 14 sediment samples, with a maximum sample concentration of 5.69 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-2.15-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-2.15-28. Uranium-238 is not identified as a COPC in sediment.

I-2.15.4 Summary of COPCs at SWMU 03-049(a)

The inorganic chemicals identified as COPCs at SWMU 03-049(a) are antimony, cadmium, chromium, hexavalent chromium, copper, lead, nickel, nitrate, perchlorate, selenium, silver, thallium, and zinc.

The organic chemicals identified as COPCs at SWMU 03-049(a) are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

The radionuclides identified as COPCs at SWMU 03-049(a) are cesium-137, tritium, and uranium-238.

I-2.15.5 Nature and Extent of Contamination at SWMU 03-049(a)

I-2.15.5.1 Nature and Extent of Inorganic COPCs

Cadmium was detected above the BV at locations MO-604981, MO-604984, and MO-604985. Concentrations decreased with depth at all three locations. Concentrations decreased down the drainage and cadmium was detected only slightly above the BV in the surface sediment sample at one of the

farthest downslope location MO-604985. Concentrations decreased with depth at this location. Cadmium was not detected above the BV in the samples at the other farthest downslope location MO-604986. The lateral and vertical extent of cadmium are defined.

Chromium was detected above the BV at multiple locations. A single depth (surface) was sampled in all 1997 locations. Concentrations decreased with depth at all other locations, except at locations MO-604949, MO-604982, MO-604983, and MO-604985. Concentrations above the BV at MO-604949, MO-604982, and MO-604983 are equivalent to or slightly above the maximum background concentration of 13 mg/kg. However, concentrations increased from 58.9 to 165 mg/kg at location MO-604985, one of the farthest downslope locations. The vertical extent of chromium is not defined at location MO-604985. The highest concentrations of chromium were detected at in the surface samples at locations MO-604984 and MO-604981 (at 465 and 449 mg/kg, respectively). Concentrations decreased in the surface samples at the two farthest downslope locations MO-604985 and MO-604986 (at 58.9 and 73.8 mg/kg, respectively). The lateral extent of chromium is defined.

Hexavalent chromium was detected at five locations. Concentrations decreased with depth at three locations and hexavalent chromium was not detected in the shallower samples but only in the deeper samples at locations MO-604981 and MO-604982. Both concentrations are less than the EDLs. Hexavalent chromium was not detected in the samples at the two farthest downslope locations MO-604985 and MO-604986. The lateral and vertical extent of hexavalent chromium are defined.

Copper was detected above the BV at multiple locations. A single depth (surface) was sampled in all 1997 locations. Concentrations decreased with depth or remained essentially with depth at all other locations. Concentrations also decreased down the drainage. The lateral and vertical extent of copper are defined.

Lead was detected above the BV at multiple locations. A single depth (surface) was sampled in all 1997 locations. Concentrations decreased with depth at all other locations. Concentrations also decreased down the drainage. The lateral and vertical extent of lead are defined.

Nickel was detected above the BV at multiple locations. A single depth (surface) was sampled in all 1997 locations. Concentrations decreased with depth at all other locations. Concentrations also decreased down the drainage. The lateral and vertical extent of nickel are defined.

Nitrate was detected at six locations, with a maximum concentration of 2.98 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at four locations. Concentrations decreased with depth at three locations. Perchlorate was detected only in the deeper sample at location MO-604978, at a concentration of 0.000626 mg/kg. All perchlorate concentrations are less than the EQLs. The lateral and vertical extent of perchlorate are defined.

Selenium was detected above the BV only in the surface sample at location MO-604984. Selenium was not detected at depth or at any other locations. The lateral and vertical extent of selenium are defined.

Silver was detected above the BV at locations 03-03233, MO-604949, and MO-604984, and decreased with depth. Silver was not detected at the downslope locations. The lateral and vertical extent of silver are defined.

Thallium was detected above the BV in only one sample at location 03-03231. Thallium was not detected at any other locations at this site. The lateral and vertical extent of thallium are defined.

Zinc was detected above the BV at multiple locations. A single depth (surface) was sampled in all 1997 locations. Concentrations increased slightly at location MO-604985 and decreased with depth at all other 2009 locations. Concentrations also decreased down the drainage. The lateral and vertical extent of zinc are defined.

I-2.15.5.2 Nature and Extent of Organic COPCs

Fourteen PAHs [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 pyrene] were detected at various locations. Concentrations decreased with depth at all locations. Concentrations decreased down the drainage and relatively low concentrations were detected in the samples at the farthest downslope locations MO-604985 and MO-604986. The lateral and vertical extent are defined for PAHs.

Acetone was detected only in the deeper sample at location MO-604980. The concentration (0.00444 mg/kg) is less than the EQL of 0.0056 mg/kg. Acetone was not detected at locations downslope from location MO-604980. The lateral and vertical extent are defined for acetone.

PCBs were analyzed for the samples collected at locations MO-604949, MO-604950, and MO-604951, and for the surface sample collected at location MO-604983. Aroclor-1254 was detected at locations MO-604950, MO-604951, and MO-604983. Aroclor-1260 was detected at all four locations. Concentrations decreased with depth or remained essentially the same at locations MO-604949, MO-604950, and MO-604951. Concentrations decreased down the drainage. The lateral and vertical extent are defined for Aroclor-1254 and Aroclor-1260.

Bis(2-ethylhexyl)phthalate was detected at seven locations. Concentrations decreased with depth at all seven locations. Concentrations decreased down the drainage. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

2-Butanone was detected in only one sample at location 03-03231, with a concentration of 0.013 mg/kg. 2-Butanone was not detected at any other locations at the site, including the downslope locations. The lateral and vertical extent of 2-butanone are defined.

Methylene chloride was detected at locations 03-03231 and 03-03233, at concentrations of 0.011 and 0.012 mg/kg, respectively. Methylene chloride was not detected at any other locations at the site, including the downslope locations. The lateral and vertical extent of methylene chloride are defined.

Dioxin/furan congeners were analyzed for the samples collected at locations MO-604949, MO-604950, and MO-604951. Seventeen dioxin/furan congeners were detected at one to three locations. Concentrations decreased with depth at all three locations. Concentrations increased from location MO-604949 to location MO-604951. The vertical extent of dioxins/furans are defined, but the lateral extent is not defined.

Toluene was detected in the deeper samples only at locations MO-604980, MO-604983, and MO-604984, at concentrations less than the EQLs. Toluene was not detected at any other locations at the site, including the downslope locations. The lateral and vertical extent of toluene are defined.

I-2.15.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected or detected above the FV at five locations. Concentrations decreased with depth at all five locations. Concentrations decreased down the drainage from location MO-604983. The lateral and vertical extent of cesium-137 are defined.

Tritium was detected at six locations. Concentrations decreased with depth at two locations. Tritium was detected only in the deeper samples at the other four locations, with concentrations in the range of approximately 0.013–0.083 pCi/g. Concentrations decreased down the drainage. The lateral and vertical extent of tritium are defined.

Uranium-235/236 was detected above the BV in only one sample, the surface sample at location MO-604985. The concentration is only slightly above the BV, and concentrations decreased with depth and down the drainage. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the BV at seven locations. Concentrations decreased with depth at five locations. A single depth was sampled at locations 03-03233 and 03-03237. Concentrations decreased down the drainage, and uranium-238 was not detected above the BV at the location farthest downslope (MO-604986). The lateral and vertical extent of uranium-238 are defined.

I-2.15.5.4 Summary of Nature and Extent for SWMU 03-049(a)

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of chromium at location MO-604985.

The lateral and vertical extent of all organic COPCs are defined, except the lateral extent of dioxins/furans.

The lateral and vertical extent of all radionuclide COPCs are defined.

I-2.16 Consolidated Unit 03-049(b)-00

A total of 48 samples (18 soil and 30 tuff) were collected in 1997 and 2009 from 23 locations at Consolidated Unit 03-049(b)-00. Table 2.17-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.17-1 shows the sampling locations.

I-2.16.1 Inorganic Chemicals at Consolidated Unit 03-049(b)-00

Forty-eight samples from Consolidated Unit 03-049(b)-00 were analyzed for TAL metals. Thirty-five samples were analyzed for nitrate, perchlorate, and total cyanide. Table 2.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.17-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown on Plate 2.17-1.

I-2.16.1.1 Inorganic Chemicals in Soil

Eighteen soil samples were collected at Consolidated Unit 03-049(b)-00 and analyzed for TAL metals. Five soil samples were analyzed for total cyanide, nitrate, and perchlorate.

Antimony was detected above the BV (0.83 mg/kg) in 1 of 18 soil samples, with a maximum sample concentration of 1.03 mg/kg, and had DLs (0.534–5.77 mg/kg) above the BV in 16 of 18 soil samples. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. The box plot for antimony in soil is presented in Figure I-2.16-1. Antimony is identified as a COPC in soil.

Cadmium was not detected above the BV but had DLs (0.413–0.583 mg/kg) above the BV (0.4 mg/kg) in 16 of 18 soil samples. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. All concentrations are less than the maximum background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-2.16-2. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) and above the maximum soil background concentration (36.5 mg/kg) in 1 of 18 soil samples. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-2.16-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for chromium in soil is presented in Figure I-2.16-3. Chromium is not identified as a COPC in soil.

Cobalt was detected above the BV (8.64 mg/kg) but below the maximum soil background concentration (9.5 mg/kg) in 1 of 18 soil samples, with a maximum sample concentration of 9.47 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.16-1. The results of both the Gehan test and the quantile indicate that the site sampling results are not statistically different than background. The box plot for cobalt in soil is presented in Figure I-2.16-4. Cobalt is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) in 5 of 18 soil samples, and above the maximum background concentration (16 mg/kg) in 4 of 18 soil samples, with a maximum sample concentration of 244 mg/kg. Copper is interpreted as being substantially above background, and no further evaluation is necessary. Copper is identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in one of five soil samples, with a maximum sample concentration of 26.4 mg/kg. Total cyanide is interpreted as being substantially above background, and no further evaluation is necessary. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 4 of 18 soil samples, and above the maximum soil background concentration (28 mg/kg) in 3 of 18 soil samples, with a maximum sample concentration of 102 mg/kg. Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) but below the maximum soil background concentration (1100 mg/kg) in 1 of 18 soil samples, with a maximum sample concentration of 1090 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.16-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in soil is presented in Figure I-2.16-5. Manganese is not identified as a COPC in soil.

Nitrate and perchlorate were detected in one or more soil samples and have no soil BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) and above the maximum soil background concentration (75.5 mg/kg) in 3 of 18 soil samples, with a maximum sample concentration of 109 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.16-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-2.16-6. Zinc is identified as a COPC in soil.

I-2.16.1.2 Inorganic Chemicals in Tuff

Thirty tuff samples collected at Consolidated Unit 03-049(b)-00 were analyzed for TAL metals, nitrate, perchlorate, and total cyanide.

Aluminum was detected above the BV (7340 mg/kg) in 16 of 30 tuff samples, and above the maximum tuff background concentration (8370 mg/kg) in 15 of 30 tuff samples, with a maximum sample concentration of 22,200 mg/kg. Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for aluminum in tuff is presented in Figure I-2.16-7. Aluminum is identified as a COPC in tuff.

Antimony was detected above the BV (0.5 mg/kg) in 1 of 30 tuff samples, with a maximum sample concentration of 0.563 mg/kg, and had DLs (0.509–1.27 mg/kg) above the BV in 24 of 30 tuff samples. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. Antimony was detected above the BV infrequently and at less than 20% above the BV. Antimony is not identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 6 of 30 tuff samples, and above the maximum tuff background concentration (5 mg/kg) in 1 of 30 tuff samples, with a maximum sample concentration of 5.86 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for arsenic in tuff is presented in Figure I-2.16-8. Arsenic is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) and above the maximum tuff background concentration (51.6 mg/kg) in 19 of 30 tuff samples, with a maximum sample concentration of 485 mg/kg. Barium is interpreted as being substantially above background, and no further evaluation is necessary. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 13 of 30 tuff samples, and above the maximum background concentration (1.8 mg/kg) in 7 of 30 tuff samples, with a maximum sample concentration of 2.8 mg/kg. Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for beryllium in tuff is presented in Figure I-2.16-9. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in 16 of 30 tuff samples, with a maximum sample concentration of 8380 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for calcium in tuff is presented in Figure I-2.16-10. Calcium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 24 of 30 tuff samples, and above the maximum tuff background concentration (13 mg/kg) in 13 of 30 tuff samples, with a maximum sample concentration of 32.2 mg/kg. Chromium is interpreted as being substantially above background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 13 of 30 tuff samples, with a maximum sample concentration of 15.7 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for cobalt in tuff is presented in Figure I-2.16-11. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 15 of 30 tuff samples, and above the maximum tuff background concentration (6.2 mg/kg) in 13 of 30 tuff samples, with a maximum sample concentration of 12.5 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-2.16-12. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) in 11 of 30 tuff samples, and above the maximum background concentration (19,500 mg/kg) in 3 of 30 tuff samples, with a maximum sample concentration of 21,000 mg/kg. Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-2.16-13. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 12 of 30 tuff samples, and above the maximum tuff background concentration (15.5 mg/kg) in 6 of 30 tuff samples, with a maximum sample concentration of 41.3 mg/kg. Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 14 of 30 tuff samples, and above the maximum background concentration (2820 mg/kg) in 9 of 30 tuff samples, with a maximum sample concentration of 5170 mg/kg. Magnesium is interpreted as being substantially above background, and no further evaluation is necessary. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 5 of 30 tuff samples, and above the maximum tuff background concentration (752 mg/kg) in 2 of 30 tuff samples, with a maximum sample concentration of 1410 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.16-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in tuff is presented in Figure I-2.16-14. Manganese is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 19 of 30 tuff samples, and above the maximum tuff background concentration (7 mg/kg) in 18 of 30 tuff samples, with a maximum sample concentration of 31.3 mg/kg. Nickel is interpreted as being substantially above background, and no further evaluation is necessary. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no tuff BVs Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 4 of 30 tuff samples, with a maximum sample concentration of 0.716 mg/kg. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. The BV is greater than the maximum background concentration (0.105 mg/kg), so the site sampling results are compared to the BV only. Selenium is identified as a COPC in tuff.

Thallium was not detected above the BV but had a DL (1.16 mg/kg) above the BV (1.1 mg/kg) in 1 of 30 tuff samples. Statistical tests were performed to determine if the site sampling results for thallium are different than background. The statistical test results are presented in Table I-2.16-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for thallium in tuff is presented in Figure I-2.16-15. Thallium is not identified as a COPC in tuff.

Vanadium was detected above the BV (17 mg/kg) in 11 of 30 tuff samples, and above the maximum background concentration (21 mg/kg) in 8 of 30 tuff samples, with a maximum sample concentration of 36.7 mg/kg. Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-2.16-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-2.16-16. Vanadium is identified as a COPC in tuff.

I-2.16.2 Organic Chemicals at Consolidated Unit 03-049(b)-00

Forty-eight samples collected at Consolidated Unit 03-049(b)-00 in 1997 and 2009 were analyzed for PCBs and TPH-DRO; 35 samples were analyzed for SVOCs; 33 samples were analyzed for VOCs; 14 samples were analyzed for dioxins/furans. Table 2.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.17-3 lists the detected organic chemicals. The sampling locations and detected concentrations above BVs are shown on Plate 2.17-2.

I-2.16.2.1 Organic Chemicals in Soil

Eighteen soil samples from Consolidated Unit 03-049(b)-00 were analyzed for PCBs and TPH-DRO. Five soil samples were analyzed for SVOCs. Three soil samples were analyzed for VOCs. Two samples were analyzed for dioxins/furans.

The following organic chemicals were detected in soil samples at Consolidated Unit 03-049(b)-00 and are identified as COPCs in soil: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total

tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and TPH-DRO.

I-2.16.2.2 Organic Chemicals in Tuff

Thirty tuff samples from Consolidated Unit 03-049(b)-00 were analyzed for SVOCs, VOCs, PCBs, and TPH-DRO; twelve tuff samples were analyzed for dioxins/furans.

The following organic chemicals were detected in one or more tuff samples at Consolidated Unit 03-049(b)-00 and are identified as COPCs in tuff: acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; and TPH-DRO.

I-2.16.3 Radionuclides at Consolidated Unit 03-049(b)-00

Thirty-nine samples collected at Consolidated Unit 03-049(b)-00 in 1997 and 2009 were analyzed for isotopic uranium; 35 samples were analyzed for gamma-emitting radionuclides and tritium. Table 2.17-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.17-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 2.17-2.

I-2.16.3.1 Radionuclides in Soil

Nine soil samples were analyzed for isotopic uranium; five soil samples were analyzed for gamma-emitting radionuclides and tritium.

Tritium was detected (0.053 pCi/g) in one of five soil samples and does not have an applicable soil FV. Tritium is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in one of nine soil samples, at a concentration of 3.74 pCi/g. Because no background data set for uranium-234 in soil is available, site sample data are compared to the BV only. Uranium-234 is identified as a COPC in soil.

Uranium-235/236 was detected above the BV (0.2 pCi/g) in two of nine soil samples, with a maximum sample concentration of 0.353 pCi/g. Because no background data set for uranium-235/236 in soil is available, site sample data are compared to the BV only. Uranium-235/236 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in two of nine soil samples, with a maximum sample concentration of 17.6 pCi/g. Because no background data set for uranium-238 in soil is available, site sample data are compared to the BV only. Uranium-238 is identified as a COPC in soil.

I-2.16.3.2 Radionuclides in Tuff

Thirty tuff samples were analyzed for gamma-emitting radionuclides and isotopic uranium; 20 tuff samples were analyzed for tritium.

Tritium was detected in 12 of 20 tuff samples and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 2 of 30 tuff samples. Because no background data set for uranium-235/236 in tuff is available, site data are compared to the BV only. Uranium-235/236 is identified as a COPC in tuff.

Uranium-238 was detected above the BV (1.93 pCi/g) in 5 of 30 tuff samples. Because no background data set for uranium-238 in tuff is available, site data are compared to the BV only. Uranium-238 is identified as a COPC in tuff.

I-2.16.4 Summary of COPCs at Consolidated Unit 03-049(b)-00

The inorganic chemicals identified as COPCs at Consolidated Unit 03-049(b)-00 are aluminum, antimony, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, total cyanide, iron, lead, magnesium, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The organic chemicals identified as COPCs at Consolidated Unit 03-049(b)-00 are acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and TPH-DRO.

The radionuclides identified as COPCs at Consolidated Unit 03-049(b)-00 are tritium, uranium-234, uranium-235/236, and uranium-238.

I-2.16.5 Nature and Extent of Contamination at Consolidated Unit 03-049(b)-00

I-2.16.5.1 Nature and Extent of Inorganic COPCs

Aluminum concentrations decreased with depth at all locations, but generally increased in concentration from north to south (downslope). The vertical extent of aluminum is defined, but the lateral extent is not defined.

Antimony was detected at two locations, and decreased with depth at both locations. Concentrations of antimony decreased downslope. The lateral and vertical extent of antimony are defined.

Arsenic concentrations decreased with depth at all locations except location MO-605032, where it was detected above the BV only in the deepest sample (6.5–7.5 ft bgs). The concentration is slightly above the maximum background concentration of 5 mg/kg, and concentrations decreased downslope. The lateral and vertical extent of arsenic are defined.

Barium concentrations decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of barium are defined.

Beryllium concentrations decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of beryllium are defined.

Calcium concentrations decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of calcium are defined.

Chromium concentrations decreased with depth at all locations. The highest concentration of chromium (82.2 mg/kg) was detected in the surface sample at location MO-605029, the farthest downslope location. The vertical extent of chromium is defined, but the lateral extent is not defined.

Cobalt concentrations decreased with depth at all locations, except location 03-03255, where only one depth was sampled. At location MO-605028, approximately 10 ft from location 03-03255, cobalt decreased with depth to below the BV. Concentrations decreased downslope. The lateral and vertical extent of cobalt are defined.

Copper was detected above the BV at three locations (03-03251, 03-03252, and 03-03253) where only a single depth was sampled. At location MO-605030, immediately downslope of those three locations, copper concentrations decreased with depth. Copper decreased with depth at all 2009 locations, and concentrations decreased downslope. The lateral and vertical extent of copper are defined.

Total cyanide was detected in only one sample, the surface sample at location MO-605029, the location farthest downslope. The concentration decreased with depth. The vertical extent of total cyanide is defined, but the lateral extent is not defined.

Iron concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of iron are defined.

Lead concentrations decreased with depth at all locations, except locations 03-03251 and 03-03252, where only surface samples were collected. At location MO-605030, immediately downslope of those locations, lead concentrations decreased with depth. Concentrations increased downslope to location MO-605029, where lead was detected at 63.5 mg/kg at the surface. The vertical extent of lead is defined, but the lateral extent is not defined.

Magnesium concentrations decreased with depth at all locations, except location 03-03255, where only a surface sample was collected. At location MO-605028, less than 10 ft to the east, magnesium concentrations decreased with depth to below the BV. Concentrations decreased downslope. The lateral and vertical extent of magnesium are defined.

Nickel concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of nickel are defined.

Nitrate concentrations detected are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate concentrations decreased with depth, except at location MO-605026, where it was detected (0.000572 mg/kg) only in the deepest sample (8–10 ft bgs), and at location MO-605028, where concentrations did not change substantially with depth. Concentrations increased or did not change substantially downslope. The lateral extent of perchlorate is not defined, but the vertical extent is defined.

Selenium concentrations decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of selenium are defined.

Vanadium concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of selenium are defined.

Zinc was detected above the BV at three locations, two of which (03-03251 and 03-03252) were sampled only at the surface. At location MO-605032, concentrations decreased with depth, and at location MO-605030, immediately downslope, zinc concentrations are below the BV at all depths. Concentrations decreased downslope. The lateral and vertical extent of zinc are defined.

I-2.16.5.2 Nature and Extent of Organic COPCs

Aroclor-1242 was detected in only two samples, the deepest samples at locations MO-605025 and MO-605029. Aroclor-1242 was not detected in any other samples. Aroclor-1254 was detected at six locations where only surface samples were collected. The highest concentrations (maximum 12 mg/kg) are at locations 03-03251, 03-03252, and 03-03253. At location MO-605030, immediately south of those locations, Aroclor-1254 was detected at a lower concentration at the surface and was not detected in any of the deeper samples. Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected only in the deepest sample or increased with depth at location MO-605029, the location farthest downslope. Concentrations decreased downslope. The lateral and vertical extent of PCBs are not defined.

TPH-DRO was detected at 13 locations that were sampled at the surface only, with a maximum concentration of 3400 mg/kg at location 03-03258. Concentrations at locations sampled at multiple depths in 2009 decreased with depth, and concentrations decreased downslope. The lateral and vertical extent of TPH-DRO are defined.

Acetone was detected in the deepest samples at four locations, with a maximum concentration of 0.00763 mg/kg at location MO-605033. Toluene and 4-isopropyltoluene were detected in the surface sample at one location, 03-03252. These VOCs were not detected at any other locations, including any locations in the drainage. The lateral and vertical extent of VOCs is defined.

Concentrations of PAHs and dibenzofuran decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of PAHs are defined.

Concentrations of dioxin/furan congeners decreased with depth at all locations, and decreased or remained substantially unchanged downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-2.16.5.3 Nature and Extent of Radionuclide COPCs

Concentrations of uranium-234, uranium-235/236, and uranium-238 decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of uranium-234, uranium-235/236, and uranium-238 are defined.

Concentrations of tritium increased with depth at four locations, and decreased with depth at one location. The lateral and vertical extent of tritium are not defined.

I-2.16.5.4 Summary of Nature and Extent for Consolidated Unit 03-049(b)-00

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral extent of aluminum, chromium, total cyanide, lead, and perchlorate on the south side of the site.

The lateral and vertical extent of all organic COPCs are defined, except for the lateral and vertical extent of PCBs at one location (MO-605029) on the southern (downslope) side of the site.

The lateral and vertical extent of all radionuclide COPCs are defined except the lateral and vertical extent of tritium.

I-2.17 SWMU 03-049(e)

A total of 28 samples (7 soil, 12 tuff, and 9 sediment) were collected in 2001 and 2009 from 16 locations at SWMU 03-049(e). Table 2.18-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.18-1 shows the sampling locations.

I-2.17.1 Inorganic Chemicals at SWMU 03-049(e)

Twenty-eight samples from SWMU 03-049(e) were analyzed for TAL metals and nitrate. Twenty-four samples were analyzed for hexavalent chromium, perchlorate, and total cyanide. Table 2.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.18-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 2.18-2.

I-2.17.1.1 Inorganic Chemicals in Soil

Seven soil samples were collected at SWMU 03-049(e) and analyzed for TAL metals and nitrate. Three soil samples were analyzed for hexavalent chromium, perchlorate, and total cyanide.

Antimony was detected above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in one of seven soil samples, with a maximum sample concentration of 1.6 mg/kg. Antimony also had DLs above the BV and the maximum background concentration in two samples. Antimony is identified as a COPC in soil.

Arsenic was detected above the BV (8.17 mg/kg) and above the maximum soil background concentration (9.3 mg/kg) in three of seven soil samples, with a maximum sample concentration of 82.3 mg/kg. Arsenic is interpreted as being substantially above background, and no further evaluation is necessary. Arsenic is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in two of seven soil samples, with a maximum sample concentration of 2 mg/kg, and had DLs (0.524–0.546 mg/kg) above the BV in three of seven soil samples. All detected concentrations and DLs are below the maximum soil background concentration (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in three of seven soil samples, and above the maximum soil background concentration (36.5 mg/kg) in one of seven soil samples, with a maximum

sample concentration of 69.8 mg/kg. Chromium is interpreted as being substantially above background, and no further evaluation is necessary. Chromium is identified as a COPC in soil.

Cobalt was detected above the BV (8.64 mg/kg) but below the maximum soil background concentration (9.5 mg/kg) in one of seven soil samples, with a maximum sample concentration of 8.9 mg/kg. The box plot for cobalt in soil is presented in Figure I-2.17-1. Cobalt is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum soil background concentration (16 mg/kg) in four of seven soil samples, with a maximum sample concentration of 177 mg/kg. Copper is interpreted as being substantially above background, and no further evaluation is necessary. Copper is identified as a COPC in soil.

Iron was detected above the BV (21,500 mg/kg) and above the maximum soil background concentration (36,000 mg/kg) in one of seven soil samples, with a maximum sample concentration of 113,000 mg/kg. Iron is interpreted as being substantially above background, and no further evaluation is necessary. Iron is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in three of seven soil samples, and above the maximum soil background concentration (28 mg/kg) in two of seven soil samples, with a maximum sample concentration of 72.5 mg/kg. Lead is interpreted as being substantially above background, and no further evaluation is necessary. Lead is identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) but below the maximum soil background concentration (1100 mg/kg) in one of seven soil samples, with a maximum sample concentration of 740 mg/kg. Manganese is not identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) and above the maximum soil background concentration (29 mg/kg) in one of seven soil samples, with a maximum sample concentration of 30.1 mg/kg. Nickel is interpreted as being substantially above background, and no further evaluation is necessary. Nickel is identified as a COPC in soil.

Nitrate was detected in three of seven soil samples and has no soil BV. Nitrate is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in five of seven soil samples, and above the maximum background concentration (75.5 mg/kg) in four of seven soil samples, with a maximum sample concentration of 631 mg/kg. Zinc is interpreted as being substantially above background, and no further evaluation is necessary. Zinc is identified as a COPC in soil.

I-2.17.1.2 Inorganic Chemicals in Tuff

Twelve tuff samples collected at SWMU 03-049(e) were analyzed for TAL metals, hexavalent chromium, nitrate, perchlorate, and total cyanide.

Antimony was detected above the BV (0.5 mg/kg) in 3 of 12 tuff samples, with a maximum sample concentration of 4.72 mg/kg, and had DLs (1.06–1.29 mg/kg) above the BV in 8 of 12 tuff samples. Because more than 80% of the site and background sampling results are nondetects, no statistical comparisons were performed. Antimony is interpreted as being substantially above background, and no further evaluation is necessary. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) and above the maximum tuff background concentration (51.6 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 54.1 mg/kg. Statistical tests

were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-2.17-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-2.17-2. Barium is not identified as a COPC in tuff.

Cadmium was not detected but had a DL (2.89 mg/kg) above the BV (1.63 mg/kg) and above the maximum tuff background concentration (1.5 mg/kg) in 1 of 12 tuff samples. Statistical tests were performed to determine if the site sampling results for cadmium are different than background. The statistical test results are presented in Table I-2.17-1. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for cadmium in tuff is presented in Figure I-2.17-3. Cadmium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 10 of 12 tuff samples, and above the maximum tuff background concentration (13 mg/kg) in 4 of 12 tuff samples, with a maximum sample concentration of 27.1 mg/kg. Chromium is interpreted as being substantially above background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Hexavalent chromium was detected in 4 of 12 tuff samples and has no tuff BV. Hexavalent chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum tuff background concentration (6.2 mg/kg) in 3 of 12 tuff samples, with a maximum sample concentration of 31.5 mg/kg. Copper is interpreted as being substantially above background, and no further evaluation is necessary. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) but below the maximum background concentration (19,500 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 14,800 mg/kg. Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-2.17-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-2.17-3. Iron is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) but below the maximum tuff background concentration (752 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 553 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-2.17-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in tuff is presented in Figure I-2.17-4. Manganese is not identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 1.65 mg/kg, and had DLs (1.05–1.28 mg/kg) above the BV in 11 of 12 tuff samples. Selenium is interpreted as being substantially above background, and no further evaluation is necessary. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 2.08 mg/kg. Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-2.17-1. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for silver in tuff is presented in Figure I-2.17-5. Silver is not identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) in 2 of 12 tuff samples, and above the maximum tuff background concentration (65.6 mg/kg) in 1 of 12 tuff samples, with a maximum sample concentration of 94.2 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.17-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for zinc in tuff is presented in Figure I-2.17-6. Zinc is identified as a COPC in tuff.

I-2.17.1.3 Inorganic Chemicals in Sediment

Nine sediment samples collected at SWMU 03-049(e) were analyzed for TAL metals, hexavalent chromium, nitrate, perchlorate, and total cyanide.

Antimony was detected above the BV (0.83 mg/kg) in three of nine sediment samples, and had DLs (1.12–1.27 mg/kg) above the BV in three of nine sediment samples, with a maximum sample concentration of 2.61 mg/kg. Antimony is interpreted as being substantially above background, and no further evaluation is necessary. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.561–0.648 mg/kg) above the BV (0.4 mg/kg) in all nine sediment samples. The BV is greater than the maximum background concentration (0.18 mg/kg), so the site sampling results are compared to the BV only. Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in two of nine sediment samples, with a maximum sample concentration of 21.9 mg/kg. The BV is greater than the maximum background concentration (9.2 mg/kg), so the site sampling results are compared to the BV only. Chromium is identified as a COPC in sediment.

Hexavalent chromium was detected in one of nine sediment samples and has no sediment BV. Hexavalent chromium is identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum sediment background concentration (12 mg/kg) in three of nine sediment samples, with a maximum sample concentration of 18.5 mg/kg. Copper is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) but below the maximum sediment background concentration (25.6 mg/kg) in two of nine sediment samples, with a maximum sample concentration of 25.2 mg/kg. The box plot for lead in sediment is presented in Figure I-2.17-7. Lead is not identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) in one of nine sediment samples, with a maximum sample concentration of 9.56 mg/kg. The BV is greater than the maximum background concentration (8.9 mg/kg), so the site sampling results are compared to the BV only. Nickel was detected above the BV infrequently and less than 20% above the BV. Nickel is not identified as a COPC in sediment.

Nitrate was detected in six of nine sediment samples and has no sediment BV. Nitrate is identified as a COPC in sediment.

Selenium was not detected but had DLs (1.13–1.31 mg/kg) above the BV (0.3 mg/kg) in all nine sediment samples. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in seven of nine sediment samples, with a maximum sample concentration of 147 mg/kg. The BV is greater than the maximum background concentration

(56.2 mg/kg), so the site sampling results are compared to the BV only. Zinc is identified as a COPC in sediment.

I-2.17.2 Organic Chemicals at SWMU 03-049(e)

Twenty-four samples collected at SWMU 03-049(e) in 2001 and 2009 were analyzed for SVOCs. Sixteen samples were analyzed for dioxins/furans. Twelve samples were analyzed for VOCs. Six samples were analyzed for PCBs. Table 2.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.18-3 lists the detected organic chemicals. The sampling locations and detected concentrations above BVs are shown on Plate 2.18-1.

I-2.17.2.1 Organic Chemicals in Soil

Three soil samples from SWMU 03-049(e) were analyzed for SVOCs; one soil sample was analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in soil samples at SWMU 03-049(e) and are identified as COPCs in soil: acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; and toluene.

I-2.17.2.2 Organic Chemicals in Tuff

Twelve tuff samples from SWMU 03-049(e) were analyzed for SVOCs and VOCs; eight tuff samples were analyzed for dioxins/furans; three tuff samples were analyzed for PCBs.

The following organic chemicals were detected in one or more tuff samples at SWMU 03-049(e) and are identified as COPCs in tuff: acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

I-2.17.2.3 Organic Chemicals in Sediment

Nine sediment samples from SWMU 03-049(e) were analyzed for SVOCs; one sediment sample was analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more sediment samples at SWMU 03-049(e) and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-2.17.3 Radionuclides at SWMU 03-049(e)

Twenty-four samples collected at SWMU 03-049(e) in 2001 and 2009 were analyzed for gamma-emitting radionuclides and tritium. Table 2.18-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.18-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 2.18-3.

I-2.17.3.1 Radionuclides in Soil

Three soil samples were analyzed for gamma-emitting radionuclides and tritium.

No radionuclides were detected or detected above BVs/FVs in soil samples. No radionuclides are identified as COPCs in soil.

I-2.17.3.2 Radionuclides in Tuff

Twelve tuff samples were analyzed for gamma-emitting radionuclides and tritium.

Cesium-137 was detected in 1 of 12 tuff samples and is identified as a COPC in tuff.

I-2.17.3.3 Radionuclides in Sediment

Nine sediment samples were analyzed for gamma-emitting radionuclides and tritium.

No radionuclides were detected or detected above BVs/FVs in sediment samples. No radionuclides are identified as COPCs in sediment.

I-2.17.4 Summary of COPCs at SWMU 03-049(e)

The inorganic chemicals identified as COPCs at SWMU 03-049(e) are antimony, arsenic, cadmium, chromium, copper, hexavalent chromium, iron, lead, nickel, nitrate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 03-049(e) are acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

The radionuclide identified as a COPC at SWMU 03-049(e) is cesium-137.

I-2.17.5 Nature and Extent of Contamination at SWMU 03-049(e)

I-2.17.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected at five locations. Concentrations increased with depth at locations MO-605009 and MO-605010, and antimony was detected above the BV at location 03-14466 where only a surface sample was collected. Antimony decreased with depth or was not detected at all other locations. Concentrations decreased downslope. The lateral extent of antimony is defined, but the vertical extent is not defined at three locations near the upper end of the site.

Arsenic was detected above the BV at three locations where only surface samples were collected. At nearby locations sampled at multiple depths in 2009 (locations MO-605009, MO-605010, and MO-605012), arsenic was not detected above the BV in samples at any depths. Concentrations decreased downslope. The lateral and vertical extent of arsenic are defined.

Cadmium was detected above the BV at two locations (03-14466 and 03-14468) where only surface samples were collected. At nearby locations sampled at multiple depths in 2009 (locations MO-605009, MO-605010, and MO-605012), cadmium was not detected in samples from any depths. Concentrations decreased downslope. The lateral and vertical extent of cadmium are defined.

Chromium increased with depth, or was detected above the BV only in the deepest samples, at eight locations. The highest chromium concentrations were at locations near the top of the site, and concentrations decreased downslope. The lateral extent of chromium is defined, but the vertical extent is not defined at multiple locations.

Copper was detected above the BV at nine locations. Concentrations decreased with depth at four locations, and increased with depth at two locations. Three locations were sampled at a single depth (surface). Concentrations decreased downslope, and copper was not detected above the BV in the two

locations farthest downslope (locations MO-605011 and MO-605020). The lateral and vertical extent of copper are defined.

Hexavalent chromium was detected at four locations (MO-605011, MO-605013, MO-605016, and MO-605017), and was detected only in the deepest samples at three of those locations. Concentrations decreased downslope. The lateral extent of hexavalent chromium is defined, but the vertical extent is not defined.

Iron was detected above the BV at two locations. The highest concentration (113,000 mg/kg) is at location 03-14466, where only a surface sample was collected. At nearby locations MO-605010 and MO-605012, iron was not detected above the BV in any samples. At location MO-605014, iron was detected above the BV only in the deepest sample, and is less than the maximum background concentration (19,500 mg/kg). Concentrations decreased downslope. The lateral and vertical extent of iron are defined.

Lead was detected above the BV at three locations (03-14466, 03-14467, and 03-14468) where only surface samples were collected. At nearby locations sampled at multiple depths in 2009 (locations MO-605009, MO-605010, and MO-605012), lead decreased with depth or was not detected above the BV. Concentrations decreased downslope. The lateral and vertical extent of lead are defined.

Nickel was detected above the BV at two locations (03-14466 and MO-605012), which are less than 10 ft apart. Location 03-14466 was sampled at the surface only. At location MO-605012, nickel decreased with depth. Concentrations decreased downslope. The lateral and vertical extent of nickel are defined.

Nitrate was detected at nine locations, and all concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Selenium was detected at only one location (MO-605009) and increased with depth. Concentrations decreased downslope. The lateral extent of selenium is defined, but the vertical extent is not defined at location MO-605009.

Zinc increased with depth at one location (MO-605010), was detected above the BV only in the deepest sample at one location (MO-605013), and was detected above the BV at four locations (03-14466, 03-14467, 03-14468, and 03-14469) that were sampled at the surface only. Concentrations decreased with depth at all other locations and decreased downslope. The lateral extent of zinc is defined, but the vertical extent is not defined.

I-2.17.5.2 Nature and Extent of Organic COPCs

Aroclor-1260 was detected at three locations (MO-605009, MO-605010, and MO-605011). Concentrations decreased with depth at two locations. At location MO-605011, the concentration increased slightly, but both concentrations are low and near EQLs. Concentrations decreased downslope. The lateral and vertical extent of Aroclor-1260 are defined.

Acetone, 4-isopropyltoluene, and toluene were detected in the deepest samples at one or two locations, and VOCs were not analyzed in surface samples. The VOCs were detected infrequently and at low concentrations near or below EQLs. Concentrations decreased downslope. The lateral and vertical extent of VOCs are defined.

PAHs decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of PAHs are defined.

Dioxin/furan congeners decreased with depth, except at location MO-605013, where most of the congeners increased slightly with depth or were detected only in the deepest sample. Concentrations are very low and are at or below EQLs. Concentrations decreased downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-2.17.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected in one tuff sample. The concentration decreased with depth at that location (MO-605015), but the surface (sediment) sample concentration (0.757 pCi/g) is below the sediment FV. Concentrations decreased downslope. The lateral and vertical extent of cesium-137 are defined.

I-2.17.5.4 Summary of Nature and Extent for SWMU 03-049(e)

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of antimony, chromium, hexavalent chromium, selenium, and zinc.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-2.18 SWMU 03-054(e)

A total of 14 samples (8 soil, 4 sediment, and 2 tuff) were collected in 1995 and 2009 from 10 locations at SWMU 03-054(e). Table 2.19-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.19-1 shows the sampling locations.

I-2.18.1 Inorganic Chemicals at SWMU 03-054(e)

Fourteen samples were analyzed for TAL metals and total cyanide; six samples were analyzed for nitrate and perchlorate. Table 2.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.19-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 2.19-2.

I-2.18.1.1 Inorganic Chemicals in Soil

Eight soil samples were analyzed for TAL metals.

Total cyanide was not detected but had DLs (1.11–1.35 mg/kg) above the BV (0.5 mg/kg) in all eight soil samples. Total cyanide is identified as a COPC in soil.

Mercury was not detected but had DLs (0.11–0.12 mg/kg) above the BV (0.1 mg/kg) in all eight soil samples. Mercury is identified as a COPC in soil.

Thallium was not detected but had DLs (1–1.3 mg/kg) above the BV (0.73 mg/kg) in all eight soil samples, and above the maximum soil background concentration (1 mg/kg) in seven of eight soil samples. The box plot for thallium in soil is presented in Figure I-2.18-1. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in seven of eight soil samples, and above the maximum soil background concentration (75.5 mg/kg) in one of eight samples, with a maximum sample concentration of 112 mg/kg. The box plot for zinc in soil is presented in Figure I-2.18-2. Zinc is identified as a COPC in soil.

I-2.18.1.2 Inorganic Chemicals in Tuff

Two tuff samples were collected at SWMU 03-054(e) and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected but had DLs (1.14–1.15 mg/kg) above the BV (0.5 mg/kg) and above the maximum tuff background concentration (1 mg/kg) in both tuff samples. The box plot for antimony in tuff is presented in Figure I-2.18-3. Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in both tuff samples, and above the maximum tuff background concentration (13 mg/kg) in one tuff sample, with a maximum sample concentration of 18.7 mg/kg. The box plot for chromium in tuff is presented in Figure I-2.18-4. Chromium is identified as a COPC in tuff.

Nitrate was detected in both tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was not detected but had DLs above the BV (0.3 mg/kg) in both tuff samples, with a maximum sample concentration of 1.14 mg/kg. Selenium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum tuff background concentration (65.6 mg/kg) in one of two tuff samples, with a maximum sample concentration of 75.8 mg/kg. The box plot for zinc in tuff is presented in Figure I-2.18-5. Zinc is identified as a COPC in tuff.

I-2.18.1.3 Inorganic Chemicals in Sediment

Four sediment samples were collected at SWMU 03-054(e) and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected, but had DLs (0.881–1.22 mg/kg) above the BV (0.83 mg/kg) in three of four sediment samples. Antimony is identified as a COPC in sediment.

Cadmium was not detected, but had DLs (0.549–0.638 mg/kg) above the BV (0.4 mg/kg) in all four sediment samples. Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) in two of four sediment samples, with a maximum sample concentration of 7570 mg/kg. Calcium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in one of four sediment samples, with a sample concentration of 11 mg/kg. The sample concentration is less than 20% above the BV. The box plot for chromium in sediment is presented in Figure I-2.18-6. Chromium is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in one of seven sediment samples, with a maximum sample concentration of 12.3 mg/kg. The box plot for copper in sediment is presented in Figure I-2.18-7. Copper is identified as a COPC in sediment.

Nitrate was detected in all four sediment samples and has no BVs. Nitrate is identified as a COPC in sediment.

Selenium was not detected, but had DLs (1.08–1.22 mg/kg) above the BV (0.3 mg/kg) in all four sediment samples. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in all four sediment samples. Zinc is identified as a COPC in sediment.

I-2.18.2 Organic Chemicals at SWMU 03-054(e)

Fourteen samples from SWMU 03-054(e) were analyzed for SVOCs and PCBs; six samples were analyzed for VOCs, and three samples were analyzed for dioxins/furans. Table 2.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.19-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.19-3.

I-2.18.2.1 Organic Chemicals in Soil

Eight soil samples collected at SWMU 03-054(e) were analyzed for SVOCs and PCBs, and four soil samples were analyzed for VOCs.

The following organic chemicals were detected in one or more soil samples and are identified as COPCs in soil: Aroclor-1260; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; diethylphthalate; fluoranthene; and pyrene.

I-2.18.2.2 Organic Chemicals in Tuff

Two tuff samples collected at SWMU 03-054(e) were analyzed for SVOCs, VOCs, and PCBs; one tuff sample was analyzed for dioxins/furans.

The following organic chemicals were detected in one tuff sample and are identified as COPCs in tuff: Aroclor-1254 and 1,2,3,4,6,7,8,9-octachlorodibenzodioxin.

I-2.18.2.3 Organic Chemicals in Sediment

Four sediment samples collected at SWMU 03-054(e) were analyzed for SVOCs and PCBs; two sediment samples were analyzed for dioxins/furans.

The following organic chemicals were detected in one or more sediment samples and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1242; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-2.18.3 Radionuclides at SWMU 03-054(e)

Sixteen samples from SWMU 03-054(e) were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 2.19-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.19-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 2.19-4.

I-2.18.3.1 Radionuclides in Soil

Eight soil samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Europium-152 and sodium-22 were each detected in one soil sample and have no FVs. Europium-152 and sodium-22 are identified as COPCs in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in two of eight surface soil samples, with a maximum sample concentration of 0.043 pCi/g, and was detected in two soil samples from depths for which the FV does not apply. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected in one soil sample from a depth for which the FV does not apply. Plutonium-239/240 is identified as a COPC in soil.

I-2.18.3.2 Radionuclides in Tuff

Two tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs in the tuff samples. No radionuclides are identified as COPCs in tuff.

I-2.18.3.3 Radionuclides in Sediment

Four sediment samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

No radionuclides were detected or detected above BVs/FVs in the sediment samples. No radionuclides are identified as COPCs in sediment.

I-2.18.4 Summary of COPCs at SWMU 03-054(e)

The inorganic chemicals identified as COPCs at SWMU 03-054(e) are antimony, cadmium, chromium, copper, total cyanide, mercury, nitrate, selenium, thallium, and zinc.

The organic chemicals identified as COPCs at SWMU 03-054(e) are acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; diethylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 03-054(e) are europium-152, plutonium-238, plutonium-239/240, and sodium-22.

I-2.18.5 Nature and Extent of Contamination at SWMU 03-054(e)

I-2.18.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV only in the deepest sample at two locations (locations MO-605022 and MO-605023) and at a location where only a surface sample was collected (location MO-605021). Concentrations are less than, equal to, or slightly above the maximum background concentration (13 mg/kg). Concentrations decreased downslope. The lateral and vertical extent of chromium are defined.

Copper was detected above the BV at only one location, MO-605021, where only a surface sample was collected. At nearby location 03-02715, where two depths were sampled, copper was not detected above the BV in either sample. Concentrations decreased downslope to below BVs. The lateral and vertical extent of copper are defined.

Nitrate was detected at five locations. All nitrate concentrations are low (maximum 2.18 mg/kg) and consistent with naturally-occurring nitrate in soil and rock. The lateral and vertical extent of nitrate are defined.

Zinc was detected above the BV at eight locations. Concentrations increased with depth at two of those locations (03-02715 and 03-02718), and concentrations were above the BV at five locations sampled only at the surface. Concentrations decreased downslope. The lateral extent of zinc is defined, but the vertical extent is not defined at multiple locations.

I-2.18.5.2 Nature and Extent of Organic COPCs

Aroclor-1242 was detected at one location (MO-605021) where only a surface sample was collected. At nearby location 03-02715, Aroclor-1242 was not detected in either depth sampled. Aroclor-1254 was detected at only one location (MO-605023), in the deepest sample. The concentration was low and near the EQL. Aroclor-1260 was detected at four locations, three of which were sampled only at the surface. The concentrations are very low in all samples (maximum 0.0596 mg/kg), and concentrations decreased downslope. The lateral and vertical extent of PCBs are defined.

Multiple PAHs were detected at one or more locations and decreased with depth at locations where two depths were sampled. The highest concentrations of most detected PAHs were at location MO-605022, the farthest downslope location sampled in 2009. The vertical extent of PAHs is defined, but the lateral extent is not defined.

Bis(2-ethylhexyl)phthalate was detected at two locations. Concentrations decreased at location MO-605022, but bis(2-ethylhexyl)phthalate was detected at location MO-605021, where only a surface sample was collected. Diethylphthalate was also detected in the single sample depth at location 03-02717. The lateral and vertical extent of phthalates are not defined.

Dioxin/furan congeners were detected at one or two locations (MO-605021 and MO-605022). Location MO-605021 was sampled at the surface only. Concentrations of dioxins/furans decreased with depth at location MO-605022. Concentrations of most congeners increased downslope from location MO-605021 to location MO-605022. The lateral extent of dioxin/furan congeners is not defined, but the vertical extent is defined.

Benzoic acid was detected in the surface sample at location MO-603021, but was not detected in the deeper sample or at any other locations. The lateral and vertical extent of benzoic acid are defined.

I-2.18.5.3 Nature and Extent of Radionuclide COPCs

The radionuclides identified as COPCs at SWMU 03-054(e) are europium-152, plutonium-238, plutonium-239/240, and sodium-22.

Europium-152 was detected at one location (03-02719) where only a surface sample was collected. At nearby locations 03-02718, MO-605023, and MO-605024, europium-152 was not detected. Concentrations decreased downslope. The lateral and vertical extent of europium-152 are defined.

Plutonium-238 was detected at five locations sampled in 1995. Concentrations increased slightly with depth at two locations (03-02715 and 03-02718). Plutonium-238 was not detected in any nearby samples collected in 2009. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected at one location sampled in 1995. The concentration increased slightly with depth at location 03-02718. Plutonium-239/240 was not detected at any nearby locations sampled in 2009. The lateral and vertical extent of plutonium-239/240 are defined.

Sodium-22 was detected in the single sample at one location (03-02720). Sodium-22 was not detected in any nearby samples collected in 2009. The lateral and vertical extent of sodium-22 are defined.

I-2.18.5.4 Summary of Nature and Extent for SWMU 03-054(e)

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of zinc.

The lateral and vertical extent of all organic COPCs are defined, except for the lateral and vertical extent of phthalates and the lateral extent of PAHs and dioxin/furan congeners.

The lateral and vertical extent of all radionuclide COPCs are defined.

I-2.19 AOC C-03-006

A total of 18 samples (13 soil and 5 tuff) were collected in 1995 and 2009 from 11 locations at AOC C-03-006. Table 2.20-1 summarizes the samples collected and the requested analyses for each sample. Figure 2.19-1 shows the sampling locations.

I-2.19.1 Inorganic Chemicals at AOC C-03-006

Ten samples from AOC C-03-006 were analyzed for nitrate and perchlorate. All 18 samples were analyzed for TAL metals and total cyanide. Table 2.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.20-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 2.20-1.

I-2.19.1.1 Inorganic Chemicals in Soil

Thirteen soil samples were analyzed for TAL metals and total cyanide, and five samples were also analyzed for nitrate and perchlorate.

Antimony was detected above the BV (0.83 mg/kg) in 1 of 13 soil samples, at a concentration of 0.862 mg/kg. This sample result did not exceed the maximum background concentration of antimony in

soil (1 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for antimony in soil is presented in Figure I-2.19-1. Antimony is not identified as a COPC in soil.

Cadmium was not detected above the BV (0.4 mg/kg), but had DLs (0.544–0.615 mg/kg) above the BV in 5 of 13 soil samples. None of the DLs exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for cadmium in soil is presented in Figure I-2.19-2. Cadmium is not identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in 1 of 13 soil samples, with a maximum concentration of 6760 mg/kg. The sample result did not exceed the maximum background concentration of calcium in soil (14000 mg/kg). Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-2.19-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in soil is presented in Figure I-2.19-3. Calcium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in 1 of 13 soil samples, with a maximum concentration of 16.6 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-2.19-1. The result of the Gehan test indicates that the site sampling results are not statistically different than background, while the result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for copper in soil is presented in Figure I-2.19-4. Copper is identified as a COPC in soil.

Total cyanide was not detected above the BV (0.5 mg/kg), but had DLs (1.11–1.35 mg/kg) above the BV in 8 of 13 soil samples. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 1 of 13 soil samples, with a maximum concentration of 23.9 mg/kg. The sample result did not exceed the maximum background concentration of lead in soil (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-2.19-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in soil is presented in Figure I-2.19-5. Lead is not identified as a COPC in soil.

Mercury was not detected above the BV (0.1 mg/kg), but had DLs (0.11 or 0.12 mg/kg) above the BV and above the maximum soil background concentration (0.1 mg/kg) in 8 of 13 soil samples. Statistical tests could not be performed because the more than 80% of the combined data (background and site data) are nondetects. The box plot for mercury in soil is presented in Figure I-2.19-6. Mercury is identified as a COPC in soil.

Nitrate was detected in five soil samples and has no BV. Nitrate is identified as a COPC in soil.

Sodium was detected above the BV (915 mg/kg) in 1 of 13 soil samples, with a maximum concentration of 1120 mg/kg. The sample result did not exceed the maximum background concentration of sodium in soil (1800 mg/kg). Statistical tests were performed to determine if the site sampling results for sodium are different than background. The statistical test results are presented in Table I-2.19-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different

than background. The box plot for sodium in soil is presented in Figure I-2.19-7. Sodium is not identified as a COPC in soil.

Thallium was not detected, but had DLs (1–1.3 mg/kg) above the BV (0.73 mg/kg) in 8 of 13 soil samples. Seven of the DLs also exceeded the maximum background concentration of thallium in soil (1 mg/kg). Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in 9 of 13 soil samples, with a maximum sample concentration of 112 mg/kg. Two sampling results also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-2.19-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-2.19-8. Zinc is identified as a COPC in soil.

I-2.19.1.2 Inorganic Chemicals in Tuff

Five tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was detected above the BV (0.5 mg/kg) in two of five tuff samples, at concentrations of 0.625 and 0.683 mg/kg. Antimony also had DLs (1.13 and 1.19 mg/kg) above the BV in two tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in two of five tuff samples, at concentrations of 47 and 56.9 mg/kg. One sample result also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). The box plot for barium in tuff is presented in Figure I-2.19-9. Barium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in four of five tuff samples, with a maximum sample concentration of 39.2 mg/kg. Three of the four sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure I-2.19-10. Chromium is identified as a COPC in tuff.

Iron was detected above the BV (14500 mg/kg) in one of five tuff samples, with a maximum concentration of 15800 mg/kg. The sample result did not exceed the maximum background concentration of iron in tuff (19500 mg/kg). The box plot for iron in tuff is presented in Figure I-2.19-11. Iron is not identified as a COPC in tuff.

Nitrate was detected in all five tuff samples and has no BV. Nitrate is identified as a COPC in tuff.

Selenium was not detected, but had DLs (1.11–1.18 mg/kg) above the BV (0.3 mg/kg) in all five tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-2.19.2 Organic Chemicals at AOC C-03-006

Two samples were analyzed for dioxins and furans. Eighteen samples were analyzed for PCBs and SVOCs. Twelve samples were analyzed for VOCs. Table 2.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.20-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 2.20-2.

I-2.19.2.1 Organic Chemicals in Soil

One soil sample was analyzed for dioxins and furans. All 13 soil samples were analyzed for PCBs and SVOCs. Seven soil samples were analyzed for VOCs.

The following organic chemicals were detected in at least one soil sample at AOC C-03-006 and are identified as COPCs in soil: Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; diethylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-2.19.2.2 Organic Chemicals in Tuff

One tuff sample was analyzed for dioxins and furans. Five tuff samples were analyzed for PCBs, SVOCs, and VOCs.

The following organic chemicals were detected in one tuff sample at AOC C-03-006 and are identified as COPCs in tuff: 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,2,3,4,6,7,8,9-octachlorodibenzofuran.

I-2.19.3 Radionuclides at AOC C-03-006

Eighteen samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Table 2.20-1 summarizes the samples collected and the requested analyses for each sample.

Table 2.20-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 2.20-3.

I-2.19.3.1 Radionuclides in Soil

Thirteen soil samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Europium-152 was detected in 1 of 13 soil samples at a concentration of 0.211 pCi/g. Europium-152 has no BV for soil and is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in four surface soil samples and was detected in two soil samples from depths where the FV does not apply, with a maximum concentration of 0.0894 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in one surface soil sample and was detected in one sample from a depth where the FV does not apply, at a concentration of 0.127 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Sodium-22 was detected in 1 of 13 soil samples at a concentration of 0.0681 pCi/g. Sodium-22 has no BV for soil and is identified as a COPC in soil.

I-2.19.3.2 Radionuclides in Tuff

Five tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Tritium was detected in one of five tuff samples with a maximum concentration of 0.067 pCi/g. Tritium has no FV for tuff and is identified as a COPC in tuff.

I-2.19.4 Summary of COPCs at AOC C-03-006

The inorganic chemicals identified as COPCs at AOC C-03-006 are antimony, barium, chromium, copper, total cyanide, mercury, nitrate, selenium, thallium, and zinc.

The organic chemicals identified as COPCs at AOC C-03-006 are Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; diethylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at AOC C-03-006 are europium-152; plutonium-238; plutonium-239/240; sodium-22; and tritium.

I-2.19.5 Nature and Extent of Contamination at AOC C-03-006

I-2.19.5.1 Nature and Extent of Inorganic COPCs

The lateral and vertical extent of the inorganic COPCs are evaluated for the locations MO-604990 through MO-604994, on the mesa top. The lateral and vertical extent of the inorganic COPCs at the locations on the canyon slope (locations 03-02715 through 03-02720) are evaluated in SWMU 03-054(e) because the slope locations are assigned to both sites.

Antimony was detected above the BV at locations MO-604992 and MO-604994. Concentrations did not change substantially with depth and all concentrations are less than the EDLs. Antimony was not

detected or detected above the BV at any other locations. The lateral and vertical extent of antimony are defined.

Barium was detected above the BV at locations MO-604990 and MO-604992. Concentrations increased with depth at location MO-604990 to slightly above the maximum background concentration (51.6 mg/kg), and decreased with depth at location MO-604992. The lateral and vertical extent of barium at these two locations are defined by samples at nearby location MO-604991, where barium was not detected above the BV.

Chromium was detected above the BV at four locations. Concentrations increases with depth at all four locations. The vertical extent of chromium is not defined. There is no clear change in concentration laterally. The lateral extent of chromium is not defined.

Copper was detected above the BV only in the surface sample at location MO-604991. Concentrations decreased with depth at this location. Copper was not detected above the BV at similar depths at nearby locations MO-604990 and MO-604992. The lateral and vertical extent of copper are defined.

Nitrate was detected in all simples on mesa top, with a maximum concentration of 5.85 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Zinc was detected above the BV at locations MO-604991 and MO-604992. Concentrations decreased with depth at both locations. Zinc was not detected in samples at nearby location MO-604990. The lateral and vertical extent of zinc are defined.

I-2.19.5.2 Nature and Extent of Organic COPCs

The lateral and vertical extent of the organic COPCs are evaluated for locations MO-604990 through MO-604994, on the mesa top. The lateral and vertical extent of the organic COPCs at the locations on the canyon slope (locations 03-02715 through 03-02720) are evaluated with SWMU 03-054(e) because the slope locations are assigned to both sites.

Aroclor-1260, benzo(k)fluoranthene, and diethylphthalate were not detected on the mesa top. The lateral and vertical extent of Aroclor-1260, benzo(k)fluoranthene, and diethylphthalate are defined.

Nine PAHs [benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were detected at one or both of locations MO-604990 and MO-604991. Concentrations decreased with depth at both locations. All concentrations are near or below the EQLs. The lateral and vertical extent of PAHs are defined.

Thirteen dioxin/furan congeners were detected only at location MO-604990. Concentrations decreased with depth and are at the EQLs. The lateral and vertical extent of dioxin/furan congeners are defined.

I-2.19.5.3 Nature and Extent of Radionuclide COPCs

The radionuclide COPCs identified at AOC C-03-006 are europium-152; plutonium-238; plutonium-239/240; sodium-22; and tritium. Sample results are presented in Table 2.20-4 and Figure 2.20-3.

The lateral and vertical extent of the radionuclide COPCs are evaluated for locations MO-604990 through MO-604994, on mesa top. The lateral and vertical extent of the radionuclide COPCs at locations on the

canyon slope (locations 03-02715 through 03-02720) are evaluated with SWMU 03-054(e) because the slope locations are assigned to both sites.

Europium-152 and sodium-22 were not detected on the mesa top. The lateral and vertical extent of europium-152 and sodium-22 are defined.

Plutonium-238 was detected above the FV at locations MO-604990 and MO-604991, at concentrations of 0.0234 and 0.0894 pCi/g. Concentrations decreased with depth at both locations, and decreased downslope. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the FV in only one sample at location MO-604991, at a concentration of 0.127 pCi/g. Concentrations decreased with depth at this location, and decreased downslope. The lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected only in the deepest sample at location MO-604991, at a concentration of 0.067 pCi/g. The lateral and vertical extent of tritium are defined.

I-2.19.5.4 Summary of Nature and Extent for AOC C-03-006

The lateral and vertical extent of all inorganic COPCs are defined at AOC C-03-006, except for the lateral and vertical extent of chromium.

The lateral and vertical extent of all organic and radionuclide COPCs are defined at AOC C-03-006.

I-3.0 COPCs FOR SITES AT TA-35

I-3.1 SWMU 35-016(g)

A total of 21 samples (8 tuff and 13 sediment) were collected in 1997 and 2009 from 11 locations at SWMU 35-016(g). Table 3.2-1 summarizes the samples collected and the requested analyses for each sample. Figure 3.1-shows sampling locations.

I-3.1.1 Inorganic Chemicals at SWMU 35-016(g)

Twenty-one samples were analyzed for hexavalent chromium and TAL metals. Table 3.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.2-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 3.2-1.

I-3.1.1.1 Inorganic Chemicals in Tuff

Eight tuff samples were analyzed for hexavalent chromium and TAL metals.

Antimony was detected above the BV (0.5 mg/kg) in one of eight tuff samples, with a maximum concentration of 1.13 mg/kg. Antimony also had DLs (1.06–8.1 mg/kg) above the BV in seven tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in four of eight tuff samples, with a maximum sample concentration of 26.3 mg/kg. Two of the four sampling results exceeded the maximum background

concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure I-3.1-1. Chromium is identified as a COPC in tuff.

Hexavalent chromium was detected in three of eight tuff samples and has no BV. Hexavalent chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in one of eight tuff samples, with a maximum concentration of 3.2 mg/kg. Results were compared only to the BV because it is equivalent to the maximum background concentration. The sample result is less than 20% above the tuff BV. The box plot for cobalt in tuff is presented in Figure I-3.1-2. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in one of eight tuff samples, with a maximum concentration of 5.2 mg/kg. The sample result did not exceed the maximum background concentration (6.2 mg/kg). The box plot for copper in tuff is presented in Figure I-3.1-3. Copper is not identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in one of eight tuff samples, with a maximum concentration of 11.6 mg/kg. The sample result did not exceed the maximum background concentration (15.5 mg/kg). The box plot for lead in tuff is presented in Figure I-3.1-4. Lead is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in two of eight tuff samples, with sample concentrations of 7 and 7.4 mg/kg. One sample result also exceeded the maximum background concentration (7 mg/kg). The box plot for nickel in tuff is presented in Figure I-3.1-5. Nickel is identified as a COPC in tuff.

Selenium was not detected but had DLs (0.31–1.19 mg/kg) above the BV (0.3 mg/kg) in six of eight tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration (65.6 mg/kg) in one of eight tuff samples, with a maximum concentration of 84.2 mg/kg. The box plot for zinc in tuff is presented in Figure I-3.1-6. Zinc is identified as a COPC in tuff.

I-3.1.1.2 Inorganic Chemicals in Sediment

Thirteen sediment samples were collected at SWMU 35-016(g) and were analyzed for hexavalent chromium and TAL metals.

Antimony was detected above the BV (0.83 mg/kg) in 1 of 13 sediment samples, with a maximum concentration of 4.22 mg/kg. Antimony also had DLs (1.1–17.4 mg/kg) above the BV in 12 sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antinomy is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.55–1.7 mg/kg) above the BV (0.4 mg/kg) in all 13 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in 2 of 13 sediment samples, with sample concentrations of 12.1 and 42.6 mg/kg. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-3.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling

results are not statistically different than background. The box plot for chromium in sediment is presented in Figure I-3.1-7. Chromium is not identified as a COPC in sediment.

Hexavalent chromium was detected in 6 of 13 sediment samples and has no BV. Hexavalent chromium is identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in 1 of 13 sediment samples, with a maximum concentration of 45.9 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-3.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for copper in sediment is presented in Figure I-3.1-8. Copper is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) but below the maximum background concentration (25.6 mg/kg) in 1 of 13 sediment samples, with a maximum concentration of 20 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-3.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in sediment is presented in Figure I-3.1-9. Lead is not identified as a COPC in sediment.

Mercury was not detected above the BV (0.1 mg/kg), but had a DL (0.13 mg/kg) above the BV in 1 of 13 sediment samples. Statistical tests were performed to determine if the site sampling results for mercury are different than background. The statistical test results are presented in Table I-3.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for mercury in sediment is presented in Figure I-3.1-10. Mercury is identified as a COPC in sediment.

Selenium was not detected, but had DLs (0.37–1.28 mg/kg) above the BV (0.3 mg/kg) in 7 of 13 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

Silver was not detected above the BV (1 mg/kg), but had DLs (1.2–2.2 mg/kg) above the BV in 3 of 13 sediment samples. Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-3.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for silver in sediment is presented in Figure I-3.1-11. Silver is identified as a COPC in sediment.

Thallium was detected above the BV (0.73 mg/kg) in 1 of 13 sediment samples, with a maximum concentration of 1.1 mg/kg. Results were compared only to the BV because background dataset for thallium in sediment is not available. Thallium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 4 of 13 sediment samples, with a maximum concentration of 325 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-3.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in sediment is presented in Figure I-3.1-12. Zinc is identified as a COPC in sediment.

I-3.1.2 Organic Chemicals at SWMU 35-016(g)

Twenty-one samples were analyzed for SVOCs. Table 3.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.2-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 3.2-2.

I-3.1.2.1 Organic Chemicals in Tuff

Eight tuff samples were analyzed for SVOCs.

Benzoic acid was detected in one tuff sample and is identified as a COPC in tuff.

I-3.1.2.2 Organic Chemicals in Sediment

Thirteen sediment samples were analyzed for SVOCs.

The following organic chemicals were detected in sediment samples at SWMU 35-016(g) and are identified as COPCs in sediment: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; and pyrene.

I-3.1.3 Radionuclides at SWMU 35-016(g)

Twenty-one samples were analyzed for gamma-emitting radionuclides and tritium. Table 3.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.2-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 3.2-3.

I-3.1.3.1 Radionuclides in Tuff

Eight tuff samples were analyzed for gamma-emitting radionuclides and tritium.

Cesium-137 and tritium were detected in tuff samples and have no FVs for tuff. Cesium-137 and tritium are identified as COPCs in tuff.

I-3.1.3.2 Radionuclides in Sediment

Thirteen sediment samples were analyzed for gamma-emitting radionuclides and tritium.

Tritium was detected above its FV in one sediment sample. Tritium is identified as a COPC in sediment.

I-3.1.4 Summary of COPCs at SWMU 35-016(g)

The inorganic chemicals identified as COPCs at SWMU 35-016(g) are antimony, cadmium, chromium, hexavalent chromium, mercury, nickel, selenium, silver, thallium, and zinc.

The organic chemicals identified as COPCs at SWMU 35-016(g) are benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; and pyrene.

The radionuclides identified as COPCs at SWMU 35-016(g) are cesium-137 and tritium.

I-3.1.5 Nature and Extent of Contamination at SWMU 35-016(g)

I-3.1.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected above the BV at location MO-604933, which is located nearest to the source. Concentrations decreased with depth at this location. Antimony was not detected at any other locations. The lateral and vertical extent of antimony are defined.

Chromium was detected above the BV at five locations. Concentrations decreased with depth at two of the five locations. A single depth was sampled at location 35-02386, with a concentration of 9.3 mg/kg, which is less than the maximum background concentration (13 mg/kg). Chromium was detected above the BV in the deeper samples at locations MO-604933 and MO-604935, at concentrations of 26.3 and 18.1 mg/kg, respectively. These concentrations are less than twice the maximum background concentration. Chromium was not detected above the BV in the samples at the farthest downslope locations MO-604936 and MO-604937. The lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected at five locations. Concentrations decreased with depth at all five locations. Concentrations also decreased toward downslope. Hexavalent chromium was detected in the samples at the farthest downslope locations MO-604936 and MO-604937, but concentrations are less than at locations near the source. The lateral and vertical extent of hexavalent chromium are defined.

Nickel was detected only at location 35-02390. Concentrations slightly decreased with depth at this location, and are equal to or slightly above the maximum background concentration of 7 mg/kg. Nickel was not detected above the BV at downslope locations. The lateral and vertical extent of nickel are defined.

Thallium was detected in only one sample at location 35-02391, at a concentration of 1.1 mg/kg. This concentration is less than the maximum background concentration of 1.7 mg/kg. Thallium was not detected above the BV at downslope locations. The lateral and vertical extent of thallium are defined.

Zinc was detected above the BV at four locations. Concentrations decreased with depth at locations 35-02387 and MO-604933. Only a single depth was sampled at locations 35-02386 and 35-02388. Concentrations at locations 35-02386 and 35-02388 are less than twice the BVs. Zinc was not detected above the BV in the samples at downslope locations. The lateral and vertical extent of zinc are defined.

I-3.1.5.2 Nature and Extent of Organic COPCs

Seven PAHs [benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; and pyrene] were detected at one or more locations on the canyon slope. Concentrations decreased with depth at all locations. All concentrations are less than or slightly above the EQLs. The lateral and vertical extent of PAHs are defined.

Benzoic acid was detected in one sample each at locations MO-604933 and MO-604937. The concentration at MO-604933 (0.323 mg/kg) decreased with depth. The concentration at location MO-604937 (0.847 mg/kg) is slightly above the EQL of 0.81 mg/kg. Concentrations increased downslope. The lateral extent of benzoic acid is not defined, but the vertical extent is defined.

Bis(2-ethylhexyl)phthalate was detected only in the deeper sample at location 35-02387, with a concentration of 0.37 mg/kg. Bis(2-ethylhexyl)phthalate was not detected at any other locations. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

I-3.1.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected in the deeper samples at locations MO-604933, MO-604936, and MO-604937. Cesium-137 was detected below the FV in surface sediment at these three locations, with concentrations higher or not substantially different than the corresponding deeper concentrations at locations MO-604933 and MO-604936. Cesium-137 was detected in surface sediment sample at a concentration of 0.133 pCi/g at location MO-604937. Cesium-137 was detected at the highest concentration (0.269 pCi/g) in tuff at location (MO-604937). The lateral and vertical extent of cesium-137 are not defined in the drainage.

Tritium was detected or detected above the FV at four locations. Concentrations decreased with depth at location 35-02390. A single depth was sampled at location 35-02386. Tritium was detected in the deeper samples at locations MO-604933 and MO-604936. Concentrations of tritium at the last three locations are at low levels (0.06–0.08 pCi/g). Tritium was not detected or detected above the FV at the farthest downslope location (MO-604937). The lateral and vertical extent of tritium are defined.

I-3.1.5.4 Summary of Nature and Extent for SWMU 35-016(g)

The lateral and vertical extent of all inorganic and organic COPCs are defined, except for the lateral extent of benzoic acid.

The lateral and vertical extent of all radionuclide COPCs are defined, except for the lateral and vertical extent for cesium-137.

I-3.2 SWMU 35-016(h)

A total of 23 samples (1 soil, 11 tuff, and 11 sediment) were collected in 1997 and 2009 from 11 locations at SWMU 35-016(h). Table 3.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 3.1-1 shows the sampling locations.

I-3.2.1 Inorganic Chemicals at SWMU 35-016(h)

Twenty-three samples were analyzed for hexavalent chromium and TAL metals. Table 3.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 3.3-1.

I-3.2.1.1 Inorganic Chemicals in Soil

One soil sample was collected at SWMU 35-016(h) and was analyzed for hexavalent chromium and TAL metals.

Antimony was not detected, but had a DL (1 mg/kg) above the BV (0.83 mg/kg) in the soil sample. The DL is equal to the maximum background concentration of antimony in soil (1 mg/kg). Antimony is not identified as a COPC in soil.

Cadmium was not detected, but had a DL (0.501 mg/kg) above the BV (0.4 mg/kg) in the soil sample. The DL did not exceed the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum background concentration of copper in soil (16 mg/kg) in the soil sample, with a concentration of 34 mg/kg. Copper is identified as a COPC in soil.

I-3.2.1.2 Inorganic Chemicals in Tuff

Eleven tuff samples were collected at SWMU 35-016(h) and were analyzed for hexavalent chromium and TAL metals.

Antimony was not detected, but had DLs (1.01–6.6 mg/kg) above the BV (0.5 mg/kg) in all 11 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 46.1 mg/kg. The sample result did not exceed the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-3.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-3.2-1. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 1.25 mg/kg. The sample result did not exceed the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-3.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-3.2-2. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 6770 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-3.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-3.2-3. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 8 of 11 tuff samples, with a maximum concentration of 45 mg/kg. Six of the eight sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-3.2-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-3.2-4. Chromium is identified as a COPC in tuff.

Hexavalent chromium was detected in 3 of 11 tuff samples and has no BV. Hexavalent chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 2 of 11 tuff samples, with concentrations of 5.22 and 7.62 mg/kg. One sample result also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-3.2-1. The result of the

Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-3.2-5. Copper is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum background concentration of nickel in tuff (7 mg/kg) in 2 of 11 tuff samples, with sample concentrations of 7.99 and 10.6 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-3.2-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-3.2-6. Nickel is identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 11 tuff samples, with a maximum concentration of 0.802 mg/kg. Selenium also had DLs (0.991–1.16 mg/kg) above the BV in eight tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure I-3.2-7. Selenium is identified as a COPC in tuff.

I-3.2.1.3 Inorganic Chemicals in Sediment

Eleven sediment samples were collected at SWMU 35-016(h) and were analyzed for hexavalent chromium and TAL metals.

Antimony was not detected, but had DLs (0.985–6.8 mg/kg) above the BV (0.83 mg/kg) in all 11 sediment samples. Results were compared only to the BV because a background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.452–0.65 mg/kg) above the BV (0.4 mg/kg) in all 11 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Calcium was detected above the BV (4420 mg/kg) in 1 of 11 sediment samples, with a maximum concentration of 24300 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-3.2-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in sediment is presented in Figure I-3.2-8. Calcium is not identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in 1 of 11 sediment samples, with a maximum concentration of 11.4 mg/kg. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-3.2-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for chromium in sediment is presented in Figure I-3.2-9. Chromium is not identified as a COPC in sediment.

Hexavalent chromium was detected in 2 of 11 sediment samples and has no BV. Hexavalent chromium identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) in 3 of 11 sediment samples, with a maximum concentration of 18 mg/kg. Two of the three sampling results also exceeded the maximum background concentration of copper in sediment (12 mg/kg). Statistical tests were performed to determine if the site

sampling results for copper are different than background. The statistical test results are presented in Table I-3.2-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for copper in sediment is presented in Figure I-3.2-10. Copper is not identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 11 sediment samples, with a maximum concentration of 0.533 mg/kg. Selenium also had DLs (0.99–1.09 mg/kg) above the BV in seven sediment samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). The box plot for selenium in sediment is presented in Figure I-3.2-11. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 1 of 11 sediment samples, with a maximum concentration of 126 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-3.2-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for zinc in sediment is presented in Figure I-3.2-12. Zinc is not identified as a COPC in sediment.

I-3.2.2 Organic Chemicals at SWMU 35-016(h)

All 23 samples from SWMU 35-016(h) were analyzed for SVOCs. Table 3.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.3-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 3.3-2.

I-3.2.2.1 Organic Chemicals in Soil

One soil sample was collected at SWMU 35-016(h) and was analyzed for SVOCs.

The following organic chemicals were detected in the soil sample at SWMU 35-016(h) and are identified as COPCs in soil: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; chrysene; fluoranthene; phenanthrene; and pyrene.

I-3.2.2.2 Organic Chemicals in Tuff

Eleven tuff samples were collected at SWMU 35-016(h) and were analyzed for SVOCs.

The following organic chemicals were detected in at least one tuff sample at SWMU 35-016(h) and are identified as COPCs in tuff: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzoic acid; chrysene; fluoranthene; and pyrene.

I-3.2.2.3 Organic Chemicals in Sediment

Eleven sediment samples were collected at SWMU 35-016(h) and were analyzed for SVOCs.

The following organic chemicals were detected in at least one sediment sample at SWMU 35-016(h) and are identified as COPCs in sediment: anthracene; benzo(a)anthracene; benzo(a)pyrene;

benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene.

I-3.2.3 Radionuclides at SWMU 35-016(h)

Twenty-three samples were analyzed for gamma-emitting radionuclides and tritium. Table 3.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 3.3-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 3.3-3.

I-3.2.3.1 Radionuclides in Soil

One soil sample was collected at SWMU 35-016(h) and was analyzed for gamma-emitting radionuclides and tritium.

Tritium was detected in the soil sample with a concentration of 0.009 pCi/g. Tritium is identified as a COPC in soil.

I-3.2.3.2 Radionuclides in Tuff

Eleven tuff samples were collected at SWMU 35-016(h) and were analyzed for gamma-emitting radionuclides and tritium.

Tritium was detected in 4 of 11 tuff samples with a maximum concentration of 0.05 pCi/g and is identified as a COPC in tuff.

Uranium-235 was detected above the BV (0.09 pCi/g) in 1 of 11 tuff samples, at a concentration of 0.149 pCi/g. Results were compared only to the BV because background dataset for uranium-235 in tuff is not available. Uranium-235 is identified as a COPC in tuff.

I-3.2.3.3 Radionuclides in Sediment

Eleven sediment samples were collected at SWMU 35-016(h) and were analyzed for gamma-emitting radionuclides and tritium.

Americium-241 was detected above the FV (0.040 pCi/g) in 1 of 11 sediment samples, at a concentration of 0.462 pCi/g. Results were compared to only FV because the FV is greater than the maximum fallout concentration of americium-241 in sediment (0.038 pCi/g). Americium-241 is identified as a COPC in sediment.

I-3.2.4 Summary of COPCs at SWMU 35-016(h)

The inorganic chemicals identified as COPCs at SWMU 35-016(h) are antimony, cadmium, chromium, hexavalent chromium, copper, nickel, and selenium.

The organic chemicals identified as COPCs at SWMU 35-016(h) are anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene.

The radionuclides identified as COPCs at SWMU 35-016(h) are americium-241, tritium, and uranium-235.

I-3.2.5 Nature and Extent of Contamination at SWMU 35-016(h)

I-3.2.5.1 Nature and Extent of Inorganic COPCs

Cadmium was detected above the BV in only one sample at location MO-605517, at a concentration of 0.452 mg/kg, which is slightly above the BV of 0.4 mg/kg. Cadmium was not detected in the deeper sample at this location. Cadmium was not detected at any other locations at the site. The lateral and vertical extent of cadmium are defined.

Chromium was detected above the BV at eight locations. Concentrations increased with depth at all eight locations. The highest concentration of chromium (45 mg/kg) was detected in the deeper sample at the farthest downslope location MO-605136. The lateral and vertical extent of chromium are not defined.

Hexavalent chromium was detected at four locations. Concentrations decreased with depth at location 35-02392. Concentrations at all other locations are low levels (0.154–0.206 mg/kg) that are less than the EDLs. The lateral and vertical extent of hexavalent chromium are defined.

Copper was detected above the BV at five locations. Concentrations decreased with depth at all locations, except at location MO-605515. Copper was detected at a concentration of 5.22 mg/kg, which is less than the maximum background concentration of 6.2 mg/kg. Copper was not detected above the BV at downslope location MO-605516, or at the farthest downslope locations of the two drainages (locations MO-605136 and MO-605520). The lateral and vertical extent of copper are defined.

Nickel was detected above the BV in the deepest samples at locations 35-02392 and MO-605134. Concentrations increased with depth at both locations. However, both concentrations are less than twice the BV. Nickel was not detected above the BV at downslope locations. The lateral and vertical extent of nickel are defined.

Selenium was detected above the BV at location MO-605134, at concentrations of 0.533 mg/kg at the surface and 0.802 mg/kg in the deeper sample. Selenium was not detected at any other locations at the site. The lateral and vertical extent of selenium are defined.

I-3.2.5.2 Nature and Extent of Organic COPCs

Eleven PAHs [anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were detected at one or more locations. Concentrations decreased with depth at all locations. Concentrations decreased downslope. The lateral and vertical extent of PAHs are defined.

Benzoic acid was detected in the deeper sample at location MO-605519. The concentration (0.459 mg/kg) is less than the EQL (0.69 mg/kg). Benzoic acid was not detected in samples at downslope location MO-605520. The lateral and vertical extent of benzoic acid are defined.

I-3.2.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected in only one sample at location MO-605133. Concentrations decreased with depth at this location. Americium-241 was not detected at downslope location MO-605136. The lateral and vertical extent of americium-241 are defined.

Tritium was detected at four locations. Concentrations decreased with depth at location MO-605134, remained essentially the same at location MO-605135, and increased with depth at locations MO-605133

and MO-605516. Tritium was not detected in samples at the location downslope from MO-605133. The lateral and vertical extent of tritium are defined.

Uranium-235 was detected above the BV in the deepest sample at location 35-02392. The concentration (0.149 pCi/g) is less than twice the BV (0.09 pCi/g). Uranium-235 was not detected above the BV at any other locations at the site. The lateral and vertical extent of uranium-235 are defined.

I-3.2.5.4 Summary of Nature and Extent for SWMU 35-016(h)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 35-016(h), except for the lateral and vertical extent of chromium, and the lateral extent of PAHs downslope from locations MO-605515 and MO-605516.

I-4.0 COPCs FOR SITES AT TA-42

I-4.1 Consolidated Unit 42-001(a)-99

A total of 169 samples (53 soil, 12 sediment, and 104 tuff) were collected in 1992 and 2009 from 44 locations at Consolidated Unit 42-001(a)-99. Table 4.2-1 summarizes the samples collected and the requested analyses for each sample. Figure 4.1-1 shows the sampling locations.

I-4.1.1 Inorganic Chemicals at Consolidated Unit 42-001(a)-99

A total of 139 samples from Consolidated Unit 42-001(a)-99 were analyzed for TAL metals; 129 samples were analyzed for total cyanide and nitrate; 127 samples were analyzed for perchlorate. Table 4.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 4.2-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown on Plate 4.2-1.

I-4.1.1.1 Inorganic Chemicals in Soil

Twenty-three soil samples were collected at Consolidated Unit 42-001(a)-99 and analyzed for TAL metals; ten samples, collected in 1992, were analyzed for lead only. Thirteen samples were analyzed for total cyanide, nitrate, and perchlorate.

Antimony was not detected above the BV but had DLs (1.03–1.16 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in 12 of 13 soil samples. Statistical tests were performed to determine if the site sampling results for antimony are different than background. The statistical test results are presented in Table I-4.1-1. The results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for antimony in soil is presented in Figure I-4.1-1. Antimony is identified as a COPC in soil.

Barium was detected above the BV (295 mg/kg) in 1 of 13 soil samples, with a maximum concentration of 349 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-4.1-1. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for barium in soil is presented in Figure I-4.1-2. Barium is not identified as a COPC in soil.

Cadmium was not detected but had DLs (0.515–0.579 mg/kg) above the BV (0.4 mg/kg) in all 13 soil samples. None of the sampling results exceeded the maximum soil background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-4.1-3. Cadmium is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 1 of 23 soil samples, at a concentration of 28.1 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-4.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in soil is presented in Figure I-4.1-4. Lead is not identified as a COPC in soil.

Nitrate and perchlorate were detected in multiple soil samples and have no soil BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in 3 of 13 soil samples, and above the maximum soil background concentration (75.5 mg/kg) in 1 of 13 samples, with a maximum concentration of 158 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-4.1-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-4.1-5. Zinc is identified as a COPC in soil.

I-4.1.1.2 Inorganic Chemicals in Tuff

A total of 104 tuff samples were collected at Consolidated Unit 42-001(a)-99 and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected but had DLs (0.97–1.26 mg/kg) above the BV (0.5 mg/kg) in all 104 tuff samples. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) in 5 of 104 tuff samples, and above the maximum tuff background concentration (51.6 mg/kg) in 3 of 104 tuff samples, with a maximum concentration of 101 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-4.1-6. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 3 of 104 tuff samples, with a maximum sample concentration of 1.34 mg/kg. None of the sample concentrations exceeded the maximum tuff background concentration (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-4.1-7. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in 3 of 104 tuff samples, with a maximum sample concentration of 8840 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different

than background. The box plot for calcium in tuff is presented in Figure I-4.1-8. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 16 of 104 tuff samples, and above the maximum tuff background concentration (13 mg/kg) in 11 of 104 tuff samples, with a maximum sample concentration of 52.4 mg/kg. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-4.1-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-4.1-9. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 4 of 104 tuff samples, and above the maximum tuff background concentration (6.2 mg/kg) in 1 of 104 tuff samples, with a maximum concentration of 8.92 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-4.1-2. The results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-4.1-10. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 5 of 104 tuff samples, with a maximum concentration of 57.7 mg/kg, and above the maximum tuff background concentration (15.5 mg/kg) in 4 of 104 tuff samples. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the quantile and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-4.1-11. Lead is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 1 of 104 tuff samples, at a concentration of 0.189 mg/kg. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum tuff background concentration (7 mg/kg) in 1 of 104 tuff samples, at a concentration of 7.66 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in tuff is presented in Figure I-4.1-12. Nickel is not identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no tuff BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected but had DLs (0.972–1.25 mg/kg) above the BV (0.3 mg/kg) in all 104 tuff samples. Selenium is identified as a COPC in tuff.

Silver was detected above the BV (1 mg/kg) in 1 of 104 tuff samples, at a concentration of 1.27 mg/kg. Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for silver in tuff is presented in Figure I-4.1-13. Silver is not identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) in 2 of 104 tuff samples, with a maximum concentration of 234 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-4.1-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than

background. The box plot for zinc in tuff is presented in Figure I-4.1-14. Zinc is not identified as a COPC in tuff.

I-4.1.1.3 Inorganic Chemicals in Sediment

Twelve sediment samples were collected at Consolidated Unit 42-001(a)-99 and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected but had DLs (1.07–1.2 mg/kg) above the BV (0.83 mg/kg) in all 12 sediment samples. Antimony is identified as a COPC in sediment.

Barium was detected above the BV (127 mg/kg) in 1 of 12 sediment samples, at a concentration of 163 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-4.1-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in sediment is presented in Figure I-4.1-15. Barium is not identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.537–0.602 mg/kg) above the BV (0.4 mg/kg) in all 12 sediment samples. Cadmium is identified as a COPC in sediment.

Nitrate and perchlorate were detected in multiple sediment samples and have no sediment BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 2 of 12 sediment samples, with a maximum concentration of 93.5 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-4.1-3. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for zinc in sediment is presented in Figure I-4.1-16. Zinc is identified as a COPC in sediment.

I-4.1.2 Organic Chemicals at Consolidated Unit 42-001(a)-99

A total of 129 samples from Consolidated Unit 42-001(a)-99 were analyzed for SVOCs, PCBs, explosive compounds, and dioxins/furans; 108 samples were analyzed for VOCs. Table 4.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 4.2-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 4.2-2.

I-4.1.2.1 Organic Chemicals in Soil

Thirteen soil samples collected at Consolidated Unit 42-001(a)-99 were analyzed for SVOCs, PCBs, explosive compounds, and dioxins/furans.

The following organic chemicals were detected in one or more soil samples and are identified as COPCs in soil: acenaphthene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran;

2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; pyrene; and total tetrachlorodibenzofurans.

I-4.1.2.2 Organic Chemicals in Tuff

A total of 104 tuff samples collected at Consolidated Unit 42-001(a)-99 were analyzed for SVOCs, VOCs, PCBs, explosive compounds, and dioxins/furans.

The following organic chemicals were detected in one or more tuff samples and are identified as COPCs in tuff: acetone; anthracene; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-4.1.2.3 Organic Chemicals in Sediment

Twelve sediment samples collected at Consolidated Unit 42-001(a)-99 were analyzed for SVOCs, PCBs, explosive compounds, and dioxins/furans; four sediment samples were analyzed for VOCs.

The following organic chemicals were detected in one or more sediment samples and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-4.1.3 Radionuclides at Consolidated Unit 42-001(a)-99

A total of 129 samples from Consolidated Unit 42-001(a)-99 were analyzed for gamma-emitting radionuclides and tritium; 162 samples were analyzed for isotopic plutonium; 131 samples were analyzed for isotopic uranium; 161 samples were analyzed for americium-241; four samples were analyzed for

isotopic thorium. Table 4.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 4.2-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown on Plate 4.2-3.

I-4.1.3.1 Radionuclides in Soil

Thirteen soil samples were analyzed for gamma-emitting radionuclides and tritium, 46 samples were analyzed for isotopic plutonium; 15 samples were analyzed for isotopic uranium; 45 samples were analyzed for americium-241; four samples were analyzed for isotopic thorium.

Americium-241 was detected in 11 soil samples collected at depths (> 0–1 ft bgs) for which the FV does not apply. Americium-241 is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in two surface (< 0–1 ft bgs) soil samples, and was also detected in four soil samples collected at depths (> 0–1 ft bgs) for which the FV does not apply. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in one surface (< 0–1 ft bgs) soil sample, and was also detected in five soil samples collected at depths (> 0–1 ft bgs) for which the FV does not apply. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in one soil sample and is identified as a COPC in soil.

I-4.1.3.2 Radionuclides in Tuff

A total of 104 tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and americium-241.

Americium-241 was detected in four tuff samples and is identified as a COPC in tuff.

Cesium-137 was detected in two tuff samples and is identified as a COPC in tuff.

Plutonium-239/240 was detected in 13 tuff samples and is identified as a COPC in tuff.

Tritium was detected in 48 tuff samples and has no tuff FV. Tritium is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 104 tuff samples, at a concentration of 2.23 pCi/g. Because no background data set for uranium-234 in tuff is available, site sample data are compared to the BV only. Because it was detected above the BV infrequently and was less than 20% above the BV, uranium-234 is not identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 4 of 104 tuff samples, with a maximum sample concentration of 0.122 pCi/g. Because no background data set for uranium-235/236 in tuff is available, site sample data are compared to the BV only. Uranium-235/236 is identified as a COPC in tuff.

I-4.1.3.3 Radionuclides in Sediment

Twelve sediment samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and americium-241.

Americium-241 was detected above the FV (0.04 pCi/g) in 2 of 12 sediment samples, with a maximum concentration of 0.168 pCi/g. Statistical tests were performed to determine if the site sampling results for americium-241 are different than background. The statistical test results are presented in Table I-4.1-4. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for americium-241 in sediment is presented in Figure I-4.1-18. Americium-241 is not identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 8 of 12 sediment samples, with a maximum sample concentration of 0.803 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) in 1 of 12 sediment samples, at a concentration of 2.52 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-4.1-4. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-4.1-19. Uranium-238 is not identified as a COPC in sediment.

I-4.1.4 Summary of COPCs at Consolidated Unit 42-001(a)-99

The inorganic chemicals identified as COPCs at Consolidated Unit 42-001(a)-99 are antimony, cadmium, chromium, copper, mercury, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at Consolidated Unit 42-001(a)-99 are acenaphthene; acetone; anthracene; aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at Consolidated Unit 42-001(a)-99 are americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, and uranium-235/236.

I-4.1.5 Nature and Extent of Contamination at Consolidated Unit 42-001(a)-99

I-4.1.5.1 Nature and Extent of Inorganic COPCs

Chromium increased with depth or was detected above the BV only in the deepest sample at five locations (MO-605060, MO-605061, MO-605069, MO-605071, and MO-605288). The highest concentration of chromium (52.4 mg/kg) is at 2.5–3.25 ft bgs at location MO-605060. At the seven locations where samples were collected to more than 30 ft bgs, concentrations of chromium were either

below the BV in all samples or decreased with depth, except at location MO-605061, where the deepest sample concentration (8.11 mg/kg) was slightly above the BV (7.14 mg/kg) but below the maximum background concentration of 13 mg/kg. Chromium was not detected above the BV in the drainage below the mesa-top. The lateral and vertical extent of chromium are defined.

Copper decreased with depth at all locations. The highest concentration above the BV (8.92 mg/kg) is at mesa-top location MO-605061, and concentrations decrease downslope. The lateral and vertical extent of copper are defined.

Mercury was detected above the BV at only one location (MO-605061), and decreased with depth. Mercury was not detected above the BV at any drainage locations. The lateral and vertical extent of mercury are defined.

Nitrate was detected at 27 locations, with a maximum concentration of 13.5 mg/kg. These concentrations are within the range of naturally-occurring nitrate. The lateral and vertical extent of nitrate are defined.

Perchlorate decreased with depth at all locations. Concentrations decreased from the mesa-top locations to the locations farthest downslope. The lateral and vertical extent of perchlorate are defined.

Zinc decreased with depth at all locations, and was not detected above the BV at locations farthest downslope. The lateral and vertical extent of zinc are defined.

I-4.1.5.2 Nature and Extent of Organic COPCs

All detected VOCs decreased with depth at all locations, except MO-605061 and MO-605072, where acetone was detected only in the deepest samples. 4-isopropyltoluene was also detected only in the deeper sample at location MO-605072. Concentrations of all VOCs decreased downslope. The lateral and vertical extent of VOCs are defined.

Concentrations of PCBs were less than 1 mg/kg at all locations, and decreased with depth at all locations, except MO-605065, where Aroclor-1254 was detected at a concentration of 0.0015 mg/kg in the deepest sample (32.5–34 ft bgs). Concentrations of PCBs decreased downslope. The lateral and vertical extent of PCBs are defined.

Concentrations of all detected PAHs decreased with depth at all locations, and decreased downslope from the mesa top, with very low concentrations near or below EQLs at the locations farthest downslope. The lateral and vertical extent of PAHs are defined.

Bis(2-ethylhexyl)phthalate was detected in only two samples. Concentrations decreased with depth and downslope. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dioxin/furan congeners were detected at very low concentrations at multiple locations. Concentrations decreased with depth and decreased downslope from the mesa top. The lateral and vertical extent of dioxin/furan congeners are defined.

I-4.1.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 decreased with depth at all locations where it was detected, except locations 42-01023, 42-01024, and 42-01026, where it was detected in the deepest samples, and location 42-01030, where concentrations did not change substantially with depth. The vertical extent is defined by nearby locations

where americium-241 was not detected to depths of 40 ft bgs. Concentrations of americium-241 decreased downslope. The lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected in only one sample, at location MO-605050, where concentrations decreased with depth. Cesium-137 was not detected at any downslope sampling locations. The lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected in only six samples, and the concentration decreased with depth at all locations, except location 42-01021, where the concentration increased in the deeper sample, and location 42-01023, where it was detected only in the deeper sample. The vertical extent of plutonium-238 is defined by multiple nearby locations where it was not detected to depths of 40 ft bgs. Plutonium-238 was not detected at any downslope sampling locations. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected at 15 locations, and decreased with depth except at locations MO-605072, 42-01023, 4201024, 42-01027, 42-01028, and 42-605288, where it either increased slightly with depth or was detected only in the deepest samples. Plutonium-239/240 was not detected in any samples deeper than 34 ft bgs. Concentrations decreased downslope. The lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected at 19 locations, and either increased with depth or was detected only in the deepest sample at 12 locations. The highest concentration of tritium (0.175 pCi/g) was detected at 37.5–40 ft bgs at location MO-605054. Tritium was not detected in tuff or above the FV in any sediment samples at downslope sampling locations. The lateral extent of tritium is defined. The vertical extent of tritium is not defined.

Uranium-234, uranium-235/236, and uranium-238 were detected above BVs in four or fewer samples, and concentrations decreased with depth at all locations. Uranium-234 and uranium-235/236 decreased downslope. Uranium-238 was detected above the BV only at the farthest downslope location (MO-605073), which is at the toe of the slope in Mortandad Canyon. The concentration (0.23 pCi/g) was only slightly above the BV. The lateral and vertical extent of uranium-234, uranium-235/236, and uranium-238 are defined.

I-4.1.5.4 Summary of Nature and Extent for Consolidated Unit 42-001(a)-99

The lateral and vertical extent of all inorganic and organic COPCs are defined.

The lateral and vertical extent of all radionuclide COPCs are defined, except for the vertical extent of tritium on the mesa-top portion of the site.

I-5.0 COPCs FOR SITES AT TA-48

I-5.1 AOC 48-001

A total of 186 samples (103 soil, 22 tuff, and 61 sediment) were collected in 1993, 1995, 1997 and 2009 from 42 locations at AOC 48-001. Table 5.2-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.2-1 shows the sampling locations.

I-5.1.1 Inorganic Chemicals at AOC 48-001

Seventy-one samples from AOC 48-001 were analyzed for nitrate, perchlorate, and total cyanide. Fifty-six samples were analyzed for hexavalent chromium. Ninety-five were analyzed for TAL metals. Table 5.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.2-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 5.2-1.

I-5.1.1.1 Inorganic Chemicals in Soil

Twenty-three soil samples were analyzed for nitrate, perchlorate, and total cyanide. Twelve were analyzed for hexavalent chromium, and forty-two were analyzed for TAL metals.

Antimony was detected above the BV (0.83 mg/kg) in 1 of 42 soil samples, at a concentration of 0.88 mg/kg. This sample concentration did not exceed the maximum background concentration of antimony in soil (1 mg/kg). Antimony also had DLs (0.969–12 mg/kg) above the BV in 35 soil samples. Twenty-nine DLs also exceeded the maximum background concentration. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for antimony in soil is presented in Figure I-5.1-1. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in 1 of 42 soil samples, at a concentration of 0.615 mg/kg. Cadmium also had DLs (0.485–0.62 mg/kg) above the BV in 31 soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for cadmium in soil is presented in Figure I-5.1-2. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in 9 of 42 soil samples, with a maximum concentration of 453 mg/kg. Six of the nine sampling results also exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for chromium in soil is presented in Figure I-5.1-3. Chromium is not identified as a COPC in soil.

Hexavalent chromium, nitrate, and perchlorate were detected in multiple soil samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in soil.

Copper was detected above the BV (14.7 mg/kg) in 9 of 42 soil samples, with a maximum concentration of 177 mg/kg. Eight of the nine sampling results also exceeded the maximum background concentration of copper in soil (16 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for copper in soil is presented in Figure I-5.1-4. Copper is not identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 23 soil samples, at a concentration of 6.75 mg/kg. Results were compared only to the BV because background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 4 of 42 soil samples, with a maximum concentration of 34.9 mg/kg. One sample result also exceeded the maximum background concentration of lead in soil (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.1-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in soil is presented in Figure I-5.1-5. Lead is not identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) in 1 of 42 soil samples, at a concentration of 1340 mg/kg. The sample result also exceeded the maximum background concentration of manganese in soil (1100 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-5.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for manganese in soil is presented in Figure I-5.1-6. Manganese is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in 10 of 42 soil samples, with a maximum concentration of 27.6 mg/kg. Mercury also had DLs (all 0.12 mg/kg) above the BV and the maximum background concentration in three soil samples. Statistical tests were performed to determine if the site sampling results for mercury are different than background. The statistical test results are presented in Table I-5.1-1. The result of the quantile test indicates that the site sampling results are not statistically different than background, while the result of the slippage test indicates that the site sampling results are different than background. The box plot for mercury in soil is presented in Figure I-5.1-7. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) in 2 of 42 soil samples, with concentrations of 30.9 and 33.2 mg/kg. Both sampling results also exceeded the maximum background concentration of nickel in soil (29 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in soil is presented in Figure I-5.1-8. Nickel is identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had DLs (all 2.4 mg/kg) above the BV in 3 of 42 soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Thallium was not detected above the BV (0.73 mg/kg), but had DLs (0.96–1.3 mg/kg) above the BV in 4 of 42 soil samples. Two of the DLs also exceeded the maximum background concentration of thallium in soil (1 mg/kg). Statistical tests were performed to determine if the site sampling results for thallium are different than background. The statistical test results are presented in Table I-5.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for thallium in soil is presented in Figure I-5.1-9. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in 12 of 42 soil samples, with a maximum concentration of 391 mg/kg. Four sampling results also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-5.1-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in soil is presented in Figure I-5.1-10. Zinc is identified as a COPC in soil.

I-5.1.1.2 Inorganic Chemicals in Tuff

One tuff sample was analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Three tuff samples were analyzed for TAL metals.

Antimony was not detected, but had DLs (0.97–6.4 mg/kg) above the BV (0.5 mg/kg) in all three tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in one of three tuff samples, with a maximum concentration of 2.8 mg/kg. This sample result did not exceed the maximum background concentration of arsenic in tuff (5 mg/kg). The box plot for arsenic in tuff is presented in Figure I-5.1-11. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in two of three tuff samples, with sample concentrations of 46.8 and 62.9 mg/kg. One sample result also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). The box plot for barium in tuff is presented in Figure I-5.1-12. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in one of three tuff samples, with a maximum concentration of 2480 mg/kg. The box plot for calcium in tuff is presented in Figure I-5.1-13. Because it was detected above the BV infrequently, was only slightly above the BV, and is an essential nutrient, calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in two of three tuff samples, with sample concentrations of 26.5 and 29.6 mg/kg. Both sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). The box plot for chromium in tuff is presented in Figure I-5.1-14. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in two of three tuff samples, with sample concentrations of 6.5 and 7.1 mg/kg. Both sampling results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). The box plot for copper in tuff is presented in Figure I-5.1-15. Copper is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in one of three tuff samples, with a maximum sample concentration of 14.1 mg/kg. This sample result also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). The box plot for nickel in tuff is presented in Figure I-5.1-16. Nickel is identified as a COPC in tuff.

Perchlorate was detected in one tuff sample and has no BV. Perchlorate is identified as a COPC in tuff.

Selenium was not detected but had DLs (0.32–0.985 mg/kg) above the BV (0.3 mg/kg) in all three tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-5.1.1.3 Inorganic Chemicals in Sediment

Forty-seven soil samples were analyzed for nitrate, perchlorate, and total cyanide. Forty-three samples were analyzed for hexavalent chromium. Fifty samples were analyzed for TAL metals.

Antimony was not detected above the BV (0.83 mg/kg), but had DLs (0.96–7.3 mg/kg) above the BV 49 of 50 sediment samples. Results were compared only to the BV because background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Arsenic was detected above the BV (3.98 mg/kg) in 1 of 50 sediment samples, at a concentration of 4.15 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for arsenic in sediment is presented in Figure I-5.1-17. Arsenic is identified as a COPC in sediment.

Barium was detected above the BV (127 mg/kg) and above the maximum background concentration of barium in sediment (also 127 mg/kg) in 1 of 50 sediment samples, at a concentration of 171 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for barium in sediment is presented in Figure I-5.1-18. Barium is identified as a COPC in sediment.

Cadmium was not detected above the BV (0.4 mg/kg), but had DLs (0.48–0.73 mg/kg) above the BV in 48 of 50 sediment samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetects. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). The box plot for cadmium in sediment is presented in Figure I-5.1-19. Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in 6 of 50 sediment samples, with a maximum sample concentration of 789 mg/kg. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for chromium in sediment is presented in Figure I-5.1-20. Chromium is not identified as a COPC in sediment.

Hexavalent chromium, nitrate, and perchlorate were detected in multiple sediment samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in sediment.

Cobalt was detected above the BV (4.73 mg/kg) in 1 of 50 sediment samples, at a concentration of 5.72 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cobalt in sediment is presented in Figure I-5.1-21. Cobalt is identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in 10 of 50 sediment samples, with a maximum concentration of 72.1 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for copper in sediment is presented in Figure I-5.1-22. Copper is not identified as a COPC in sediment.

Iron was detected above the BV (13800 mg/kg) in 3 of 50 sediment samples, with a maximum sample concentration of 22400 mg/kg. Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-5.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically

different than background. The box plot for iron in sediment is presented in Figure I-5.1-23. Iron is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 4 of 50 sediment samples, with a maximum concentration of 52.8 mg/kg. Two of the four results also exceeded the maximum background concentration (25.6 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.1-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in sediment is presented in Figure I-5.1-24. Lead is not identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) in 1 of 50 sediment samples, at a concentration of 20.9 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in sediment is presented in Figure I-5.1-25. Nickel is identified as a COPC in sediment.

Selenium was not detected, but had DLs (0.36–1.2 mg/kg) above the BV (0.3 mg/kg) in 49 of 50 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) in 1 of 50 sediment samples, at a concentration of 1.01 mg/kg. Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for silver in sediment is presented in Figure I-5.1-26. Silver is identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) in 2 of 50 sediment samples, with sample concentrations of 27.4 and 28.5 mg/kg. Both results also exceeded the maximum background concentration (20 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for vanadium in sediment is presented in Figure I-5.1-27. Vanadium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 11 of 50 sediment samples, with a maximum concentration of 125 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-5.1-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in sediment is presented in Figure I-5.1-28. Zinc is identified as a COPC in sediment.

I-5.1.2 Organic Chemicals at AOC 48-001

Thirty samples from AOC 48-001 were analyzed for dioxins/furans and PCBs. Ninety-eight samples were analyzed for SVOCs. Eighteen were analyzed for VOCs. Table 5.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.2-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.2-2.

I-5.1.2.1 Organic Chemicals in Soil

Nine soil samples were analyzed for dioxins/furans and PCBs. Forty-four samples were analyzed for SVOCs. Thirteen samples were analyzed for VOCs.

The following organic chemicals were detected in soil samples at AOC 48-001 and are identified as COPCs in soil: 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; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; butylbenzylphthalate; chrysene; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

I-5.1.2.2 Organic Chemicals in Tuff

Four tuff samples were analyzed for SVOCs, and two samples were analyzed for VOCs.

Fluoranthene and pyrene were detected in tuff samples at AOC 48-001 and are identified as COPCs in tuff.

I-5.1.2.3 Organic Chemicals in Sediment

Twenty-one sediment samples were analyzed for dioxins/furans and PCBs. Fifty samples were analyzed for SVOCs, and three samples were analyzed for VOCs.

The following organic chemicals were detected in sediment samples at AOC 48-001 and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene;

2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; toluene; and trichlorofluoromethane.

I-5.1.3 Radionuclides at AOC 48-001

Fifty-eight samples from AOC 48-001 were analyzed for americium-241. One hundred and sixty-one samples were analyzed for gamma-emitting radionuclides. Seventy-one samples were analyzed for tritium. One hundred and thirty-one samples were analyzed for isotopic plutonium. One hundred and twenty-seven samples were analyzed for isotopic thorium. One hundred thirty-five samples were analyzed for isotopic uranium. Eighty-nine samples were analyzed for strontium-90. Table 5.2-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.2-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown on Plate 5.2-3.

I-5.1.3.1 Radionuclides in Soil

Twenty-eight soil samples were analyzed for americium-241. Eighty-five samples were analyzed for gamma-emitting radionuclides. Twenty-three samples were analyzed for tritium. Seventy-five samples were analyzed for isotopic plutonium. Seventy-three samples were analyzed for isotopic thorium. Eighty-one samples were analyzed for isotopic uranium. Forty-three samples were analyzed for strontium-90.

Americium-241 was detected above the FV (0.013 pCi/g) in two surface soil samples and was detected in five soil samples from depths where the FV does not apply, with a maximum concentration of 5.27 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in three soil samples from depths where the FV does not apply, with a maximum concentration of 0.754 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in three surface soil samples and was detected in 13 soil samples from depths where the FV does not apply, with a maximum concentration of 223 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in three surface soil samples and was detected in 12 soil samples from depths where the FV does not apply, with a maximum concentration of 11.9 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in four soil samples from depths where the FV does not apply, with a maximum concentration of 2.9 pCi/g. Strontium-90 is identified as a COPC in soil.

Thorium-227 was detected in two soil samples with concentrations of 0.053 and 0.068 pCi/g. Thorium-227 has no FV and is identified as a COPC in soil.

Thorium-230 was detected above the BV (2.29 pCi/g) in 6 of 73 soil samples, with a maximum concentration of 4.19 pCi/g. Results were compared only to the BV because background dataset for thorium-230 in soil is not available. Thorium-230 is identified as a COPC in soil.

Tritium was detected in eight soil samples with a maximum concentration of 0.068 pCi/g and is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in 2 of 73 soil samples, with sample concentrations of 3.17 and 6.63 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in soil is not available. Uranium-234 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in 2 of 73 soil samples, with sample concentrations of 3.11 and 5.64 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in soil is not available. Uranium-238 is identified as a COPC in soil.

I-5.1.3.2 Radionuclides in Tuff

Six tuff samples were analyzed for americium-241. Seventeen samples were analyzed for gamma-emitting radionuclides. One sample was analyzed for tritium. Eighteen samples were analyzed for isotopic plutonium. Nineteen samples were analyzed for isotopic thorium and isotopic uranium. Fifteen samples were analyzed for strontium-90.

Cesium-137 was detected in 1 of 17 tuff samples with a maximum concentration of 0.845 pCi/g. Cesium-137 is identified as a COPC in tuff.

Plutonium-238 was detected in 1 of 11 tuff samples with a maximum concentration of 0.277 pCi/g. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 1 of 11 tuff samples with a maximum concentration of 0.045 pCi/g. Plutonium-239/240 is identified as a COPC in tuff.

Thorium-227 was detected in 1 of 19 tuff samples with a maximum concentration of 0.085 pCi/g. Thorium-227 has no BV for tuff and is identified as a COPC in tuff.

Thorium-230 was detected above the BV (1.98 pCi/g) in 1 of 19 tuff samples, with a maximum concentration of 2.07 pCi/g. Results were compared only to the BV because a background dataset for thorium-230 in tuff is not available. Thorium-230 is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 19 tuff samples, with a maximum concentration of 2.04 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in tuff is not available. Because uranium-234 was detected slightly and infrequently above the BV, it is not identified as a COPC in tuff.

Uranium-235 was detected above the BV (0.09 pCi/g) in 2 of 13 tuff samples, with sample concentrations of 0.1033 and 0.119 pCi/g. Results were compared only to the BV because background dataset for uranium-235 in tuff is not available. Uranium-235 is identified as a COPC in tuff.

I-5.1.3.3 Radionuclides in Sediment

Twenty-four tuff samples were analyzed for americium-241. Fifty-nine samples were analyzed for gamma-emitting radionuclides. Forty-seven samples were analyzed for tritium. Thirty-eight samples were analyzed for isotopic plutonium. Thirty-five samples were analyzed for isotopic thorium and isotopic uranium. Thirty-one samples were analyzed for strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) in 6 of 24 sediment samples, with a maximum concentration of 0.545 pCi/g. Results were compared only to the FV because the FV is greater than the maximum sediment fallout concentration (0.038 pCi/g). Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.90 pCi/g) in 4 of 59 sediment samples, with a maximum concentration of 2.09 pCi/g. Two sampling results also exceeded the maximum fallout concentration of cesium-137 in sediment (1.28 pCi/g). Statistical tests were performed to determine if the site sampling results for cesium-137 are different than background. The statistical test results are presented in Table I-5.1-3. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cesium-137 in sediment is presented in Figure I-5.1-29. Cesium-137 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 8 of 38 sediment samples, with a maximum concentration of 3.15 pCi/g. Results were compared to only FV because the FV is greater than the maximum fallout concentration of plutonium-239-/240 in sediment (0.065 pCi/g). Plutonium-239/240 is interpreted as being substantially different than background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Thorium-227 was detected in 1 of 35 sediment samples with a maximum concentration of 0.046 pCi/g. Thorium-227 has no BV for sediment and is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in 2 of 47 sediment samples, with concentrations of 0.100233 and 334 pCi/g. Results were compared only to the FV because the FV is greater than the maximum fallout concentration of tritium in sediment (0.0856 pCi/g). Tritium is interpreted as being substantially different than background and no further evaluation is necessary. Tritium is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) in 1 of 35 sediment samples, at a concentration of 3.02 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-234 are different than background. The statistical test results are presented in Table I-5.1-3. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for uranium-234 in sediment is presented in Figure I-5.1-30. Uranium-234 is identified as a COPC in sediment.

Uranium-235/236 was detected above the BV (0.20 pCi/g) in 1 of 35 sediment samples, with a maximum concentration of 0.248 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-235/236 are different than background. The statistical test results are presented in Table I-5.1-3. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for uranium-235/236 in sediment is presented in Figure I-5.1-31. Uranium-235/236 is identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) in 3 of 35 sediment samples, with a maximum sample concentration of 3.21 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-5.1-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-5.1-32. Uranium-238 is not identified as a COPC in sediment.

I-5.1.4 Summary of COPCs at AOC 48-001

The inorganic chemicals identified as COPCs at AOC 48-001 are antimony, arsenic, barium, cadmium, chromium, hexavalent chromium, cobalt, copper, total cyanide, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, thallium, vanadium, and zinc.

The organic chemicals identified as COPCs at AOC 48-001 are acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at AOC 48-001 are americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, thorium-227, thorium-230, tritium, uranium-234, uranium-235/236, and uranium-238.

I-5.1.5 Nature and Extent of Contamination at AOC 48-001

I-5.1.5.1 Nature and Extent of Inorganic COPCs

Because AOC 48-001 is a surface (air deposition) contamination site only, the vertical extent of contamination is not evaluated. The lateral extent of inorganic COPCs is evaluated using results from surface samples at AOC 48-001 and from other SWMUs and AOCs within the boundary of AOC 48-001.

Antimony was detected above the BV in only one surface sample at location 48-02133, with a concentration of 0.88 mg/kg. Antimony was not detected above the BV at any other surface locations. The lateral extent of antimony is defined.

Arsenic was detected above the BV in only one surface sample at location MO-605125. The concentration (4.15 mg/kg) is only slightly above the BV of 3.98 mg/kg. Arsenic was not detected above the BV at any other surface locations. The lateral extent of arsenic is defined.

Barium was detected above the BV in one surface sample each at locations MO-604945 and MO-605152. The concentration at location MO-605152 is less than the maximum background concentration (51.6 mg/kg), and the concentration at location MO-604945 is less than twice the BV (127 mg/kg). Barium was not detected above the BV at any other surface locations. The lateral extent of barium is defined.

Chromium was detected above the BV in surface samples at nine locations. Seven of the nine samples are located at Consolidated Unit 48-007(a)-00, and the lateral extent of chromium is defined for that site (section I-5.7.5.1). Concentrations of the other two samples (13.4 and 12.3 mg/kg at locations MO-604945 and MO-605114) are only slightly above the sediment BV of 10.5 mg/kg, and concentrations decreased downslope. The lateral extent of chromium is defined.

Hexavalent chromium was detected in surface samples at 12 locations. Three of the 12 samples are located at Consolidated Unit 48-007(a)-00, and the lateral extent of hexavalent chromium is defined for

that site (section I-5.7.5.1). Concentrations of the other nine samples are all less than the EQLs, and concentrations decreased downslope. The lateral extent of hexavalent chromium is defined.

Cobalt was detected above the BV in only one surface sample, at location MO-604945. The concentration (5.72 mg/kg) is only slightly above the BV of 4.73 mg/kg. Cobalt was not detected above the BV at any other surface locations. The lateral extent of cobalt is defined.

Copper was detected above the BV in surface samples at 16 locations. Eight of the 16 samples are located at Consolidated Unit 48-007(a)-00, and the lateral extent of copper is defined for that site (section I-5.7.5.1). Concentrations of the other eight samples are all less than twice the BV, and concentrations decreased downslope. The lateral extent of copper is defined.

Total cyanide was detected above the BV in only one surface sample, at location MO-604942. The concentration (6.75 mg/kg) is substantially above the BV of 0.5 mg/kg, and there are no samples downslope for which total cyanide was analyzed. The lateral extent is not defined for total cyanide at location MO-604942.

Manganese was detected above the BV in only one surface sample, at location MO-605127. The concentration (1340 mg/kg) is slightly above the maximum background concentration of 1100 mg/kg. Manganese was not detected above the BV at any other surface locations. The lateral extent of manganese is defined.

Mercury was detected above the BV in surface samples at 10 locations. Seven of the 10 samples are located at SWMUs 48-002(a,b), and the lateral extent of mercury is defined for that site (section I-5.2.5.1). Three of the 10 samples are located at Consolidated Unit 48-007(a)-00, and the lateral extent of mercury is also defined for that site (section I-5.7.5.1). The lateral extent of mercury is defined.

Nitrate was detected in multiple surface samples at TA-48, with a maximum concentration of 10.1 mg/kg. These concentrations are likely naturally occurring. The lateral extent of nitrate is defined.

Perchlorate was detected in multiple surface samples at TA-48, with a maximum concentration of 1.78 mg/kg. Concentrations of perchlorate in the nine surface samples collected in 2009, surrounding TA-48 on the mesa top, are in the range of 0.00051–0.00425 mg/kg, and concentrations decreased downslope. The lateral extent of perchlorate is defined.

Vanadium was detected above the BV in two surface samples, at locations MO-604945 and MO-605125. Both concentrations are less than twice the BV. Vanadium was not detected above the BV at any other surface locations. The lateral extent of vanadium is defined.

Zinc was detected above the BV in surface samples at 19 locations. Samples at locations MO-605101, MO-605110, MO-605131, and MO-605147 are located at AOC 03-007, SWMU 03-049(e), and SWMU 48-005, respectively. Samples at locations MO-605163 and MO-605165 are located at SWMU 48-003. Samples at locations MO-604921 and MO-604924 are located at SWMUs 48-002(a,b). In addition, eight samples are located at Consolidated Unit 48-007(a)-00. The lateral extent of zinc is defined at all these sites. Three of the nine surface samples collected in 2009, surrounding TA-48 on mesa top, have concentrations only slightly above the BV, and concentrations decreased downslope. The lateral extent of zinc is defined.

I-5.1.5.2 Nature and Extent of Organic COPCs

Because AOC 48-001 is a surface (air deposition) contamination site only, the vertical extent of contamination is not evaluated. The lateral extent of organic COPCs is evaluated using results from surface samples at AOC 48-001 and from other SWMUs and AOCs within the boundary of AOC 48-001.

Fifteen PAHs [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; naphthalene; phenanthrene; and pyrene] were detected at various locations. The lateral extent of PAHs for each site within the boundary of AOC 48-001 is defined. Concentrations of PAHs in the nine surface samples collected on the mesa top in 2009, are at low levels and decreased downslope. The lateral extent of PAHs is defined.

Aroclor-1242 was detected in only one surface sample, at location MO-605098, with a concentration of 0.0032 mg/kg. Aroclor-1254 and Aroclor-1260 were detected in multiple surface samples, with maximum concentrations of 0.0675 and 0.0424 mg/kg, respectively. Concentrations of all PCBs decreased downslope. The lateral extent of Aroclor-1242, Aroclor-1254, and Aroclor-1260 is defined.

Acetone, 2-butanone, carbazole, 4-isopropyltoluene, methylene chloride, toluene, and trichlorofluoromethane were not analyzed in surface samples. They were identified as COPCs because of results from deeper samples that were historically assigned to AOC 48-001. Concentrations of these VOCs are unrelated to AOC 48-001.

Benzoic acid was detected in two surface samples, at locations MO-605097 and MO-605122. Both concentrations are less than the EQLs. Benzoic acid was not detected at any other surface locations. The lateral extent of benzoic acid is defined.

Bis(2-ethylhexyl)phthalate was detected in two surface samples, at locations MO-604924 and MO-605144. One concentration less than the EQL and the other slightly above the EQL. Bis(2-ethylhexyl)phthalate was not detected at any other surface locations. The lateral extent of bis(2-ethylhexyl)phthalate is defined.

Butylbenzylphthalate, di-n-butylphthalate, and di-n-octylphthalate were not detected in surface samples at AOC 48-001. They were identified as COPCs because of deeper samples that were historically assigned to AOC 48-001, and the detected concentrations are not related to AOC 48-001. The lateral extent of butylbenzylphthalate, di-n-butylphthalate, and di-n-octylphthalate is defined.

Dibenzofuran was detected in only one surface sample, at location MO-605098, with a concentration of 0.779 mg/kg. Dibenzofuran was not detected at any other surface locations. The lateral extent of dibenzofuran is defined.

Seventeen dioxin/furan congeners were detected at various locations. All concentrations, including those in the nine surface samples collected in 2009 on the mesa top, are at or below the EQLs, and concentrations decreased downslope. The lateral extent of these dioxin/furan congeners is defined.

2-Methylnaphthalene was detected in surface samples at nine locations, with a maximum concentration of 0.323 mg/kg. All concentrations are below the EQLs, and concentrations decreased downslope. The lateral extent of 2-methylnaphthalene is defined.

1,2,4-Trimethylbenzene was detected in only one surface sample, at location MO-604926, with a concentration of 0.004 mg/kg. This concentration is below the EQL. 1,2,4-Trimethylbenzene was not detected in any other surface samples at the site. The lateral extent of 1,2,4-trimethylbenzene is defined.

I-5.1.5.3 Nature and Extent of Radionuclide COPCs

Because AOC 48-001 is a surface (air deposition) contamination site only, the vertical extent of contamination is not evaluated. The lateral extent of radionuclide COPCs is evaluated using results from surface samples at AOC 48-001 and from other SWMUs and AOCs within the boundary of AOC 48-001.

Americium-241 was detected above the FV in surface samples at six locations. Samples at locations 48-02020, 48-02054, 48-02055, MO-605149 are located at SWMU 48-003. The lateral extent of americium-241 is defined for this site. Americium-241 was detected above the FV in two of the nine surface samples collected on the mesa top in 2009, with a maximum concentration of 0.0728 pCi/g. Concentrations decreased downslope. The lateral extent of americium-241 is defined.

Cesium-137 was detected above the FV in surface samples at eight locations. Samples at locations 48-02153, 48-02167, and 48-02172 are located at SWMUs 48-007(c) and 48-007(b), and Consolidated Unit 48-007(a)-00, respectively. Samples at locations MO-605145, MO-605152, and MO-605160 are located at SWMU 48-003. The lateral extent of cesium-137 is defined for each of these sites. Cesium-137 was detected above the FV in two of the nine surface samples collected in 2009. The concentration at location MO-604945 is less than twice the FV and the concentration at location MO-604939 is slightly above twice the BV. Concentrations decreased downslope. The lateral extent of cesium-137 is defined.

Plutonium-238 was detected above the FV in surface samples at four locations. Samples at locations 48-02020 and 48-2080 are located at Consolidated Unit 48-007(a)-00. Samples at locations 48-02067 and 48-02068 are located at AOC 48-002(e). The lateral extent of plutonium-238 is defined for both sites. Plutonium-238 was not detected above the FV in the nine surfaces samples collected in 2009. The lateral extent of plutonium-238 is defined.

Plutonium-239/240 was detected above the FV in surface samples at 10 locations. Samples at locations 48-02020, 48-2080, and MO-605122 are located at Consolidated Unit 48-007(a)-00. Samples at locations 48-02054, 48-2055, MO-605145, and MO-605149 are located at SWMU 48-003. The lateral extent of plutonium-238 is defined for both sites. Plutonium-239/240 was detected above the FV in three of the nine surfaces samples collected in 2009, and concentrations decreased downslope. The lateral extent of plutonium-239/240 is defined.

Thorium-230 was detected above the BV in only one surface sample, at location 48-02006. The concentration (3.88 pCi/g) is less than twice the BV of 2.29 pCi/g. Thorium-230 was not detected above the BV at any other surface locations. The lateral extent of thorium-230 is defined.

Tritium was detected or detected above the FV in surface samples at 11 locations. Ten of the 11 results are at low levels with a maximum concentration of approximately 0.1 pCi/g. Tritium was detected in the surface sample at location MO-605147, with a concentration of 334 pCi/g. This location is at SWMU 48-003, and the lateral extent of tritium is defined for this site because concentrations decreased downslope from location MO-605147. The lateral extent of tritium is defined.

Uranium-234 was detected above the BV in only one surface sample, at location MO-605122. The concentration (3.17 pCi/g) is less than twice the BV of 2.59 pCi/g, and concentrations decreased downslope. Uranium-234 was not detected above the BV at any other surface locations. The lateral extent of uranium-234 is defined.

Uranium-235/236 was detected above the BV in only one surface sample, at location MO-604939. The concentration (0.248 pCi/g) is only slightly above the BV of 0.2 pCi/g, and concentrations decreased

downslope from that location. Uranium-235/236 was not detected above the BV at any other surface locations. The lateral extent of uranium-235/236 is defined.

Uranium-238 was detected above the BV in surface samples at locations MO-604939, MO-605122, and MO-605145. All concentrations are less than twice the BV, and concentrations decreased downslope from those locations. Uranium-238 was not detected above the BV at any other surface locations. The lateral extent of uranium-238 is defined.

I-5.1.5.4 Summary of Nature and Extent for AOC 48-001

The lateral extent of all inorganic COPCs is defined, except for the lateral extent of total cyanide at location MO-604942.

The lateral extent of all organic and radionuclide COPCs is defined.

I-5.2 SWMUs 48-002(a and b)

Fifty-six samples (17 soil and 39 tuff) were collected in 1993, 1995, and 2009 from 16 locations at SWMUs 48-002(a and b). Table 5.3-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.3-1 shows the sampling locations.

I-5.2.1 Inorganic Chemicals at SWMUs 48-002(a) and 48-002(b)

Forty-eight samples were analyzed for TAL metals, and 46 samples were analyzed for total cyanide, nitrate, and perchlorate. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 5.3-2.

I-5.2.1.1 Inorganic Chemicals in Soil

Nine soil samples were analyzed for TAL metals. Seven samples were analyzed for total cyanide, nitrate, and perchlorate.

Antimony was detected above the BV (0.83 mg/kg) in one of nine soil samples, at a concentration of 0.88 mg/kg. Antimony also had DLs (0.984–1.02 mg/kg) above the BV in six of nine soil samples. The maximum DL is above the maximum soil background concentration (1 mg/kg). The box plot for antimony in soil is presented in Figure I-5.2-1. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in one of nine soil samples, with a maximum sample concentration of 0.615 mg/kg. Cadmium also had DLs (0.492–0.51 mg/kg) above the BV in six of nine soil samples. All sample concentrations are below the maximum soil background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-5.2-2. Cadmium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) in two of nine soil samples, with a maximum concentration of 24.2 mg/kg, which is also above the maximum soil background concentration (16 mg/kg). The box plot for copper in soil is presented in Figure I-5.2-3. Copper is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) in seven of nine soil samples, with a maximum concentration of 27.6 mg/kg. Mercury is interpreted as being substantially above background, and no further evaluation is necessary. Mercury is identified as a COPC in soil.

Nitrate and perchlorate were detected in all seven soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) in two of nine soil samples, with a maximum concentration of 50 mg/kg. All sample concentrations are below the maximum soil background concentration (75.5 mg/kg). The box plot for zinc in soil is presented in Figure I-5.2-4. Zinc is not identified as a COPC in soil.

I-5.2.1.2 Inorganic Chemicals in Tuff

Thirty-nine tuff samples were collected at SWMUs 48-002(a and b) and analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Aluminum was detected above the BV (7340 mg/kg) in 1 of 39 tuff samples, at a concentration of 7720 mg/kg. Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure I-5.2-5. Aluminum is not identified as a COPC in tuff.

Antimony was not detected but had DLs (1.02–1.19 mg/kg) above the BV (0.5 mg/kg) in all 39 tuff samples. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) and above the maximum tuff background concentration (51.6 mg/kg) in 2 of 39 tuff samples, with a maximum concentration of 146 mg/kg. Barium is interpreted as being substantially above background, and no further evaluation is necessary. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 2 of 39 tuff samples, with a maximum concentration of 1.47 mg/kg. Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in tuff is presented in Figure I-5.2-6. Beryllium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in 2 of 39 tuff samples, with a maximum concentration of 2550 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-5.2-7. Calcium is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 1 of 39 tuff samples, at a concentration of 4.96 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.2-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.2-8. Copper is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum tuff background concentration (7 mg/kg) in 1 of 39 tuff samples, at a concentration of 8.56 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.2-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in tuff is presented in Figure I-5.2-9. Nickel is not identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no tuff BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected but had DLs (1.02–1.15 mg/kg) above the BV (0.3 mg/kg) in all 39 tuff samples. Selenium is identified as a COPC in tuff.

I-5.2.2 Organic Chemicals at SWMUs 48-002(a) and 48-002(b)

A total of 48 samples from SWMUs 48-002(a and b) were analyzed for SVOCs, 10 samples were analyzed for PCBs and dioxins/furans, and 39 samples were analyzed for VOCs. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.3-3.

I-5.2.2.1 Organic Chemicals in Soil

Nine soil samples were analyzed for SVOCs. One sample was analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more soil and soil samples and are identified as COPCs in soil: acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-5.2.2.2 Organic Chemicals in Tuff

Thirty-nine tuff samples were analyzed for SVOCs and VOCs, and nine samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one tuff sample and are identified as COPCs in tuff: acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; carbon disulfide; 4-chloro-3-methylphenol; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; indeno(1,2,3-cd)pyrene; isopropylbenzene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; phenanthrene; and pyrene.

I-5.2.3 Radionuclides at SWMUs 48-002(a) and 48-002(b)

A total of 54 samples from SWMUs 48-002(a and b) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium; 46 samples were analyzed for tritium; eight samples were analyzed for isotopic thorium. Table 5.3-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.3-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 5.3-4.

I-5.2.3.1 Radionuclides in Soil

Fifteen soil samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium; seven samples were analyzed for tritium; eight samples were analyzed for isotopic thorium.

Thorium-230 was detected above the BV (2.29 pCi/g) in three of eight soil samples, with a maximum concentration of 4.19 pCi/g. Because no background data set for isotopic thorium in soil or soil is available, site sampling results are compared to the BV only. Thorium-230 is identified as a COPC in soil.

Tritium was detected in one of seven soil samples and is identified as a COPC in soil.

I-5.2.3.2 Radionuclides in Tuff

A total of 39 tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Plutonium-239/240 was detected in three tuff samples and is identified as a COPC in tuff.

Tritium was detected in five tuff samples and is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 39 tuff samples, at a concentration of 0.116 pCi/g. The site sampling results are compared to the BV only. Uranium-235/236 is identified as a COPC in tuff.

I-5.2.4 Summary of COPCs at SWMUs 48-002(a) and 48-002(b)

The inorganic chemicals identified as COPCs at SWMUs 48-002(a and b) are antimony, barium, copper, mercury, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMUs 48-002(a and b) are acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; carbon disulfide; 4-chloro-3-methylphenol; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; isopropylbenzene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMUs 48-002(a and b) are plutonium-239/240, thorium-230, tritium, and uranium-235/236.

I-5.2.5 Nature and Extent of Contamination at SWMUs 48-002(a) and 48-002(b)

I-5.2.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected in only one sample, at location 48-02133, where only a surface sample was collected. Antimony was not detected in samples collected from greater depths across the site. The lateral and vertical extent of antimony are defined.

Barium was detected above the BV at only one location (MO-604930), where it decreased with depth. Concentrations decreased downslope. The lateral and vertical extent of barium are defined.

Copper was detected above the BV at three locations. Concentrations decreased with depth at two of those locations. Copper was detected above the BV only in the deepest sample at location MO-604930, where it was less than the maximum background concentration (6.2 mg/kg). Concentrations decreased downslope. The lateral and vertical extent of copper are defined.

Mercury was detected above the BV at seven locations. Concentrations decreased with depth at five of the seven locations, and mercury was detected above the BV in the single surface samples at two locations. Mercury was not detected above the BV in any samples deeper than 0.5 ft bgs. Concentrations decreased downslope. The lateral and vertical extent of mercury are defined.

Nitrate was detected at numerous locations, with a maximum concentration of 10.1 mg/kg. Concentrations are likely naturally-occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate concentrations increased slightly or did not change substantially with depth at seven locations. The highest concentration is at location MO-604923, where the concentrations decrease with depth. Concentrations decreased downslope. The lateral extent of perchlorate is defined, but the vertical extent is not defined.

I-5.2.5.2 Nature and Extent of Organic COPCs

PAHs were detected at multiple locations, and concentrations decreased with depth at all locations except 48-02133 and 48-02134, where only surface samples were collected. Concentrations decreased downslope. The lateral and vertical extent of PAHs are defined.

Benzoic acid was detected in the deepest sample at one location (MO-604921), at a concentration of 0.277 mg/kg. Benzoic acid was not detected in samples from similar and greater depths at other locations. Concentrations decreased downslope. The lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected in the surface sample only at one location (MO-604924). Concentrations decreased with depth and downslope. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Carbon disulfide, 4-chloro-3-methylphenol, dibenzofuran, and 4-isopropyltoluene were each detected in one sample. Concentrations decreased with depth at all locations, and concentrations decreased downslope. The lateral and vertical extent of carbon disulfide, 4-chloro-3-methylphenol, dibenzofuran, and 4-isopropyltoluene are defined.

Concentrations of dioxin/furan congeners decreased with depth at all locations, except location MO-604922, where the concentration increased slightly in the deepest sample. The concentration was very low and at the EQL. Concentrations decreased downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-5.2.5.3 Nature and Extent of Radionuclide COPCs

Plutonium-239/240 was detected in three samples at two locations. The concentrations decreased with depth at both locations, and decreased downslope. The lateral and vertical extent of plutonium-239/240 are defined.

Thorium-230 was detected above the BV at only one location (48-02006), where the concentrations decreased with depth. The lateral and vertical extent of thorium-230 are defined.

Tritium was detected at three locations, and increased slightly with depth at location MO-604924, with a concentration of 0.0422 pCi/g in the deepest sample (12.5–14 ft bgs). Tritium was detected infrequently and at very low concentrations. Concentrations decreased downslope. The lateral and vertical extent of tritium are defined.

Uranium-235/236 was detected above the BV in only one sample, the deepest sample (12.5–14 ft bgs) at location MO-604922. The sample concentration (0.116 pCi/g) is only slightly above the BV. The lateral and vertical extent of uranium-235/236 are defined.

I-5.2.5.4 Summary of Nature and Extent for SWMUs 48-002(a) and 48-002(b)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMUs 48-002(a) and 48-002(b) except the vertical extent of perchlorate.

I-5.3 AOC 48-002(e)

A total of 22 samples (12 soil and 10 tuff) were collected in 1993, 1997, 2009 from eight locations at AOC 48-002(e). Table 5.5-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.5-1 shows the sampling locations.

I-5.3.1 Inorganic Chemicals at AOC 48-002(e)

Fifteen samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide. Table 5.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.5-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 5.5-2.

I-5.3.1.1 Inorganic Chemicals in Soil

Five soil samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.07–1.24 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in all five soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.537–0.62 mg/kg) above the BV (0.4 mg/kg) in all five soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in one of five soil samples, with a maximum concentration of 1.01 mg/kg. Results were compared only to the BV because background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Nitrate and perchlorate were detected in soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

I-5.3.1.2 Inorganic Chemicals in Tuff

Ten tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.06–1.12 mg/kg) above the BV (0.5 mg/kg) in all 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) and above the maximum background concentration of barium in tuff (51.6 mg/kg) in 3 of 10 tuff samples, with a maximum concentration of 63.5 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.3-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for barium in tuff is presented in Figure I-5.3-1. Barium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 1 of 10 tuff samples, with a maximum concentration of 8480 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-5.3-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-5.3-2. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 1 of 10 tuff samples, with a maximum concentration of 7.92 mg/kg. This sample result did not exceed the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.3-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-5.3-3. Chromium is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 1 of 10 tuff samples, at a concentration of 15 mg/kg. This sample result did not exceed the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.3-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-5.3-4. Lead is not identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had DLs (1.06–1.15 mg/kg) above the BV (0.3 mg/kg) in all 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-5.3.2 Organic Chemicals at AOC 48-002(e)

Fifteen samples were analyzed for dioxins/furans. Three samples were analyzed for PCBs. Table 5.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.5-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.5-3.

I-5.3.2.1 Organic Chemicals in Soil

Five soil samples were analyzed for dioxins/furans. One soil sample was analyzed for PCBs.

The following organic chemicals were detected in at least one soil sample at AOC 48-002(e) and are identified as COPCs in soil: 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; and total tetrachlorodibenzofurans.

I-5.3.2.2 Organic Chemicals in Tuff

Ten tuff samples were analyzed for dioxins/furans. Two tuff samples were analyzed for PCBs.

Total heptachlorodibenzodioxins and 1,2,3,4,6,7,8,9-octachlorodibenzodioxin are detected in at least one tuff sample at AOC 48-002(e) and are identified as COPCs in tuff.

I-5.3.3 Radionuclides at AOC 48-002(e)

Nineteen samples from AOC 48-002(e) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, and isotopic uranium. Fifteen samples were analyzed for tritium. Table 5.5-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.5-4 presents the radionuclides detected or detected above BVs/FVs.

I-5.3.3.1 Radionuclides in Soil

Nine soil samples were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, and isotopic uranium. Five soil samples were analyzed for tritium.

No radionuclides were detected or detected above BV/FV in soil samples from AOC 48-002(e).

I-5.3.3.2 Radionuclides in Tuff

Ten tuff samples were analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic thorium, and isotopic uranium.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 10 tuff samples, at a concentration of 0.0946 pCi/g. Results were compared only to the BV because background dataset for uranium-235 in tuff is not available. The sample result is less than 20% above the BV. Because uranium-235/236 is detected slightly and infrequently above background (1 of 10 samples), it is eliminated as a COPC in tuff.

I-5.3.4 Summary of COPCs at AOC 48-002(e)

The inorganic chemicals identified as COPCs at AOC 48-002(e) are antimony, barium, chromium, total cyanide, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at AOC 48-002(e) are 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; and total tetrachlorodibenzofurans.

There are no radionuclide COPCs identified at AOC 48-002(e).

I-5.3.5 Nature and Extent of Contamination at AOC 48-002(e)

I-5.3.5.1 Nature and Extent of Inorganic COPCs

Barium was detected above the BV at locations MO-605137, MO-605139, and MO-605141. Concentrations decreased with depth at these locations. Barium was not detected above the BV at the downslope location MO-605138. The lateral and vertical extent of barium are defined.

Chromium and total cyanide were detected above BVs in only one sample (at different depth) at location MO-605139. Concentrations of both decreased with depth. They were not detected in samples at nearby locations. The lateral and vertical extent of chromium and total cyanide are defined.

Nitrate was detected at five locations, with a maximum concentration of 1.55 mg/kg. The concentrations of nitrate are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at five locations, with a maximum concentration of 0.00562 mg/kg. Concentrations decreased with depth at these locations, and decreased downslope. The lateral and vertical extent of perchlorate are defined.

I-5.3.5.2 Nature and Extent of Organic COPCs

Four dioxin/furan congeners were detected at one or more locations. Concentrations decreased or did not change substantially with depth, and decreased downslope. The concentrations are at low levels equivalent to the EQLs. The lateral and vertical extent of the dioxin/furan congeners are defined.

I-5.3.5.3 Nature and Extent of Radionuclide COPCs

No radionuclide COPCs are identified at AOC 48-002(e).

I-5.3.5.4 Summary of Nature and Extent for AOC 48-002(e)

The lateral and vertical extent of all inorganic and organic COPCs are defined at AOC 48-002(e), and there are no radionuclide COPCs identified at the site.

I-5.4 SWMU 48-003

A total of 115 samples (21 soil, 74 tuff, and 20 sediment) were collected in 1993, 1997, 2009 from 34 locations at SWMU 48-003. Table 5.6-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.6-1 shows the sampling locations.

I-5.4.1 Inorganic Chemicals at SWMU 48-003

Eighty-three samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Ninety-three samples were analyzed for TAL metals. Table 5.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.6-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 5.6-1.

I-5.4.1.1 Inorganic Chemicals in Soil

Three soil samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Twelve soil samples were analyzed for TAL metals.

Antimony was not detected, but had DLs (0.969–6.17 mg/kg) above the BV (0.83 mg/kg) in all 12 soil samples. Eleven DLs (1.03–6.17 mg/kg) exceeded the maximum background concentration of antimony in soil (1 mg/kg). Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.485–0.617 mg/kg) above the BV (0.4 mg/kg) in all 12 soil samples. None of the DLs exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Nitrate and perchlorate were detected in soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

I-5.4.1.2 Inorganic Chemicals in Tuff

Sixty-five tuff samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (0.97–1.18 mg/kg) above the BV (0.5 mg/kg) in all 65 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 3 of 65 tuff samples, with a maximum concentration of 253 mg/kg. Two of the three sampling results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not

statistically different than background. The box plot for barium in tuff is presented in Figure I-5.4-1. Barium is not identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 2 of 65 tuff samples, with sample concentrations of 1.33 and 1.4 mg/kg. Neither of the sampling results exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for beryllium in tuff is presented in Figure I-5.4-2. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 1 of 65 tuff samples, at a concentration of 3240 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. However, the sample concentration is less than twice the maximum background concentration. Based on EPA's Risk Assessment Guidance for Superfund, section 5.9.4, page 5-23, calcium may be eliminated as a COPC if detected infrequently above background (1 of 65 tuff samples) and not substantially above background. The box plot for calcium in tuff is presented in Figure I-5.4-3. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 7 of 65 tuff samples, with a maximum concentration of 28.9 mg/kg. Three of the seven sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-5.4-4. Chromium is identified as a COPC in tuff.

Hexavalent chromium, nitrate, and perchlorate were detected in multiple tuff samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 1 of 65 tuff samples, with a maximum concentration of 3.51 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cobalt in tuff is presented in Figure I-5.4-5. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 2 of 65 tuff samples, with sample concentrations of 5.02 and 5.59 mg/kg. Neither of the sampling results exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.4-6. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 65 tuff samples, with a maximum concentration of 0.613 mg/kg. Results were compared only to the BV because background dataset for total cyanide in tuff is not available. The sample result is less than 20% above the tuff BV. Because total cyanide is detected slightly and infrequently above background (1 of 65 samples), it is eliminated as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 1 of 65 tuff samples, with a maximum concentration of 13.9 mg/kg. The sample result did not exceed the maximum background concentration of lead in tuff (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.4-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-5.4-7. Lead is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 1 of 65 tuff samples, with a maximum concentration of 6.59 mg/kg. The sample result did not exceed the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in tuff is presented in Figure I-5.4-8. Nickel is not identified as a COPC in tuff.

Selenium was not detected, but had DLs (0.985–1.15 mg/kg) above the BV (0.3 mg/kg) in all 65 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) and above the maximum background concentration of zinc in tuff (65.6 mg/kg) in 1 of 65 tuff samples, with a maximum concentration of 91 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-5.4-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for zinc in tuff is presented in Figure I-5.4-9. Zinc is not identified as a COPC in tuff.

I-5.4.1.3 Inorganic Chemicals in Sediment

Fifteen sediment samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Sixteen sediment samples were analyzed for TAL metals.

Antimony was not detected, but had DLs (0.961–6.67 mg/kg) above the BV (0.83 mg/kg) in all 16 sediment samples. Results were compared only to the BV because background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was not detected, but had DLs (0.48–0.667 mg/kg) above the BV (0.4 mg/kg) in all 16 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Hexavalent chromium, nitrate, and perchlorate were detected in sediment samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in sediment.

Copper was detected above the BV (11.2 mg/kg) in 2 of 16 sediment samples, with sample concentrations of 16.3 and 21.7 mg/kg. Both sampling results also exceeded the maximum background concentration of copper in sediment (12 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.4-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for copper in sediment is presented in Figure I-5.4-10. Copper is not identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) and above the maximum background concentration of lead in sediment (25.6 mg/kg) in 1 of 16 sediment samples, with a maximum concentration of 52.8 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.4-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in sediment is presented in Figure I-5.4-11. Lead is not identified as a COPC in sediment.

Selenium was not detected, but had DLs (0.958–1.13 mg/kg) above the BV (0.3 mg/kg) in all 16 sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in 1 of 16 sediment samples, with a maximum concentration of 70.5 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-5.4-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for zinc in sediment is presented in Figure I-5.4-12. Zinc is identified as a COPC in sediment.

I-5.4.2 Organic Chemicals at SWMU 48-003

Twenty-five samples were analyzed for dioxins/furans and PCBs. Ninety-three samples were analyzed for SVOCs. Table 5.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.6-3 presents the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.6-2.

I-5.4.2.1 Organic Chemicals in Soil

One soil sample was analyzed for dioxins/furans and PCBs. Twelve soil samples were analyzed for SVOCs.

The following organic chemicals were detected in soil samples at SWMU 48-003 and are identified as COPCs in soil: Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-5.4.2.2 Organic Chemicals in Tuff

Sixteen tuff samples were analyzed for dioxins/furans and PCBs. Sixty-five samples were analyzed for SVOCs. Sixty-four samples were analyzed for VOCs.

The following organic chemicals were detected in tuff samples at SWMU 48-003 and are identified as COPCs in tuff: acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin;

1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; total tetrachlorodibenzofurans; and toluene.

I-5.4.2.3 Organic Chemicals in Sediment

Three sediment samples were analyzed for dioxins/furans and PCBs. Sixteen sediment samples were analyzed for SVOCs.

The following organic chemicals were detected in sediment samples at SWMU 48-003 and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-5.4.3 Radionuclides at SWMU 48-003

Ninety-five samples from SWMU 48-003 were analyzed for americium-241. One hundred and ten samples were analyzed for gamma-emitting radionuclides. Eighty-three samples were analyzed for tritium. One hundred and fifteen samples were analyzed for isotopic plutonium, isotopic thorium, and isotopic uranium. Ninety-three samples were analyzed for strontium-90. Table 5.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.6-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.6-2.

I-5.4.3.1 Radionuclides in Soil

Eleven soil samples were analyzed for americium-241. Eighteen samples were analyzed for gamma-emitting radionuclides. Three samples were analyzed for tritium. Twenty-one samples were analyzed for isotopic plutonium, isotopic thorium, and isotopic uranium. Twelve samples were analyzed for strontium-90.

Americium-241 was detected above the FV (0.013 pCi/g) in two surface soil samples and was detected in three soil samples from depths where the FV does not apply, with a maximum concentration of 1.16 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected above the FV (1.65 pCi/g) in one surface soil sample and was detected in four soil samples from depths where the FV does not apply, with a maximum concentration of 2.549 pCi/g. Cesium-137 is identified as a COPC in soil.

Cobalt-60 was detected (0.0795 pCi/g) in 1 of 11 soil samples and has no BV. Cobalt-60 is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in one surface soil sample and was detected in one soil sample from a depth where the FV does not apply, with a maximum concentration of 0.162 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in two surface soil samples and was detected in one soil sample from a depth where the FV does not apply, with a maximum concentration of 6.4 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected in one soil sample from a depth where the FV does not apply, at a concentration of 0.834 pCi/g. Strontium-90 is identified as a COPC in soil.

Thorium-230 was detected above the BV (2.29 pCi/g) in 1 of 11 soil samples, at a concentration of 2.35 pCi/g. Results were compared only to the BV because background dataset for thorium-230 in soil is not available. The sample result is less than 20% above the soil BV. Because thorium-230 is detected slightly and infrequently above background (1 of 11 samples), it is eliminated as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in 2 of 11 soil samples, with sample concentrations of 3.48 and 6.63 pCi/g. Results were compared only to the BV because background dataset for uranium-234 in soil is not available. Uranium-234 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in 2 of 11 soil samples, with sample concentrations of 3.97 and 5.64 pCi/g. Results were compared only to the BV because background dataset for uranium-238 in soil is not available. Uranium-238 is identified as a COPC in soil.

I-5.4.3.2 Radionuclides in Tuff

Sixty-five tuff samples were analyzed for americium-241, tritium, and strontium-90. Seventy-four samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, and isotopic uranium.

Cesium-137 was detected in 4 of 74 tuff samples with a maximum concentration of 0.318 pCi/g. Cesium-137 is identified as a COPC in tuff.

Plutonium-238 was detected in 1 of 74 tuff samples with a maximum concentration of 0.277 pCi/g. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 10 of 74 tuff samples with a maximum concentration of 0.045 pCi/g. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 14 of 65 tuff samples with a maximum concentration of 0.13238 pCi/g. Tritium is identified as a COPC in tuff.

I-5.4.3.3 Radionuclides in Sediment

Nineteen sediment samples were analyzed for americium-241. Eighteen samples were analyzed for gamma-emitting radionuclides. Fifteen samples were analyzed for tritium. Twenty samples were analyzed for isotopic plutonium, isotopic thorium, and isotopic uranium. Sixteen samples were analyzed for strontium-90.

Americium-241 was detected above the FV (0.040 pCi/g) in 5 of 19 sediment samples, with a maximum concentration of 0.545 pCi/g. Results were compared only to the FV because the FV is greater than the maximum fallout concentration of americium-241 in sediment (0.038 pCi/g). Americium-241 is interpreted

as being substantially different than background and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.90 pCi/g) in 2 of 18 sediment samples, with sample concentrations of 1.08 and 2.09 pCi/g. One sample result also exceeded the maximum fallout concentration of cesium-137 in sediment (1.28 pCi/g). Statistical tests were performed to determine if the site sampling results for cesium-137 are different than background. The statistical test results are presented in Table I-5.4-3. The result of the Gehan test indicates that the site sampling results are not statistically different than background, while the result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for cesium-137 in sediment is presented in Figure I-5.4-13. Cesium-137 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 6 of 20 sediment samples, with a maximum concentration of 3.15 pCi/g. Results were compared only to the FV because the FV is greater than the maximum fallout concentration of plutonium-239-/240 in sediment (0.065 pCi/g). Plutonium-239/240 is interpreted as being substantially different than background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in 1 of 15 sediment samples, with a maximum concentration of 334 pCi/g. Results were compared only to the FV because the FV is greater than the maximum fallout concentration of tritium in sediment (0.0856 pCi/g). Tritium is interpreted as being substantially different than background and no further evaluation is necessary. Tritium is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) in 1 of 20 sediment samples, with a maximum concentration of 3.02 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-234 are different than background. The statistical test results are presented in Table I-5.4-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-234 in sediment is presented in Figure I-5.4-14. Uranium-234 is not identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) in 2 of 20 sediment samples, with sample concentrations of 2.37 and 2.93 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-5.4-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-5.4-15. Uranium-238 is not identified as a COPC in sediment.

I-5.4.4 Summary of COPCs at SWMU 48-003

The inorganic chemicals identified as COPCs at SWMU 48-003 are antimony, beryllium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 48-003 are acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene;

4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; and toluene.

The radionuclides identified as COPCs at SWMU 48-003 are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, tritium, uranium-234, and uranium-238.

I-5.4.5 Nature and Extent of Contamination at SWMU 48-003

I-5.4.5.1 Nature and Extent of Inorganic COPCs

Beryllium was detected above the BV only at location MO-605152. Concentrations decreased with depth at this location. Beryllium was not detected above the BV in the samples at the other locations at the site. The lateral and vertical extent of beryllium are defined.

Chromium was detected above the BV at six locations. Concentrations decreased with depth at five of the six locations. Chromium was detected above the BV only in the deepest sample at location MO-605146, with a concentration of 14.6 mg/kg that is only slightly above the maximum background concentration of 13 mg/kg. Chromium was not detected above the BV in similar depth samples at nearby locations MO-605143 and MO-605147, and was detected at lower concentration in the same depth sample at nearby location MO-605153. The lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected at eight locations, with a maximum concentration of 0.306 mg/kg. Concentrations did not change substantially with depth, but decreased downslope. All concentrations are less than the EDLs. The lateral and vertical extent of hexavalent chromium are defined.

Cobalt was detected above the BV in only one sample at location MO-605157. The concentration (3.51 mg/kg) is slightly above the BV of 3.14 mg/kg. Cobalt was not detected at any other locations at the site, including the locations downslope from location MO-605157. The lateral and vertical extent of cobalt are defined.

Copper was detected above the BV at locations MO-605147, MO-605152, MO-605153, and MO-605157. Concentrations decreased at three of the four locations. Concentrations increased slightly with depth at location MO-605157, where copper was above the BV in the deeper sample but was less than the maximum background concentration of 6.2 mg/kg. Copper was not detected above the BV in any other locations on the mesa top or on the canyon slope downslope from location MO-605157. The lateral and vertical extent of copper are defined.

Lead was detected above the BV at locations MO-605147 and MO-605148. Concentrations decreased with depth at location MO-605147. Copper was detected above the BV only in the deepest sample at location MO-605148, with a concentration of 13.9 mg/kg, which is less than the maximum background concentration of 15.5 mg/kg. Lead was not detected above the BV in any other locations on the mesa top or on the canyon slope. The lateral and vertical extent of lead are defined.

Nitrate was detected at multiple locations, with a maximum concentration of 6.88 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at multiple locations, with a maximum concentration of 0.427 mg/kg. Most concentrations, including those on the canyon slope, are less than the EDLs, and concentrations decreased with depth at most locations. Concentrations on the canyon slope are lower than at locations on the mesa top. The lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV in the deepest sample at location MO-605144, at a concentration of 90 mg/kg, respectively. The concentration is less than twice of the maximum background concentration of 65.6 mg/kg. Zinc was detected at the surface at location MO-605147 and decreased with depth. Zinc was not detected above the BV in any other locations on mesa top and along the canyon slope. The lateral and vertical extent of zinc are defined.

I-5.4.5.2 Nature and Extent of Organic COPCs

Eleven PAHs [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were detected at various locations. Concentrations decreased with depth at all locations. All concentrations are at low levels less than approximately 0.05 mg/kg. PAHs were not detected on canyon slope, except at location MO-605160 where two PAHs [benzo(b)fluoranthene and fluoranthene] were detected at concentrations less than the EQLs and less than concentrations at mesa top locations. The lateral and vertical extent of PAHs are defined.

Acetone was detected at locations MO-605145, MO-605152, and MO-605158. Concentrations decreased with depth at two of these locations. Concentrations at locations MO-605145 and MO-605152 are less than the EQLs. Acetone was not detected in the samples at the farther downslope locations from location MO-605158. The lateral and vertical extent are defined for acetone.

PCBs were analyzed for the samples collected at locations MO-605153 through MO-605156. Aroclor-1254 was detected at locations MO-605153, MO-605154, and MO-605156. Aroclor-1260 was detected at all four locations. Concentrations decreased with depth at all four locations. Concentrations are at or near the EQLs, and do not change substantially in any lateral direction. The lateral and vertical extent of PCBs are defined.

Benzoic acid was detected at locations 48-02137 and 48-02138, with concentrations of 0.018 and 0.013 mg/kg, respectively. Concentrations decreased at both locations. Benzoic acid was not detected in any other locations at the site, including the locations on the mesa top and the locations downslope from location 48-02138. The lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected at locations 48-02137, 48-02139, and MO-605144. Concentrations are less than the EQLs, and decreased with depth at location MO-605144. Bis(2-ethylhexyl)phthalate was not detected at locations MO-605145 and MO-605149. Bis(2-ethylhexyl)phthalate was not detected at the locations downslope of location 48-02138. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

4-Isopropyltoluene was detected only in the deeper sample at location MO-605158, with a concentration of 0.0127 mg/kg. 4-Isopropyltoluene was not detected at any other locations, including the locations downslope of location MO-605158. The lateral and vertical extent of 4-isopropyltoluene are defined.

Eleven dioxin/furan congeners were detected at one to four locations. Concentrations decreased with depth at all three locations. All concentrations are at the EQLs, and concentrations decreased downslope. The lateral and vertical extent of the dioxin/furan congeners are defined.

Toluene was detected only in the deeper sample at location MO-605158, with a concentration of 0.00261 mg/kg. Toluene was not detected at any other locations, including the locations downslope of location MO-605158. The lateral and vertical extent of toluene are defined.

I-5.4.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected or detected above the FV at five locations. Concentrations decreased with depth at location MO-605149, and remained substantially unchanged with depth at locations 48-02054 and 48-02055. A single depth was sampled at locations 48-02019 and 48-02020. Amercium-241 was not detected or not detected above the FV at location MO-605148, located to the west of location MO-605149 on the canyon edge. The lateral extent is defined for americium-241 at location MO-605149. Concentrations at locations 48-02054 and 48-02055 are in the range of 0.213–0.713 pCi/g with deepest sample at 2.5–3.5 ft. Americium-241 was not detected or detected above the FV at a downslope location with samples as deep as 15.5–17 ft, location MO-605151. The lateral and vertical extent are defined for americium-241 at locations 48-02054 and 48-02055. Concentrations of americium-241 are 0.153 and 1.16 pCi/g at locations 48-02019 and 48-02020, respectively, where a single depth was sampled. Location 48-02019 is on the canyon slope. The lateral and vertical extent of americium-241 at location 48-02019 are defined by the samples at downslope locations (locations MO-605157 through MO-605160). Location MO-605144 is within 15 ft to the southwest of location 48-02020. Americium-241 was not detected or detected above the FV at location MO-605144 with samples as deep as 15.5–17 ft bgs. The lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected or detected above the FV at nine locations. Concentrations decreased with depth at seven locations, increased slightly with depth at location 48-02140, and a single depth was sampled at location 48-02019. Both locations 48-02019 and 48-02140 were on the canyon slope. Concentrations decreased down the canyon slope from location 48-02018 to 48-02140, and decreased with depth at the two farthest downslope locations MO-605159 and MO-605160. The lateral and vertical extent of cesium-137 are defined.

Cobalt-60 was detected in only one sample at location 48-02140, with a concentration of 0.0795 pCi/g. Concentrations decreased with depth at this location. Cobalt-60 was not detected at the two farthest downslope locations MO-605159 and MO-605160. The lateral and vertical extent of cobalt-60 are defined.

Plutonium-238 was detected at locations 48-02014 and 48-02020. Concentrations decreased with depth at location 48-02014. A single depth was sampled at location 48-02020, at a concentration of 0.162 pCi/g. Location MO-605144 is within 15 ft to the southwest of location 48-02020. Plutonium-238 was not detected or detected above the FV at location MO-605144 with samples as deep as 15.5–17 ft bgs. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected at multiple locations. Concentrations decreased with depth at all locations, except at locations 48-02019, 48-02020, and 48-02140. A single depth was sampled at location 48-02020, with a concentration of 6.4 pCi/g. Location MO-605144 is within 15 ft to the southwest of location 48-02020. Plutonium-239/240 was not detected or detected above the FV at location MO-605144 with samples as deep as 15.5–17 ft bgs. Locations 48-02019 and 48-02140 are on canyon slope. The lateral and vertical extent of plutonium-239/240 on canyon slope are defined by the samples at the locations farthest downslope, locations MO-605159 and MO-605160. The lateral and vertical extent of plutonium-239/240 are defined.

Strontium-90 was detected only at locations 48-02136, 48-02137, and 48-02140. Concentrations decreased with depth at location 48-02136, and increased with depth at locations 48-02137 and 48-02140. All locations are on the canyon slope. Strontium-90 was not detected or detected above the FV in the samples at the two locations farthest downslope, locations MO-605159 and MO-605160. The lateral extent of strontium-90 is defined, but the vertical extent is not defined.

Tritium was detected or detected above the FV at seven locations. Concentrations decreased with depth or remained essentially the same with depth at all seven locations. All results, except one, are at low levels with a maximum concentration of approximately 0.13 pCi/g. Tritium was detected in the surface sample at location MO-605147, with a concentration of 334 pCi/g. Concentrations decreased with depth at this location. Tritium was not detected or detected at low levels in the samples at locations surrounding this location (locations MO-605143, MO-605146, MO-605148, and MO-605156). The lateral and vertical extent of tritium are defined.

Uranium-234 was detected above the BV at locations 48-02019, 48-02054, and 48-02055. Concentrations decreased with depth at locations 48-02054 and 48-02055. Uranium-234 was not detected above the BV in the samples at downslope location MO-605151. A single depth was sampled at location 48-02019, with a concentration of 3.48 pCi/g, which is less than twice the BV of 2.29 pCi/g. Uranium-234 was not detected above the BV at any other locations, including the locations downslope of location 48-02019. The lateral and vertical extent of uranium-234 are defined.

Uranium-238 was detected above the BV at locations 48-02019, 48-02054, 48-02055, and MO-605145. Concentrations decreased with depth at three locations and a single depth was sampled at location 48-02019. Uranium-238 was not detected above the BV in the samples at location MO-605151, downslope from locations 48-02054 and 48-02055. Uranium-238 was not detected above the BV at any other locations, including the locations downslope of location 48-02019. The lateral and vertical extent of uranium-238 are defined.

I-5.4.5.4 Summary of Nature and Extent for SWMU 48-003

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 48-003, except for the vertical extent of strontium-90.

I-5.5 Consolidated Unit 48-004(a)-99

Consolidated Unit 48-004(a)-99 is proposed for delayed investigation. Section 5.7 of the investigation report presents the details for this site.

I-5.6 SWMU 48-005

A total of 61 samples (39 soil, 18 tuff, and 4 sediment) were collected in 1993, 1997, and 2009 from 23 locations at SWMU 48-005. Table 5.8-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.8-1 shows the sampling locations.

I-5.6.1 Inorganic Chemicals at SWMU 48-005

Sixteen samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Twenty-three samples were analyzed for TAL metals. Table 5.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.8-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 5.8-2.

I-5.6.1.1 Inorganic Chemicals in Soil

Two soil samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide. Nine soil samples were analyzed for TAL metals.

Antimony was not detected, but had DLs (1.07–12 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration of antimony in soil (1 mg/kg) in all nine soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected, but had DLs (0.534–0.6 mg/kg) above the BV in all nine soil samples. None of the results exceeded the maximum background concentration of cadmium in soil (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in two of nine soil samples, with concentrations of 20 and 26 mg/kg. Neither of the results exceeded the maximum background concentration of chromium in soil (36.5 mg/kg). The box plot for chromium in soil is presented in Figure I-5.6-1. Chromium is not identified as a COPC in soil.

Mercury was not detected, but had DLs (all 0.12 mg/kg) above the BV (0.1 mg/kg) and above the maximum soil background concentration (0.1 mg/kg) in three of nine soil samples. Mercury is identified as a COPC in soil.

Nitrate was detected in two of nine soil samples and has no BV. Nitrate is identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had DLs (all 2.4 mg/kg) above the BV in three of nine soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. Silver is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in two of nine soil samples, with concentrations of 74 and 391 mg/kg. One sample result also exceeded the maximum background concentration for zinc in soil (75.5 mg/kg). The box plot for zinc in soil is presented in Figure I-5.6-2. Zinc is identified as a COPC in soil.

I-5.6.1.2 Inorganic Chemicals in Tuff

Ten tuff samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.02–1.15 mg/kg) above the BV (0.5 mg/kg) in all 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 3 of 10 tuff samples, with a maximum concentration of 81.4 mg/kg. Two of the three sampling results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.6-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-5.6-3. Barium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 5 of 10 tuff samples, with a maximum concentration of 27.7 mg/kg. Four of the five sampling results also exceeded the maximum background

concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.6-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-5.6-4. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 1 of 10 tuff samples, at a concentration of 3.41 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-5.6-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure I-5.6-5. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above maximum background concentration of copper in tuff (6.2 mg/kg) the in 1 of 10 tuff samples, at a concentration of 7.69 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.6-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.6-6. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above maximum tuff background concentration (15.5 mg/kg) the in 1 of 10 tuff samples, with a maximum concentration of 13.6 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.6-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-5.6-7. Lead is not identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 1 of 10 tuff samples, at a concentration of 528 mg/kg. The sample result did not exceed the maximum background concentration of manganese in tuff (752 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-5.6-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for manganese in tuff is presented in Figure I-5.6-8. Manganese is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BV. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had DLs (0.995–1.2 mg/kg) above the BV (0.3 mg/kg) in all 10 tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-5.6.1.3 Inorganic Chemicals in Sediment

Three sediment samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (0.984–1.09 mg/kg) above the BV (0.83 mg/kg) in all three sediment samples. Results were compared only to the BV because background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.492–0.547 mg/kg) above the BV (0.4 mg/kg) in all three sediment samples. Results were compared only to the BV because the BV is greater than the maximum

background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Nitrate and perchlorate were detected in sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected, but had DLs (0.988–1.11 mg/kg) above the BV (0.3 mg/kg) in all three sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

I-5.6.2 Organic Chemicals at SWMU 48-005

Nine samples from SWMU 48-005 were analyzed for dioxins/furans and PCBs. Twenty-seven samples were analyzed for SVOCs. Seventeen samples were analyzed for VOCs. Table 5.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.8-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.8-3.

I-5.6.2.1 Organic Chemicals in Soil

One soil sample was analyzed for dioxins/furans and PCBs. Thirteen soil samples were analyzed for SVOCs. Seven soil samples were analyzed for VOCs.

The following organic chemicals were detected in at least one soil sample at SWMU 48-005 and are identified as COPCs in soil: acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; phenanthrene; and pyrene.

I-5.6.2.2 Organic Chemicals in Tuff

Six tuff samples were analyzed for dioxins/furans and PCBs. Eleven tuff samples were analyzed for SVOCs. Ten tuff samples were analyzed for VOCs.

The following organic chemicals were detected in at least one tuff sample at SWMU 48-005 and are identified as COPCs in tuff: acetone; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and toluene.

I-5.6.2.3 Organic Chemicals in Sediment

Two sediment samples were analyzed for dioxins/furans and PCBs. Three sediment samples were analyzed for SVOCs.

The following organic chemicals were detected in at least one sediment sample at SWMU 48-005 and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-5.6.3 Radionuclides at SWMU 48-005

Sixteen samples from SWMU 48-005 were analyzed for americium-241. Forty-eight samples were analyzed for gamma-emitting radionuclides. Fifteen samples were analyzed for tritium. Thirty-two samples were analyzed for isotopic plutonium. Forty-four samples were analyzed for isotopic thorium and isotopic uranium. Twenty-eight samples were analyzed for strontium-90. Table 5.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.8-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.8-4.

I-5.6.3.1 Radionuclides in Soil

Eleven soil samples were analyzed for americium-241. Thirty-one soil samples were analyzed for gamma-emitting radionuclides. Two soil samples were analyzed for tritium. Twenty-six soil samples were analyzed for isotopic plutonium. Thirty-six soil samples were analyzed for isotopic thorium and isotopic uranium. Twenty-five soil samples were analyzed for strontium-90.

Americium-241 was detected in two soil samples from depths where the FV does not apply, with concentrations of 4.51 and 5.27 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in two soil samples from depths where the FV does not apply, with concentrations of 0.118 and 0.258 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-238 was detected above the FV in one soil sample, and was detected in 10 soil samples from depths for which the FV does not apply, with a maximum concentration of 223 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected in 10 soil samples from depths where the FV does not apply, with a maximum concentration of 11.9 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected four soil samples at depths that the FV do not apply, with a maximum concentration of 2.9 pCi/g. Strontium-90 is identified as a COPC in soil.

Thorium-230 was detected above the BV (2.29 pCi/g) in 2 of 44 soil samples, with concentrations of 3.11 and 3.85 pCi/g. Results were compared only to the BV because background dataset for thorium-230 in soil is not available. Thorium-230 is identified as a COPC in soil.

I-5.6.3.2 Radionuclides in Tuff

Five tuff samples were analyzed for americium-241. Thirteen tuff samples were analyzed for gamma-emitting radionuclides. Ten tuff samples were analyzed for tritium. Six tuff samples were analyzed for isotopic plutonium. Seven tuff samples were analyzed for isotopic thorium and isotopic uranium. Two tuff samples were analyzed for strontium-90.

Cesium-137 was detected in 1 of 13 tuff samples with a maximum concentration of 0.121 pCi/g. Cesium-137 is identified as a COPC in tuff.

Thorium-230 was detected above the BV (1.98 pCi/g) in one of seven tuff samples, with a maximum concentration of 2.07 pCi/g. Results were compared only to the BV because background dataset for thorium-230 in tuff is not available. The sample result is less than 20% above the BV. Because thorium-230 is detected slightly and infrequently above background (one of seven samples), it is eliminated as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in one of seven tuff samples, with a maximum concentration of 2.04 pCi/g. Results were compared only to the BV because background dataset for thorium-230 in tuff is not available. The sample result is less than 20% above the BV. Because uranium-234 is detected slightly and infrequently above background (one of seven samples), it is eliminated as a COPC in tuff.

I-5.6.3.3 Radionuclides in Sediment

Four sediment samples were analyzed for gamma-emitting radionuclides. Three sediment samples were analyzed for tritium. One sediment sample was analyzed for isotopic thorium, isotopic uranium, and strontium-90.

No radionuclides were detected or detected above BV/FV in sediment samples from SWMU 48-005.

I-5.6.4 Summary of COPCs at SWMU 48-005

The inorganic chemicals identified as COPCs at SWMU 48-005 are antimony, cadmium, chromium, copper, manganese, mercury, nitrate, perchlorate, selenium, silver, and zinc.

The organic chemicals identified as COPCs at SWMU 48-005 are acenaphthene; acetone; anthracene; Aroclor-1248; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; and toluene.

The radionuclides identified as COPCs at SWMU 48-005 are americium-241, cesium-137, plutonium-238, plutonium-239/240, strontium-90, and thorium-230.

I-5.6.5 Nature and Extent of Contamination at SWMU 48-005

I-5.6.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV at four locations. Concentrations decreased with depth at location 48-02155, remained essentially the same at location MO-605130, and increased with depth at locations MO-605131 and MO-605132. The lateral extent of chromium at location 48-02155 is defined by samples at nearby location MO-604920, where chromium was not detected above the BV. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Concentrations of chromium above the BV on the canyon slope are in the range of 9.53–27.7 mg/kg, and there is no clear trend in concentration down the canyon slope. Chromium was detected at the farthest downslope location, MO-605130, at concentrations of 18.4 and 17.4 mg/kg. The lateral and vertical extent of chromium are not defined.

Copper was detected above the BV in only in the deepest sample at location MO-605128. The concentration (7.69 mg/kg) is slightly above the maximum background concentration (6.2 mg/kg). Copper was not detected above the BV at any other locations at the site, either on the mesa top or on the canyon slope. The lateral and vertical extent of copper are defined.

Manganese was detected above the BV in only one sample at location MO-605130. Concentrations decreased with depth at this location. Location MO-605130 is the farthest downslope location at the site. However, the concentration (528 mg/kg) is less than the maximum background concentration (752 mg/kg). Manganese was not detected at any other locations at the site. The lateral and vertical extent of manganese are defined.

Nitrate was detected at four locations, with a maximum concentration of 1.44 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected only at three locations. All concentrations are at low levels (0.000518–0.0018 mg/kg) that are less than EDLs. Concentrations increased with depth at two locations, and increased to the location farthest downslope (MO-605130). The lateral and vertical extent of perchlorate are not defined.

Zinc was detected above the BV at locations 48-02155 and MO-605131. Concentrations decreased with depth at both locations. The lateral extent of zinc at location 48-02155 is defined by samples at nearby location MO-604920, where zinc was not detected above the BV. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. On the canyon slope, zinc was not detected above the BV at the downslope locations MO-605129, MO-605132, and MO-605130. The lateral and vertical extent of zinc are defined.

I-5.6.5.2 Nature and Extent of Organic COPCs

Twelve PAHs [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] were detected at locations MO-605130 and MO-605131. Concentrations of the PAHs decreased with depth at both locations. In addition, fluoranthene was detected in the surface sample at location MO-605129 and pyrene was detected in one sample at location 48-02155. The lateral extent of pyrene at location 48-02155 is defined by samples at nearby location MO-604920. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Pyrene was not detected at location MO-604920. Concentrations of the PAHs decreased down the canyon slope. The lateral and vertical extent of PAHs are defined.

Acetone was detected at five locations. Concentrations decreased with depth or did not change substantially with depth at four locations. Acetone was detected in the deepest sample at the farthest downslope location MO-605130 at a concentration (0.00251 mg/kg) less than the EQL. The lateral and vertical extent of acetone are defined.

Aroclor-1248 was detected at location MO-605129, Aroclor-1254 was detected at locations MO-605128, MO-605129, and MO-605130, and Aroclor-1260 was detected at locations MO-605129 and MO-605130. Concentrations decreased with depth at all locations, except that Aroclor-1254 was detected only in the deepest sample at location MO-605128. All concentrations are less than or slightly above the EQLs, and did not change substantially downslope. The lateral and vertical extent of Aroclor-1248, Aroclor-1254, and Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected at locations 48-02142, 48-02148, and 48-02155. Butylbenzylphthalate, di-n-butylphthalate, and di-n-octylphthalate were each detected in only one sample, at location 48-02155. All concentrations decreased with depth, except bis(2-ethylhexyl)phthalate at location 48-02148. Bis(2-ethylhexyl)phthalate was detected at locations 48-02142 and 48-02148 at low levels (three detections are 0.18, 0.092, and 0.23 mg/kg). The lateral extent of bis(2-ethylhexyl)phthalate at location 48-02155 is defined by samples at nearby location MO-604920. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Bis(2-ethylhexyl)phthalate was not detected at location MO-604920. Bis(2-ethylhexyl)phthalate was not detected at any locations down the drainage. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Eight dioxin/furan congeners were detected at one to three of locations. Concentrations increased slightly with depth at location MO-605128 for 3 congeners, and decreased with depth at locations MO-605129 and MO605130 for all congeners. Concentrations decreased downslope, and all concentrations are at or below the EQLs. The lateral and vertical extent of these dioxins/furans are defined.

4-Isopropyltoluene was detected in only one sample at location MO-605130. Concentrations decreased with depth at this location. Although location MO-605130 is the farthest downslope location, 4-isopropyltoluene was detected at a low level of 0.00475 mg/kg, and 4-isopropyltoluene was not detected in any other samples. The lateral and vertical extent of 4-isopropyltoluene are defined.

Methylene chloride was detected only in the deeper samples at locations 48-02142 and 48-02148, at low levels of 0.002 and 0.004 mg/kg, respectively. Methylene chloride was detected infrequently and at low levels on mesa top, and was not detected in any samples down the drainage. The lateral and vertical extent of methylene chloride are defined.

Toluene was detected only in one sample at location MO-605131 at a concentration of 0.000369 mg/kg. Concentrations decreased with depth at this location. Toluene was not detected in samples at the location farthest downslope (MO-605030). The lateral and vertical extent of toluene are defined.

I-5.6.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected in one sample each at locations 48-02026 and 48-02158. Concentrations decreased with depth at both locations. Locations 48-02026 and 48-02158 are situated together with locations 48-02156 and 48-02157, where samples were not analyzed for americium-241 but were analyzed for gamma-emitting radionuclides, which include americium-241. Americium-241 was not detected at locations 48-02156 and 48-02157. Americium-241 was not detected at any locations in the drainage. The lateral and vertical extent of amerium-241 are defined.

Cesium-137 was detected in one sample each at locations 48-02153, 48-02155, and MO-605128. Cesium-137 was detected in the deepest sample at location 48-02155 at a concentration of 0.118 pCi/g. The lateral and vertical extent of cesium-137 at location 48-02155 are defined by samples at nearby location MO-604920. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Cesium-137 was not detected at location MO-604920. The lateral and vertical extent of cesium-137 at location 48-02153 are defined by nondetects in the samples at downslope location 48-02154. The lateral and vertical extent of cesium-137 at location MO-605128 are defined by nondetects or detects below the FV in the samples at all the downslope locations. The lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected at six locations. Concentrations decreased with depth at four locations (locations 48-02026, 48-02067, 48-02157, and 48-02158), and increased slightly with depth at location 48-02155. A single depth was sampled at location 48-02068. The lateral extent of plutonium-238 at locations 48-02067 and 48-02068 and the vertical extent at location 48-02068 are defined by nondetects in similar depth samples at location 48-02069. The lateral extent of plutonium-238 is defined by nondetects in the samples at location 48-02156. The lateral and vertical extent of plutonium-238 at location 48-02155 are defined by samples at nearby location MO-604920. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Plutonium-238 was not detected at location MO-604920. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected at locations 48-02026, 48-02155, 48-02157, and 48-02158. Concentrations increased slightly with depth at location 48-02155 and decreased with depth at the other three locations. Locations 48-02026, 48-02157, and 48-02158 are situated together with location 48-02156. The lateral extent of plutonium-238/240 at location 48-02026 is defined by nondetects in the samples at location 48-02156. The lateral and vertical extent of plutonium-239/240 at location 48-02155 are defined by samples at nearby location MO-604920. This location is at the western end of SWMUs 48-002(a,b) and is closest to location 48-02155. Plutonium-239/240 was not detected at location MO-604920. The lateral and vertical extent of plutonium-239/240 are defined.

Strontium-90 was detected at locations 48-02150, 48-02157, and 48-02158. Concentrations decreased to nondetects at all locations. The lateral extent of strontium-90 is defined by nondetects in the samples at nearby locations 48-02151 (near location 48-02150) and 48-02156 and 48-02157 (near location 48-02158). The lateral and vertical extent of strontium-90 are defined.

Thorium-230 was detected above the BV at locations 48-02024 and 48-02025. Concentrations decreased with depth at both locations. The lateral extent of thorium-230 is defined by the samples at nearby locations 48-02150 and 48-02151 where thorium-230 was not detected above the BV. The lateral and vertical extent of thorium-230 are defined.

I-5.6.5.4 Summary of Nature and Extent for SWMU 48-005

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined at SWMU 48-005, except for the lateral and vertical extent of chromium and perchlorate.

I-5.7 Consolidated Unit 48-007(a)-00

A total of 48 samples (14 soil, 10 sediment, and 24 tuff) were collected in 1995, 1997, and 2009 from 17 locations at Consolidated Unit 48-007(a)-00. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.9-1 shows the sampling locations.

I-5.7.1 Inorganic Chemicals at Consolidated Unit 48-007(a)-00

Forty-eight samples from SWMU 48-007(f) were analyzed for TAL metals. Thirty-two samples were analyzed for nitrate, perchlorate, hexavalent chromium, and total cyanide. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.9-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 5.9-2.

I-5.7.1.1 Inorganic Chemicals in Soil

Twelve soil samples were analyzed for TAL metals. Three soil samples were analyzed for total cyanide, nitrate, perchlorate, and hexavalent chromium.

Antimony was not detected, but had DLs (0.97–6.2 mg/kg) above the BV (0.83 mg/kg) in all 12 soil samples. Eleven results (1.04–6.2 mg/kg) exceeded the maximum soil background concentration of antimony (1 mg/kg). Antimony is identified as a COPC in soil.

Arsenic was detected above the BV (8.17 mg/kg) and above the maximum background concentration (9.3 mg/kg) in 1 of 12 soil samples, at a concentration of 9.9 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-5.7-1. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in soil is presented in Figure I-5.7-2. Arsenic is not identified as a COPC in soil.

Cadmium was not detected above the BV (0.4 mg/kg), but had DLs (0.485–0.62 mg/kg) above the BV in 4 of 12 soil samples. None of the sampling results exceeded the maximum soil background concentration (2.6 mg/kg). Statistical tests were performed to determine if the site sampling results for cadmium are different than background. The statistical test results are presented in Table I-5.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for cadmium in soil is presented in Figure I-5.7-3. Cadmium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in 10 of 12 soil samples, with a maximum sample concentration of 1080 mg/kg. Nine sampling results exceeded the maximum soil background concentration (36.5 mg/kg). Chromium is interpreted as being substantially above background and no further evaluation is necessary. Chromium is identified as a COPC in soil.

Hexavalent chromium, nitrate, and perchlorate were detected in one or more soil samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum soil background concentration (16 mg/kg) in 9 of 12 soil samples, with a maximum sample concentration of 177 mg/kg. Copper is interpreted as being substantially above background and no further evaluation is necessary. Copper is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 3 of 12 soil samples, with a maximum sample concentration of 34.9 mg/kg. One sample result exceeded the maximum soil background concentration (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than

background. The box plot for lead in soil is presented in Figure I-5.7-4. Lead is not identified as a COPC in soil.

Manganese was detected above the BV (671 mg/kg) and the maximum soil background concentration (1100 mg/kg) in 1 of 12 soil samples, at a concentration of 1340 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-5.7-1. The results of the Gehan test indicate that manganese in site samples is different than background. The box plot for manganese in soil is presented in Figure I-5.7-5. Manganese is identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) in 3 of 12 soil samples, with a maximum sample concentration of 0.2 mg/kg. Statistical tests were performed to determine if the site sampling results for mercury are different than background. The statistical test results are presented in Table I-5.7-1. The results of the quantile test indicate that mercury in site samples is not statistically different than background, while the results of the slippage test indicate that the site sampling results are statistically different than background. The box plot for mercury in soil is presented in Figure I-5.7-6. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) and above the maximum background concentration (29 mg/kg) in 2 of 12 soil samples, with a maximum sample concentration of 33.2 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in soil is presented in Figure I-5.7-7. Nickel is not identified as a COPC in soil.

Thallium was not detected above the BV, but had DLs (0.88–1.3 mg/kg) above the BV (0.73 mg/kg) in 7 of 12 soil samples, and had DLs (1.1 and 1.3 mg/kg) above the maximum soil background concentration (1 mg/kg) in two soil samples. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) and the maximum soil background concentration (75.5 mg/kg) in 8 of 12 soil samples, with a maximum concentration of 140 mg/kg. Zinc is interpreted as being substantially above background, and no further evaluation is necessary. Zinc is identified as a COPC in soil.

I-5.7.1.2 Inorganic Chemicals in Tuff

Twenty-four tuff samples were analyzed for TAL metals. Twenty-two tuff samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.01–6.4 mg/kg) above the BV (0.5 mg/kg) in all 24 tuff samples. The BV for antimony in tuff is greater than the maximum tuff background concentration (0.4 mg/kg), so antimony results are compared only to the tuff BV. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 1 of 24 tuff samples, at a concentration of 2.8 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-5.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure I-5.7-8. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) in 1 of 24 tuff samples, with a maximum sample concentration of 62.9 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-5.7-9. Barium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum background concentration (2230 mg/kg) in 1 of 24 tuff samples, at a concentration of 2480 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-5.7-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-5.7-10. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum background concentration (13 mg/kg) in 8 of 24 tuff samples, with a maximum sample concentration of 153 mg/kg. Chromium is interpreted as being substantially different than background, and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Hexavalent chromium, nitrate, and perchlorate were detected in one or more tuff samples, and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in tuff.

Copper was detected above the BV (4.66 mg/kg) in 5 of 24 tuff samples, with a maximum sample concentration of 15.3 mg/kg. Four of the five sampling results are also above the maximum tuff background concentration for copper (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.7-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.7-11. Copper is identified as a COPC in tuff.

Total cyanide was detected above the BV (0.5 mg/kg) in 1 of 22 tuff samples, at a concentration of 12.9 mg/kg. Total cyanide is interpreted as being substantially different than background, and no further evaluation is necessary. Total cyanide is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and the maximum tuff background concentration (7 mg/kg) in 1 of 24 tuff samples, at a concentration of 14.1 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in tuff is presented in Figure I-5.7-12. Nickel is not identified as a COPC in tuff.

Selenium was detected (0.698 mg/kg) above the BV (0.3 mg/kg) in 1 of 24 tuff samples, and had DLs (0.32–1.18 mg/kg) above the BV in 23 samples. Statistical tests were not performed because more than 80% of the site and background sampling results were nondetects. The site sampling results are compared only to the BV. The box plot for selenium in tuff is presented in Figure I-5.7-13. Selenium is identified as a COPC in tuff.

I-5.7.1.3 Inorganic Chemicals in Sediment

Ten sediment samples were analyzed for TAL metals. Seven sediment samples were analyzed for nitrate, hexavalent chromium, perchlorate, and total cyanide.

Antimony was not detected but had DLs (1–7.3 mg/kg) above the BV (0.83 mg/kg) in all 10 sediment samples. Antimony is identified as a COPC in sediment.

Arsenic was detected above the BV (3.98 mg/kg) in 1 of 10 sediment samples, at a concentration of 4.15 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-5.7-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in sediment is presented in Figure I-5.7-14. Arsenic is not identified as a COPC in sediment.

Cadmium was not detected above the BV, but had DLs (0.5–0.73 mg/kg) above the BV (0.4 mg/kg) in 9 of 10 sediment samples. Cadmium is identified as a COPC in sediment.

Chromium was detected above the BV (10.5 mg/kg) in 4 of 10 sediment samples, with a maximum sample concentration of 789 mg/kg. Chromium is interpreted as being substantially above background, and no further evaluation is necessary. Chromium is identified as a COPC in sediment.

Hexavalent chromium, nitrate, and perchlorate were detected in one or more sediment samples and have no BVs. Hexavalent chromium, nitrate, and perchlorate are identified as COPCs in sediment.

Lead was detected above the BV (19.7 mg/kg) in 2 of 10 sediment samples, and above the maximum sediment background concentration (25.6 mg/kg) in one sample, with a maximum sample concentration of 31.2 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.7-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in sediment is presented in Figure I-5.7-15. Lead is not identified as a COPC in tuff.

Nickel was detected above the BV (9.38 mg/kg) in 1 of 10 sediment samples, at a concentration of 20.9 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.7-3. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in sediment is presented in Figure I-5.7-16. Nickel is not identified as a COPC in sediment.

Selenium was not detected, but had DLs (0.36–1.14 mg/kg) above the BV (0.3 mg/kg) in 9 of 10 sediment samples. Selenium is identified as a COPC in sediment.

Vanadium was detected above the BV (19.7 mg/kg) and above the maximum background concentration (20 mg/kg) in 1 of 10 sediment samples, at a concentration of 27.4 mg/kg. Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-5.7-3. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for vanadium in sediment is presented in Figure I-5.7-17. Vanadium is not identified as a COPC in tuff.

Zinc was detected above the BV (60.2 mg/kg) in 4 of 10 sediment samples, with a maximum sample concentration of 91.8 mg/kg. Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-5.7-3. The results of the quantile test indicate that the site sampling results are not statistically different than background, while the results of the slippage test indicate that the site sampling results are statistically different than

background. The box plot for zinc in sediment is presented in Figure I-5.7-18. Zinc is identified as a COPC in sediment.

I-5.7.2 Organic Chemicals at Consolidated Unit 48-007(a)-00

Forty-six samples collected at Consolidated Unit 48-007(a)-00 in 1995, 1997, and 2009 were analyzed for SVOCs; 36 samples were analyzed for VOCs; 10 samples were analyzed for PCBs and dioxins/furans. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.9-3 lists the detected organic chemicals. The sampling locations and detected concentrations above BVs are shown on Plate 5.9-1.

I-5.7.2.1 Organic Chemicals in Soil

Twelve soil samples were analyzed for SVOCs; nine soil samples were analyzed for VOCs.

The following organic chemicals were detected in soil samples at Consolidated Unit 48-007(a)-00 and are identified as COPCs in soil: acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

I-5.7.2.2 Organic Chemicals in Tuff

Twenty-four tuff samples were analyzed for SVOCs and VOCs, and seven tuff samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more tuff samples at Consolidated Unit 48-007(a)-00 and are identified as COPCs in tuff: acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and toluene.

I-5.7.2.3 Organic Chemicals in Sediment

Ten sediment samples were analyzed for SVOCs, and three sediment samples were analyzed for VOCs, PCBs, and dioxins/furans.

The following organic chemicals were detected in one or more sediment samples at Consolidated Unit 48-007(a)-00 and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254;

Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; and trichlorofluoromethane.

I-5.7.3 Radionuclides at Consolidated Unit 48-007(a)-00

Forty-six samples collected at Consolidated Unit 48-007(a)-00 in 1995, 1997, and 2009 were analyzed for gamma-emitting radionuclides, isotopic thorium, and strontium-90; 32 samples were analyzed for tritium; 47 samples were analyzed for isotopic plutonium and isotopic uranium. Table 5.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.9-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 5.9-3.

I-5.7.3.1 Radionuclides in Soil

Twelve soil samples were analyzed for gamma-emitting radionuclides, isotopic thorium, and strontium-90; 13 samples were analyzed for isotopic plutonium and isotopic uranium; three samples were analyzed for tritium.

Cesium-137 was detected in two soil samples collected at depths for which the FV does not apply (> 0–1 ft bgs). Cesium-137 is identified as a COPC in soil.

Plutonium-238 was detected (0.5 pCi/g) above the FV (0.023 pCi/g) in one surface (< 0–1 ft bgs) soil sample. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in two surface soil samples, and was detected in one soil sample from a depth (1–2 ft bgs) for which the FV does not apply. Plutonium-239/240 is identified as a COPC in soil.

Thorium-227 was detected in two soil samples and has no BV. Thorium-227 is identified as a COPC in soil.

Tritium was detected in two soil samples and is identified as a COPC in soil.

Uranium-234 was detected (3.17 pCi/g) above the BV (2.59 pCi/g) in 1 of 13 soil samples. No background data set for uranium-234 in soil is available, so site sample data are compared to the BV only. Uranium-234 is identified as a COPC in soil.

Uranium-238 was detected (3.11 pCi/g) above the BV (2.29 pCi/g) in 1 of 13 soil samples. No background data set for uranium-238 in soil is available, so site sample data are compared to the BV only. Uranium-238 is identified as a COPC in soil.

I-5.7.3.2 Radionuclides in Tuff

Twenty-four tuff samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, and strontium-90; 22 tuff samples were analyzed for tritium.

Cesium-137, thorium-227, and tritium were detected in one tuff sample and have no FVs. Cesium-137 thorium-227, and tritium are identified as COPCs in tuff.

Uranium-234 was detected above the BV in 1 of 24 tuff samples. No background data set for uranium-234 in tuff is available, so site sample data are compared to the BV only. Uranium-234 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV in 2 of 24 tuff samples. No background data set for uranium-235/236 in tuff is available, so site sample data are compared to the BV only. Uranium-235/236 is identified as a COPC in tuff.

Uranium-238 was detected above the BV in 1 of 24 tuff samples. No background data set for uranium-238 in tuff is available, so site sample data are compared to the BV only. Uranium-238 is identified as a COPC in tuff.

I-5.7.3.3 Radionuclides in Sediment

Ten sediment samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, and strontium-90; seven sediment samples were analyzed for tritium.

Thorium-227 was detected in one sediment sample and has no FV. Thorium-227 is identified as a COPC in sediment.

Tritium was detected (0.10 pCi/g) above the FV (0.093 pCi/g) in one of seven sediment samples. Tritium is identified as a COPC in sediment.

I-5.7.4 Summary of COPCs at Consolidated Unit 48-007(a)-00

The inorganic chemicals identified as COPCs at Consolidated Unit 48-007(a)-00 are antimony, cadmium, chromium, hexavalent chromium, copper, total cyanide, manganese, mercury, nitrate, perchlorate, selenium, thallium, and zinc.

The organic chemicals identified as COPCs at Consolidated Unit 48-007(a)-00 are acenaphthene; acetone, anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans;

indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichlorofluoromethane; and 1,2,4-trimethylbenzene.

The radionuclides identified as COPCs at Consolidated Unit 48-007(a)-00 are cesium-137, plutonium-238, plutonium-239/240, thorium-227, tritium, uranium-234, uranium-235/236, and uranium-238.

I-5.7.5 Nature and Extent of Contamination at Consolidated Unit 48-007(a)-00

I-5.7.5.1 Nature and Extent of Inorganic COPCs

Chromium concentrations increased with depth at three locations (48-02159, 48-02161, and 48-02162). At nearby locations (MO-605118, MO-605121, and MO-605120) with deeper samples, concentrations of chromium decreased with depth. Concentrations generally decreased downslope from the maximum detected concentration. The lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected at four locations (MO-605123, MO-605124, MO-605125, and MO-605127). Concentrations decreased with depth at all four locations. The highest sample concentration (8.61 mg/kg) is at location MO-605125, and the concentration decreased at the location farthest downslope (MO-605127). The lateral and vertical extent of hexavalent chromium are defined.

Copper increased with depth at one location (48-02159). The concentration is slightly above the maximum background concentration of 6.2 mg/kg. At the nearest location with deeper samples (MO-605118), copper was not detected above the BV at any sample depths. Concentrations decreased downslope from the maximum detected concentration. The lateral and vertical extent of copper are defined.

Total cyanide was detected above the BV only once, in the deepest sample at location MO-605123. In samples at the same and deeper depths at locations MO-605118 and MO-605119, total cyanide was not detected above the BV at any sample depths. Total cyanide was not detected above the BV in any samples downslope of location MO-605123. The lateral and vertical extent of total cyanide are defined.

Manganese was detected above the BV only once, in the surface sample at location MO-605127. The concentration is less than twice the maximum background concentration of 1100 mg/kg , and decreased in the deepest sample. The lateral and vertical extent of manganese are defined.

Mercury was detected above the BV at three locations (48-02171, 48-02172, and MO-605122). The concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of mercury are defined.

Nitrate was detected at five locations, with a maximum concentration of 2.76 mg/kg. The concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate concentrations increased slightly with depth at two locations (MO-605124 and MO-605126), but decreased with depth at all other locations. Concentrations are low (0.00371 to 0.00916 mg/kg), and decreased downslope. The lateral and vertical extent of perchlorate are defined.

Selenium was detected at only one location (MO-605124), where the concentration decreased with depth. Concentrations decreased downslope. The lateral and vertical extent of selenium are defined.

Zinc was detected above the BV at nine locations. Concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of zinc are defined.

I-5.7.5.2 Nature and Extent of Organic COPCs

Acetone, 2-butanone, 4-isopropyltoluene, toluene, and trichlorofluoromethane were each detected only in the deepest sample at one location, with concentrations at or below the EQL. These VOCs were detected infrequently and at very low concentrations. The lateral and vertical extent of VOCs are defined.

Aroclor-1254 was detected at three locations, and Aroclor-1260 was detected at two locations. Concentrations were low (maximum 0.0196 mg/kg) and decreased with depth at all locations. Concentrations decreased or did not change substantially downslope. The lateral and vertical extent of PCBs are defined.

PAHs were detected at multiple locations and decreased with depth at all locations. Concentrations decreased downslope. The lateral and vertical extent of PAHs are defined.

Benzoic acid was detected only once, in the surface sample at location MO-605122. Concentrations decreased with depth at that location and decreased downslope. The lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected at only one location (48-02173), where it increased slightly with depth. The sample concentrations (maximum 0.19 mg/kg) are below EQLs and decrease downslope. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Carbazole and 1,2,4-trimethylbenzene were each detected in only one sample. Concentrations decreased with depth. The lateral and vertical extent of carbazole and 1,2,4-trimethylbenzene are defined.

Concentrations of dioxin/furan congeners decrease with depth at all locations except location MO-605124, where 1,2,3,7,-pentachlorodibenzofuran was detected only in the deepest sample, at a concentration of 0.000000276 mg/kg. The sample concentration is at the EQL. Concentrations are all very low, at or below EQLs, and decrease downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-5.7.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected at three locations, and decreased with depth at all three locations. Cesium-137 was not detected above the FV at location MO-605127, the location farthest downslope. The lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected above the FV only once, at location 48-02080, where only a surface sample was collected. At the nearest locations sampled at multiple depths (MO-605118 and MO-605121) plutonium-238 was not detected to depths of 16.5 ft bgs and 17.5 ft bgs. Plutonium-238 was not detected or detected above the FV at any downslope locations. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the FV at two locations and was detected at one location in a sample for which the FV does not apply. Concentrations decreased with depth at two locations (48-02173

and MO-605122), and was detected above the FV at location 48-02080 where only a surface sample was collected. At nearby locations, plutonium-239/240 was not detected in samples to depths of 17.5 ft bgs. Concentrations decreased downslope. The lateral and vertical extent of plutonium-239/240 are defined.

Thorium-227 was detected at three locations (48-02159, 48-02161, and 48-02162). Thorium-227 was not detected at other locations, including locations downslope in the drainage. The lateral and vertical extent of thorium-227 are defined.

Tritium was detected at four locations, and decreased with depth at all four locations. Concentrations decreased downslope. The lateral and vertical extent of tritium are defined.

Uranium-234 was detected above the BV at two locations. Concentrations decreased with depth at location MO-605122, but increased with depth at location MO-605127. The concentration at location MO-605127 is only slightly (10 percent) above the BV. Concentrations decreased downslope. The lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above the BV only in the deepest samples at two locations (MO-605124 and MO-605127). Both sample concentrations are only slightly (less than 20 percent) above the BV. Uranium-235/236 was not detected above the BV at any other locations, including locations downslope in the drainage. The lateral and vertical extent of uranium-235/236 are defined.

Uranium-238 was detected above the BV at two locations. Concentrations decreased with depth at location MO-605122, but increased slightly with depth at location MO-605127. The concentration at location MO-605127 is only slightly above the BV, and concentrations decreased downslope. The lateral and vertical extent of uranium-238 are defined.

I-5.7.5.4 Summary of Nature and Extent for Consolidated Unit 48-007(a)-00

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

I-5.8 SWMU 48-007(b)

A total of 28 samples (4 soil, 8 sediment, and 16 tuff) were collected in 1997 and 2009 from eight locations at SWMU 48-007(b). Table 5.10-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.10-1 shows the sampling locations.

I-5.8.1 Inorganic Chemicals at SWMU 48-007(b)

Twenty-four samples were analyzed for TAL metals, hexavalent chromium, total cyanide, nitrate, and perchlorate. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.10-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 5.10-2.

I-5.8.1.1 Inorganic Chemicals in Soil

One soil sample was analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected in the soil sample, but had a DL (1.14 mg/kg) above the BV (0.83 mg/kg) and above the maximum background concentration (1 mg/kg). Antimony is identified as a COPC in soil.

Cadmium was not detected in the soil sample, but had a DL (0.571 mg/kg) above the BV (0.4 mg/kg). The sample result is below the maximum background concentration of cadmium in soil (2.6 mg/kg), but is more than 20% above the BV. Cadmium is identified as a COPC in soil.

Nitrate and perchlorate were detected in the soil sample and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected (55.3 mg/kg) above the BV (48.8 mg/kg) but below the maximum background concentration (75.5 mg/kg) in the soil sample. Zinc is not identified as a COPC in soil.

I-5.8.1.2 Inorganic Chemicals in Tuff

Sixteen tuff samples were analyzed for TAL metals, hexavalent chromium, total cyanide, nitrate, and perchlorate.

Aluminum was detected above the BV (7340 mg/kg) and above the maximum tuff background concentration (8370 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 12,100 mg/kg. Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for aluminum in tuff is presented in Figure I-5.8-1. Aluminum is identified as a COPC in tuff.

Antimony was detected above the BV (0.5 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 0.565 mg/kg, and had DLs (1.05–1.17 mg/kg) above the BV in 14 of 16 tuff samples. Because more than 80 percent of the site sample and background sampling results are nondetects, statistical comparisons are not possible, and the site sampling results are compared to the BV only. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 3.96 mg/kg. Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-5.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in soil is presented in Figure I-5.8-2. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) and above the maximum tuff background concentration (51.6 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 126 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-5.8-3. Barium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 5 of 16 tuff samples, and above the maximum tuff background concentration (13 mg/kg) in 3 of 16 tuff samples, with a maximum sample concentration of 40.6 mg/kg. Chromium is interpreted as being substantially above background and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Hexavalent chromium and perchlorate were detected in one or more tuff samples and have no BVs. Hexavalent chromium and perchlorate are identified as COPCs in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 1 of 16 tuff samples, at a concentration of 5.08 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-5.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for cobalt in tuff is presented in Figure I-5.8-4. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 7 of 16 tuff samples, and above the maximum tuff background concentration (6.2 mg/kg) in 5 of 16 tuff samples, with a maximum sample concentration of 11.5 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.8-5. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14,500 mg/kg) in 1 of 16 tuff samples, at a concentration of 14,700 mg/kg. Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-5.8-6. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above the maximum tuff background concentration (15.5 mg/kg) in 1 of 16 tuff samples, at a concentration of 25.1 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-5.8-7. Lead is identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 1 of 16 tuff samples, at a concentration of 1850 mg/kg. Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-5.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for magnesium in tuff is presented in Figure I-5.8-8. Magnesium is not identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) and above the maximum tuff background concentration (7 mg/kg) in 1 of 16 tuff samples, at a concentration of 8.2 mg/kg. Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are not statistically different than background, while the results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-5.8-9. Nickel is identified as a COPC in tuff.

Selenium was not detected, but had DLs (1.06–1.18 mg/kg) above the BV (0.3 mg/kg) in all 16 tuff samples. Selenium is identified as a COPC in tuff.

Vanadium was detected above the BV (17 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 24 mg/kg. One sample result exceeded the maximum background concentration (21 mg/kg). Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-5.8-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-5.8-10. Vanadium is identified as a COPC in tuff.

I-5.8.1.3 Inorganic Chemicals in Sediment

Seven sediment samples were analyzed for TAL metals, hexavalent chromium, total cyanide, nitrate, and perchlorate.

Antimony was not detected, but had DLs (0.96–1.21 mg/kg) above the BV (0.83 mg/kg) in all seven sediment samples. Antimony is identified as a COPC in sediment.

Cadmium was not detected, but had DLs (0.48–0.605 mg/kg) above the BV (0.4 mg/kg) in all seven sediment samples. Cadmium is identified as a COPC in sediment.

Chromium was detected (12.3 mg/kg) above the BV (10.5 mg/kg) in one of seven sediment samples. The sample concentration is less than 20% above the BV. Chromium is not identified as a COPC in sediment.

Copper was detected above the BV (11.2 mg/kg) and above the maximum background concentration (12 mg/kg) in three of seven sediment samples, with a maximum sample concentration of 32.6 mg/kg. Copper is interpreted as being substantially above background and no further evaluation is necessary. Copper is identified as a COPC in sediment.

Nitrate and perchlorate were detected in sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected, but had DLs (0.978–1.2 mg/kg) above the BV (0.3 mg/kg) in all seven sediment samples. Selenium is identified as a COPC in sediment.

Zinc was detected (104 and 106 mg/kg) above the BV (60.2 mg/kg) in two of seven sediment samples. Zinc is identified as a COPC in sediment.

I-5.8.2 Organic Chemicals at SWMU 48-007(b)

Twenty-four samples were analyzed for organic chemicals, including SVOCs, VOCs, PCBs, and dioxins/furans. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.10-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.10-1.

I-5.8.2.1 Organic Chemicals in Soil

One soil sample was analyzed for SVOCs.

The following organic chemicals were detected in the soil sample and are identified as COPCs in soil: anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene.

I-5.8.2.2 Organic Chemicals in Tuff

Sixteen tuff samples were analyzed for SVOCs and VOCs. Eight tuff samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more tuff samples and are identified as COPCs in tuff: acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene;

benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-5.8.2.3 Organic Chemicals in Sediment

Seven sediment samples were analyzed for SVOCs. Four sediment samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more sediment samples and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

I-5.8.3 Radionuclides at SWMU 48-007(b)

Twenty-eight samples from SWMU 48-007(b) were analyzed for gamma-emitting radionuclides. Twenty-four samples were analyzed for tritium. Table 5.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.10-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown in Figure 5.10-3.

I-5.8.3.1 Radionuclides in Soil

One soil sample was analyzed for gamma-emitting radionuclides and tritium.

No radionuclides were detected above BVs/FVs in the surface (0–1 ft bgs) soil sample. No radionuclides are identified as COPCs in soil.

I-5.8.3.2 Radionuclides in Tuff

Sixteen tuff samples were analyzed for gamma-emitting radionuclides and tritium.

Cesium-137 was detected in 5 of 16 tuff samples and is identified as a COPC in tuff.

I-5.8.3.3 Radionuclides in Sediment

Eight sediment samples were analyzed for gamma-emitting radionuclides. Seven sediment samples were analyzed for tritium.

No radionuclides were detected in any of the sediment samples. No radionuclides are identified as COPCs in sediment.

I-5.8.4 Summary of COPCs at SWMU 48-007(b)

The inorganic chemicals identified as COPCs at SWMU 48-007(b) are aluminum, antimony, cadmium, chromium, hexavalent chromium, copper, iron, lead, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

The organic chemicals identified as COPCs at SWMU 48-007(b) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; and total tetrachlorodibenzofurans.

The radionuclide identified as a COPC at SWMU 48-007(b) is cesium-137.

I-5.8.5 Nature and Extent of Contamination at SWMU 48-007(b)

I-5.8.5.1 Nature and Extent of Inorganic COPCs

The concentrations of aluminum, chromium, iron, nickel, perchlorate, and vanadium increased with depth or were above the BV only in the deepest sample at location MO-605111. Chromium also increased with depth at location MO-605114 and was above the BV in the deepest sample at location MO-605110. Concentrations decreased downslope. The lateral extent is defined, but the vertical extent of these COPCs is not defined.

Hexavalent chromium was detected only once, in the deepest sample (3–4 ft bgs) at location MO-605112, at a concentration of 0.172 mg/kg. Hexavalent chromium was not detected at any downslope locations. The lateral and vertical extent of hexavalent chromium are defined.

Copper was detected above the BV at four sampling locations. The concentrations decreased with depth at all locations, and copper was not detected above the BV at any downslope locations. The lateral and vertical extent of copper are defined.

Lead was above the BV only in the deepest sample (2.5–3.5 ft bgs) at location MO-605114, with a concentration of 25.1 mg/kg. Lead was not detected above the BV at any downslope locations. The lateral extent of lead is defined, but the vertical extent of lead is not defined.

Nitrate was detected at four sampling locations, with a maximum concentration of 5.88 mg/kg. The concentrations of nitrate are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at six sampling locations. The concentrations of perchlorate decreased with depth except at locations MO-605111, MO-605116, and MO-605117, where concentrations increased slightly, with a maximum sample concentration of 0.00438 mg/kg. Most concentrations are near or below detection limits. Concentrations decreased downslope from location MO-605115 to location MO-605117The lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV at three sampling locations. Concentrations decreased with depth at all three locations. Concentrations decreased downslope. The lateral and vertical extent of zinc are defined.

I-5.8.5.2 Nature and Extent of Organic COPCs

Aroclor-1254 and Aroclor-1260 were detected at low concentrations (maximum 0.021 mg/kg) at three and one location, respectively. Concentrations decreased with depth at all locations and decreased downslope. The lateral and vertical extent of PCBs are defined.

PAHs were detected at multiple locations. Concentrations decreased with depth and decreased downslope, with the exception of acenaphthene and fluorene, whose concentrations increased slightly with depth at location MO-605110 (maximum concentrations of 0.0506 and 0.0455 mg/kg, respectively). The lateral and vertical extent of PAHs are defined.

Naphthalene and 2-methylnaphthalene increased with depth or were detected only in the deepest sample at location MO-605110, with maximum concentrations at the EQL. Concentrations decreased downslope. The lateral and vertical extent of naphthalene and 2-methylnaphthalene are defined.

Fourteen dioxin/furan congeners were detected at low concentrations (generally less than 1×10^{-4} mg/kg). Concentrations decreased with depth at all locations. Concentrations decreased downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-5.8.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected at four sampling locations. Concentrations decreased with depth at three locations, and decreased downslope. The lateral and vertical extent of cesium-137 are defined.

I-5.8.5.4 Summary of Nature and Extent for SWMU 48-007(b)

The lateral and vertical extent of all inorganic COPCs are defined, except the vertical extent of aluminum, chromium, iron, lead, nickel, perchlorate, and vanadium.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-5.9 SWMU 48-007(c)

A total of 27 samples (4 soil, 13 tuff, and 10 sediment) were collected in 1997 and 2009 from 10 locations at SWMU 48-007(c). Table 5.11-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.11-1 shows the sampling locations.

I-5.9.1 Inorganic Chemicals at SWMU 48-007(c)

Eighteen samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide. Table 5.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.11-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 5.11-2.

I-5.9.1.1 Inorganic Chemicals in Soil

One soil sample was analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide. No inorganic chemicals were detected above BVs, had DLs above BVs, or were detected with no BVs. No inorganic chemicals are identified as COPCs in soil.

I-5.9.1.2 Inorganic Chemicals in Tuff

Twelve tuff samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.02–1.21 mg/kg) above the BV (0.5 mg/kg) in all 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum tuff background concentration (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum tuff background concentration (2230 mg/kg) in 1 of 12 tuff samples, at a concentration of 9520 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-5.9-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-5.9-1. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 7 of 12 tuff samples, with a maximum concentration of 24.3 mg/kg. Three of the seven sampling results also exceeded the maximum tuff background concentration (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-5.9-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-5.9-2. Chromium is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 3 of 12 tuff samples, with a maximum concentration of 9.99 mg/kg. The maximum sample concentration also exceeded the maximum tuff background concentration (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-5.9-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-5.9-3. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) and above maximum tuff background concentration (15.5 mg/kg) the in 1 of 12 tuff samples, at a concentration of 28.6 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-5.9-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for lead in tuff is presented in Figure I-5.9-4. Lead is identified as a COPC in tuff.

Perchlorate was detected in 5 of 12 tuff samples and has no BV. Perchlorate is identified as a COPC in tuff.

Selenium was not detected, but had DLs (1.03–1.17 mg/kg) above the BV (0.3 mg/kg) in all 12 tuff samples. Results were compared only to the BV because the BV is greater than the maximum tuff background concentration (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-5.9.1.3 Inorganic Chemicals in Sediment

Six sediment samples were analyzed for nitrate, hexavalent chromium, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (0.992–1.04 mg/kg) above the BV (0.83 mg/kg) in all six sediment samples. Results were compared only to the BV because background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.496–0.518 mg/kg) above the BV (0.4 mg/kg) in all six sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of cadmium in sediment (0.18 mg/kg). Cadmium is identified as a COPC in sediment.

Iron was detected above the BV (13800 mg/kg) in two of six sediment samples, with sample concentrations of 14900 and 22400 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of iron in sediment (13000 mg/kg). The box plot for iron in sediment is presented in Figure I-5.9-5. Iron is identified as a COPC in sediment.

Nitrate and perchlorate were detected in sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected, but had DLs (0.989–1.03 mg/kg) above the BV (0.3 mg/kg) in all six sediment samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

Silver was detected above the BV (1 mg/kg) in one of six sediment samples, with a maximum concentration of 1.01 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of silver in sediment (0.28 mg/kg). The box plot for silver in sediment is presented in Figure I-5.9-6. The sample result is less than 20% above the BV. Because silver is detected slightly and infrequently above background (one of six samples), it is eliminated as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in two of six sediment samples, with concentrations of 85.7 and 125 mg/kg. Results were compared only to the BV because the BV is greater than the maximum background concentration of zinc in sediment (56.2 mg/kg). The box plot for zinc in sediment is presented in Figure I-5.9-7. Zinc is identified as a COPC in sediment.

I-5.9.2 Organic Chemicals at SWMU 48-007(c)

Nine samples were analyzed for dioxins/furans and PCBs. Eighteen samples were analyzed for SVOCs. Twelve samples were analyzed for VOCs. Table 5.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.11-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.11-1.

I-5.9.2.1 Organic Chemicals in Tuff

Six tuff samples were analyzed for dioxins/furans and PCBs. Twelve tuff samples were analyzed for SVOCs and VOCs.

The following organic chemicals were detected in at least one tuff sample at SWMU 48-007(c) and are identified as COPCs in tuff: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-5.9.2.2 Organic Chemicals in Sediment

The following organic chemicals were detected in at least one sediment sample at SWMU 48-007(c) and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-5.9.3 Radionuclides at SWMU 48-007(c)

Twenty-seven samples were analyzed for gamma-emitting radionuclides. Eighteen samples were analyzed for tritium. Table 5.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.11-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 5.11-3.

I-5.9.3.1 Radionuclides in Soil

Four soil samples were analyzed for gamma-emitting radionuclides.

Cesium-137 was detected in one of four soil samples from a depth for which the FV does not apply, at a concentration of 0.144 pCi/g. Cesium-137 is identified as a COPC in soil.

I-5.9.3.2 Radionuclides in Tuff

Thirteen tuff samples were analyzed for gamma-emitting radionuclides. Twelve tuff samples were analyzed for tritium.

Cesium-137 was detected in 6 of 13 tuff samples with a maximum concentration of 0.805 pCi/g. Cesium-137 is identified as a COPC in tuff.

Uranium-235 was detected above the BV (0.09 pCi/g) in 1 of 13 tuff samples, at a concentration of 0.119 pCi/g. Results were compared only to the BV because background dataset for uranium-235 in tuff is not available. Uranium-235 is identified as a COPC in tuff.

I-5.9.3.3 Radionuclides in Sediment

Ten sediment samples were analyzed for gamma-emitting radionuclides. Six samples were analyzed for tritium.

No radionuclides were detected or detected above BV/FV in sediment samples. No radionuclide COPCs are identified in sediment.

I-5.9.4 Summary of COPCs at SWMU 48-007(c)

The inorganic chemicals identified as COPCs at SWMU 48-007(c) are antimony, cadmium, chromium, copper, iron, lead, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 48-007(c) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 48-007(c) are cesium-137 and uranium-235.

I-5.9.5 Nature and Extent of Contamination at SWMU 48-007(c)

I-5.9.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV at five locations. Concentrations increased with depth at all five locations. The highest concentration is 24.3 mg/kg, which is less than twice the maximum background concentration of 13 mg/kg, in sample of 2.5–3.5 ft bgs at location MO-605163. Concentrations decreased from location MO-605163 to the location farthest downslope, MO-605165. The lateral extent of chromium is defined, but the vertical extent is not defined.

Copper was detected above the BV at locations MO-605161 and MO-605165. Concentrations decreased with depth at location MO-605161 and did not change substantially at location MO-605165. Concentrations decreased downslope. The lateral and vertical extent of copper are defined.

Iron was detected above the BV in one sample each at locations MO-605163 and MO-605165. Concentrations decreased with depth at these locations. Concentrations decreased downslope. The lateral and vertical extent of iron are defined.

Lead was detected above the BV only in the deepest sample at location MO-605165, the location farthest downslope. The concentration (28.6 mg/kg) is less than twice the maximum background concentration of 15.5 mg/kg. The lateral and vertical extent of lead are not defined.

Nitrate was detected in one sample each at three locations, with a maximum concentration of 1.46 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at five locations. Concentrations decreased with depth at four locations, and remained substantially the same with depth at location MO-605165. All concentrations are less than the EDLs. Concentrations increased slightly downslope at location MO-605165, but concentrations at that location are still very low (0.00121 mg/kg) and decrease with depth. The lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV in one sample each at locations MO-605163 and MO-605165. Concentrations decreased with depth at these locations. Both concentrations are less than or approximately twice the BV, and concentrations decreased downslope. The lateral and vertical extent of zinc are defined.

I-5.9.5.2 Nature and Extent of Organic COPCs

Fourteen PAHs [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; naphthalene; phenanthrene; and pyrene] were detected at the site. Concentrations decreased with depth and decreased down the drainage from location MO-605161 to location MO-605165. The lateral and vertical extent of PAHs are defined.

Aroclor-1254 and Aroclor-1260 were detected at locations MO-605161, MO-615162, and MO-605163. Concentrations decreased with depth and decreased down the drainage from location MO-605161 to location MO-605163. The lateral and vertical extent of Aroclor-1254 and Aroclor-1260 are defined.

2-Methylnaphthalene was detected in only one sample, at location MO-605164. Concentrations decreased with depth at this location. 2-Methylnaphthalene was not detected in samples at downslope location MO-605165. The lateral and vertical extent of 2-methylnaphthalene are defined.

Fourteen dioxin/furan congeners were detected at one or more locations. Concentrations decreased with depth at all locations, and decreased down the drainage from location MO-605161 to location MO-605163. The lateral and vertical extent of dioxin/furan congeners are defined.

I-5.9.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected at six locations. Concentrations decreased with depth at all six locations. Concentrations decreased down the drainage from location MO-605161 to location MO-605165. The lateral and vertical extent of cesium-137are defined.

Uranium-235 was detected above the BV only in the deeper sample at location 48-02166. Uranium-235 was not detected above the BV in the similar depth sample at nearby location 48-02169. Uranium-235 was also not detected in samples at downslope locations. The lateral and vertical extent of uranium-235are defined.

I-5.9.5.4 Summary of Nature and Extent for SWMU 48-007(c)

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of chromium and the lateral and vertical extent of lead.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-5.10 SWMU 48-007(f)

A total of 28 samples (6 soil, 5 sediment, and 17 tuff) was collected in 1997 and 2009 from 12 locations at SWMU 48-007(f). Table 5.12-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.12-1 shows the sampling locations.

I-5.10.1 Inorganic Chemicals at SWMU 48-007(f)

Twenty-four samples were analyzed for TAL metals, total cyanide, nitrate, and perchlorate. Table 5.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.12-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 5.12-2.

I-5.10.1.1 Inorganic Chemicals in Soil

Four soil samples were analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected but had DLs (1.02–1.11 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in all four soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected above the BV but had DLs (0.526–0.553 mg/kg) above the BV (0.4 mg/kg) in three of the four soil samples. All sampling results were below the maximum soil background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-5.10-1. Cadmium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum soil background concentration (16 mg/kg) in one soil sample, at a concentration of 23.5 mg/kg. The box plot for copper in soil is presented in Figure I-5.10-2. Copper is identified as a COPC in soil.

Nitrate and perchlorate were detected in three and four soil samples, respectively, and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Zinc was detected above the BV (48.8 mg/kg) and above the maximum soil background concentration (75.5 mg/kg) in one of four soil samples, at a concentration of 78 mg/kg. The box plot for zinc in soil is presented in Figure I-5.10-3. Zinc is identified as a COPC in soil.

I-5.10.1.2 Inorganic Chemicals in Tuff

Sixteen tuff samples were analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected but had DLs (0.991–1.11 mg/kg) above the BV (0.5 mg/kg) in all 16 tuff samples. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) in 2 of 16 tuff samples, and above the maximum tuff background concentration (51.6 mg/kg) in 1 of 16 tuff samples, at a concentration of 60.8 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-5.10-1. The results of the Gehan test indicate that the site sampling results are not statistically different than background, while the results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for barium in tuff is presented in Figure I-5.10-4. Barium is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 11 of 16 tuff samples and above the maximum background concentration (13 mg/kg) in 7 of 16 tuff samples, with a maximum sample concentration of 37.6 mg/kg. Chromium is interpreted as being substantially above background and no further evaluation is necessary. Chromium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 2 of 16 tuff samples, with a maximum sample concentration of 633 mg/kg. Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-5.10-1. The results of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for manganese in tuff is presented in Figure I-5.10-5. Manganese is identified as a COPC in tuff.

Nitrate and perchlorate were detected in one or more tuff samples and have no BVs. Therefore nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected but had DLs (1–1.15 mg/kg) above the BV (0.3 mg/kg) in all 16 tuff samples. Selenium is identified as a COPC in tuff.

I-5.10.1.3 Inorganic Chemicals in Sediment

Four sediment samples were analyzed for TAL metals, total cyanide, nitrate, and perchlorate.

Antimony was not detected, but had DLs (0.976–1.05 mg/kg) above the BV (0.83 mg/kg) in all four sediment samples. Antimony is identified as a COPC in sediment.

Cadmium was not detected, but had DLs (0.488–0.525 mg/kg) above the BV (0.4 mg/kg) in all four sediment samples. Cadmium is identified as a COPC in sediment.

Nitrate and perchlorate were detected in three of four sediment samples and have no BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected, but had DLs (0.959–1.04 mg/kg) above the BV (0.3 mg/kg) in all four sediment samples. Selenium is identified as a COPC in sediment.

I-5.10.2 Organic Chemicals at SWMU 48-007(f)

Twenty-four samples were analyzed for organic chemicals, including SVOCs, VOCs, PCBs, and dioxins/furans. Table 5.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.12-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 5.12-1.

I-5.10.2.1 Organic Chemicals in Soil

Four soil samples were analyzed for SVOCs. Three samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more soil samples and are identified as COPCs in soil: acenaphthene; anthracene; Aroclor-1242; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzoic acid; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-5.10.2.2 Organic Chemicals in Tuff

Sixteen tuff samples were analyzed for SVOCs and VOCs. Eight tuff samples were analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more tuff samples and are identified as COPCs in tuff: acetone; Aroclor-1242; Aroclor-1254; benzo(a)pyrene; benzo(b)fluoranthene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; phenanthrene; pyrene; and toluene.

I-5.10.2.3 Organic Chemicals in Sediment

Four sediment samples were analyzed for SVOCs. One sediment sample was analyzed for PCBs and dioxins/furans.

The following organic chemicals were detected in one or more sediment samples and are identified as COPCs in sediment: acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-5.10.3 Radionuclides at SWMU 48-007(f)

Twenty-eight samples were analyzed for radionuclides, including gamma-emitting radionuclides, tritium, and isotopic plutonium. Table 5.12-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.12-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs are shown in Figure 5.12-3.

I-5.10.3.1 Radionuclides in Soil

Six soil samples were analyzed for gamma-emitting radionuclides. Four soil samples were analyzed for tritium and isotopic plutonium.

Tritium was detected in three soil samples, and is identified as a COPC in soil.

I-5.10.3.2 Radionuclides in Tuff

Seventeen tuff samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic plutonium.

Cesium-137, plutonium-239/240, and tritium were detected in one or more tuff samples, and are identified as COPCs in tuff.

Uranium-235 was detected (0.1033 pCi/g) above the BV (0.09 pCi/g) in one tuff sample. Background data are not available for uranium-235 in tuff, so the site sample result is compared only to the BV. Because it was detected infrequently and at less than 20% above the BV, uranium-235 is not identified as a COPC in tuff.

I-5.10.3.3 Radionuclides in Sediment

Five sediment samples were analyzed for gamma-emitting radionuclides. Four sediment samples were analyzed for tritium and isotopic plutonium.

No radionuclides were detected in any of the five sediment samples. Therefore no radionuclides are identified as COPCs in sediment.

I-5.10.4 Summary of COPCs at SWMU 48-007(f)

The inorganic chemicals identified as COPCs at SWMU 48-007(f) are antimony, barium, cadmium, chromium, copper, manganese, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 48-007(f) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 48-007(f) are cesium-137, plutonium-239/240, and tritium.

I-5.10.5 Nature and Extent of Contamination at SWMU 48-007(f)

I-5.10.5.1 Nature and Extent of Inorganic COPCs

Barium was detected above the BV at two locations. Concentrations decreased with depth at location MO-605101. Barium was detected above the BV only in the deepest sample at location MO-605097, at a concentration of 60.8 mg/kg, slightly above the maximum background concentration of 51.6 mg/kg. Concentrations decreased downslope. The lateral extent of barium is defined, but the vertical extent is not defined.

Chromium was detected above the BV at six locations. Concentrations increased with depth or were above the BV only in the deepest samples at five locations. Concentrations increased at the location farthest downslope (location MO-605104). The lateral and vertical extent of chromium are not defined.

Copper was detected above the BV in only one sample, the surface sample at location MO-605100. The concentration decreased with depth and decreased downslope. The lateral and vertical extent of copper are defined.

Manganese was detected above the BV only in the deepest samples at two locations (MO-605097 and MO-605103), at concentrations less than the maximum background concentration of 752 mg/kg. The concentration of manganese decreased downslope. The lateral and vertical extent of manganese are defined.

Nitrate was detected at six locations, with a maximum concentration of 4 mg/kg. These concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at eight locations. Perchlorate concentrations decreased with depth at all locations except location MO-605100, where it increased slightly (0.000372 mg/kg). Concentrations decreased downslope from the mesa top, and all perchlorate concentrations are low and near the detection limits. The lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV in only one sample, the surface sample at location MO-605101. Concentrations decreased with depth and downslope. The lateral and vertical extent of zinc are defined.

I-5.10.5.2 Nature and Extent of Organic COPCs

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected at low concentrations (maximum 0.0133 mg/kg) at four locations. Concentrations decreased with depth at all locations. Concentrations decreased or did not change substantially downslope. The lateral and vertical extent of PCBs are defined.

Acetone and 4-isopropyltoluene were detected low concentrations at or near the EQL at only one location (MO-605104), and decreased with depth. Toluene was detected at three locations and decreased with depth except at location MO-605099, where it was detected (0.000583 mg/kg) only in the deepest sample. The lateral and vertical extent of VOCs are defined.

PAHs were detected at low concentrations at multiple locations. Concentrations of all PAHs decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of PAHs are defined.

Benzoic acid was detected in only one sample, the surface sample at location MO-605097. Concentrations decreased with depth and downslope. The lateral and vertical extent of benzoic acid are defined.

Dioxin/furan congeners were detected at low concentrations (less than 1×10^{-4} mg/kg) at multiple locations. Concentrations decreased with depth at all locations, and decreased or did not change substantially downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-5.10.5.3 Nature and Extent of Radionuclide COPCs

Cesium-137 was detected in only two samples. The concentration of cesium-137 decreased with depth at both locations, and decreased downslope. The lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected at a low concentration (0.019 pCi/g) in only one sample, the deepest sample at location MO-605103. The detected concentration is low and less than the soil FV.The lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected at three locations. Concentrations decreased with depth and downslope. The lateral and vertical extent of tritium are defined.

I-5.10.5.4 Summary of Nature and Extent for SWMU 48-007(f)

The lateral and vertical extent of all inorganic COPCs are defined, except the lateral and vertical extent of chromium and the vertical extent of barium.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-5.11 AOC 48-011

Four tuff samples were collected in 2009 from one location at AOC 48-011. Table 5.13-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.13-1 shows the sampling locations.

I-5.11.1 Inorganic Chemicals at AOC 48-011

Four samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide. Table 5.13-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.13-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 5.13-2.

I-5.11.1.1 Inorganic Chemicals in Tuff

Four tuff samples were analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had DLs (1.02–1.09 mg/kg) above the BV (0.5 mg/kg) in all four tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Nitrate and perchlorate were detected in tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected, but had DLs (1.05–1.09 mg/kg) above the BV (0.3 mg/kg) in all four tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). Selenium is identified as a COPC in tuff.

I-5.11.2 Organic Chemicals at AOC 48-011

Four samples were analyzed for dioxins/furans, PCBs, SVOCs, and VOCs. Table 5.13-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.13-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.13-3.

I-5.11.2.1 Organic Chemicals in Tuff

Four tuff samples were analyzed for dioxins/furans, PCBs, SVOCs, and VOCs.

The following organic chemicals were detected in tuff samples at AOC 48-011 and are identified as COPCs in tuff: Aroclor-1254; benzoic acid; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,1,2-trichloroethane.

I-5.11.3 Radionuclides at AOC 48-011

Four samples were analyzed for gamma-emitting radionuclides and tritium. Table 5.13-1 summarizes the samples collected and the requested analyses for each sample.

No radionuclides were detected or detected above BVs/FVs. No radionuclide COPCs are identified at AOC 48-011.

I-5.11.4 Summary of COPCs at AOC 48-011

The inorganic chemicals identified as COPCs at AOC 48-011 are antimony, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at AOC 48-011 are Aroclor-1254; benzoic acid; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; and 1,1,2-trichloroethane.

No radionuclides are identified as COPCs at AOC 48-011.

I-5.11.5 Nature and Extent of Contamination at AOC 48-011

I-5.11.5.1 Nature and Extent of Inorganic COPCs

Nitrate was detected in three samples, with a maximum concentration of 0.979 mg/kg. These concentrations are likely naturally occurring. The vertical extent of nitrate is defined.

Perchlorate was detected in all four samples at low concentrations that remained essentially the same with depth and ranged from 0.00451 mg/kg to 0.00591 mg/kg. The vertical extent of perchlorate is defined.

I-5.11.5.2 Nature and Extent of Organic COPCs

Aroclor-1254, benzoic acid, and 1,1,2-trichloroethane were each detected in only one sample (different depth) at concentrations less than the EQLs. Aroclor-1254 and 1,1,2-trichloroethane concentrations decreased with depth. The vertical extent is defined for Aroclor-1254, benzoic acid, and 1,1,2-trichloroethane.

Two dioxin/furan congeners were detected at concentrations equivalent to the EQLs. The vertical extent is defined for these dioxin/furan congeners.

I-5.11.5.3 Nature and Extent of Radionuclide COPCs

No radionuclides are identified as COPCs at AOC 48-011.

I-5.11.5.4 Summary of Nature and Extent for AOC 48-011

The vertical extent of all inorganic and organic COPCs is defined at AOC 48-011, and there are no radionuclide COPCs identified at the site.

I-5.12 AOC 48-012

A total of 22 samples (10 soil and 12 tuff) were collected in 2002 and 2009 from 14 locations at AOC 48-012. Table 5.14-1 summarizes the samples collected and the requested analyses for each sample. Figure 5.14-1 shows the sampling locations.

I-5.12.1 Organic Chemicals at AOC 48-012

Twelve samples were analyzed for PCBs and TPH-DRO. Twenty-two samples were analyzed for SVOCs and VOCs. Table 5.14-1 summarizes the samples collected and the requested analyses for each sample.

Table 5.14-2 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 5.14-2.

I-5.12.1.1 Organic Chemicals in Soil

Ten soil samples were analyzed for SVOCs and VOCs.

The following organic chemicals were detected in at least one soil sample at AOC 48-012 and are identified as COPCs in soil: acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; dibenzofuran; 2,4-dimethylphenol; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; 2-methylphenol; 4-methylphenol; naphthalene; phenanthrene; and pyrene.

I-5.12.1.2 Organic Chemicals in Tuff

No organic chemicals were detected in tuff samples from AOC 48-012.

I-5.12.2 Summary of COPCs at AOC 48-012

The organic chemicals identified as COPCs at AOC 48-012 are acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; dibenzofuran; 2,4-dimethylphenol; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; 2-methylphenol; 4-methylphenol; naphthalene; phenanthrene; and pyrene.

I-5.12.3 Nature and Extent of Contamination at AOC 48-012

I-5.12.3.1 Nature and Extent of Organic COPCs

All the organic chemicals detected at AOC 48-012 are in samples collected in 2002. Four locations on the site boundary were sampled in 2009 to define the lateral and vertical extent of the organic chemicals. Because no organic chemicals were detected in samples collected in 2009, the lateral and vertical extent of the organic COPCs are defined.

I-5.12.3.2 Summary of Nature and Extent for AOC 48-012

The lateral and vertical extent of all organic COPCs are defined at AOC 48-012.

I-6.0 COPCs FOR SITES AT TA-50

I-6.1 SWMU 50-001(a)

SWMU 50-001(a) is proposed for delayed investigation. Section 6.2 of the investigation report presents the details for this site.

I-6.2 AOC 50-001(b)

AOC 50-001(b) is proposed for delayed investigation. Section 6.3 of the investigation report presents the details for this site.

I-6.3 SWMU 50-002(a)

SWMU 50-002(a) is proposed for delayed investigation. Section 6.4 of the investigation report presents the details for this site.

I-6.4 Consolidated Unit 50-002(b)-00

Consolidated Unit 50-002(b)-00 is proposed for delayed investigation. Section 6.4 of the investigation report presents the details for this site.

I-6.5 AOC 50-002(d)

Four swipe samples were collected in 2009 from four locations at AOC 50-002(d). Table 6.6-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.6-1 shows the sampling locations.

I-6.5.1 Inorganic Chemicals at AOC 50-002(d)

All four swipe samples were analyzed for TAL metals. Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.6-2 lists the inorganic chemicals detected on the swipe samples at AOC 50-002(d). The sampling locations and detected concentrations are shown in Figure 6.6-2.

The following inorganic chemicals were detected (units in μg/filter) on at least one swipe sample: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc.

I-6.5.2 Organic Chemicals at AOC 50-002(d)

All four swipe samples were analyzed for PCBs and SVOCs. Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.6-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.6-3.

The following organic chemicals were detected (units in μg/filter) on at least one swipe sample: acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

I-6.5.3 Radionuclides at AOC 50-002(d)

All four swipe samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Table 6.6-1 summarizes the samples collected and the requested analyses for each sample.

No radionuclides were detected on the swipe samples at AOC 50-002(d).

I-6.5.4 Summary of COPCs at AOC 50-002(d)

Inorganic and organic chemicals were detected on the swipe samples, but are not identified as COPCs. No BVs are available for swipe samples, and performing risk-screening assessments with swipe sampling results is not possible.

The inorganic chemicals detected on swipe samples at AOC 50-002(d) are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, nickel, potassium, sodium, vanadium, and zinc.

The organic chemicals detected on swipe samples at AOC 50-002(d) are acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

No radionuclides were detected on swipe samples at AOC 50-002(d).

I-6.5.5 Nature and Extent of Contamination at AOC 50-002(d)

I-6.5.5.1 Nature and Extent of Inorganic Chemicals

Although inorganic chemicals were detected on swipe samples, the extent of those inorganic chemicals was not evaluated. The nature of the swipe samples does not make possible an evaluation of the extent of contamination, but the nitric acid tank is located such that any leaks would be contained by the concrete sump, thus defining the extent of potential contamination.

I-6.5.5.2 Nature and Extent of Organic COPCs

Although organic chemicals were detected on swipe samples, the extent of those organic chemicals was not evaluated. The nature of the swipe samples does not make possible an evaluation of the extent of contamination, but the nitric acid tank is located such that any leaks would be contained by the concrete sump, thus defining the extent of potential contamination.

I-6.5.5.3 Summary of Nature and Extent for AOC 50-002(d)

The lateral and vertical extent of inorganic and organic chemicals are not defined by the swipe sampling results, but the extent of potential contamination is effectively defined by the presence of the concrete sump, which would contain any leaks from the nitric acid tank.

I-6.6 AOC 50-003(a)

AOC 50-003(a) was approved for clean closure by NMED in November 2004 (NMED 2004, 098488), and no further investigation is needed. Section 6.7 of the investigation report presents the details for this site.

I-6.7 Consolidated Unit 50-004(a)-00

A total of 156 samples (57 soil, 98 tuff, and 1 sediment) were collected in 1993, 1994, 2003, and 2009 from 58 locations at Consolidated Unit 50-004(a)-00. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.8-1 shows the sampling locations.

I-6.7.1 Inorganic Chemicals at Consolidated Unit 50-004(a)-00

Eighty-eight samples were analyzed for nitrate. One hundred and fifty-five samples were analyzed for TAL metals. Eighty-two samples were analyzed for perchlorate and total cyanide. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown on Plate 6.8-1.

I-6.7.1.1 Inorganic Chemicals in Soil

Twenty-three soil samples were analyzed for nitrate. Fifty-six samples were analyzed for TAL metals. Twenty-two samples were analyzed perchlorate and total cyanide.

Aluminum was detected above the BV (29200 mg/kg) in 1 of 56 soil samples, at a concentration of 32,300 mg/kg. This sample result did not exceed the maximum background concentration of aluminum in soil (61500 mg/kg). Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for aluminum in soil is presented in Figure I-6.7-1. Aluminum is not identified as a COPC in soil.

Antimony was detected above the BV (0.83 mg/kg) in 1 of 56 soil samples, with a maximum concentration of 8.6 mg/kg. Antimony also had DLs (1.06–6.7 mg/kg) above the BV in 54 soil samples. These DLs also exceeded the maximum soil background concentration (1 mg/kg). Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. The box plot for antimony in soil is presented in Figure I-6.7-2. Antimony is identified as a COPC in soil.

Beryllium was detected above the BV (1.83 mg/kg) in 1 of 56 soil samples, at a concentration of 4.7 mg/kg. The sample result did not exceed the maximum soil background concentration (3.95 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for beryllium in soil is presented in Figure I-6.7-3. Beryllium is not identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in 23 of 56 soil samples, with a maximum background concentration of 1.8 mg/kg. Cadmium also had DLs (0.41–0.601 mg/kg) above the BV in 24 soil samples. None of the results exceeded the maximum soil background concentration (2.6 mg/kg). Statistical tests were performed to determine if the site sampling results for cadmium are different than background. The statistical test results are presented in Table I-6.7-1. The result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for cadmium in soil is presented in Figure I-6.7-4. Cadmium is identified as a COPC in soil.

Calcium was detected above the BV (6120 mg/kg) in 2 of 56 soil samples, with concentrations of 12900 and 17200 mg/kg. One sample result also exceeded the maximum soil background concentration (14,000 mg/kg). Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in soil is presented in Figure I-6.7-5. Calcium is not identified as a COPC in soil.

Chromium was detected above the BV (19.3 mg/kg) in 1 of 56 soil samples, at a concentration of 20 mg/kg. This sample result did not exceed the maximum soil background concentration (36.5 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background.

The box plot for chromium in soil is presented in Figure I-6.7-6. Chromium is not identified as a COPC in soil.

Copper was detected above the BV (14.7 mg/kg) and above the maximum soil background concentration (16 mg/kg) in 1 of 56 soil samples, at a concentration of 16.9 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-6.7-1. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in soil is presented in Figure I-6.7-7. Copper is identified as a COPC in soil.

Total cyanide was detected above the BV (0.5 mg/kg) in 2 of 22 soil samples, with concentrations of 1.39 and 3.97 mg/kg. Results were compared only to the BV because a background dataset for total cyanide in soil is not available. Total cyanide is identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) in 1 of 56 soil samples, at a concentration of 24.5 mg/kg. The sample result did not exceed the maximum soil background concentration (28 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in soil is presented in Figure I-6.7-8. Lead is not identified as a COPC in soil.

Magnesium was detected above the BV (4610 mg/kg) in 1 of 56 soil samples, at a concentration of 7700 mg/kg. The sample result did not exceed the maximum soil background concentration (10,000 mg/kg). Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for magnesium in soil is presented in Figure I-6.7-9. Magnesium is not identified as a COPC in soil.

Mercury was detected above the BV (0.1 mg/kg) and above the maximum background concentration of mercury in soil (also 0.1 mg/kg) in one soil sample, at a concentration of 0.146 mg/kg. Mercury also had DLs (0.12–0.25 mg/kg) above the BV and above the maximum background concentration in four soil samples. Statistical tests were performed to determine if the site sampling results for mercury are different than background. The statistical test results are presented in Table I-6.7-1. The result of the quantile test indicates that the site sampling results are not statistically different than background, while the result of the slippage test indicates that the site sampling results are statistically different than background. The box plot for mercury in soil is presented in Figure I-6.7-10. Mercury is identified as a COPC in soil.

Nickel was detected above the BV (15.4 mg/kg) in 1 of 56 soil samples, at a concentration of 16.2 mg/kg. The sample result did not exceed the maximum soil background concentration (29 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for nickel in soil is presented in Figure I-6.7-11. Nickel is not identified as a COPC in soil.

Nitrate and perchlorate were detected in multiple soil samples and have no BVs. Nitrate and perchlorate are identified as COPCs in soil.

Potassium was detected above the BV (3460 mg/kg) in 1 of 56 soil samples, at a concentration of 4270 mg/kg. This sample result did not exceed the maximum soil background concentration (6850 mg/kg). Statistical tests were performed to determine if the site sampling results for potassium are

different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for potassium in soil is presented in Figure I-6.7-12. Potassium is not identified as a COPC in soil.

Silver was not detected above the BV (1 mg/kg), but had a DL (1.2 mg/kg) above the BV in 1 of 56 soil samples. Results were compared only to the BV because a background dataset for silver in soil is not available. The sample result is 20% above the BV. Because silver is detected slightly and infrequently above background (1 of 56 samples), it is eliminated as a COPC in soil.

Thallium was detected above the BV (0.73 mg/kg) in 1 of 56 soil samples, at a concentration of 0.92 mg/kg. This sample result did not exceed the maximum background concentration of thallium in soil (1 mg/kg). Statistical tests were performed to determine if the site sampling results for thallium are different than background. The statistical test results are presented in Table I-6.7-1. The result of the quantile test indicates that the site sampling results are statistically different than background. The box plot for thallium in soil is presented in Figure I-6.7-13. Thallium is identified as a COPC in soil.

Zinc was detected above the BV (48.8 mg/kg) in 3 of 56 soil samples, with a maximum concentration of 66.4 mg/kg. None of the sampling results exceeded the maximum soil background concentration (75.5 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-6.7-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for zinc in soil is presented in Figure I-6.7-14. Zinc is not identified as a COPC in soil.

I-6.7.1.2 Inorganic Chemicals in Tuff

Sixty-four tuff samples were analyzed for nitrate. Ninety-eight samples were analyzed for TAL metals. Fifty-nine samples were analyzed perchlorate and total cyanide.

Aluminum was detected above the BV (7340 mg/kg) in 6 of 98 tuff samples, with a maximum concentration of 17600 mg/kg. Three of the six sampling results also exceeded the maximum background concentration of aluminum in tuff (8370 mg/kg). Statistical tests were performed to determine if the site sampling results for aluminum are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for aluminum in tuff is presented in Figure I-6.7-15. Aluminum is not identified as a COPC in tuff.

Antimony was not detected above the BV (0.5 mg/kg), but had DLs (0.986–6 mg/kg) above the BV in 92 of 98 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). The box plot for antimony in tuff is presented in Figure I-6.7-16. Antimony is identified as a COPC in tuff.

Arsenic was detected above the BV (2.79 mg/kg) in 3 of 98 tuff samples, with a maximum concentration of 6.5 mg/kg. One sample result also exceeded the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure I-6.7-17. Arsenic is not identified as a COPC in tuff.

Barium was detected above the BV (46.0 mg/kg) in 16 of 98 tuff samples, with a maximum concentration of 114 mg/kg. Nine of the 16 sampling results also exceeded the maximum background concentration of barium in tuff (51.6 mg/kg). Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for barium in tuff is presented in Figure I-6.7-18. Barium is identified as a COPC in tuff.

Beryllium was detected above the BV (1.21 mg/kg) in 6 of 98 tuff samples, with a maximum sample concentration of 2.1 mg/kg. One sample result also exceeded the maximum background concentration of beryllium in tuff (1.8 mg/kg). Statistical tests were performed to determine if the site sampling results for beryllium are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for beryllium in tuff is presented in Figure I-6.7-18. Beryllium is identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and the maximum background concentration of calcium in tuff (2230 mg/kg) in 7 of 98 tuff samples, with a maximum concentration of 6650 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-6.7-19. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 20 of 98 tuff samples, with a maximum concentration of 103 mg/kg. Sixteen of the 20 sampling results also exceeded the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-6.7-20. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 2 of 98 tuff samples, with concentrations of 4.17 and 6.95 mg/kg. Statistical tests were performed to determine if the site sampling results for cobalt are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for cobalt in tuff is presented in Figure I-6.7-21. Cobalt is identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) in 5 of 98 tuff samples, with a maximum concentration of 12.7 mg/kg. Three of the five sampling results also exceeded the maximum background concentration of copper in tuff (6.2 mg/kg). Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-6.7-22. Copper is identified as a COPC in tuff.

Iron was detected above the BV (14500 mg/kg) in 1 of 98 tuff samples, at a concentration of 16800 mg/kg. The sample result did not exceed the maximum background concentration of iron in tuff (19500 mg/kg). Statistical tests were performed to determine if the site sampling results for iron are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for iron in tuff is presented in Figure I-6.7-23. Iron is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 7 of 98 tuff samples, with a maximum concentration of 70.1 mg/kg. Two of the seven sampling results also exceeded the maximum background concentration

(15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-6.7-24. Lead is not identified as a COPC in tuff.

Magnesium was detected above the BV (1690 mg/kg) in 2 of 98 tuff samples, with sample concentrations of 1960 and 2470 mg/kg. Magnesium was not detected but had a DL (2670 mg/kg) above the BV in one tuff sample. None of the results exceeded the maximum background concentration of magnesium in tuff (2820 mg/kg). Statistical tests were performed to determine if the site sampling results for magnesium are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for magnesium in tuff is presented in Figure I-6.7-25. Magnesium is identified as a COPC in tuff.

Manganese was detected above the BV (482 mg/kg) in 2 of 11 tuff samples, with concentrations of 582 and 790 mg/kg. One sample result also exceeded the maximum background concentration of manganese in tuff (752 mg/kg). Statistical tests were performed to determine if the site sampling results for manganese are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for manganese in tuff is presented in Figure I-6.7-26. Manganese is not identified as a COPC in tuff.

Mercury was not detected above the BV (0.1 mg/kg), but had DLs (0.12–0.19 mg/kg) above the BV in 4 of 98 tuff samples. Results were compared only to the BV because background dataset for mercury in tuff is not available. Mercury is identified as a COPC in tuff.

Nickel was detected above the BV (6.58 mg/kg) in 6 of 98 tuff samples, with a maximum concentration of 10.3 mg/kg. Four of the six sampling results also exceeded the maximum background concentration of nickel in tuff (7 mg/kg). Statistical tests were performed to determine if the site sampling results for nickel are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for nickel in tuff is presented in Figure I-6.7-27. Nickel is identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was not detected above the BV (0.3 mg/kg), but had DLs (0.518–1.2 mg/kg) above the BV in 97 of 98 tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure I-6.7-28. Selenium is identified as a COPC in tuff.

Silver was not detected above the BV (1 mg/kg), but had one DL (1.1 mg/kg) above the BV in 1 of 98 tuff sample. This DL did not exceed the maximum background concentration of silver in tuff (1.9 mg/kg). Statistical tests were performed to determine if the site sampling results for silver are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for silver in tuff is presented in Figure I-6.7-29. Silver is not identified as a COPC in tuff.

Vanadium was detected above the BV (17.0 mg/kg) in 1 of 98 tuff samples, at a concentration of 17.2 mg/kg. This sample result did not exceed the maximum background concentration (21 mg/kg).

Statistical tests were performed to determine if the site sampling results for vanadium are different than background. The statistical test results are presented in Table I-6.7-2. The result of the Gehan test indicates that the site sampling results are statistically different than background. The box plot for vanadium in tuff is presented in Figure I-6.7-30. Vanadium is identified as a COPC in tuff.

Zinc was detected above the BV (63.5 mg/kg) in 2 of 98 tuff samples, with sample concentrations of 64.5 and 78 mg/kg. One sample result also exceeded the maximum background concentration of zinc in tuff (65.6 mg/kg). Statistical tests were performed to determine if the site sampling results for zinc are different than background. The statistical test results are presented in Table I-6.7-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for zinc in tuff is presented in Figure I-6.7-31. Zinc is not identified as a COPC in tuff.

I-6.7.1.3 Inorganic Chemicals in Sediment

One sediment sample was analyzed for nitrate, TAL metals, perchlorate, and total cyanide.

Antimony was not detected, but had a DL (1.14 mg/kg) above the BV (0.83 mg/kg) in the sediment sample. Result was compared only to the BV because background dataset for antimony in sediment is not available. Antimony is identified as a COPC in sediment.

Selenium was not detected, but had a DL (1.18 mg/kg) above the BV (0.3 mg/kg) in the sediment sample. Result was compared only to the BV because the BV is greater than the maximum background concentration of selenium in sediment (0.1 mg/kg). Selenium is identified as a COPC in sediment.

I-6.7.2 Organic Chemicals at Consolidated Unit 50-004(a)-00

Eighty-two samples were analyzed for dioxins and furans. Twenty-two samples were analyzed for PCBs. Eighty-three samples were analyzed for SVOCs. Seventy-nine samples were analyzed for VOCs. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.8-2.

I-6.7.2.1 Organic Chemicals in Soil

Twenty-two samples were analyzed for dioxins and furans. Six samples were analyzed for PCBs. Twenty-three samples were analyzed for SVOCs. Nineteen samples were analyzed for VOCs.

The following organic chemicals were detected in soil samples at Consolidated Unit 50-004(a)-00 and are identified as COPCs in soil: acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; and toluene.

I-6.7.2.2 Organic Chemicals in Tuff

Fifty-nine tuff samples were analyzed for dioxins/furans, SVOCs, and VOCs. Fifteen samples were analyzed for PCBs.

The following organic chemicals were detected in tuff samples at Consolidated Unit 50-004(a)-00 and are identified as COPCs in tuff: 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; chrysene; di-n-butylphthalate; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; toluene; trichloroethene; and 1,3-xylene+1,4-xylene.

I-6.7.2.3 Organic Chemicals in Sediment

One sediment sample was analyzed for dioxins/furans, PCBs, SVOCs, and VOCs.

The following organic chemicals were detected in the sediment sample at Consolidated Unit 50-004(a)-00 and are identified as COPCs in sediment: Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; 1,1-dichloroethene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; and 1,2,4-trimethylbenzene.

I-6.7.3 Radionuclides at Consolidated Unit 50-004(a)-00

One hundred fifty-six samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium. One hundred fifty-four samples were analyzed for isotopic plutonium. One sample was analyzed for strontium-90. Table 6.8-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.8-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown on Plate 6.8-3.

I-6.7.3.1 Radionuclides in Soil

Fifty-seven soil samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium. Fifty-six samples were analyzed for isotopic plutonium. One sample was analyzed for strontium-90.

Americium-241 was detected in 6 of 57 soil samples from depths where the FV does not apply, with a maximum concentration of 1.06 pCi/g. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected in 7 of 57 soil samples from depths where the FV does not apply, with a maximum concentration of 0.628 pCi/g. Cesium-137 is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in two surface soil samples and was detected in 10 soil samples from depths where the FV does not apply, with a maximum concentration of 0.0874 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in four surface soil samples and was detected in 31 soil samples from depths where the FV does not apply, with a maximum concentration of 3.49 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in 24 of 57 soil sample with a maximum concentration of 1.3 pCi/g. Tritium is identified as a COPC in soil.

Uranium-235/236 was detected above the BV (0.20 pCi/g) in 1 of 57 soil samples, at a concentration of 0.38 pCi/g. Results were compared only to the BV because background dataset for uranium-235/236 in soil is not available. Uranium-235/236 is identified as a COPC in soil.

I-6.7.3.2 Radionuclides in Tuff

Ninety-eight tuff samples were analyzed for gamma-emitting radionuclides, tritium, and isotopic uranium. Ninety-seven were analyzed for isotopic plutonium.

Americium-241 was detected in 1 of 98 tuff samples at a concentration of 3.1 pCi/g, and is identified as a COPC in tuff.

Cesium-137 was detected in 2 of 98 tuff samples with concentrations of 0.318 and 0.472 pCi/g, and is identified as a COPC in tuff.

Plutonium-238 was detected in 11 of 98 tuff samples with a maximum concentration of 1.58 pCi/g, and is identified as a COPC in tuff.

Plutonium-239/240 was detected in 32 of 98 tuff samples with a maximum concentration of 7.51 pCi/g, and is identified as a COPC in tuff.

Tritium was detected in 43 of 98 tuff samples with a maximum concentration of 2.59649 pCi/g, and is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 4 of 98 tuff samples, with a maximum concentration of 0.132 pCi/g. Results were compared only to the BV because a background dataset for uranium-235 in tuff is not available. Uranium-235/236 is identified as a COPC in tuff.

I-6.7.3.3 Radionuclides in Sediment

One sediment sample was analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Americium-241 was detected above the FV (0.040 pCi/g) in the sediment sample, at a concentration of 1.52 pCi/g. The result was compared only to the FV because the FV is greater than the maximum sediment fallout concentration (0.038 pCi/g). Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.90 pCi/g) in the sediment sample, with a concentration of 1.25 pCi/g. This sample result did not exceed the maximum sediment fallout concentration (1.28 pCi/g). The box plot for cesium-137 in sediment is presented in Figure I-6.7-32. Cesium-137 is not identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) in the sediment sample, with a concentration of 7.75 pCi/g. Results were compared only to the FV because the FV is equal to the maximum sediment fallout concentration (0.006 pCi/g). Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in the sediment sample, with a concentration of 3.13 pCi/g. Results were compared only to the FV because the FV is greater than the maximum sediment fallout concentration (0.065 pCi/g). Plutonium-239/240 is identified as a COPC in sediment.

I-6.7.4 Summary of COPCs at Consolidated Unit 50-004(a)-00

The inorganic chemicals identified as COPCs at Consolidated Unit 50-004(a)-00 are antimony, barium, beryllium, cadmium, chromium, cobalt, copper, total cyanide, iron, magnesium, mercury, nickel, nitrate, perchlorate, selenium, thallium, and vanadium.

The organic chemicals identified as COPCs at Consolidated Unit 50-004(a)-00 are 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; chrysene; di-n-butylphthalate; 1,1-dichloroethene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; 2,3,7,8-tetrachlorodibenzofuran; total tetrachlorodibenzofurans; toluene; trichloroethene; 1,2,4-trimethylbenzene; and 1,3-xylene+1,4-xylene.

The radionuclides identified as COPCs at Consolidated Unit 50-004(a)-00 are americium-241, cesium-137, plutonium-238, plutonium-238/240, tritium, and uranium-235/236.

I-6.7.5 Nature and Extent of Contamination at Consolidated Unit 50-004(a)-00

I-6.7.5.1 Nature and Extent of Inorganic COPCs

Antimony was detected above the BV only once, at location 50-03032, where it decreased with depth. The lateral and vertical extent of antimony are defined.

Barium increased with depth at one location (50-03038) and was detected above the BV only in the deepest samples at nine locations. The highest concentration (114 mg/kg) was detected in the deepest sample (3–4 ft bgs) at location MO-605473, near the western end of the site. The lateral and vertical extent of barium are not defined.

Beryllium was detected above the BV only in the deepest samples at five locations. All concentrations are less than the maximum background concentration of 1.8 mg/kg. The lateral and vertical extent of beryllium are defined.

Cadmium was detected above the BV at 22 locations. The concentrations decreased with depth at all locations except location 50-03023, where only one depth (5.5–6.5 ft bgs) was sampled. At nearby location MO-605476, cadmium was not detected above the BV to a depth of 23.5 ft bgs. The highest concentration (1.8 mg/kg) is less than the maximum background concentration of 2.6 mg/kg. The lateral and vertical extent of cadmium are defined.

Chromium was detected above the BV at 12 locations. Concentrations increased with depth at five locations (MO-605106, MO-605460, MO-605462, MO-605464, and MO-605628), and chromium was above the BV in only the deepest sample at six locations. The highest concentrations were detected near the center of the site, and concentrations decrease toward the eastern end of the site. The lateral extent of chromium is defined, but the vertical extent is not defined at 10 locations.

Cobalt was detected above the BV at only two locations (MO-605458 and MO-605473), both near the eastern end of the site. Cobalt was detected above the BV only in the deepest samples at both locations. The lateral and vertical extent of cobalt are not defined.

Copper was detected above the BV at six locations, and was above the BV only in the deepest samples at three of those locations (50-03038, MO-605458, and MO-605473), in the center of the site and near the eastern end of the site. The lateral and vertical extent of copper are not defined.

Total cyanide was detected above the BV at only two locations, and the concentrations decreased with depth at both locations. The lateral and vertical extent of total cyanide are defined.

Iron was detected above the BV only in the deepest sample at location MO-605458. The concentration (16,800 mg/kg) is less than the maximum background concentration of 19,500 mg/kg. The lateral and vertical extent of iron are defined.

Magnesium was detected above the BV at only three locations. At locations 50-03009 and MO-605464, magnesium concentrations decreased with depth. At location 50-03028, magnesium was detected above the BV only in the deepest sample (10.3–13 ft bgs). The concentration is less than 20% above the BV. The lateral and vertical extent of magnesium are defined.

Mercury was detected above the BV only once, in the deepest sample (18–22 ft bgs) at location 50-03009. The concentration (0.146 mg/kg) is less than twice the BV. The lateral and vertical extent of mercury are defined.

Nickel was detected above the BV at seven locations. It was above the BV only in the deepest samples at five locations, with a maximum sample concentration of 10.3 mg/kg. In deeper samples at adjacent locations, nickel was not detected above the BV. The highest concentration at the site (16.2 mg/kg) was detected at location 50-03009, near the eastern end of the site. The vertical extent of nickel is defined, but the lateral extent is not defined.

Nitrate was detected at 24 locations, with maximum concentration of 24.8 mg/kg. The concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected at nine locations. Perchlorate was detected only in the deepest sample (0.000844 mg/kg at 14–15 ft bgs) at location MO-605469, and increased slightly with depth (maximum

0.00101 mg/kg at 10–11 ft bgs) at location MO-605628. All concentrations (maximum 0.00266 mg/kg) are low and near detection limits. The lateral and vertical extent of perchlorate are defined.

Thallium was detected above the BV only once, at location 50-03035, and decreased with depth. The lateral and vertical extent of thallium are defined.

Vanadium was detected above the BV only once, in the deepest sample at location MO-605473. The concentration (17.2 mg/kg) is less than the maximum background concentration of 21 mg/kg. The lateral and vertical extent of vanadium are defined.

I-6.7.5.2 Nature and Extent of Organic COPCs

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected at one to four locations, all in the central portion of the site. Concentrations maximum (0.42 mg/kg) are low and decrease with depth at all locations. The lateral and vertical extent of PCBs are defined.

PAHs were detected at low concentrations at multiple locations. Concentrations decreased with depth, except at location MO-605462, where PAHs were detected only in the deepest sample (15–16 ft bgs) or increased with depth. Most concentrations are at or below EQLs, and concentrations decreased toward the east end of the site. The lateral and vertical extent of PAHs are defined.

Acetone, 1,1-dichloroethene, 4-isopropyltoluene, toluene, trichloroethene, 1,2,4-trimethylbenzene, and 1,3-xylene+1,4-xylene were detected infrequently and at very low concentrations at or below EQLs. Concentrations decreased with depth and toward the east end of the site. The lateral and vertical extent of VOCs are defined.

Fourteen dioxin/furan congeners were detected at very low concentrations at multiple locations. Concentrations decreased with depth, except at location MO-605457, where concentrations of several congeners increased slightly with depth. Concentrations are very low, less than 1×10^{-4} mg/kg, and decreased toward the east end of the site. The lateral and vertical extent of dioxins/furans are defined.

Di-n-butylphthalate was detected only once, in the deepest sample (15–16 ft bgs) at location MO-605462. The concentration is at the EQL. The lateral and vertical extent of di-n-butylphthalate are defined.

I-6.7.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected above the FV or detected in samples with no applicable FV at eight locations. Concentrations decreased with depth at all locations. The highest sample concentration (3.1 pCi/g) was detected at location MO-605476, near the center of the site, and concentrations decreased toward the eastern and western sides of the site. The lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected above the FV or detected in samples with no applicable FV at eight locations. Concentrations decreased with depth at all locations. The highest sample location (1.25 pCi/g) was detected at location MO-605473, near the eastern end of the site. Cesium-137 was not detected at the two locations farther east (MO-605106 and MO-605628) The lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected above the FV or detected in samples with no applicable FV at 16 locations. Plutonium-238 was detected only in the deepest samples at two locations (50-03021 and 50-03027), but concentrations decreased with depth at all other locations. The highest concentration of plutonium-238

(7.75 pCi/g) was detected at 2–3 ft bgs at location MO-605473. Concentrations decreased downslope to the east of that location at locations MO-605106 and MO-605628. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the FV or detected in samples with no applicable FV at 35 locations. Plutonium-239/240 was detected only in the deepest sample, or concentrations increased with depth, at nine locations. The highest sample concentration (7.51 pCi/g) was detected at location MO-605476, near the center of the site, and concentrations decreased downslope to the eastern end of the site. The lateral extent of plutonium-239/240 is defined, but the vertical extent is not defined.

Tritium was detected at 34 locations. Tritium was detected only in the deepest sample, or concentrations increased with depth, at 17 locations. The highest concentration (2.6 pCi/g) was detected at 5–6 ft bgs at location 50-03031, near the western end of the site, and concentrations generally decreased toward the east. The lateral extent of tritium is defined, but the vertical extent is not defined.

Uranium-235/236 was detected above the BV at five locations, with a maximum sample concentration of 0.38 pCi/g. Concentrations are less than twice the BV and decreased with depth at all locations. Uranium-235/236 was not detected above the BV at the location (MO-605106) farthest downslope to the east. The lateral and vertical extent of uranium-235/236 are defined.

I-6.7.5.4 Summary of Nature and Extent for Consolidated Unit 50-004(a)-00

The lateral and vertical extent of all inorganic COPCs are defined, except for the vertical extent of chromium, the lateral extent of nickel, and the lateral and vertical extent of barium, beryllium, cobalt, and copper.

The lateral and vertical extent of all organic COPCs are defined.

The lateral and vertical extent of all radionuclide COPCs are defined, except that the vertical extent of plutonium-239/240 and tritium are not defined at multiple locations.

I-6.8 SWMU 50-006(a)

A total of 132 samples (22 soil, 6 tuff, and 104 sediment) were collected in 1993, 2005, and 2009 from 65 locations at SWMU 50-006(a). Table 6.9-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.9-1 shows the sampling locations.

I-6.8.1 Inorganic Chemicals at SWMU 50-006(a)

Seventy-four samples were analyzed for TAL metals. Eight samples were analyzed for total cyanide. Nine samples were analyzed for anions and perchlorate. Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown in Figure 6.9-2.

I-6.8.1.1 Inorganic Chemicals in Soil

Seven soil samples were analyzed for TAL metals.

Antimony was not detected but had DLs (all 11.2 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in all seven soil samples. The box plot for antimony in soil is presented in Figure I-6.8-1. Antimony is identified as a COPC in soil.

Cadmium was detected above the BV (0.4 mg/kg) in three of seven soil samples, with a maximum sample concentration of 1.7 mg/kg, and also had DLs (0.8 mg/kg) above the BV in four of seven soil samples. No site sampling results or DLs exceeded the maximum soil background concentration (2.6 mg/kg). The box plot for cadmium in soil is presented in Figure I-6.8-2. Cadmium is not identified as a COPC in soil.

Selenium was not detected but had a DL (3 mg/kg) above the BV (1.52 mg/kg) and above the maximum soil background concentration (1.7 mg/kg) in one of seven soil samples. The box plot for selenium in soil is presented in Figure I-6.8-3. Selenium is identified as a COPC in soil.

Silver was not detected but had DLs (1.4 mg/kg) above the BV (1 mg/kg) in all seven soil samples. Because no background data set for silver in soil is available, site sampling results are compared to the BV only. Silver is identified as a COPC in soil.

Thallium was not detected but had DLs (1 mg/kg) above the BV (0.73 mg/kg) in all seven soil samples. The DLs are equal to the maximum soil background concentration (1 mg/kg). The box plot for thallium in soil is presented in Figure I-6.8-4. Thallium is not identified as a COPC in soil.

I-6.8.1.2 Inorganic Chemicals in Tuff

Six tuff samples were analyzed for TAL metals, total cyanide, anions, and perchlorate.

Antimony was not detected but had DLs (1.04–1.19 mg/kg) above the BV (0.5 mg/kg) in all six tuff samples. Because the BV exceeds the maximum tuff background concentration (0.4 mg/kg), site sampling results are compared to the BV only. Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum tuff background concentration (13 mg/kg) in all six tuff samples, with a maximum sample concentration of 37 mg/kg. The box plot for chromium in tuff is presented in Figure I-6.8-5. Chromium is identified as a COPC in tuff.

Fluoride was detected in all six tuff samples and has no tuff BV. Fluoride is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) but below the maximum tuff background concentration (15.5 mg/kg) in one of six tuff samples, at a concentration of 11.8 mg/kg. The box plot for lead in tuff is presented in Figure I-6.8-6. Lead is not identified as a COPC in tuff.

Nitrate was detected in all six tuff samples and has no tuff BV. Nitrate is identified as a COPC in tuff.

Selenium was not detected but had DLs (1.03–1.2 mg/kg) above the BV (0.3 mg/kg) in all six tuff samples. Because the BV for selenium in tuff exceeds the maximum tuff background concentration (0.105 mg/kg), the site sampling results are compared to the BV only. Selenium is identified as a COPC in tuff.

I-6.8.1.3 Inorganic Chemicals in Sediment

Sixty-one sediment samples were analyzed for TAL metals. Three samples were analyzed for total cyanide, anions, and perchlorate.

Antimony was not detected but had DLs (0.398–11.2 mg/kg) above the BV (0.83 mg/kg) in 60 of 61 sediment samples. Because no background data set for antimony in sediment is available, site sampling results are compared to the BV only. Antimony is identified as a COPC in sediment.

Barium was detected above the BV (127 mg/kg) in 1 of 61 sediment samples, at a concentration of 129 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-6.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in sediment is presented in Figure I-6.8-7. Barium is not identified as a COPC in sediment.

Cadmium was detected above the BV (0.4 mg/kg) in 18 of 61 sediment samples, with a maximum sample concentration of 1.4 mg/kg, and had DLs (0.496–0.91 mg/kg) above the BV in 43 of 61 sediment samples. Statistical tests were performed to determine if the site sampling results for cadmium are different than background. The statistical test results are presented in Table I-6.8-1. The results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for cadmium in sediment is presented in Figure I-6.8-8. Cadmium is identified as a COPC in sediment.

Fluoride was detected in 2 of 61 sediment samples and has no sediment BV. Fluoride is identified as a COPC in sediment.

Lead was detected above the BV (19.7 mg/kg) in 4 of 61 sediment samples, two of which exceeded the maximum sediment background concentration (25.6 mg/kg), with a maximum sample concentration of 39.1 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-6.8-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in sediment is presented in Figure I-6.8-9. Lead is not identified as a COPC in sediment.

Nickel was detected above the BV (9.38 mg/kg) and above the maximum sediment background concentration (8.9 mg/kg) in 3 of 61 sediment samples, with a maximum sample concentration of 58.9 mg/kg. Nickel is interpreted as being substantially above background and no further evaluation is necessary. Nickel is identified as a COPC in sediment.

Nitrate was detected in one of three sediment samples and has no sediment BV. Nitrate is identified as a COPC in sediment.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 61 sediment samples, at a concentration of 0.62 mg/kg, and had DLs (0.6–3 mg/kg) above the BV in 60 of 61 sediment samples. Because more than 80% of the site sample and background results are nondetects, statistical comparisons to background are not possible. Selenium is identified as a COPC in sediment.

Silver was not detected above the BV but had DLs (1.4 mg/kg) above the BV (1 mg/kg) in 58 of 61 sediment samples. Because more than 80% of the site sample and background results are nondetects, statistical comparisons to background are not possible. Silver is identified as a COPC in sediment.

Thallium was not detected above the BV but had DLs (0.565–1 mg/kg) above the BV (0.73 mg/kg) in 58 of 61 sediment samples. Because more than 80% of the site sample and background results are nondetects, statistical comparisons to background are not possible. Thallium is identified as a COPC in sediment.

Total phosphorus was detected in one sediment sample and has no sediment BV. Total phosphorus is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in one of three sediment samples with a maximum sample concentration of 81.5 mg/kg. Because the BV exceeds the maximum sediment background concentration (56.2 mg/kg), site sampling results are compared to the BV only. Zinc is identified as a COPC in sediment.

I-6.8.2 Organic Chemicals at SWMU 50-006(a)

Twelve samples were analyzed for SVOCs and dioxins/furans. Four samples were analyzed for PCBs. Nine samples were analyzed for VOCs. Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown on Plate 6.9-1.

I-6.8.2.1 Organic Chemicals in Soil

Three soil samples were analyzed for SVOCs and dioxins/furans. One sample was analyzed for PCBs.

The following organic chemicals were detected in one or more soil and soil samples and are identified as COPCs in soil: Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

I-6.8.2.2 Organic Chemicals in Tuff

Nine tuff samples were analyzed for SVOCs, VOCs, and dioxins/furans; three tuff samples were analyzed for PCBs.

The following organic chemicals were detected in one tuff sample and are identified as COPCs in tuff: 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; and total pentachlorodibenzodioxins.

I-6.8.3 Radionuclides at SWMU 50-006(a)

Forty-five samples from SWMU 50-006(a) were analyzed for americium-241. One hundred ten samples were analyzed for gamma-emitting radionuclides. One hundred thirty-one samples were analyzed for tritium and isotopic uranium. One hundred thirty-two samples were analyzed for isotopic plutonium and

strontium-90. Table 6.9-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.9-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown on Plate 6.9-2.

I-6.8.3.1 Radionuclides in Soil

Twenty-two soil samples were analyzed for tritium, isotopic plutonium, isotopic uranium, and strontium-90. Fifteen samples were analyzed for gamma-emitting radionuclides. One soil sample was analyzed for americium-241.

Americium-241 was detected above the FV (0.013 pCi/g) in one surface soil sample, at a concentration of 0.052 pCi/g. Because the FV is equal to the maximum soil background concentration (0.013 pCi/g), site sampling results are compared to the FV only. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected above the FV (1.65 pCi/g) in one surface soil sample, at a concentration of 1.73 pCi/g. Cesium-137 was detected above the FV infrequently and at less than 20% above the FV. The box plot for cesium-137 in soil is presented in Figure I-6.8-10. Cesium-137 is not identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in seven surface soil samples, and was detected in two soil samples from depths for which the FV does not apply. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in six surface soil samples, and was detected in seven soil samples from depths for which the FV does not apply. Plutonium-239/240 is identified as a COPC in soil.

Thorium-232 was detected above the BV (2.33 pCi/g) in two soil samples, with a maximum sample concentration of 3.41 pCi/g. Because no background data set for thorium-232 in soil is available, site sampling results are compared to the BV only. Thorium-232 is identified as a COPC in soil.

Tritium was detected in 22 soil samples and is identified as a COPC in soil.

Uranium-235/236 was detected above the BV (0.2 pCi/g) in 1 of 22 soil samples, at a concentration of 0.255 pCi/g. Because it was detected above the BV infrequently and only slightly above the BV, uranium-235/236 is not identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in 4 of 22 soil samples, with a maximum sample concentration of 3.006 pCi/g. Because no background data set for uranium-238 in soil is available, site sampling results are compared to the BV only. Uranium-238 is identified as a COPC in soil.

I-6.8.3.2 Radionuclides in Tuff

Six tuff samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

Americium-241 was detected in two tuff samples and is identified as a COPC in tuff.

Cesium-137 was detected in one tuff sample and is identified as a COPC in tuff.

Plutonium-238 was detected in two tuff samples and is identified as a COPC in tuff.

Plutonium-239/240 was detected in four tuff samples and is identified as a COPC in tuff.

Strontium-90 was detected in one tuff sample and is identified as a COPC in tuff.

I-6.8.3.3 Radionuclides in Sediment

Thirty-eight sediment samples were analyzed for americium-241. Eighty-nine samples were analyzed for gamma-emitting radionuclides. One hundred three samples were analyzed for tritium and isotopic uranium. One hundred four samples were analyzed for isotopic plutonium and strontium-90.

Americium-241 was detected above the FV (0.04 pCi/g) in 37 sediment samples, with a maximum sample concentration of 2.844 pCi/g. Americium-241 is interpreted as being substantially above background, and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.9 pCi/g) in 21 sediment samples, and above the maximum background concentration (1.28 pCi/g) in 14 samples, with a maximum sample concentration of 3.585 pCi/g. Cesium-137 is interpreted as being substantially above background, and no further evaluation is necessary. Cesium-137 is identified as a COPC in sediment.

Cobalt-60 was detected in one sediment sample and has no sediment BV. Cobalt-60 is identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) in 95 sediment samples, with a maximum sample concentration of 67.817 pCi/g. Plutonium-238 is interpreted as being substantially above background, and no further evaluation is necessary. Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 63 sediment samples, with a maximum sample concentration of 12.815 pCi/g. Plutonium-239/240 is interpreted as being substantially above background, and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Strontium-90 was detected above the FV (1.04 pCi/g) in five sediment samples, with a maximum sample concentration of 3.11 pCi/g. Statistical tests were performed to determine if the site sampling results for strontium-90 are different than background. The statistical test results are presented in Table I-6.8-2. The results of both the quantile test and the slippage test indicate that the site sampling results are not statistically different than background. The box plot for strontium-90 in sediment is presented in Figure I-6.8-11. Strontium-90 is not identified as a COPC in sediment.

Thorium-232 was detected above the BV (2.33 pCi/g) in 19 sediment samples, with a maximum sample concentration of 6.5209 pCi/g. Statistical tests were performed to determine if the site sampling results for thorium-232 are different than background. The statistical test results are presented in Table I-6.8-2. The results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for thorium-232 in sediment is presented in Figure I-6.8-12. Thorium-232 is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in 36 sediment samples, with a maximum sample concentration of 1.26403 pCi/g. Tritium is interpreted as being substantially above background, and no further evaluation is necessary. Tritium is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) in 1 of 103 sediment samples, at a concentration of 2.735 pCi/g. Because it was detected above the BV infrequently and at less than 20% above the BV, uranium-234 is not identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) in 7 of 103 sediment samples, with a maximum sample concentration of 3.049 pCi/g. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-6.8-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-6.8-13. Uranium-238 is not identified as a COPC in sediment.

I-6.8.4 Summary of COPCs at SWMU 50-006(a)

The inorganic chemicals identified as COPCs at SWMU 50-006(a) are antimony, cadmium, chromium, fluoride, nickel, nitrate, total phosphorous, selenium, silver, thallium, and zinc.

The organic chemicals identified as COPCs at SWMU 50-006(a) are Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; 2,3,7,8-tetrachlorodibenzodioxin; total tetrachlorodibenzodioxins; and total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 50-006(a) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, and uranium-238.

I-6.8.5 Nature and Extent of Contamination at SWMU 50-006(a)

Numerous samples were collected prior to 2009 at locations in Ten Site Canyon, downslope from SWMU 50-006(a). The approved investigation work plan (LANL 2008, 100750; NMED 2008, 101110) called for collecting samples near the head of Ten Site Canyon within the footprint of SWMU 50-006(a). Discussions of nature and extent for SWMU 50-006(a) are focused primarily on the samples collected in 2009. Ten Site Canyon has been investigated separately (LANL 2007, 100119).

I-6.8.5.1 Nature and Extent of Inorganic COPCs

Cadmium was detected above the BV at 17 locations. Concentrations increased with depth, or the sample concentration was above the BV where only one depth was sampled, at 11 locations. Concentrations increased or did not change substantially downslope. The lateral and vertical extent of cadmium are not defined.

Chromium was detected above the BV at three locations (MO-605076, MO-605077, and MO-605078), all in the upper portion of the site. Concentrations increased with depth at all three locations, with a

maximum sample concentration of 37 mg/kg. Concentrations decreased downslope. The lateral extent of chromium is defined, but the vertical extent is not defined.

Fluoride was detected at three locations (MO-605076, MO-605077, and MO-605078). Concentrations increased with depth at location MO-605078. Fluoride was not analyzed in downslope samples in Ten Site Canyon. The lateral and vertical extent of fluoride are not defined.

Nickel was detected above the BV at three locations, all in Ten Site Canyon. Concentrations decreased with depth at all three locations, and decreased downslope. The lateral and vertical extent of nickel are defined.

Nitrate was detected at three locations (MO-605076, MO-605077, and MO-605078), with a maximum concentration of 1.62 mg/kg. These concentrations are likely naturally-occurring. The lateral and vertical extent of nitrate are defined.

Total phosphorus was detected in one sample, and was not analyzed in any other samples. The sample concentration (93.3 mg/kg) is well below natural concentrations of phosphorus in soil and rock. The lateral and vertical extent of phosphorus are defined.

Selenium was detected above the BV in only one sample, the surface sample at location 50-06533, and concentrations decreased with depth. The lateral and vertical extent of selenium are defined.

Zinc was detected above the BV in only one sample, the surface sample at location MO-605076. The concentration decreased with depth. The lateral and vertical extent of zinc are defined.

I-6.8.5.2 Nature and Extent of Organic COPCs

Several VOCs (acetone, carbon tetrachloride, 2-hexanone, 4-methyl-2-pentanone, methylene chloride, and toluene) were detected in 19 surface sediment samples and two surface soil samples collected in 1993 at locations in Ten Site Canyon. Concentrations were low (maximum 0.027 mg/kg) and below or near the EQLs. No VOCs were detected in more recent samples collected from the upper portion of the site. The lateral and vertical extent of VOCs are defined.

Aroclor-1254 was detected in two samples, and Aroclor-1260 was detected in 17 samples. Aroclor-1254 decreased with depth at location 50-06520, but was detected (0.0059 mg/kg) only in the deepest sample at location MO-605077. Aroclor-1260 was detected in the deepest or only samples at 10 locations. The highest concentration (1.37 mg/kg) was in the single sample collected at location 50-06561. At locations where multiple depths were sampled, concentrations decreased with depth, and only very low concentrations (0.0059 and 0.0014 mg/kg) were detected in tuff samples. Concentrations of Aroclor-1254 and Aroclor-1260 decreased downslope. The lateral and vertical extent of PCBs are defined.

PAHs were detected at in samples collected from the upper portion of the site. Concentrations were low (maximum 0.309 mg/kg) and decreased with depth at all three locations sampled in 2009. Concentrations decreased from west to east (downslope) in Ten Site Canyon. The lateral and vertical extent of PAHs are defined.

Bis(2-ethylhexyl)phthalate, butylbenzylphthalate, di-n-butylphthalate, and diethylphthalate were not detected in any samples collected in 2009, at locations in the upper portion of the site. The lateral and vertical extent of phthalates are defined.

Multiple dioxin/furan congeners were detected at low concentrations (less than 1×10^{-4} mg/kg) in samples collected in 2009. Concentrations decreased with depth at all locations, and decreased downslope. The lateral and vertical extent of dioxins/furans are defined.

I-6.8.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected or detected above the FV in four samples collected in 2009. Concentrations decreased with depth at all locations. The lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected in only one sample collected in 2009, and the concentration decreased with depth. The lateral and vertical extent of cesium-137 are defined.

Cobalt-60 was not detected in any samples collected in 2009. The lateral and vertical extent of cobalt-60 are defined.

Plutonium-238 was detected in three samples collected in 2009. Concentrations decreased with depth at all locations. The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected in six samples collected in 2009. Concentrations decreased with depth at all locations. The lateral and vertical extent of plutonium-239/240 are defined.

Strontium-90 was detected (1.24 pCi/g) only in the deeper (2–3 ft bgs) tuff sample at location MO-605078. In deeper samples (2.5–3.5 ft bgs) at locations MO-605076 and MO-605077, strontium-90 was not detected. The lateral and vertical extent of strontium-90 are defined.

Thorium-232 was not analyzed in any samples collected in 2009. Thorium-232 was detected at 17 locations sampled before 2009. Concentrations decreased with depth at 12 of those locations, and decreased down the drainage. The lateral and vertical extent of thorium-232 are defined.

Tritium was not detected in any samples collected in 2009. The lateral and vertical extent of tritium are defined.

Uranium-238 was not detected above the BV in any samples collected in 2009. The lateral and vertical extent of uranium-238 are defined.

I-6.8.5.4 Summary of Nature and Extent for SWMU 50-006(a)

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral and vertical extent of cadmium and fluoride, and the vertical extent of chromium.

The lateral and vertical extent of all organic and radionuclide COPCs are defined.

I-6.9 SWMU 50-006(c)

A total of 64 samples (45 soil, 1 tuff, and 18 sediment) were collected in 1993 and 2009 from 64 locations at SWMU 50-006(c). The samples collected in 2009 were surface samples collected as part of the characterization of Consolidated Unit 50-004(a)-00, SWMU 50-006(a), and SWMU 50-006(d). The approved work plan (LANL 2008, 100750; NMED 2008, 101110) did not direct any samples to be collected specifically for SWMU 50-006(c). Table 6.10-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.10-1 shows the sampling locations.

I-6.9.1 Inorganic Chemicals at SWMU 50-006(c)

Twelve samples were analyzed for TAL metals, anions, perchlorate, and total cyanide. Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown on Plate 6.10-1.

I-6.9.1.1 Inorganic Chemicals in Soil

Three soil samples were analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected but had DLs (1.07–1.12 mg/kg) above the BV (0.83 mg/kg) in all three soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected but had DLs (0.533–0.561 mg/kg) above the BV (0.4 mg/kg) in all three soil samples. Cadmium is identified as a COPC in soil.

Nitrate and perchlorate were detected in one or more soil samples and have no soil BVs. Nitrate and perchlorate are identified as COPCs in soil.

I-6.9.1.2 Inorganic Chemicals in Tuff

One tuff sample was analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected but had a DL (1.19 mg/kg) above the BV (0.5 mg/kg) in the tuff sample. Antimony is identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) and above the maximum tuff background concentration (13 mg/kg) in the tuff sample, with a sample concentration of 18.3 mg/kg. Chromium is identified as a COPC in tuff.

Fluoride and nitrate were detected in the tuff sample and have no tuff BVs. Fluoride and nitrate are identified as COPCs in tuff.

Selenium was not detected but had a DL (1.2 mg/kg) above the BV (0.3 mg/kg) in the tuff sample. Because the BV exceeds the maximum tuff background concentration (0.105 mg/kg), site sampling results are compared to the BV only. Selenium is identified as a COPC in tuff.

I-6.9.1.3 Inorganic Chemicals in Sediment

Nine sediment samples were analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected but had DLs (0.423–1.21 mg/kg) above the BV (0.83 mg/kg) in eight of nine sediment samples. Because no background data set for antimony in sediment is available, site sampling results are compared to the BV only. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.524–0.605 mg/kg) above the BV (0.4 mg/kg) in all nine sediment samples. Because the BV exceeds the maximum sediment background concentration (0.18 mg/kg), site sampling results are compared to the BV only. Cadmium is identified as a COPC in sediment.

Fluoride, nitrate, and perchlorate were detected in multiple sediment samples and have no sediment BVs. Fluoride, nitrate, and perchlorate are identified as COPCs in sediment.

Selenium was not detected but had DLs (1.05–1.17 mg/kg) above the BV (0.3 mg/kg) in all nine sediment samples. Because the BV exceeds the maximum sediment background concentration (0.1 mg/kg), site sampling results are compared to the BV only. Selenium is identified as a COPC in sediment.

Zinc was detected above the BV (60.2 mg/kg) in one of nine sediment samples, with a maximum sample concentration of 81.5 mg/kg. Because the BV exceeds the maximum sediment background concentration (56.2 mg/kg), site sampling results are compared to the BV only. Zinc is identified as a COPC in sediment.

I-6.9.2 Organic Chemicals at SWMU 50-006(c)

Fifty-six samples were analyzed for SVOCs; 10 samples were analyzed for PCBs; eight samples were analyzed for dioxins/furans; one sample was analyzed for VOCs. Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-3 lists the detected organic chemicals. The sampling locations and detected concentrations above BVs are shown on Plate 6.10-2.

I-6.9.2.1 Organic Chemicals in Soil

Forty soil samples were analyzed for SVOCs. One soil sample was analyzed for PCBs. Three samples were analyzed for dioxins/furans.

The following organic chemicals were detected in soil samples at SWMU 50-006(c) and are identified as COPCs in soil: acenaphthene; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; diethylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-6.9.2.2 Organic Chemicals in Tuff

One tuff sample was analyzed for SVOCs, VOCs, dioxins/furans, and PCBs.

The following organic chemical was detected in the tuff sample at SWMU 50-006(c) and is identified as COPCs in tuff: 1,2,3,4,6,7,8,9-octachlorodibenzodioxin.

I-6.9.2.3 Organic Chemicals in Sediment

Nine sediment samples were analyzed for SVOCs and PCBs. Five sediment samples were analyzed for dioxins/furans.

The following organic chemicals were detected in one or more sediment samples at SWMU 50-006(c) and are identified as COPCs in sediment: anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; dibenz(a,h)anthracene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-6.9.3 Radionuclides at SWMU 50-006(c)

Sixty-four samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium; three samples were analyzed for americium-241; 31 samples were analyzed for strontium-90. Table 6.10-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.10-4 lists the radionuclide COPCs detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown on Plate 6.10-3.

I-6.9.3.1 Radionuclides in Soil

Forty-five soil samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium; 15 soil samples were analyzed for strontium-90.

Plutonium-238 was detected above the FV (0.023 pCi/g) in 10 of 45 surface soil samples, and above the maximum soil background concentration (0.037 pCi/g) in 5 of 45 surface soil samples, with a maximum sample concentration of 0.127 pCi/g. Statistical tests were performed to determine if the site sampling results for plutonium-238 are different than background. The statistical test results are presented in Table I-6.9-1. The results of the Gehan test indicate that the site samples are not statistically different than background, while the results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for plutonium-238 in soil is presented in Figure I-6.9-1. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in 27 of 45 surface soil samples, and above the maximum soil background concentration (0.055 pCi/g) in 26 of 45 surface soil samples, with a maximum sample concentration of 1.606 pCi/g. Statistical tests were performed to determine if the site sampling results for plutonium-239/240 are different than background. The statistical test results are presented in Table I-6.9-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for plutonium-239/240 in soil is presented in Figure I-6.9-2. Plutonium-239/240 is identified as a COPC in soil.

Thorium-232 was detected above the BV (2.33 pCi/g) in 1 of 45 surface soil samples, at a concentration of 4.03 pCi/g. No background data set for thorium-232 in soil is available, so site sampling results are compared to the BV only. Thorium-232 is identified as a COPC in soil.

Tritium was detected in 41 of 45 surface soil samples and is identified as a COPC in soil.

I-6.9.3.2 Radionuclides in Tuff

One tuff sample was analyzed for americium-241, gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium and strontium-90.

Americium-241, cesium-137, plutonium-238, and plutonium-239/240 were detected in the tuff sample and are identified as COPCs in tuff.

I-6.9.3.3 Radionuclides in Sediment

Eighteen sediment samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90. Two sediment samples were analyzed for americium-241.

Americium-241 was detected above the FV (0.04 pCi/g) in 3 of 18 sediment samples, with a maximum sample concentration of 10 pCi/g. Americium-241 is interpreted as being substantially above background and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.9 pCi/g) in 1 of 18 sediment samples, at a concentration of 4.16 pCi/g. Cesium-137 is interpreted as being substantially above background and no further evaluation is necessary. Cesium-137 is identified as a COPC in sediment.

Cobalt-60 was detected in 1 of 18 sediment samples and has no BV. Cobalt-60 is identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) in 8 of 18 sediment samples, with a maximum concentration of 2.7 pCi/g. Plutonium-238 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 8 of 18 sediment samples, with a maximum concentration of 14.8 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in 1 of 18 sediment samples, at a concentration of 0.250 pCi/g. Statistical tests were performed to determine if the site sampling results for tritium are different than background. The statistical test results are presented in Table I-6.9-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for tritium in sediment is presented in Figure I-6.9-3. Tritium is not identified as a COPC in sediment.

I-6.9.4 Summary of COPCs at SWMU 50-006(c)

The inorganic chemicals identified as COPCs at SWMU 50-006(c) are antimony, cadmium, chromium, fluoride, nitrate, perchlorate, selenium, and zinc.

The organic chemicals identified as COPCs at SWMU 50-006(c) are acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; diethylphthalate; fluoranthene; fluorene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin;

1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans.

The radionuclides identified as COPCs at SWMU 50-006(c) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, thorium-232, and tritium.

I-6.9.5 Nature and Extent of Contamination at SWMU 50-006(c)

Because SWMU 50-006(c) is a surface-only site related to surface deposition of airborne emissions, only surface samples were collected. The vertical extent of contamination is defined by the nature of the potential contamination source.

I-6.9.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV in only one sample, at a concentration of 18.3 mg/kg at location MO-605078, which is associated with the outfall in SWMU 50-006(a). The lateral and vertical extent of chromium are defined.

Fluoride was detected in surface samples at three locations, with a maximum sample concentration of 0.651 mg/kg. The three locations are associated with the outfall in SWMU 50-006(a). The lateral and vertical extent of fluoride are defined.

Nitrate was detected in nine samples, with a maximum sample concentration of 2.08 mg/kg. The sample concentrations are likely naturally occurring. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected in surface samples at four locations, with a maximum sample concentration of 0.00474 mg/kg. All four locations are associated with the drain line and outfall in SWMU 50-006(d). The lateral and vertical extent of perchlorate are defined.

Zinc was detected above the BV in only one sample, at a concentration of 81.5 mg/kg. The lateral and vertical extent of zinc are defined.

I-6.9.5.2 Nature and Extent of Organic COPCs

SWMU 50-006(c) is identified as primarily radionuclide surface soil contamination from historical stack emissions. The organic chemicals detected include PAHs, PCBs, phthalates, and dioxins/furans, which are likely not related to historical stack emissions. The lateral and vertical extent of organic COPCs are defined.

I-6.9.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 was detected above the FV at four samples, with a maximum sample concentration of 10 pCi/g. The highest concentration was at location MO-605085, which is associated with the outfall in SWMU 50-006(d). The other three detected concentrations were in samples associated with the outfall in SWMU 50-006(a). The lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected above the FV in two samples, with a maximum sample concentration of 4.16 pCi/g. The two detected concentrations are from samples associated with the outfalls in SWMUs 50-006(d) and 50-006(a). The lateral and vertical extent of cesium-137 are defined.

Cobalt-60 was detected in only one sample, at a concentration of 1.52 pCi/g. The sample was from a location associated with the waste line of SWMU 50-006(d). The lateral and vertical extent of cobalt-60 are defined.

Plutonium-238 was detected above the FV in 19 samples, with a maximum sample concentration of 2.7 pCi/g. The highest concentrations of plutonium-238 were in samples associated with the outfalls in SWMUs 50-006(d) and 50-006(a). The lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the FV in 36 samples, with a maximum sample concentration of 14.8 pCi/g. The highest concentrations of plutonium-239/240 were in samples associated with the outfalls in SWMUs 50-006(d) and 50-006(a). The lateral and vertical extent of plutonium-239/240 are defined.

Thorium-232 was detected in only one sample, at a concentration of 4.03 pCi/g. The lateral and vertical extent of thorium-232 are defined.

Tritium was detected above the FV in 42 samples, with a maximum sample concentration of 0.25 pCi/g. The concentrations of tritium are low and do not change substantially in any lateral direction. Tritium was not detected in the outfall samples in SWMUs 50-006(a) and 50-006(d), effectively bounding the downslope extent of tritium. The lateral and vertical extent of tritium are defined.

I-6.9.5.4 Summary of Nature and Extent for SWMU 50-006(c)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

I-6.10 SWMU 50-006(d)

A total of 92 samples (28 soil, 31 tuff, and 33 sediment) were collected in 1993 and 2009 from 44 locations at SWMU 50-006(d). Table 6.11-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.11-1 shows the sampling locations.

I-6.10.1 Inorganic Chemicals at SWMU 50-006(d)

Forty samples were analyzed for TAL metals, anions, perchlorate, and total cyanide. Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations above BVs are shown on Plate 6.11-1.

I-6.10.1.1 Inorganic Chemicals in Soil

Two soil samples were analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected but had DLs (1.06–1.1 mg/kg) above the BV (0.83 mg/kg) and above the maximum soil background concentration (1 mg/kg) in both soil samples. Antimony is identified as a COPC in soil.

Cadmium was not detected but had DLs (0.531–0.548 mg/kg) above the BV (0.4 mg/kg) in both soil samples. The DLs are less than the maximum background concentration (2.6 mg/kg). Cadmium is not identified as a COPC in soil.

Lead was detected above the BV (22.3 mg/kg) but below the maximum background concentration (28 mg/kg) in one of two soil samples, at a concentration of 26.8 mg/kg. The box plot for lead in soil is presented in Figure I-6.10-1. Lead is not identified as a COPC in soil.

Nitrate was detected in both soil samples and has no soil BV. Nitrate is identified as a COPC in soil.

I-6.10.1.2 Inorganic Chemicals in Tuff

Thirty-one tuff samples were analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected above the BV but had DLs (0.335–1.45 mg/kg) above the BV (0.5 mg/kg) in 28 of 31 tuff samples. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. The box plot for antimony in tuff is presented in Figure I-6.10-2. Antimony is identified as a COPC in tuff.

Barium was detected above the BV (46 mg/kg) in 2 of 31 tuff samples, and above the maximum tuff background concentration (51.6 mg/kg) in 1 of 31 tuff samples, at a concentration of 87.4 mg/kg. Statistical tests were performed to determine if the site sampling results for barium are different than background. The statistical test results are presented in Table I-6.10-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for barium in tuff is presented in Figure I-6.10-3. Barium is not identified as a COPC in tuff.

Calcium was detected above the BV (2200 mg/kg) and above the maximum tuff background concentration (2230 mg/kg) in 2 of 31 tuff samples, with a maximum concentration of 6650 mg/kg. Statistical tests were performed to determine if the site sampling results for calcium are different than background. The statistical test results are presented in Table I-6.10-1. The results of the both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for calcium in tuff is presented in Figure I-6.10-4. Calcium is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 5 of 31 tuff samples, and above the maximum tuff background concentration (13 mg/kg) in 3 of 31 tuff samples, with a maximum concentration of 16 mg/kg. Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-6.10-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for chromium in tuff is presented in Figure I-6.10-5. Chromium is identified as a COPC in tuff.

Cobalt was detected above the BV (3.14 mg/kg) in 1 of 31 tuff samples, at a concentration of 3.3 mg/kg. Cobalt was detected above the BV infrequently and at less than 20% above the BV. The box plot for cobalt in tuff is presented in Figure I-6.10-6. Cobalt is not identified as a COPC in tuff.

Copper was detected above the BV (4.66 mg/kg) and above the maximum tuff background concentration (6.2 mg/kg) in 3 of 31 tuff samples, with a maximum concentration of 16.1 mg/kg. Statistical tests were performed to determine if the site sampling results for copper are different than background. The statistical test results are presented in Table I-6.10-1. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for copper in tuff is presented in Figure I-6.10-7. Copper is identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 1 of 31 tuff samples, at a concentration of 11.5 mg/kg. Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-6.10-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-6.10-8. Lead is not identified as a COPC in tuff.

Mercury was detected above the BV (0.1 mg/kg) in 1 of 31 tuff samples, at a concentration of 0.127 mg/kg. Because no background data set for mercury in tuff is available, site sampling results are compared to the BV only. Mercury is identified as a COPC in tuff.

Nitrate and perchlorate were detected in multiple tuff samples and have no tuff BVs. Nitrate and perchlorate are identified as COPCs in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 1 of 31 tuff samples, at a concentration of 0.616 mg/kg, and had DLs (0.991–1.44 mg/kg) above the BV in 30 of 31 tuff samples. Because more than 80% of site sample and background results are nondetects, statistical comparisons to background are not possible. The box plot for selenium in tuff is presented in Figure I-6.10-9. Selenium is identified as a COPC in tuff.

I-6.10.1.3 Inorganic Chemicals in Sediment

Seven sediment samples were analyzed for TAL metals, anions, perchlorate, and total cyanide.

Antimony was not detected but had DLs (1.06–1.16 mg/kg) above the BV (0.83 mg/kg) in six of seven sediment samples. Site sampling results are compared to the BV only. Antimony is identified as a COPC in sediment.

Cadmium was not detected but had DLs (0.529–0.58 mg/kg) above the BV (0.4 mg/kg) in all seven sediment samples. Because the BV exceeds the maximum sediment background concentration (0.18 mg/kg), site sampling results are compared to the BV only. Cadmium is identified as a COPC in sediment.

Nitrate and perchlorate were detected in three of seven sediment samples and have no sediment BVs. Nitrate and perchlorate are identified as COPCs in sediment.

Selenium was not detected but had DLs (1.05–1.17 mg/kg) above the BV (0.3 mg/kg) in all seven sediment samples. Because the BV exceeds the maximum sediment background concentration (0.1 mg/kg), site sampling results are compared to the BV only. Selenium is identified as a COPC in sediment.

I-6.10.2 Organic Chemicals at SWMU 50-006(d)

Ninety samples were analyzed for SVOCs; 52 samples were analyzed for PCBs; 17 samples were analyzed for dioxins/furans; 33 samples were analyzed for VOCs. Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-3 lists the detected organic chemicals. The sampling locations and detected concentrations above BVs are shown on Plate 6.11-2.

I-6.10.2.1 Organic Chemicals in Soil

Twenty-eight soil samples were analyzed for SVOCs. Six soil samples were analyzed for PCBs. One sample was analyzed for dioxins/furans. Two samples were analyzed for VOCs.

The following organic chemicals were detected in soil samples at SWMU 50-006(d) and are identified as COPCs in soil: Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; total hexachlorodibenzodioxins; 2,3,4,6,7,8-hexachlorodibenzofuran; hexachlorodibenzofurans; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzofurans; toluene; and 1,3-xylene+1,4-xylene.

I-6.10.2.2 Organic Chemicals in Tuff

Thirty-one tuff samples were analyzed for SVOCs and VOCs; 29 samples were analyzed for PCBs; 13 samples were analyzed for dioxins/furans.

The following organic chemicals were detected in one or more tuff samples at SWMU 50-006(d) and are identified as COPCs in tuff: acetone; Aroclor-1242; Aroclor-1254; Aroclor-1260; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,6,7,8-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; total hexachlorodibenzofurans; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; total pentachlorodibenzofurans; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; and toluene.

I-6.10.2.3 Organic Chemicals in Sediment

Thirty-one sediment samples were analyzed for SVOCs; 17 samples were analyzed for PCBs; three samples were analyzed for dioxins/furans.

The following organic chemicals were detected in one or more sediment samples at SWMU 50-006(d) and are identified as COPCs in sediment: anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; and total tetrachlorodibenzofurans.

I-6.10.3 Radionuclides at SWMU 50-006(d)

Ninety-two samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium. Eighty-nine samples were analyzed for strontium-90. Table 6.11-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.11-4 lists the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations above BVs/FVs are shown on Plate 6.11-3.

I-6.10.3.1 Radionuclides in Soil

Twenty-eight soil samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium; 27 samples were analyzed for strontium-90.

Americium-241 was detected above the FV (0.013 pCi/g) in one surface soil sample, at a concentration of 18.221 pCi/g, and was detected in one soil sample from a depth for which the FV does not apply. Americium-241 is identified as a COPC in soil.

Cesium-137 was detected above the FV (1.65 pCi/g) in 8 of 28 surface soil samples, with a maximum sample concentration of 67.685 pCi/g, and was detected in 9 of 28 soil samples from depths for which the FV does not apply. Cesium-137 is identified as a COPC in soil.

Cobalt-60 was detected in 5 of 28 soil samples and has no soil BV. Cobalt-60 is identified as a COPC in soil.

Plutonium-238 was detected above the FV (0.023 pCi/g) in 10 of 28 surface soil samples, with a maximum sample concentration of 7.372 pCi/g, and was detected in 12 of 28 soil samples from depths for which the FV does not apply. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected above the FV (0.054 pCi/g) in 11 of 28 surface soil samples, with a maximum sample concentration of 17.555 pCi/g, and was detected in 14 of 28 soil samples from depths for which the FV does not apply. Plutonium-239/240 is identified as a COPC in soil.

Strontium-90 was detected above the FV (1.31 pCi/g) in 5 of 28 surface soil samples, with a maximum sample concentration of 3.01 pCi/g, and was detected in 6 of 28 soil samples from depths for which the FV does not apply. Strontium-90 is identified as a COPC in soil.

Thorium-232 was detected above the BV (2.33 pCi/g) in 4 of 28 soil samples, with a maximum sample concentration of 3.22 pCi/g. Because no background data set is available for thorium-232 in soil, the site sampling results are compared to the BV only. Thorium-232 is identified as a COPC in soil.

Tritium was detected in 27 of 28 soil samples and is identified as a COPC in soil.

Uranium-234 was detected above the BV (2.59 pCi/g) in 6 of 28 soil samples, with a maximum sample concentration of 5.608 pCi/g. Because no background data set for uranium-234 in soil is available, site sampling results are compared to the BV only. Uranium-234 is identified as a COPC in soil.

Uranium-235/236 was detected above the BV (0.2 pCi/g) in 3 of 28 soil samples, with a maximum sample concentration of 0.315 pCi/g. Because no background data set for uranium-235/236 in soil is available, site sampling results are compared to the BV only. Uranium-235/236 is identified as a COPC in soil.

Uranium-238 was detected above the BV (2.29 pCi/g) in 6 of 28 soil samples, with a maximum sample concentration of 7.125 pCi/g. Because no background data set for uranium-238 in soil is available, site sampling results are compared to the BV only. Uranium-238 is identified as a COPC in soil.

I-6.10.3.2 Radionuclides in Tuff

Thirty-one tuff samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium; 29 samples were analyzed for strontium-90.

Americium-241 was detected in 3 of 31 tuff samples and is identified as a COPC in tuff.

Cesium-137 was detected in 4 of 31 tuff samples and is identified as a COPC in tuff.

Plutonium-238 was detected in 4 of 31 tuff samples and is identified as a COPC in tuff.

Plutonium-239/240 was detected in 4 of 31 tuff samples and is identified as a COPC in tuff.

Strontium-90 was detected in 2 of 29 tuff samples and has no tuff FV. Strontium-90 is identified as a COPC in tuff.

Tritium was detected in 21 of 31 tuff samples and is identified as a COPC in tuff.

Uranium-234 was detected above the BV (1.98 pCi/g) in 1 of 31 tuff samples, at a concentration of 2.54 pCi/g. Because no background data set for uranium-234 in tuff is available, site sampling results are compared to the BV only. Uranium-234 is identified as a COPC in tuff.

Uranium-235/236 was detected above the BV (0.09 pCi/g) in 1 of 31 tuff samples, at a concentration of 0.12 pCi/g. Because no background data set for uranium-235/236 in tuff is available, site sampling results are compared to the BV only. Uranium-235/236 is identified as a COPC in tuff.

I-6.10.3.3 Radionuclides in Sediment

Thirty-three sediment samples were analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, isotopic uranium, and strontium-90.

Americium-241 was detected above the FV (0.04 pCi/g) in 16 of 33 sediment samples, with a maximum sample concentration of 71.003 pCi/g. Americium-241 is interpreted as being substantially above background and no further evaluation is necessary. Americium-241 is identified as a COPC in sediment.

Cesium-137 was detected above the FV (0.9 pCi/g) in 21 of 33 sediment samples, with a maximum sample concentration of 373.11 pCi/g. Cesium-137 is interpreted as being substantially above background and no further evaluation is necessary. Cesium-137 is identified as a COPC in sediment.

Cobalt-60 was detected in 15 of 33 sediment samples and has no sediment BV. Cobalt-60 is identified as a COPC in sediment.

Plutonium-238 was detected above the FV (0.006 pCi/g) in 23 of 33 sediment samples, with a maximum sample concentration of 13.804 pCi/g. Plutonium-238 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-238 is identified as a COPC in sediment.

Plutonium-239/240 was detected above the FV (0.068 pCi/g) in 22 of 33 sediment samples, with a maximum sample concentration of 47.816 pCi/g. Plutonium-239/240 is interpreted as being substantially above background and no further evaluation is necessary. Plutonium-239/240 is identified as a COPC in sediment.

Strontium-90 was detected above the FV (1.04 pCi/g) in 14 of 33 sediment samples, with a maximum sample concentration of 18.3 pCi/g. Strontium-90 is interpreted as being substantially above background and no further evaluation is necessary. Strontium-90 is identified as a COPC in sediment.

Thorium-232 was detected above the BV (2.33 pCi/g) and above the maximum sediment background concentration (2.03 pCi/g) in 2 of 33 sediment samples, with a maximum sample concentration of 4.38 pCi/g. Statistical tests were performed to determine if the site sampling results for thorium-232 are different than background. The statistical test results are presented in Table I-6.10-2. The results of the Gehan test indicate that the site sampling results are not statistically different than background, while the results of the quantile test indicate that the site sampling results are statistically different than background. The box plot for thorium-232 in sediment is presented in Figure I-6.10-10. Thorium-232 is identified as a COPC in sediment.

Tritium was detected above the FV (0.093 pCi/g) in 23 of 33 sediment samples, with a maximum sample concentration of 105.024 pCi/g. Tritium is interpreted as being substantially above background and no further evaluation is necessary. Tritium is identified as a COPC in sediment.

Uranium-234 was detected above the BV (2.59 pCi/g) and above the maximum sediment background concentration (2.5 pCi/g) in 2 of 33 sediment samples. Statistical tests were performed to determine if the site sampling results for uranium-234 are different than background. The statistical test results are presented in Table I-6.10-2. The results of the Gehan test indicate that the site sampling results are statistically different than background. The box plot for uranium-234 in sediment is presented in Figure I-6.10-11. Uranium-234 is identified as a COPC in sediment.

Uranium-238 was detected above the BV (2.29 pCi/g) and above the maximum sediment background concentration (2.1 pCi/g) in 2 of 33 sediment samples. Statistical tests were performed to determine if the site sampling results for uranium-238 are different than background. The statistical test results are presented in Table I-6.10-2. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for uranium-238 in sediment is presented in Figure I-6.10-12. Uranium-238 is not identified as a COPC in sediment.

I-6.10.4 Summary of COPCs at SWMU 50-006(d)

The inorganic chemicals identified as COPCs at SWMU 50-006(d) are antimony, cadmium, chromium, copper, mercury, nitrate, perchlorate, and selenium.

The organic chemicals identified as COPCs at SWMU 50-006(d) are 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; benzoic acid; bis(2-ethylhexyl)phthalate; chrysene; fluoranthene; 1,2,3,4,6,7,8-heptachlorodibenzodioxin; total heptachlorodibenzodioxins; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; total heptachlorodibenzofurans; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; total hexachlorodibenzodioxins; 1,2,3,4,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; total hexachlorodibenzofurans; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; total pentachlorodibenzodioxins; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; phenanthrene; pyrene; total tetrachlorodibenzodioxins; total tetrachlorodibenzofurans; toluene; and 1,3-xylene+1,4-xylene.

The radionuclides identified as COPCs at SWMU 50-006(d) are americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, uranium-234, uranium-235/236, and uranium-238.

I-6.10.5 Nature and Extent of Contamination at SWMU 50-006(d)

I-6.10.5.1 Nature and Extent of Inorganic COPCs

Chromium was detected above the BV in five samples. Chromium was detected above the BV only in the deepest samples at two locations (MO-605085 and MO-605506), with a maximum sample concentration of 16 mg/kg at 5.5–6 ft bgs at location MO-605506. The maximum concentration is slightly higher than the maximum background concentration of 13 mg/kg. In deeper samples and other samples at comparable depths in the vicinity (locations MO-605083, MO-605507, MO-605508), chromium was not detected above the BV. Concentrations decreased downslope, toward the outfall end of the SWMU 50-006(d). The lateral and vertical extent of chromium are defined.

Copper was detected above the BV in three samples. Copper was detected above the BV only in the deepest sample at location MO-605085, and increased slightly with depth at location MO-605088. Locations MO-605085 and MO-605088 are the locations farthest downslope. The concentrations decreased downslope from location MO-605088 to location MO-605085. The lateral extent of copper is defined, but the vertical extent is not defined.

Mercury was detected above the BV in only one sample, the deepest sample at location MO-605085, the location farthest downslope. The sample concentration (0.127 mg/kg) is only slightly above the BV. The lateral and vertical extent of mercury are not defined.

Nitrate was detected in 17 samples, with a maximum concentration of . Concentrations increased with depth at three locations (MO-605085, MO-605459, and MO-605504). All concentrations are consistent with naturally-occurring nitrate except in the deepest sample at the location farthest downslope (42 mg/kg at 1.5–2.5 ft bgs, location MO-605085). The lateral and vertical extent of nitrate are not defined.

Perchlorate was detected in 12 samples. Concentrations increased with depth at three locations (MO-605085, MO-605087, and MO-605088), and perchlorate was detected only in the deepest sample at location MO-605506. The maximum sample concentration of perchlorate is 0.895 mg/kg in the deepest sample at location MO-605085. The lateral and vertical extent of perchlorate are not defined.

I-6.10.5.2 Nature and Extent of Organic COPCs

VOCs (acetone, 4-isopropyltoluene, toluene, and 1,3-xylene+1,4-xylene were) detected in one or more samples. Concentrations decreased with depth, except for acetone at locations MO-605085 and MO-605511, 4-isopropyltoluene at location MO-605085, and toluene at location MO-605085. Concentrations are low and at or near EQLs. The lateral and vertical extent of VOCs are defined.

Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected at low concentrations (maximum 0.204 mg/kg) in one or more samples. Aroclor-1242 was detected only in the deepest sample at location MO-605504. Aroclor-1254 was detected only in the deepest samples at locations MO-605085, MO-605088, and MO-605504. Aroclor-1260 increased with depth at location MO-605083, and was detected only in the deepest samples at locations MO-605085 and MO-605088. The lateral and vertical extent of PCBs are not defined.

PAHs were detected in one or more samples. Concentrations decreased with depth at all locations, except phenanthrene, which increased slightly at location 50-06023. The highest concentration of each PAH is at location MO-605085, the location farthest downslope from the outfall. The vertical extent of PAHs is defined, but the lateral extent is not defined.

Bis(2-ethylhexyl)phthalate was detected in only two samples, with a maximum sample concentration of 0.046 mg/kg. Both sample concentrations are at or below the EQLs, and bis(2-ethylhexyl)phthalate was not detected in the outfall area or downslope. The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dioxin/furan congeners were detected at low concentrations (less than 1×10^{-4} mg/kg) in multiple samples. Concentrations decreased with depth, and did not change substantially downslope. The lateral and vertical extent of dioxin/furan congeners are defined.

I-6.10.5.3 Nature and Extent of Radionuclide COPCs

Americium-241 increased with depth, or was detected in single samples or the deepest samples at nine locations. The highest concentration (235 pCi/g) is at location MO-605088, but decreases downslope to location MO-605085. The vertical extent of americium-241 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Cesium-137 increased with depth, or was detected in single samples or the deepest samples at 18 locations. The location farthest downslope (MO-605085) had a cesium-137 concentration of 73.3 mg/kg in the deepest sample (1.5–2.5 ft bgs). The vertical extent of cesium-137 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Cobalt-60 increased with depth, or was detected in single samples or the deepest samples at eight locations. Cobalt-60 was not detected at any of the locations below the outfall. The vertical extent of cobalt-60 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Plutonium-238 increased with depth, or was detected in single samples or the deepest samples at 17 locations. The vertical extent of plutonium-238 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Plutonium-239/240 increased with depth, or was detected in single samples or the deepest samples at 13 locations. The vertical extent of plutonium-239/240 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Strontium-90 increased with depth, or was detected in single samples or the deepest samples at 11 locations. The vertical extent of strontium-90 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Tritium increased with depth, or was detected in single samples or the deepest samples at all but five locations. The vertical extent of tritium is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Uranium-234 increased with depth, or was detected in single samples or the deepest samples at three locations. The vertical extent of uranium-234 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Uranium-235/236 was detected above the BV at four locations. Concentrations increased with depth at two locations (50-06003 and MO-605511). The vertical extent of uranium-235/236 is not defined. The lateral extent is defined to the toe of the slope in Mortandad Canyon.

Uranium-238 was detected above the BV at eight locations. Concentrations decreased with depth at all locations, and decreased down the canyon from location 50-06009. The lateral and vertical extent of uranium-238 are defined.

I-6.10.5.4 Summary of Nature and Extent for SWMU 50-006(d)

The lateral and vertical extent of all inorganic COPCs are defined, except for the lateral and vertical extent of copper, mercury, nitrate, and perchlorate near the outfall at location MO-605085.

The lateral and vertical extent of all organic COPCs are defined, except for the lateral and vertical extent of PCBs and the lateral extent of PAHs.

The lateral extent of all radionuclide COPCs is defined. The vertical extent of americium-241, cesium-137, cobalt-60, plutonium-238, plutonium-239/240, strontium-90, thorium-232, tritium, uranium-234, and uranium-235/236 is not defined.

I-6.11 AOC 50-007

AOC 50-007 was approved for clean closure by NMED in July 1998 (NMED 1998, 106948), and no further investigation is needed. Section 6.12 of the investigation report presents the details for this site.

I-6.12 AOC 50-008

AOC 50-008 is an active permitted storage unit operated in accordance with the requirements of 20.4.1.500 NMAC; 40 CFR 264, Subparts A–D and I; and the Laboratory HWFP. No investigation was proposed in the approved investigation work plan (LANL 2008, 100750; NMED 2008, 101110). Any additional investigation will be conducted as part of the RCRA closure process. Section 6.13 of the investigation report presents the details for this site.

I-6.13 SWMU 50-009

A Phase II investigation was completed for MDA C in March 2009, and the investigation report (LANL 2009, 106047) was submitted to NMED in May 2009. Section 6.14 of the investigation report presents the details for this site.

I-6.14 AOC 50-010

AOC 50-010 is proposed for delayed investigation. Section 6.15 of the investigation report presents the details for this site.

I-6.15 SWMU 50-011(a)

A total of 13 samples (1 soil and 12 tuff) were collected in 1993, 2004, and 2006 from seven locations at SWMU 50-011(a). Table 6.16-1 summarizes the samples collected and the requested analyses for each sample. Figure 6.16-1 shows the sampling locations.

I-6.15.1 Inorganic Chemicals at SWMU 50-011(a)

Thirteen samples were analyzed for TAL metals. Four samples were analyzed for perchlorate. Table 6.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.16-2 lists the inorganic chemicals above BVs and detected inorganic chemicals that have no BVs. The sampling locations and detected concentrations are shown in Figure 6.16-2.

I-6.15.1.1 Inorganic Chemicals in Soil

One soil sample was analyzed for TAL metals.

Antimony was not detected, but had a DL (4.6 mg/kg) above the BV (0.83 mg/kg) in the soil sample. The DL also exceeded the maximum background concentration of antimony in soil (1 mg/kg). Antimony is identified as a COPC in soil.

I-6.15.1.2 Inorganic Chemicals in Tuff

Twelve tuff samples were analyzed for TAL metals. Four tuff samples were analyzed for perchlorate.

Antimony was not detected, but had DLs (4.4–4.7 mg/kg) above the BV (0.5 mg/kg) in six tuff samples. Results were compared only to the BV because the BV is greater than the maximum background concentration of antimony in tuff (0.4 mg/kg). Antimony is identified as a COPC in tuff.

Arsenic was not detected above the BV (2.79 mg/kg), but had two DLs (both 3 mg/kg) above the BV in 2 of 12 tuff samples. The DLs did not exceed the maximum background concentration of arsenic in tuff (5 mg/kg). Statistical tests were performed to determine if the site sampling results for arsenic are different than background. The statistical test results are presented in Table I-6.15-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for arsenic in tuff is presented in Figure I-6.15-1. Arsenic is not identified as a COPC in tuff.

Chromium was detected above the BV (7.14 mg/kg) in 1 of 12 tuff samples, at a concentration of 8.2 mg/kg. The sample result did not exceed the maximum background concentration of chromium in tuff (13 mg/kg). Statistical tests were performed to determine if the site sampling results for chromium are different than background. The statistical test results are presented in Table I-6.15-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for chromium in tuff is presented in Figure I-6.15-2. Chromium is not identified as a COPC in tuff.

Lead was detected above the BV (11.2 mg/kg) in 1 of 12 tuff samples, at a concentration of 20.7 mg/kg. The sample result also exceeded the maximum background concentration (15.5 mg/kg). Statistical tests were performed to determine if the site sampling results for lead are different than background. The statistical test results are presented in Table I-6.15-1. The results of both the Gehan test and the quantile test indicate that the site sampling results are not statistically different than background. The box plot for lead in tuff is presented in Figure I-6.15-3. Lead is not identified as a COPC in tuff.

Selenium was detected above the BV (0.3 mg/kg) in 2 of 12 tuff samples, with concentrations of 0.332 and 0.57 mg/kg. Selenium also had DLs (0.53–2.5 mg/kg) above the BV in nine tuff samples. Statistical tests could not be performed because more than 80% of the combined data (background and site data) are nondetected values. Results were compared only to the BV because the BV is greater than the

maximum background concentration of selenium in tuff (0.105 mg/kg). The box plot for selenium in tuff is presented in Figure I-6.15-4. Selenium is identified as a COPC in tuff.

I-6.15.2 Organic Chemicals at SWMU 50-011(a)

Two samples were analyzed for PCBs, pesticides, SVOCs, and TPH-DRO. Four were analyzed for VOCs. Table 6.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.16-3 lists the detected organic chemicals. The sampling locations and detected concentrations are shown in Figure 6.16-3.

I-6.15.2.1 Organic Chemicals in Soil

No soil samples were analyzed for organic chemicals.

I-6.15.2.2 Organic Chemicals in Tuff

Two tuff samples from SWMU 50-011(a) were analyzed for PCBs, pesticides, SVOCs, and TPH-DRO. Four samples were analyzed for VOCs.

Acetone was detected in four tuff samples and is identified as a COPC in tuff.

I-6.15.3 Radionuclides at SWMU 50-011(a)

Four samples were analyzed for americium-241. Thirteen samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Eleven samples were analyzed for tritium. Two samples were analyzed for strontium-90. Table 6.16-1 summarizes the samples collected and the requested analyses for each sample.

Table 6.16-4 presents the radionuclides detected or detected above BVs/FVs. The sampling locations and detected concentrations are shown in Figure 6.16-4.

I-6.15.3.1 Radionuclides in Soil

One soil sample was collected at SWMU 50-011(a) and was analyzed for gamma-emitting radionuclides, tritium, isotopic plutonium, and isotopic uranium.

Plutonium-238 was detected in the soil sample from a depth where the FV does not apply, at a concentration of 0.03 pCi/g. Plutonium-238 is identified as a COPC in soil.

Plutonium-239/240 was detected in the soil sample from a depth where the FV does not apply, at a concentration of 0.06 pCi/g. Plutonium-239/240 is identified as a COPC in soil.

Tritium was detected in the soil sample with a concentration of 1.41531 pCi/g, and is identified as a COPC in soil.

I-6.15.3.2 Radionuclides in Tuff

Four tuff samples were analyzed for americium-241. Twelve tuff samples were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium. Ten tuff samples were analyzed for tritium. Two samples were analyzed for strontium-90.

Plutonium-238 was detected in 3 of 12 tuff samples with a maximum concentration of 0.0326 pCi/g. Plutonium-238 is identified as a COPC in tuff.

Plutonium-239/240 was detected in 3 of 12 tuff samples with a maximum concentration of 0.0506 pCi/g. Plutonium-239/240 is identified as a COPC in tuff.

Tritium was detected in 14 tuff samples with a maximum concentration of 1.32 pCi/g. Tritium is identified as a COPC in tuff.

I-6.15.4 Summary of COPCs at SWMU 50-011(a)

The inorganic chemicals identified as COPCs at SWMU 50-011(a) are antimony and selenium.

The organic chemical identified as a COPC at SWMU 50-011(a) is acetone.

The radionuclides identified as COPCs at SWMU 50-011(a) are plutonium-238, plutonium-239/240, and tritium.

I-6.15.5 Nature and Extent of Contamination at SWMU 50-011(a)

I-6.15.5.1 Nature and Extent of Inorganic COPCs

Selenium was detected above the BV only in the deepest samples at locations 50-03042 and 50-23548. The concentrations, 0.332 and 0.57 mg/kg, are less than twice the BV. The lateral and vertical extent are defined for selenium.

I-6.15.5.2 Nature and Extent of Organic COPCs

Acetone was detected at locations 50-23548 and 50-23549. Concentrations did not change substantially with depth and are at low levels (0.0143–0.0332 mg/kg). The lateral and vertical extent are defined for acetone.

I-6.15.5.3 Nature and Extent of Radionuclide COPCs

Plutonium-238 was detected at locations 50-03011, 50-03043, and 50-23549. Concentrations decreased with depth or remained essentially the same at all locations. All concentrations are at low levels (0.007 to 0.0326 pCi/g). The lateral and vertical extent are defined for plutonium-238.

Plutonium-239/240 was detected at locations 50-03011, 50-03042, 50-03043, and 50-23549. Concentrations decreased with depth at all locations, except at location 50-03042, where plutonium-239/240 was detected only in the deepest sample at 0.02 pCi/g. All concentrations are at low levels (0.02–0.06 pCi/g). The lateral and vertical extent are defined for plutonium-239/240.

Tritium was detected at six locations. Concentrations decreased with depth at four of the six locations, except at location 50-03044 where a single depth was sampled and at location 50-23549 where tritium was detected only in the deepest sample. The vertical extent of tritium at location 50-03044 is defined by samples in similar or deeper depths at nearby locations 50-03043, 50-03042, and 50-03011. The lateral extent of tritium is also defined because concentrations decreased from west to east toward the downslope locations.

I-6.15.5.4 Summary of Nature and Extent for SWMU 50-011(a)

The lateral and vertical extent of all inorganic, organic, and radionuclide COPCs are defined.

I-6.16 SWMU 50-011(b)

SWMU 50-011(b) is proposed for delayed investigation. Section 6.17 of the investigation report presents the details for this site.

I-7.0 COPCs FOR SITE AT TA-55

I-7.1 SWMU 55-008

SWMU 55-008 is proposed for delayed investigation. Section 7.2 of the investigation report presents the details for this site.

I-8.0 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 NewMexico 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.

Gehan, E.A., June 1965. "A Generalized Wilcoxon Test for Comparing Arbitrarily Singly-Censored Samples," *Biometrika,* Vol. 52, No. 1 and 2, pp. 203–223. (Gehan 1965, 055611)

Gilbert, R.O., and J.C. Simpson, November 1990. "Statistical Sampling and Analysis Issues and Needs for Testing Attainment of Background-Based Cleanup Standards at Superfund Sites," Proceedings of The Workshop on Superfund Hazardous Waste: Statistical Issues in Characterizing a Site: Protocols, Tools, and Research Needs, U.S. Environmental Protection Agency, Arlington, Virginia. (Gilbert and Simpson 1990, 055612)

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)

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LANL (Los Alamos National Laboratory), February 2008. "Investigation Work Plan for Upper Mortandad Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-1272, Los Alamos, New Mexico. (LANL 2008, 100750)

LANL (Los Alamos National Laboratory), May 2009. "Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos National Laboratory document LA-UR-09-2842, Los Alamos, New Mexico. (LANL 2009, 106047)

NMED (New Mexico Environment Department), July 2, 1998. "Approval of the Closure Certification and Report for the Controlled Air Incinerator at Technical Area 50, EPA I.D. No. NM 089 001 0515," New Mexico Environment Department letter to G. Todd (DOE-LAAO) and J. Browne (LANL Director) from E. Kelley (Director/Water and Waste Management Division), Santa Fe, New Mexico. (NMED 1998, 106948)

NMED (New Mexico Environment Department), March 24, 2008. "Approval with Modifications, Investigation Work Plan for Upper Mortandad Canyon Aggregate Area," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 101110)

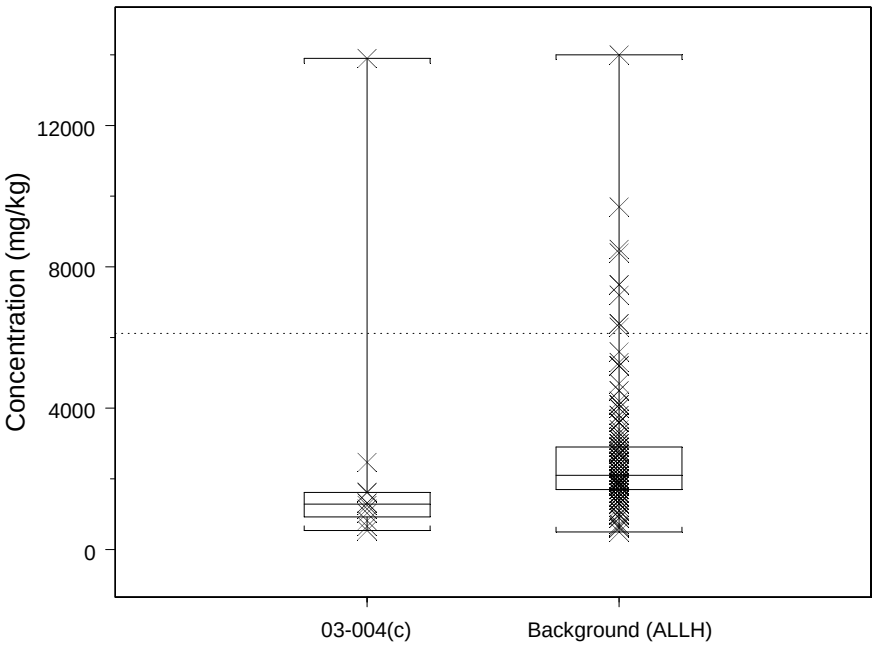


Figure I-2.3-1 Site concentrations of calcium in soil at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

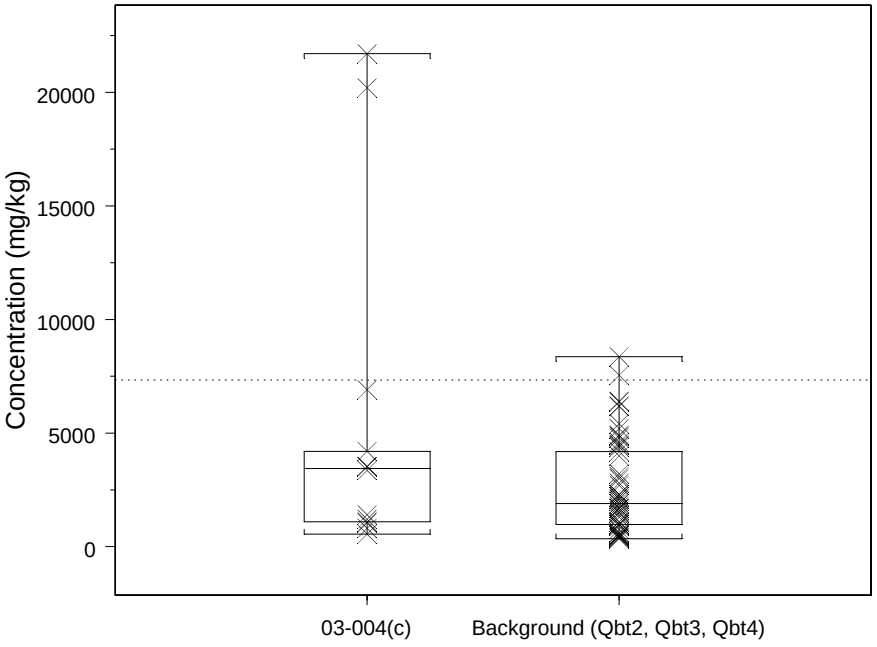


Figure I-2.3-2 Site concentrations of aluminum in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

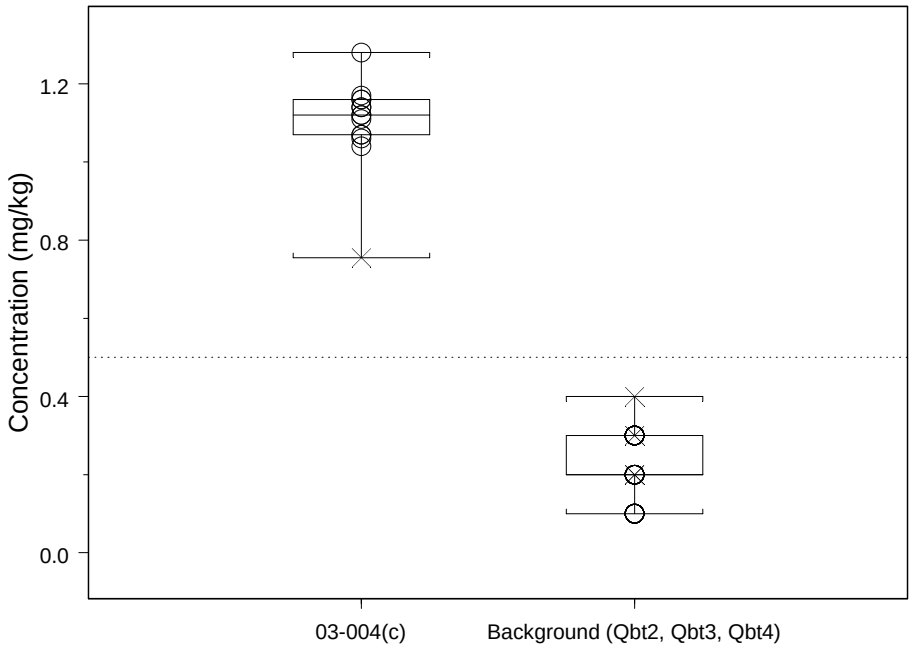


Figure I-2.3-3 Site concentrations of antimony in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

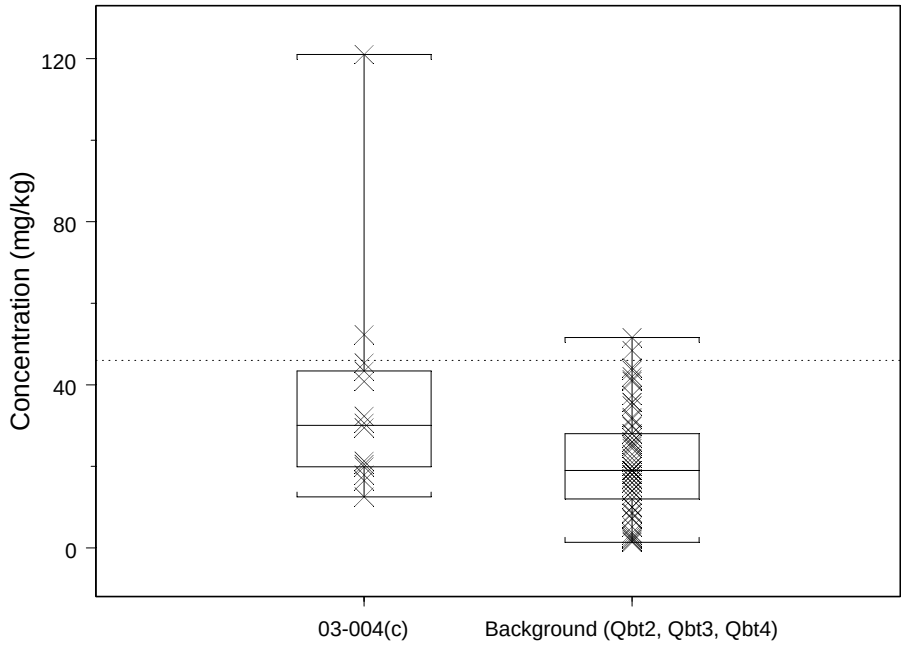


Figure I-2.3-4 Site concentrations of barium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

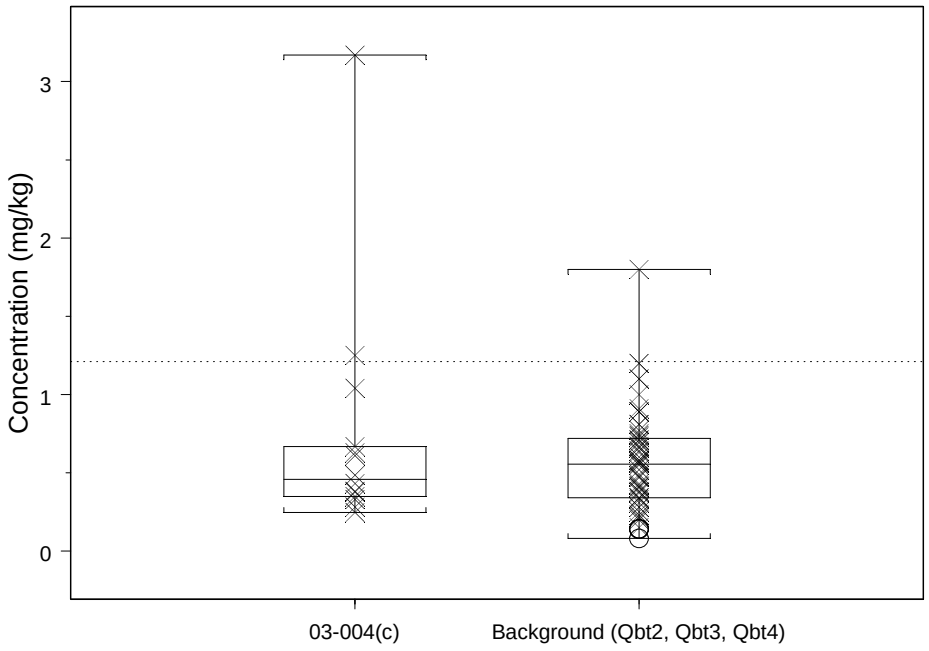


Figure I-2.3-5 Site concentrations of beryllium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

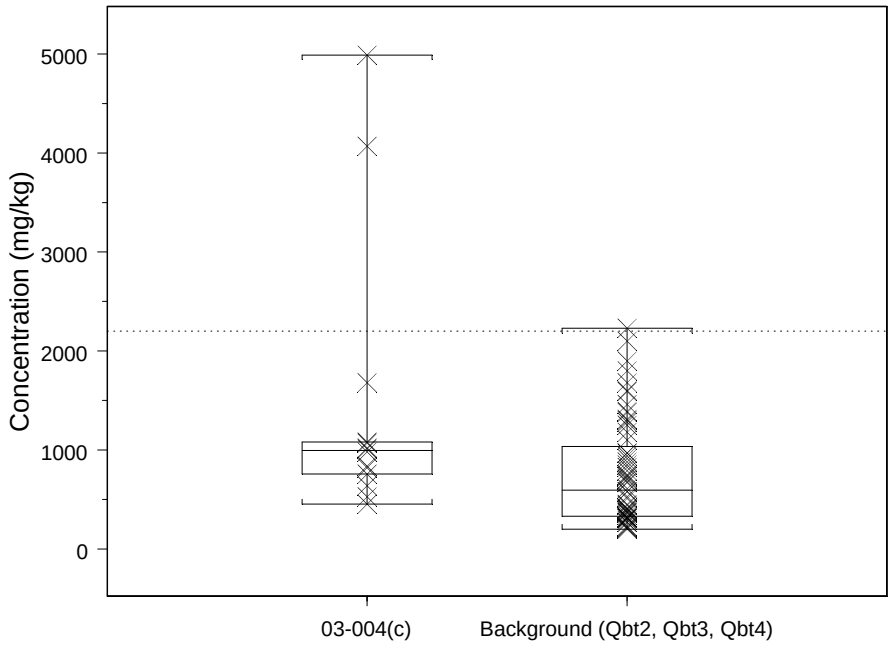


Figure I-2.3-6 Site concentrations of calcium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

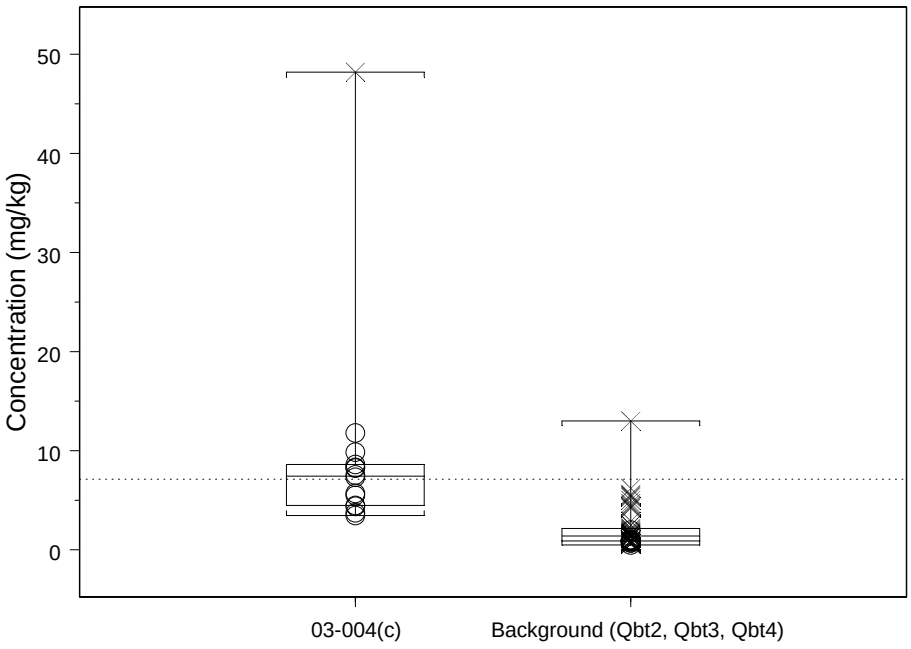


Figure I-2.3-7 Site concentrations of chromium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

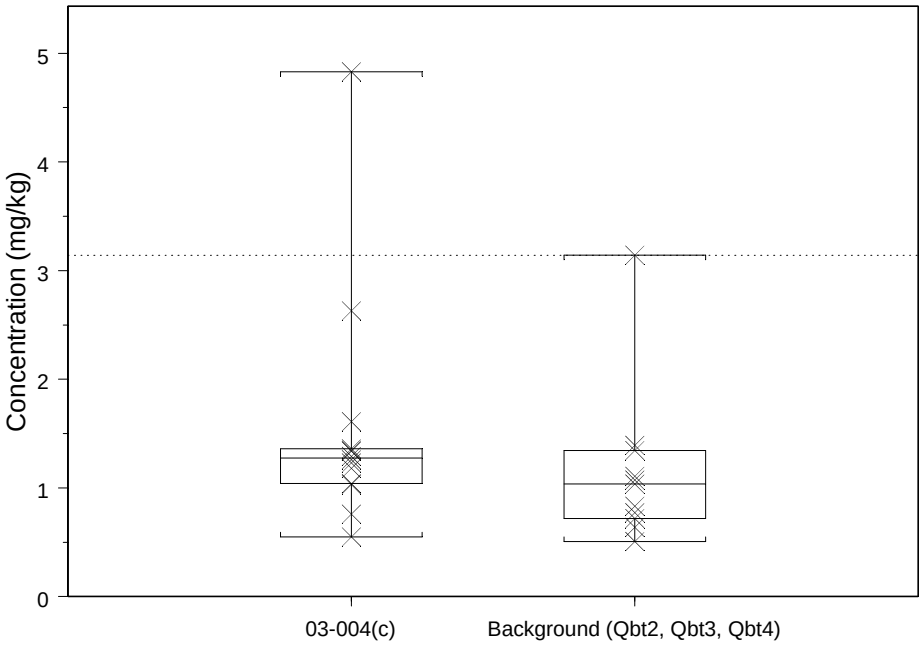


Figure I-2.3-8 Site concentrations of cobalt in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

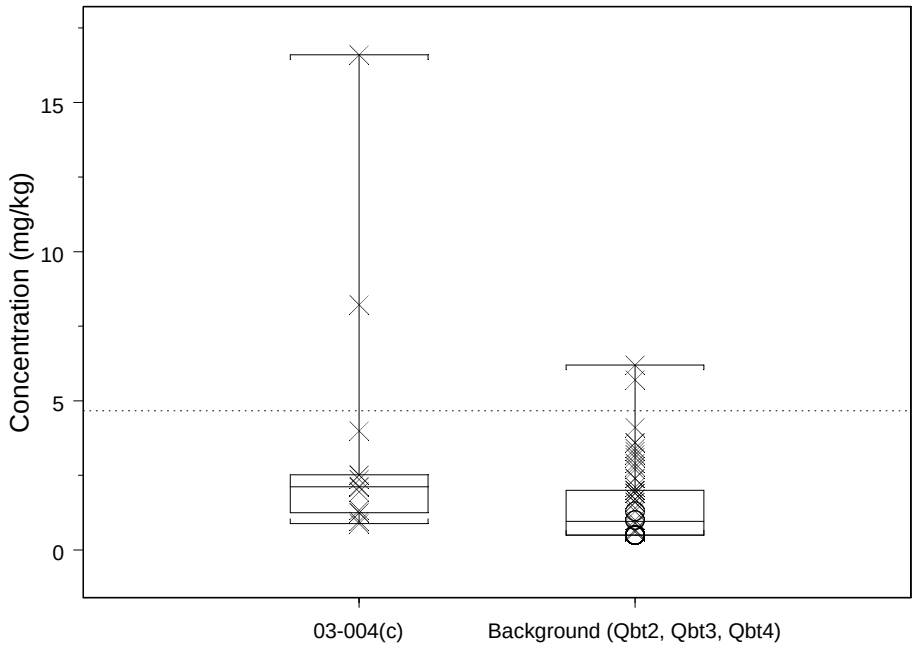


Figure I-2.3-9 Site concentrations of copper in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

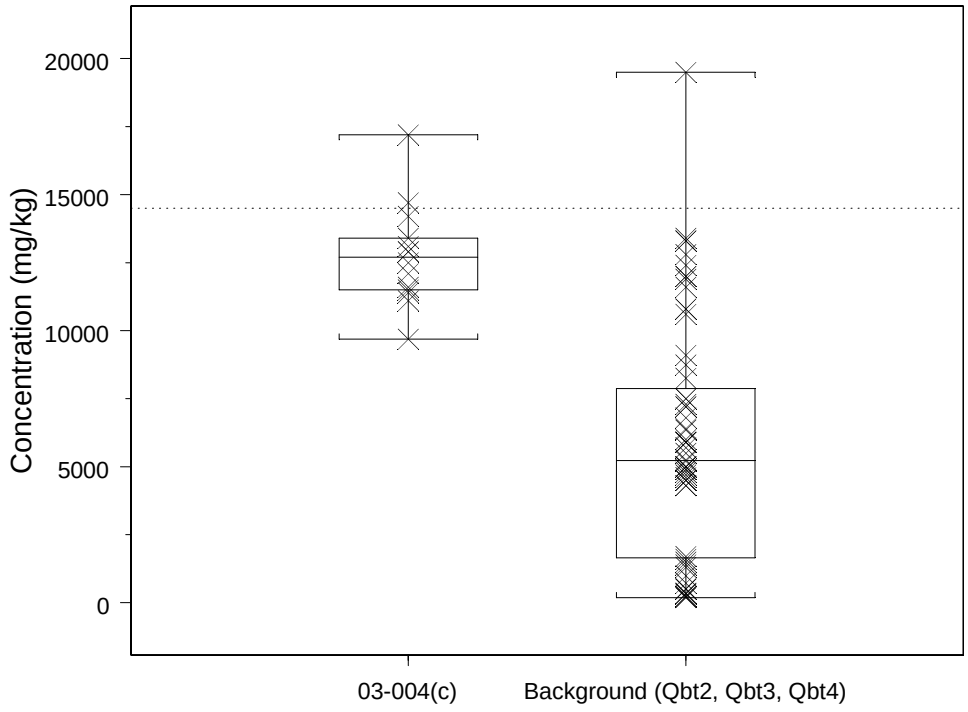


Figure I-2.3-10 Site concentrations of iron in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

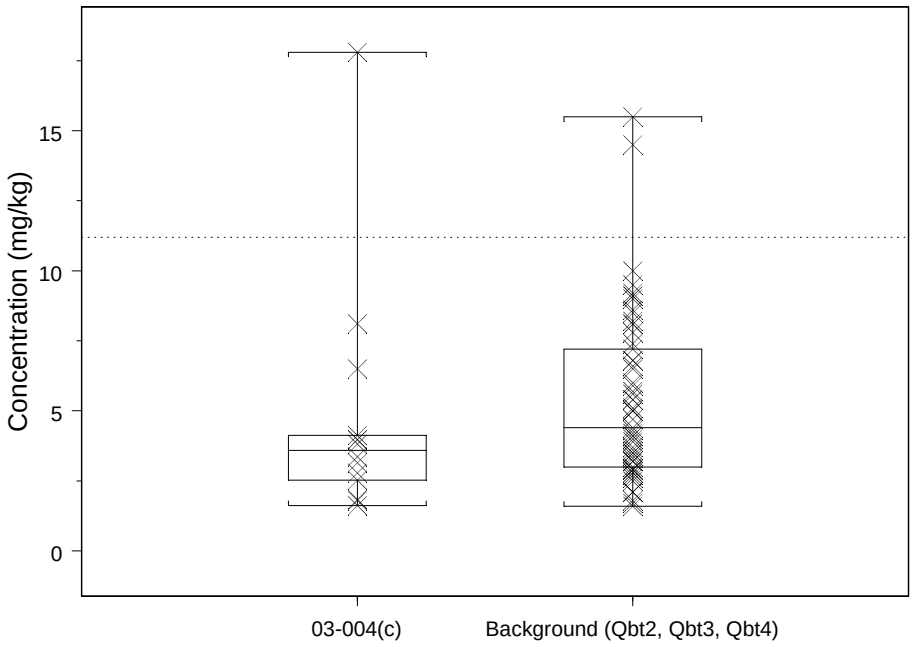


Figure I-2.3-11 Site concentrations of lead in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

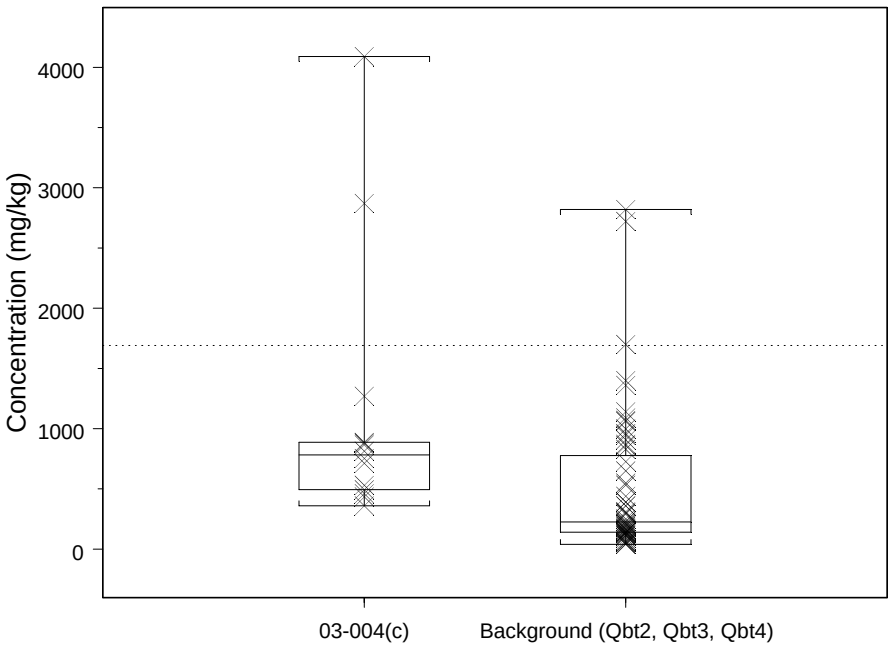


Figure I-2.3-12 Site concentrations of magnesium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

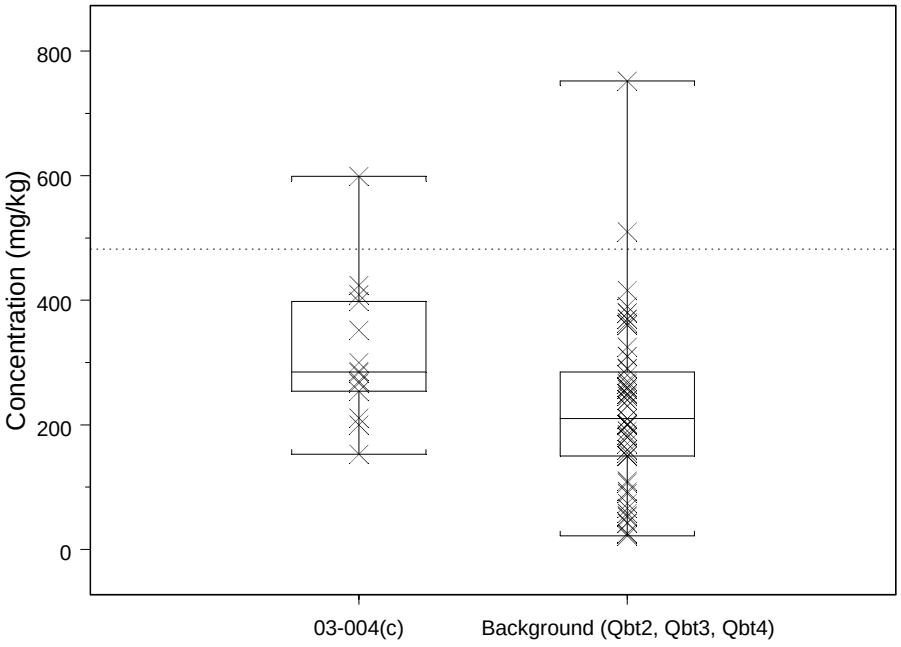


Figure I-2.3-13 Site concentrations of manganese in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

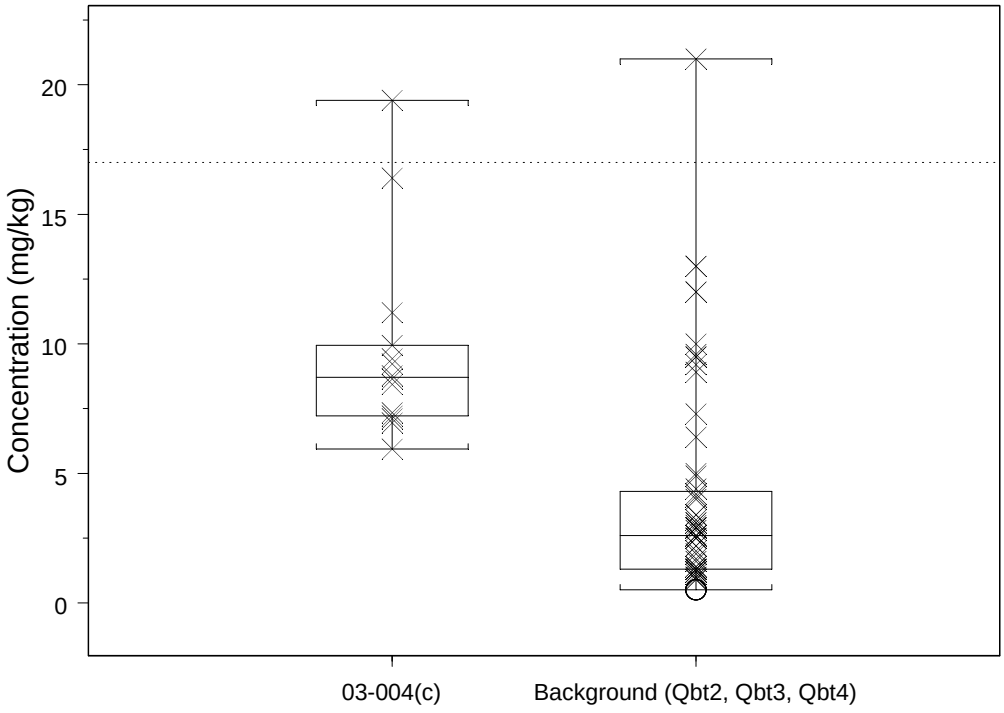


Figure I-2.3-14 Site concentrations of vanadium in tuff at AOC 03-004(c) compared to background
(× = detect, ○ = nondetect)

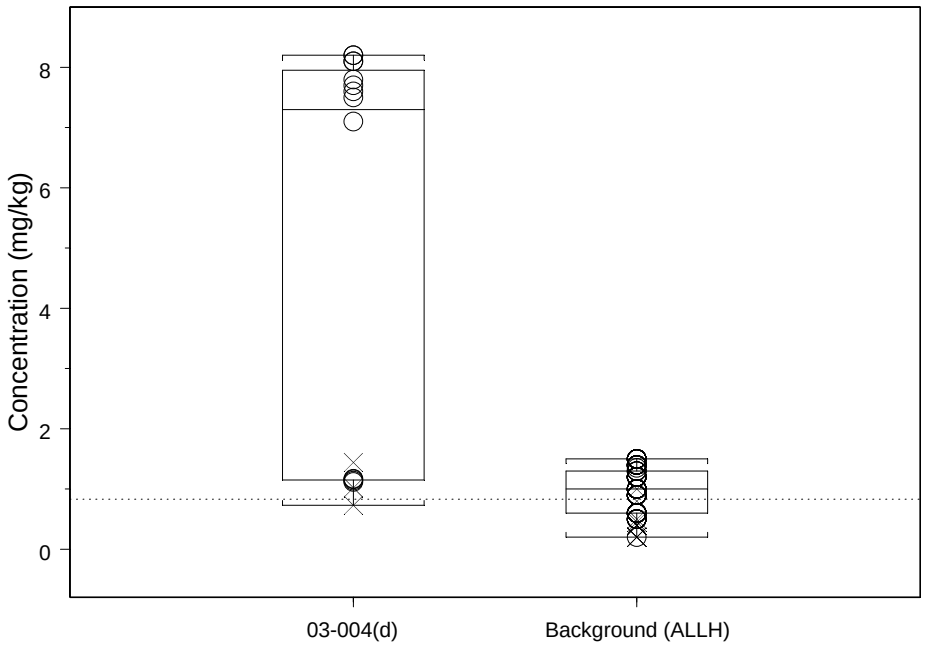


Figure I-2.4-1 Site concentrations of antimony in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

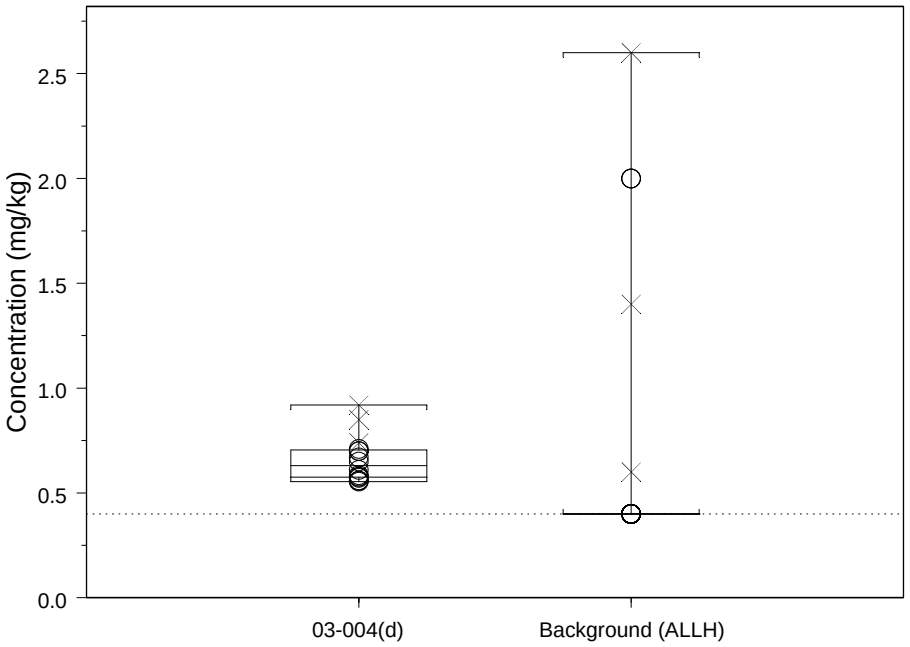


Figure I-2.4-2 Site concentrations of cadmium in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

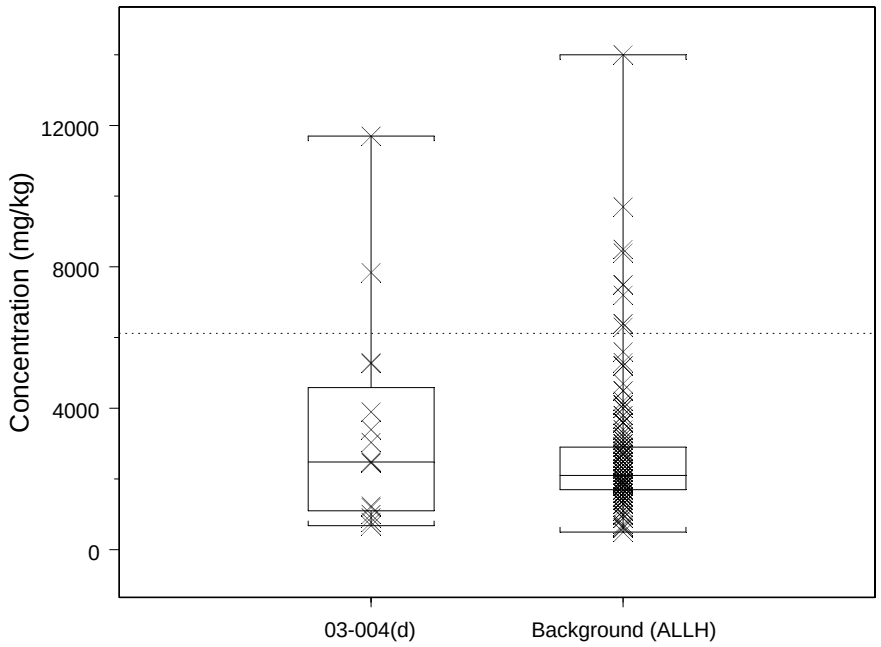


Figure I-2.4-3 Site concentrations of calcium in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

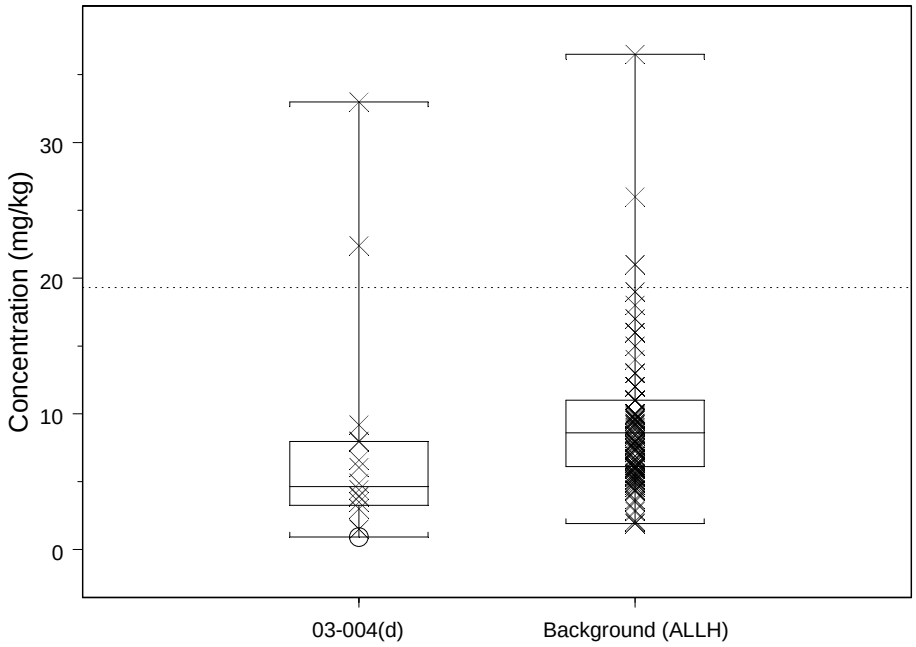


Figure I-2.4-4 Site concentrations of chromium in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

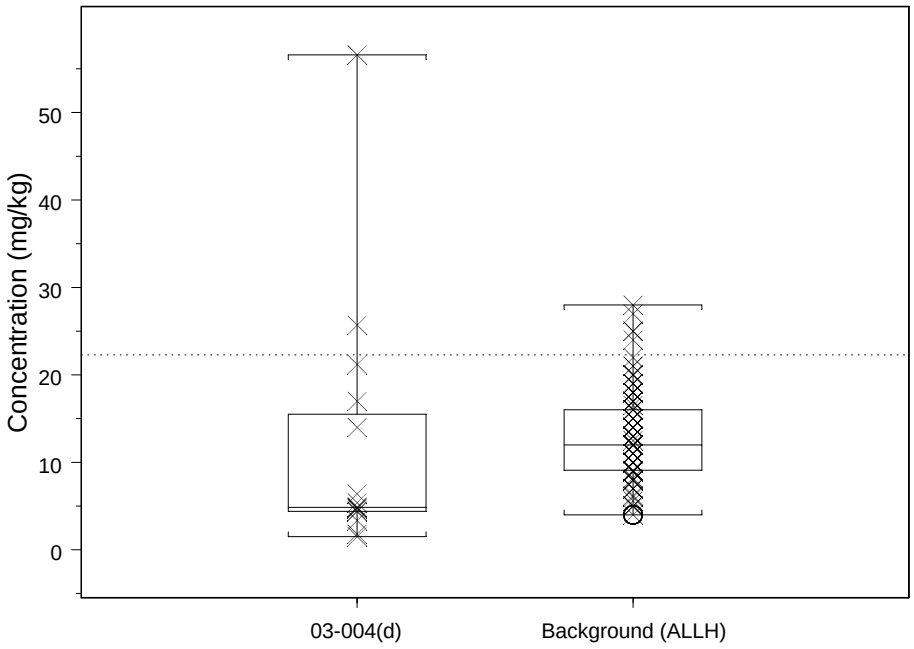


Figure I-2.4-5 Site concentrations of lead in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

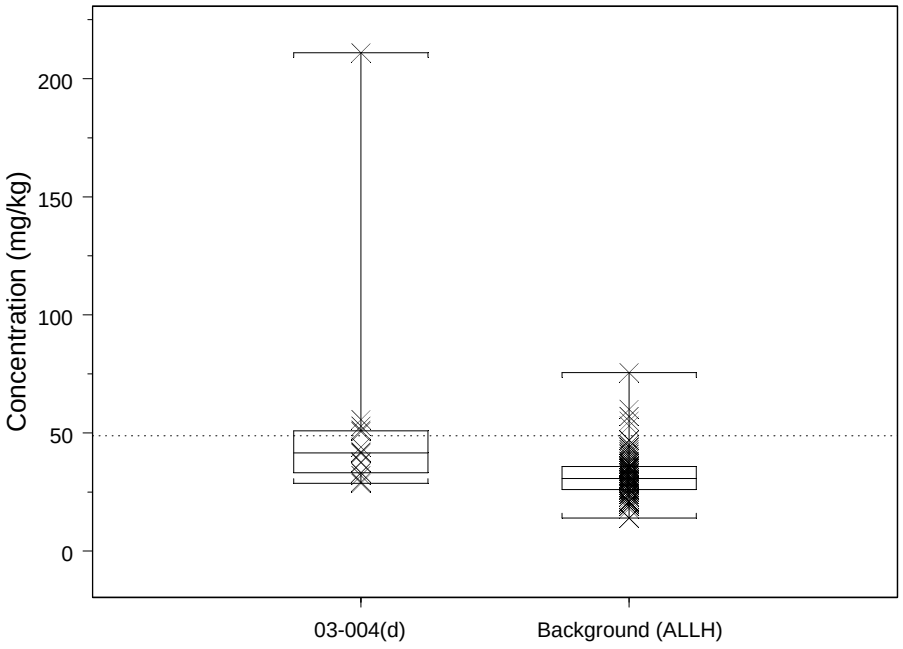


Figure I-2.4-6 Site concentrations of zinc in soil at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

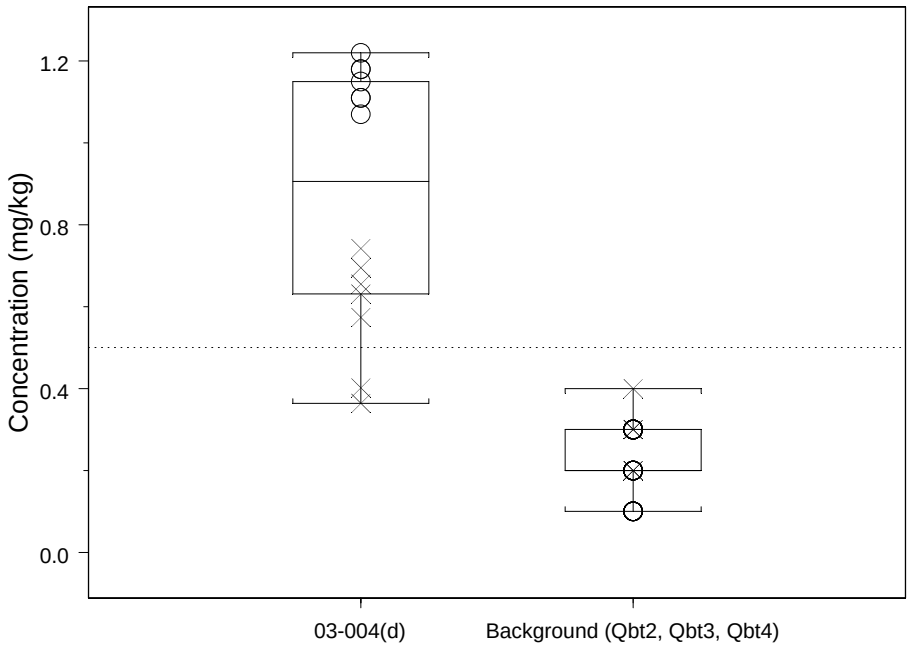


Figure I-2.4-7 Site concentrations of antimony in tuff at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

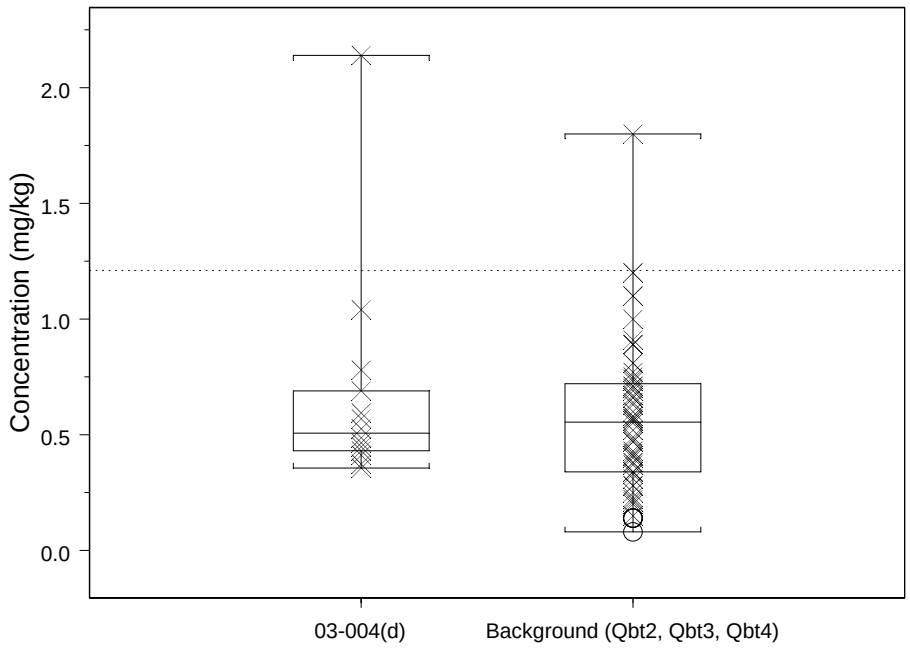


Figure I-2.4-8 Site concentrations of beryllium in tuff at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

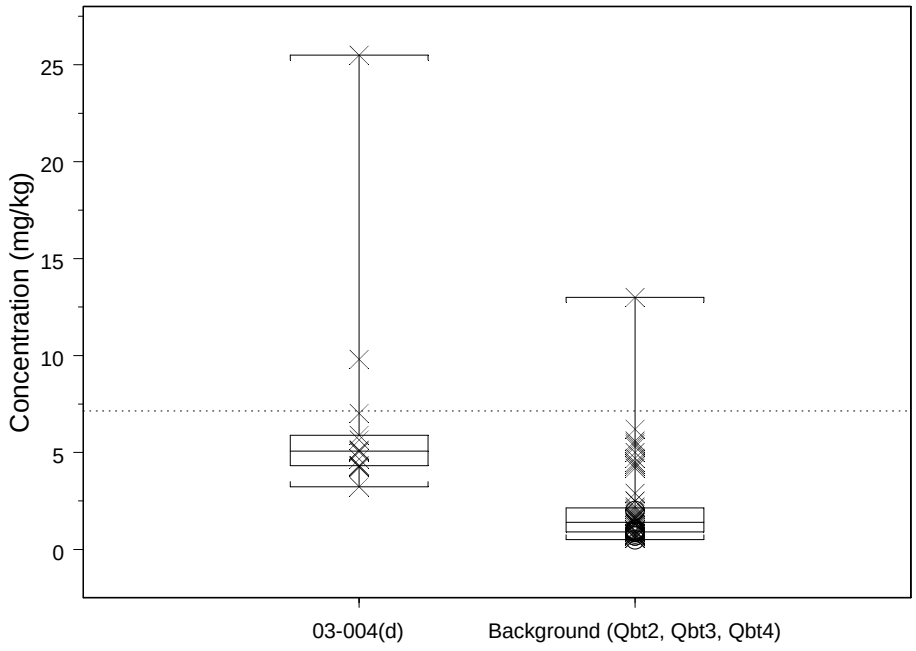


Figure I-2.4-9 Site concentrations of chromium in tuff at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

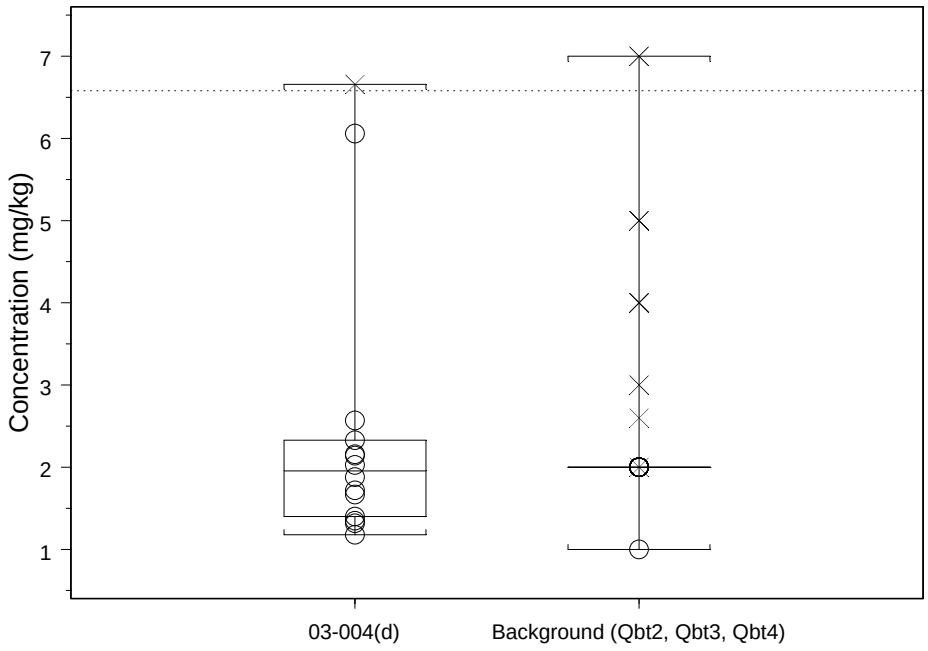


Figure I-2.4-10 Site concentrations of nickel in tuff at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

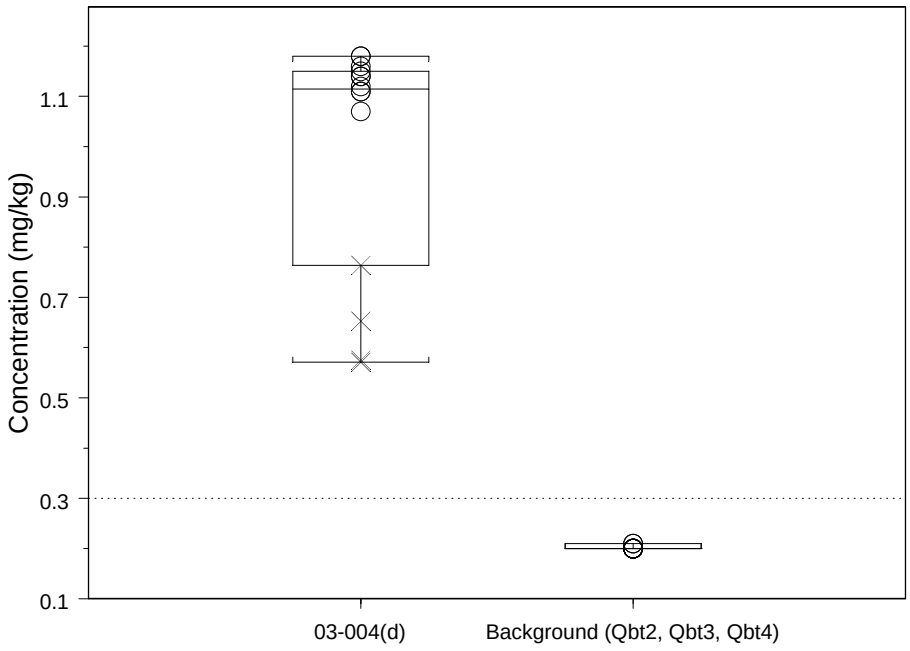


Figure I-2.4-11 Site concentrations of selenium in tuff at AOC 03-004(d) compared to background
(× = detect, ○ = nondetect)

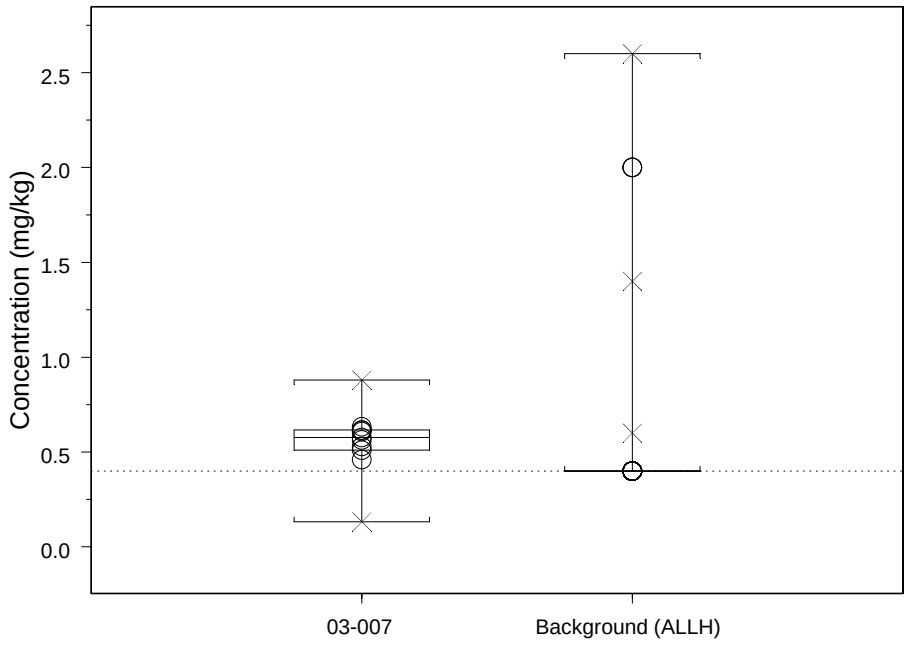


Figure I-2.5-1 Site concentrations of cadmium in soil at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

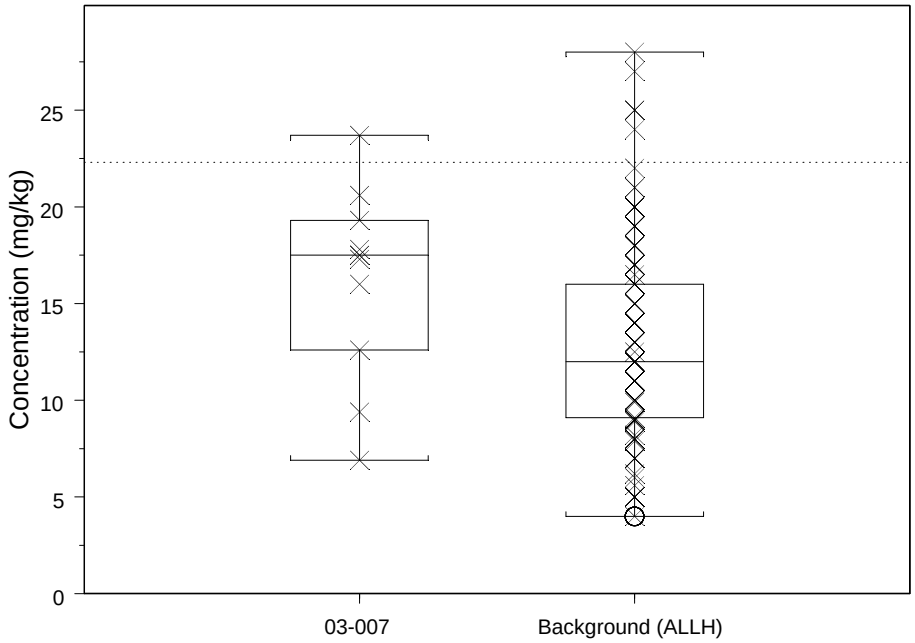


Figure I-2.5-2 Site concentrations of lead in soil at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

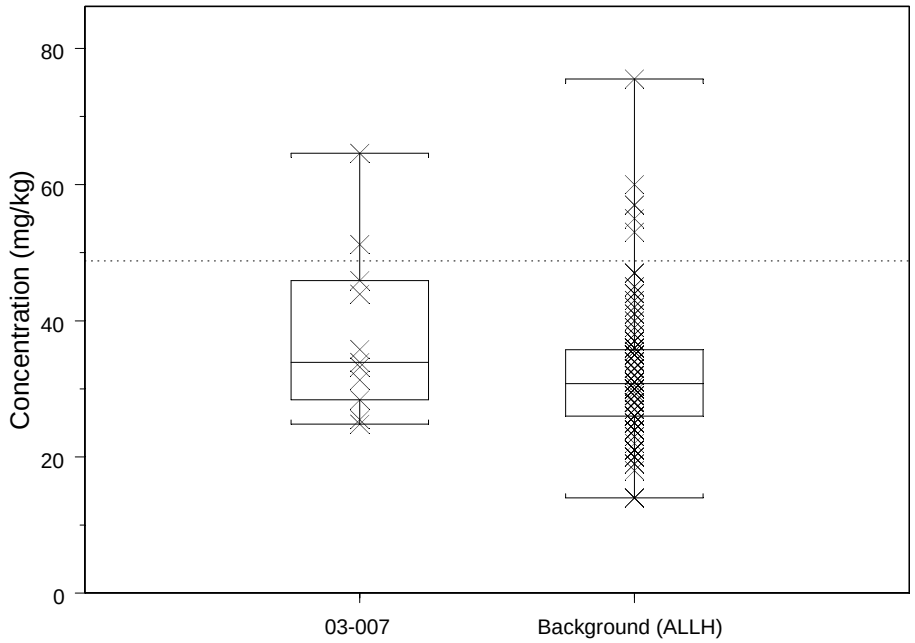


Figure I-2.5-3 Site concentrations of zinc in soil at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

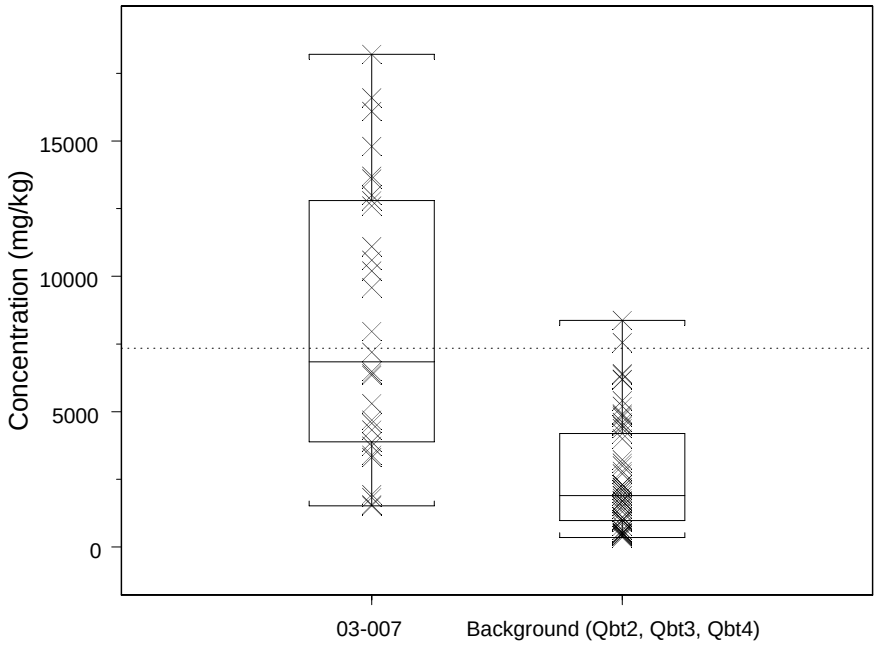


Figure I-2.5-4 Site concentrations of aluminum in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

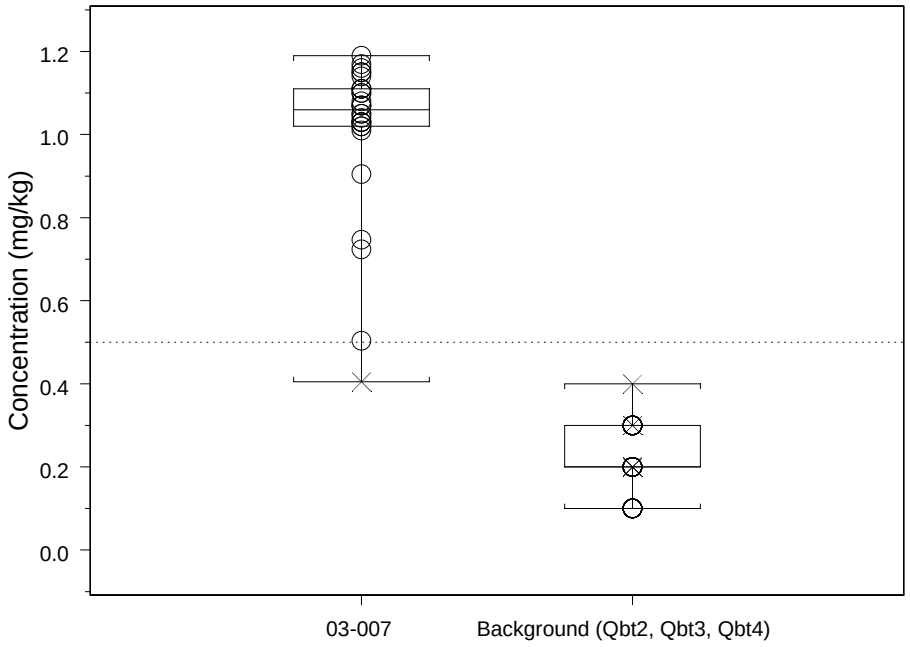


Figure I-2.5-5 Site concentrations of antimony in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

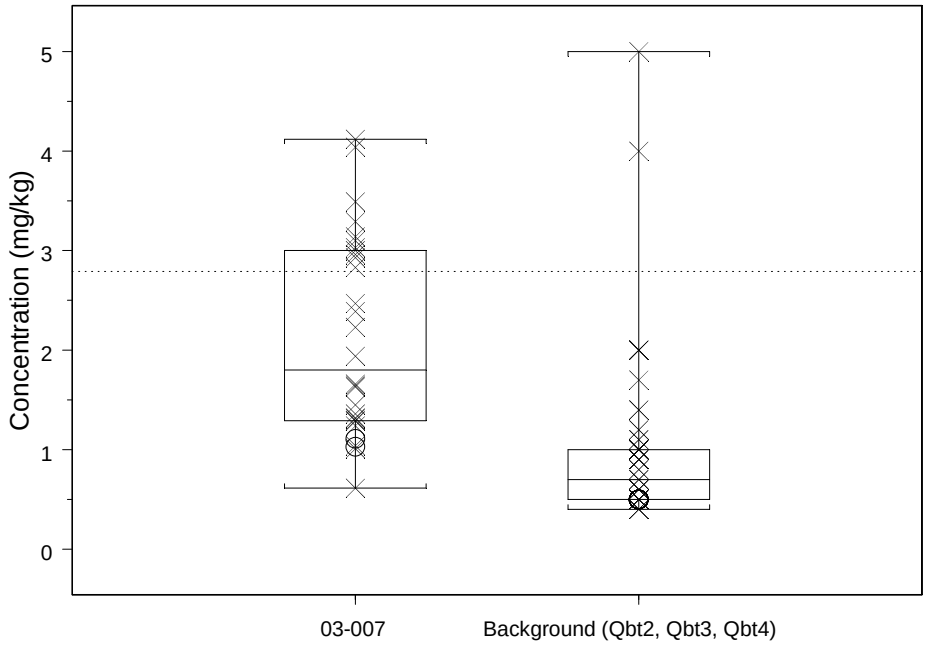


Figure I-2.5-6 Site concentrations of arsenic in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

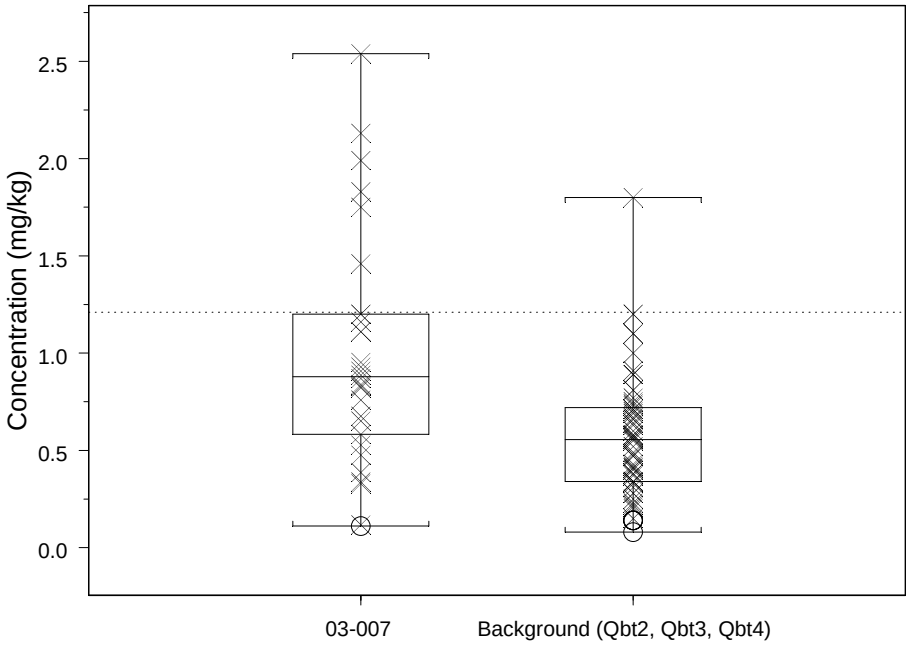


Figure I-2.5-7 Site concentrations of beryllium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

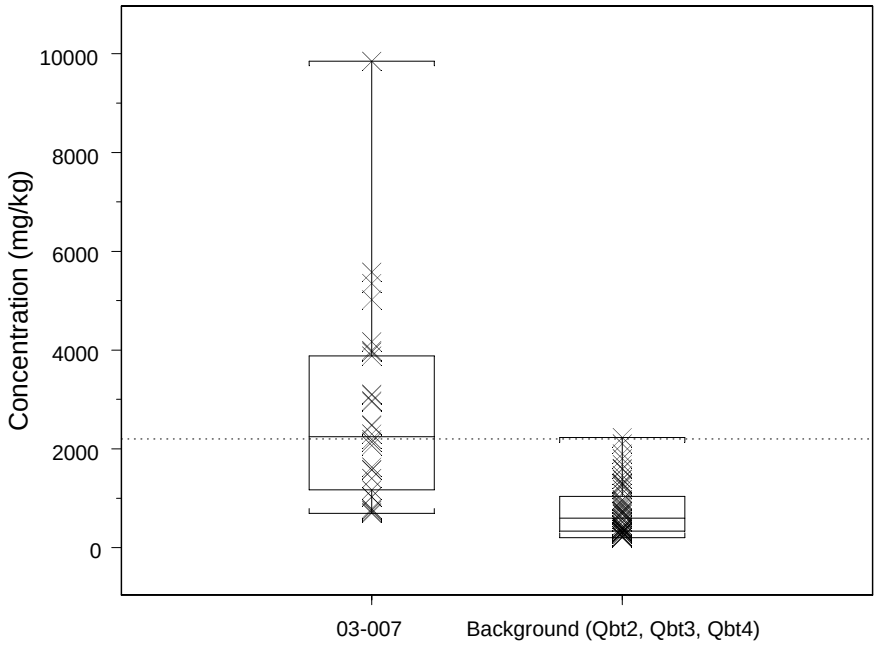


Figure I-2.5-8 Site concentrations of calcium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

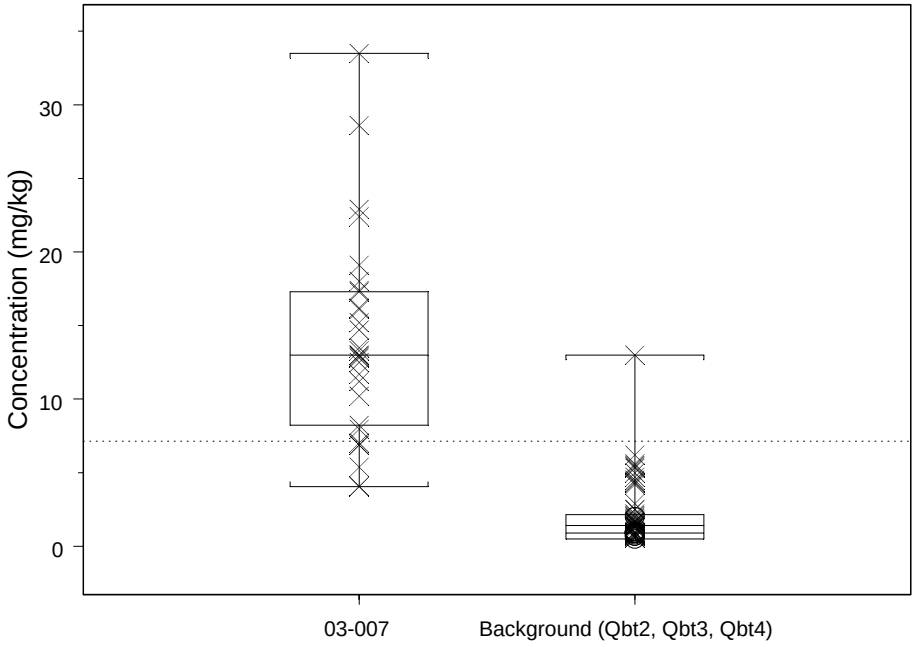


Figure I-2.5-9 Site concentrations of chromium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

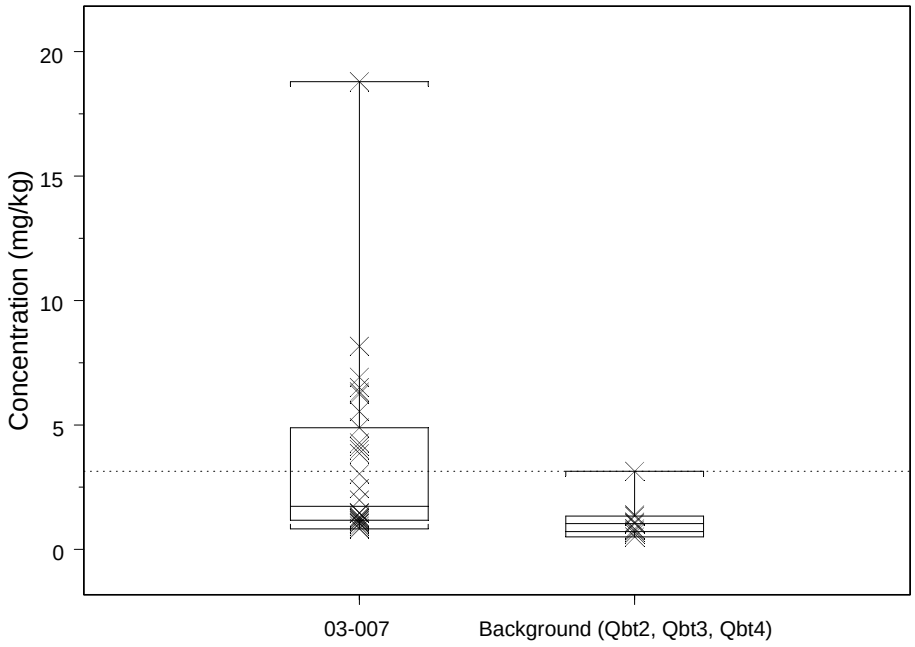


Figure I-2.5-10 Site concentrations of cobalt in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

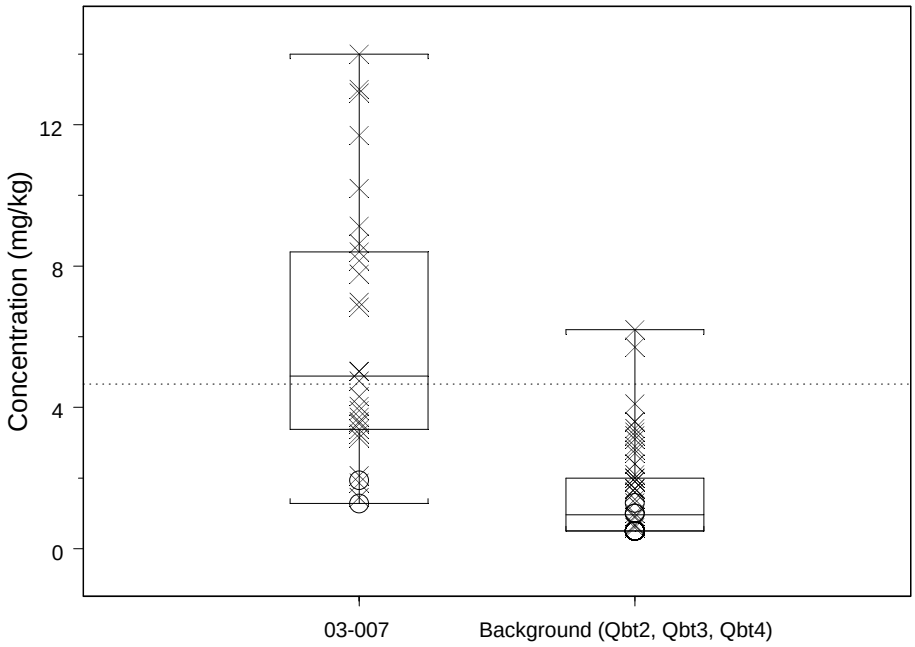


Figure I-2.5-11 Site concentrations of copper in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

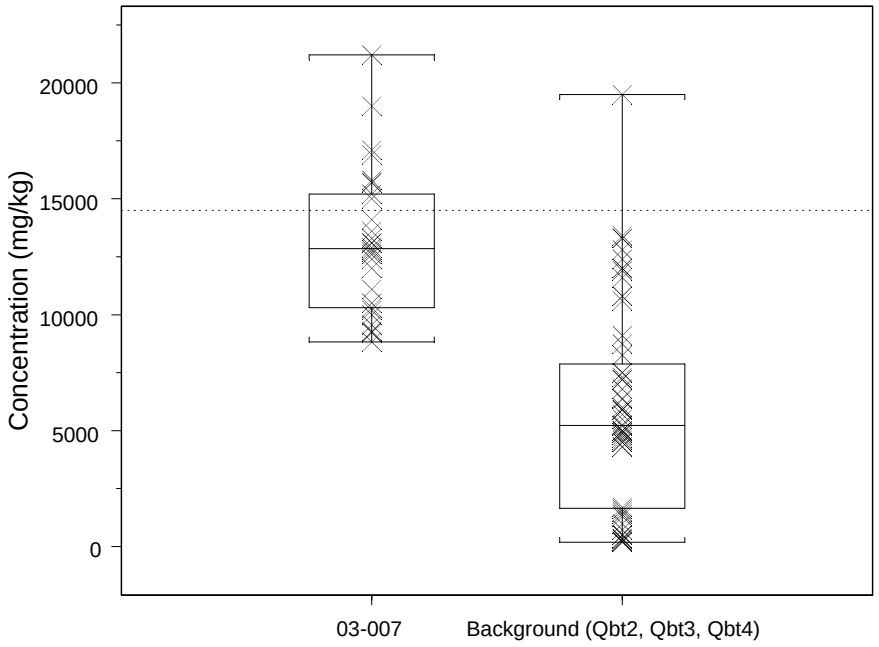


Figure I-2.5-12 Site concentrations of iron in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

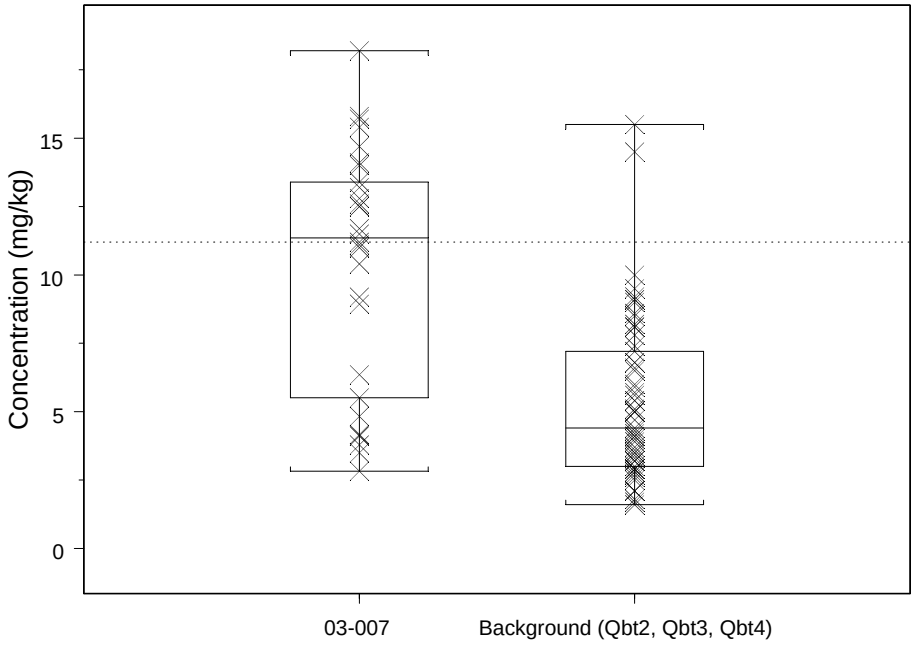


Figure I-2.5-13 Site concentrations of lead in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

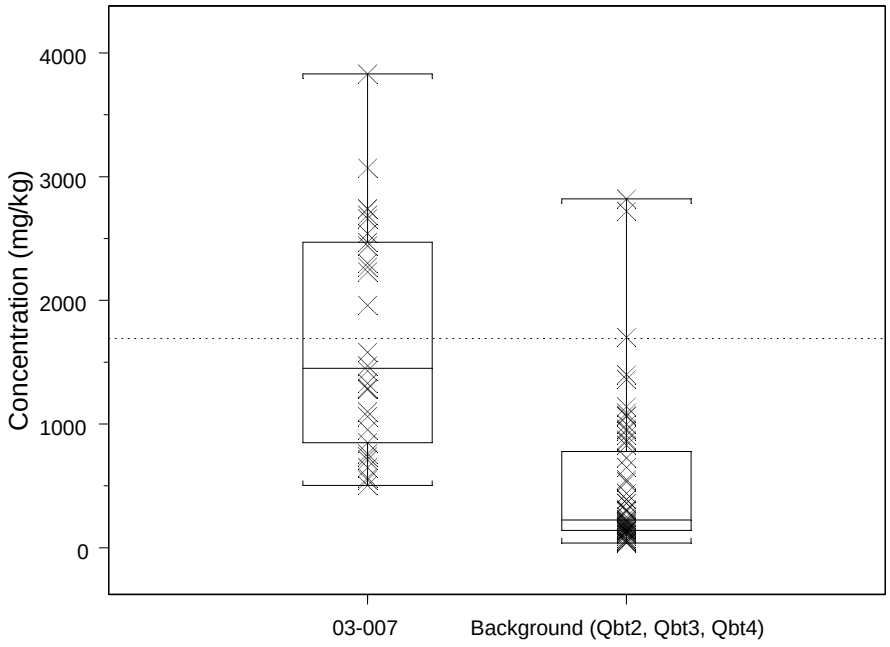


Figure I-2.5-14 Site concentrations of magnesium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

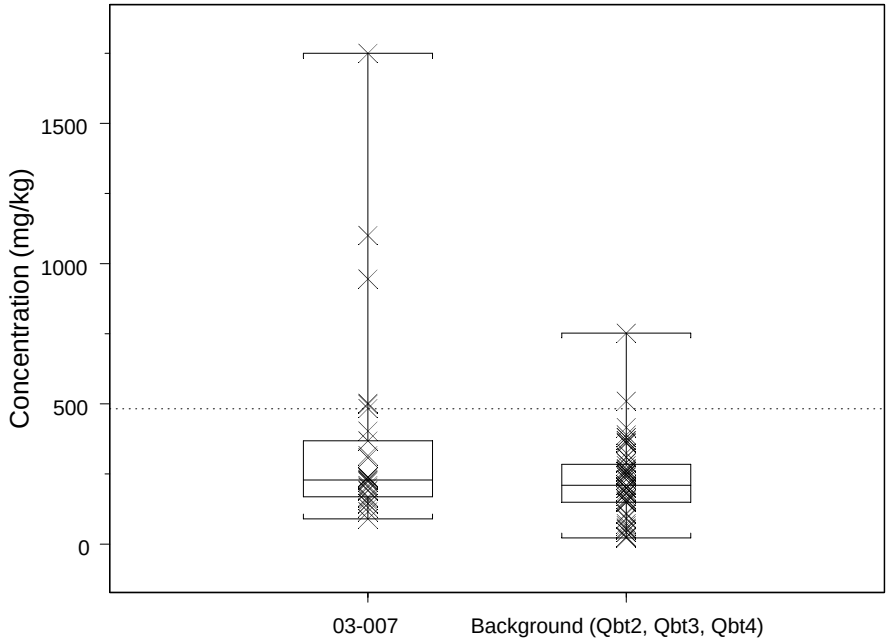


Figure I-2.5-15 Site concentrations of manganese in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

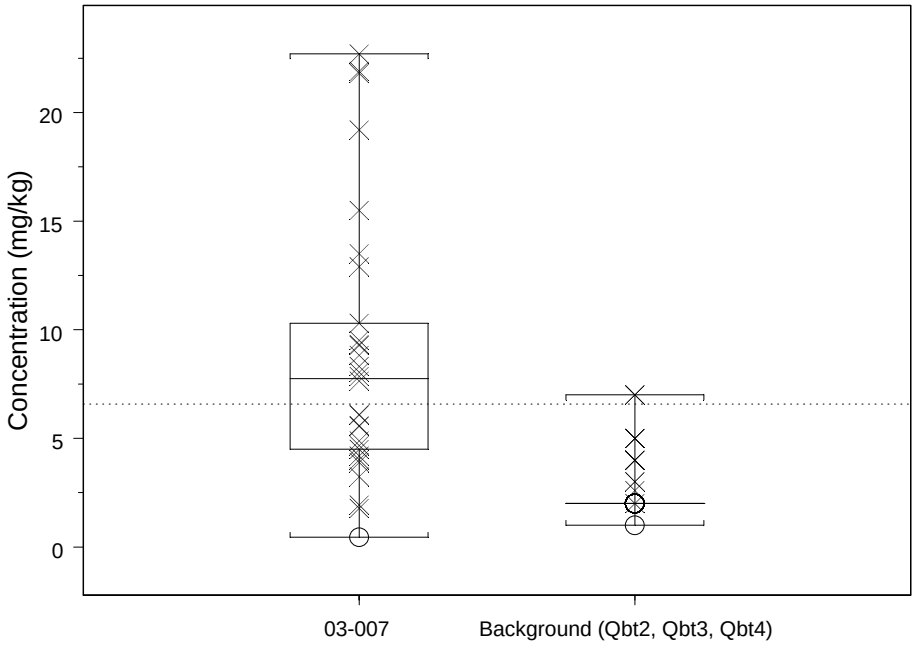


Figure I-2.5-16 Site concentrations of nickel in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

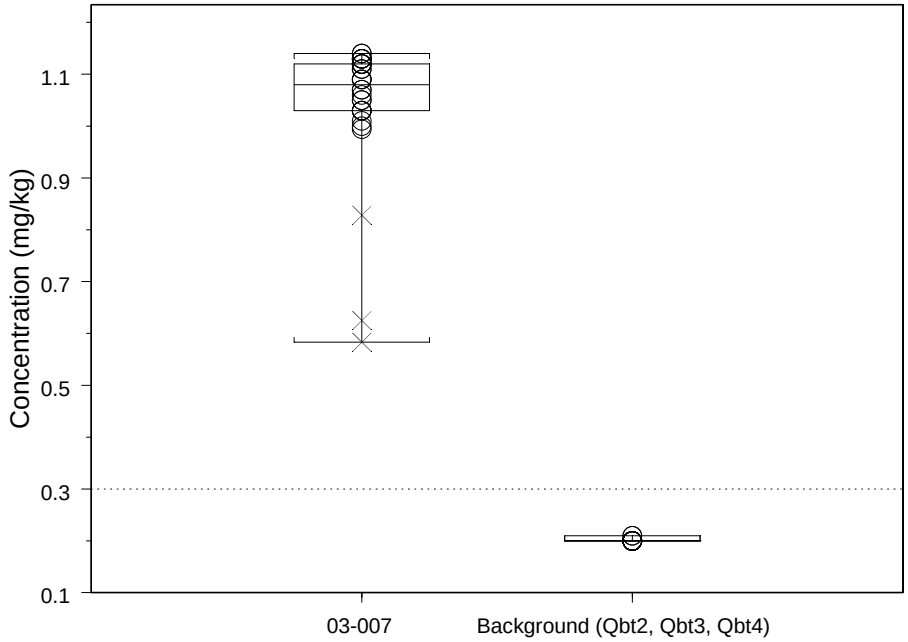


Figure I-2.5-17 Site concentrations of selenium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

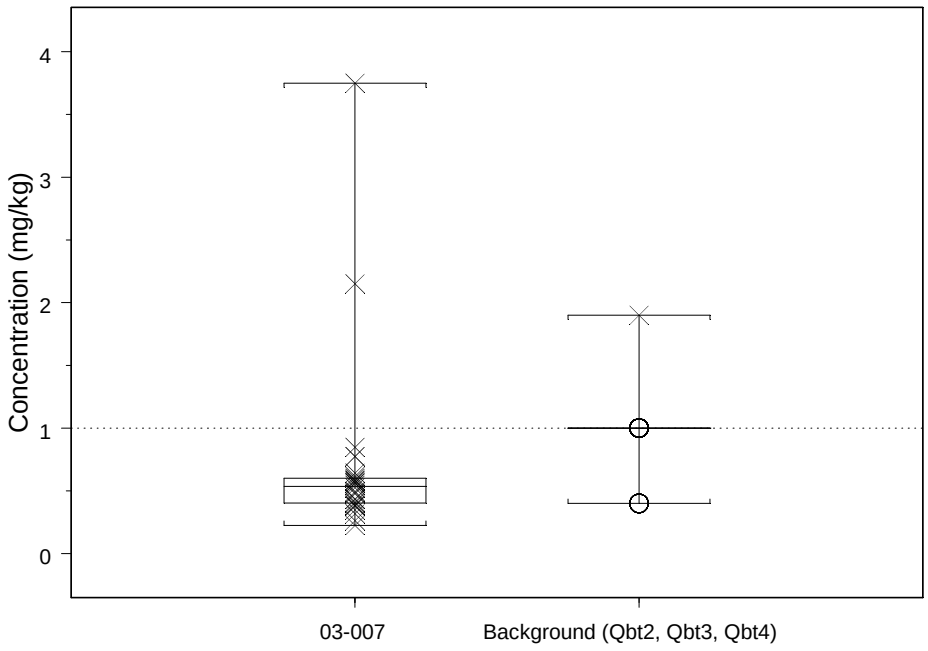


Figure I-2.5-18 Site concentrations of silver in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

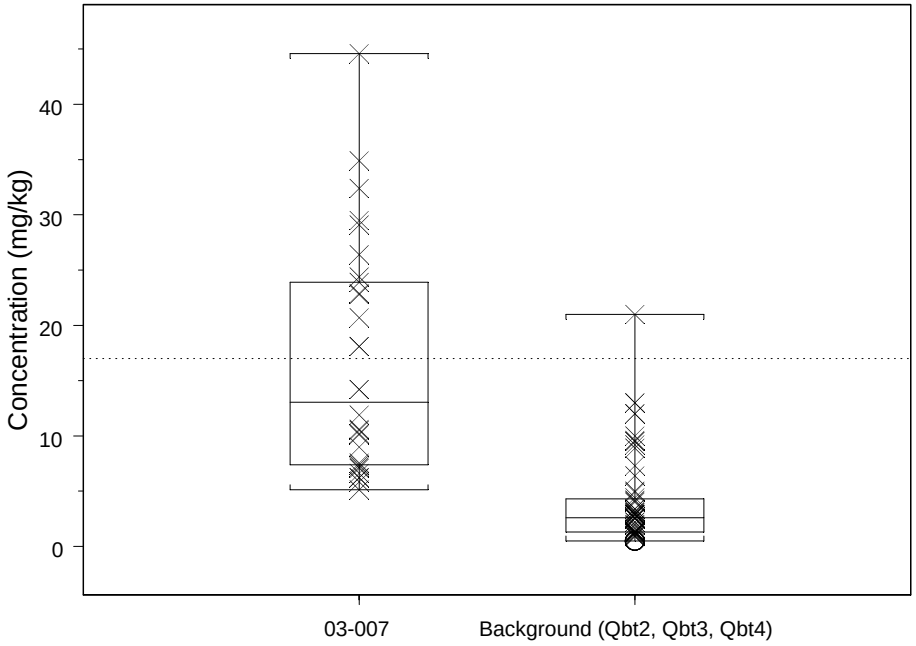


Figure I-2.5-19 Site concentrations of vanadium in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

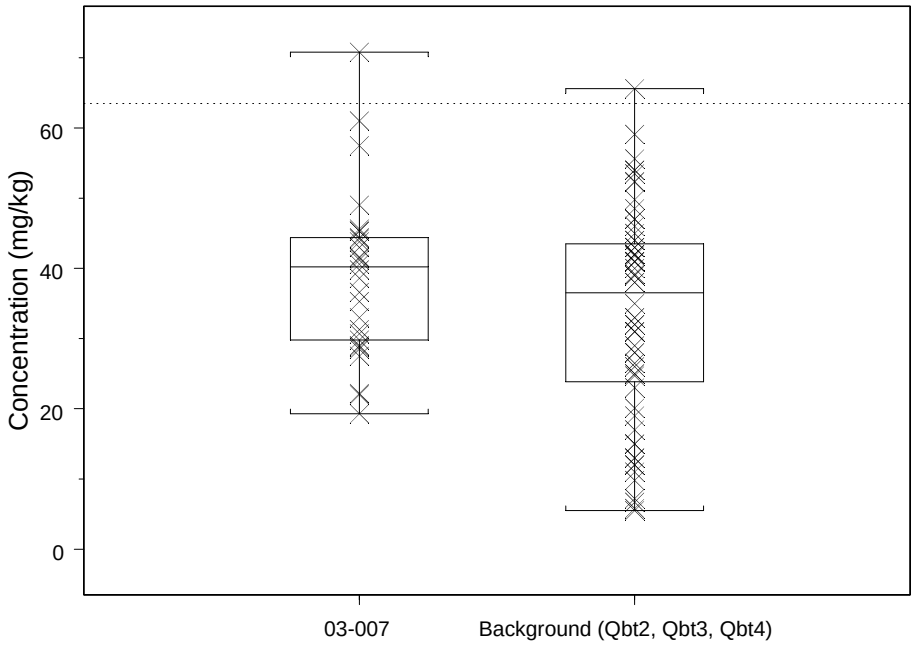


Figure I-2.5-20 Site concentrations of zinc in tuff at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

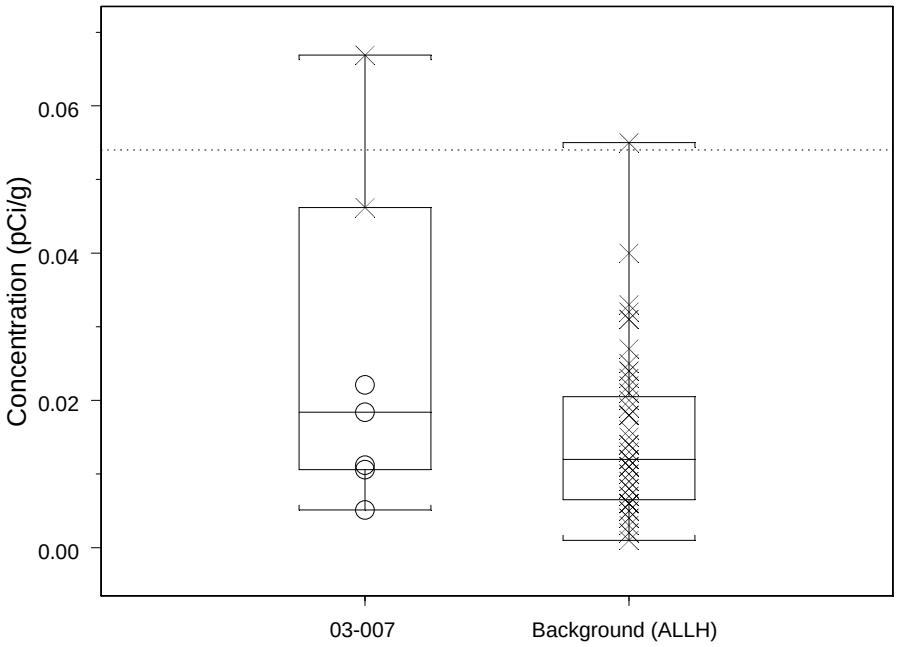


Figure I-2.5-22 Site concentrations of plutonium-239/240 in soil at AOC 03-007 compared to background
(× = detect, ○ = nondetect)

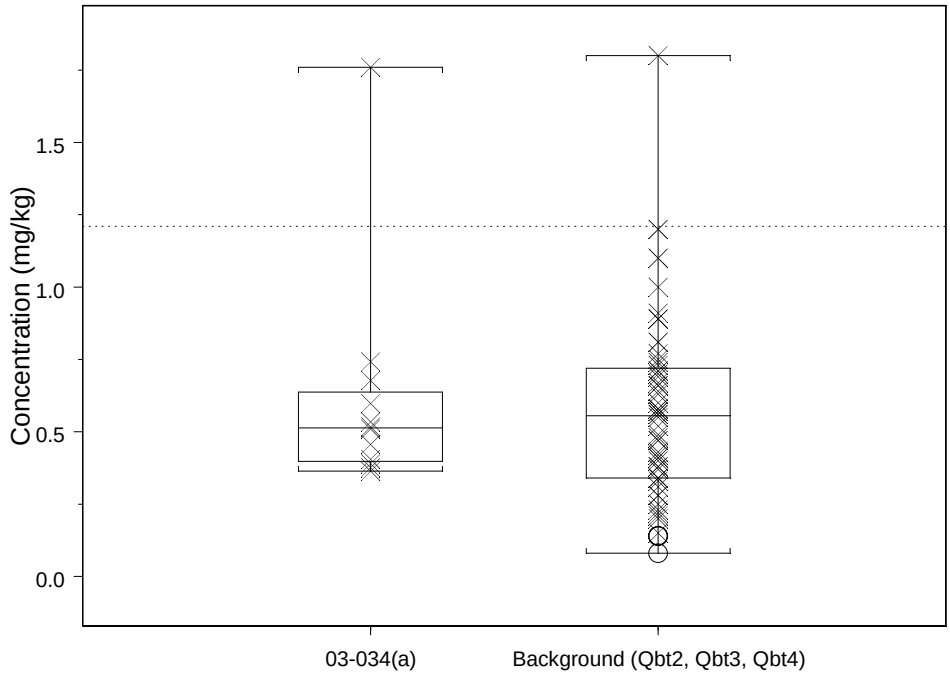


Figure I-2.11-1 Site concentrations of beryllium in tuff at SWMU 03-034(a) compared to background
(× = detect, ○ = nondetect)

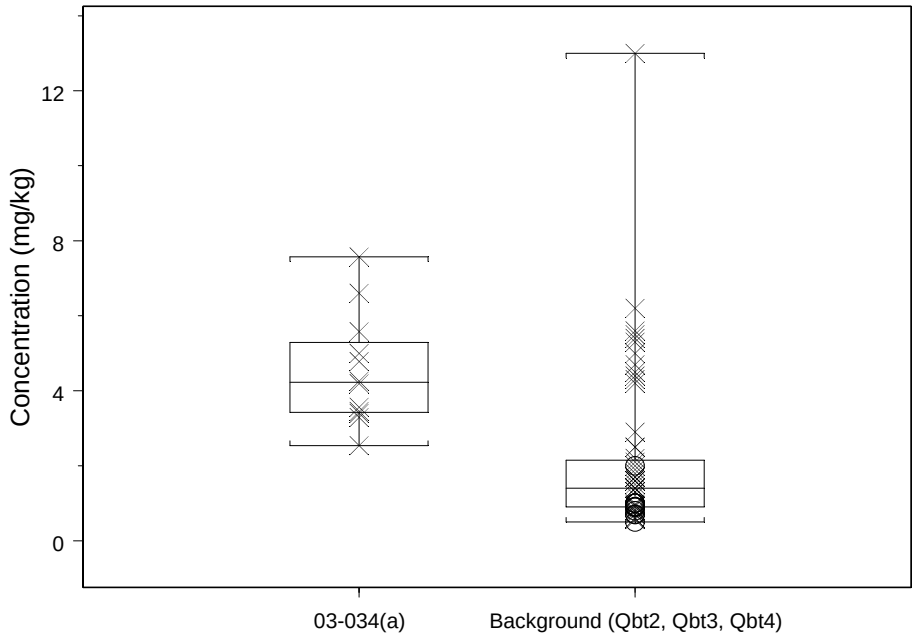


Figure I-2.11-2 Site concentrations of chromium in tuff at SWMU 03-034(a) compared to background
(× = detect, ○ = nondetect)

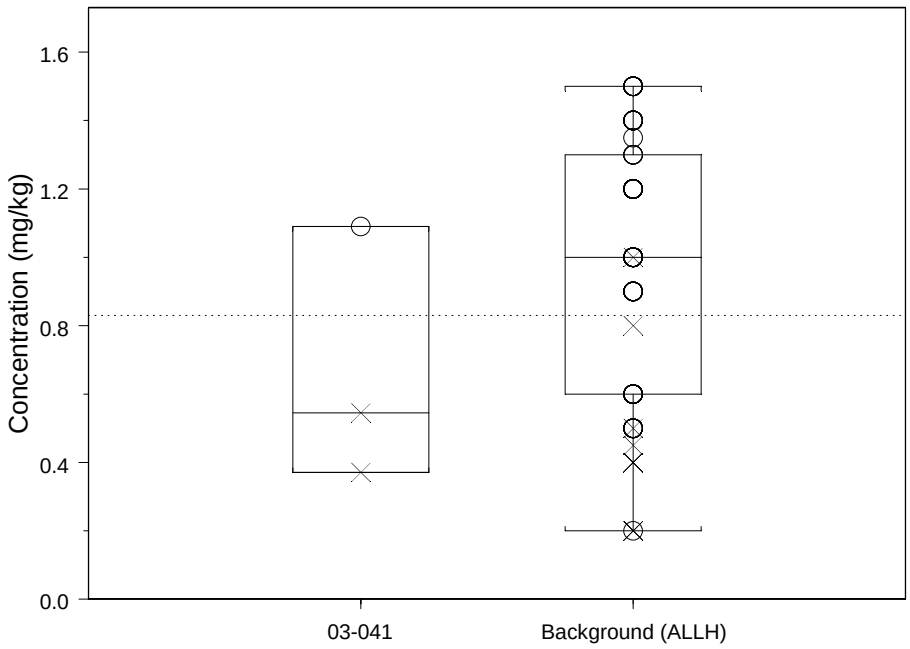


Figure I-2.13-1 Site concentrations of antimony in soil at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

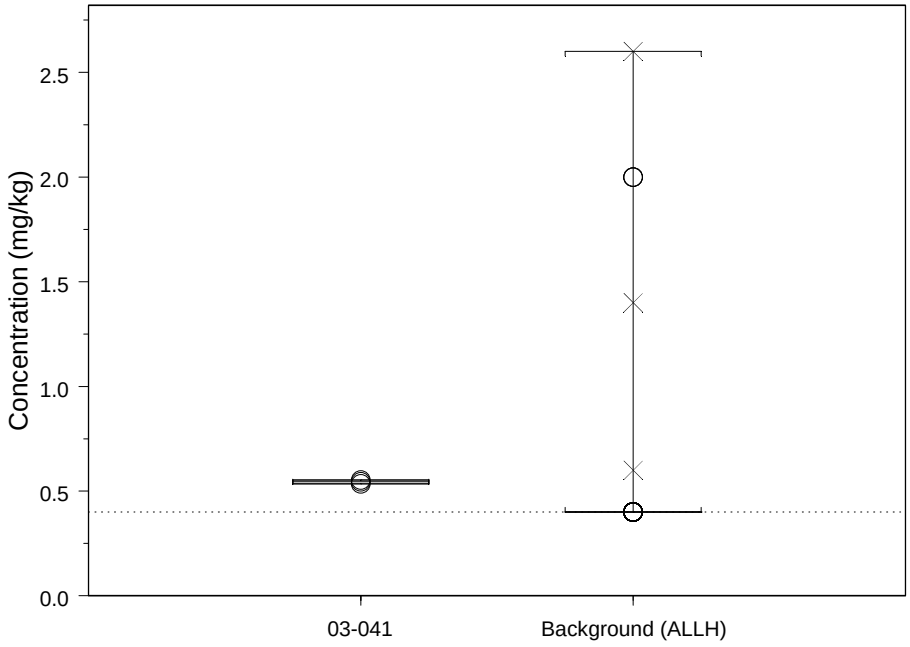


Figure I-2.13-2 Site concentrations of cadmium in soil at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

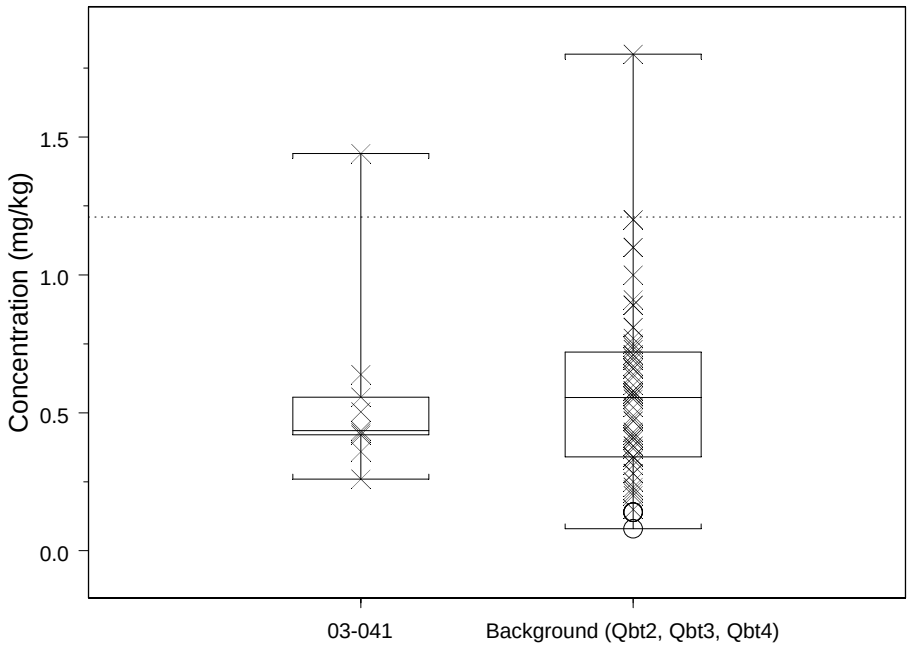


Figure I-2.13-3 Site concentrations of beryllium in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

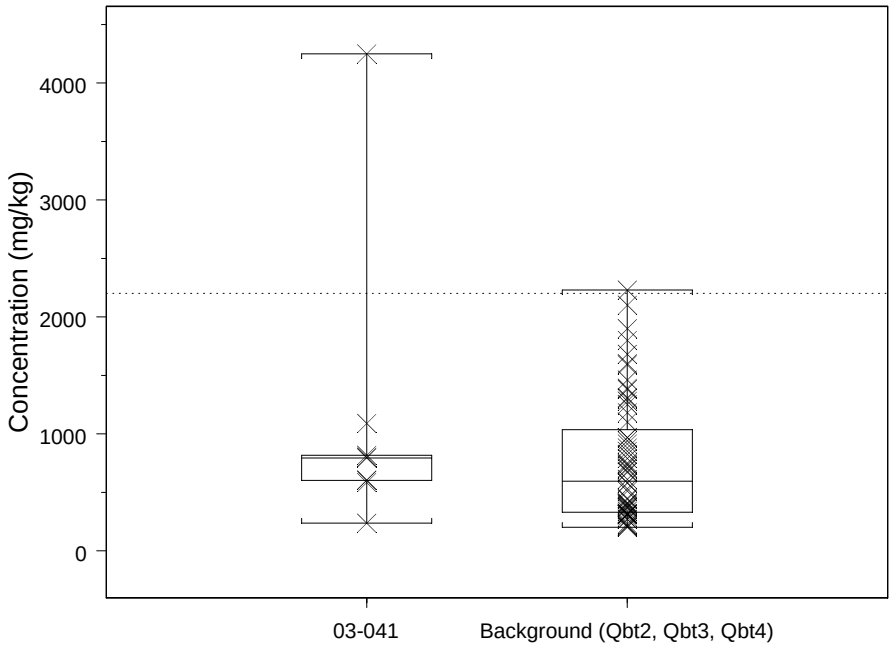


Figure I-2.13-4 Site concentrations of calcium in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

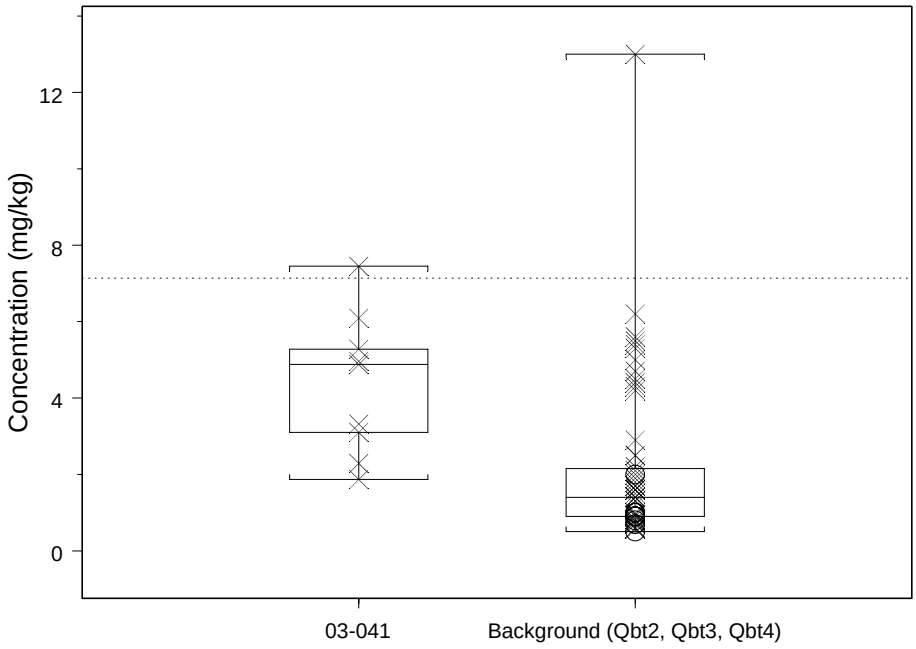


Figure I-2.13-5 Site concentrations of chromium in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

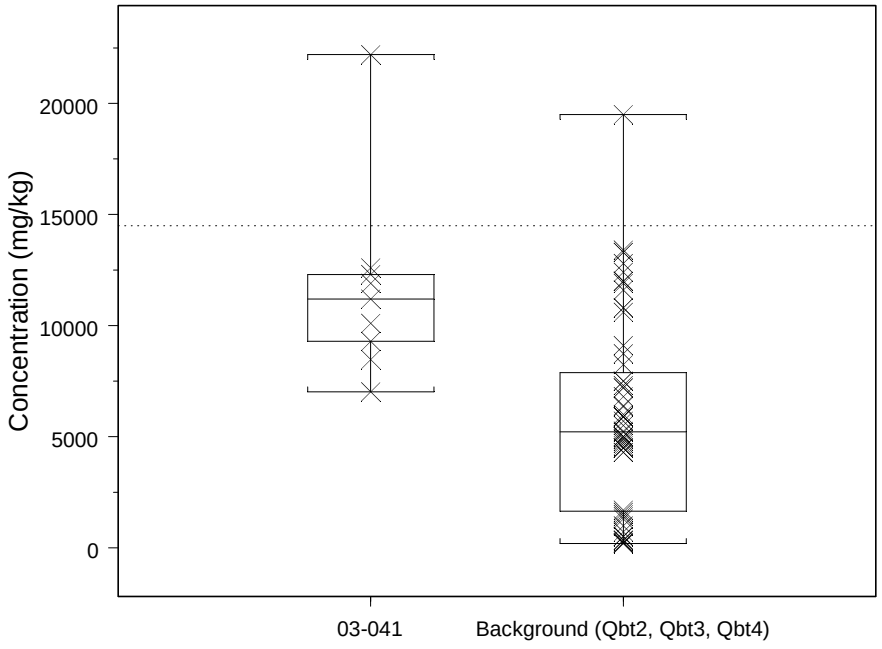


Figure I-2.13-6 Site concentrations of iron in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

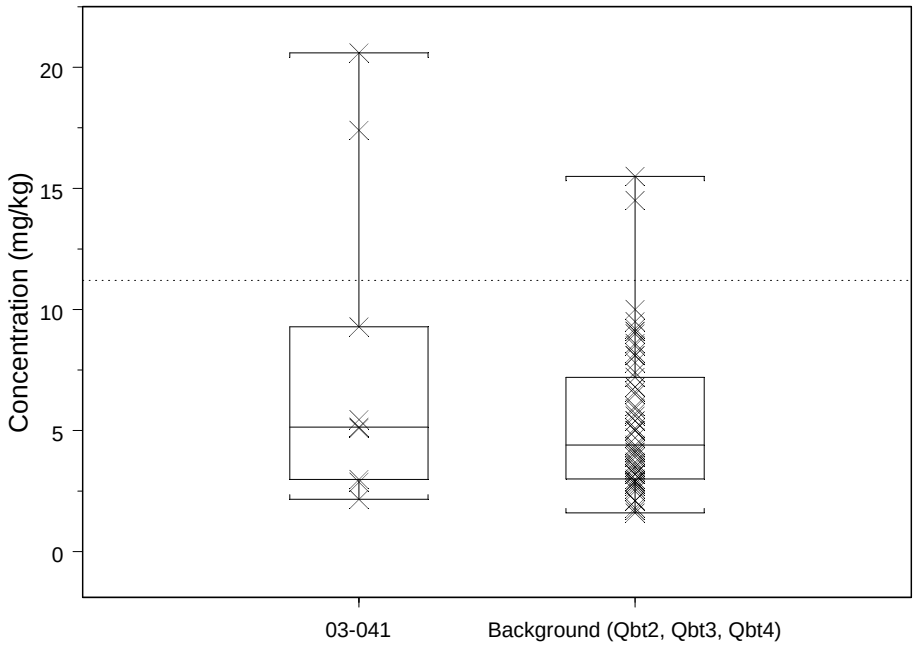


Figure I-2.13-7 Site concentrations of lead in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

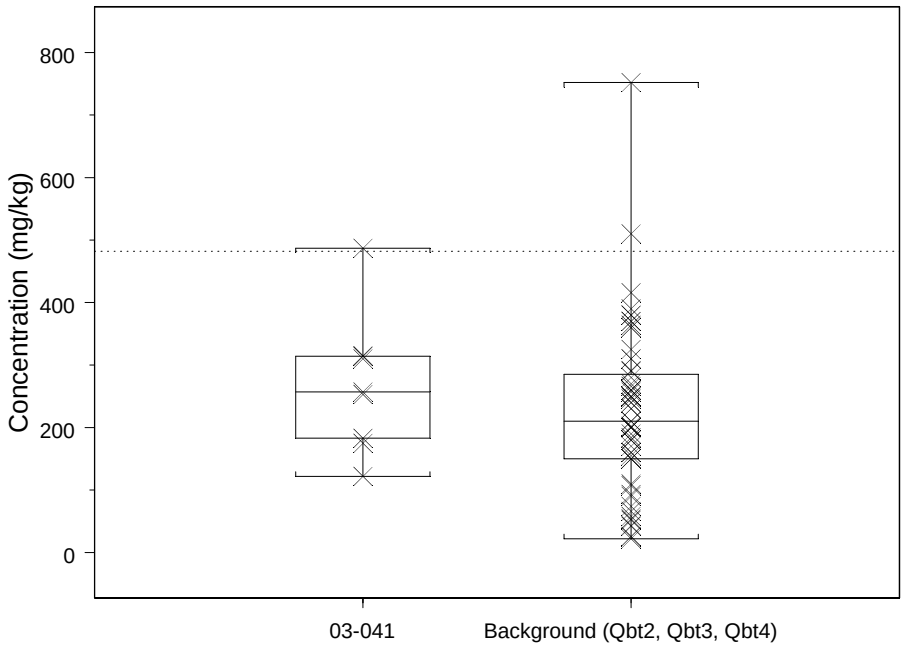


Figure I-2.13-8 Site concentrations of manganese in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

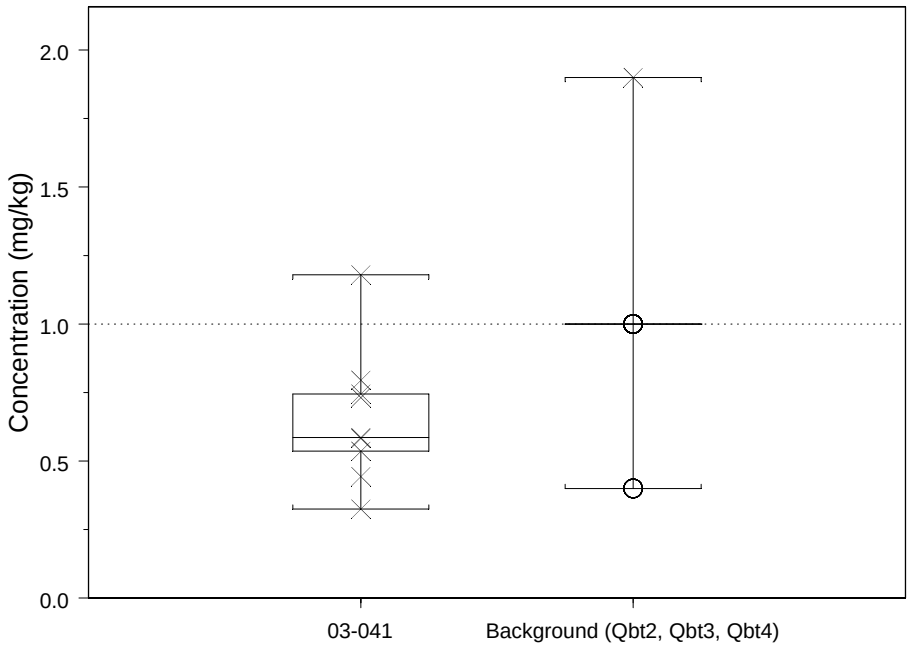


Figure I-2.13-9 Site concentrations of silver in tuff at AOC 03-041 compared to background
(× = detect, ○ = nondetect)

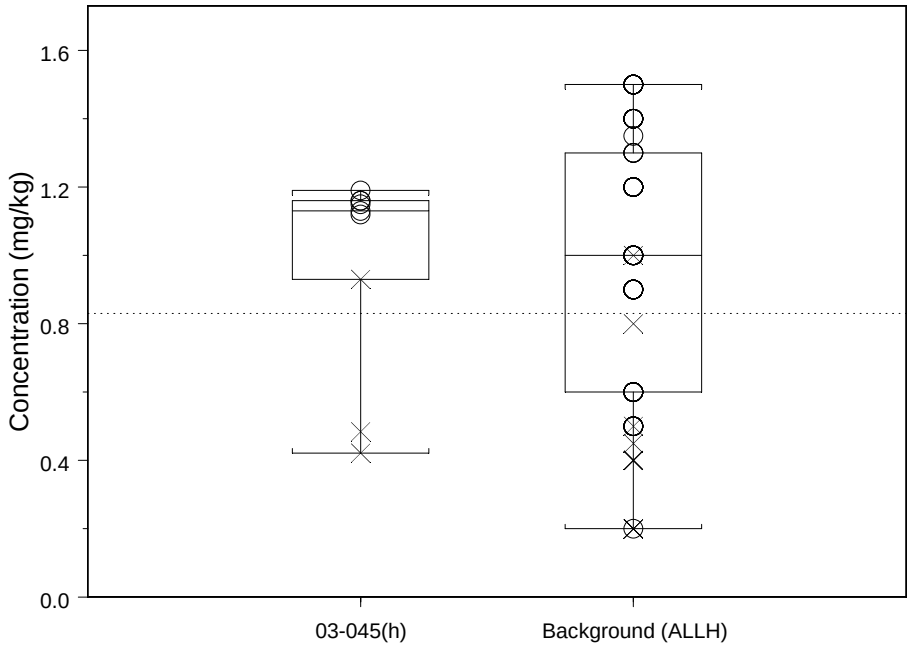


Figure I-2.14-1 Site concentrations of antimony in soil at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

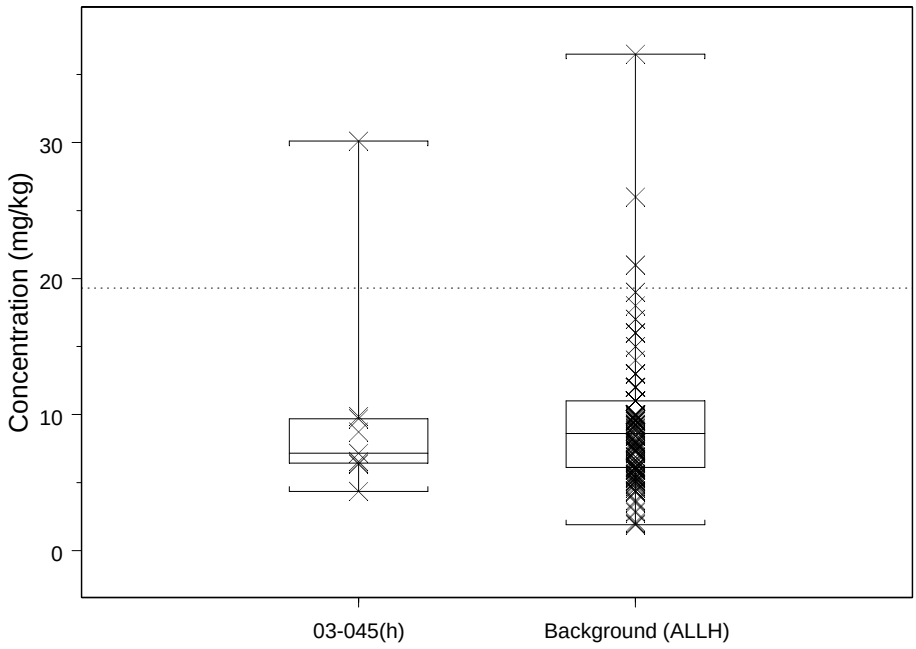


Figure I-2.14-2 Site concentrations of chromium in soil at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

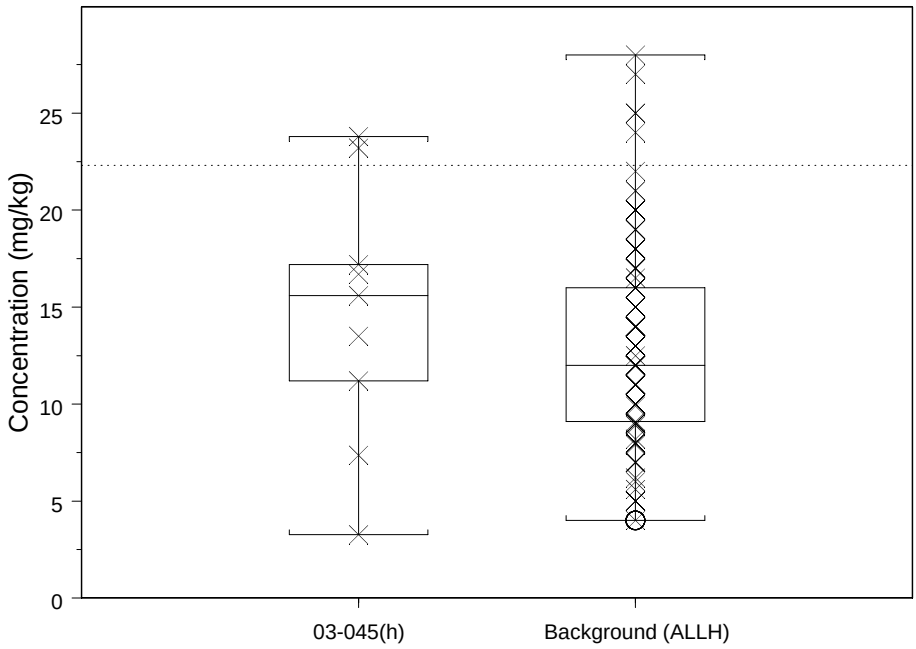


Figure I-2.14-3 Site concentrations of lead in soil at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

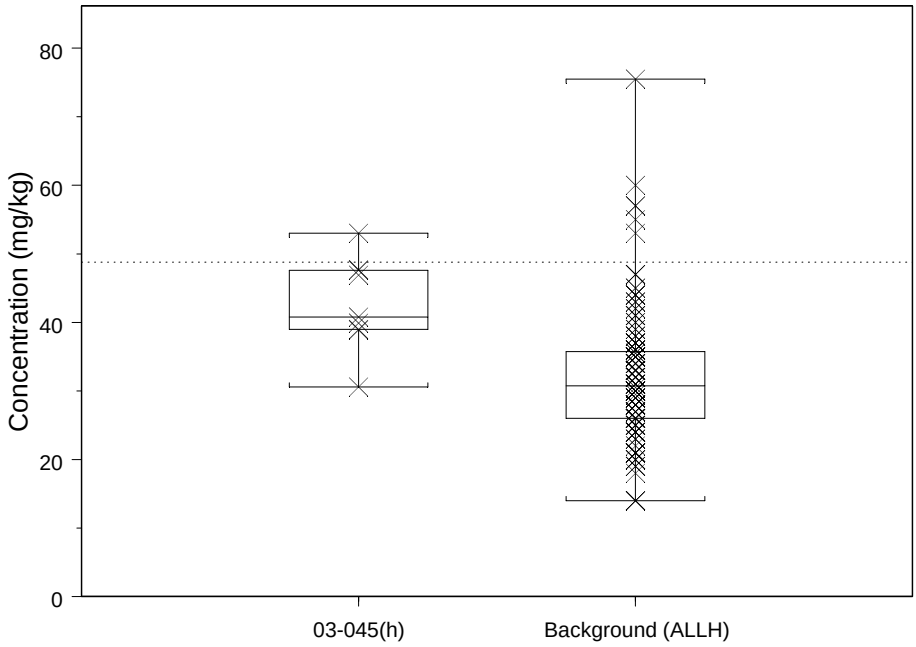


Figure I-2.14-4 Site concentrations of zinc in soil at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

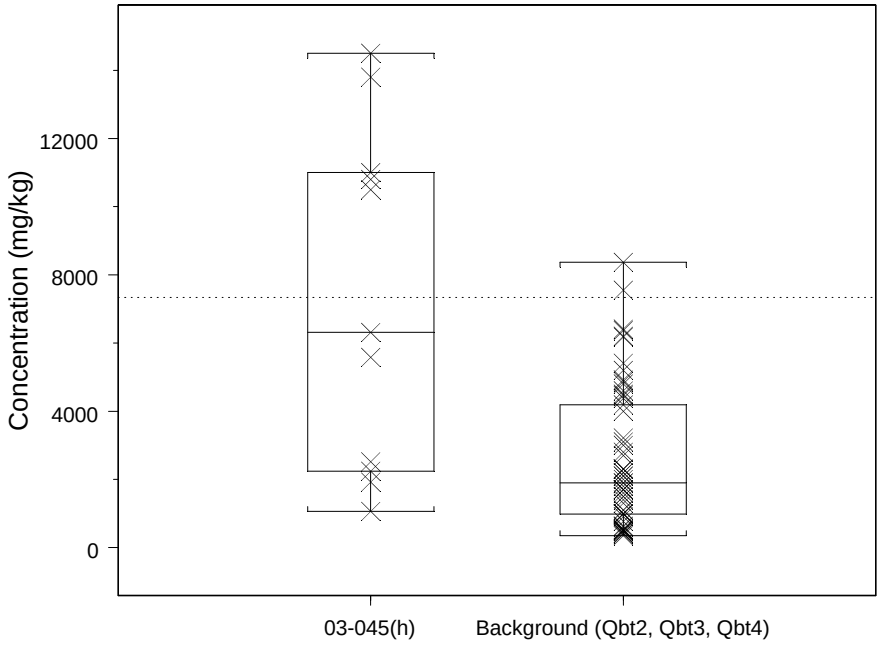


Figure I-2.14-5 Site concentrations of aluminum in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

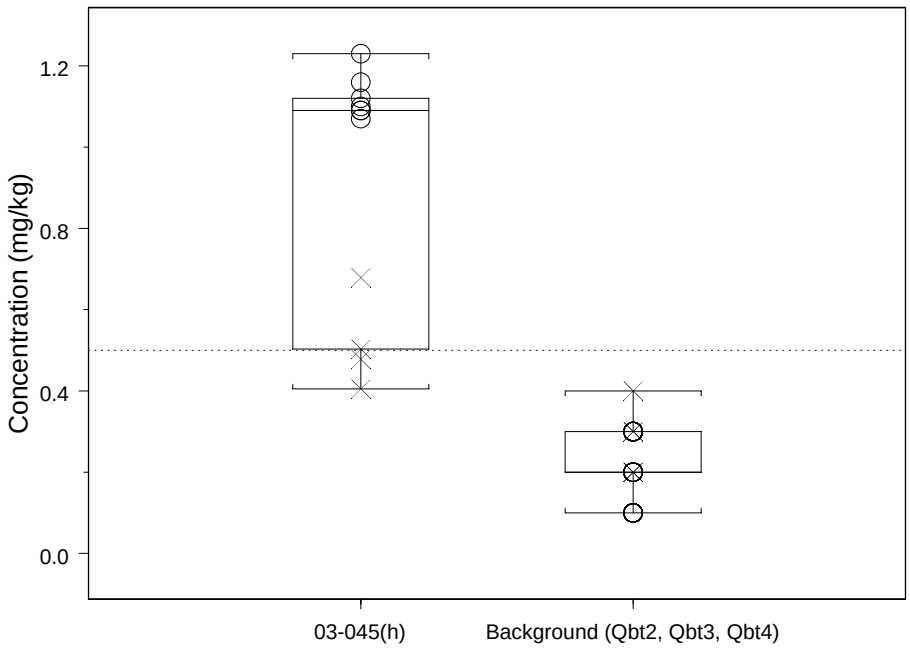


Figure I-2.14-6 Site concentrations of antimony in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

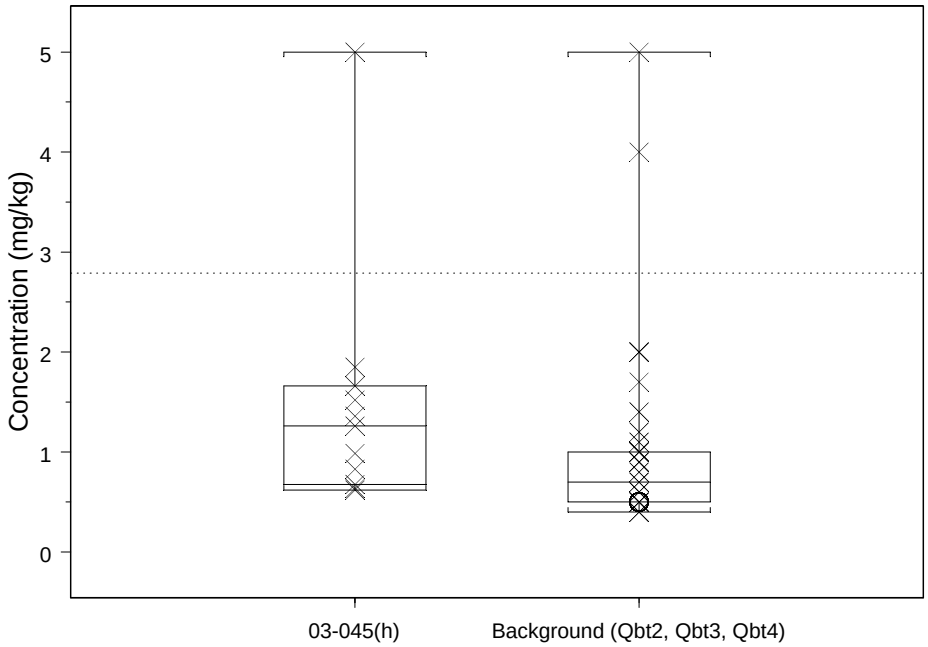


Figure I-2.14-7 Site concentrations of arsenic in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

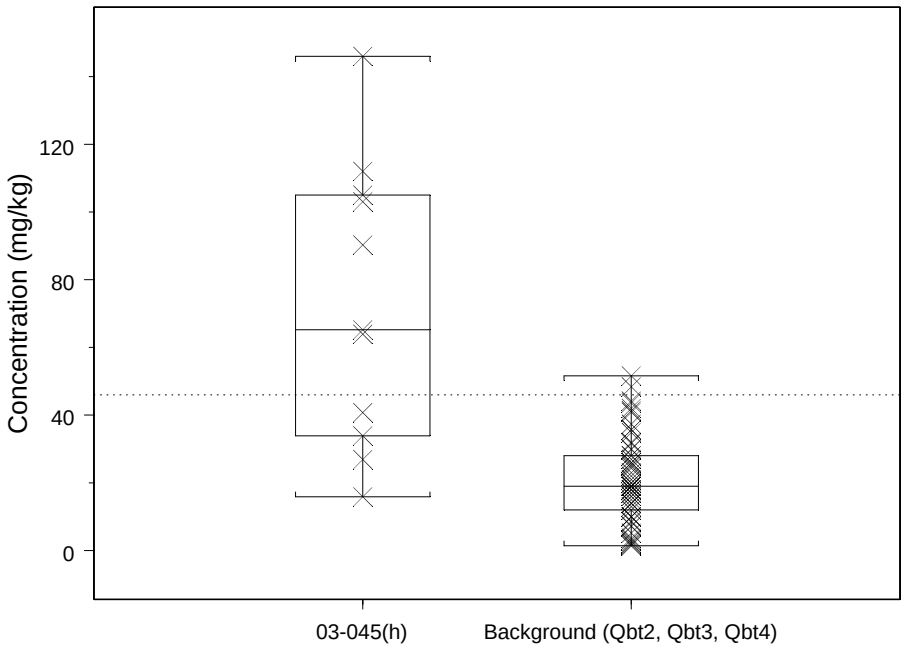


Figure I-2.14-8 Site concentrations of barium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

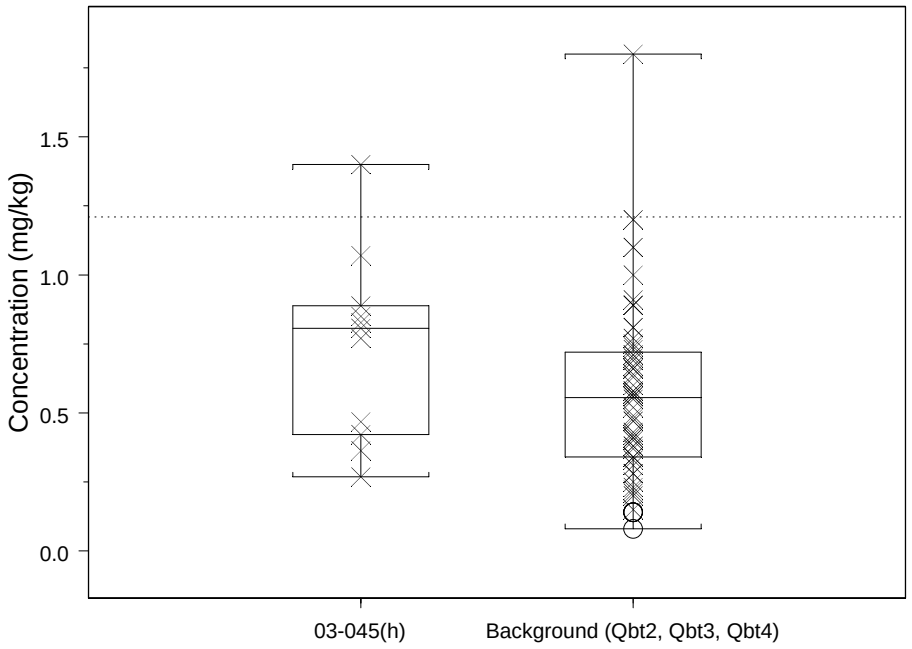


Figure I-2.14-9 Site concentrations of beryllium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

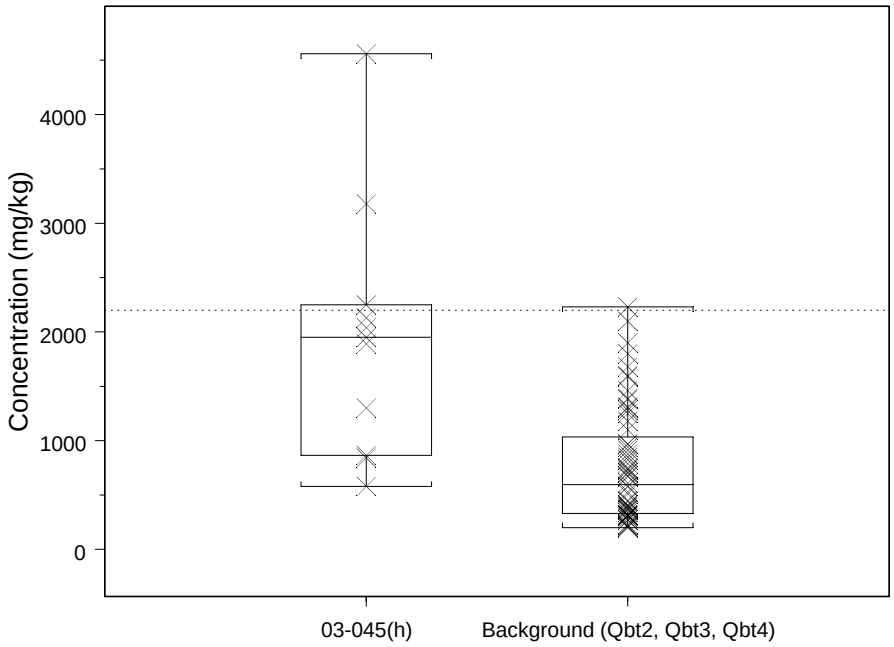


Figure I-2.14-10 Site concentrations of calcium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

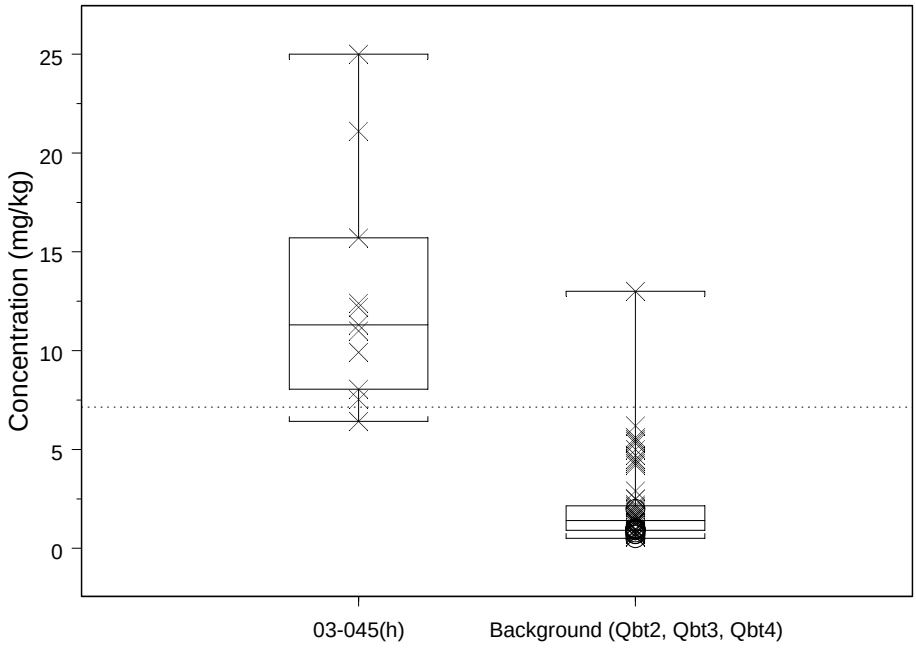


Figure I-2.14-11 Site concentrations of chromium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

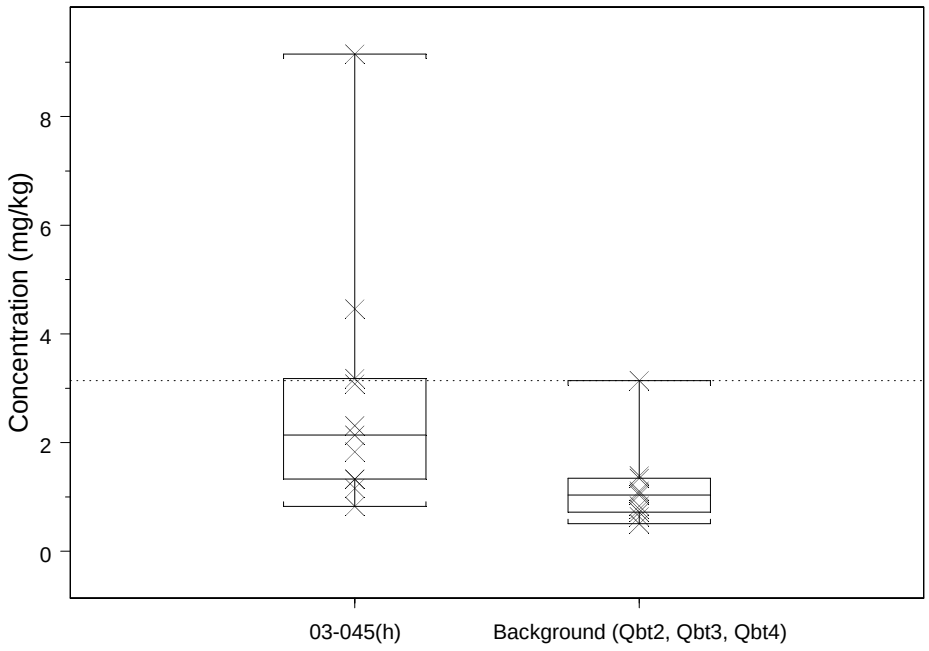


Figure I-2.14-12 Site concentrations of cobalt in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

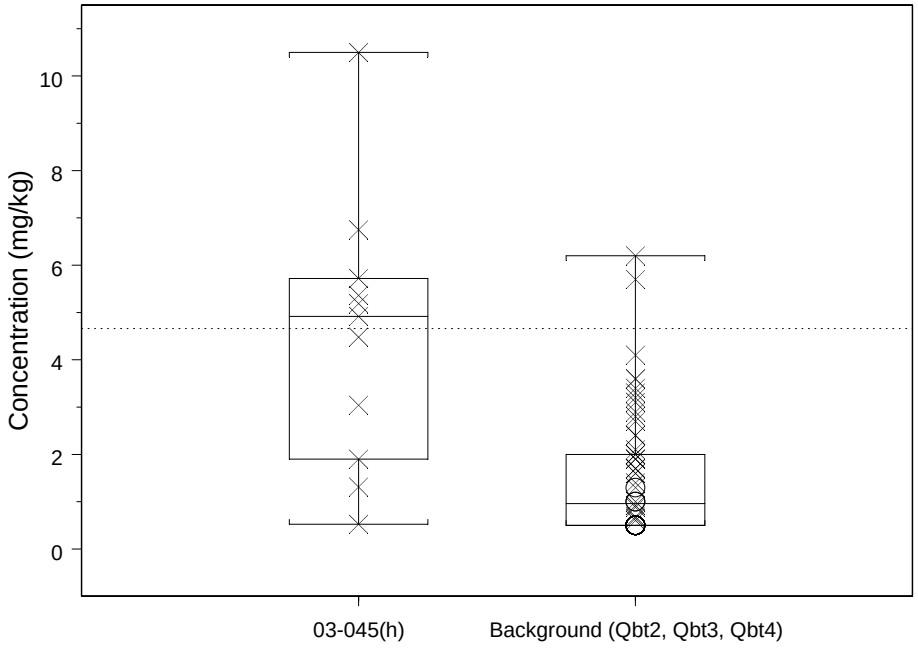


Figure I-2.14-13 Site concentrations of copper in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

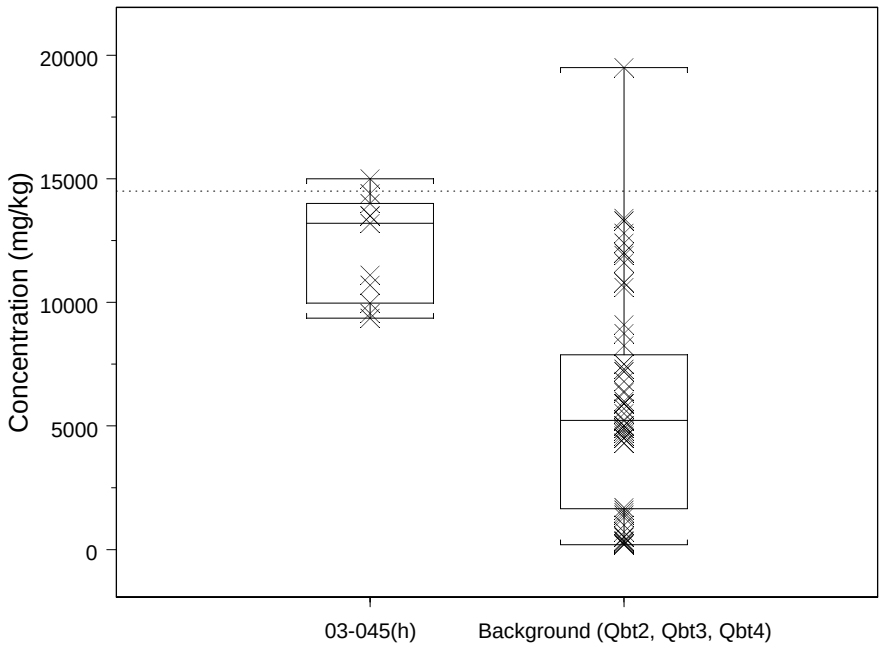


Figure I-2.14-14 Site concentrations of iron in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

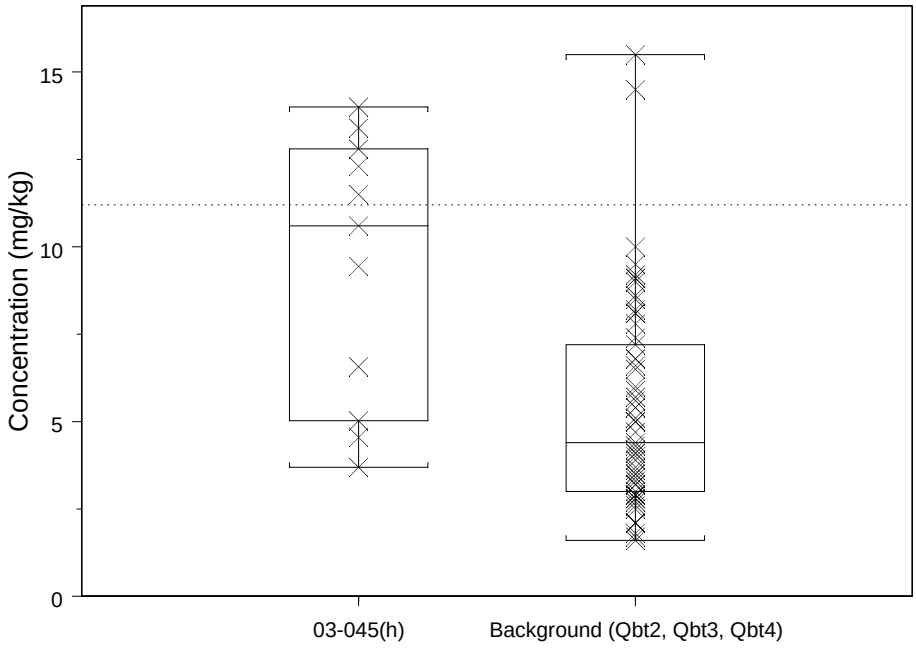


Figure I-2.14-15 Site concentrations of lead in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

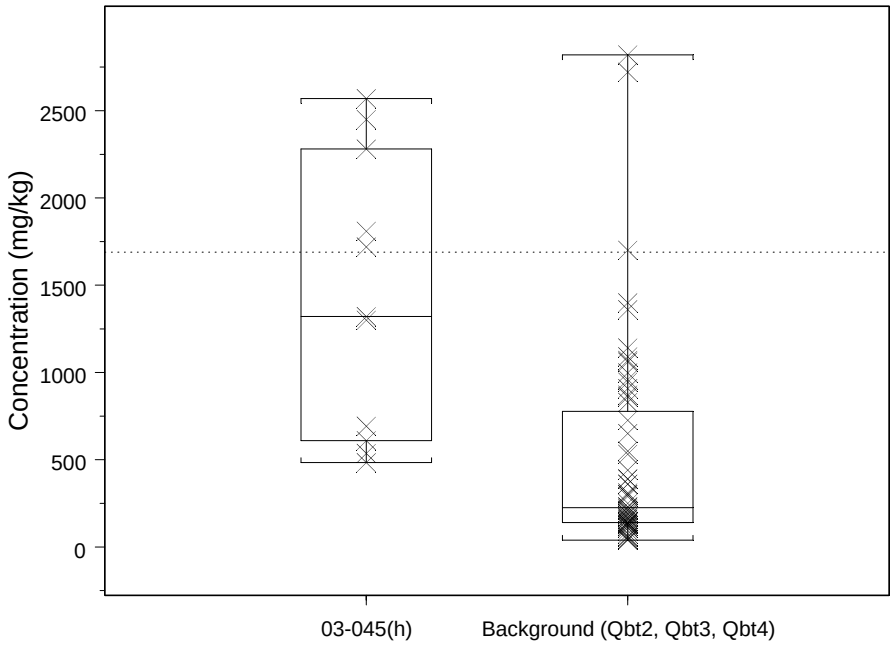


Figure I-2.14-16 Site concentrations of magnesium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

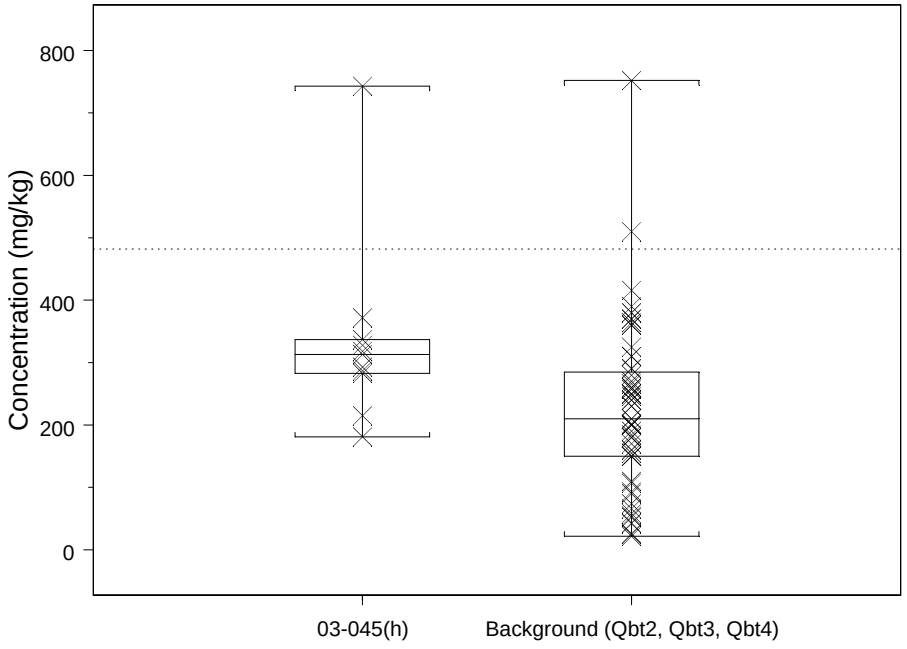


Figure I-2.14-17 Site concentrations of manganese in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

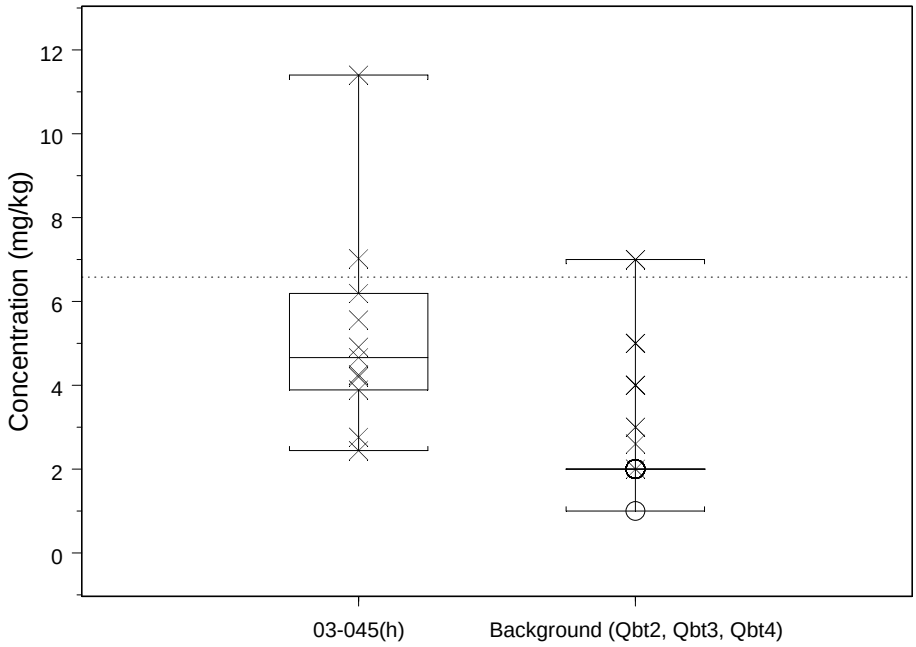


Figure I-2.14-18 Site concentrations of nickel in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

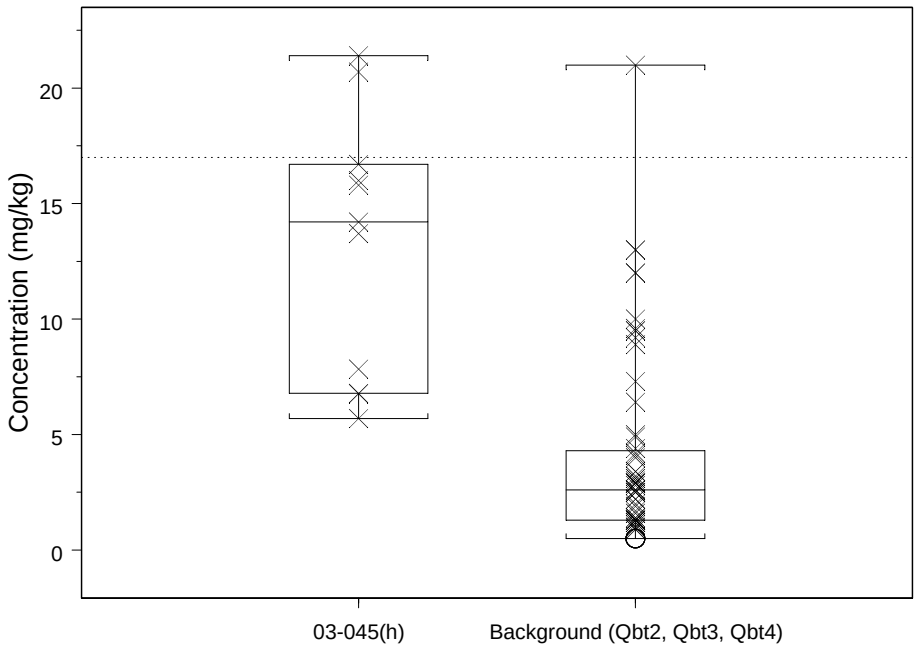


Figure I-2.14-19 Site concentrations of vanadium in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

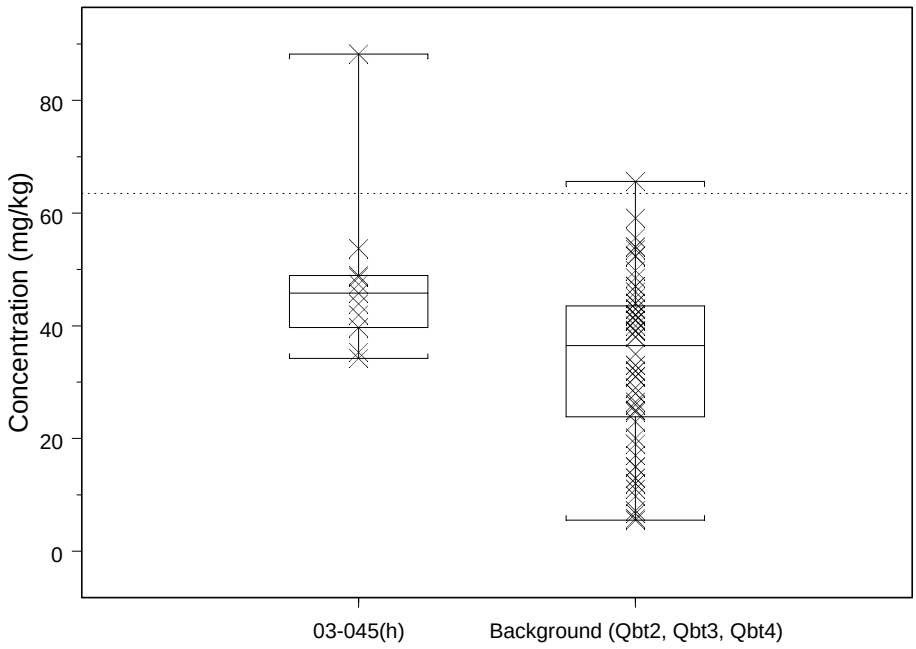


Figure I-2.14-20 Site concentrations of zinc in tuff at SWMU 03-045(h) compared to background
(× = detect, ○ = nondetect)

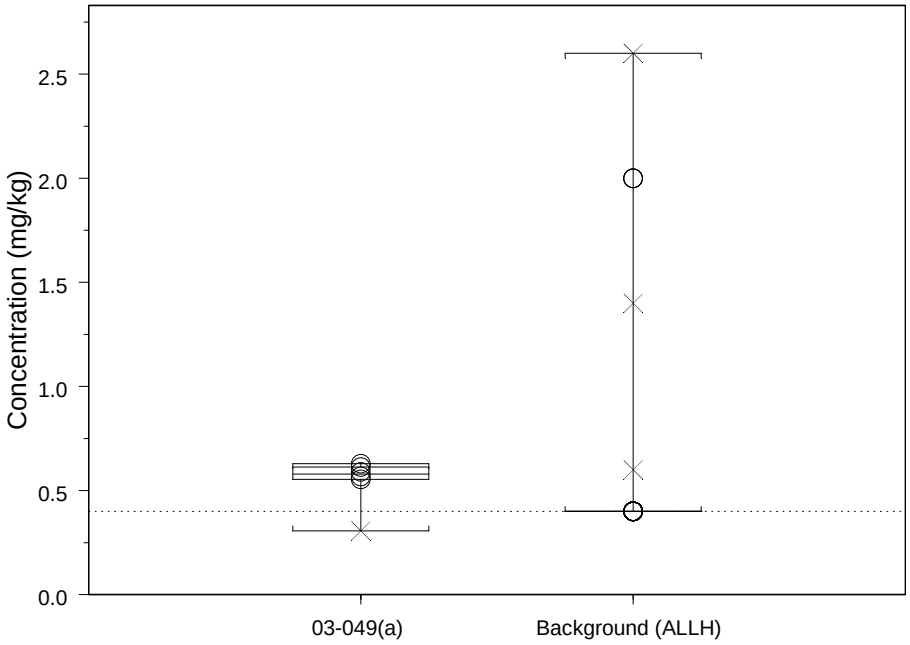


Figure I-2.15-1 Site concentrations of cadmium in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

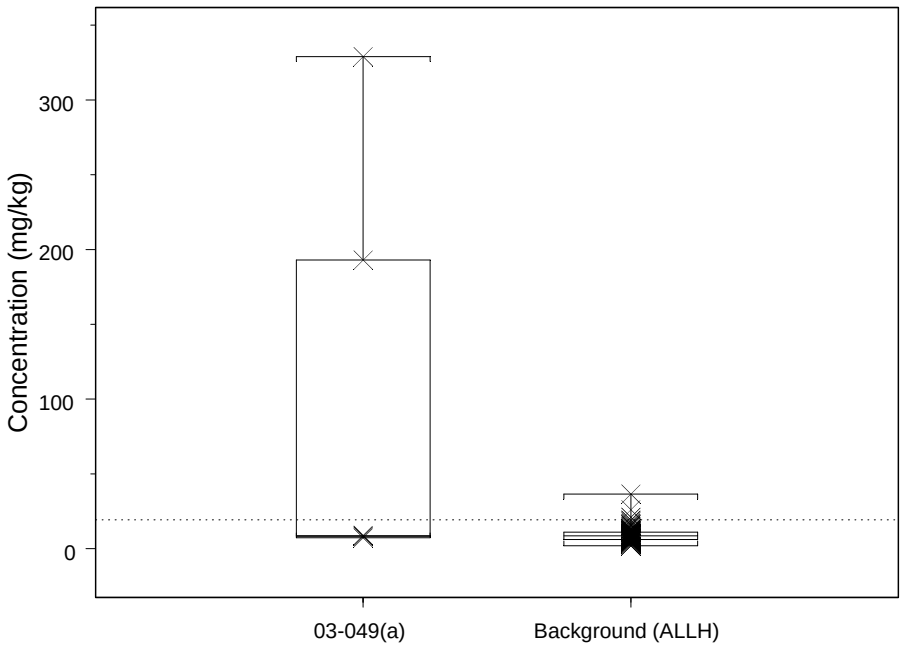


Figure I-2.15-2 Site concentrations of chromium in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

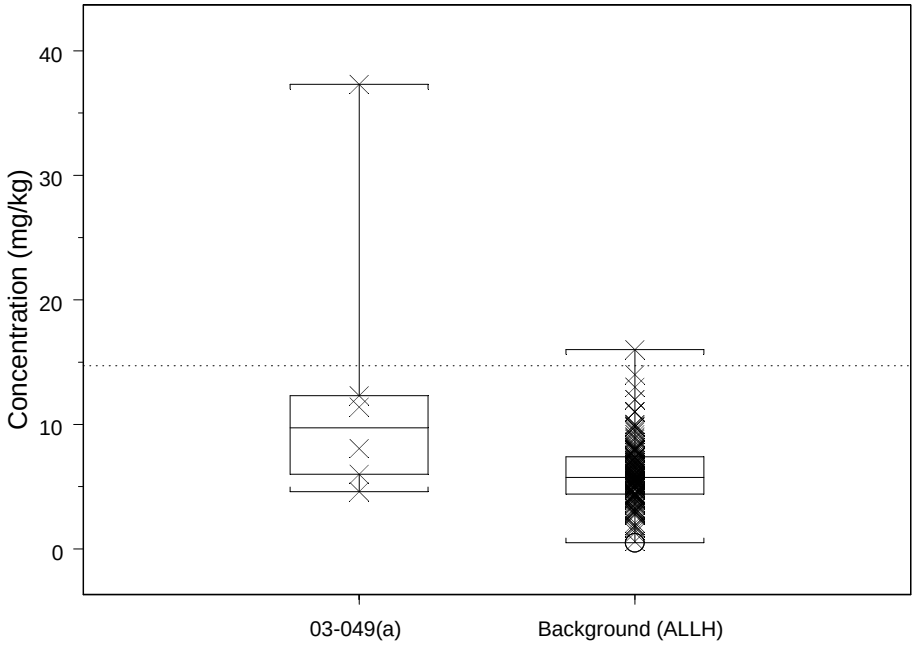


Figure I-2.15-3 Site concentrations of copper in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

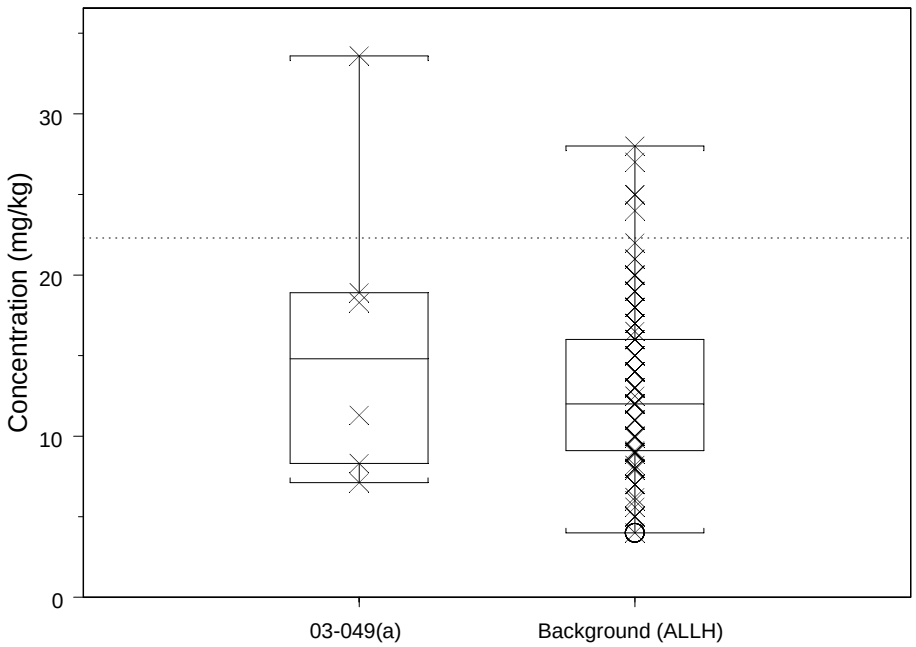


Figure I-2.15-4 Site concentrations of lead in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

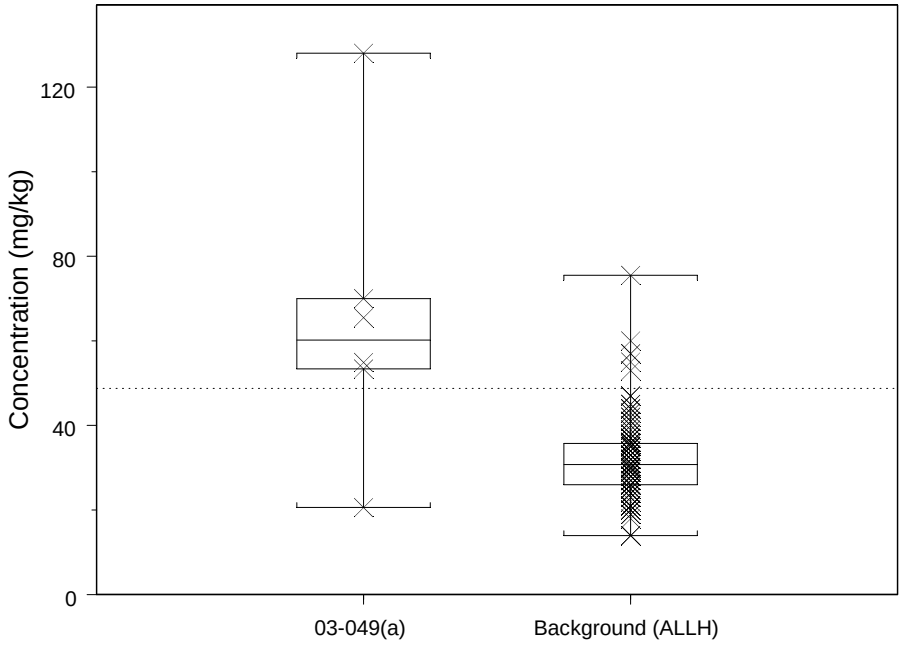


Figure I-2.15-5 Site concentrations of zinc in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

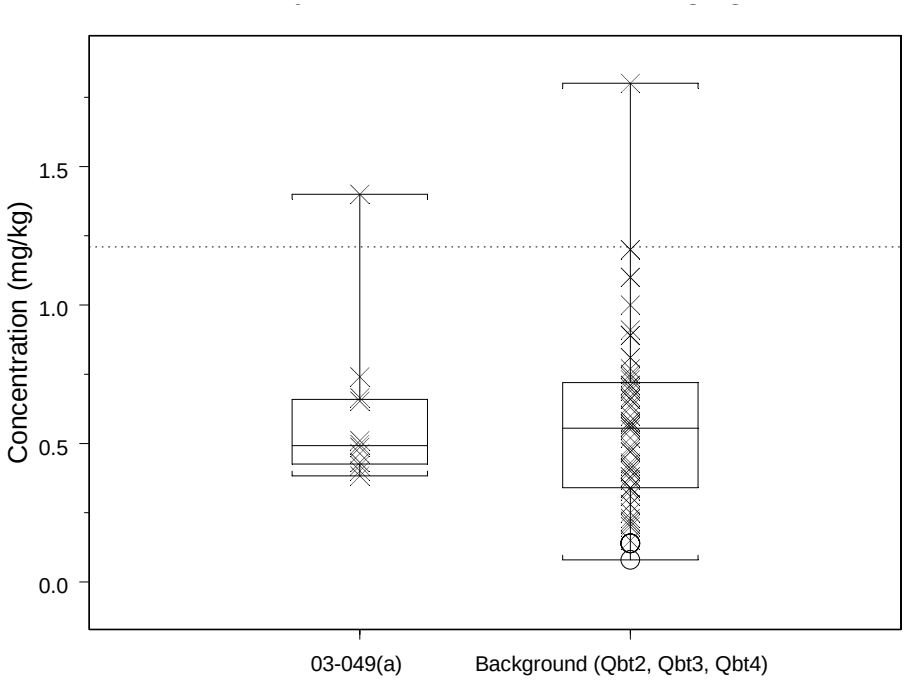


Figure I-2.15-6 Site concentrations of beryllium in tuff at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

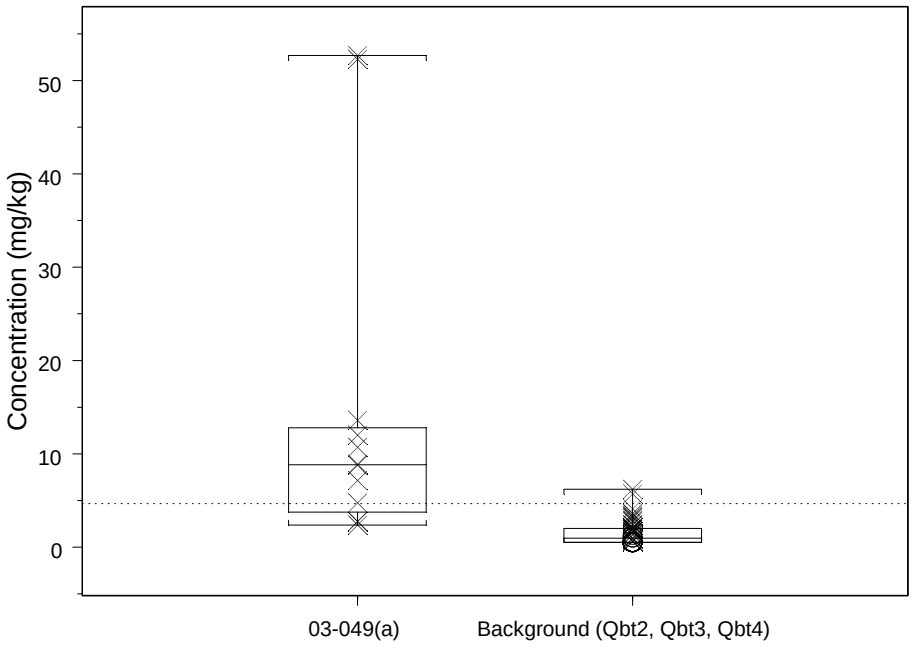


Figure I-2.15-7 Site concentrations of copper in tuff at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

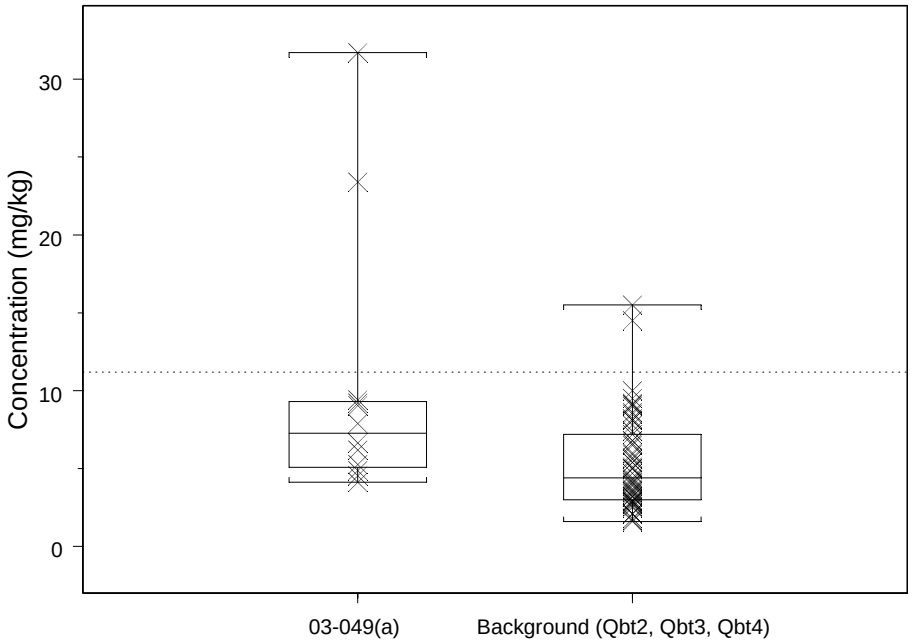


Figure I-2.15-8 Site concentrations of lead in tuff at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

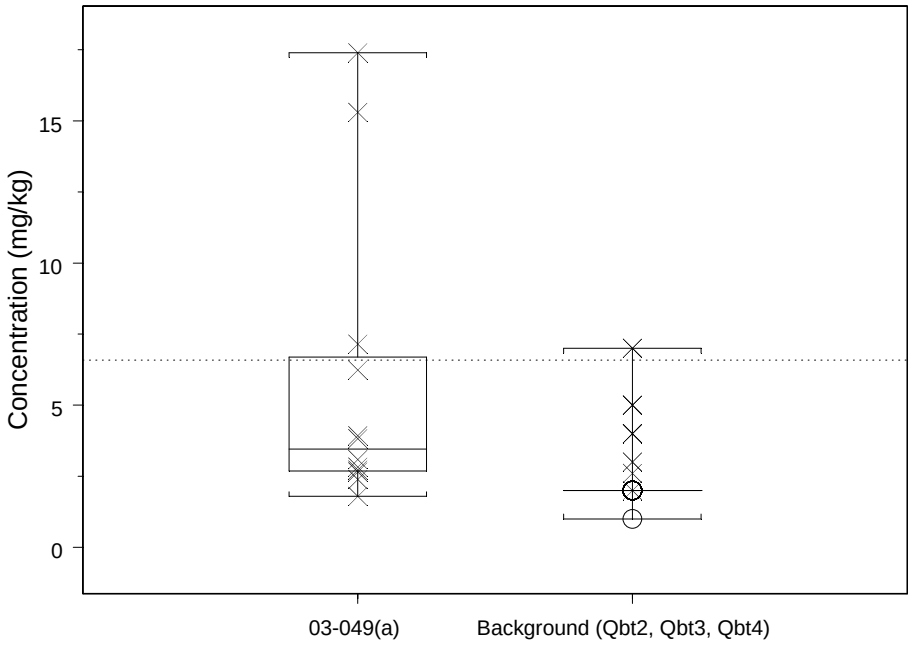


Figure I-2.15-9 Site concentrations of nickel in tuff at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

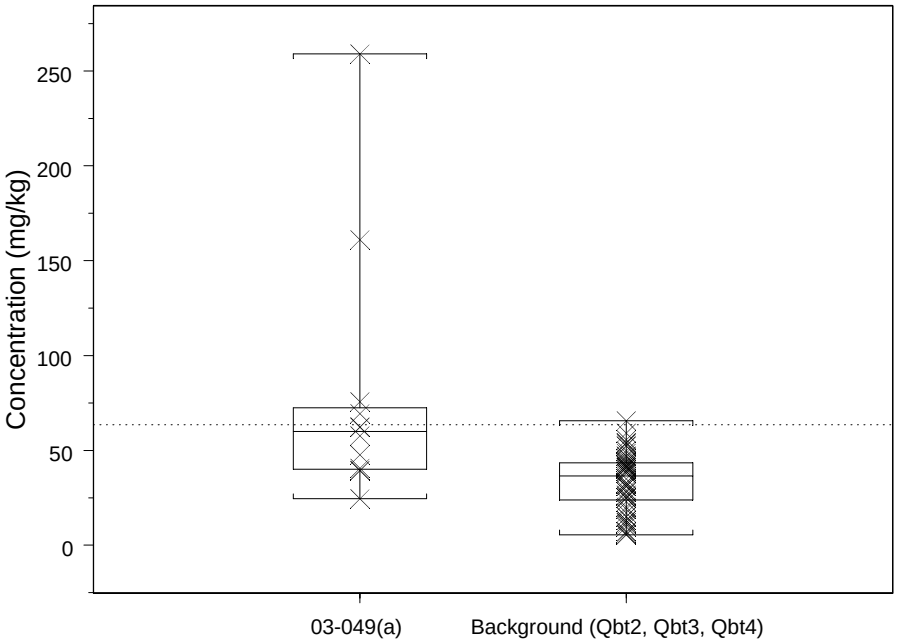


Figure I-2.15-10 Site concentrations of zinc in tuff at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

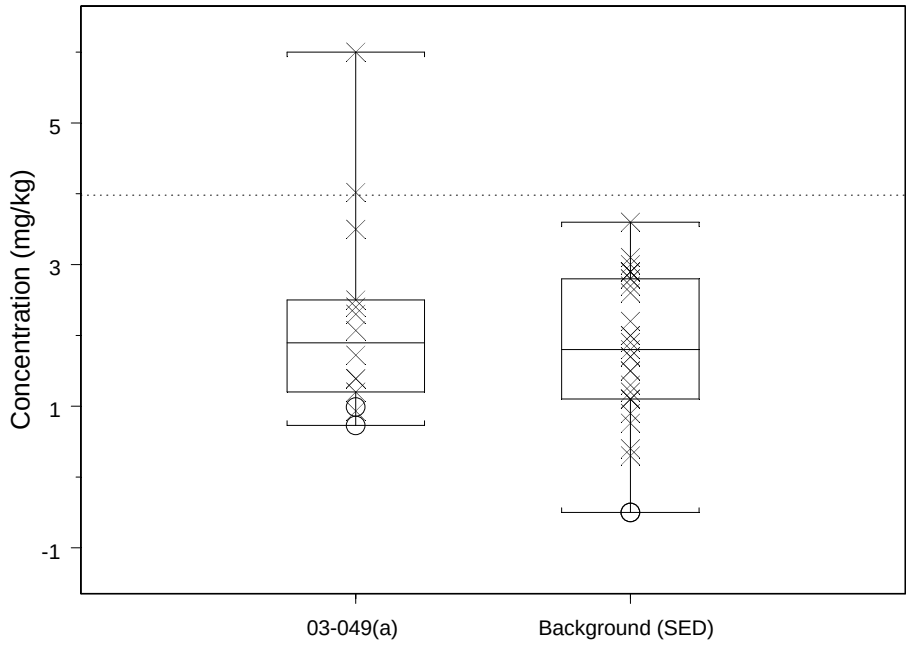


Figure I-2.15-11 Site concentrations of arsenic in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

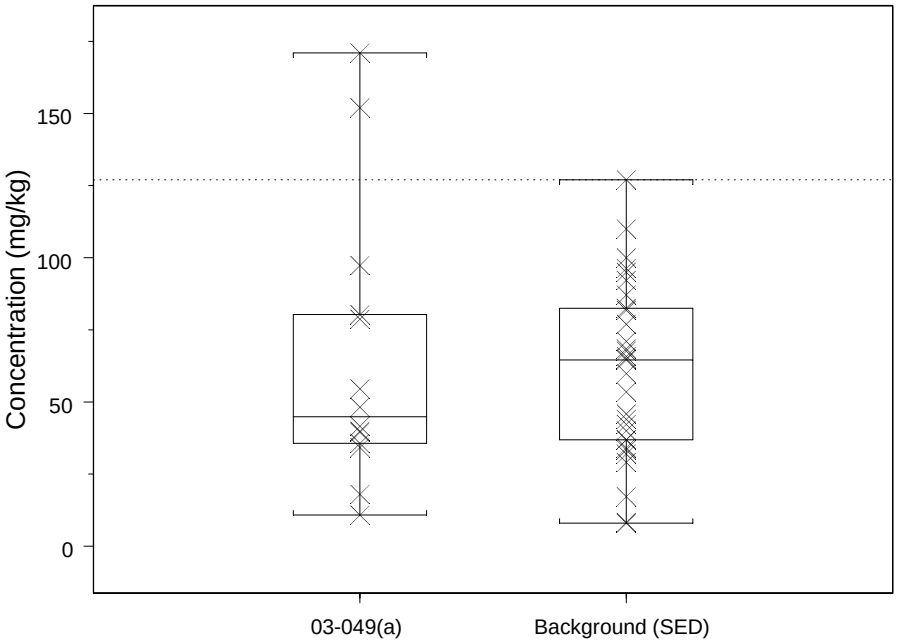


Figure I-2.15-12 Site concentrations of barium in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

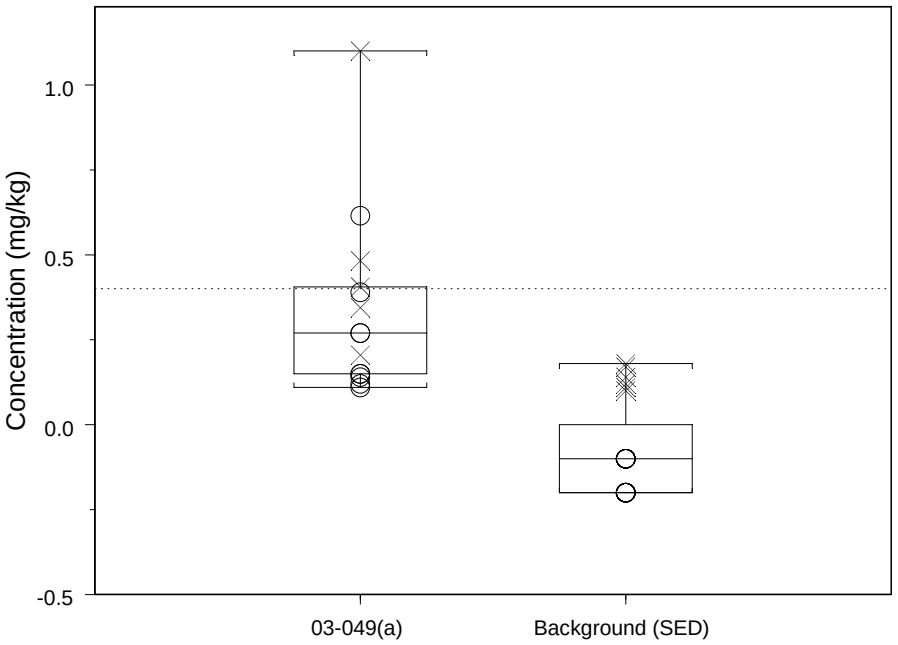


Figure I-2.15-13 Site concentrations of cadmium in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

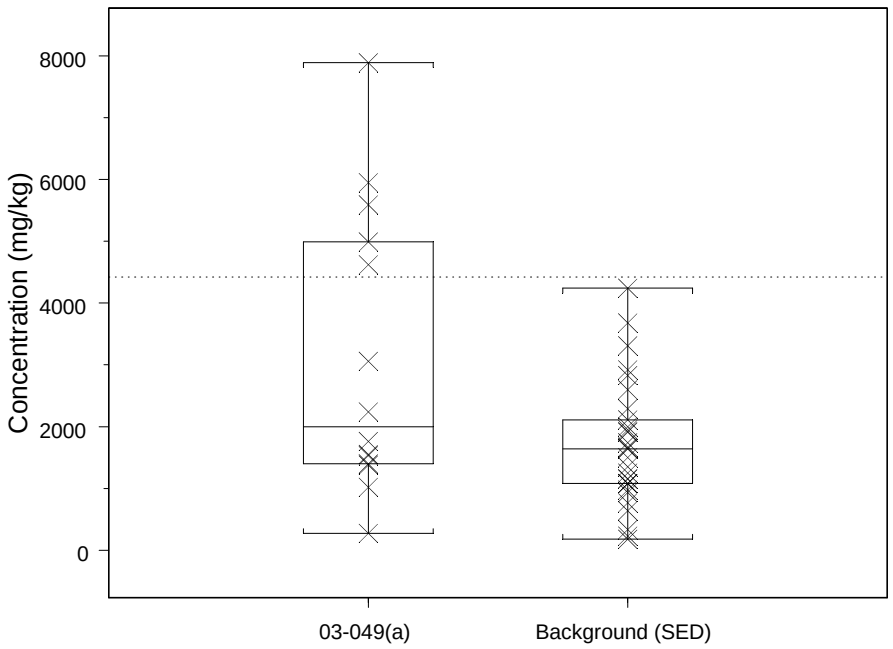


Figure I-2.15-14 Site concentrations of calcium in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

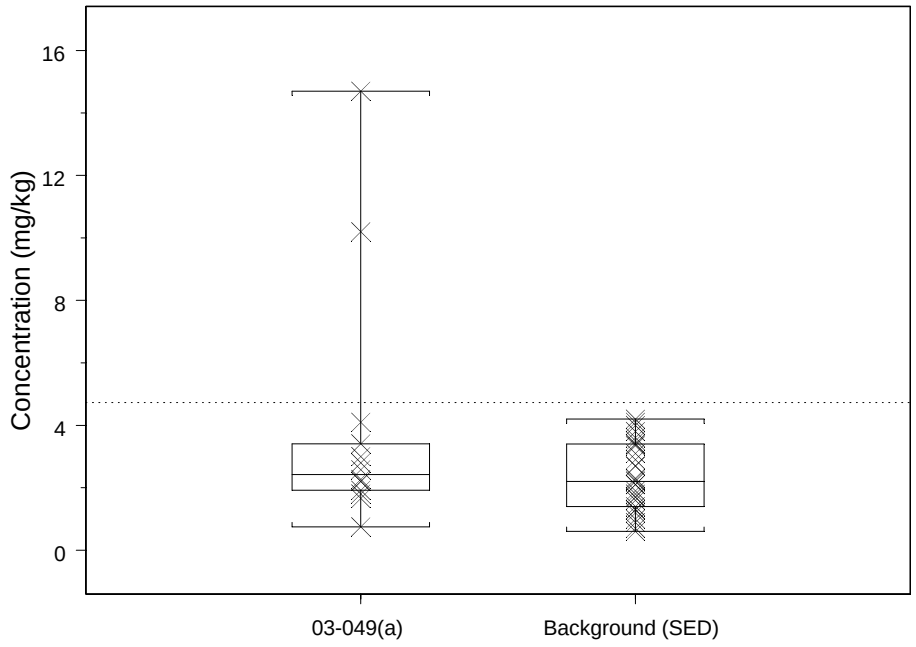


Figure I-2.15-15 Site concentrations of cobalt in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

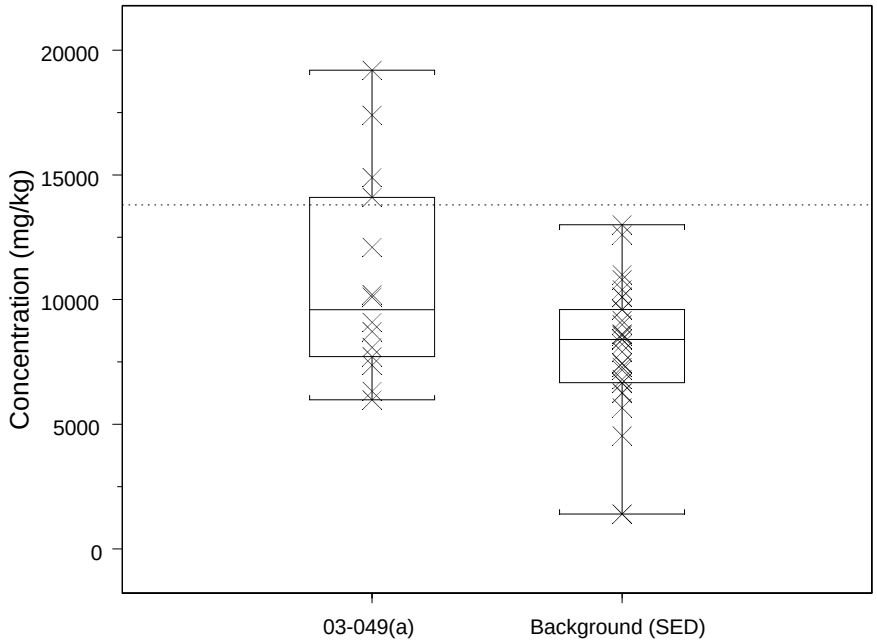


Figure I-2.15-16 Site concentrations of iron in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

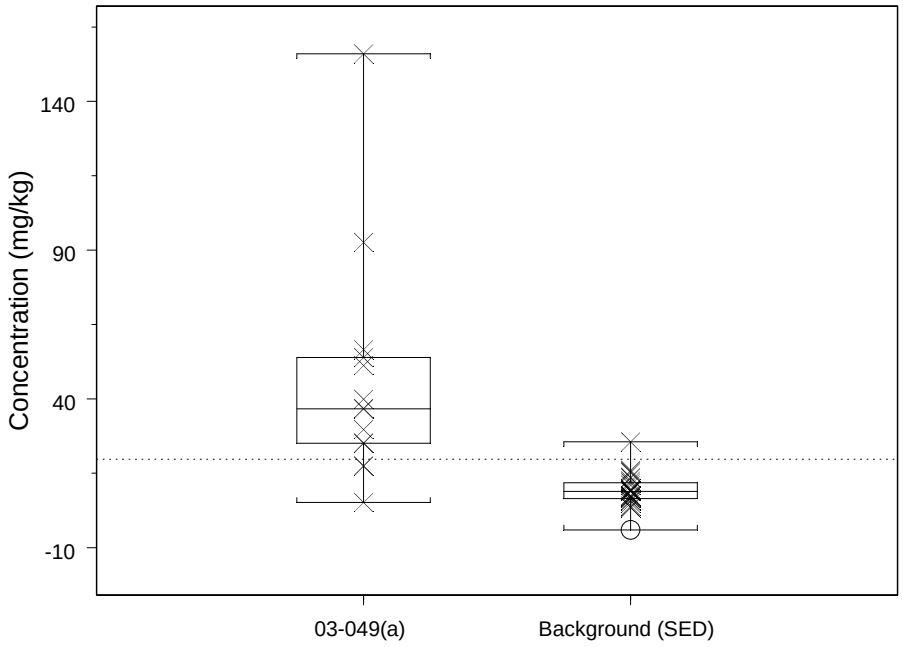


Figure I-2.15-17 Site concentrations of lead in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

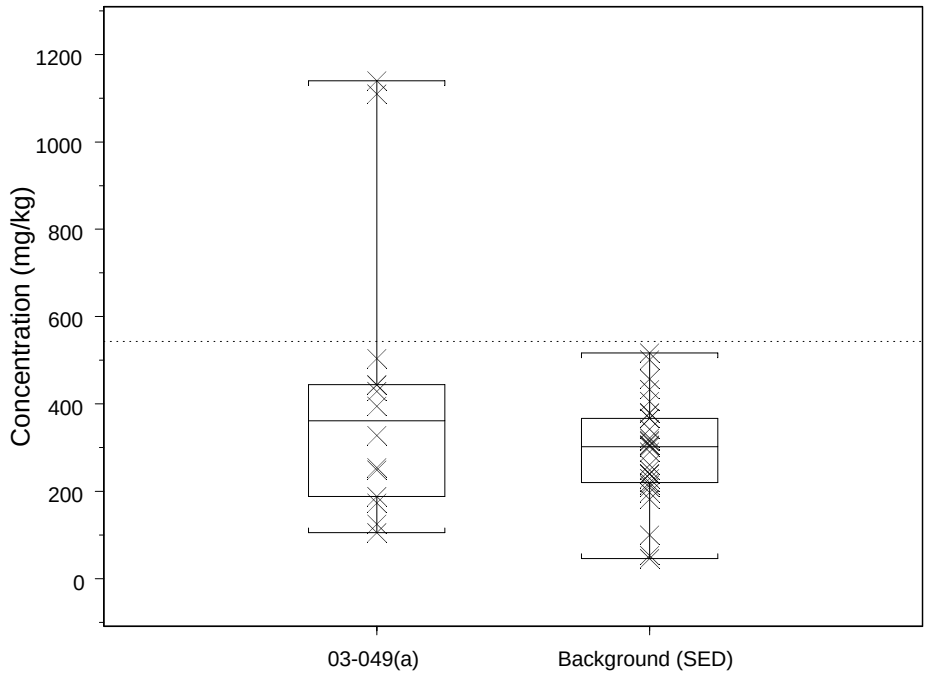


Figure I-2.15-18 Site concentrations of manganese in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

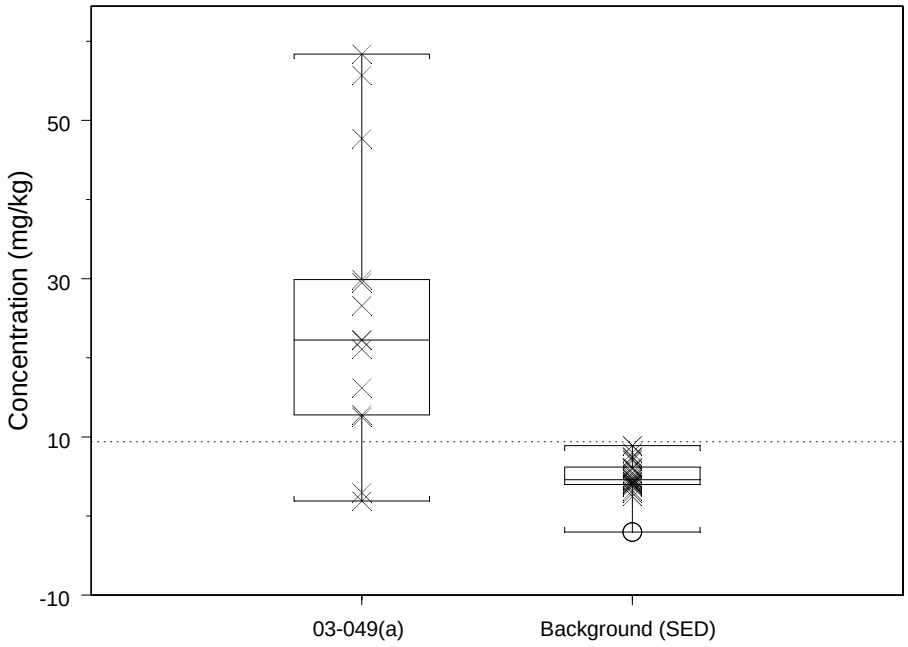


Figure I-2.15-19 Site concentrations of nickel in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

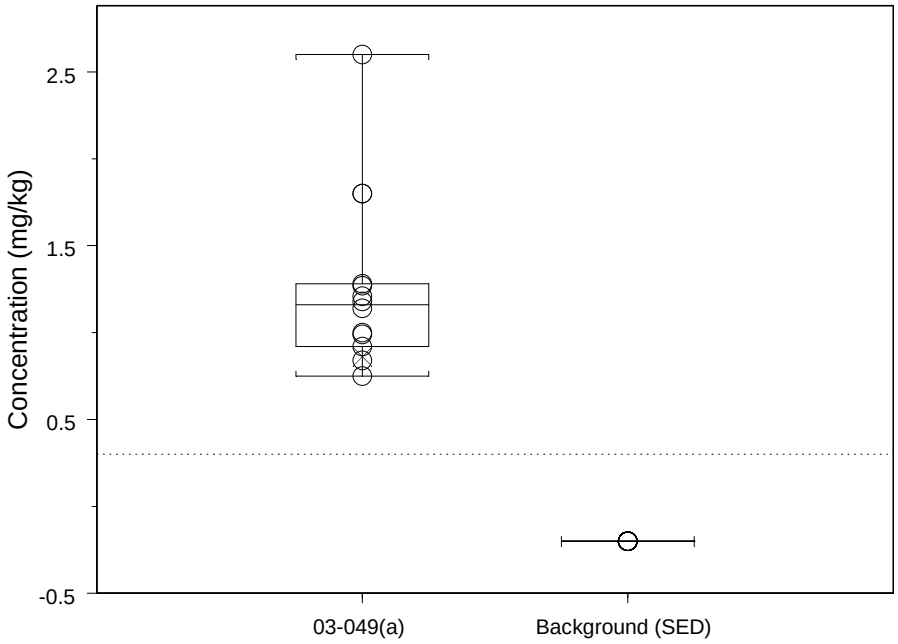


Figure I-2.15-20 Site concentrations of selenium in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

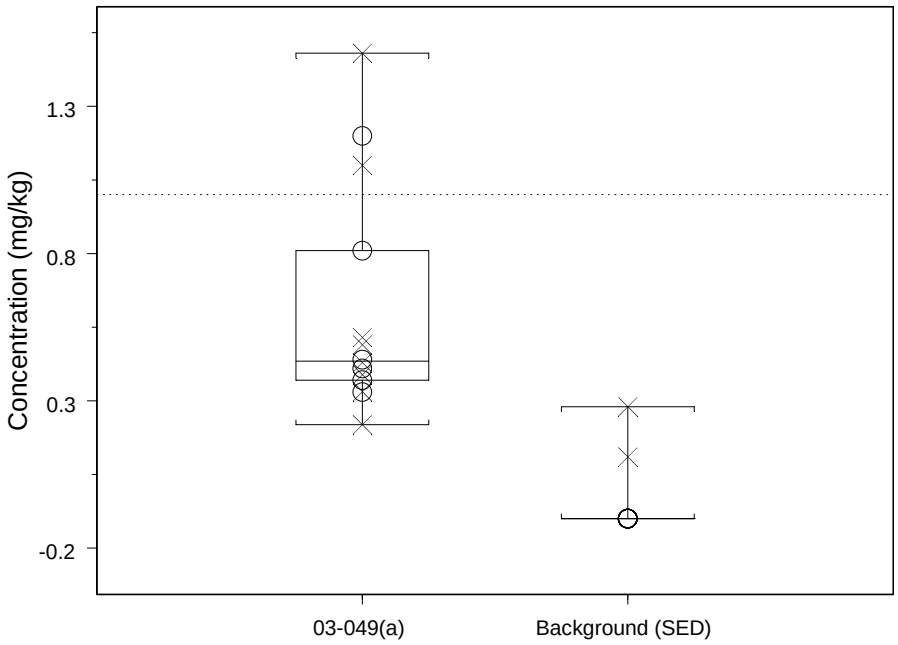


Figure I-2.15-21 Site concentrations of silver in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

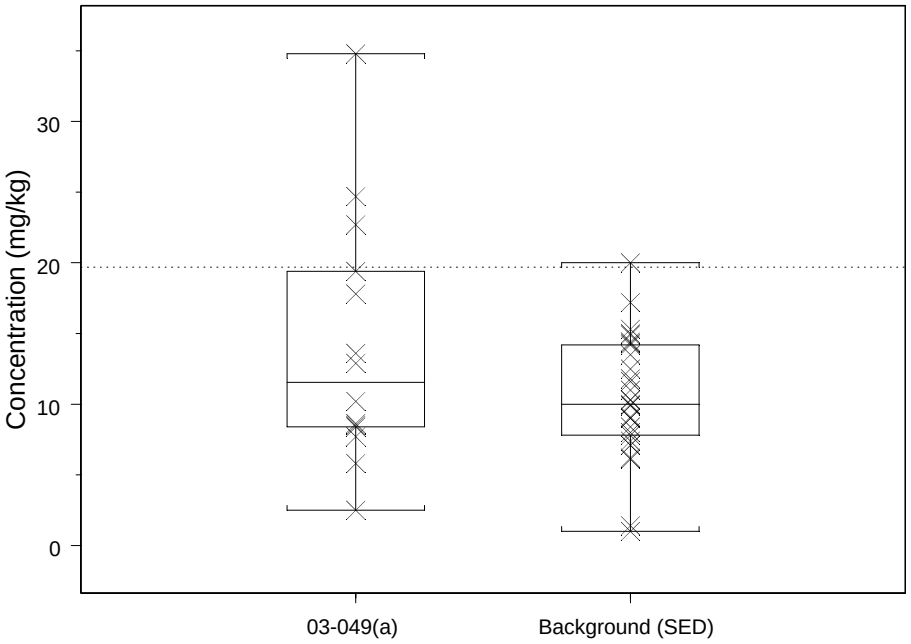


Figure I-2.15-22 Site concentrations of vanadium in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

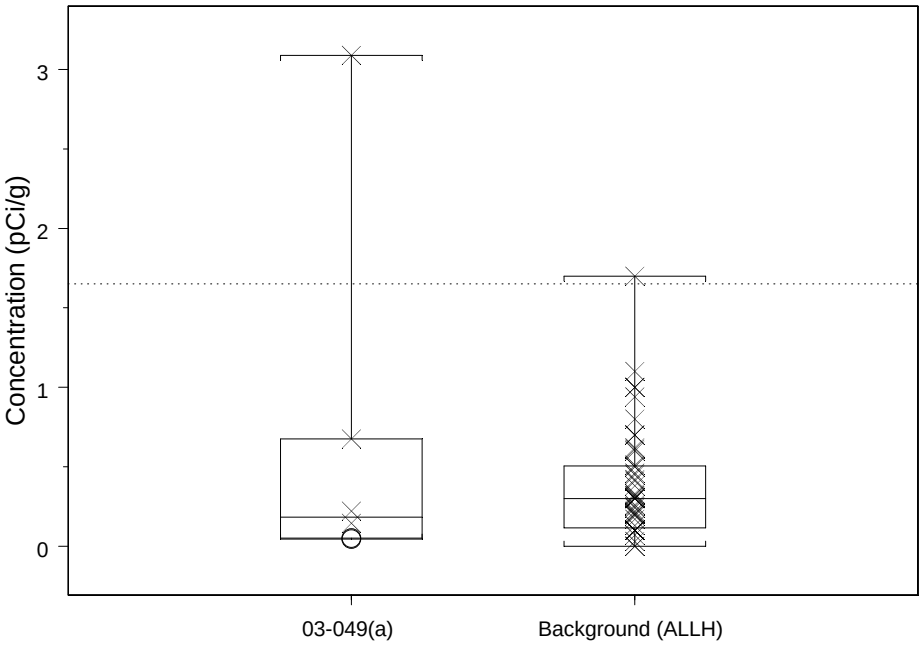


Figure I-2.15-23 Site concentrations of cesium-137 in soil at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

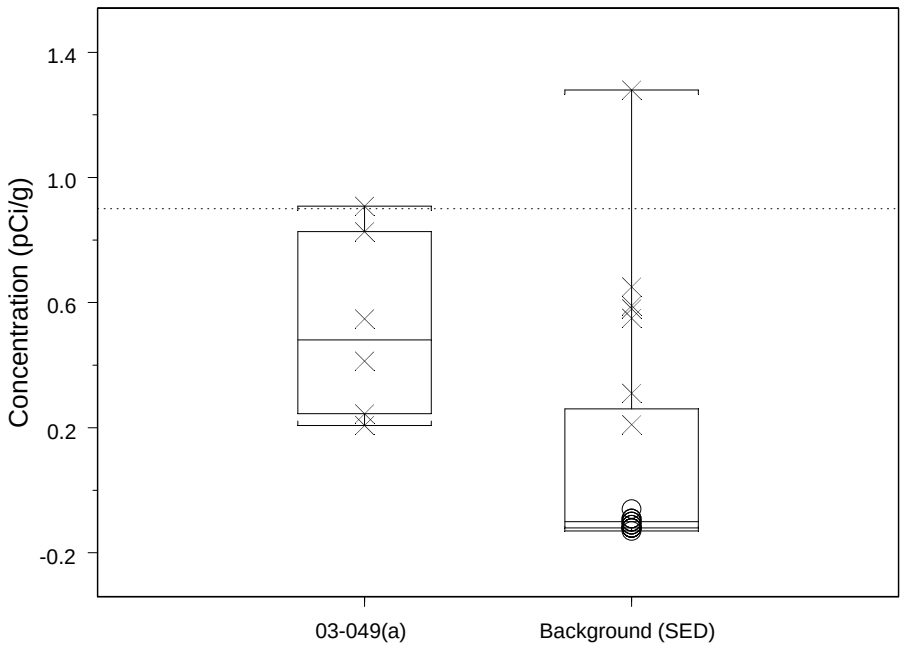


Figure I-2.15-24 Site concentrations of cesium-137 in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

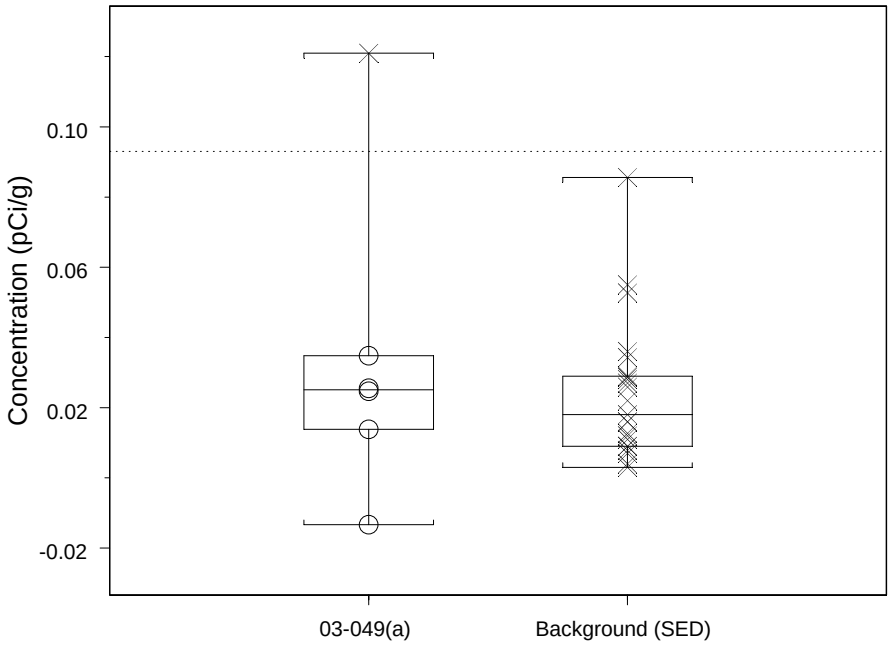


Figure I-2.15-25 Site concentrations of tritium in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

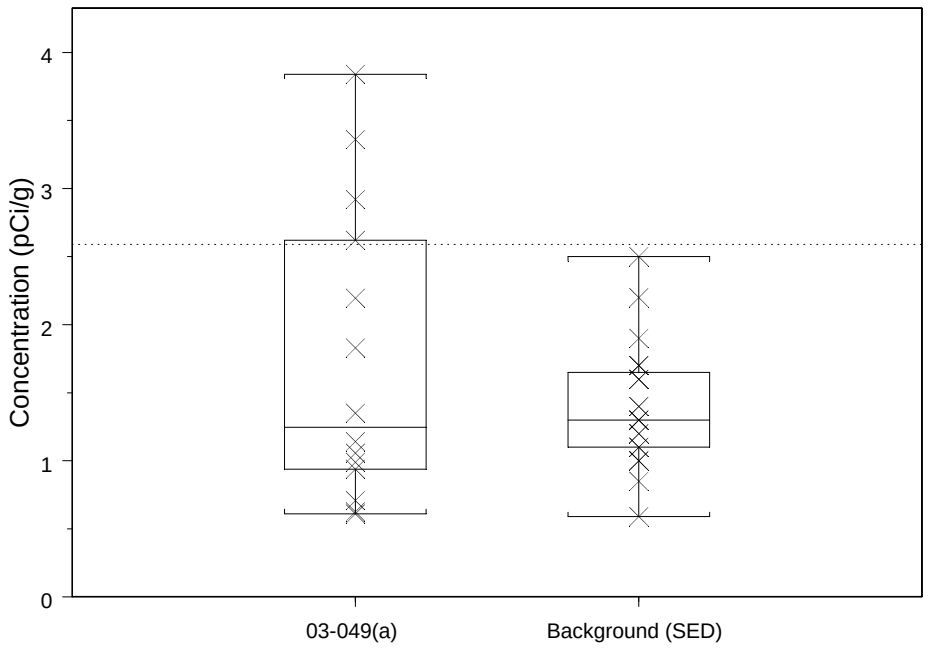


Figure I-2.15-26 Site concentrations of uranium-234 in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

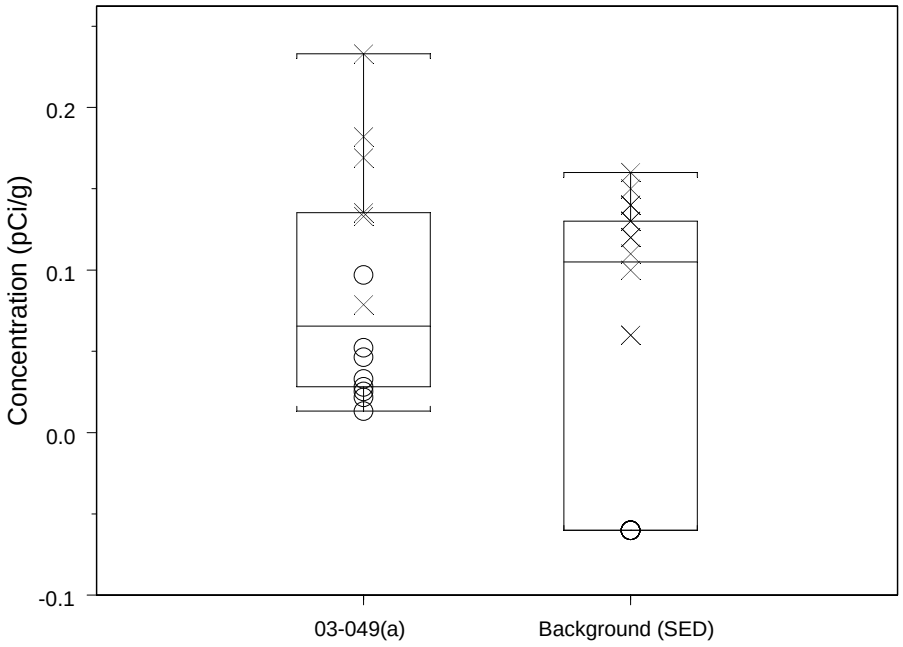


Figure I-2.15-27 Site concentrations of uranium-235/236 in sediment at SWMU 03-049(a) compared to background

(× = detect, ○ = nondetect)

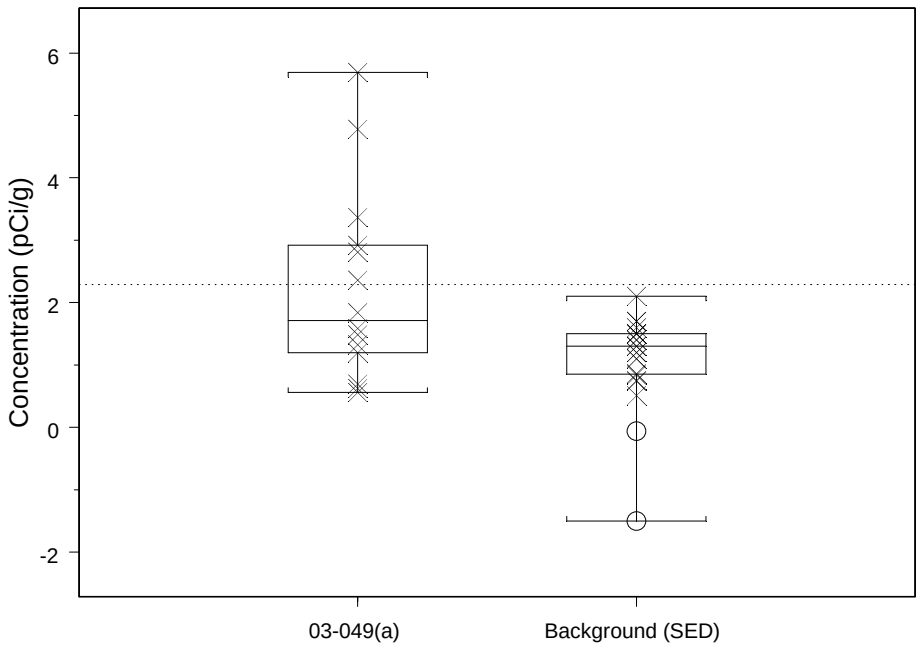


Figure I-2.15-28 Site concentrations of uranium-238 in sediment at SWMU 03-049(a) compared to background
(× = detect, ○ = nondetect)

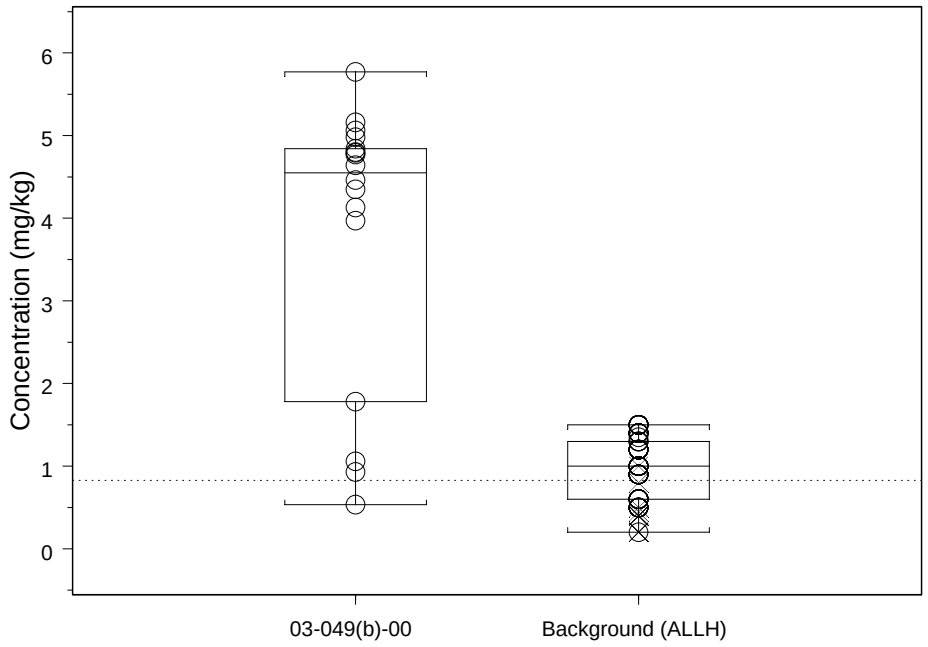


Figure I-2.16-1 Site concentrations of antimony in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

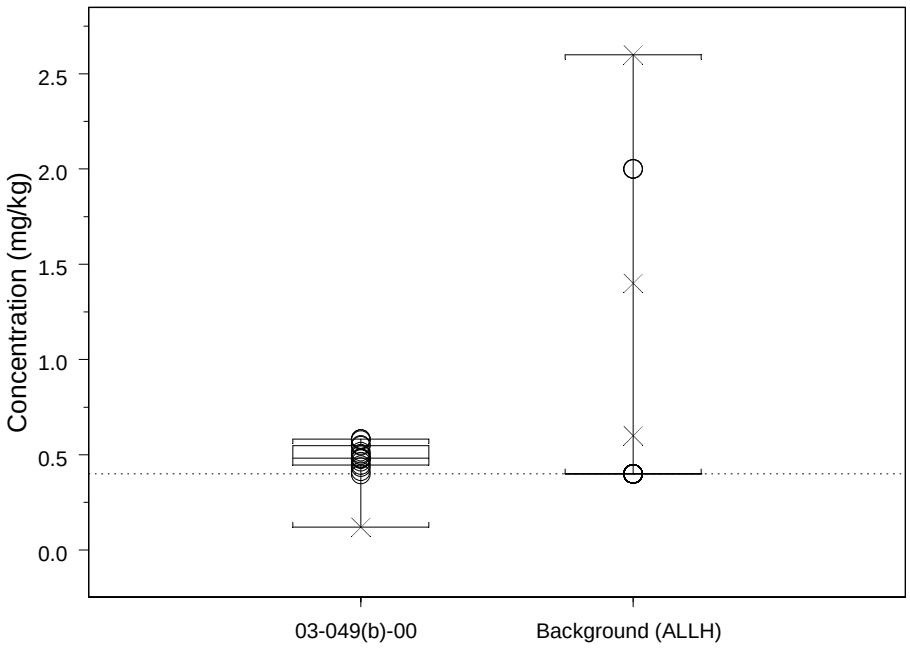


Figure I-2.16-2 Site concentrations of cadmium in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

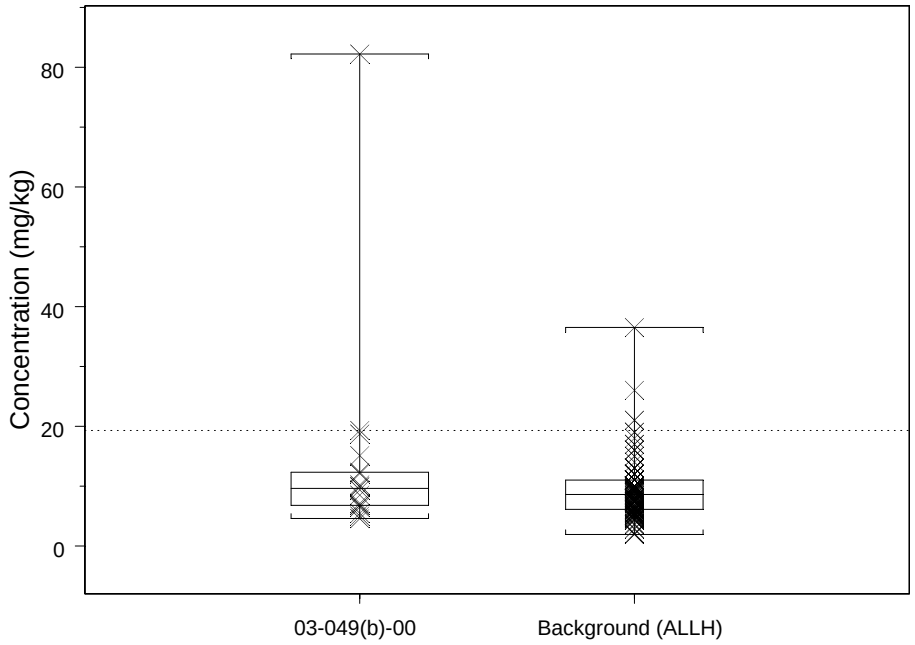


Figure I-2.16-3 Site concentrations of chromium in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

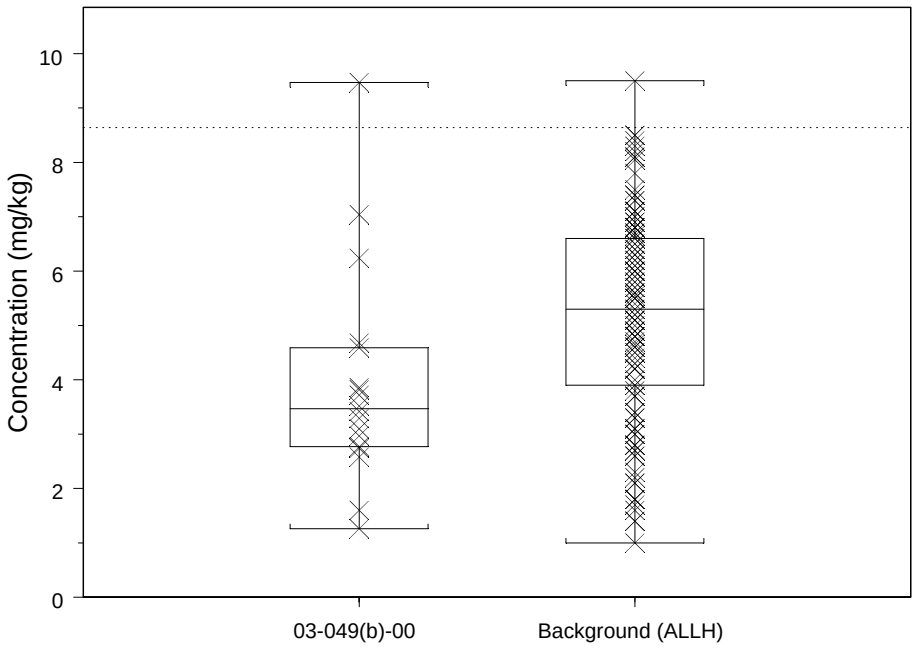


Figure I-2.16-4 Site concentrations of cobalt in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

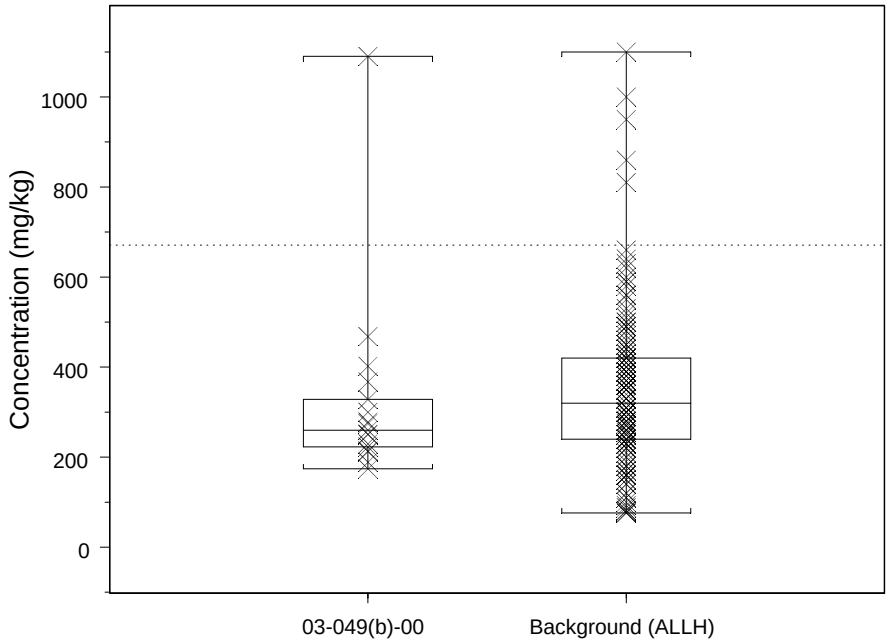


Figure I-2.16-5 Site concentrations of manganese in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

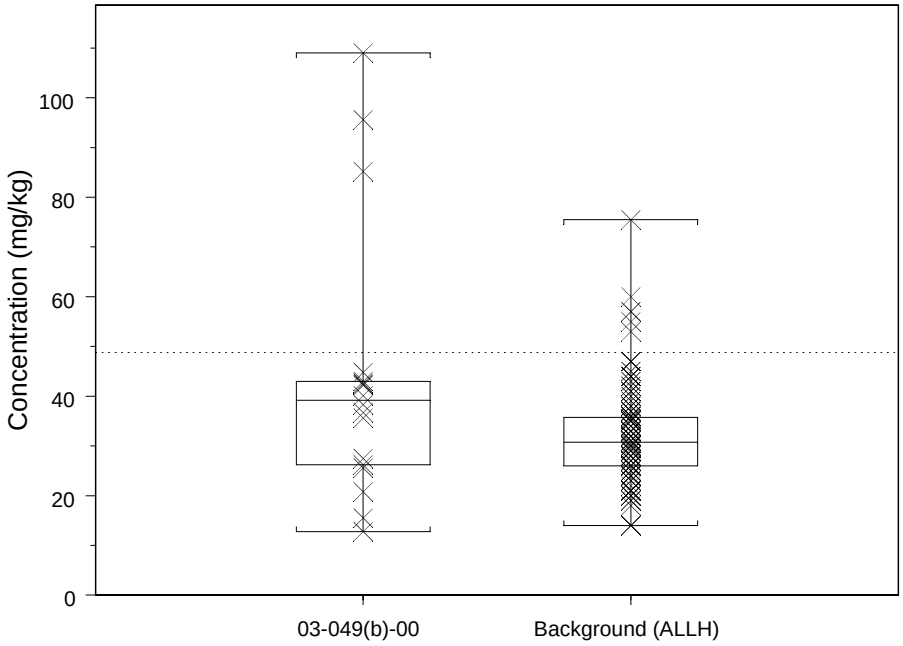


Figure I-2.16-6 Site concentrations of zinc in soil at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

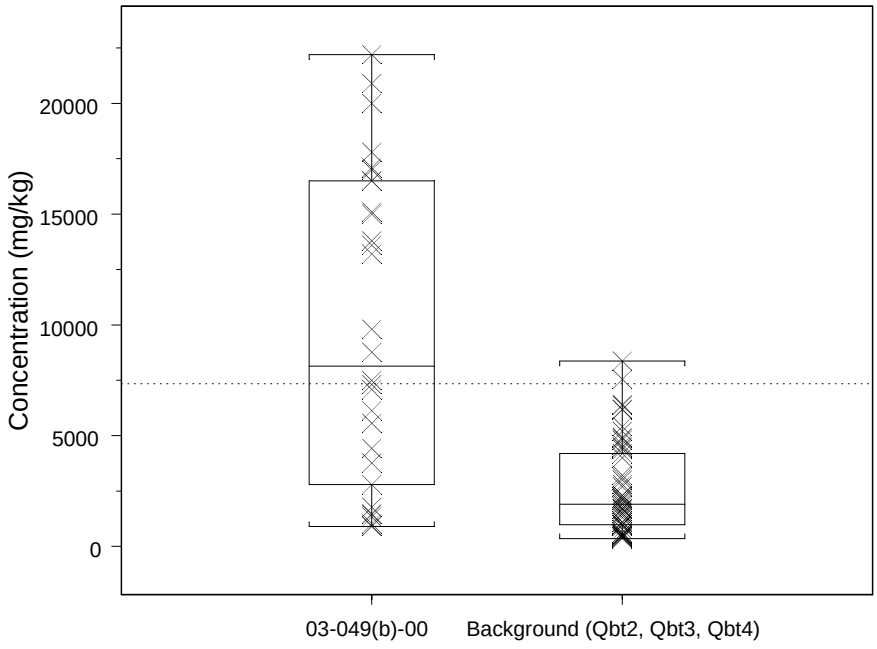


Figure I-2.16-7 Site concentrations of aluminum in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

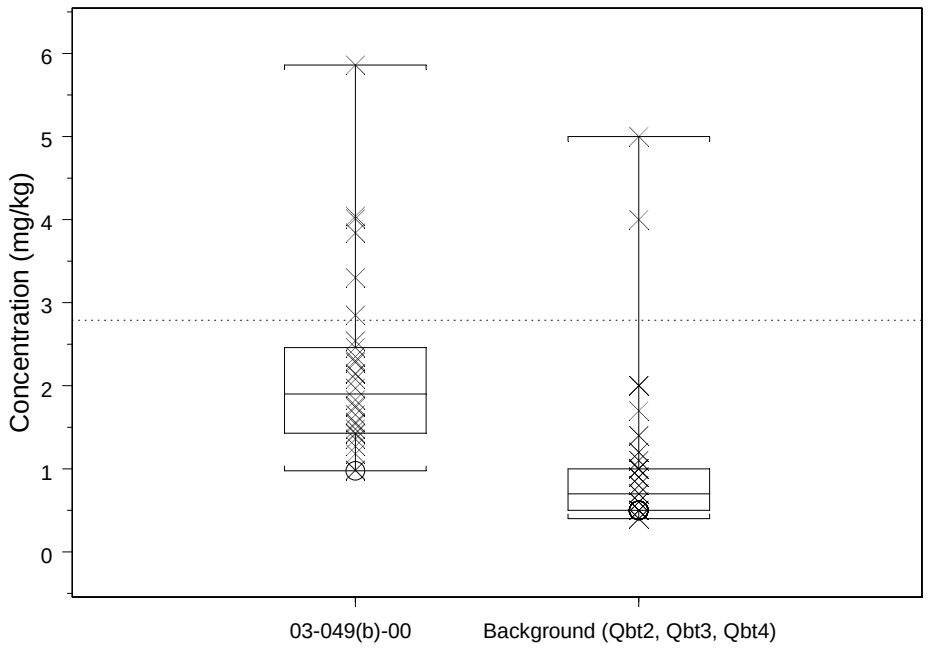


Figure I-2.16-8 Site concentrations of arsenic in tuff at Consolidated Unit 03-049(b)-00 compared to background

(× = detect, ○ = nondetect)

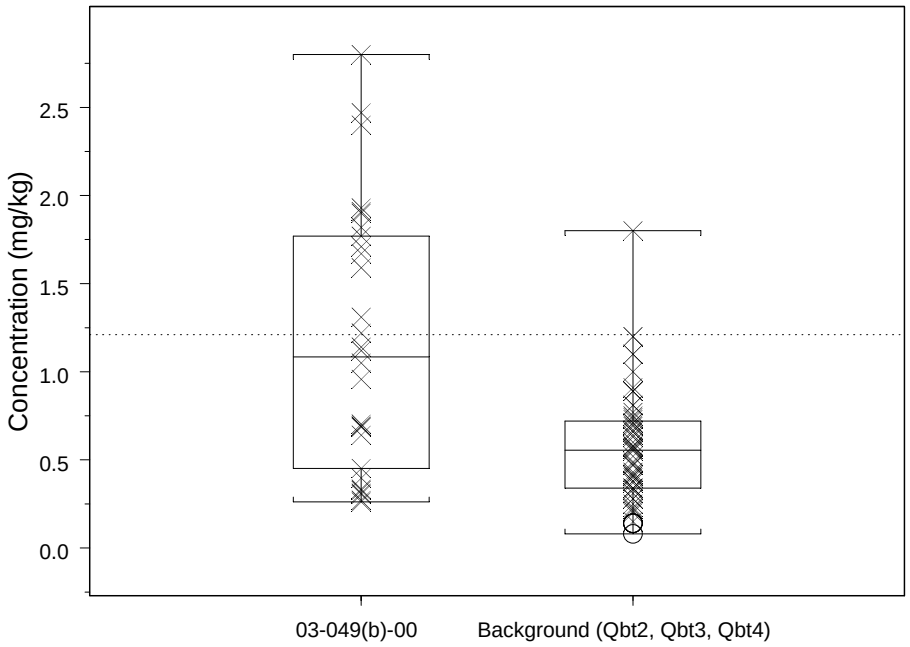


Figure I-2.16-9 Site concentrations of beryllium in tuff at Consolidated Unit 03-049(b)-00 compared to background

(× = detect, ○ = nondetect)

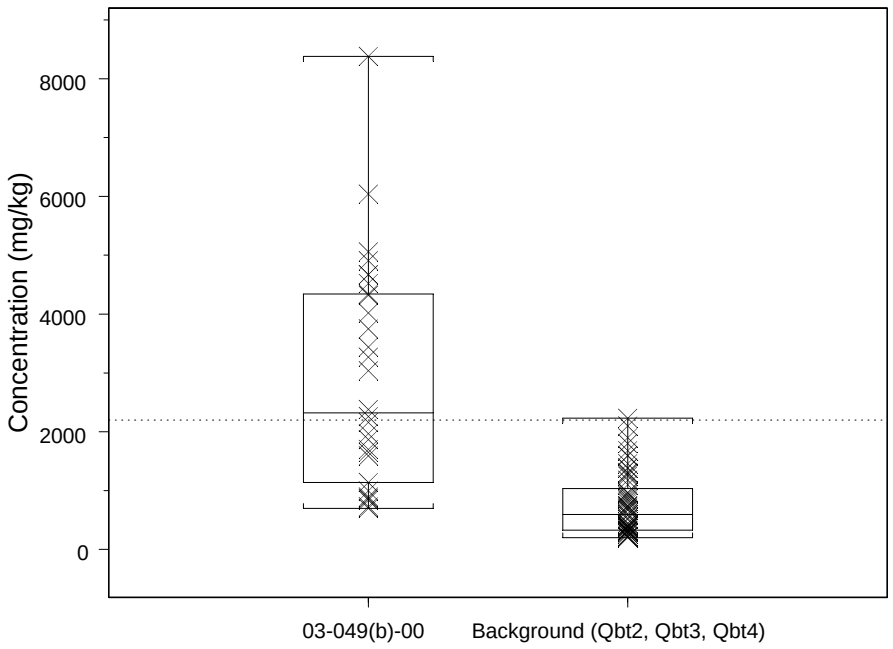


Figure I-2.16-10 Site concentrations of calcium in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

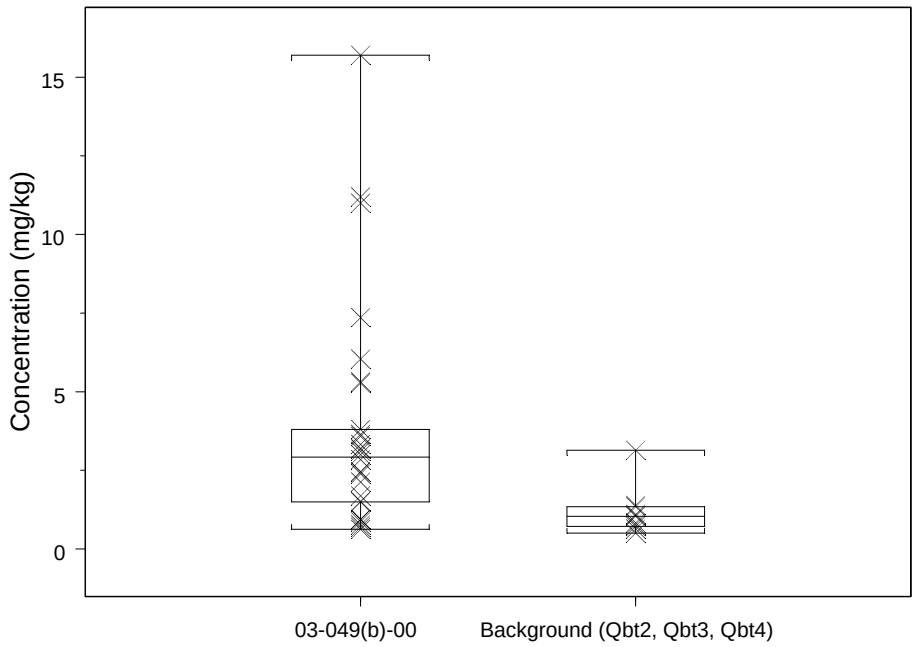


Figure I-2.16-11 Site concentrations of cobalt in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

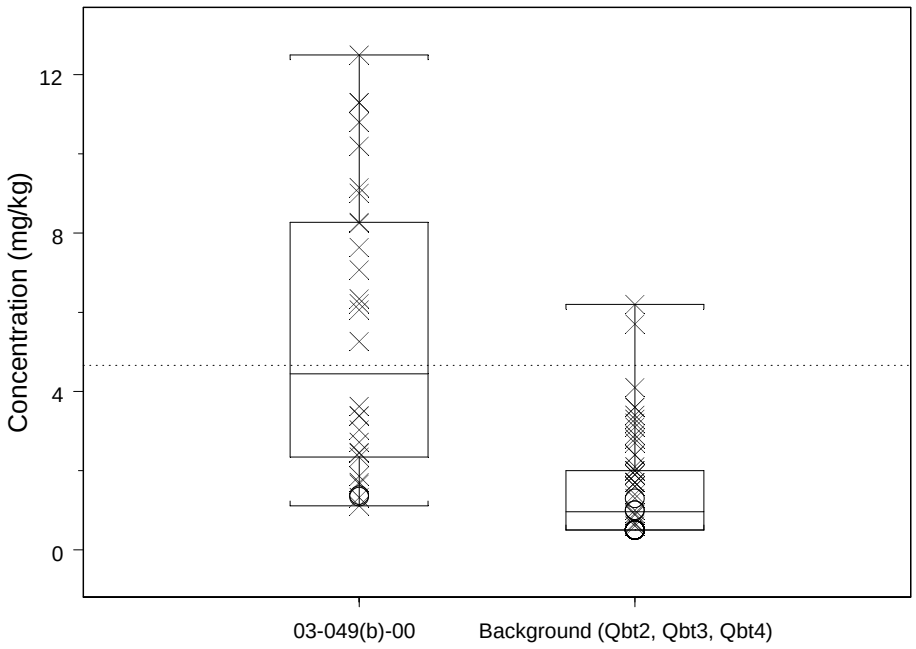


Figure I-2.16-12 Site concentrations of copper in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

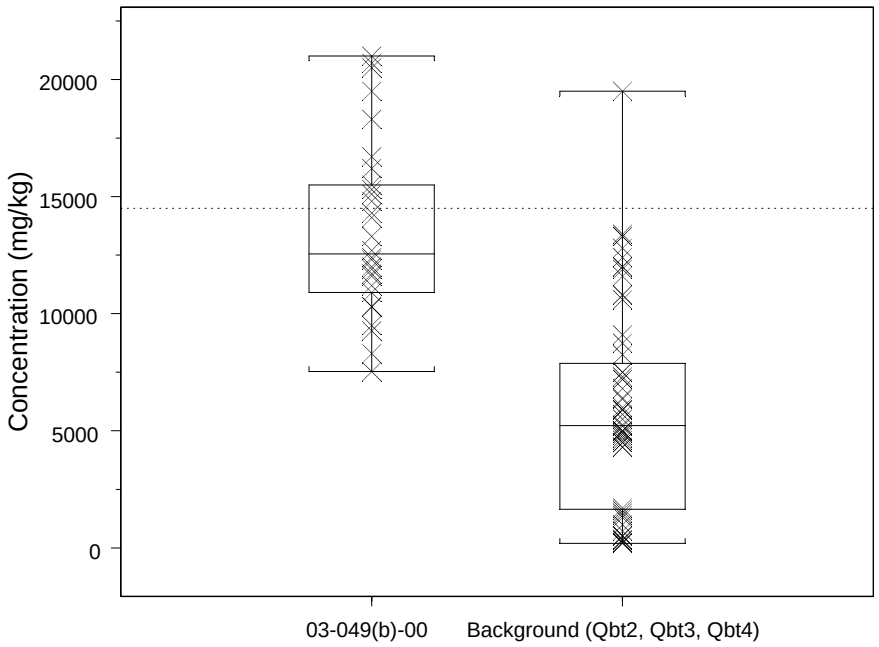


Figure I-2.16-13 Site concentrations of iron in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

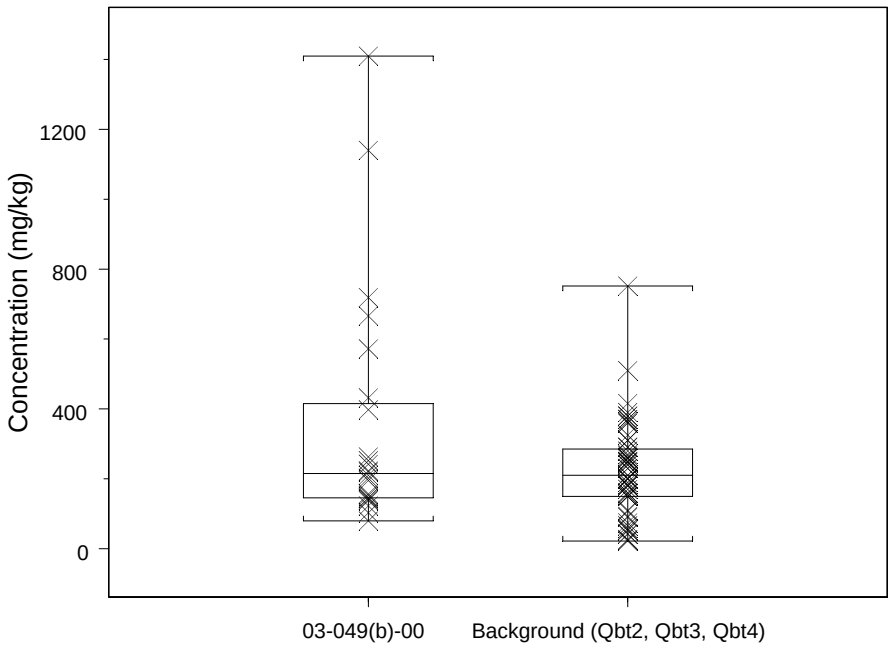


Figure I-2.16-14 Site concentrations of manganese in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

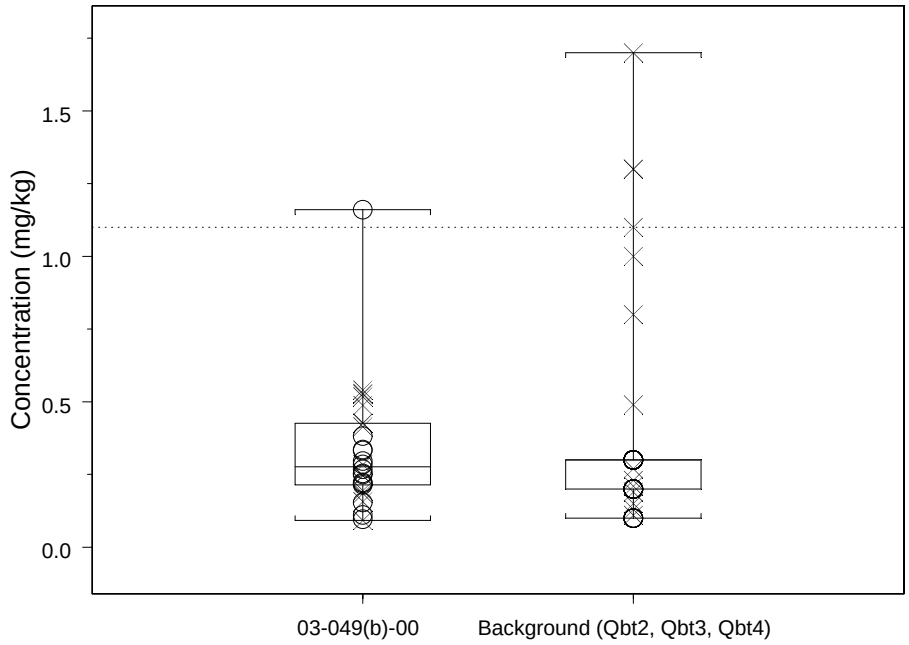


Figure I-2.16-15 Site concentrations of thallium in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

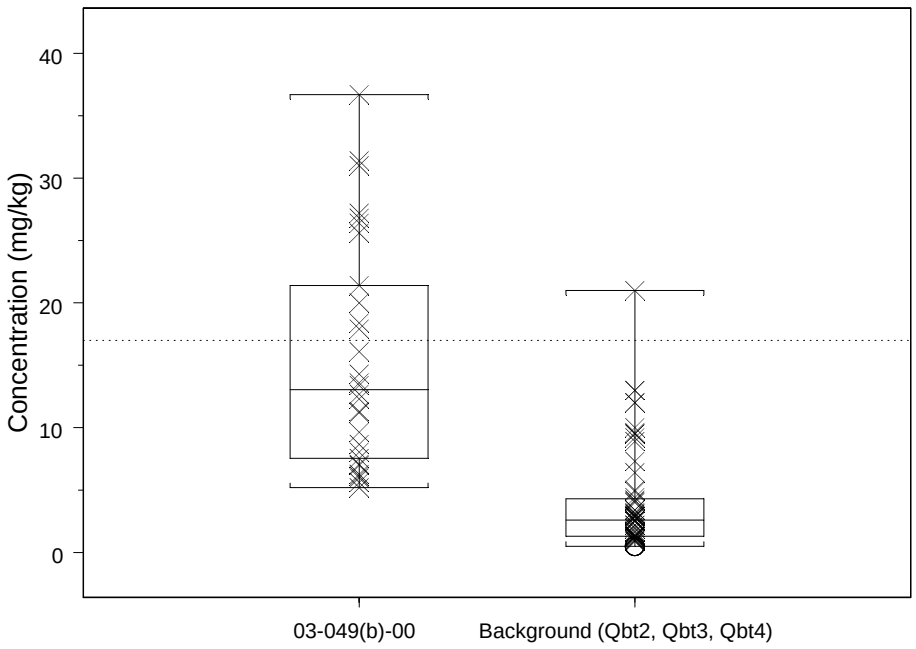


Figure I-2.16-16 Site concentrations of vanadium in tuff at Consolidated Unit 03-049(b)-00 compared to background
(× = detect, ○ = nondetect)

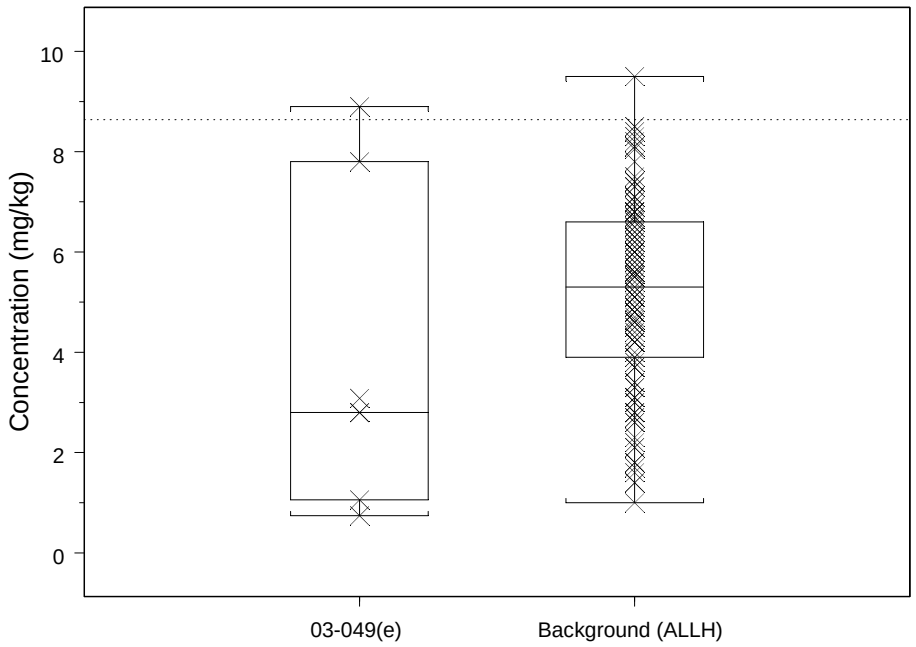


Figure I-2.17-1 Site concentrations of cobalt in soil at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

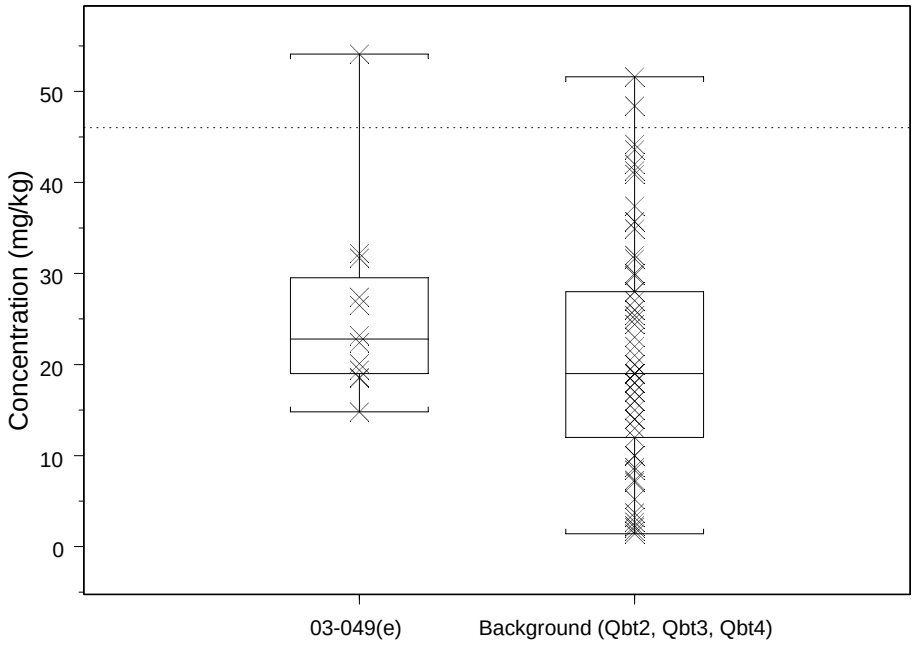


Figure I-2.17-2 Site concentrations of barium in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

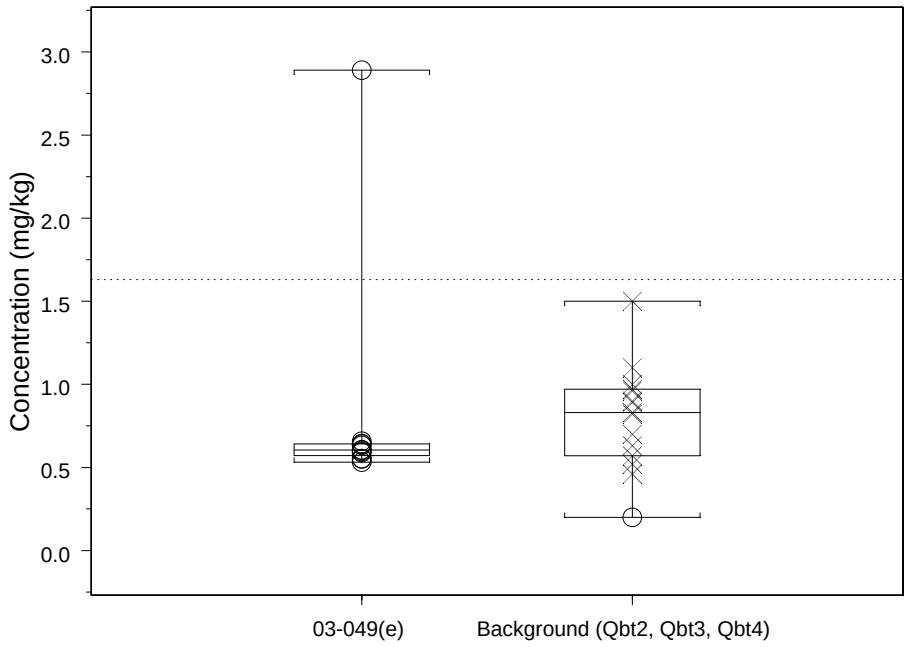


Figure I-2.17-2 Site concentrations of cadmium in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

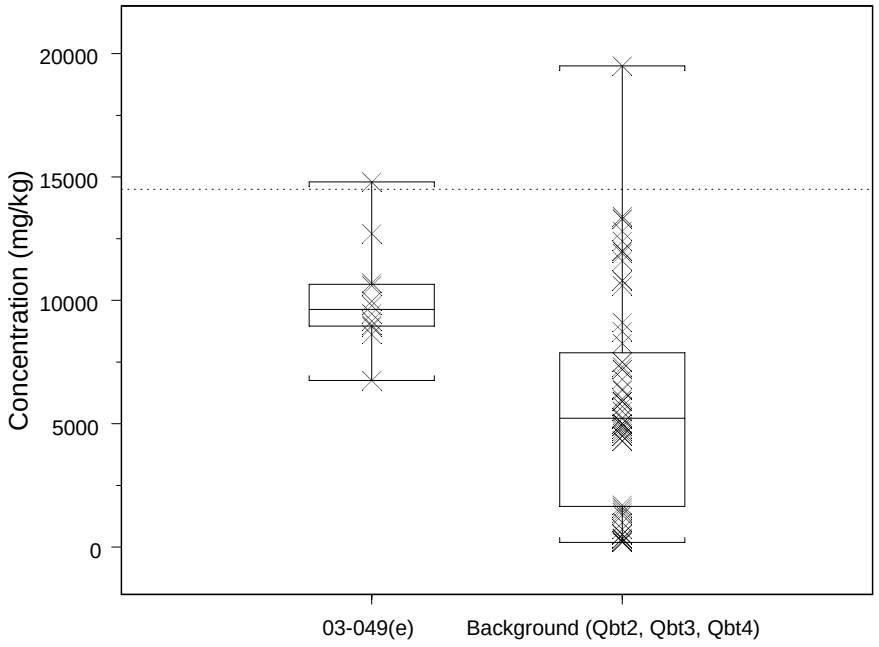


Figure I-2.17-3 Site concentrations of iron in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

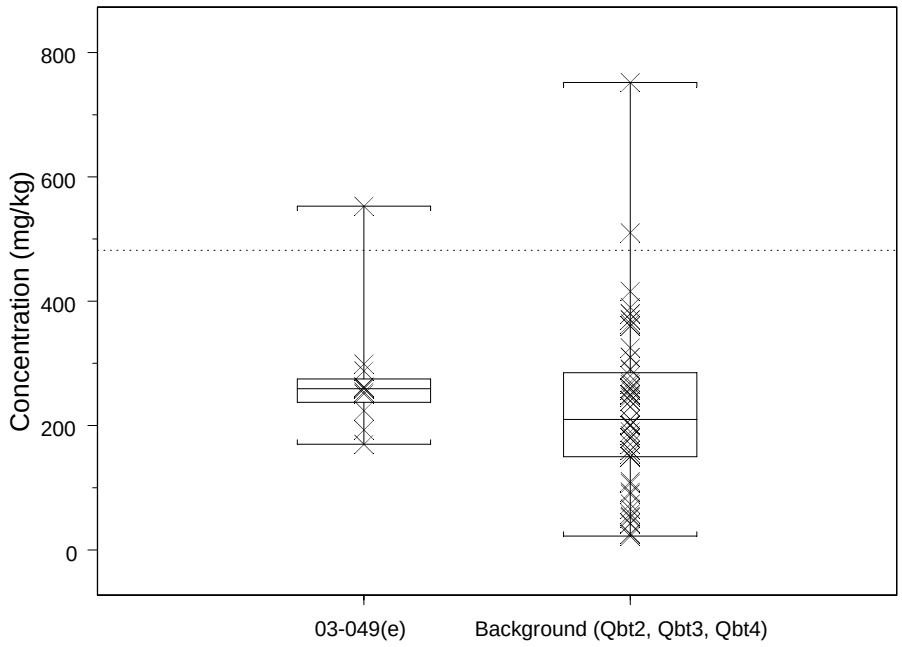


Figure I-2.17-4 Site concentrations of manganese in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

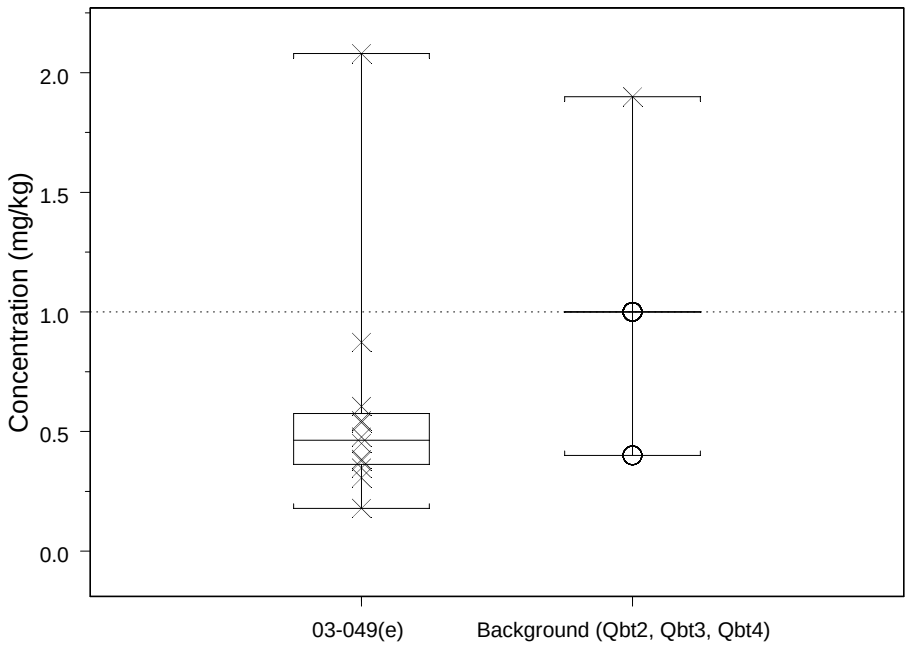


Figure I-2.17-5 Site concentrations of silver in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

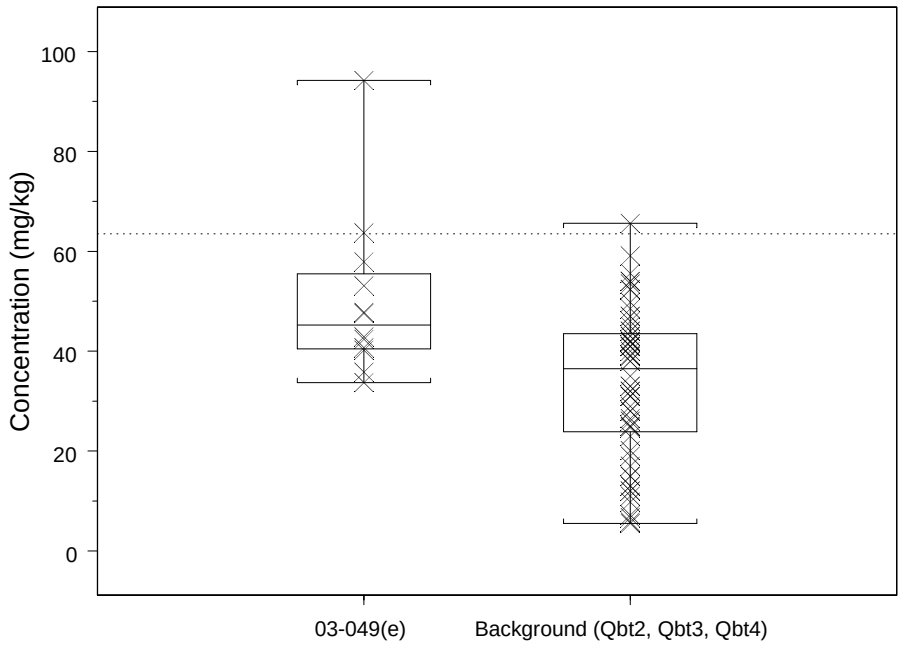


Figure I-2.17-6 Site concentrations of zinc in tuff at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

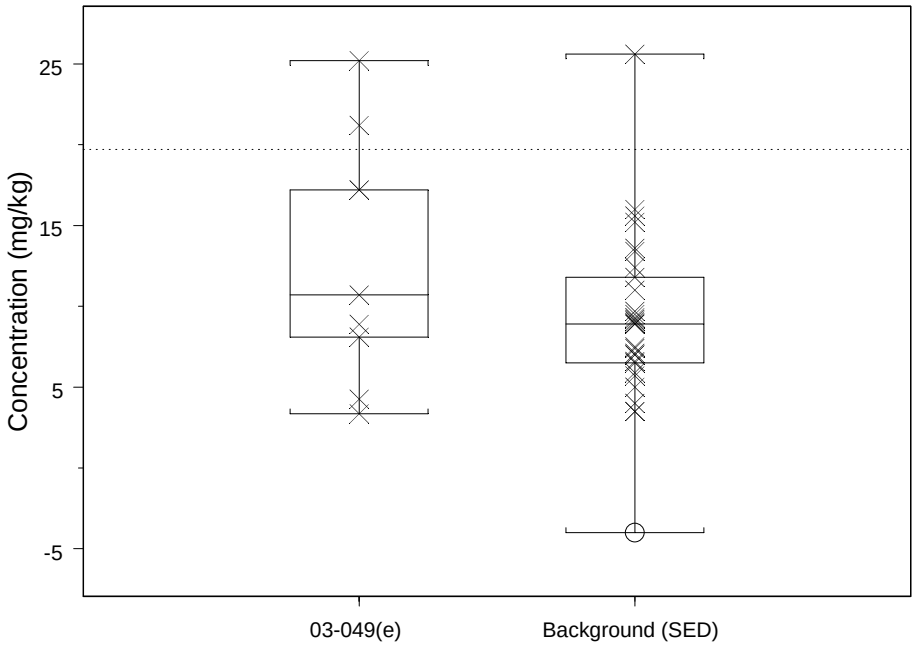


Figure I-2.17-7 Site concentrations of lead in sediment at SWMU 03-049(e) compared to background
(× = detect, ○ = nondetect)

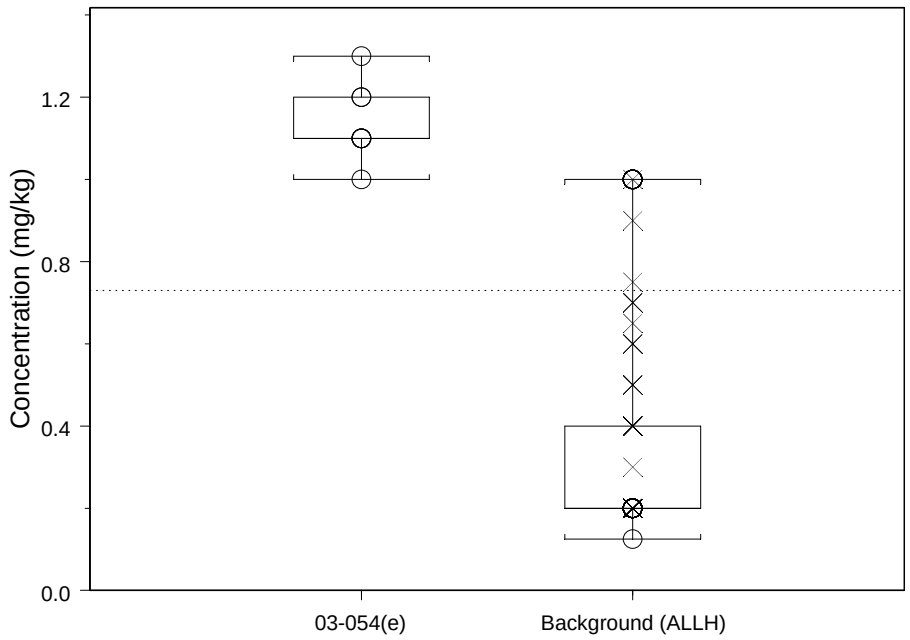


Figure I-2.18-1 Site concentrations of thallium in soil at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

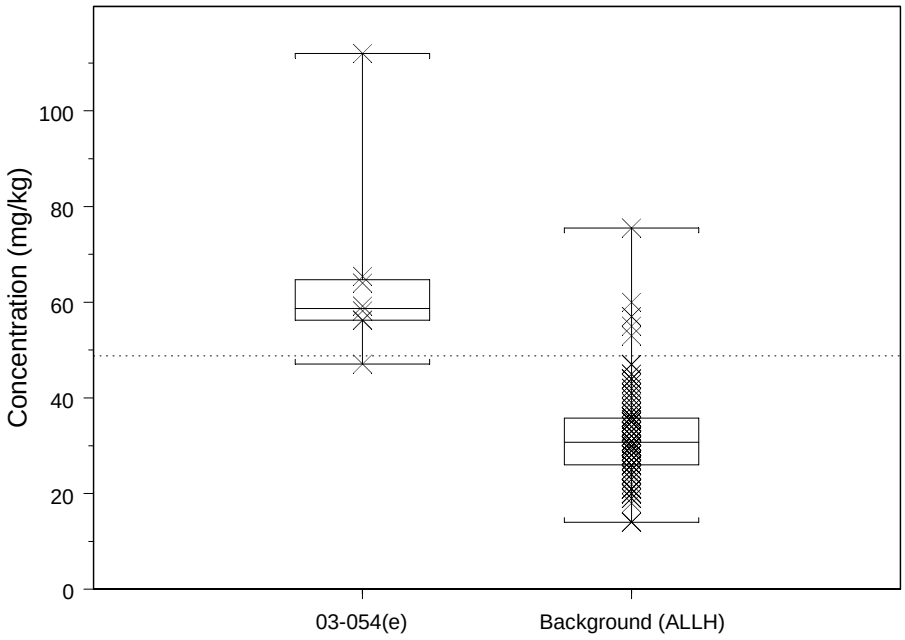


Figure I-2.18-2 Site concentrations of zinc in soil at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

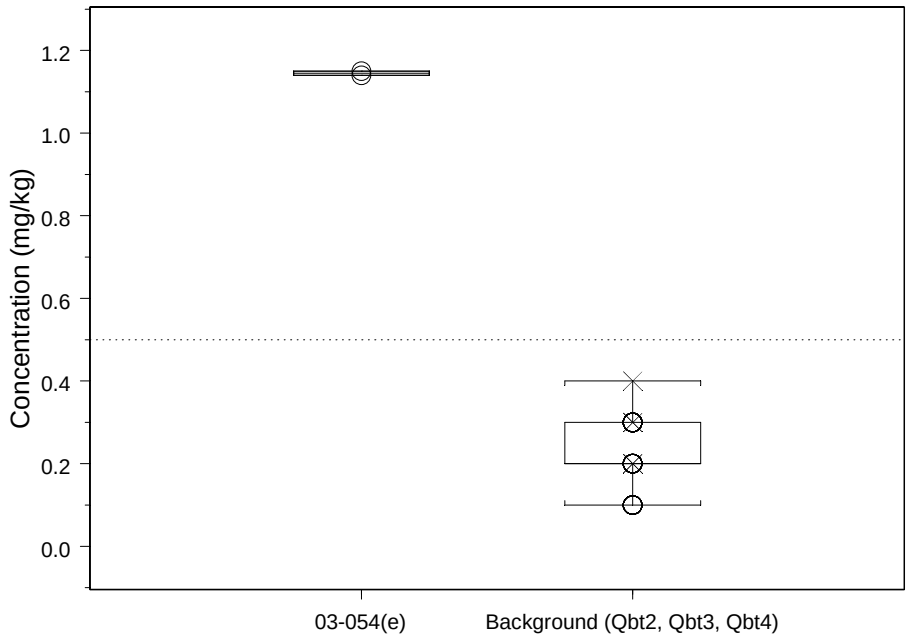


Figure I-2.18-3 Site concentrations of antimony in tuff at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

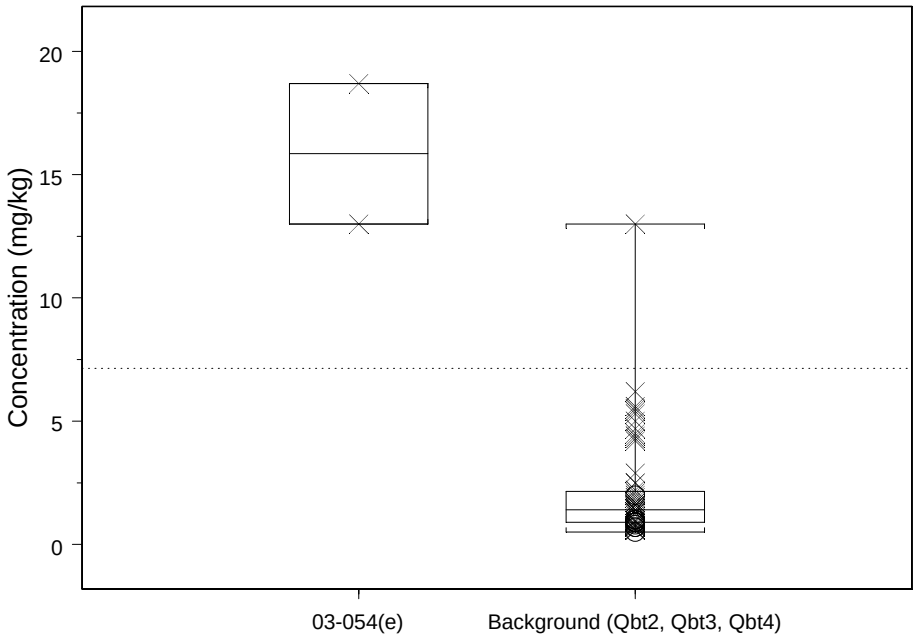


Figure I-2.18-4 Site concentrations of chromium in tuff at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

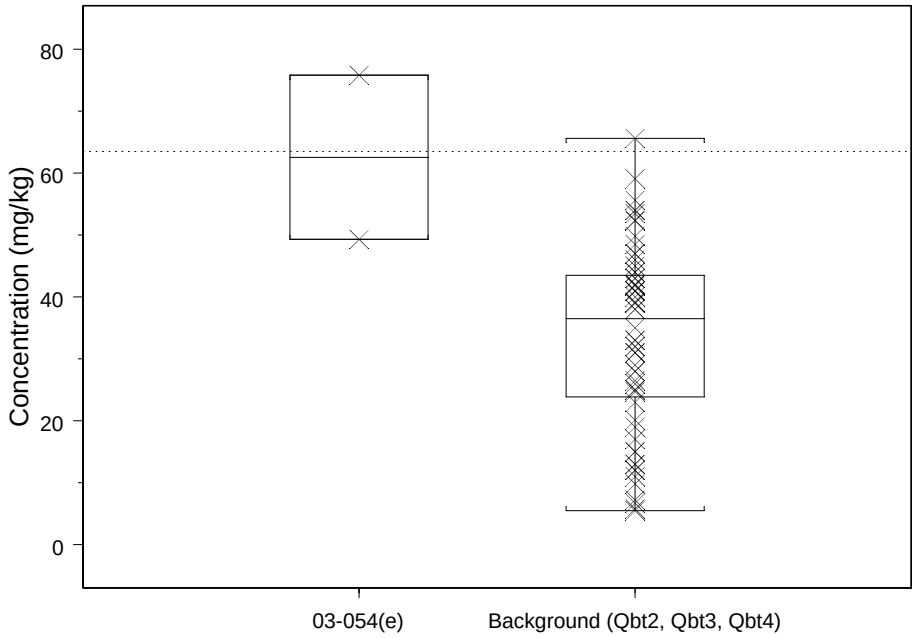


Figure I-2.18-5 Site concentrations of zinc in tuff at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

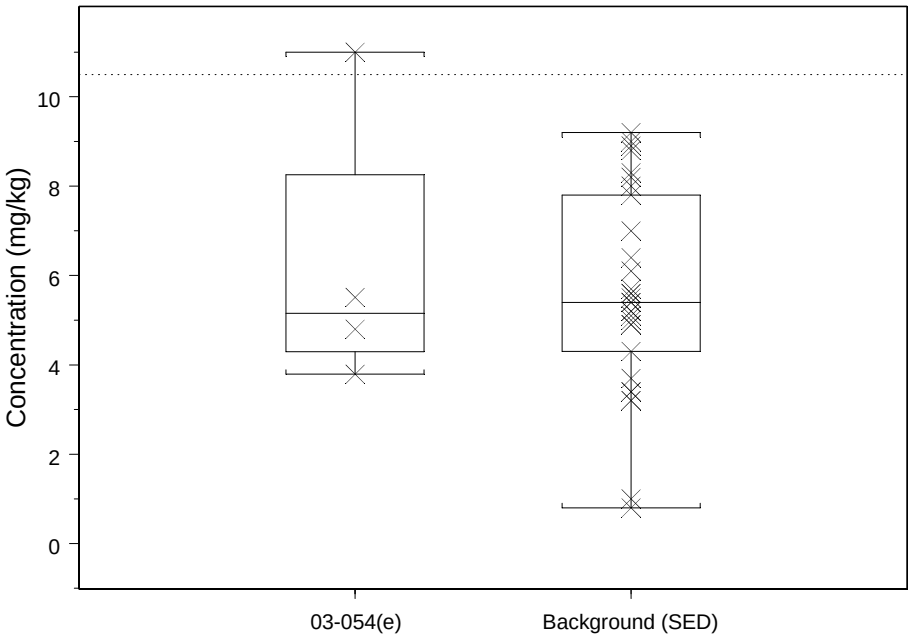


Figure I-2.18-6 Site concentrations of chromium in sediment at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

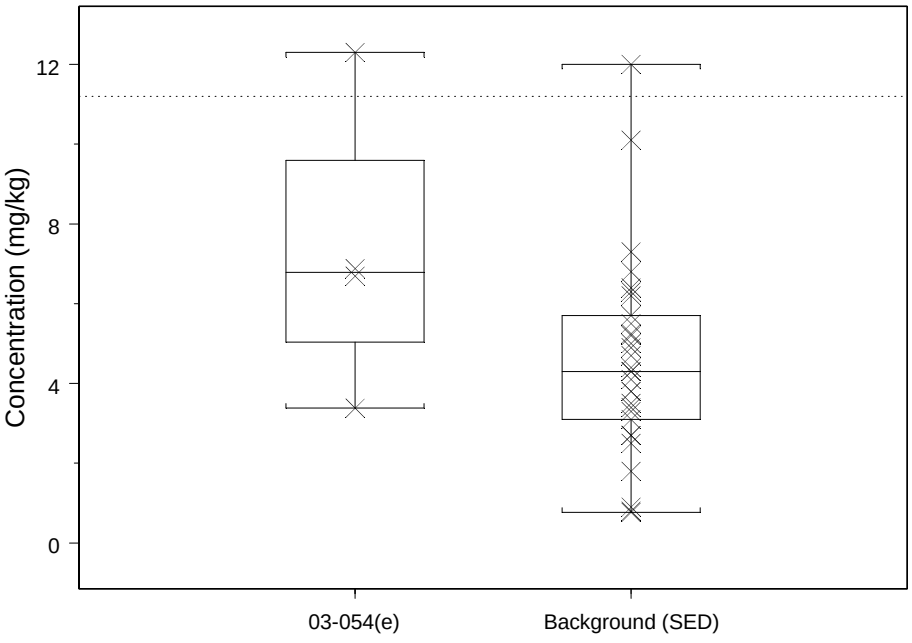


Figure I-2.18-7 Site concentrations of copper in sediment at SWMU 03-054(e) compared to background
(× = detect, ○ = nondetect)

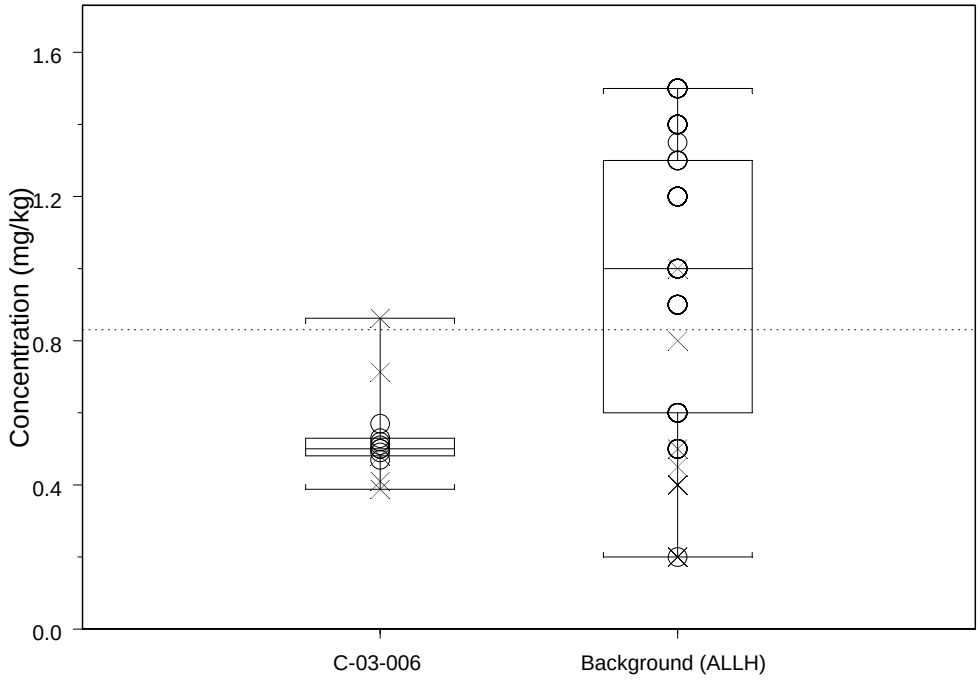


Figure I-2.19-1 Site concentrations of antimony in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

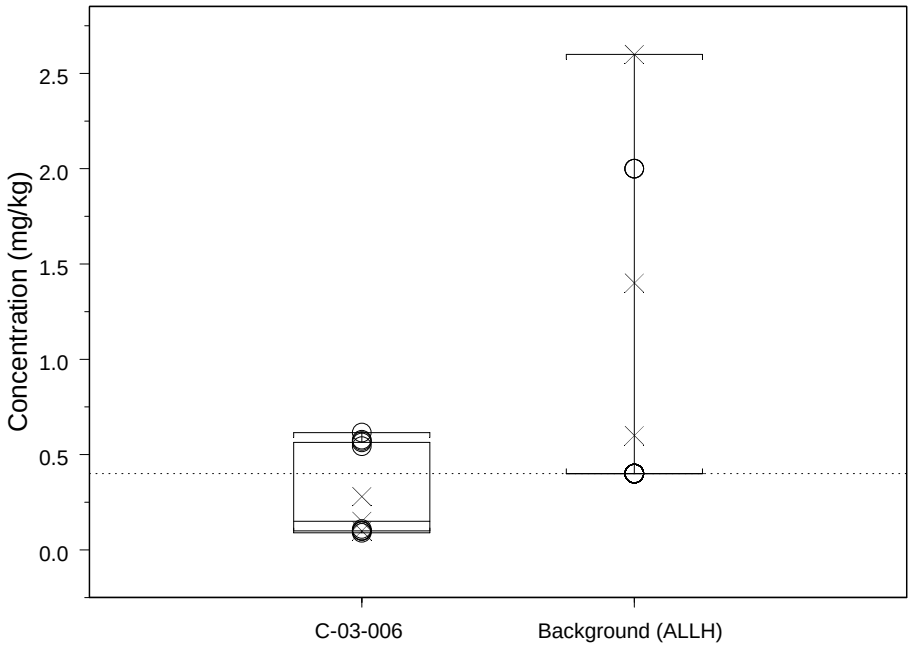


Figure I-2.19-2 Site concentrations of cadmium in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

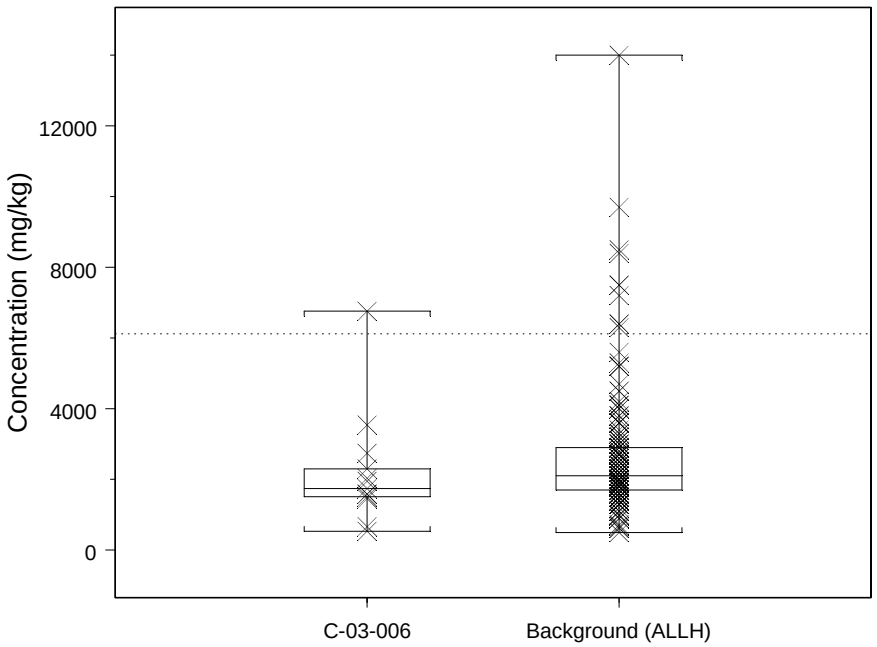


Figure I-2.19-3 Site concentrations of calcium in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

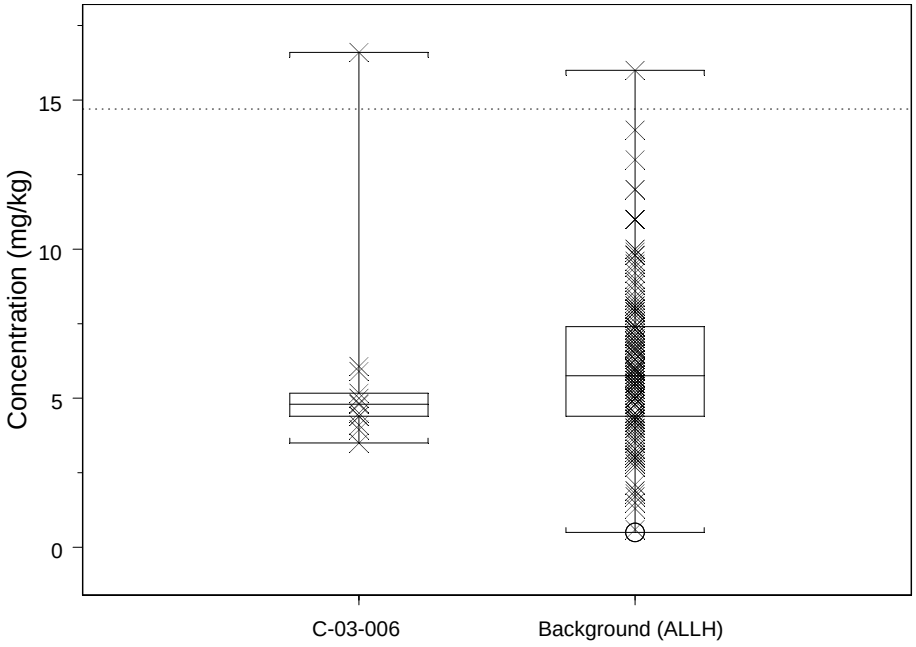


Figure I-2.19-4 Site concentrations of copper in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

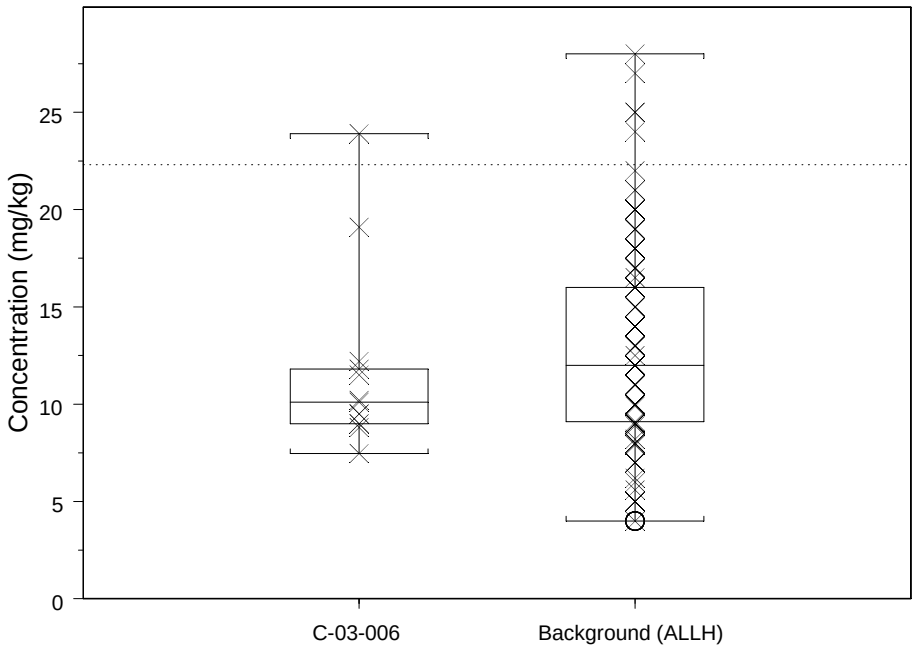


Figure I-2.19-5 Site concentrations of lead in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

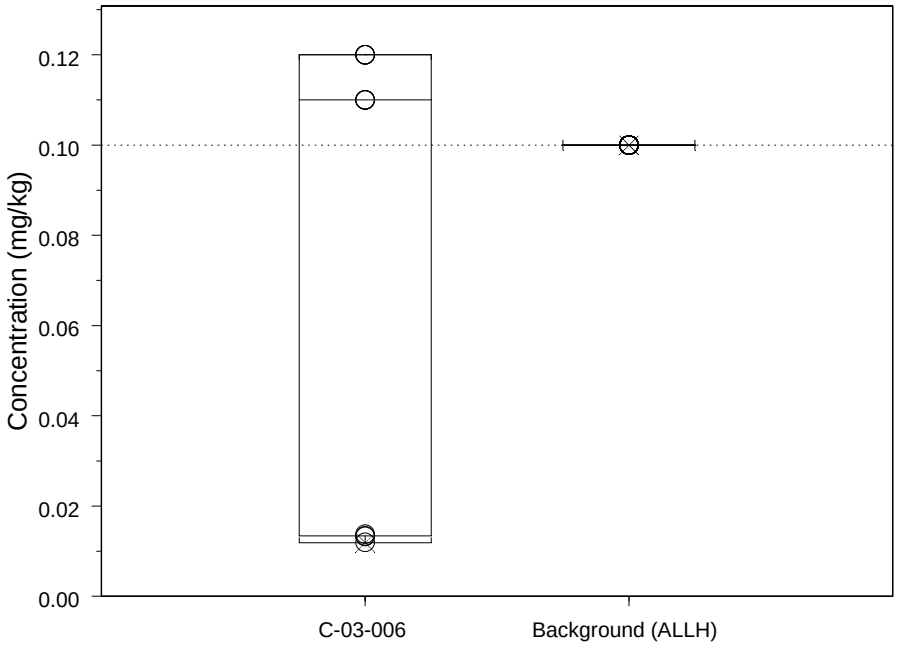


Figure I-2.19-6 Site concentrations of mercury in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

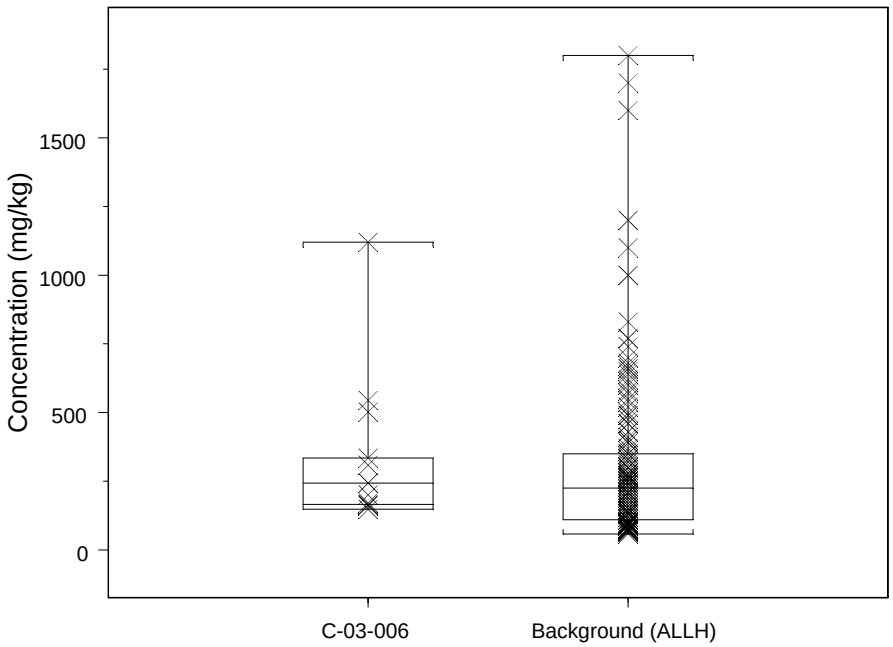


Figure I-2.19-7 Site concentrations of sodium in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

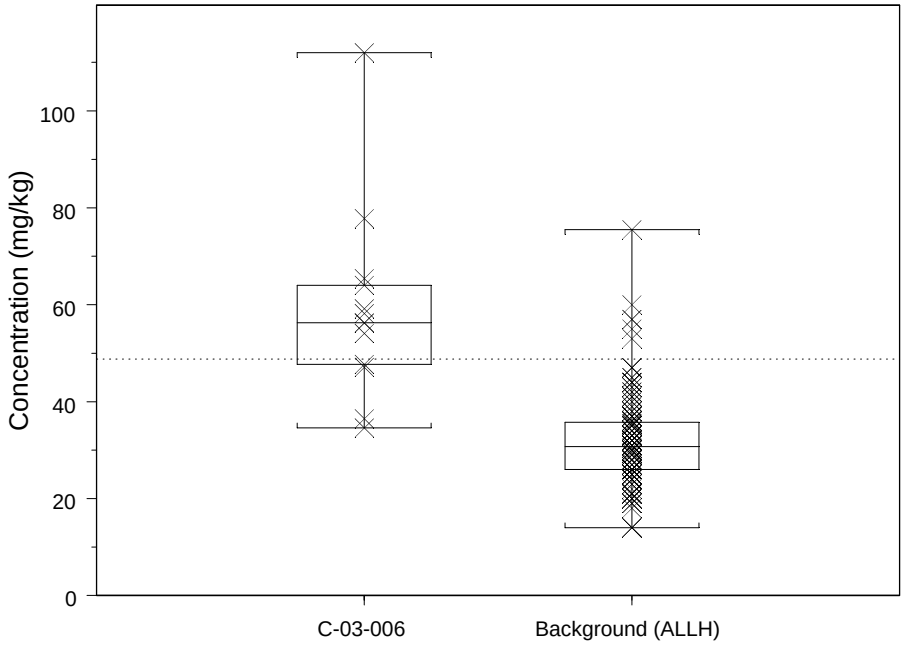


Figure I-2.19-8 Site concentrations of zinc in soil at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

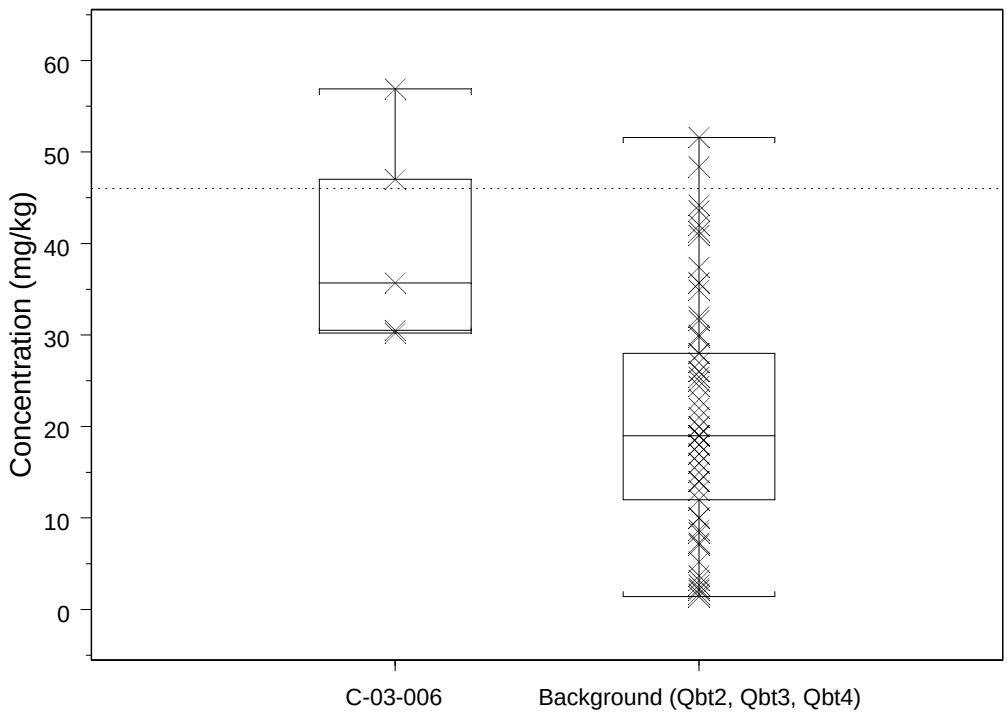


Figure I-2.19-9 Site concentrations of barium in tuff at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

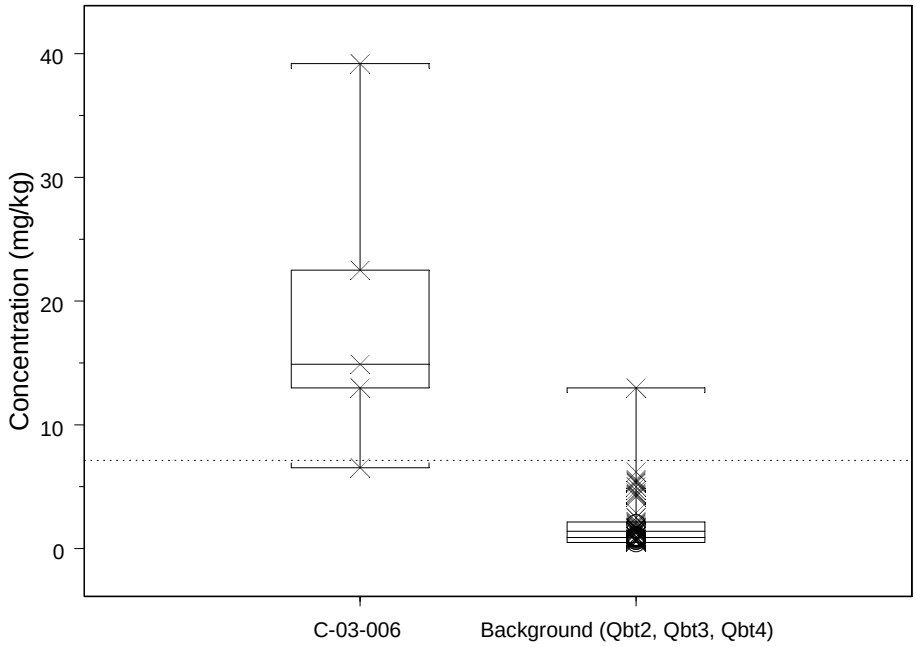


Figure I-2.19-10 Site concentrations of chromium in tuff at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

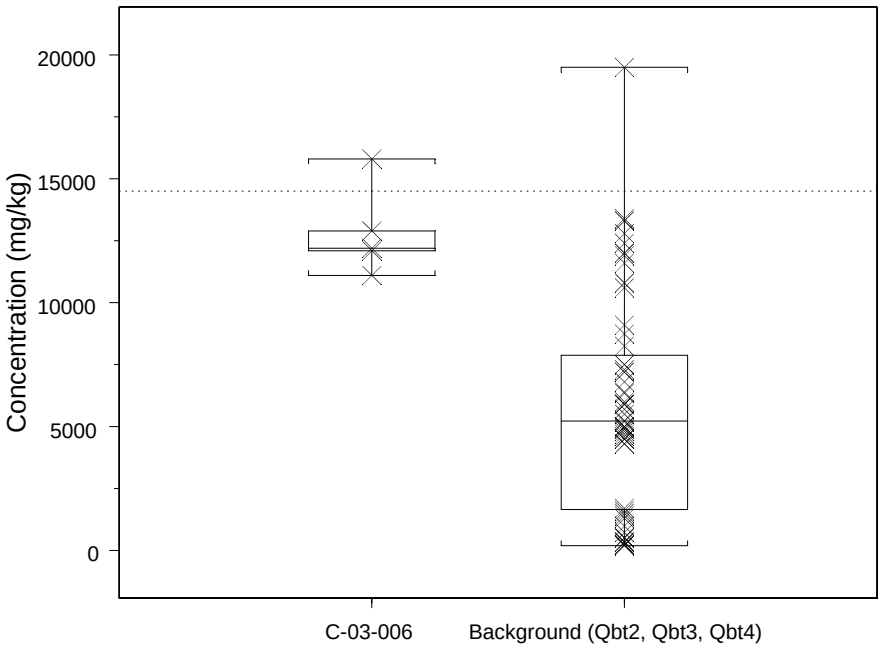


Figure I-2.19-11 Site concentrations of iron in tuff at AOC C-03-006 compared to background
(× = detect, ○ = nondetect)

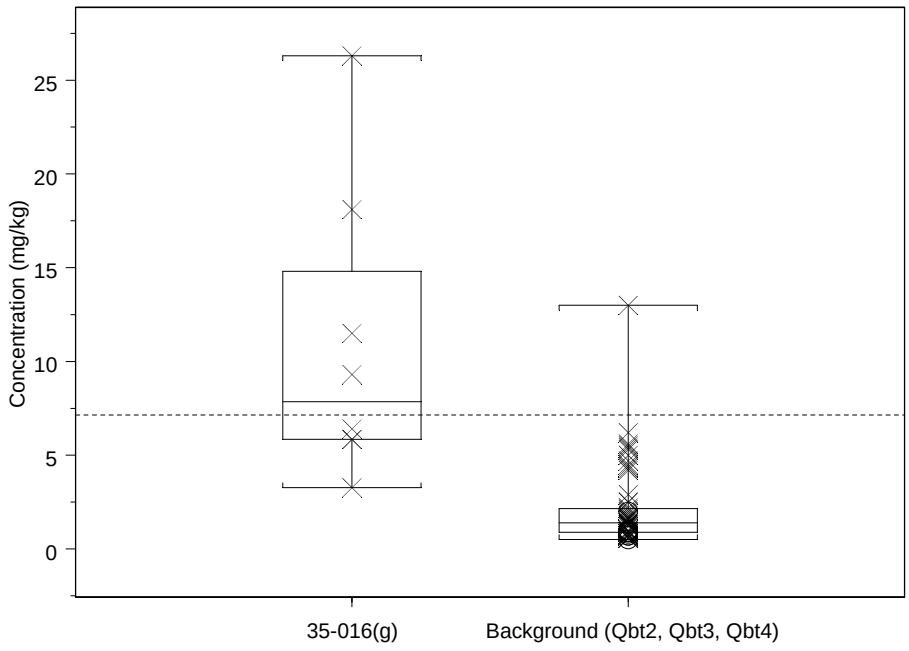


Figure I-3.1-1 Site concentrations of chromium in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

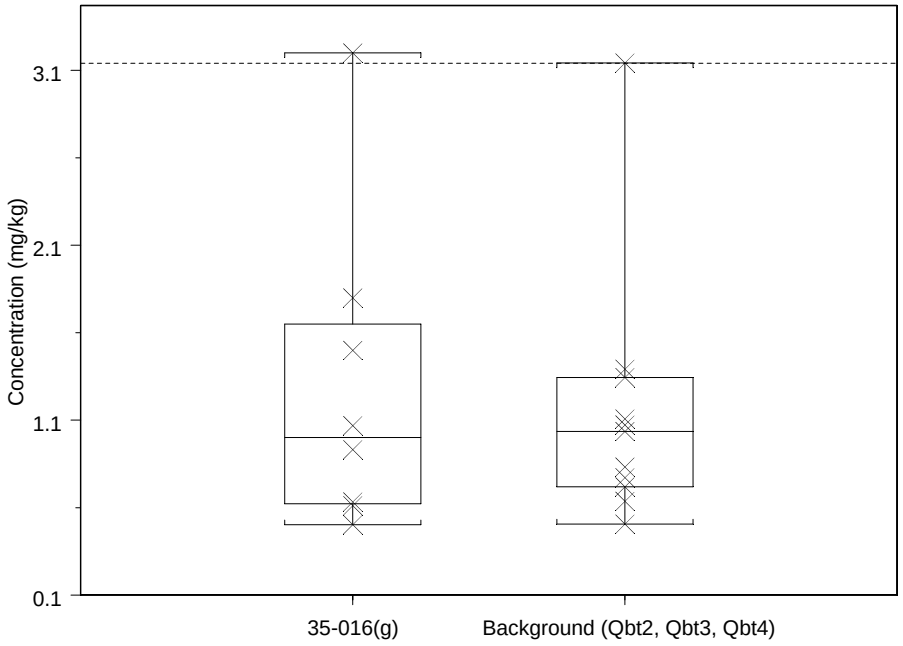


Figure I-3.1-2 Site concentrations of cobalt in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

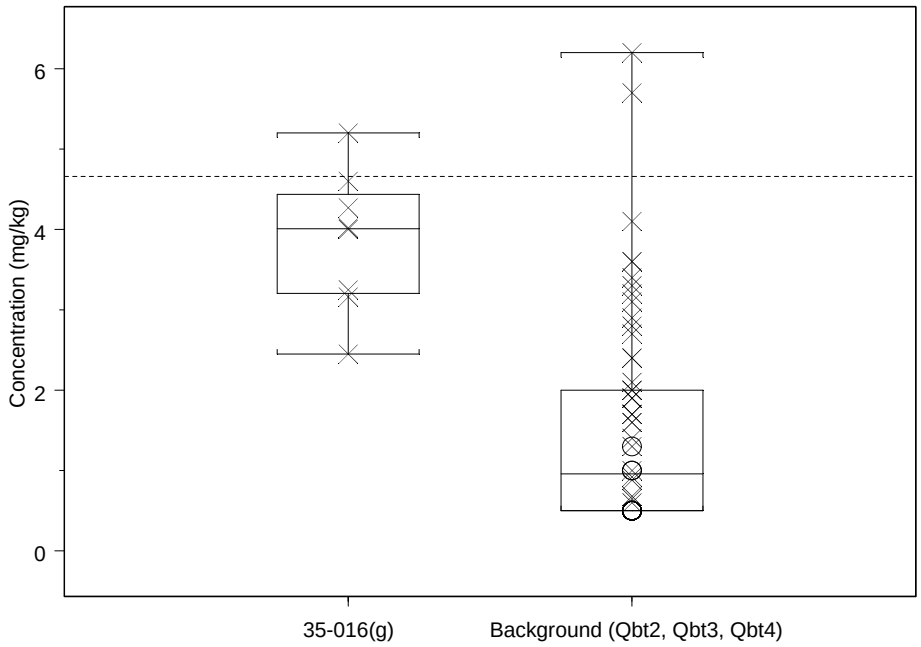


Figure I-3.1-3 Site concentrations of copper in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

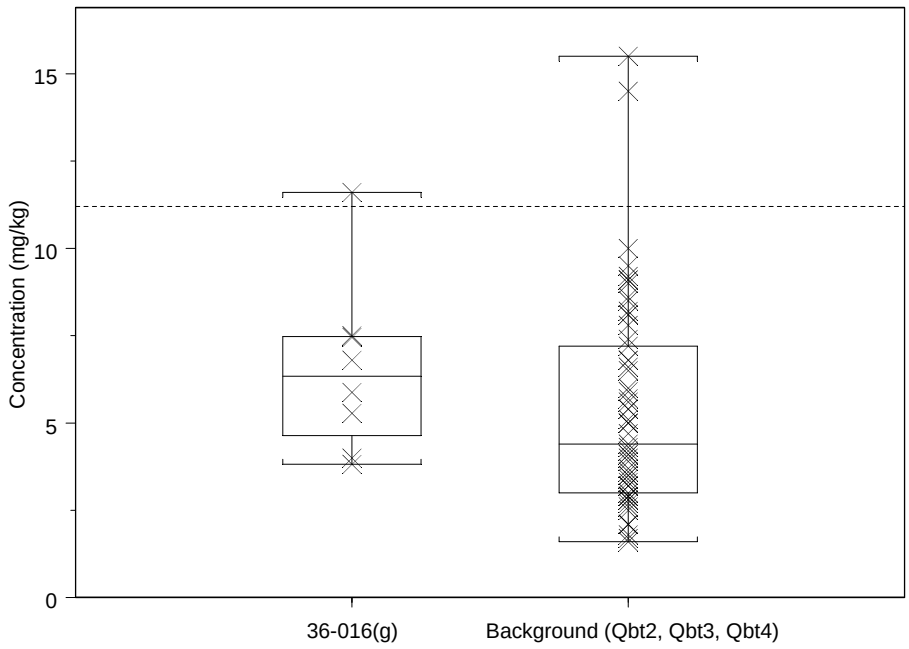


Figure I-3.1-4 Site concentrations of lead in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

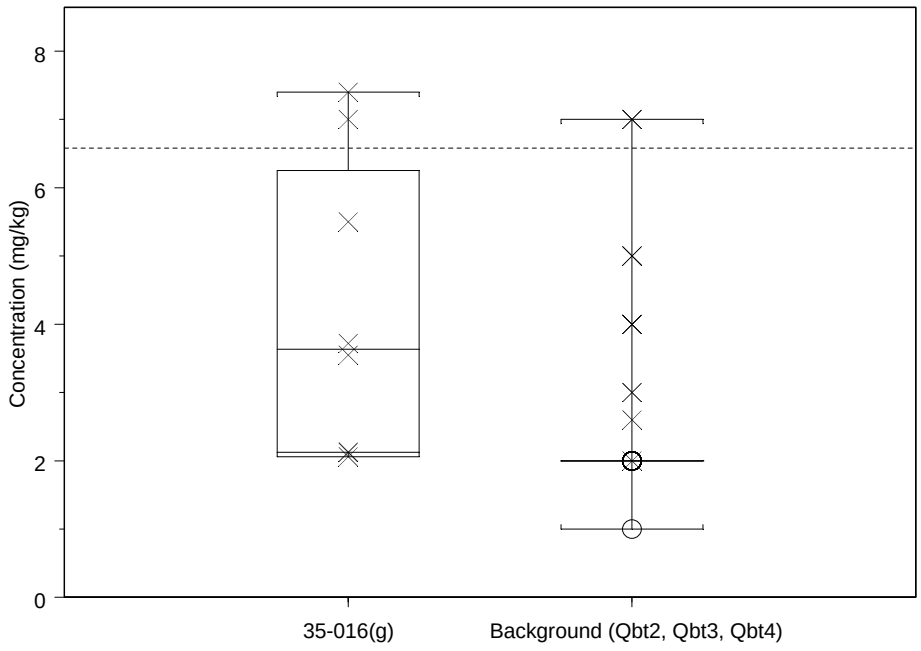


Figure I-3.1-5 Site concentrations of nickel in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

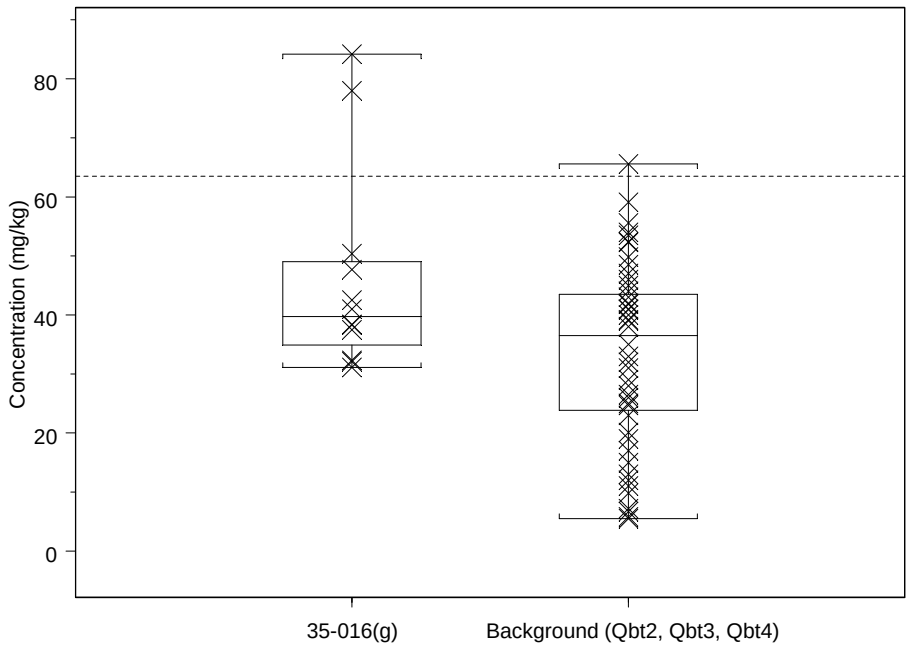


Figure I-3.1-6 Site concentrations of zinc in tuff at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

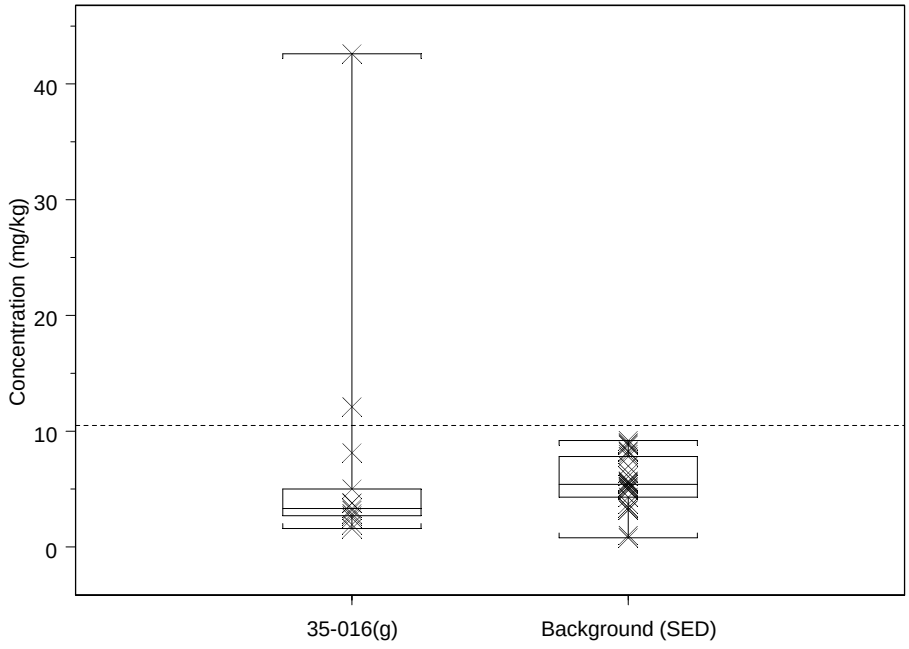


Figure I-3.1-7 Site concentrations of chromium in sediment at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

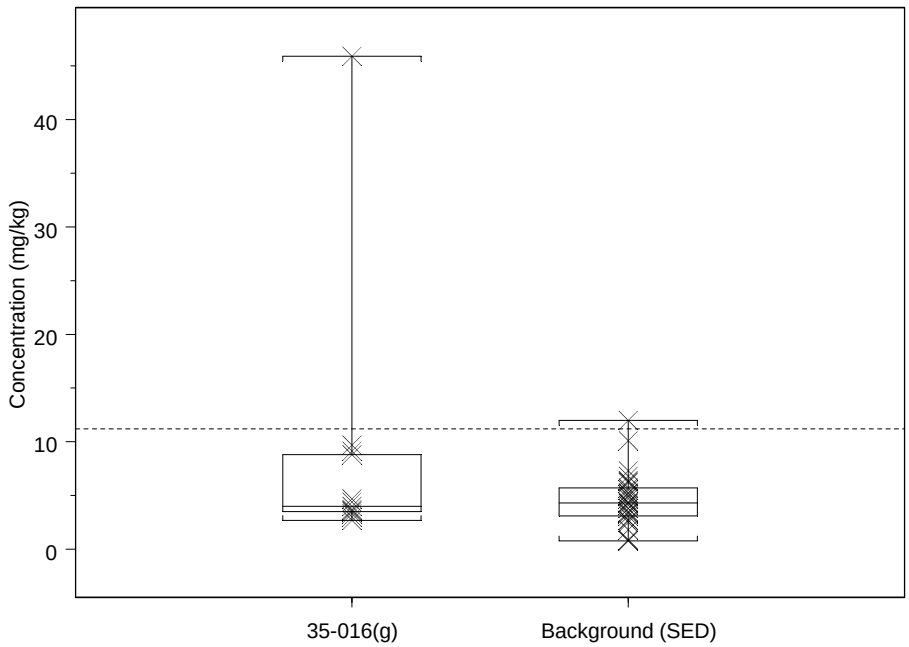


Figure I-3.1-8 Site concentrations of copper in sediment at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

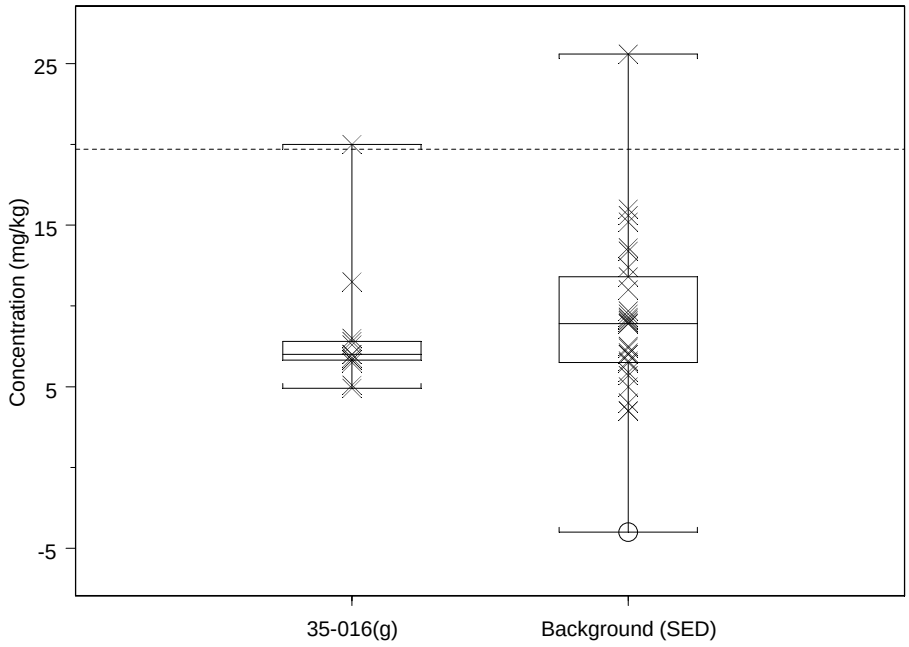


Figure I-3.1-9 Site concentrations of lead in sediment at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

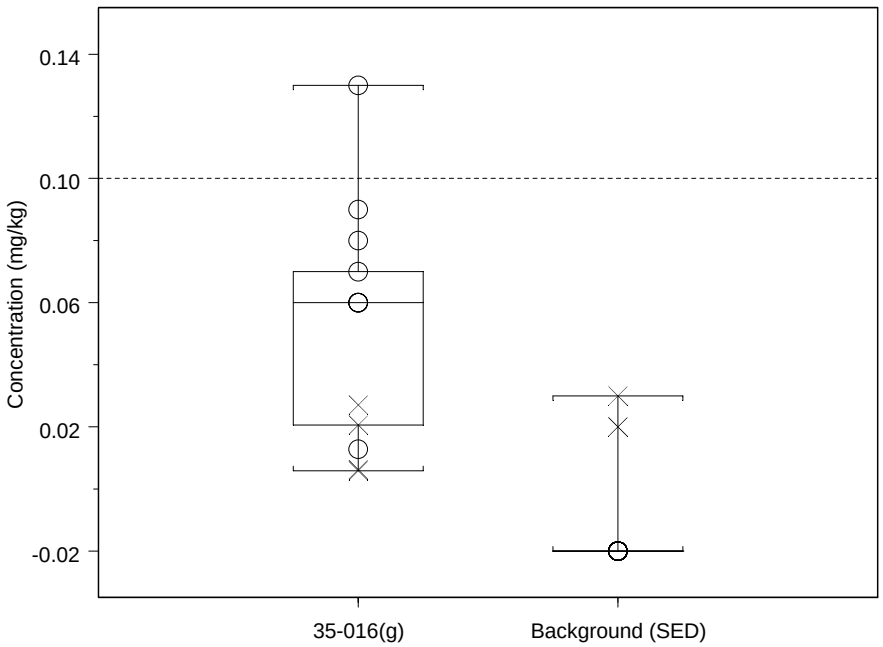


Figure I-3.1-10 Site concentrations of mercury in sediment at SWMU 35-016(g) compared to background

(× = detect, ○ = nondetect)

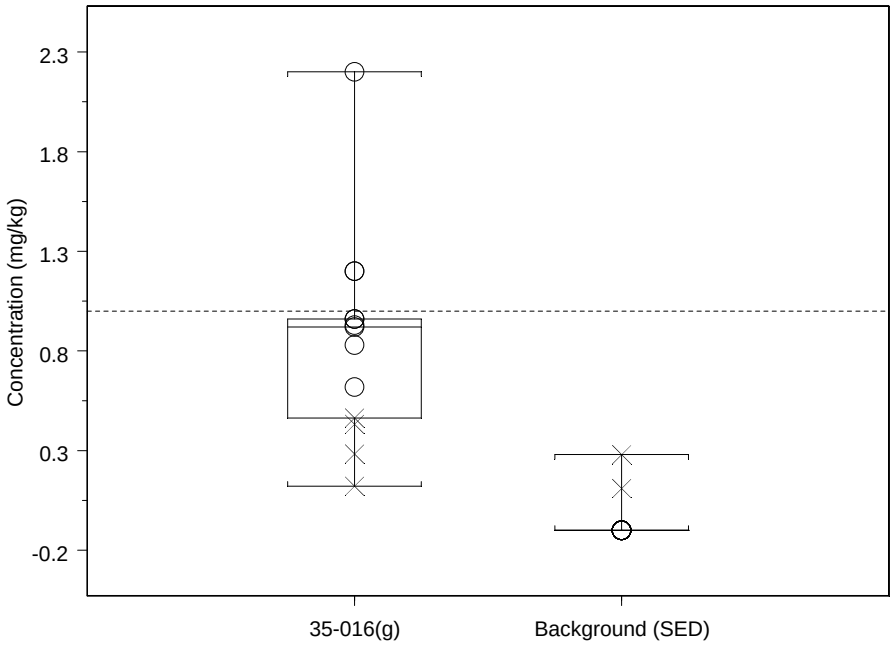


Figure I-3.1-11 Site concentrations of silver in sediment at SWMU 35-016(g) compared to background

(× = detect, ○ = nondetect)

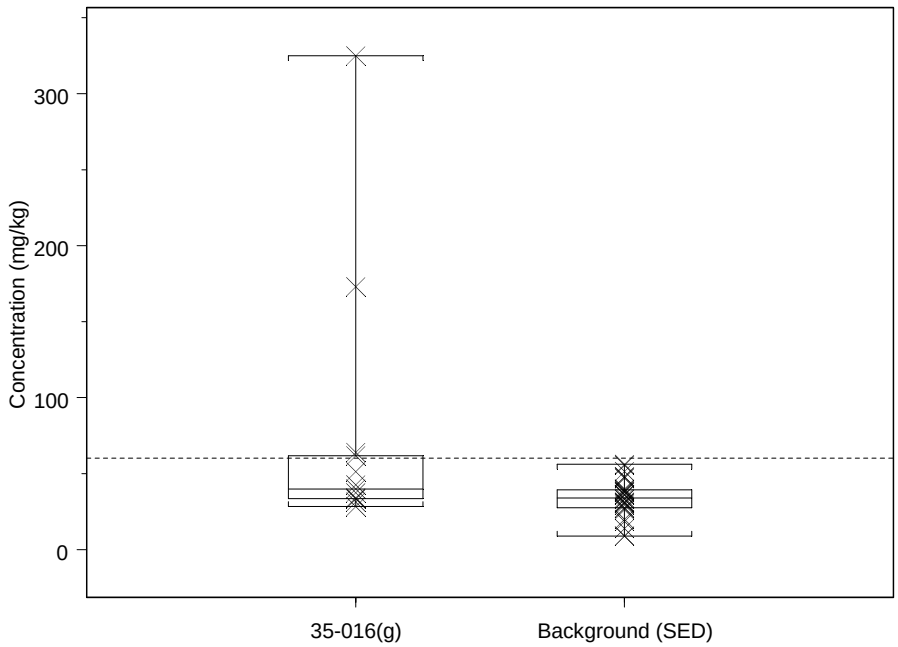


Figure I- 3.1-12 Site concentrations of zinc in sediment at SWMU 35-016(g) compared to background
(× = detect, ○ = nondetect)

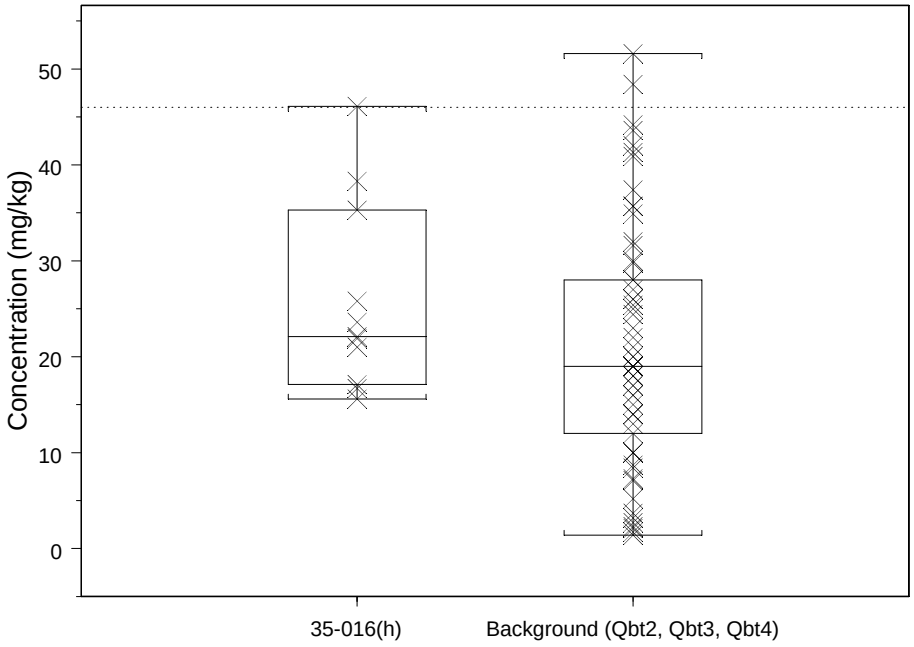


Figure I-3.2-1 Site concentrations of barium in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

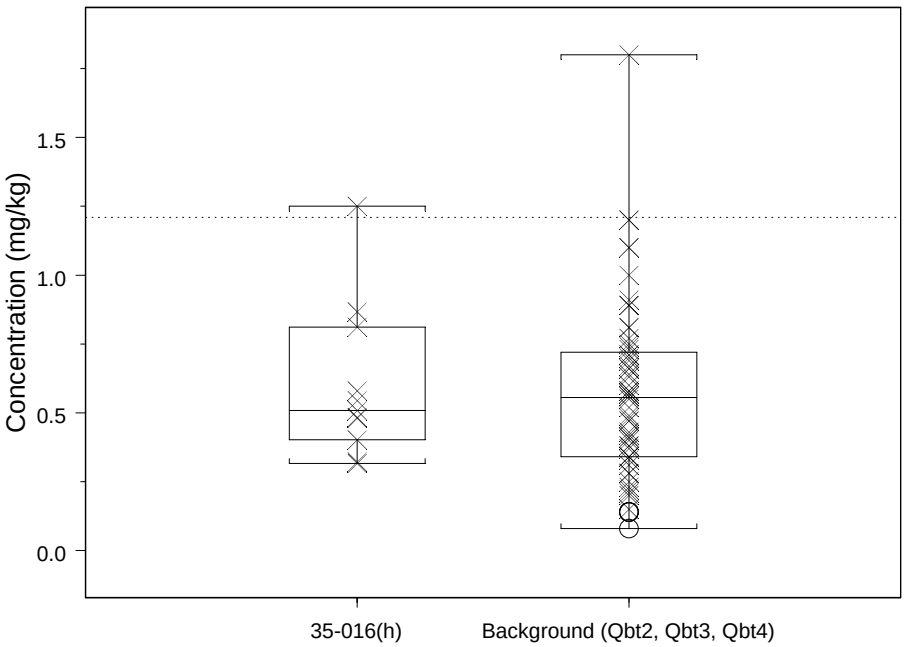


Figure I-3.2-2 Site concentrations of beryllium in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

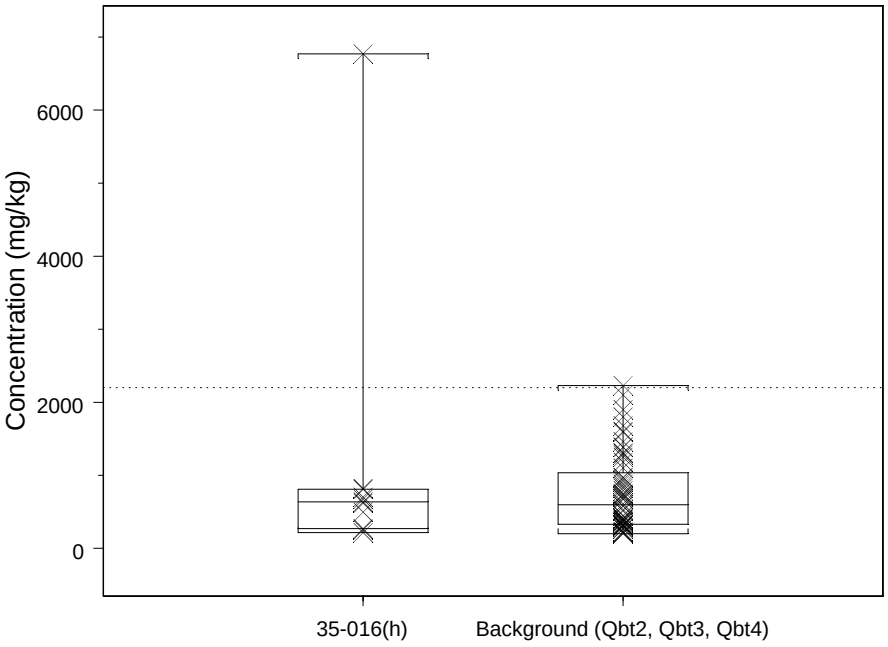


Figure I-3.2-3 Site concentrations of calcium in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

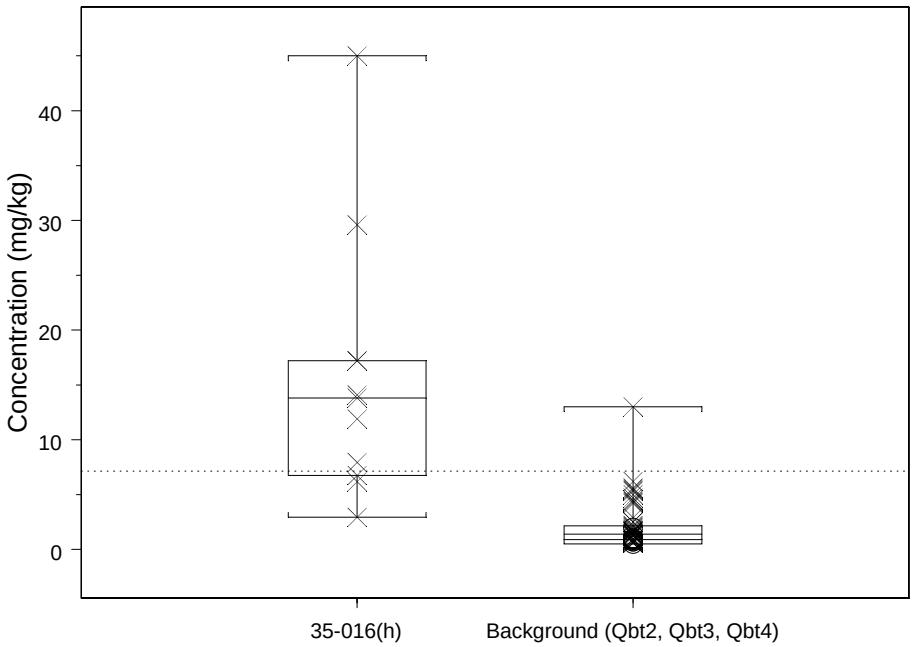


Figure I-3.2-4 Site concentrations of chromium in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

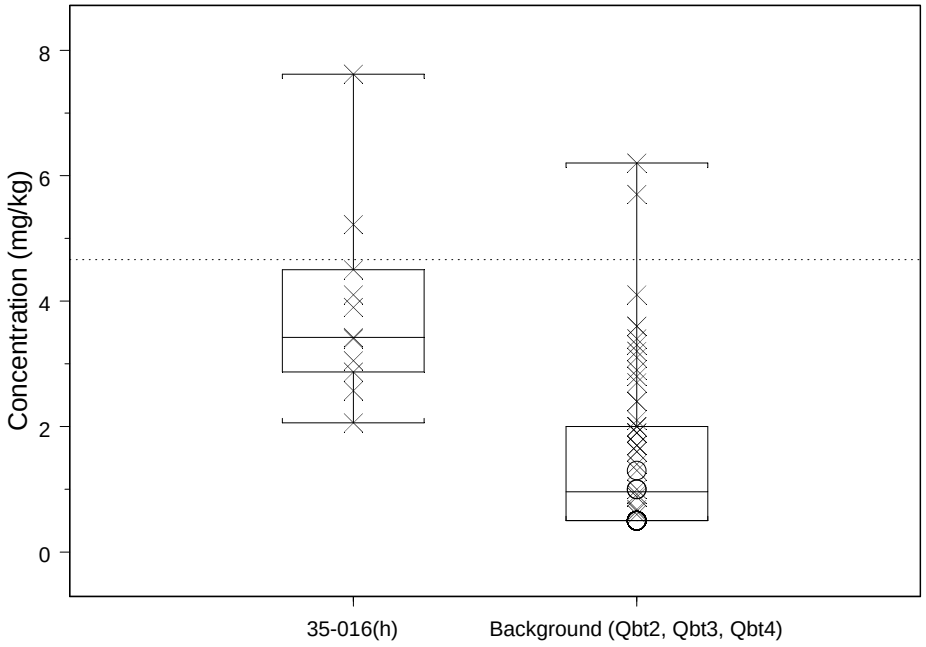


Figure I-3.2-5 Site concentrations of copper in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

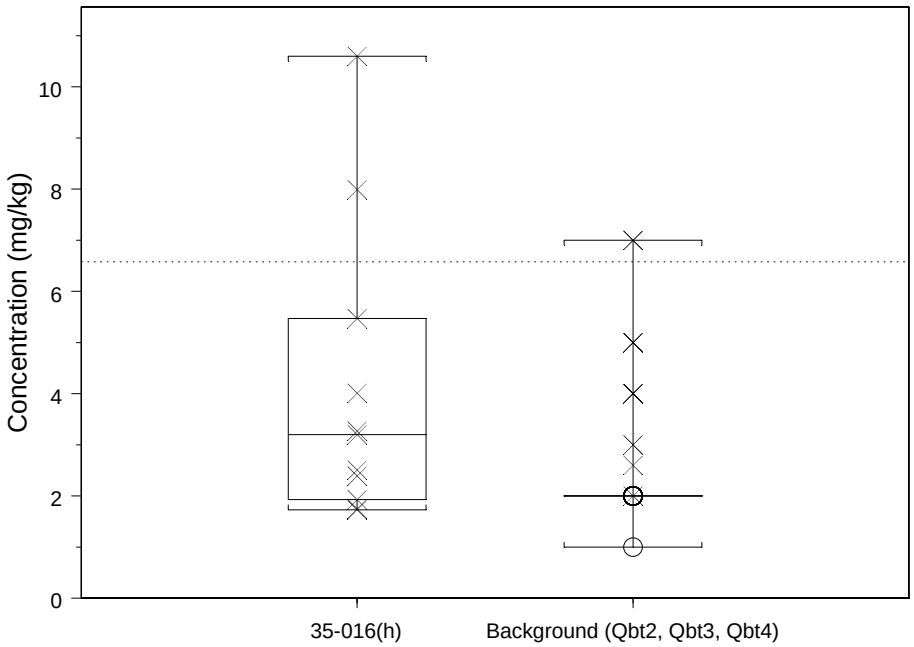


Figure I-3.2-6 Site concentrations of nickel in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

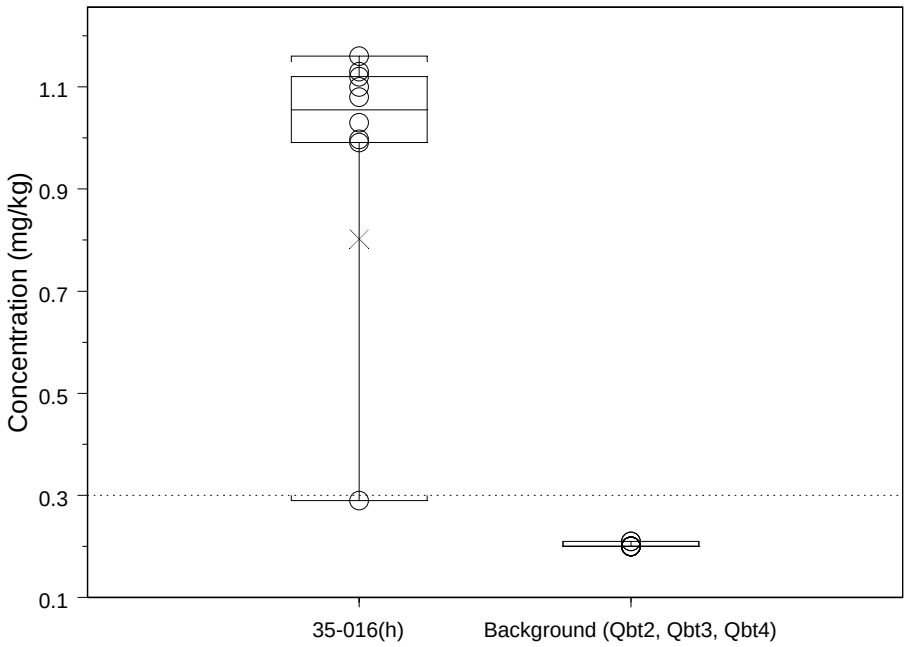


Figure I-3.2-7 Site concentrations of selenium in tuff at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

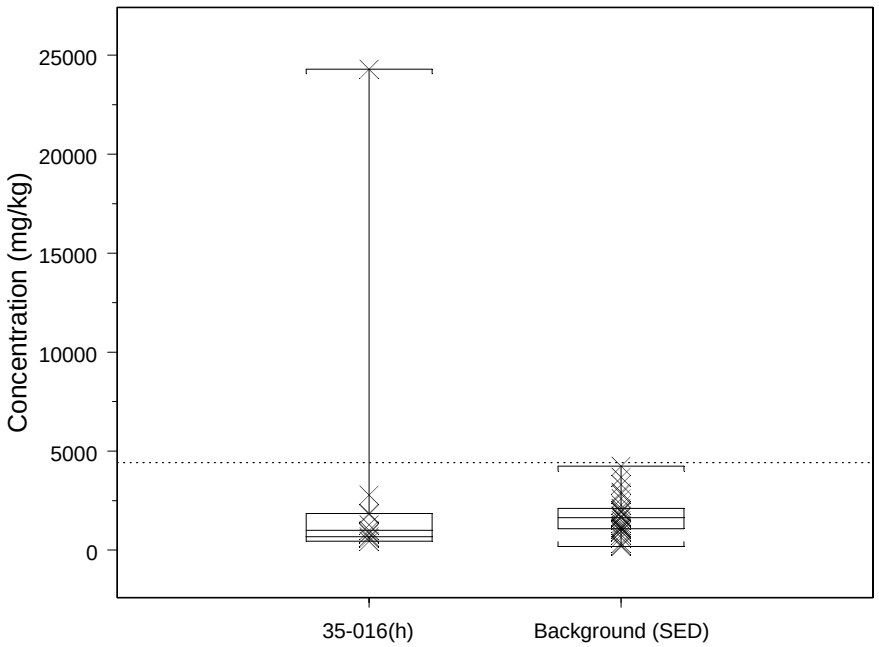


Figure I-3.2-8 Site concentrations of calcium in sediment at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

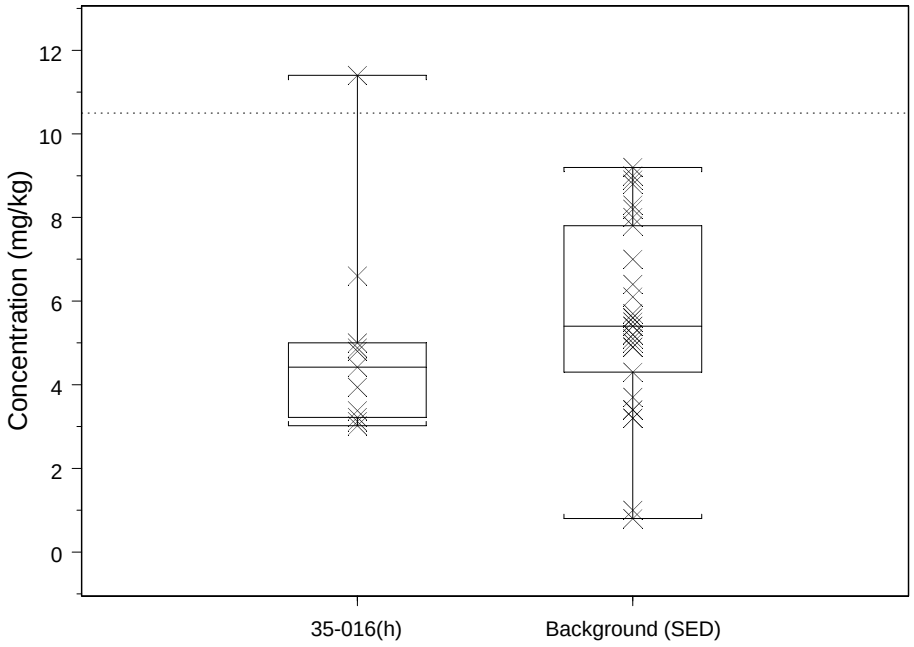


Figure I-3.2-9 Site concentrations of chromium in sediment at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

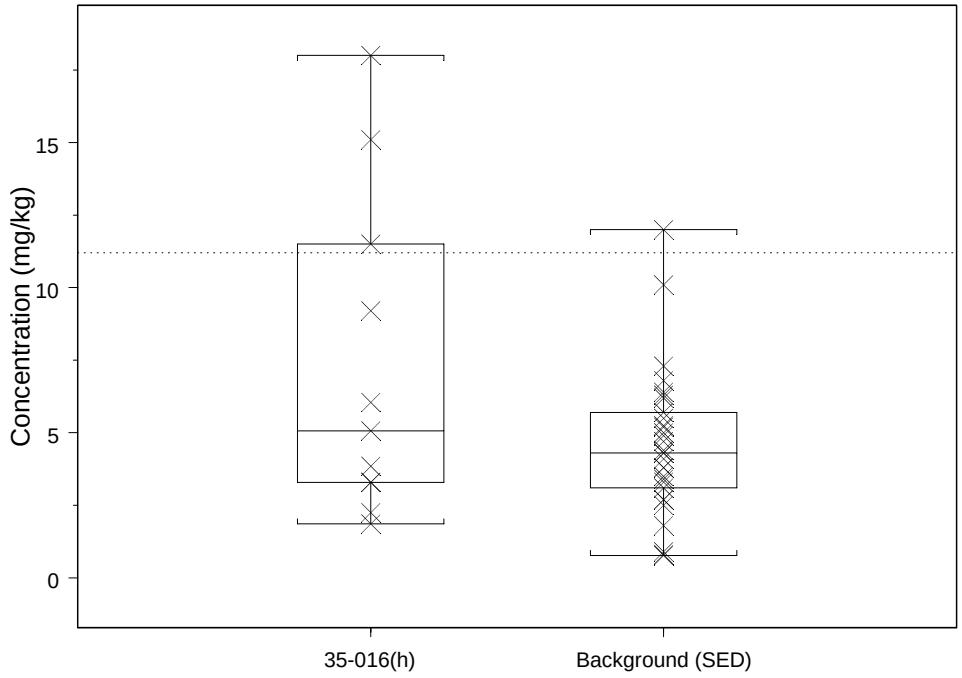


Figure I-3.2-10 Site concentrations of copper in sediment at SWMU 35-016(h) compared to background

(× = detect, ○ = nondetect)

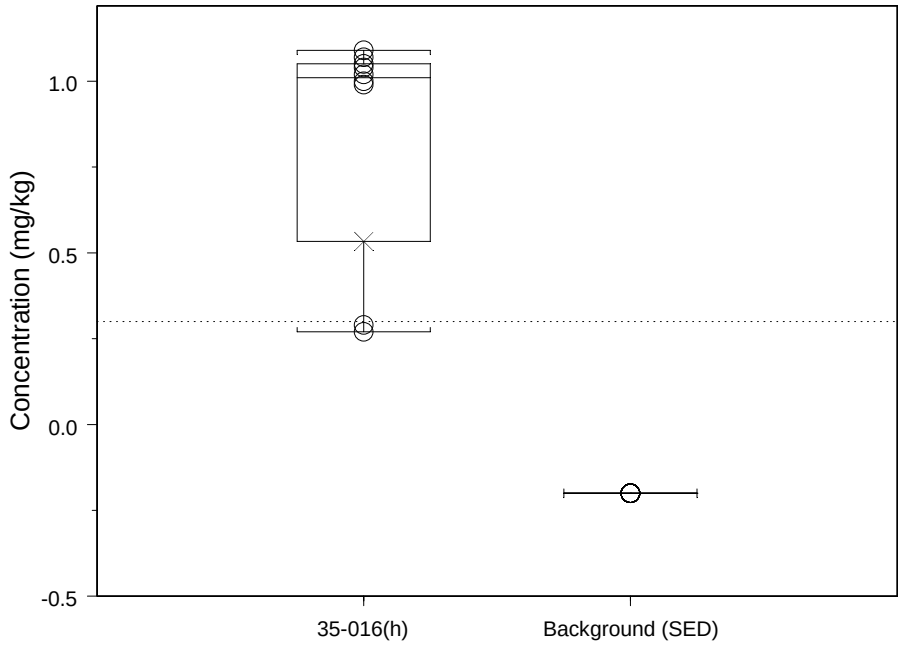


Figure I-3.2-11 Site concentrations of selenium in sediment at SWMU 35-016(h) compared to background

(× = detect, ○ = nondetect)

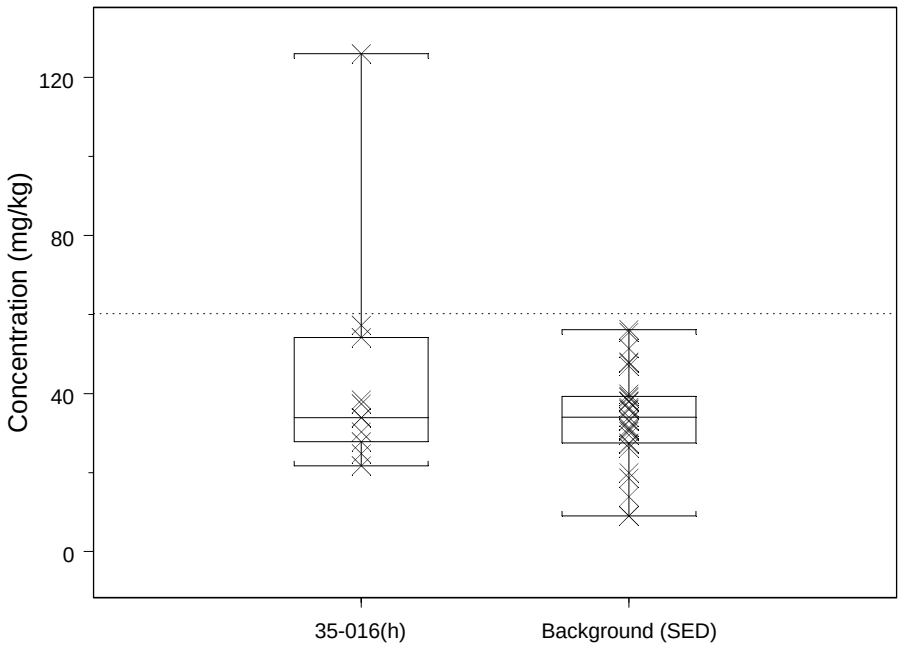


Figure I-3.2-12 Site concentrations of zinc in sediment at SWMU 35-016(h) compared to background
(× = detect, ○ = nondetect)

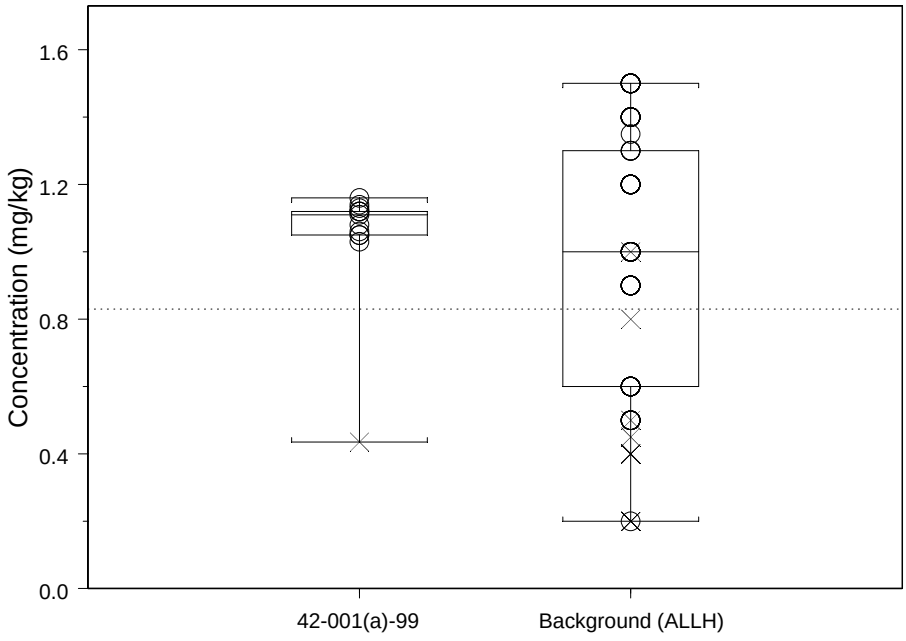


Figure I-4.1-1 Site concentrations of antimony in soil at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

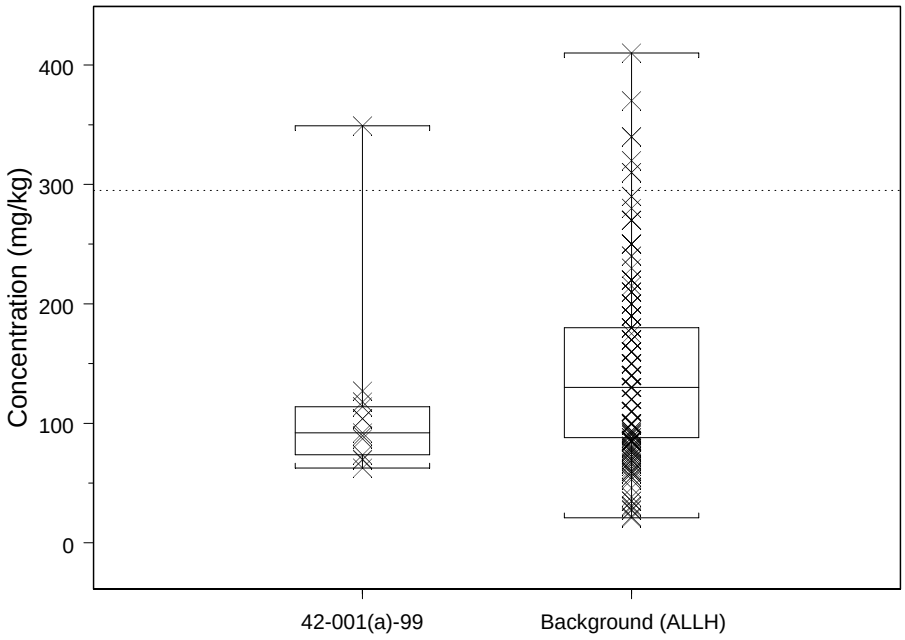


Figure I-4.1-2 Site concentrations of barium in soil at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

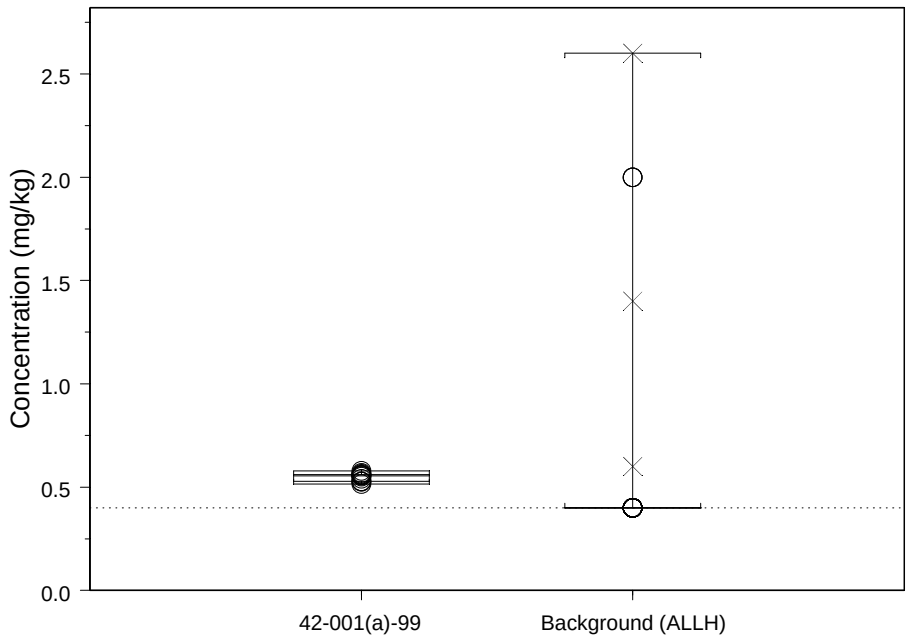


Figure I-4.1-3 Site concentrations of cadmium in soil at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

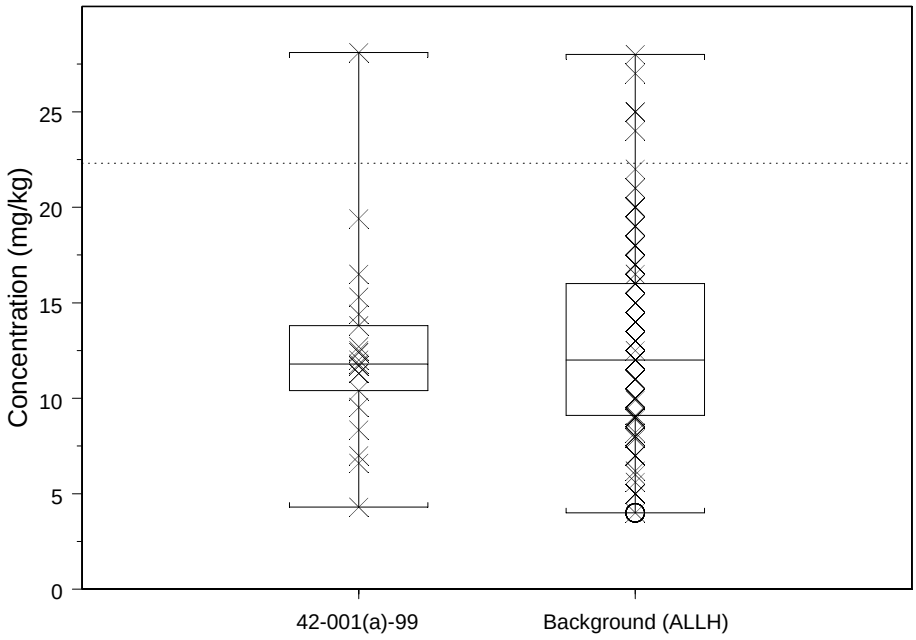


Figure I-4.1-4 Site concentrations of lead in soil at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

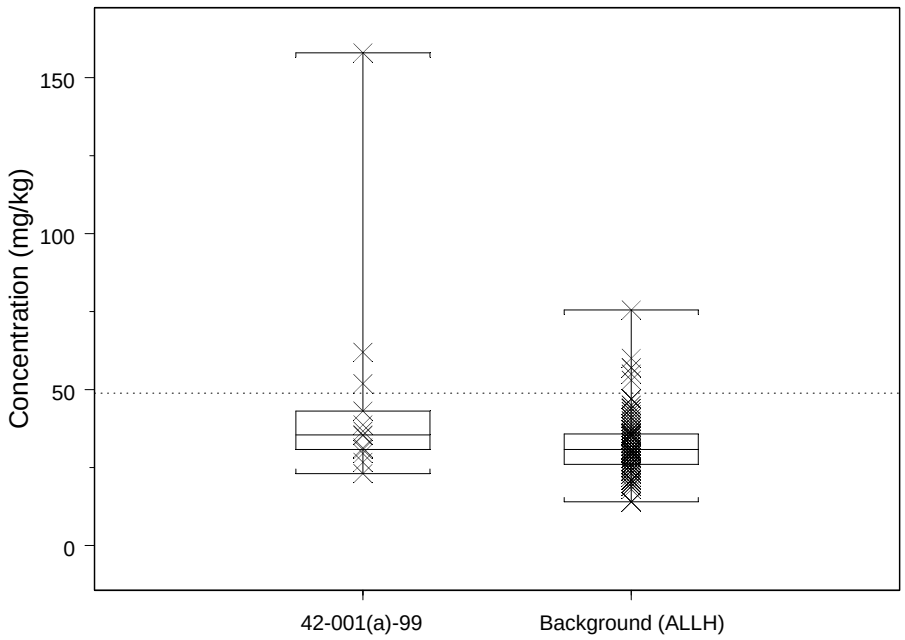


Figure I-4.1-5 Site concentrations of zinc in soil at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

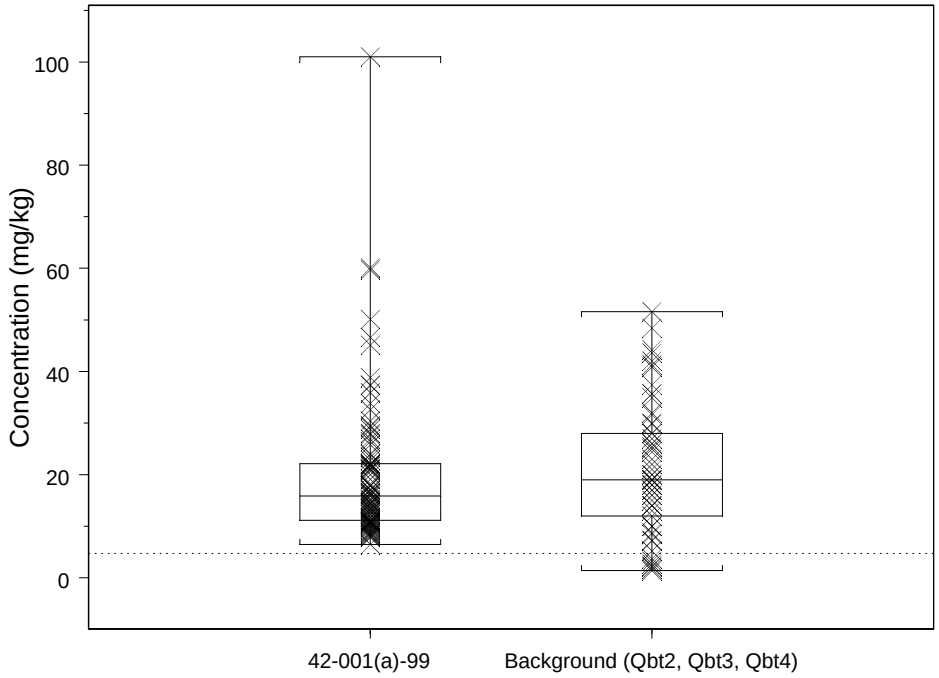


Figure I-4.1-6 Site concentrations of barium in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

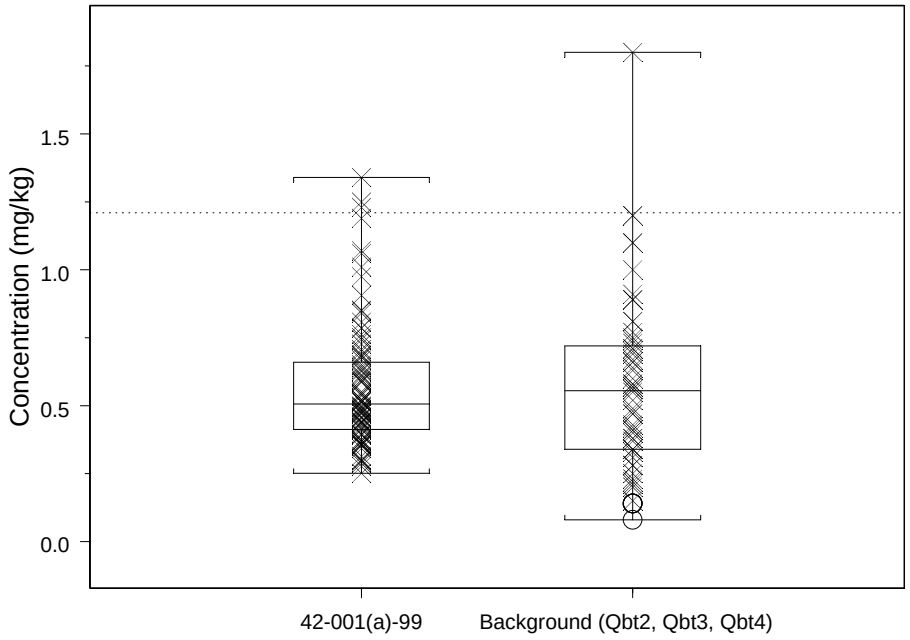


Figure I-4.1-7 Site concentrations of beryllium in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

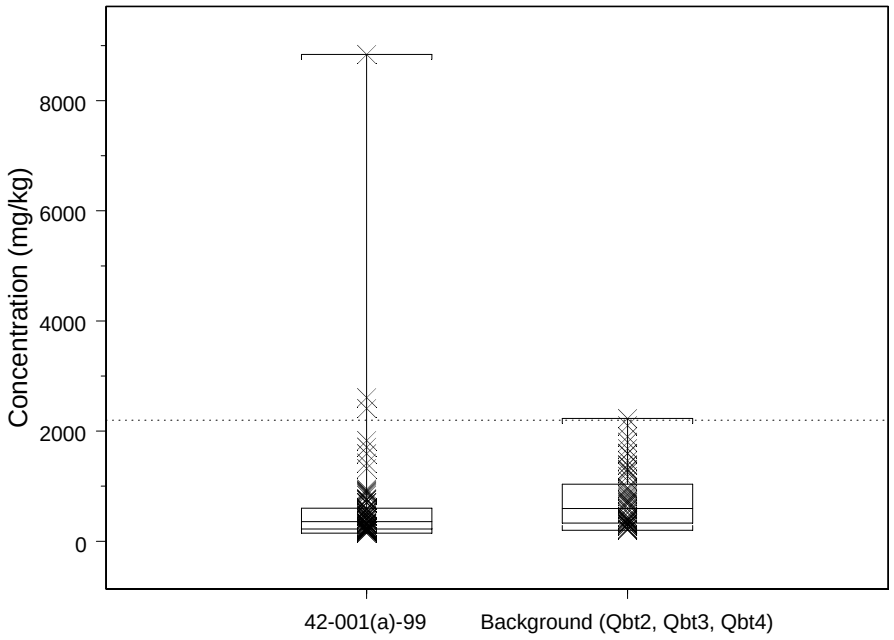


Figure I-4.1-8 Site concentrations of calcium in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

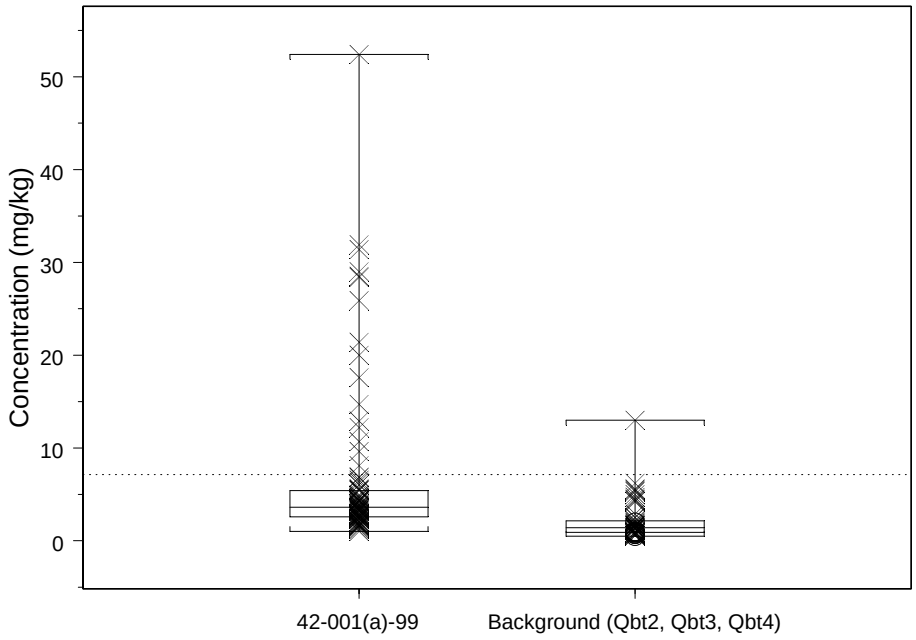


Figure I-4.1-9 Site concentrations of chromium in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

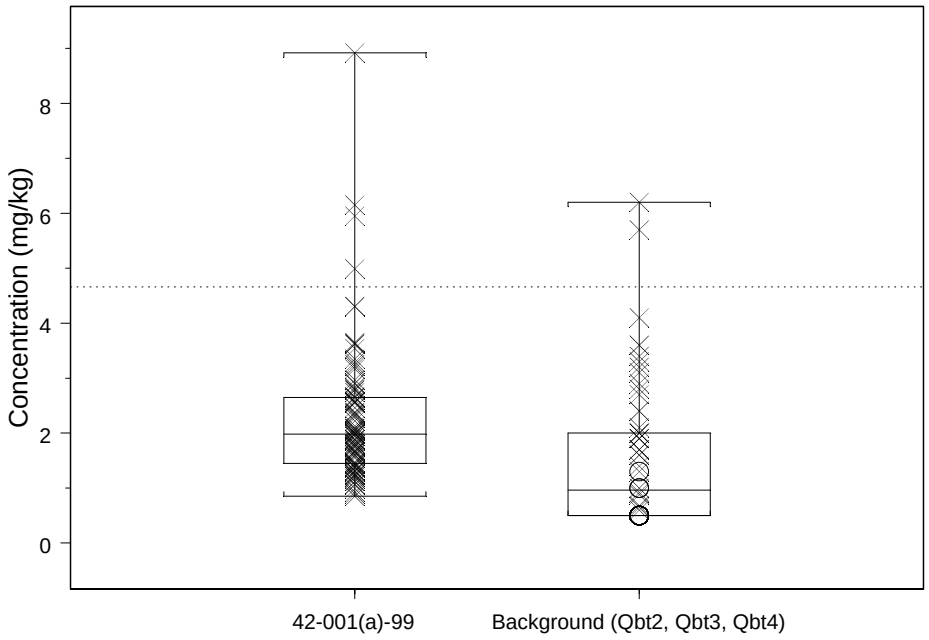


Figure I-4.1-10 Site concentrations of copper in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

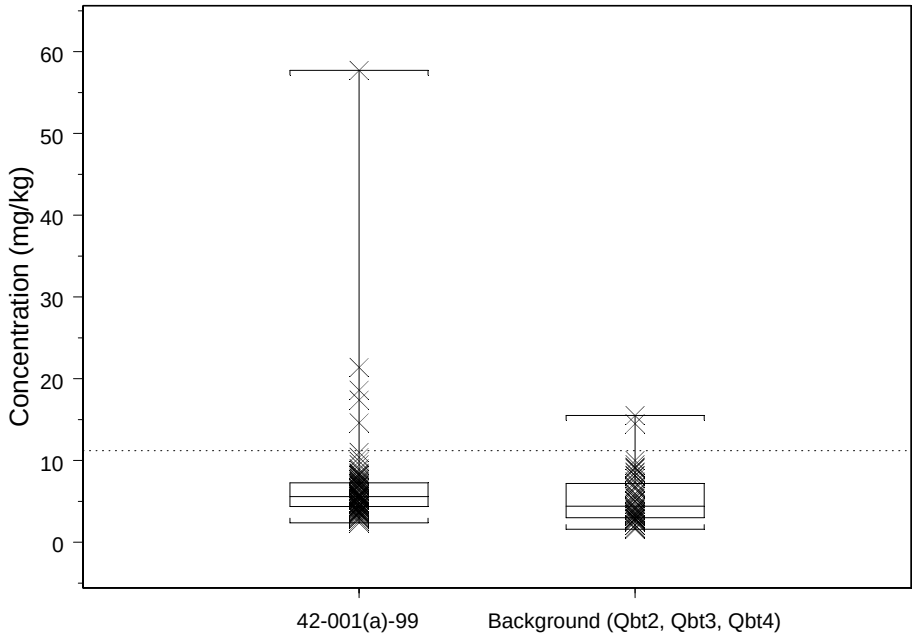


Figure I-4.1-11 Site concentrations of lead in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

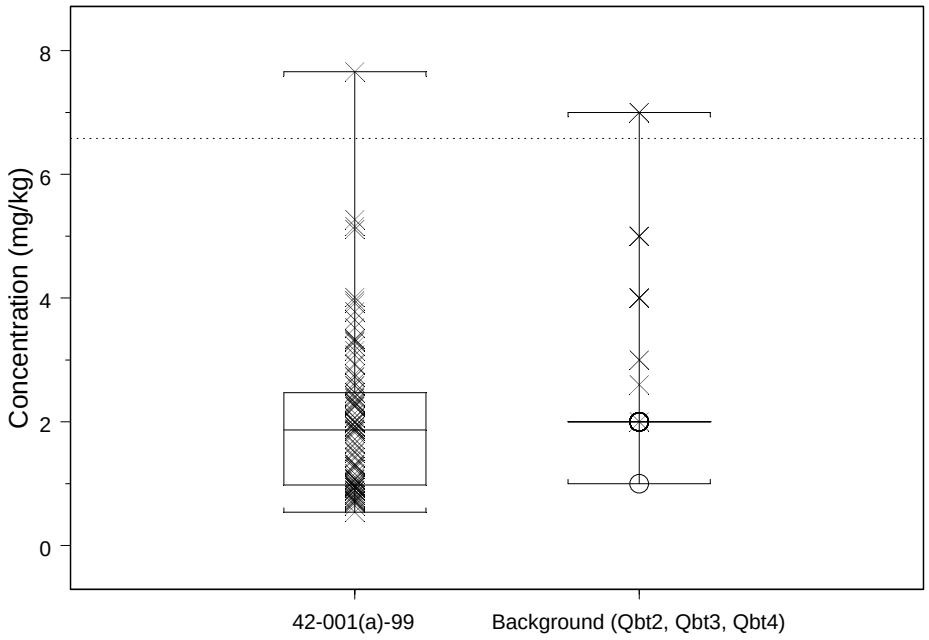


Figure I-4.1-12 Site concentrations of nickel in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

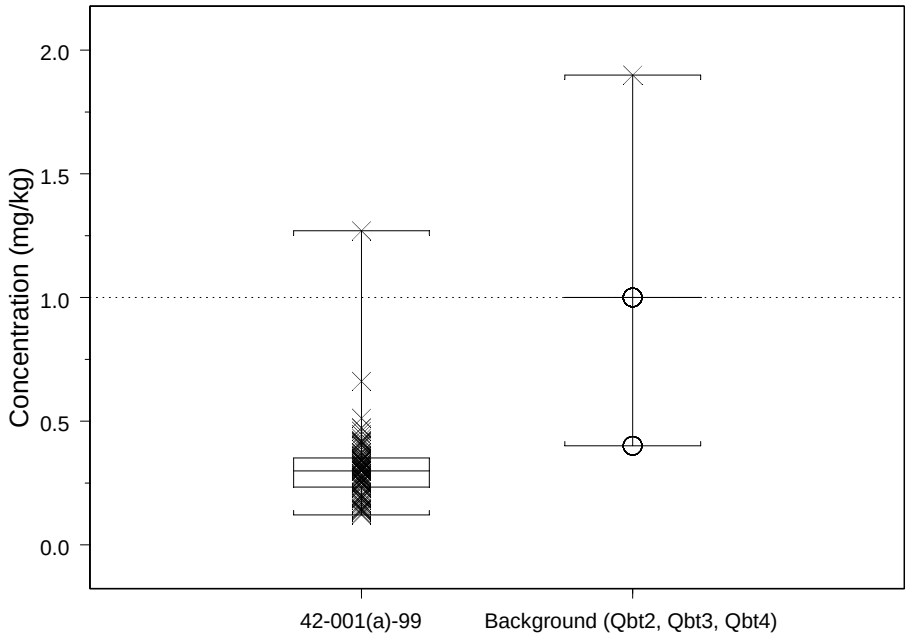


Figure I-4.1-13 Site concentrations of silver in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

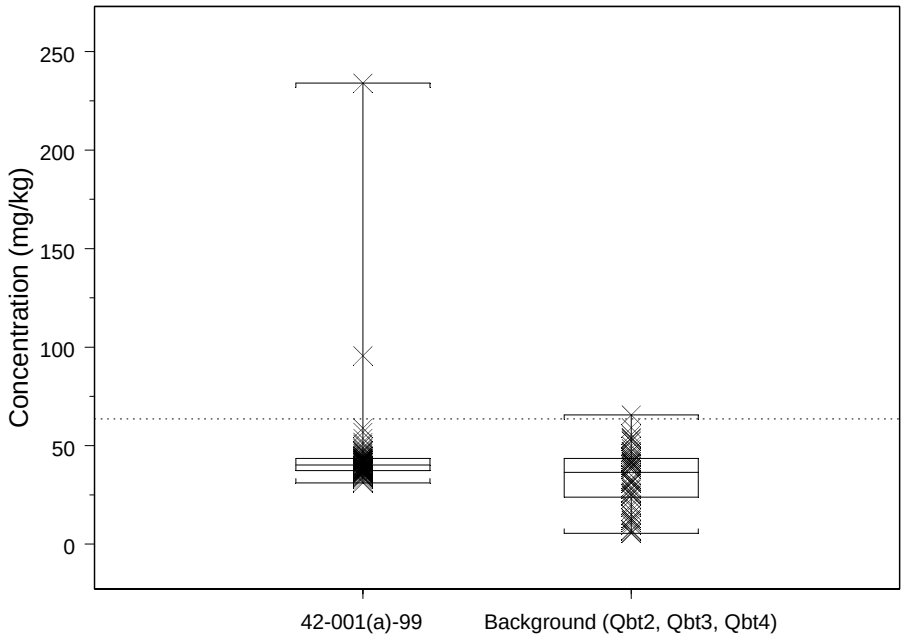


Figure I-4.1-14 Site concentrations of zinc in tuff at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

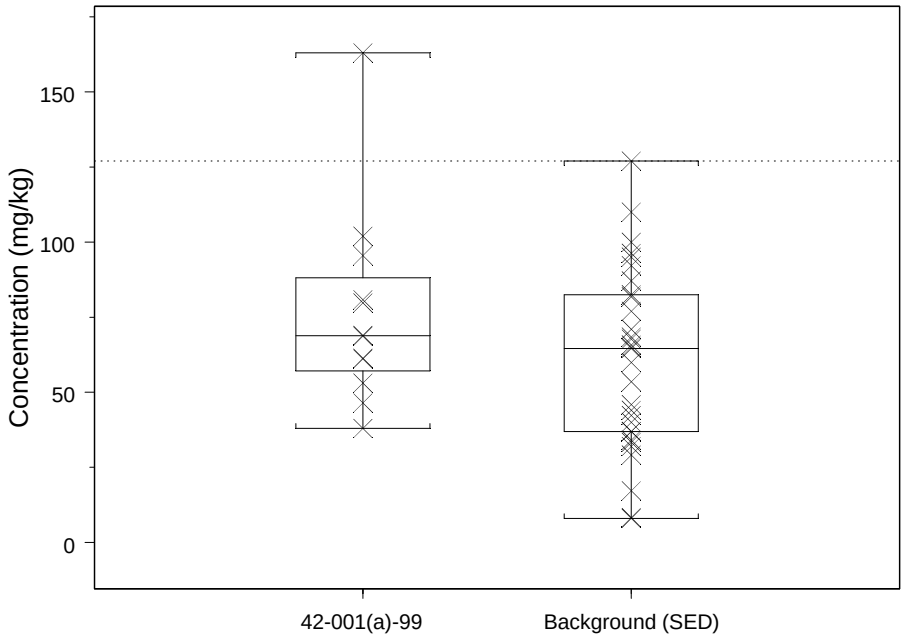


Figure I-4.1-15 Site concentrations of barium in sediment at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

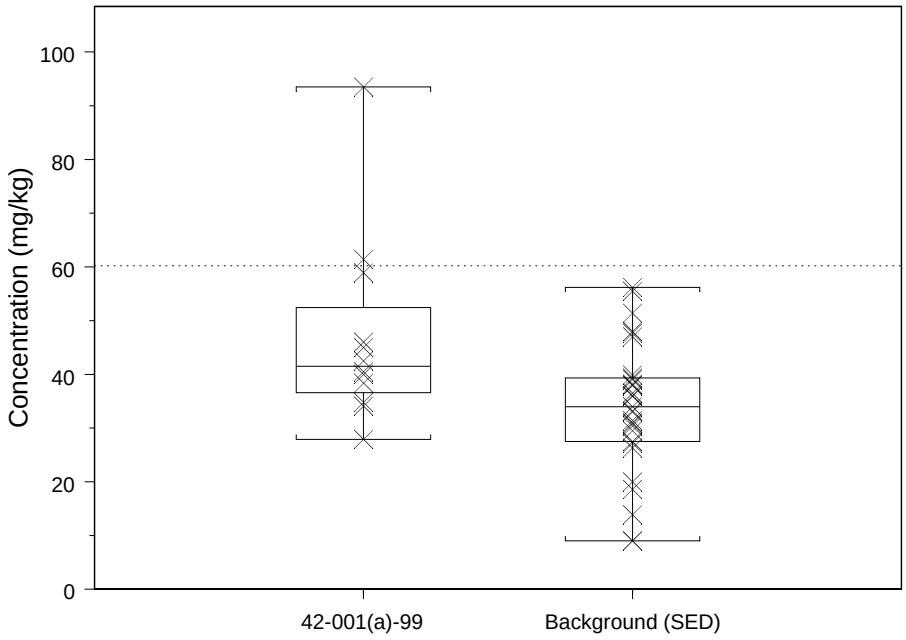


Figure I-4.1-16 Site concentrations of zinc in sediment at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

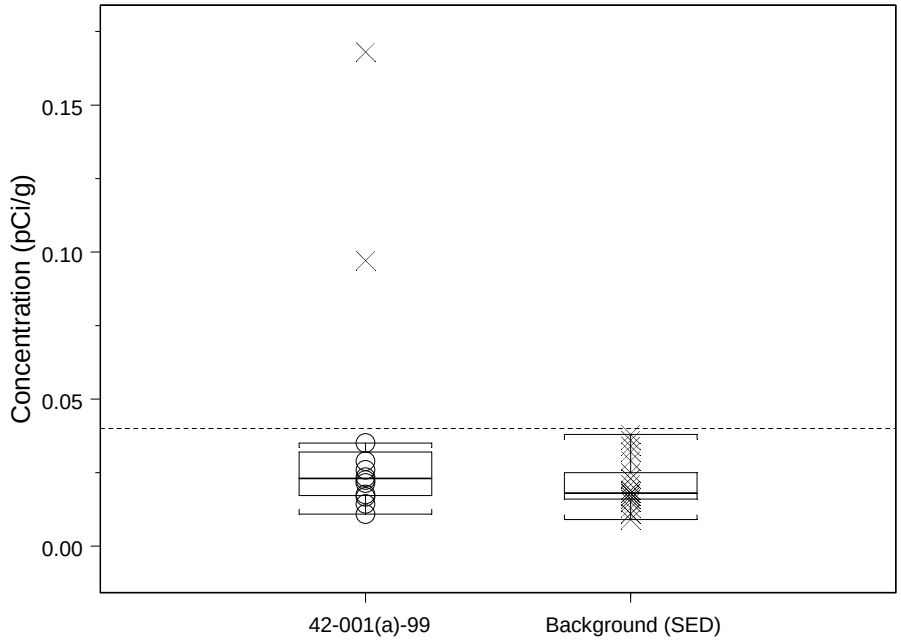


Figure I-4.1-18 Site concentrations of americium-241 in sediment at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

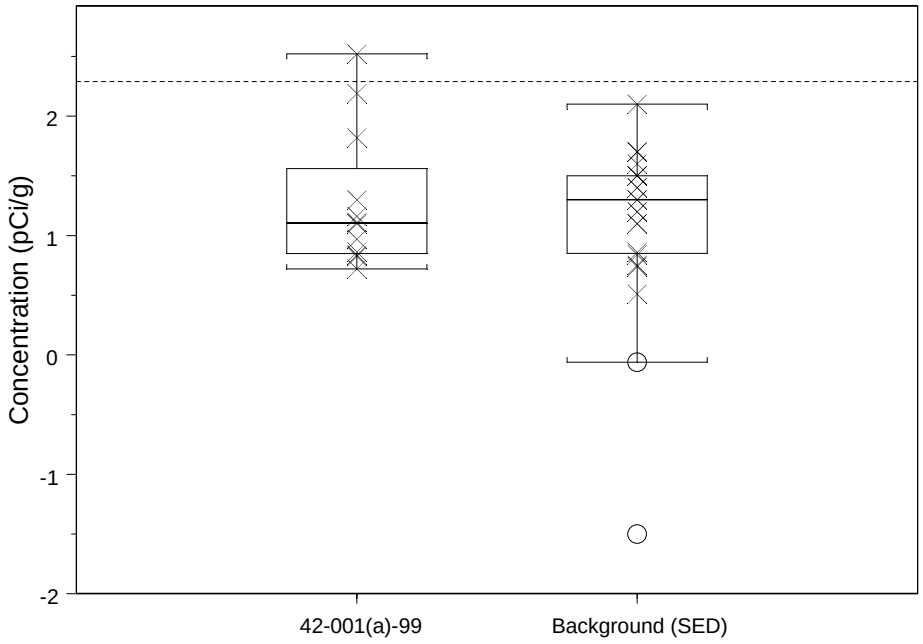


Figure I-4.1-19 Site concentrations of uranium-238 in sediment at Consolidated Unit 42-001(a)-99 compared to background
(× = detect, ○ = nondetect)

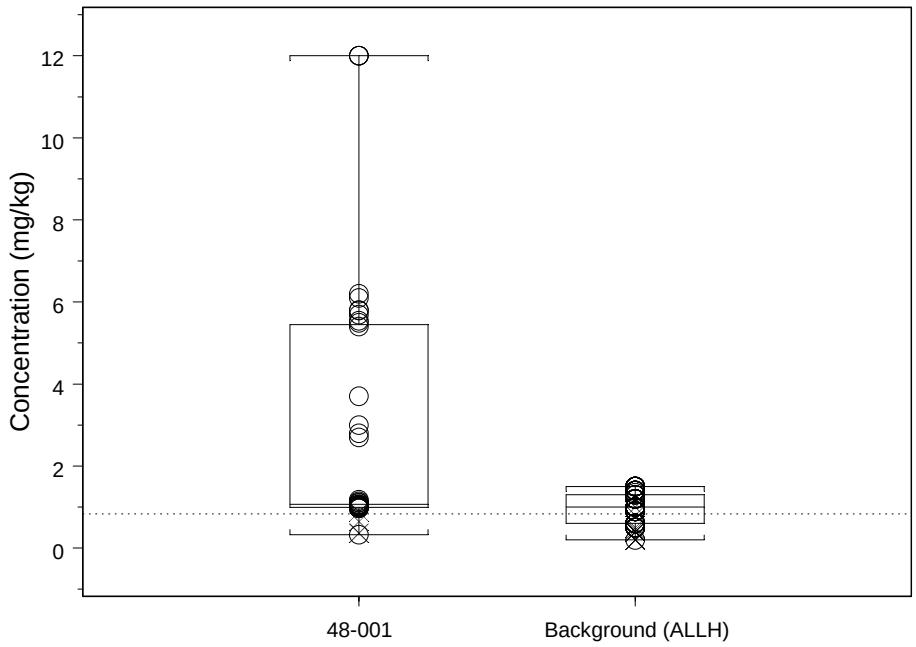


Figure I-5.1-1 Site concentrations of antimony in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

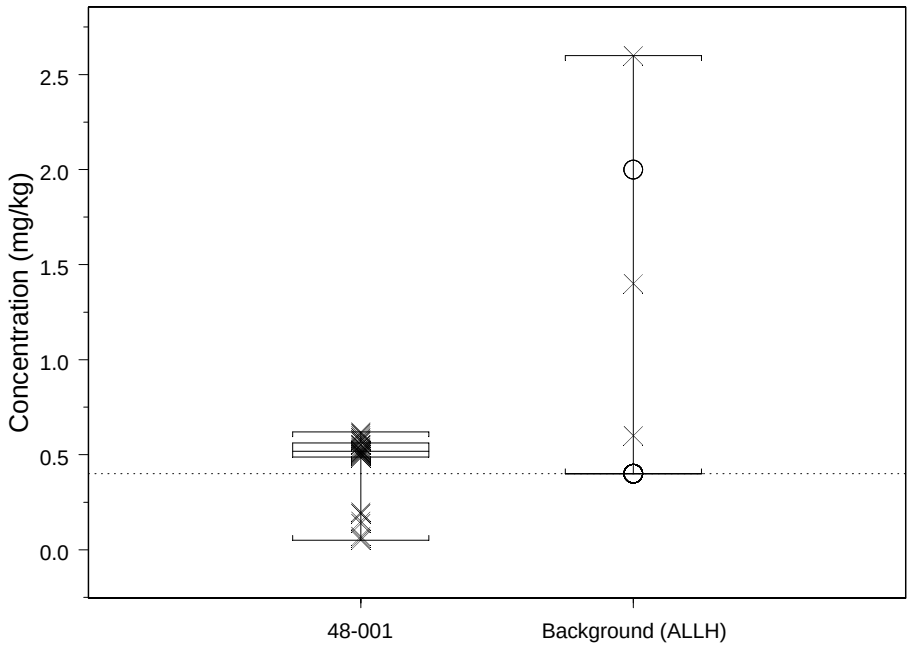


Figure I-5.1-2 Site concentrations of cadmium in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

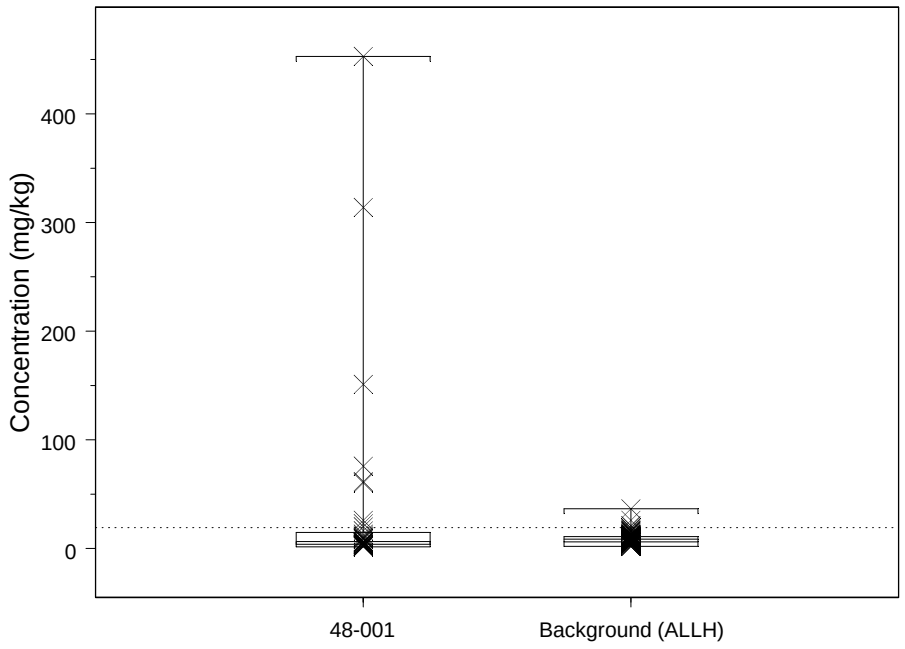


Figure I-5.1-3 Site concentrations of chromium in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

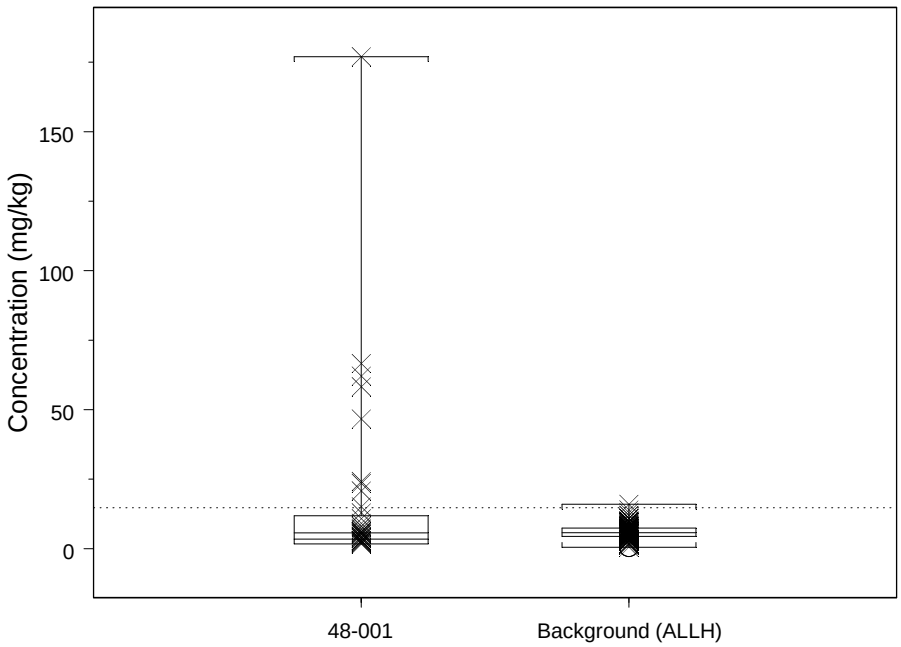


Figure I-5.1-4 Site concentrations of copper in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

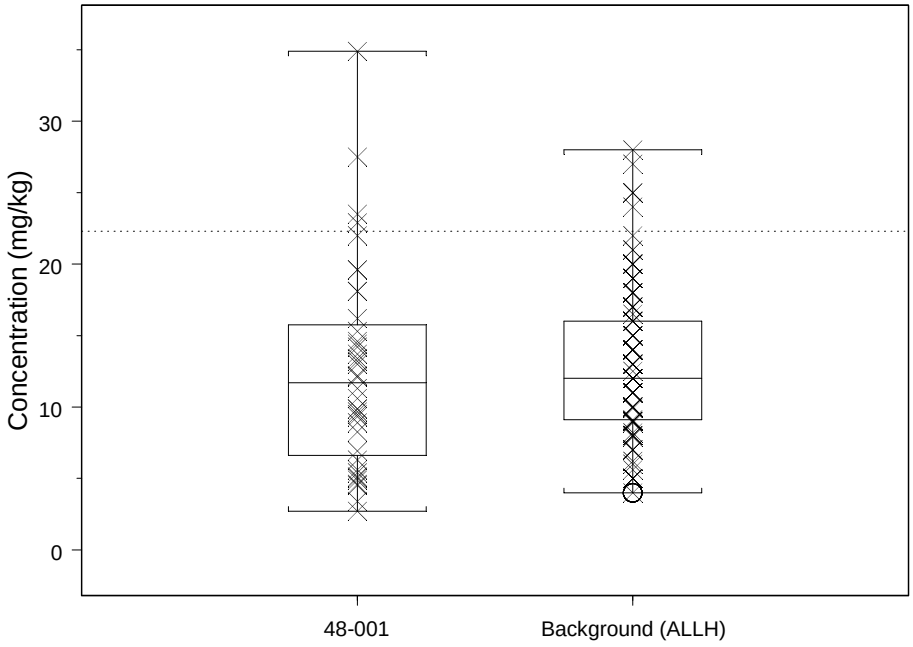


Figure I-5.1-5 Site concentrations of lead in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

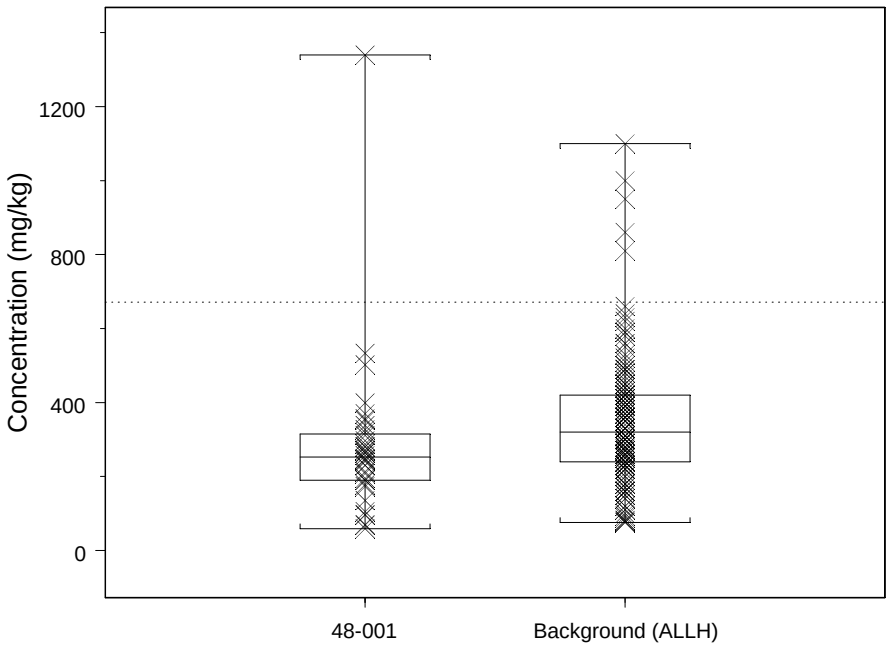


Figure I-5.1-6 Site concentrations of manganese in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

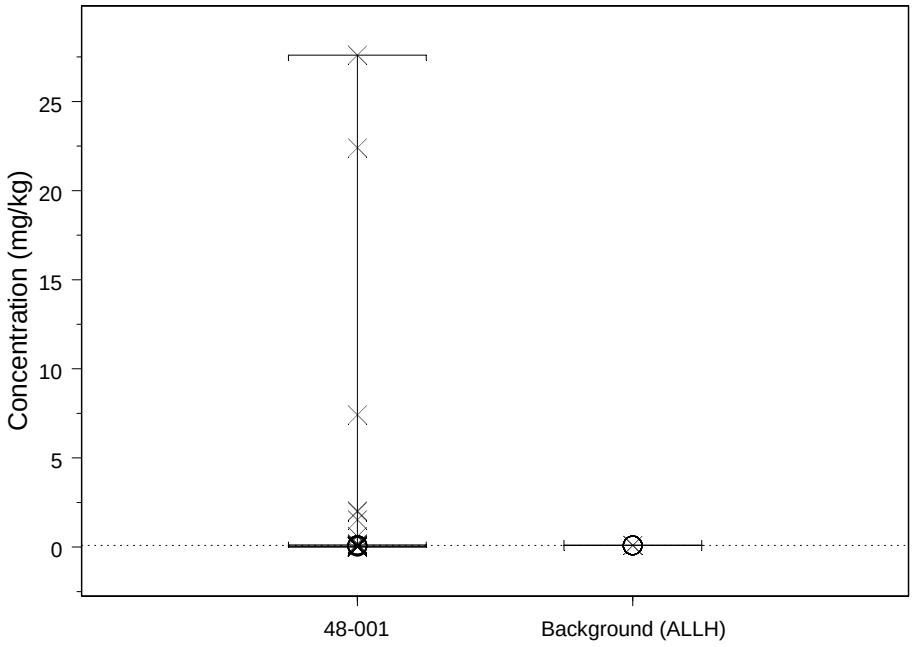


Figure I-5.1-7 Site concentrations of mercury in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

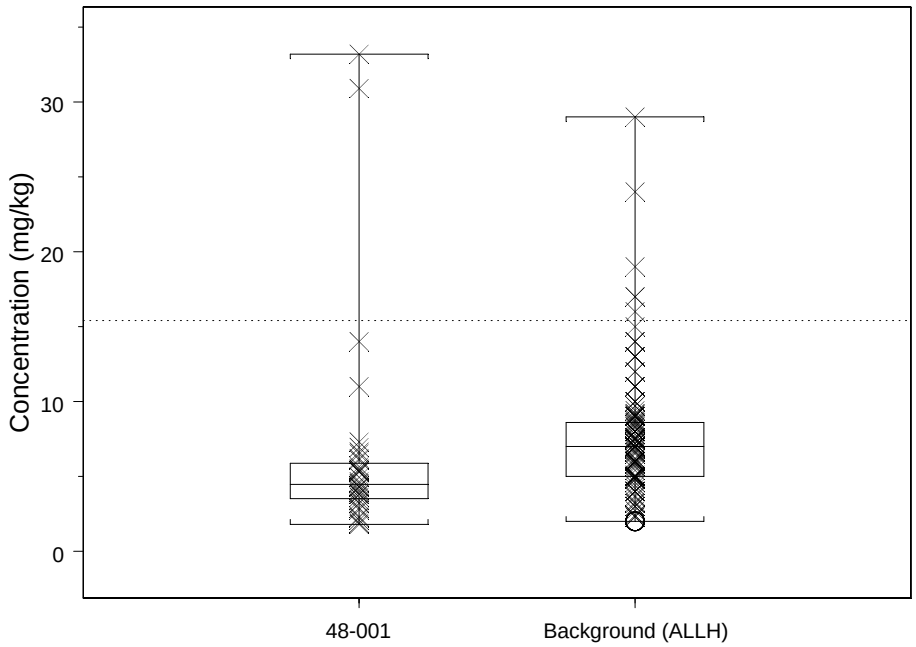


Figure I-5.1-8 Site concentrations of nickel in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

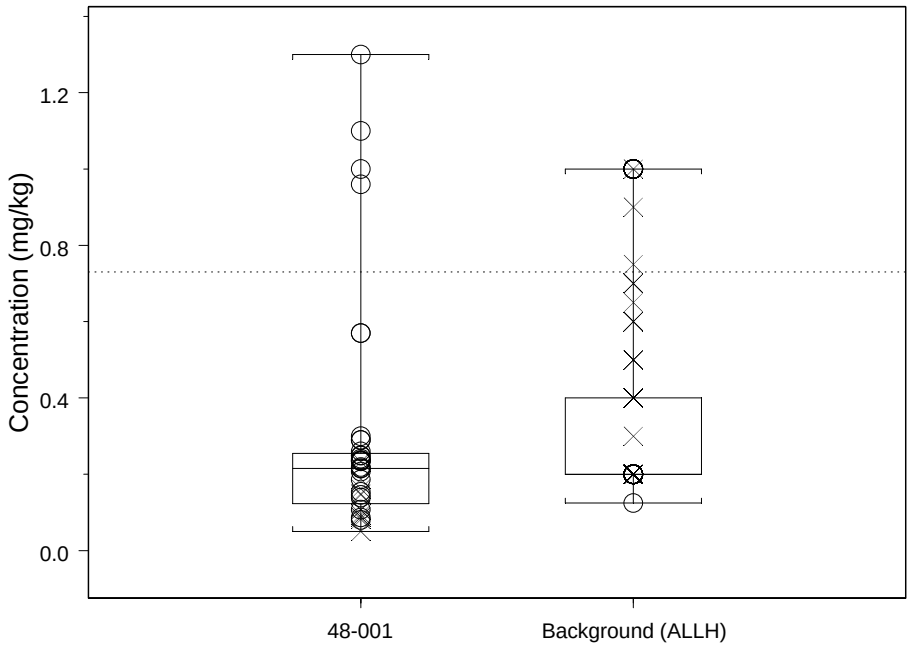


Figure I-5.1-9 Site concentrations of thallium in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

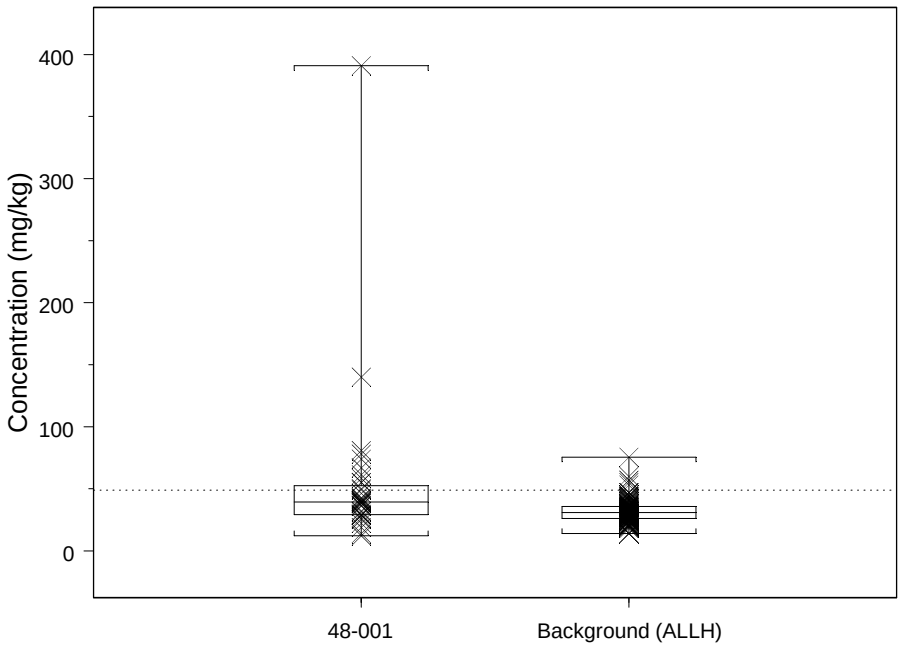


Figure I-5.1-10 Site concentrations of zinc in soil at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

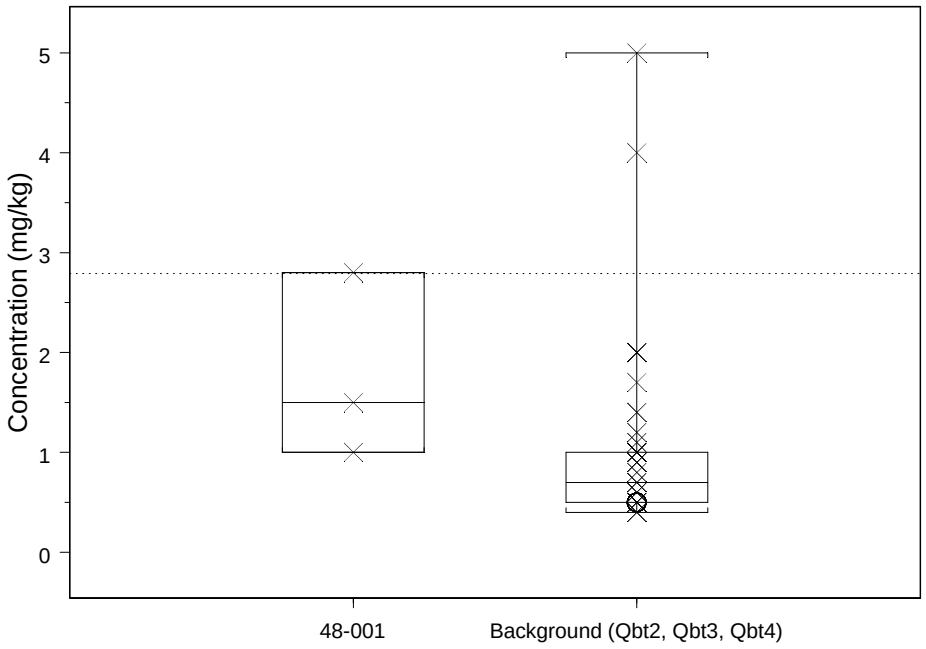


Figure I-5.1-11 Site concentrations of arsenic in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

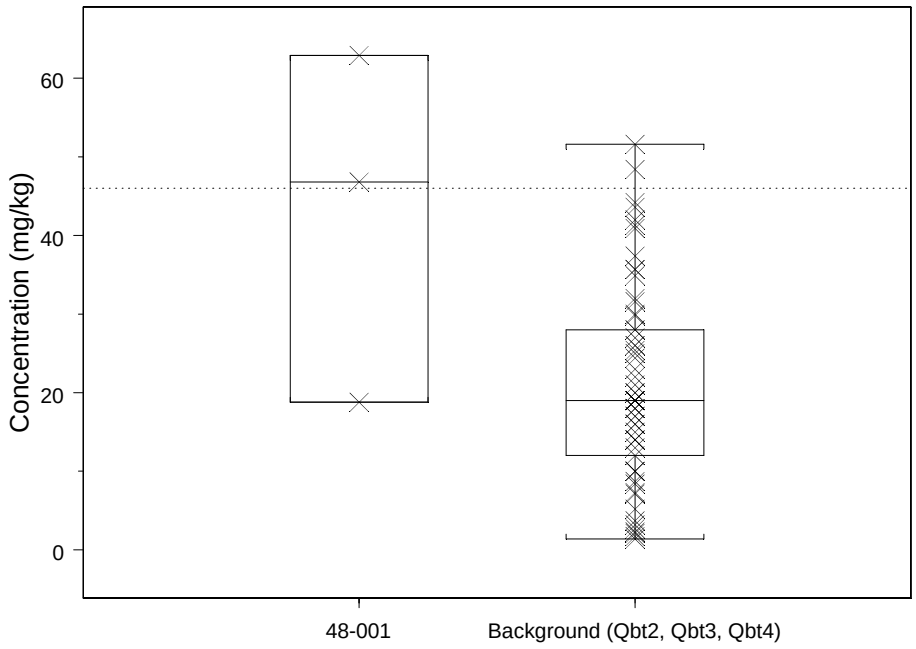


Figure I-5.1-12 Site concentrations of barium in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

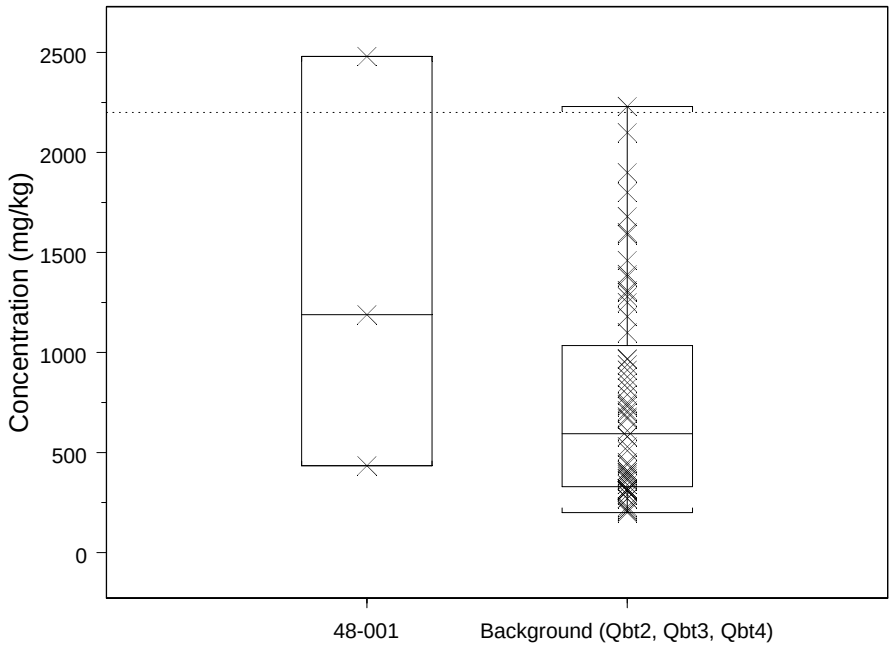


Figure I-5.1-13 Site concentrations of calcium in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

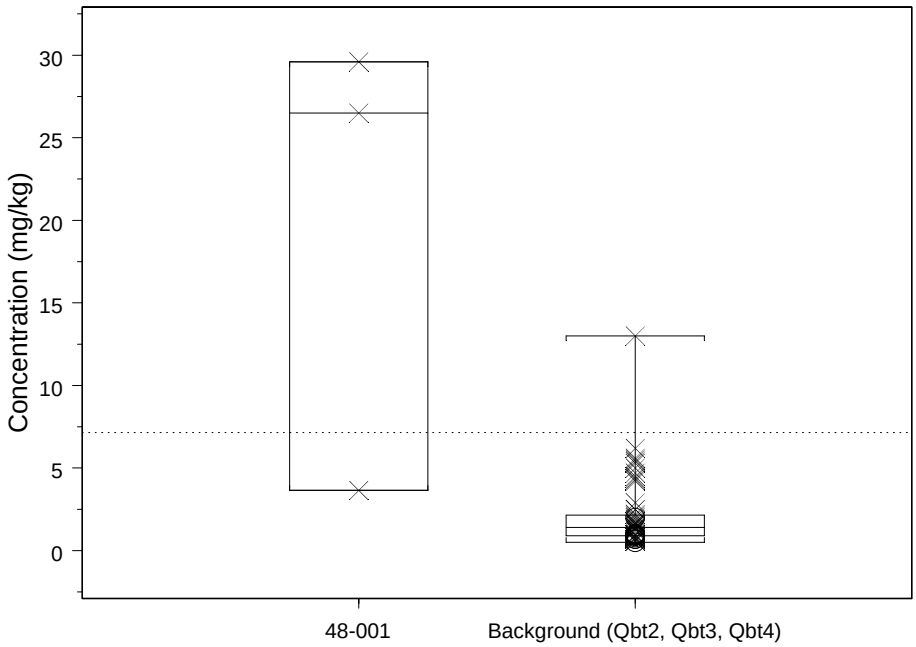


Figure I-5.1-14 Site concentrations of chromium in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

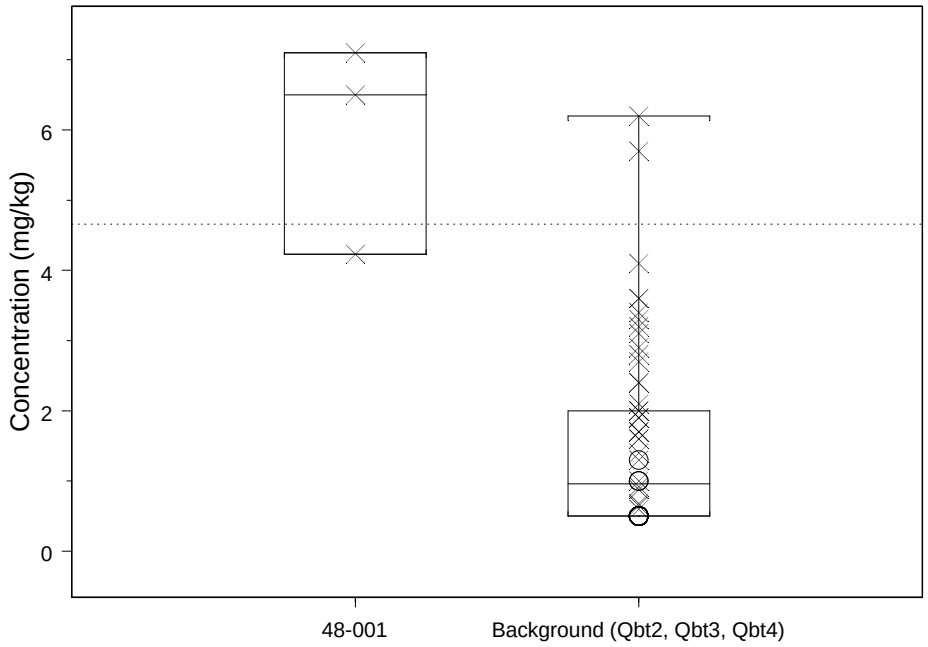


Figure I-5.1-15 Site concentrations of copper in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

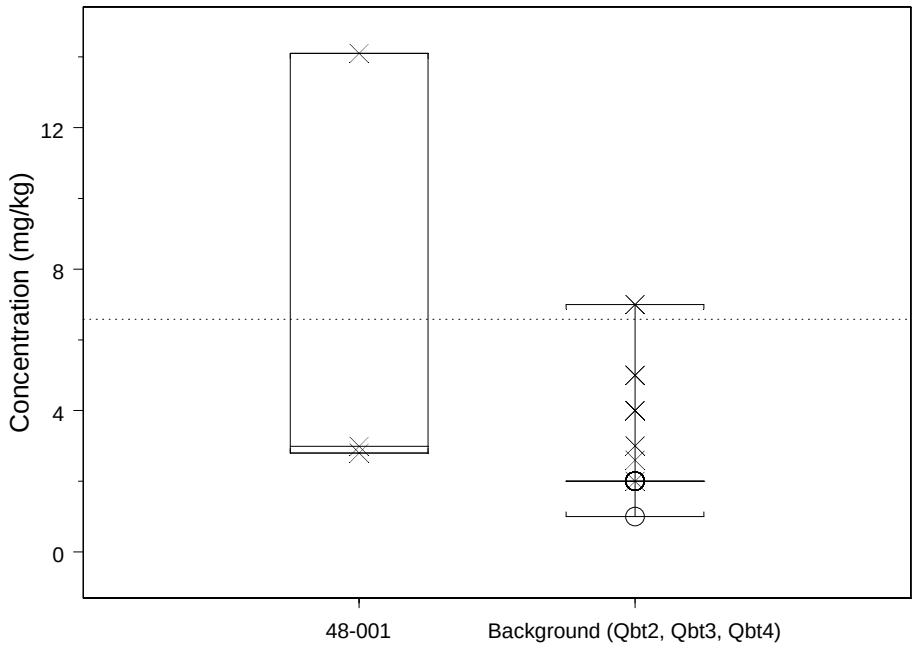


Figure I-5.1-16 Site concentrations of nickel in tuff at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

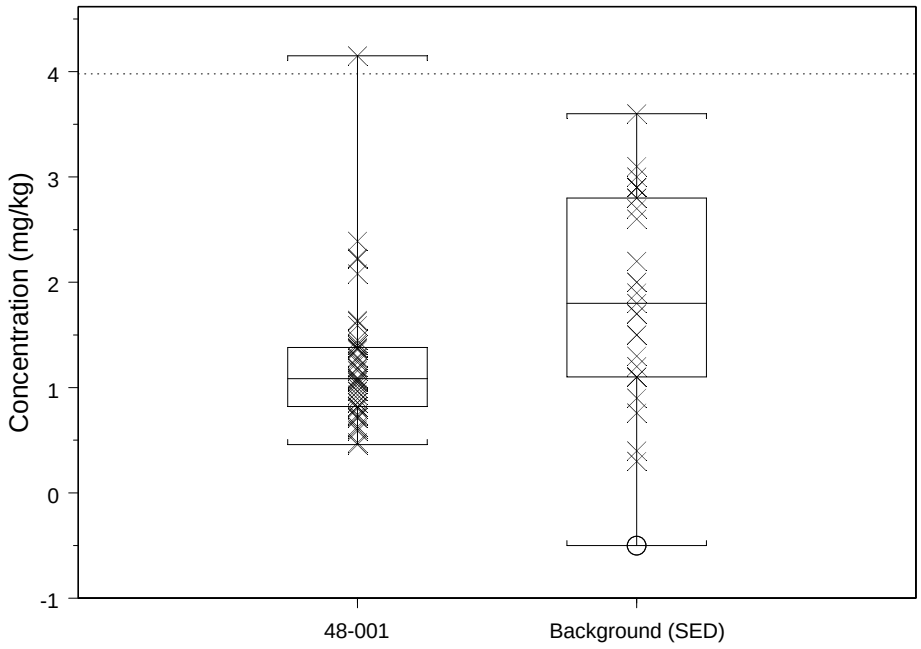


Figure I-5.1-17 Site concentrations of arsenic in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

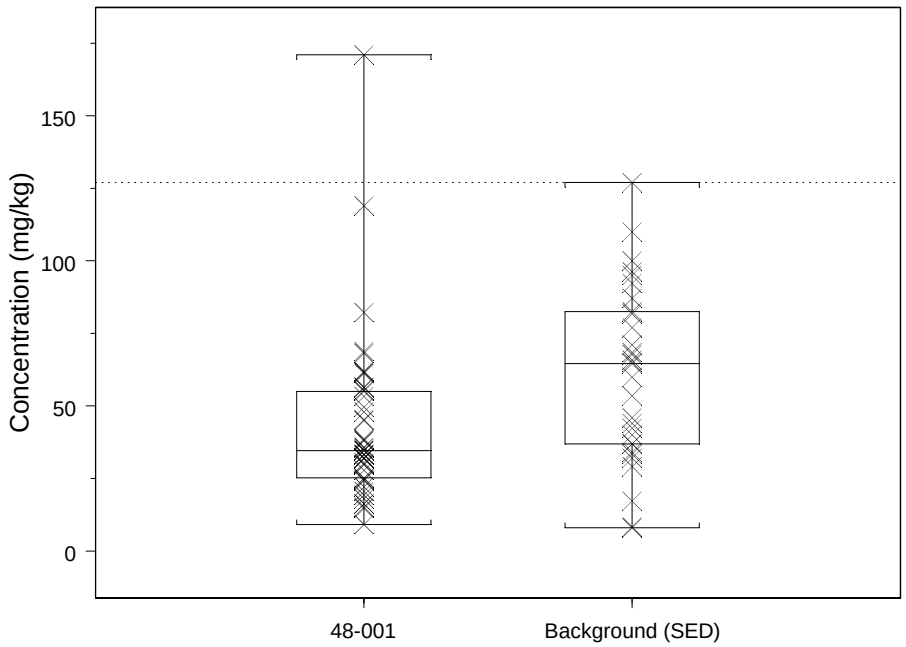


Figure I-5.1-18 Site concentrations of barium in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

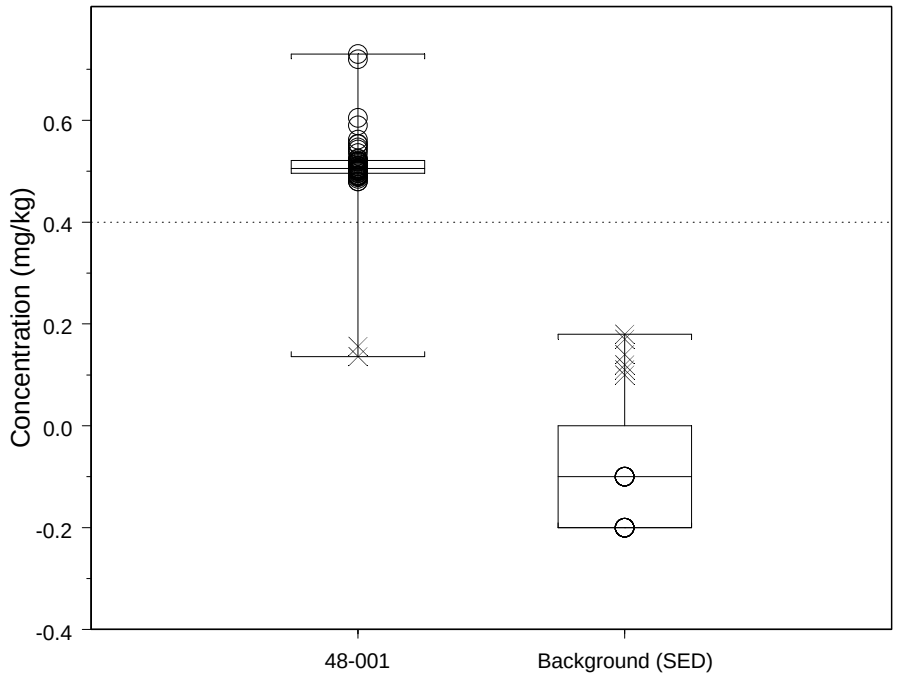


Figure I-5.1-19 Site concentrations of cadmium in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

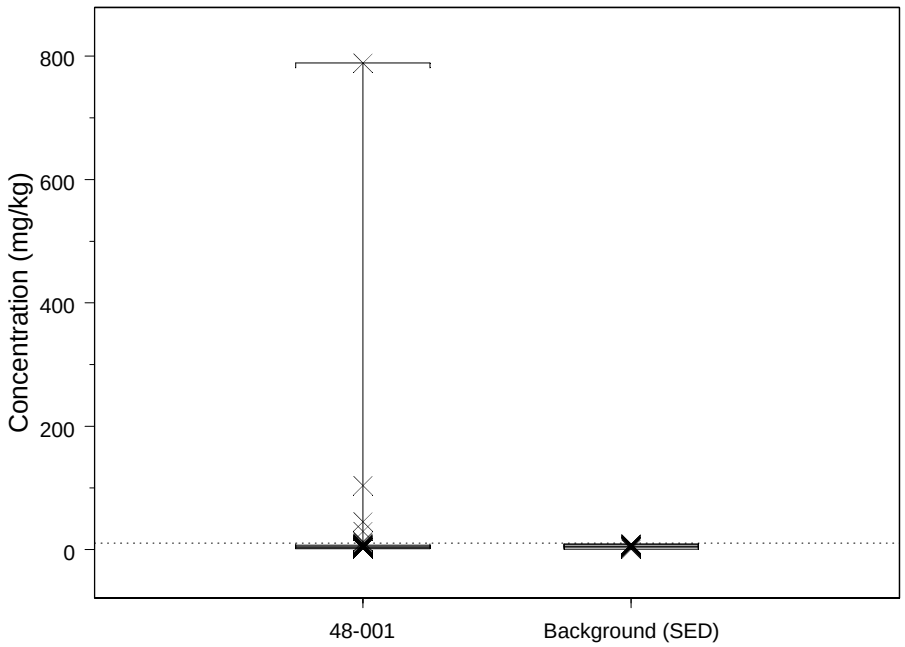


Figure I-5.1-20 Site concentrations of chromium in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

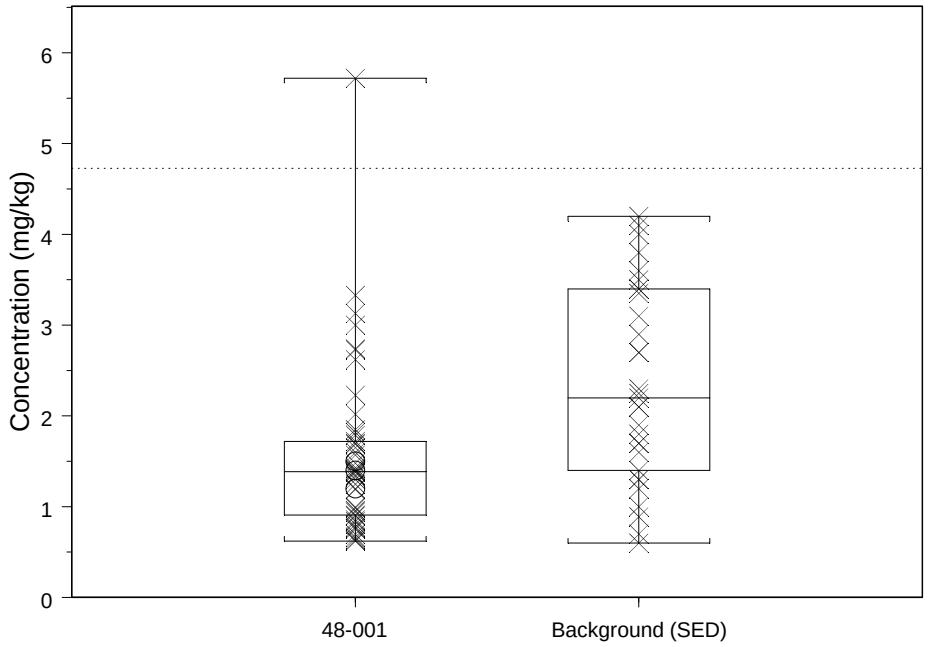


Figure I-5.1-21 Site concentrations of cobalt in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

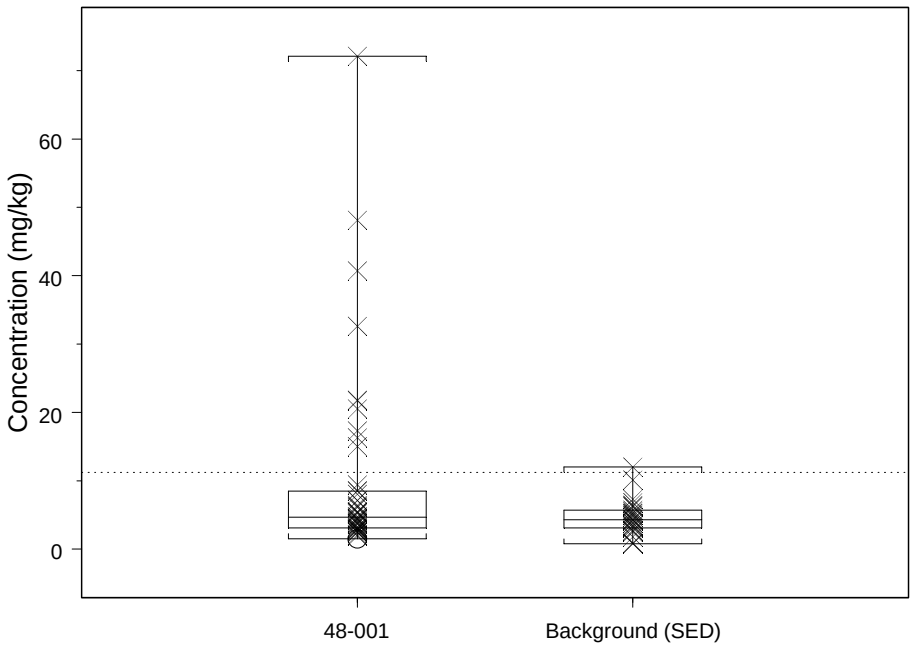


Figure I-5.1-22 Site concentrations of copper in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

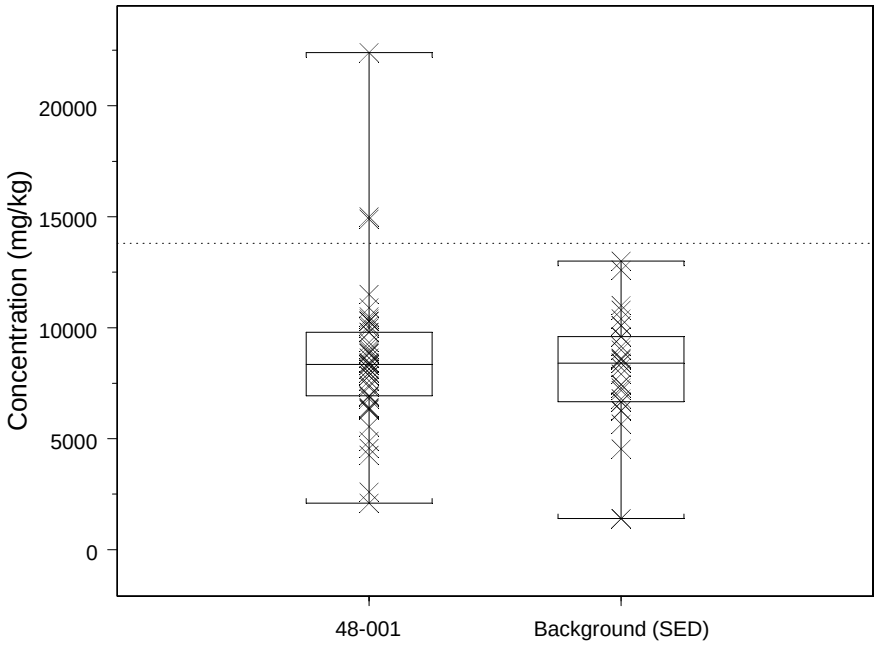


Figure I-5.1-23 Site concentrations of iron in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

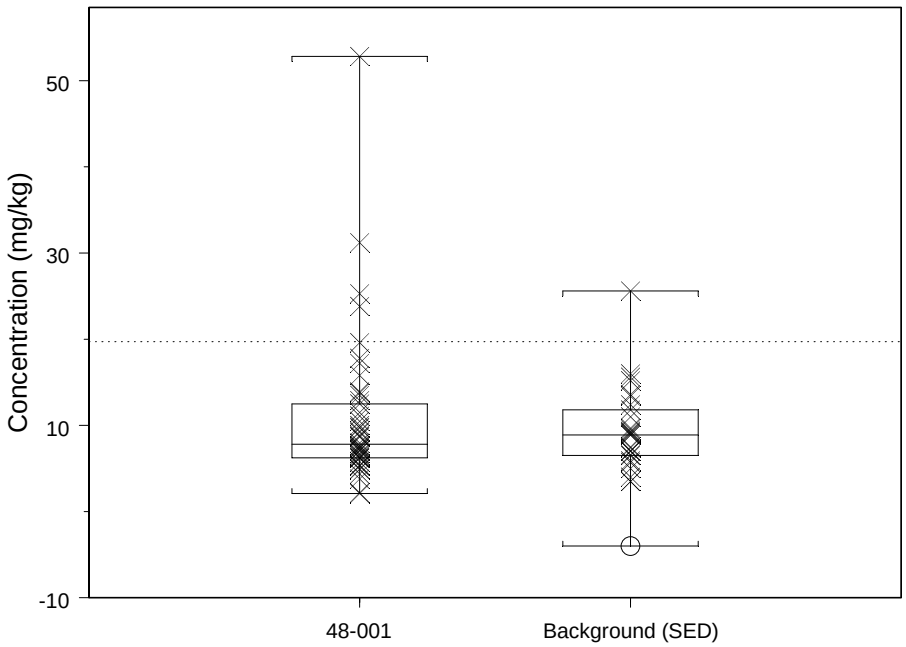


Figure I-5.1-24 Site concentrations of lead in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

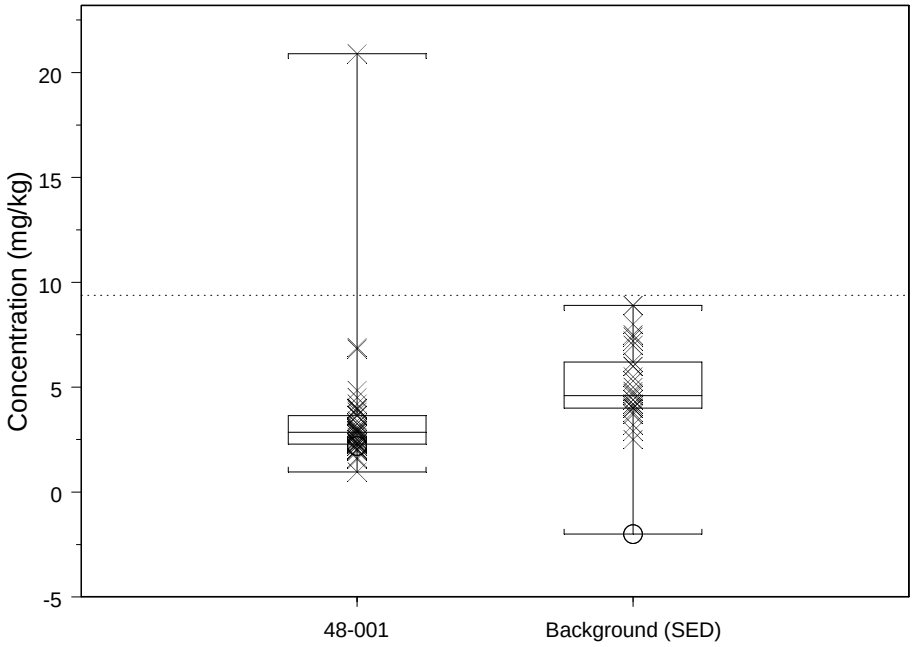


Figure I-5.1-25 Site concentrations of nickel in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

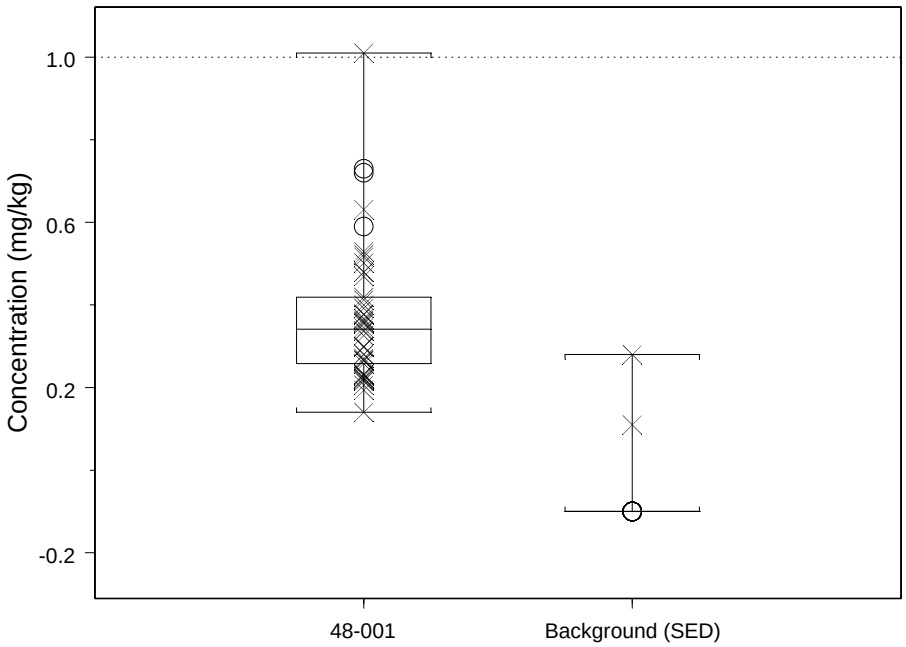


Figure I-5.1-26 Site concentrations of silver in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

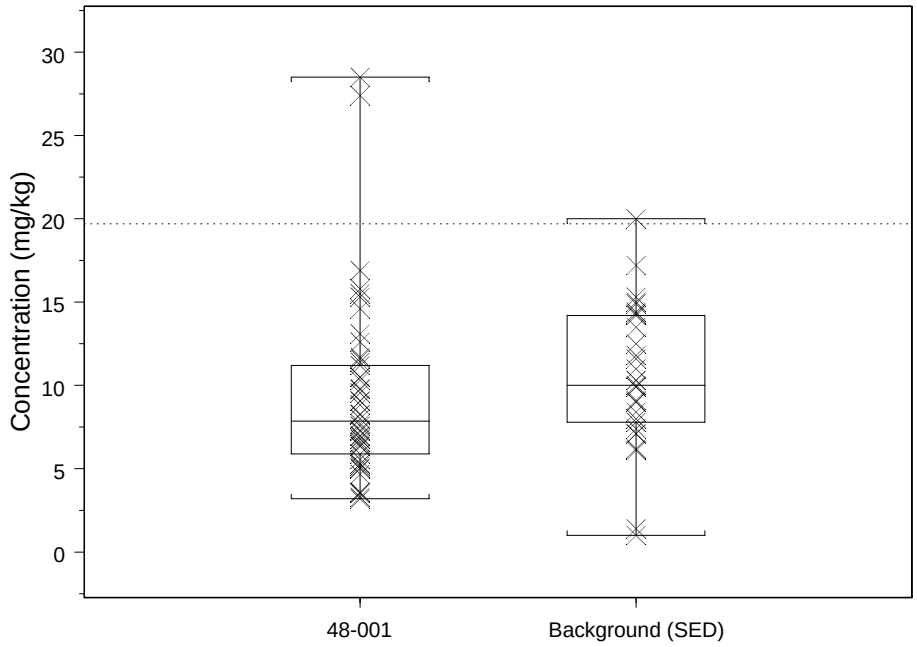


Figure I-5.1-27 Site concentrations of vanadium in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

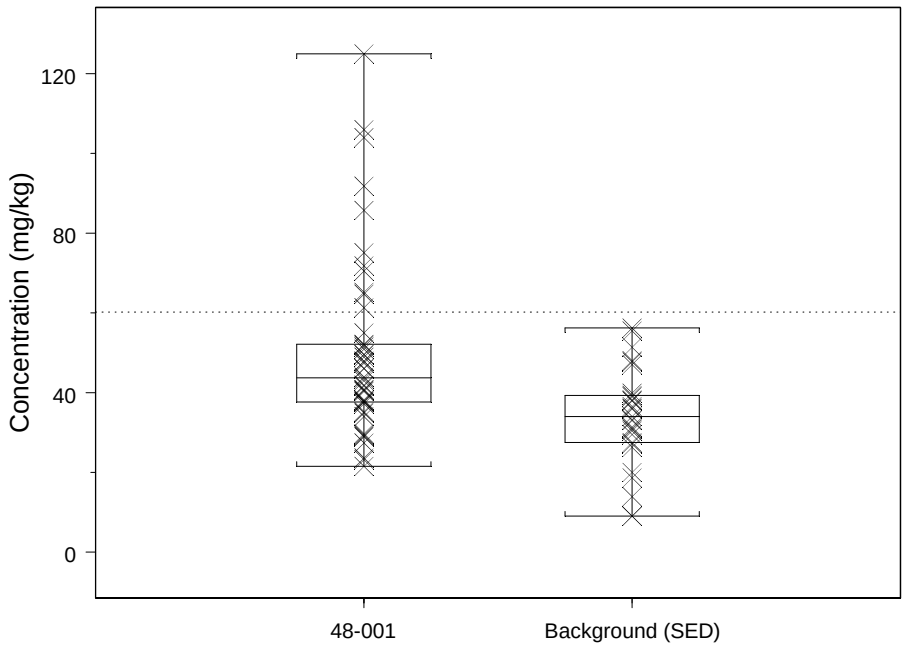


Figure I-5.1-28 Site concentrations of zinc in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

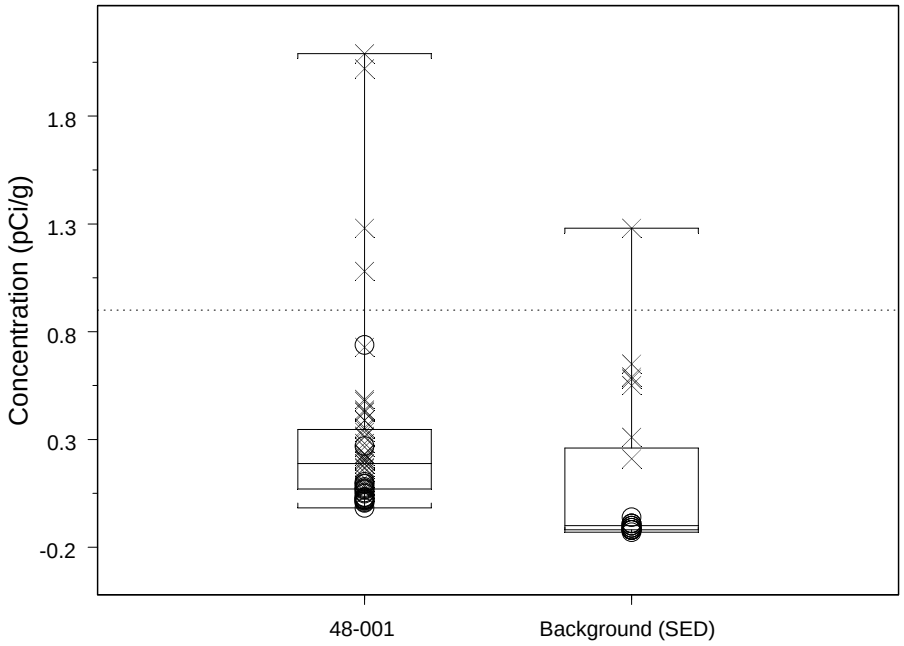


Figure I-5.1-29 Site concentrations of cesium-137 in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

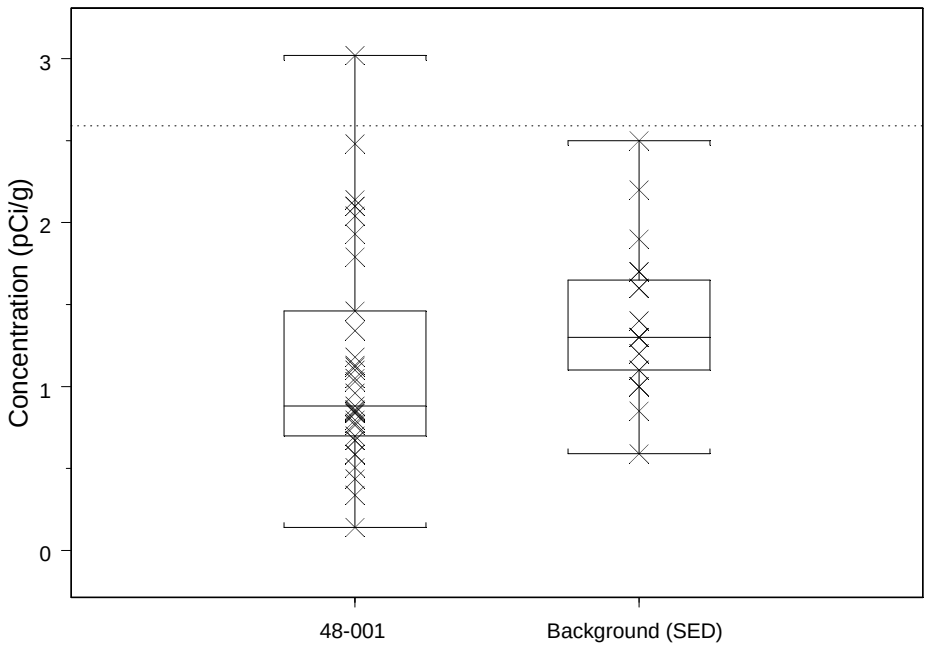


Figure I-5.1-30 Site concentrations of uranium-234 in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

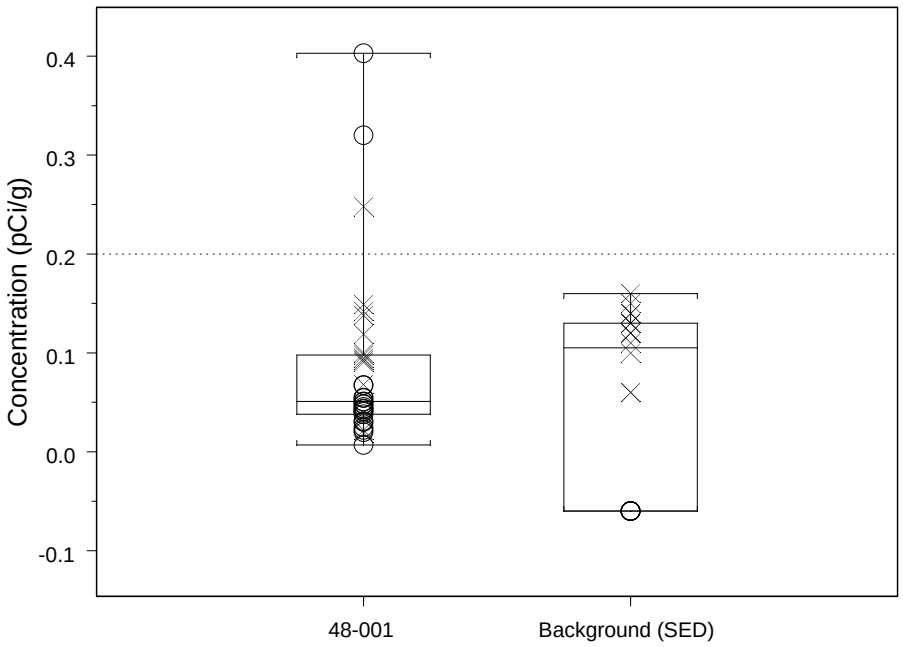


Figure I-5.1-31 Site concentrations of uranium-235/236 in sediment at SWMU 48-001 compared to background
(× = detect, ○ = nondetect)

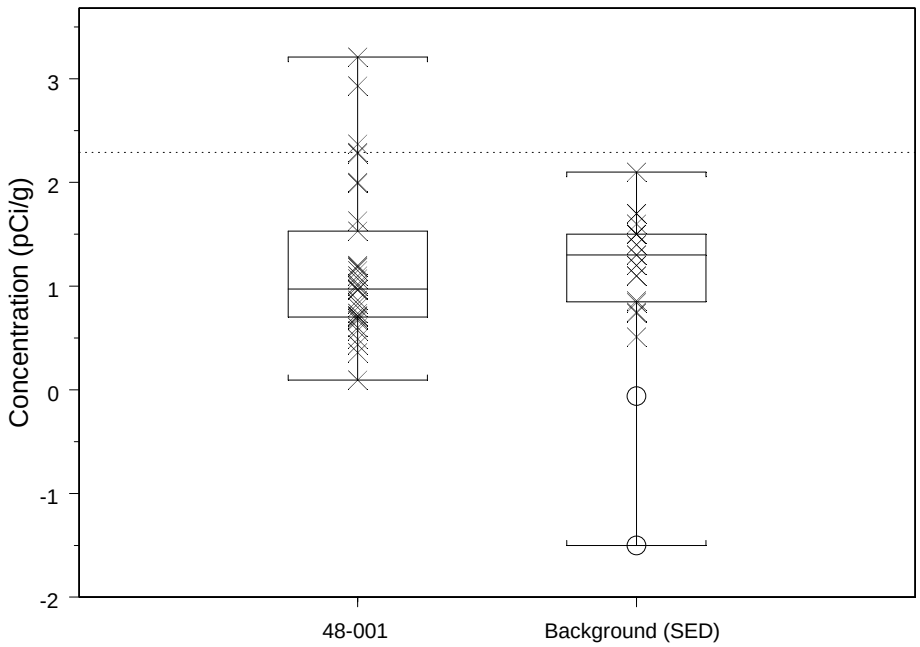


Figure I-5.1-32 Site concentrations of uranium-238 in sediment at SWMU 48-001 compared to background

(× = detect, ○ = nondetect)

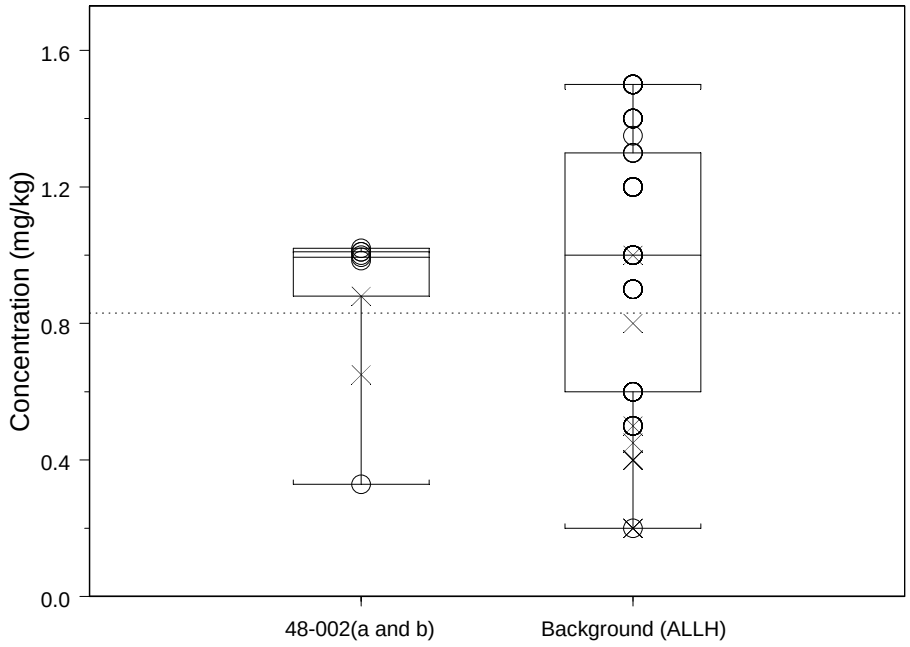


Figure I-5.2-1 Site concentrations of antimony in soil at SWMUs 48-002(a and b) compared to background

(× = detect, ○ = nondetect)

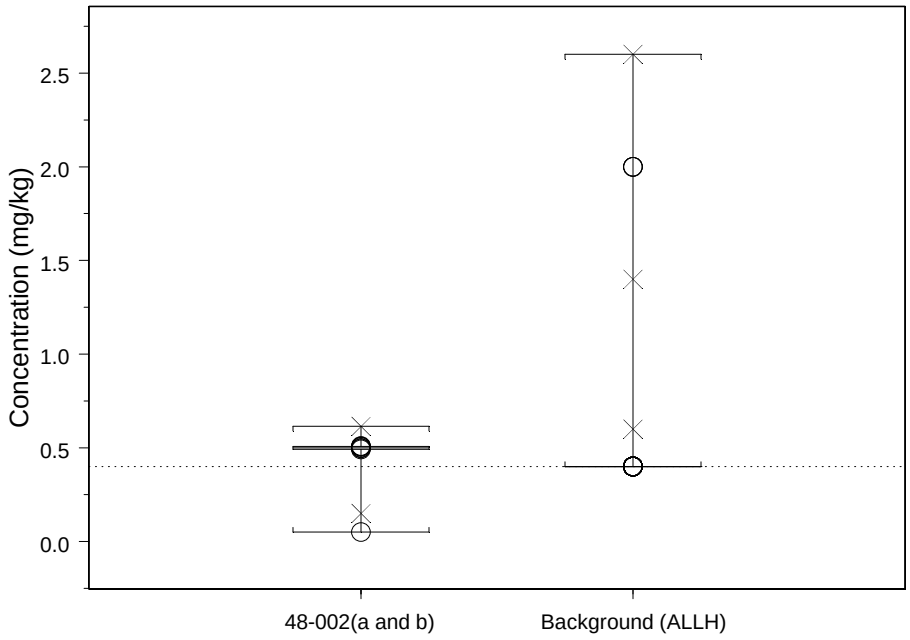


Figure I-5.2-2 Site concentrations of cadmium in soil at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

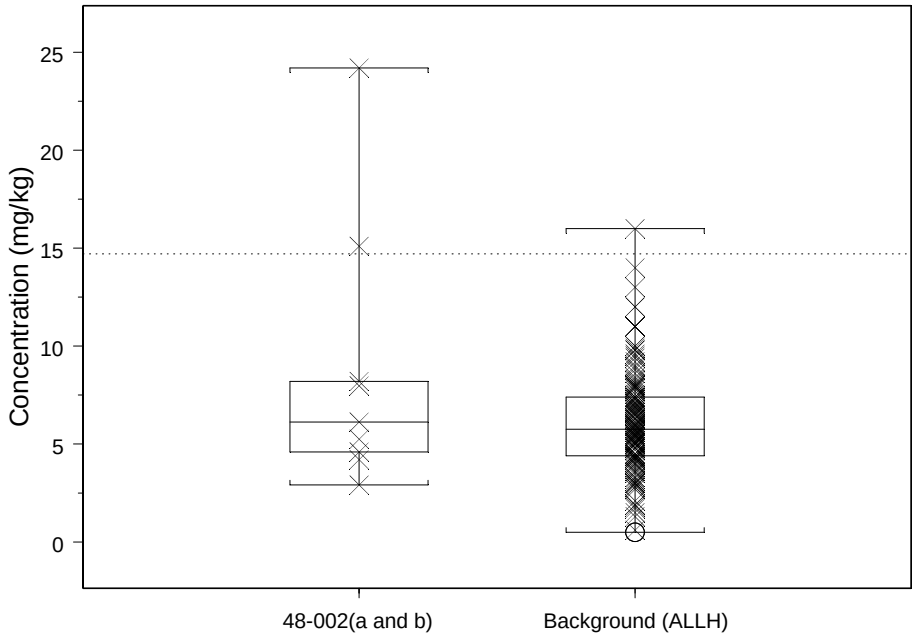


Figure I-5.2-3 Site concentrations of copper in soil at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

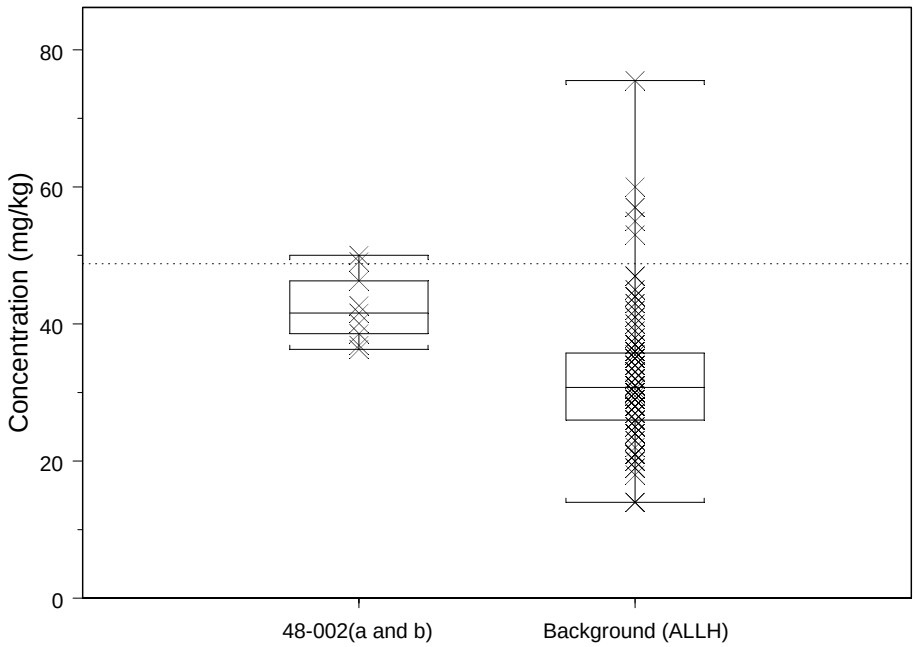


Figure I-5.2-4 Site concentrations of zinc in soil at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

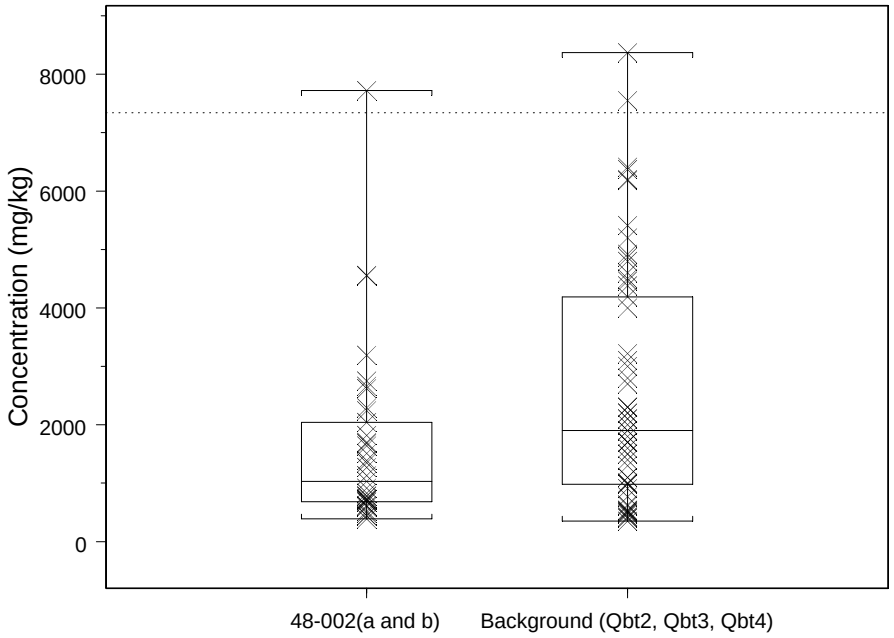


Figure I-5.2-5 Site concentrations of aluminum in tuff at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

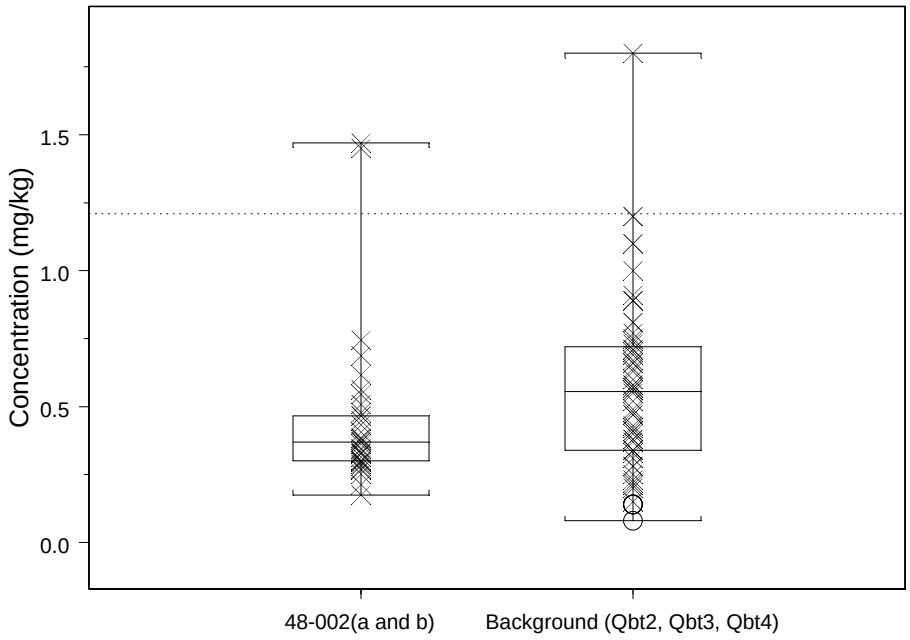


Figure I-5.2-6 Site concentrations of beryllium in tuff at SWMUs 48-002(a and b) compared to background

(× = detect, ○ = nondetect)

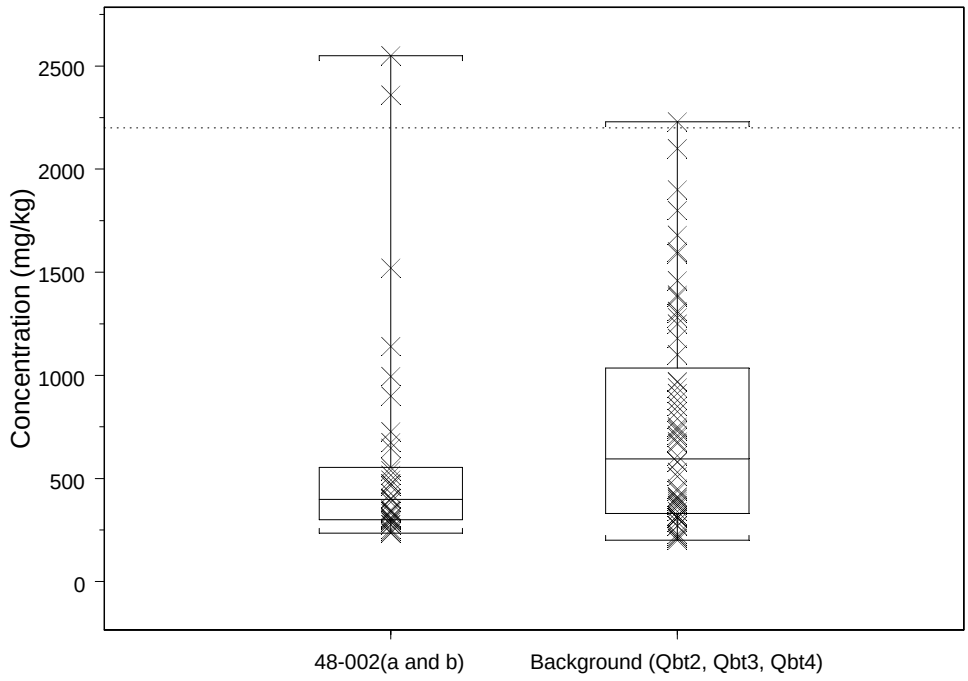


Figure I-5.2-7 Site concentrations of calcium in tuff at SWMUs 48-002(a and b) compared to background

(× = detect, ○ = nondetect)

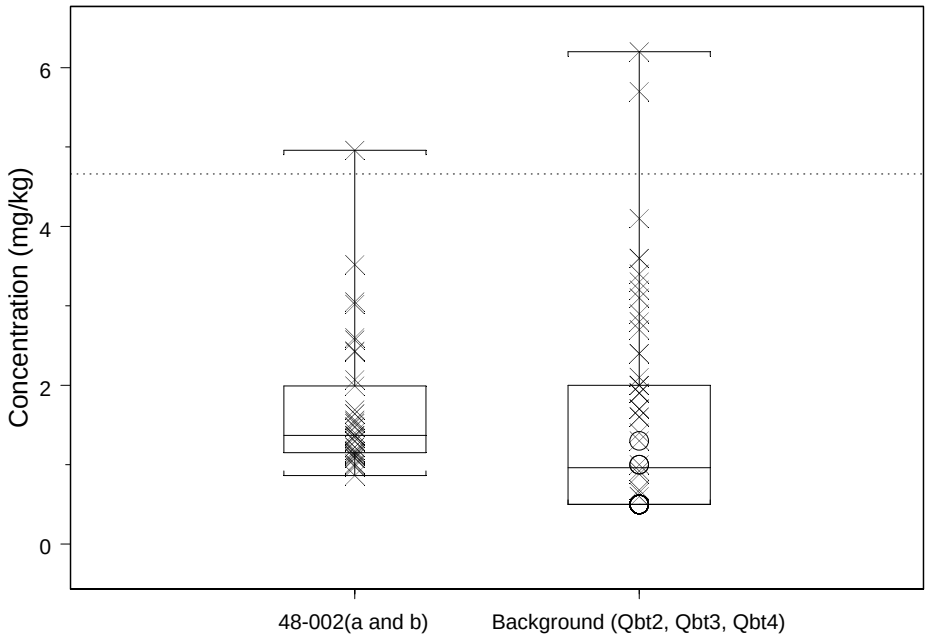


Figure I-5.2-8 Site concentrations of copper in tuff at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

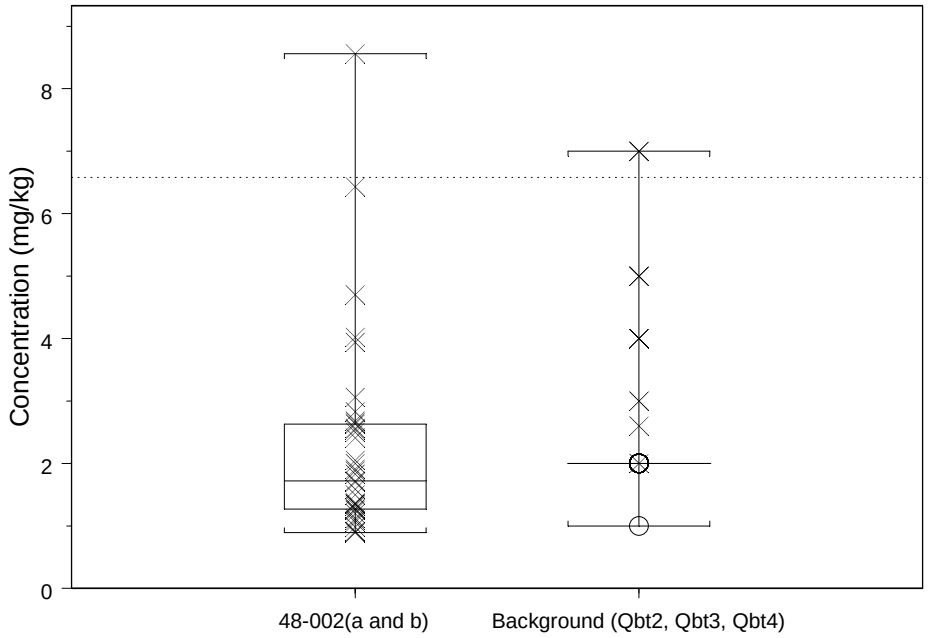


Figure I-5.2-9 Site concentrations of nickel in tuff at SWMUs 48-002(a and b) compared to background
(× = detect, ○ = nondetect)

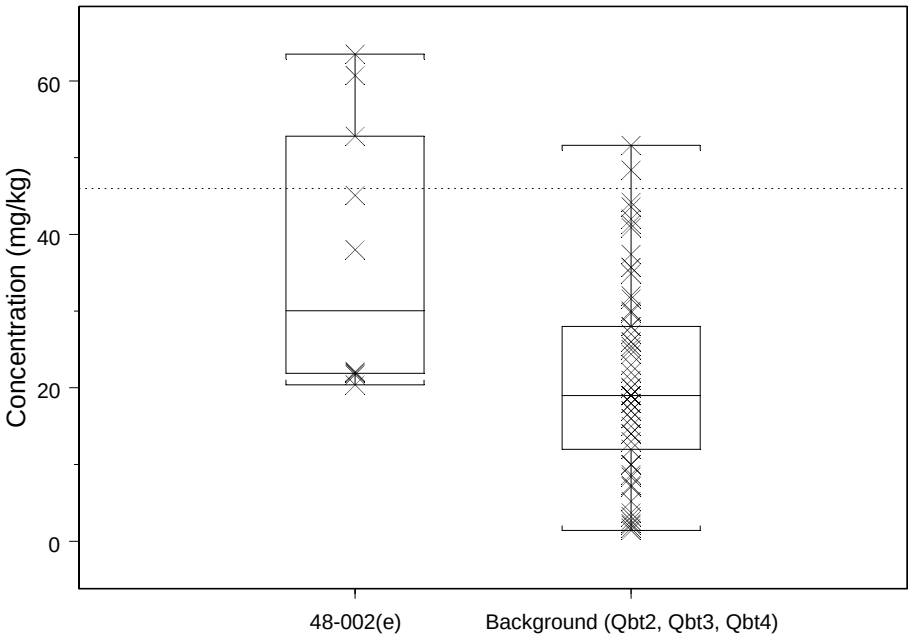


Figure I-5.3-1 Site concentrations of barium in tuff at AOC 48-002(e) compared to background
(× = detect, ○ = nondetect)

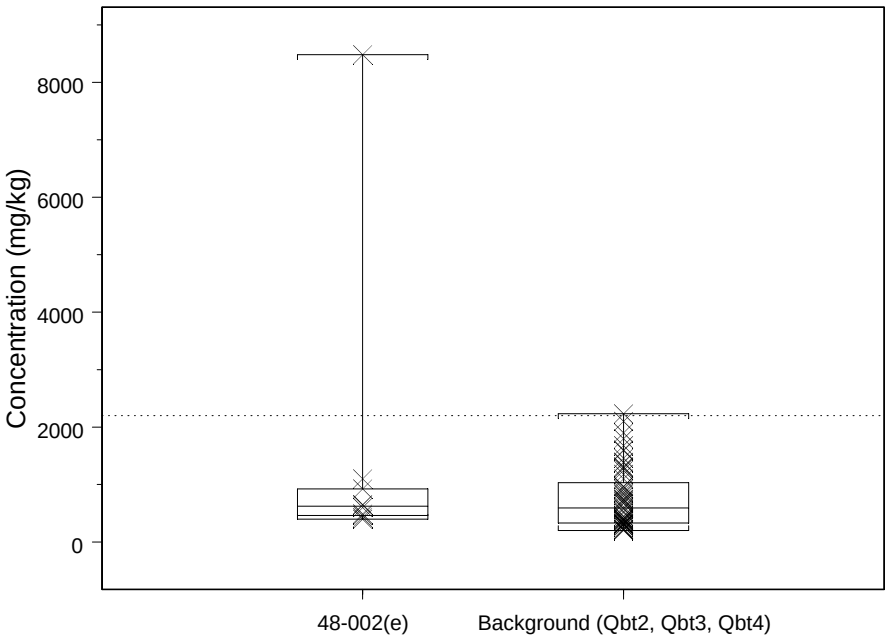


Figure I-5.3-2 Site concentrations of calcium in tuff at AOC 48-002(e) compared to background
(× = detect, ○ = nondetect)

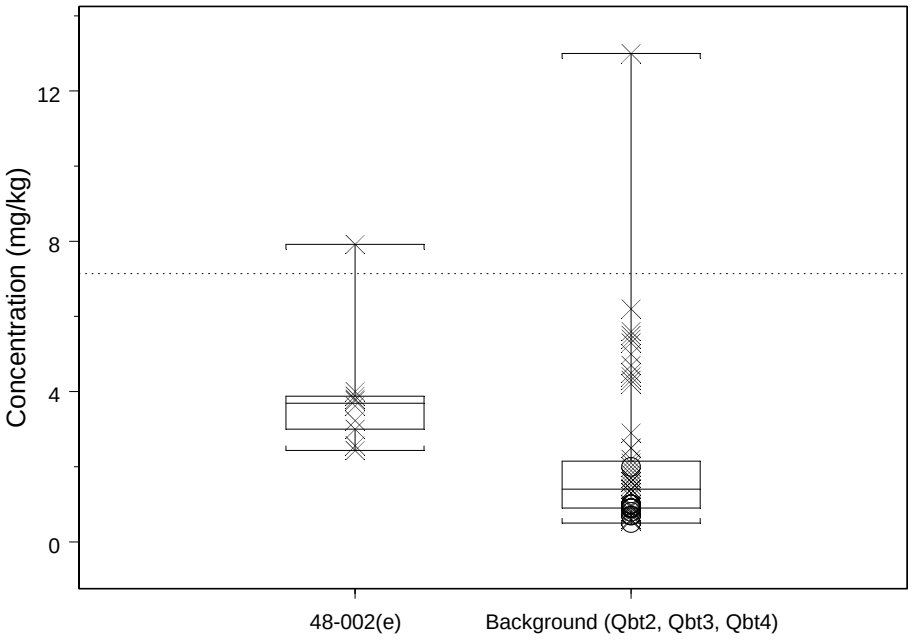


Figure I-5.3-3 Site concentrations of chromium in tuff at AOC 48-002(e) compared to background
(× = detect, ○ = nondetect)

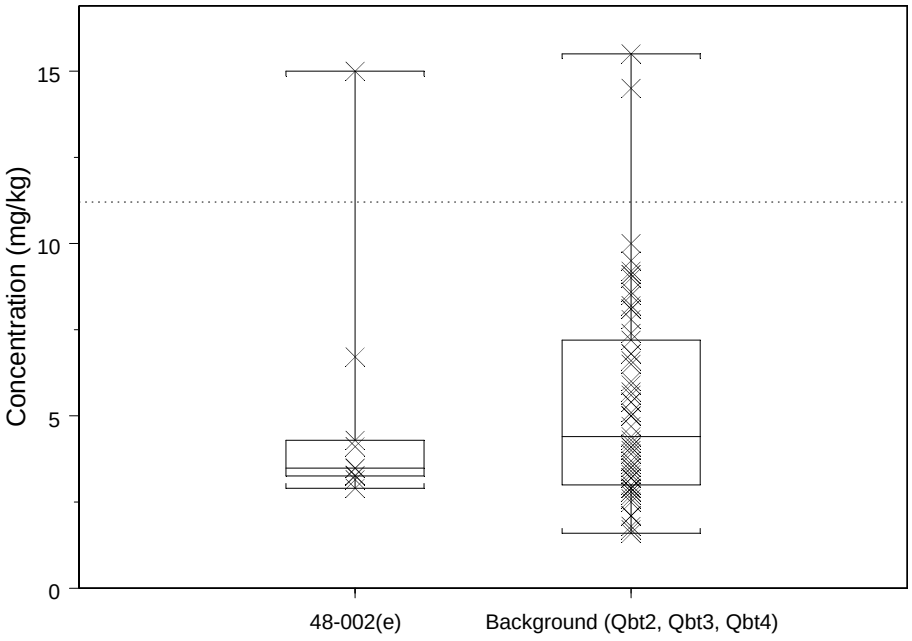


Figure I-5.3-4 Site concentrations of lead in tuff at AOC 48-002(e) compared to background
(× = detect, ○ = nondetect)

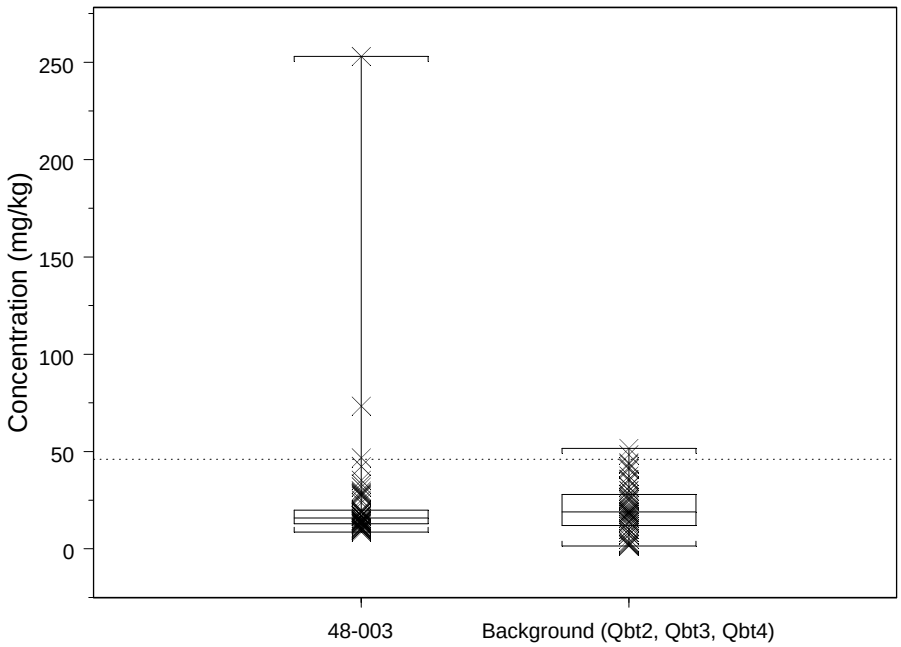


Figure I-5.4-1 Site concentrations of barium in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

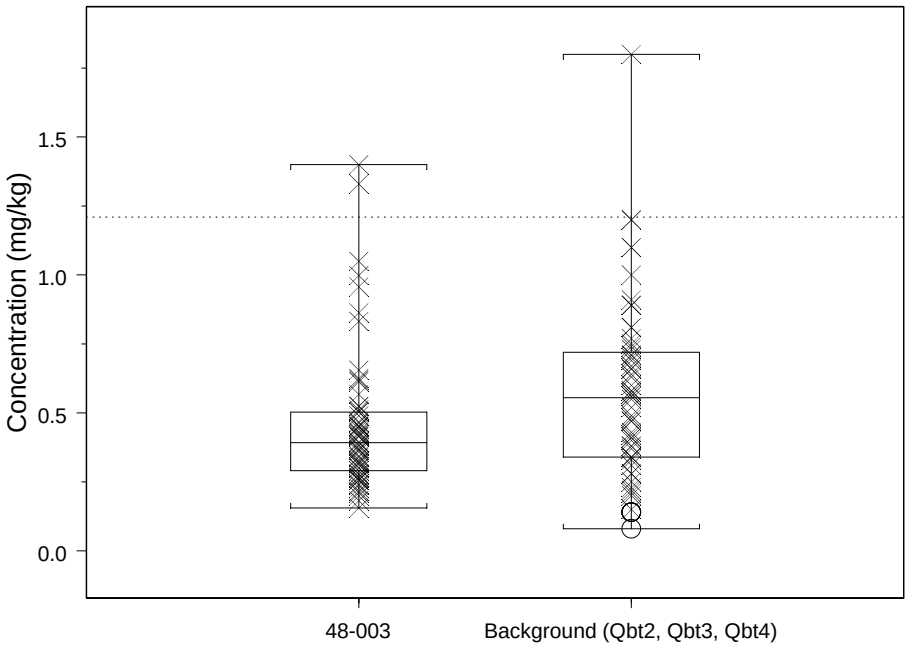


Figure I-5.4-2 Site concentrations of beryllium in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

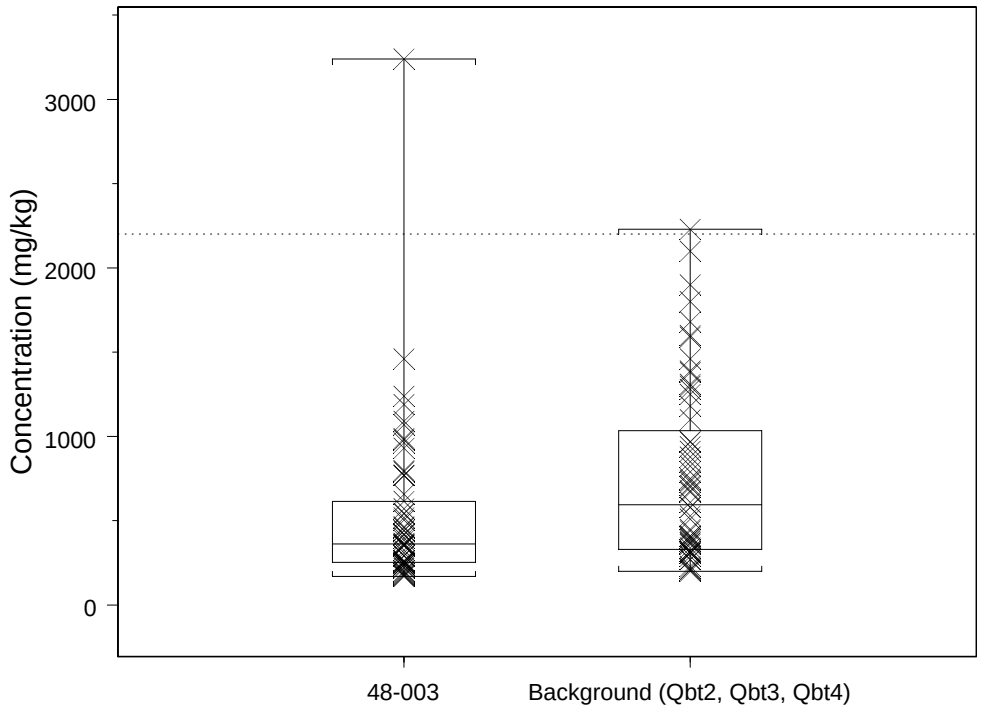


Figure I-5.4-3 Site concentrations of calcium in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

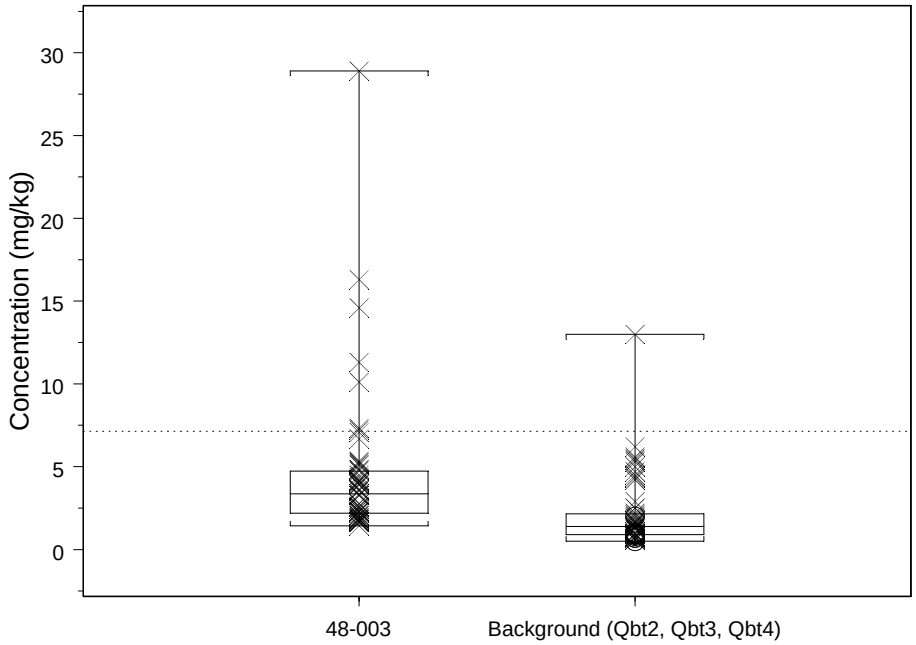


Figure I-5.4-4 Site concentrations of chromium in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

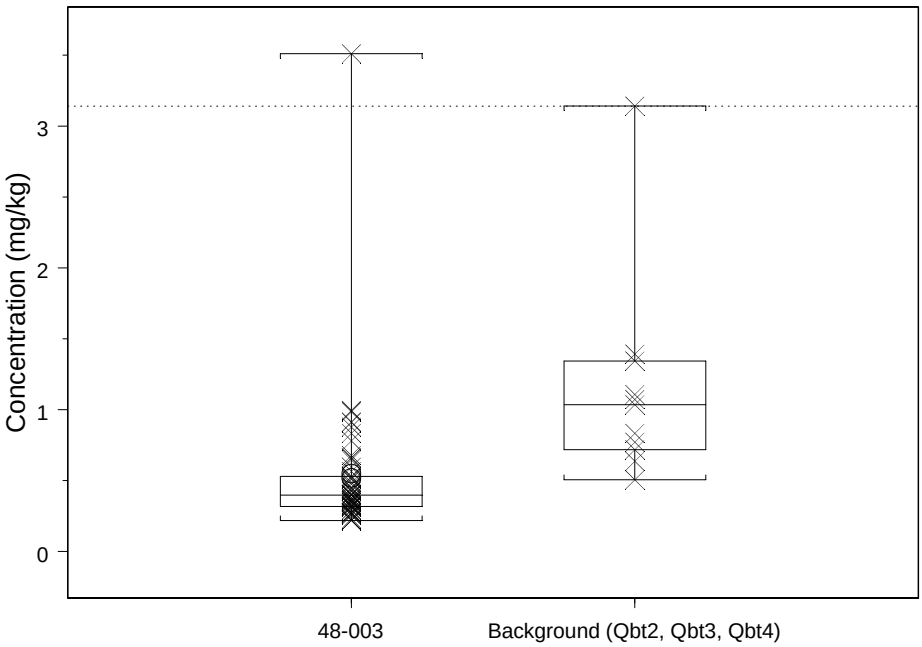


Figure I-5.4-5 Site concentrations of cobalt in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

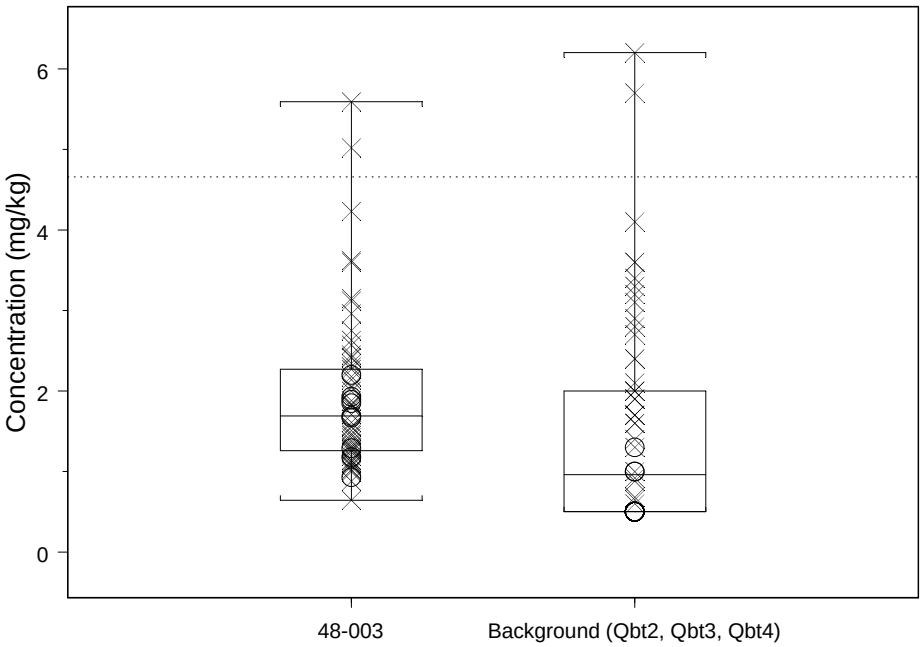


Figure I-5.4-6 Site concentrations of copper in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

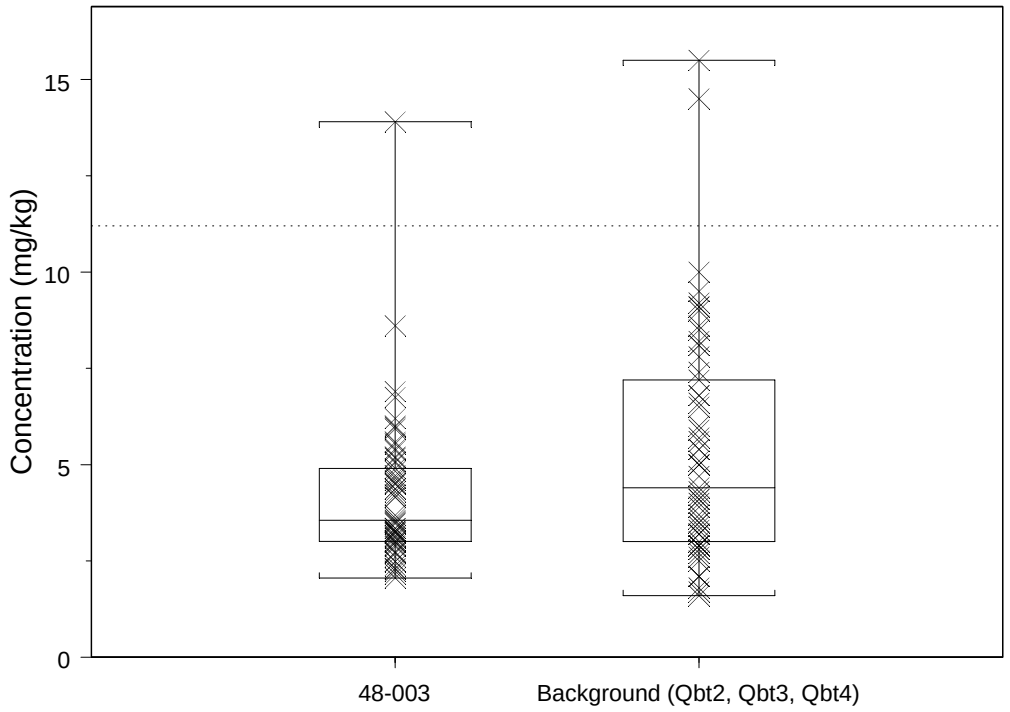


Figure I-5.4-7 Site concentrations of lead in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

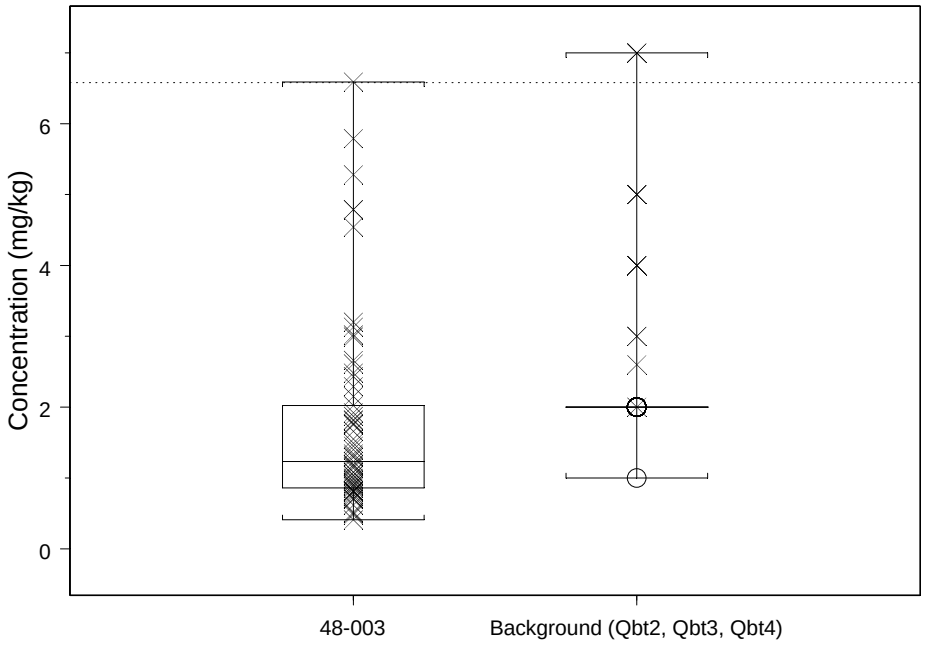


Figure I-5.4-8 Site concentrations of nickel in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

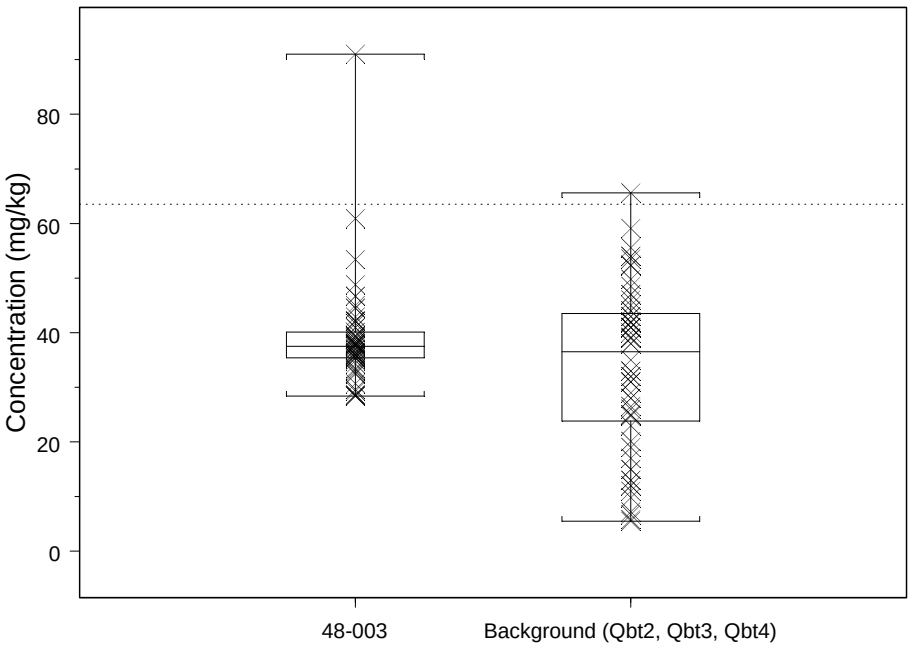


Figure I-5.4-9 Site concentrations of zinc in tuff at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

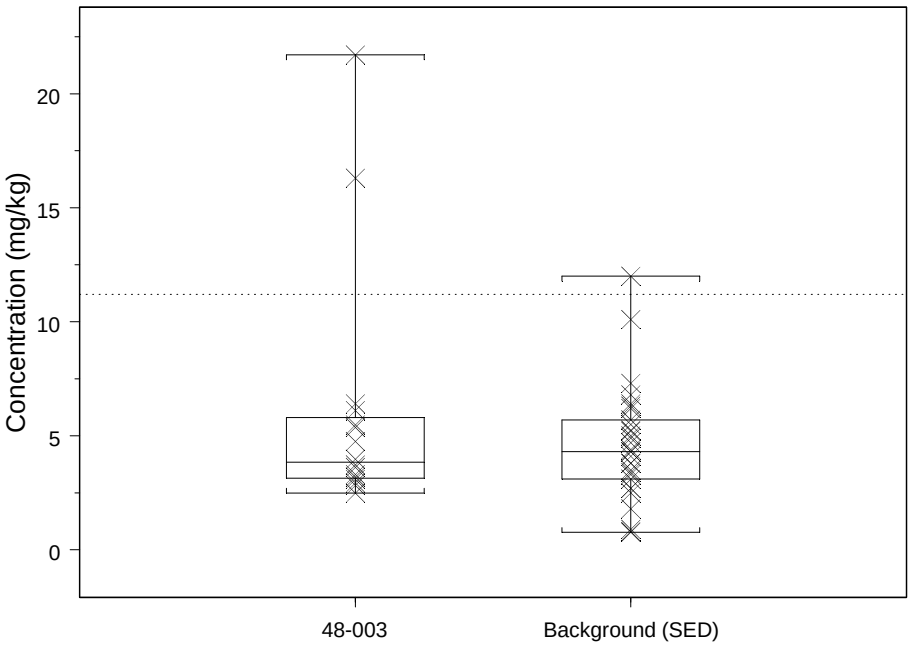


Figure I-5.4-10 Site concentrations of copper in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

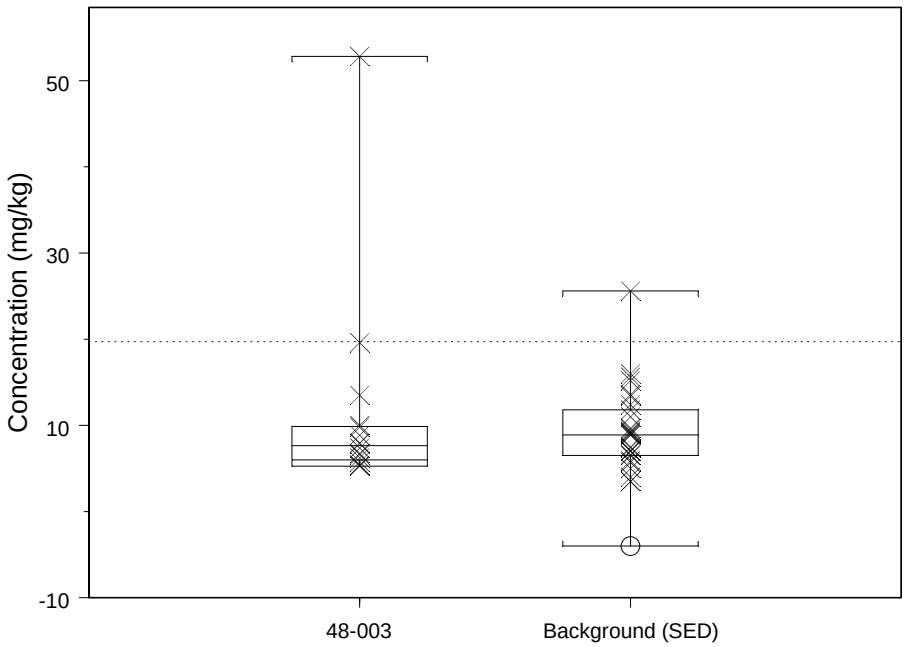


Figure I-5.4-11 Site concentrations of lead in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

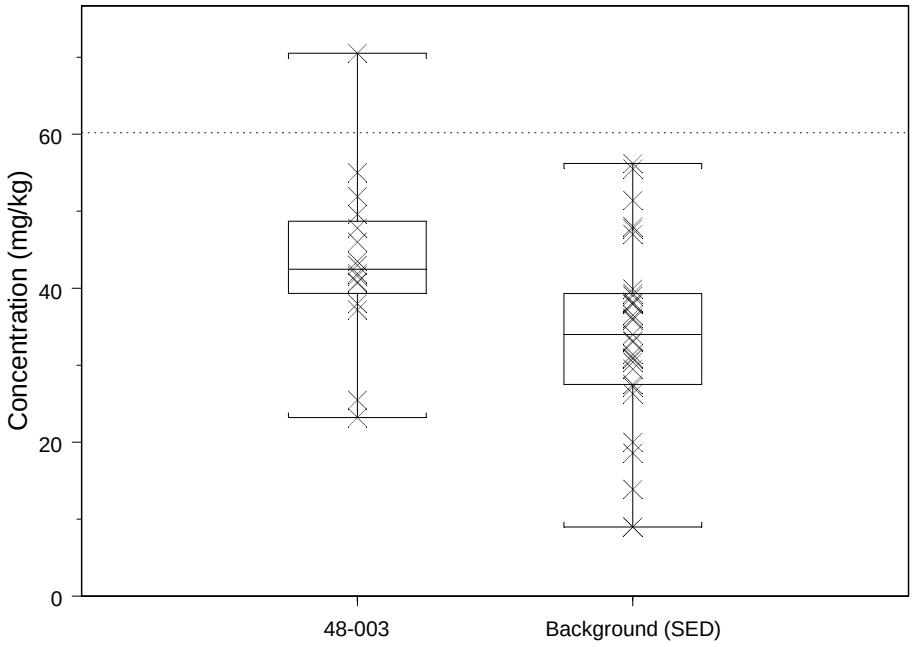


Figure I-5.4-12 Site concentrations of zinc in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

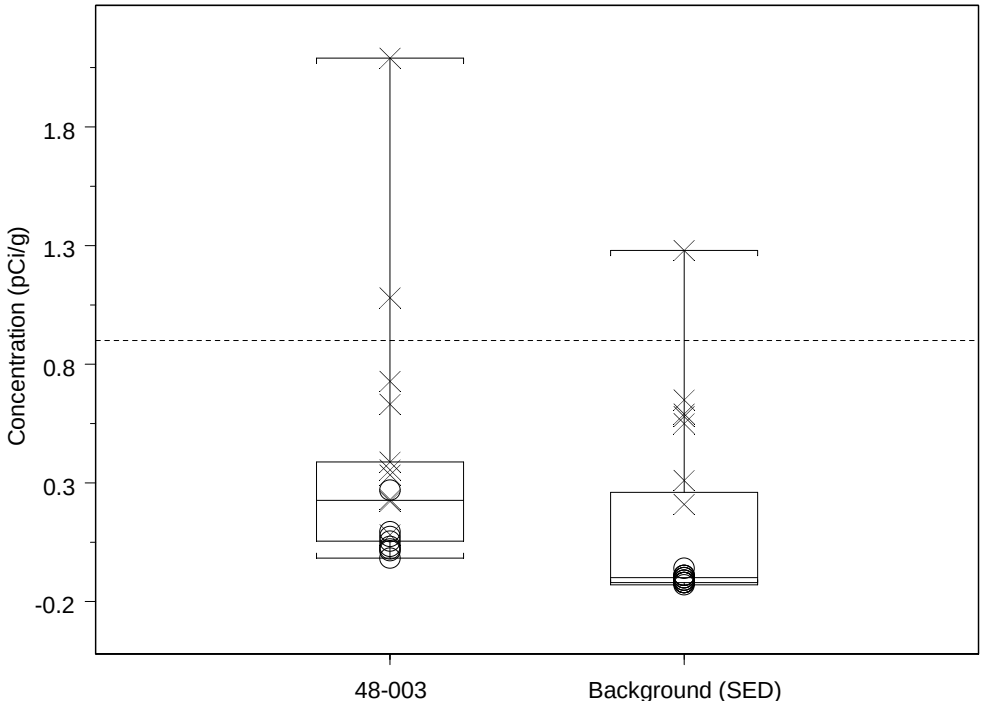


Figure I-5.4-13 Site concentrations of cesium-137 in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

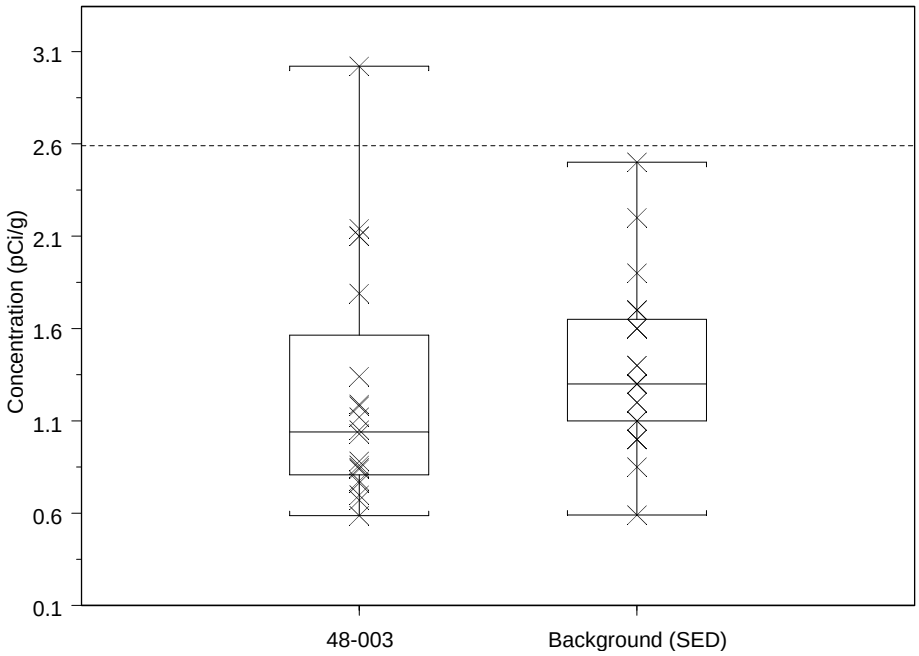


Figure I-5.4-14 Site concentrations of uranium-234 in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

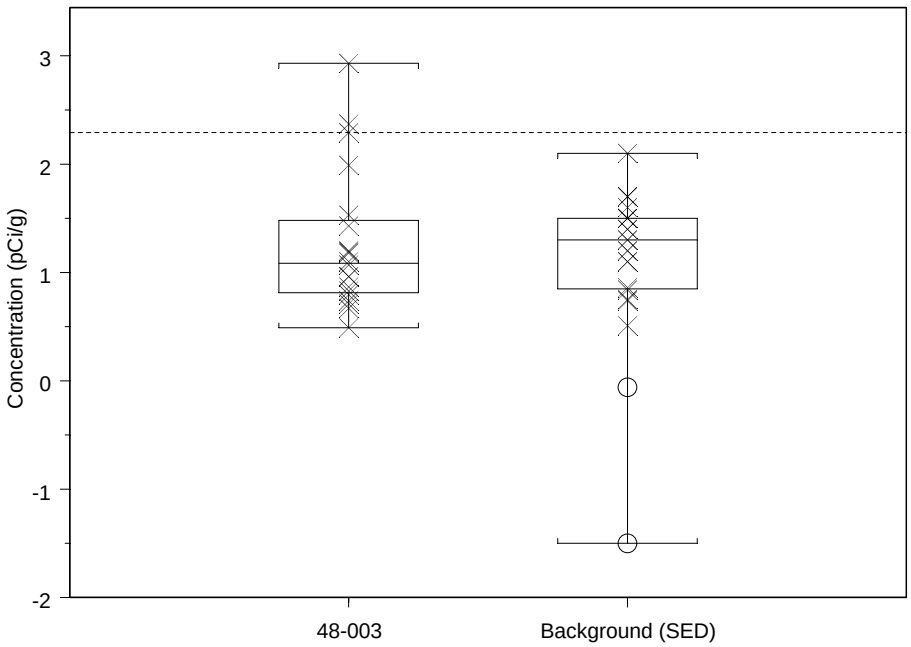


Figure I-5.4-15 Site concentrations of uranium-238 in sediment at SWMU 48-003 compared to background
(× = detect, ○ = nondetect)

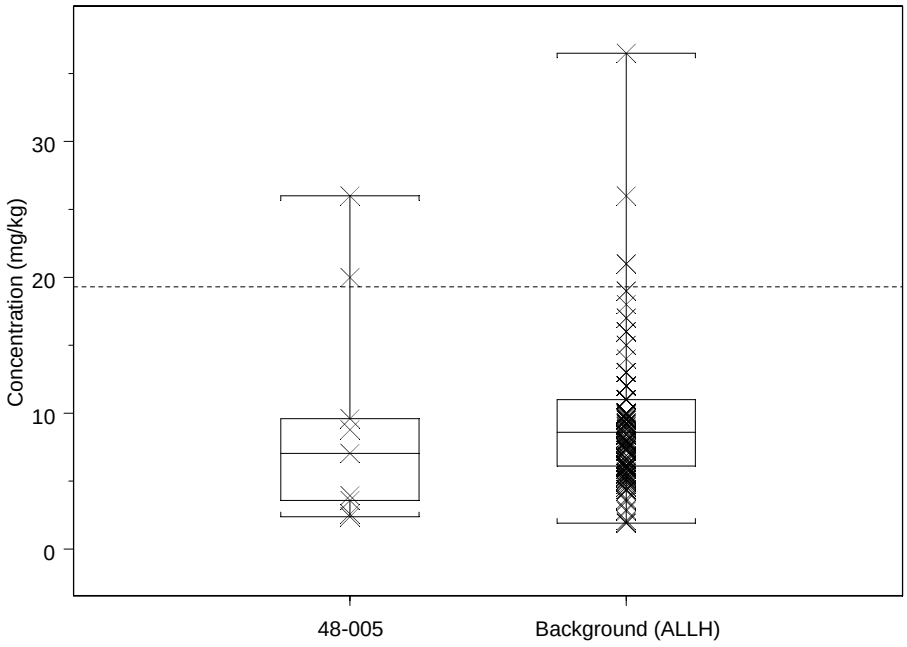


Figure I-5.6-1 Site concentrations of chromium in soil at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

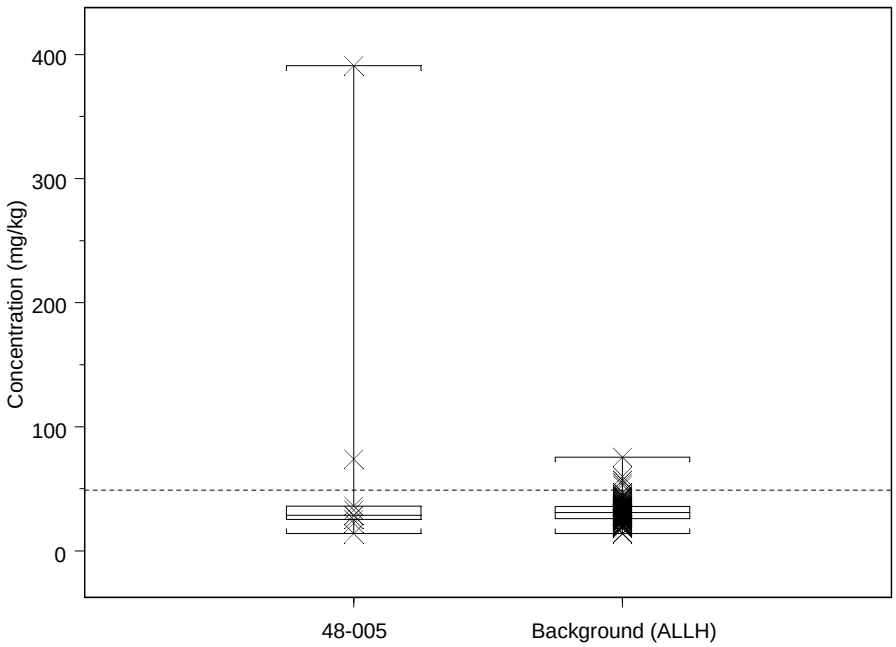


Figure I-5.6-2 Site concentrations of zinc in soil at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

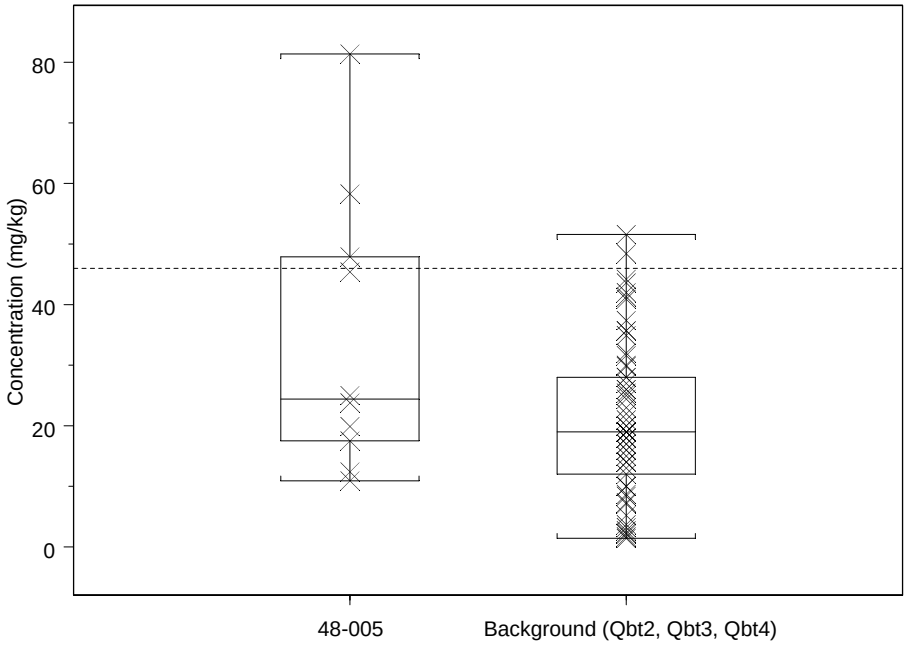


Figure I-5.6-3 Site concentrations of barium in tuff at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

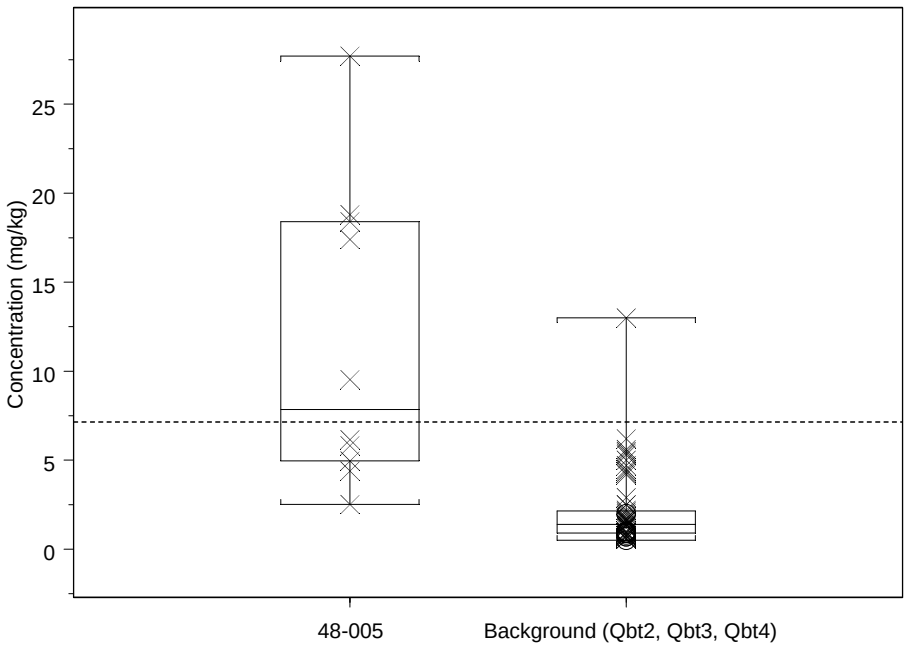


Figure I-5.6-4 Site concentrations of chromium in tuff at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

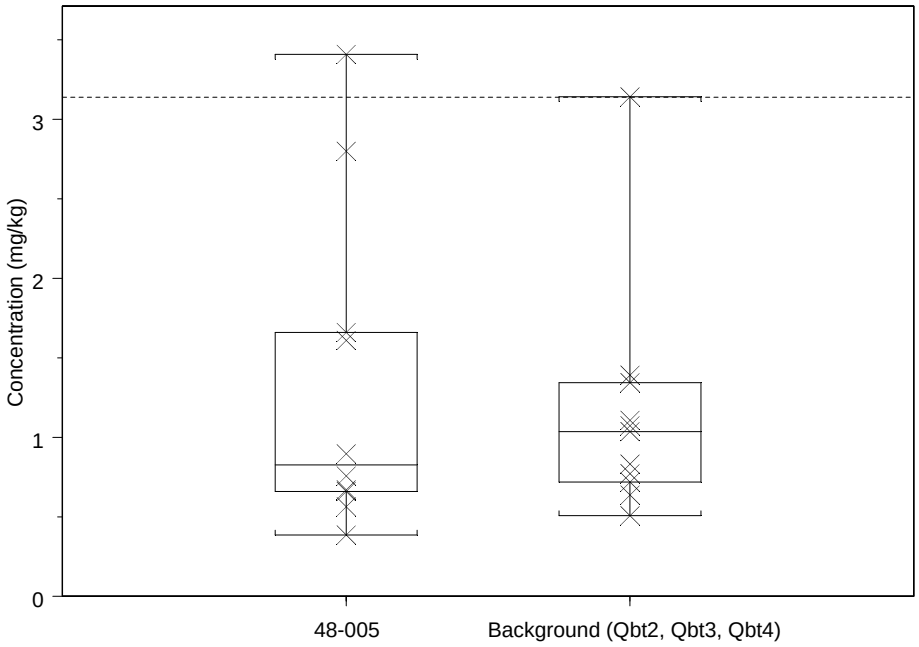


Figure I-5.6-5 Site concentrations of cobalt in tuff at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

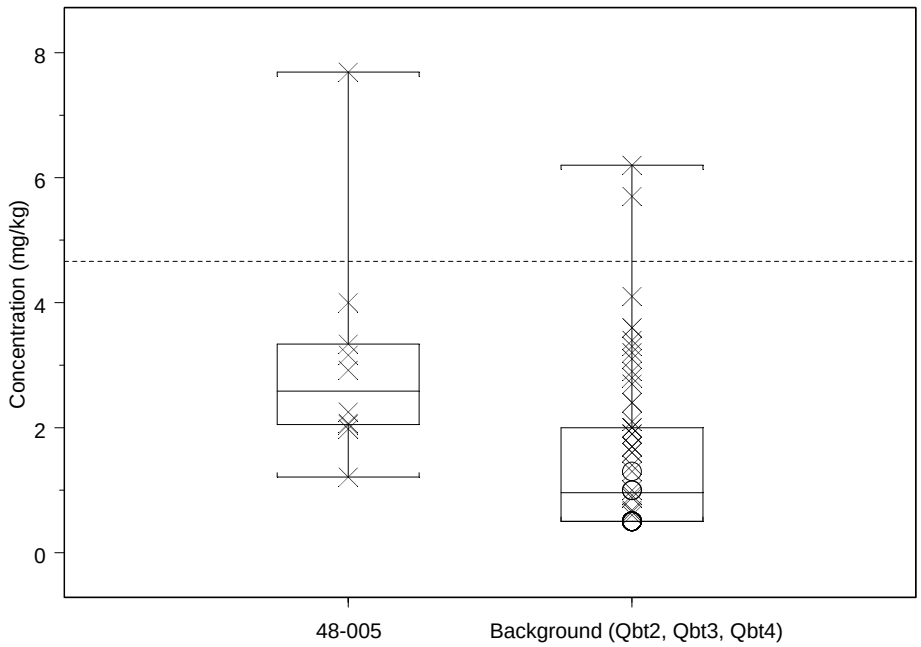


Figure I-5.6-6 Site concentrations of copper in tuff at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

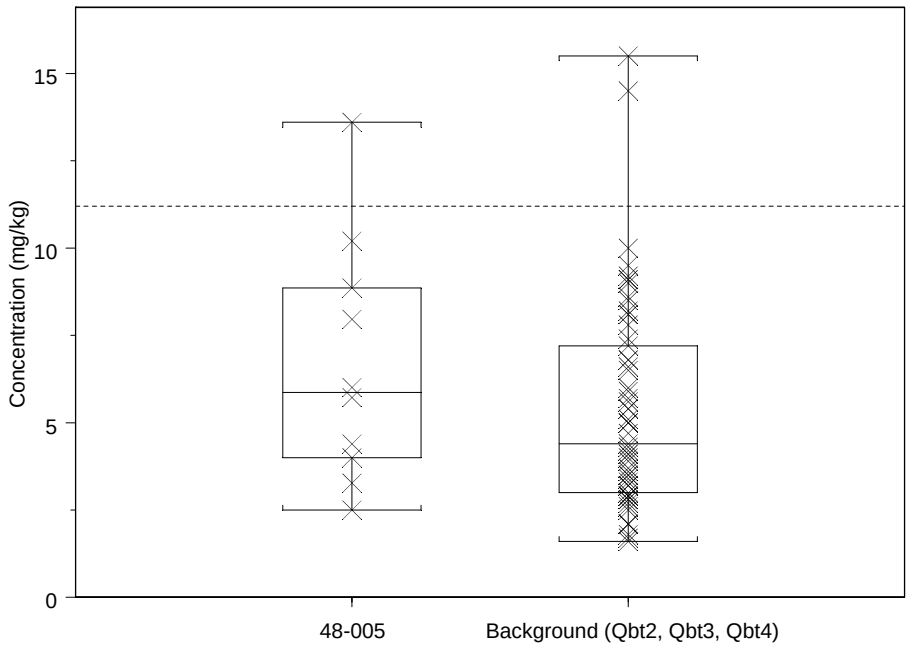


Figure I-5.6-7 Site concentrations of lead in tuff at SWMU 48-005 compared to background
(× = detect, ○ = nondetect)

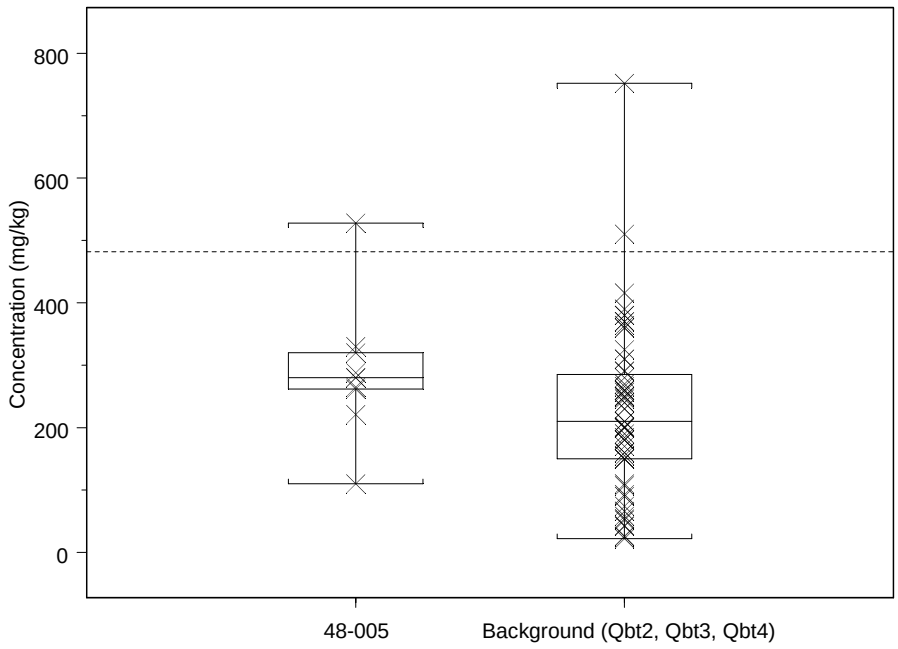


Figure I-5.6-8 Site concentrations of manganese in tuff at SWMU 48-005 compared to background

(× = detect, ○ = nondetect)

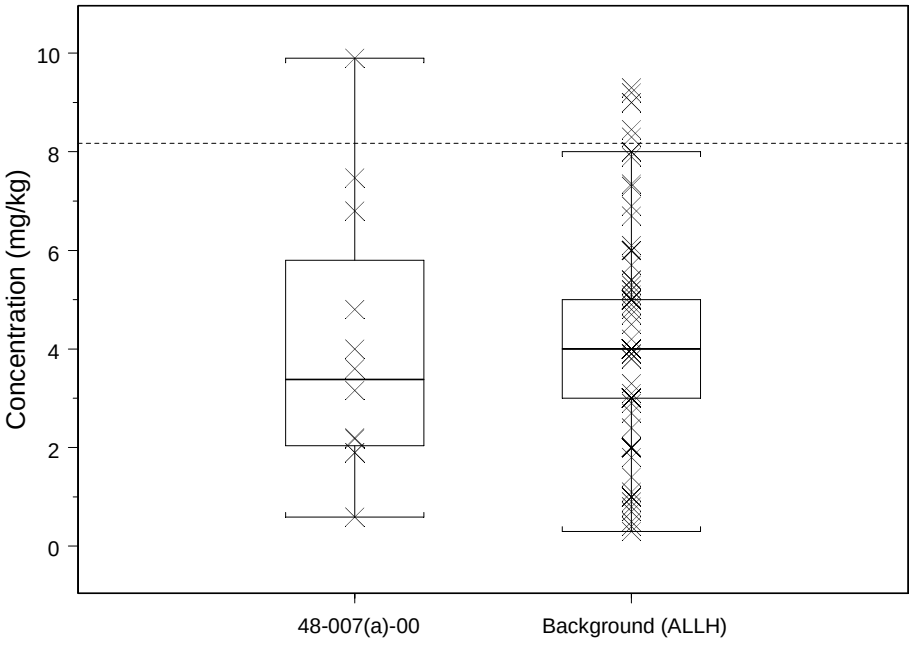


Figure I-5.7-2 Site concentrations of arsenic in soil at Consolidated Unit 48-007(a)-00 compared to background

(× = detect, ○ = nondetect)

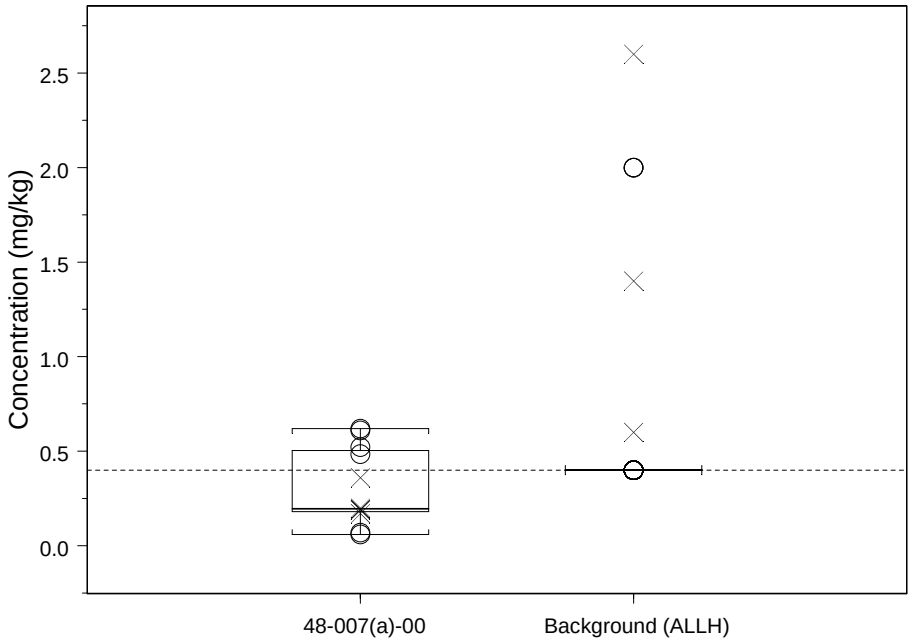


Figure I-5.7-3 Site concentrations of cadmium in soil at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

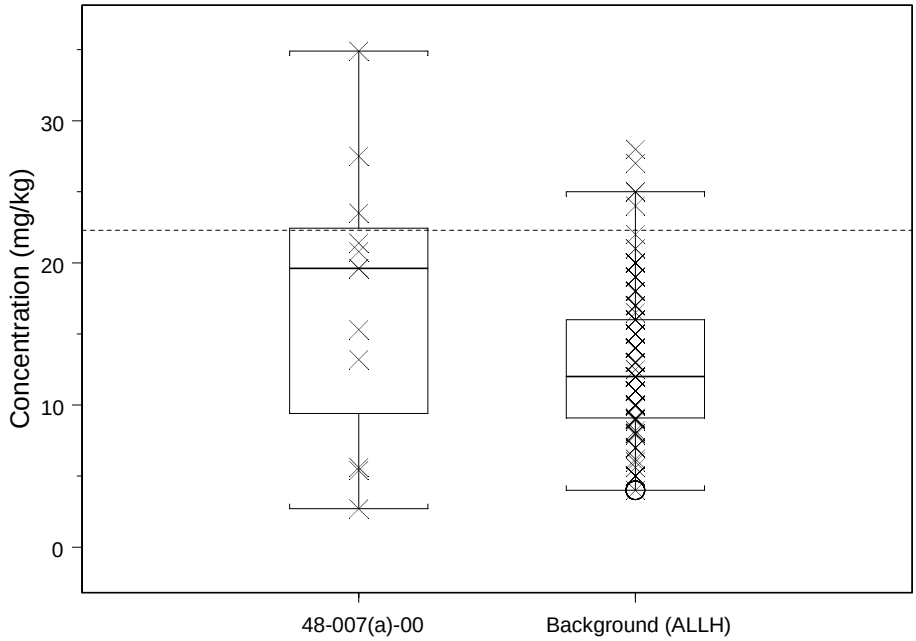


Figure I-5.7-4 Site concentrations of lead in soil at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

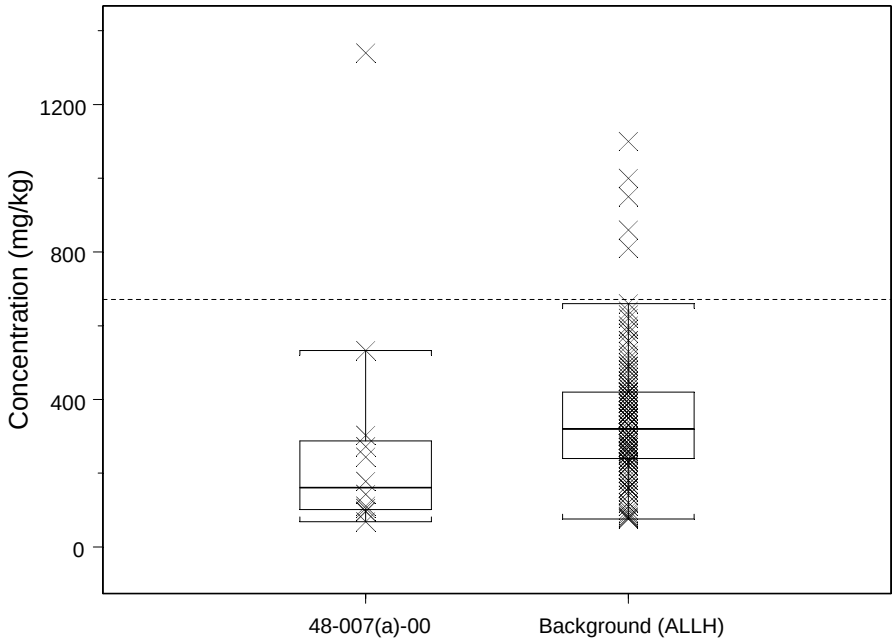


Figure I-5.7-5 Site concentrations of manganese in soil at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

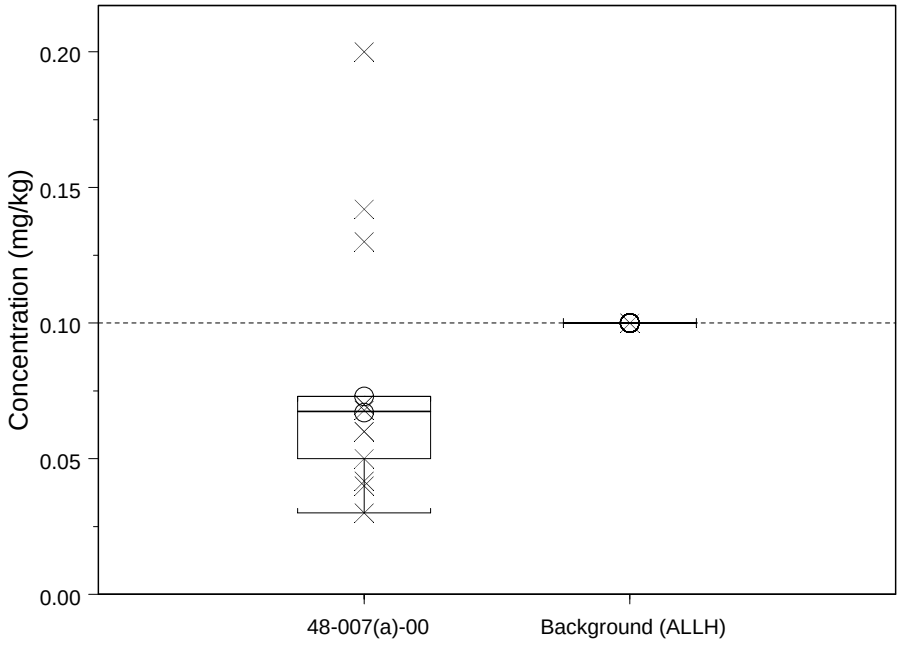


Figure I-5.7-6 Site concentrations of mercury in soil at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

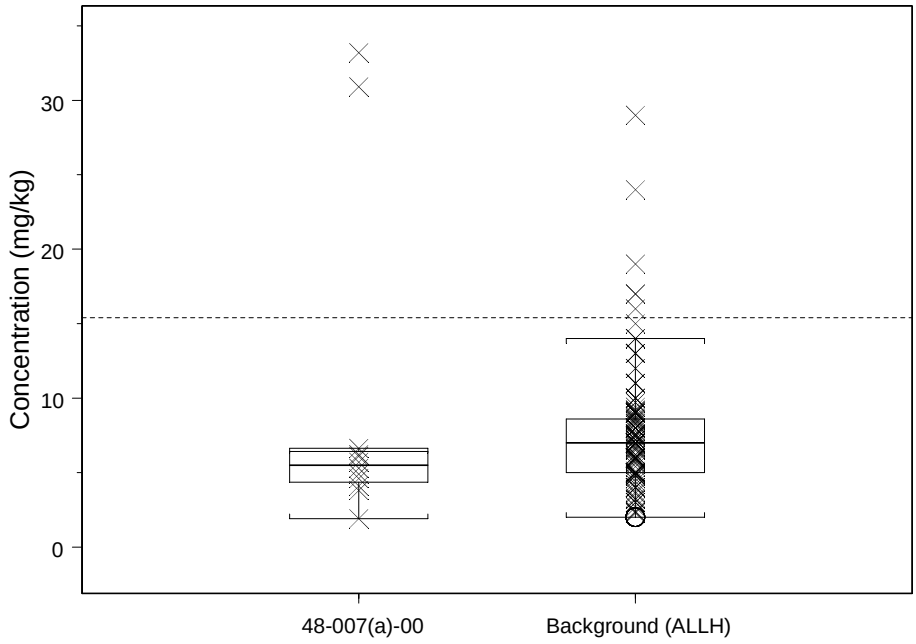


Figure I-5.7-7 Site concentrations of nickel in soil at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

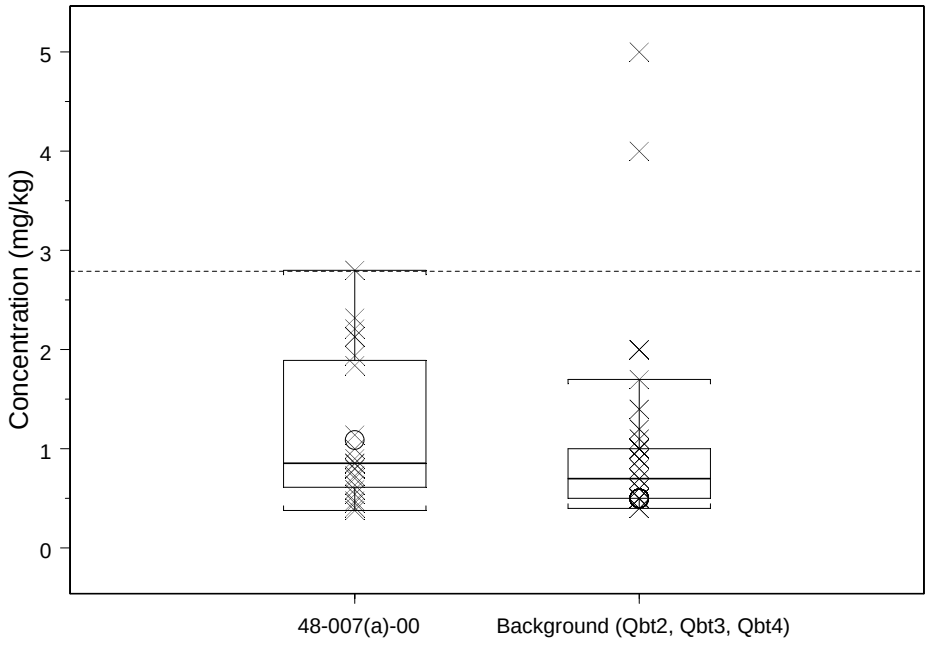


Figure I-5.7-8 Site concentrations of arsenic in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

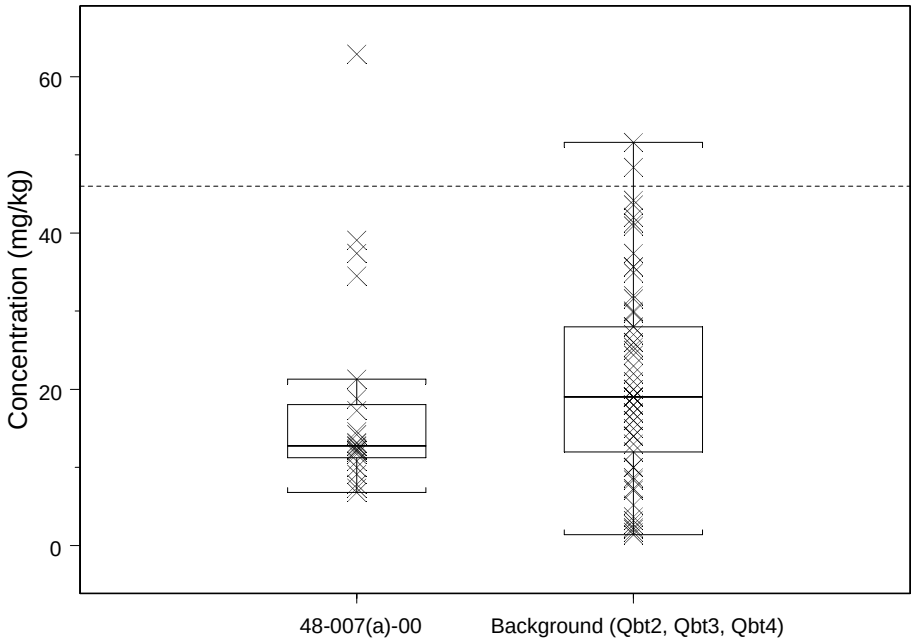


Figure I-5.7-9 Site concentrations of barium in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

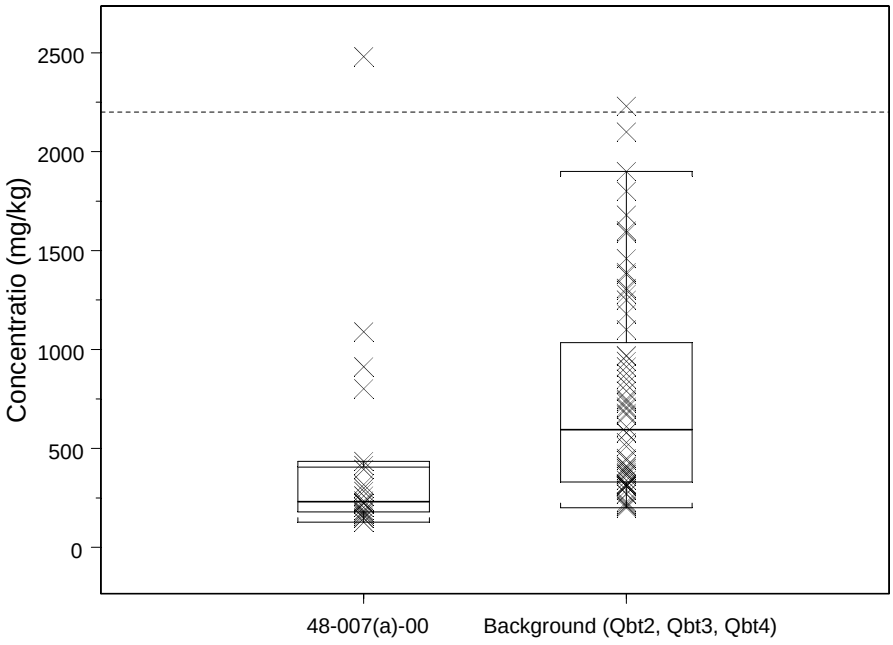


Figure I-5.7-10 Site concentrations of calcium in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

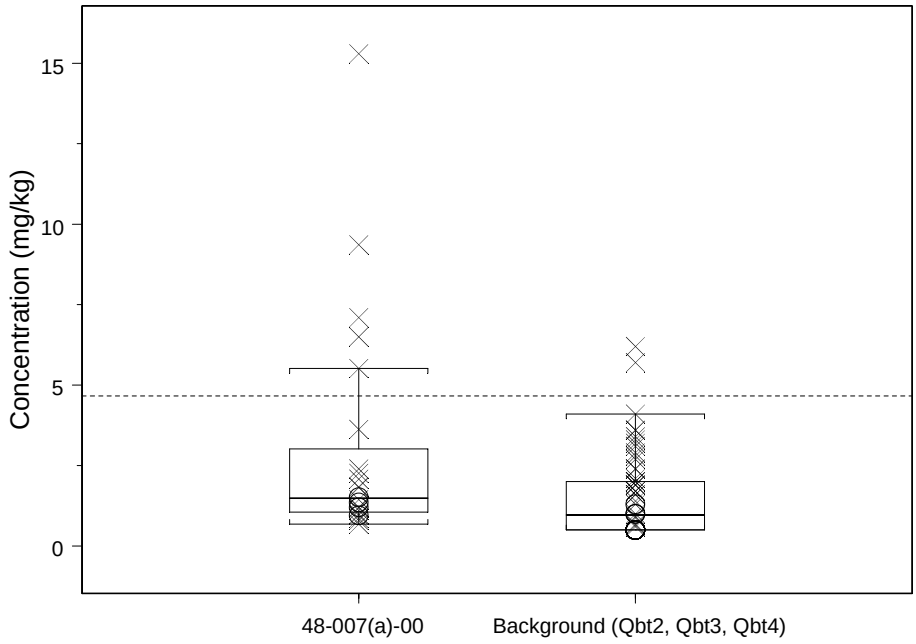


Figure I-5.7-11 Site concentrations of copper in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

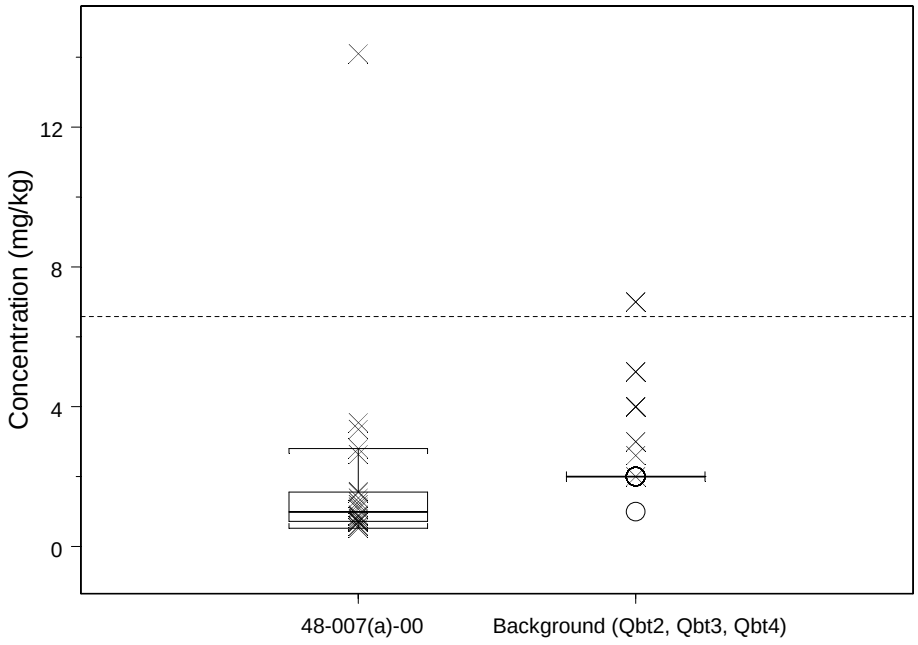


Figure I-5.7-12 Site concentrations of nickel in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

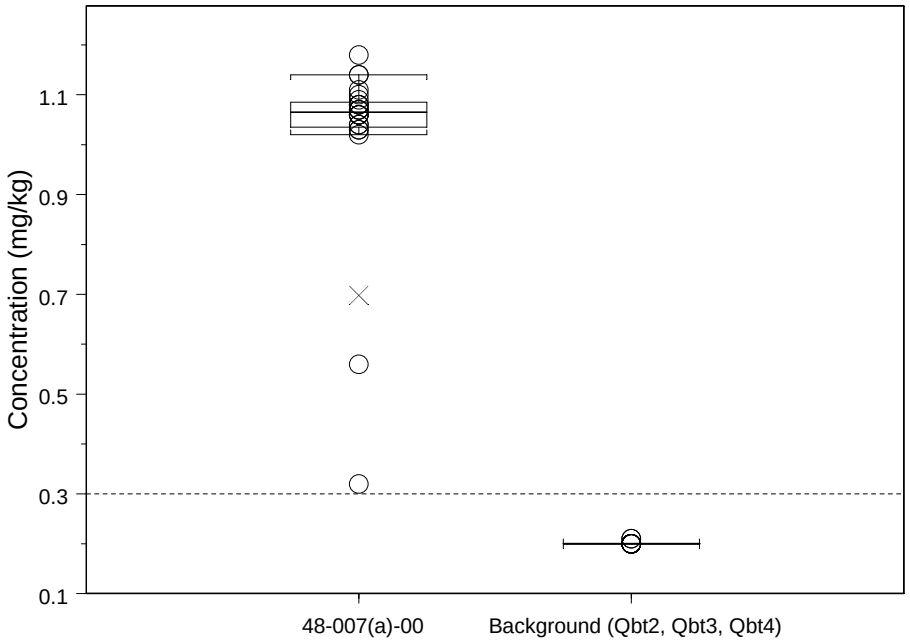


Figure I-5.7-13 Site concentrations of selenium in tuff at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

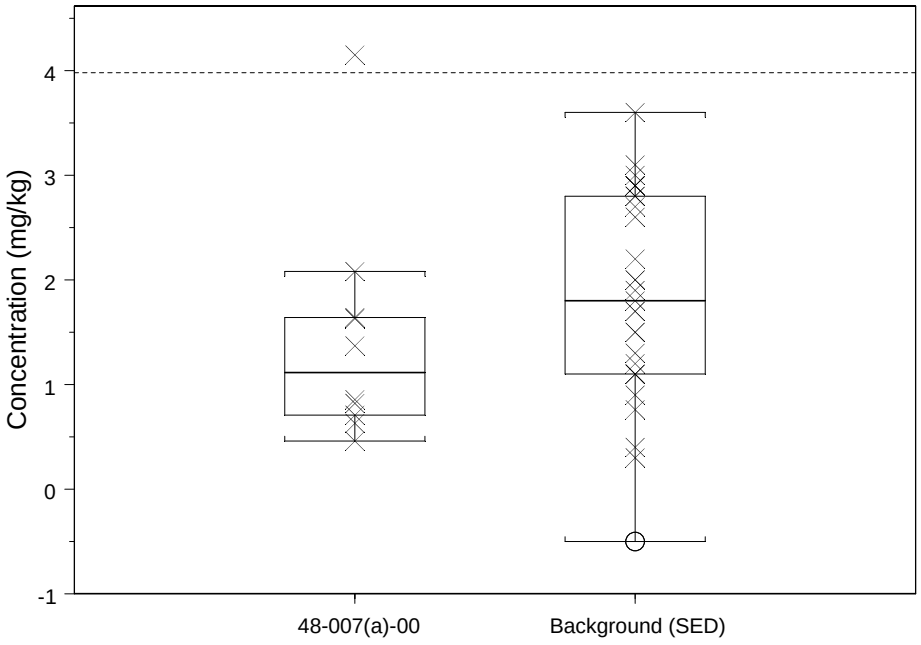


Figure I-5.7-14 Site concentrations of arsenic in sediment at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

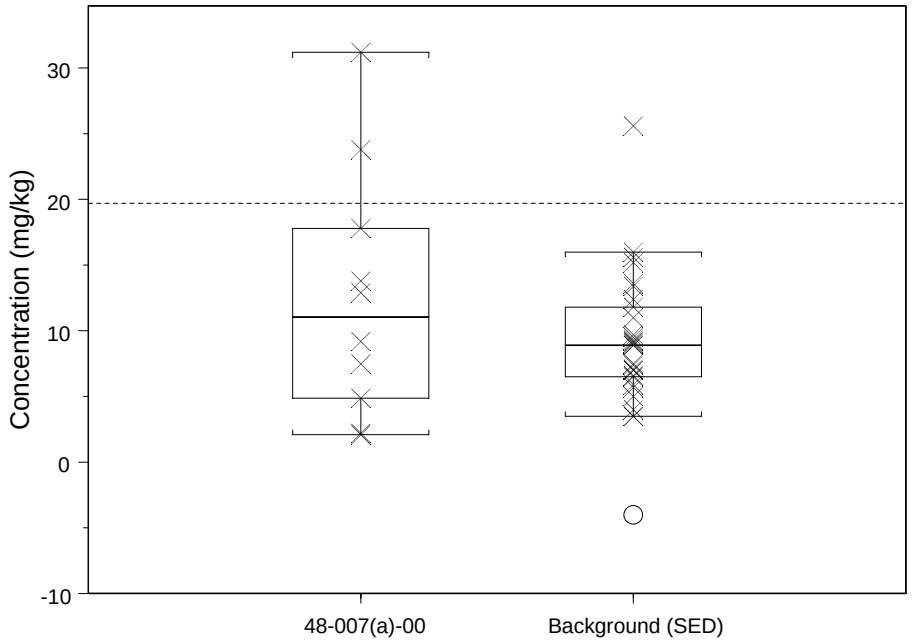


Figure I-5.7-15 Site concentrations of lead in sediment at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

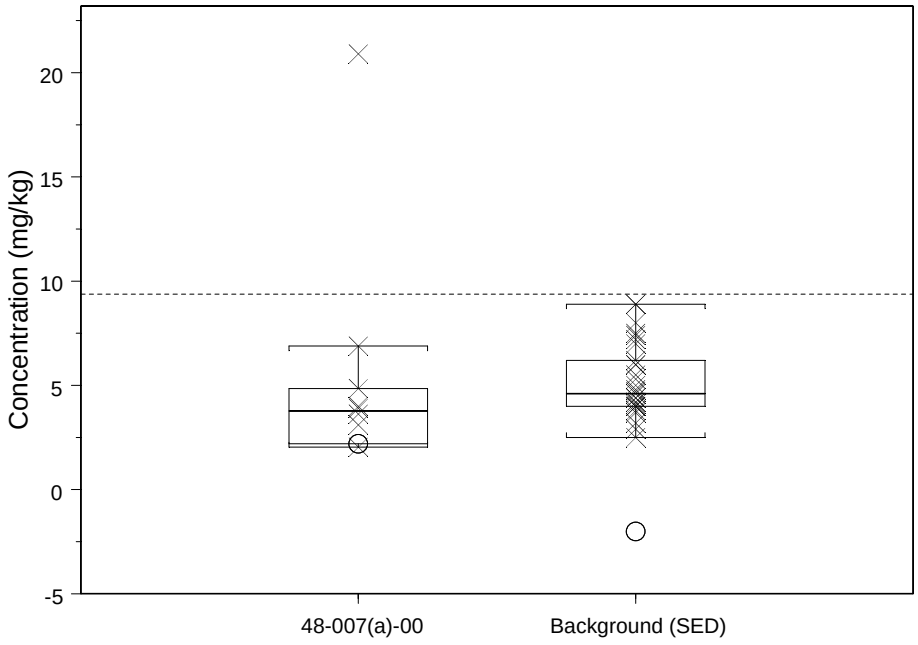


Figure I-5.7-16 Site concentrations of nickel in sediment at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

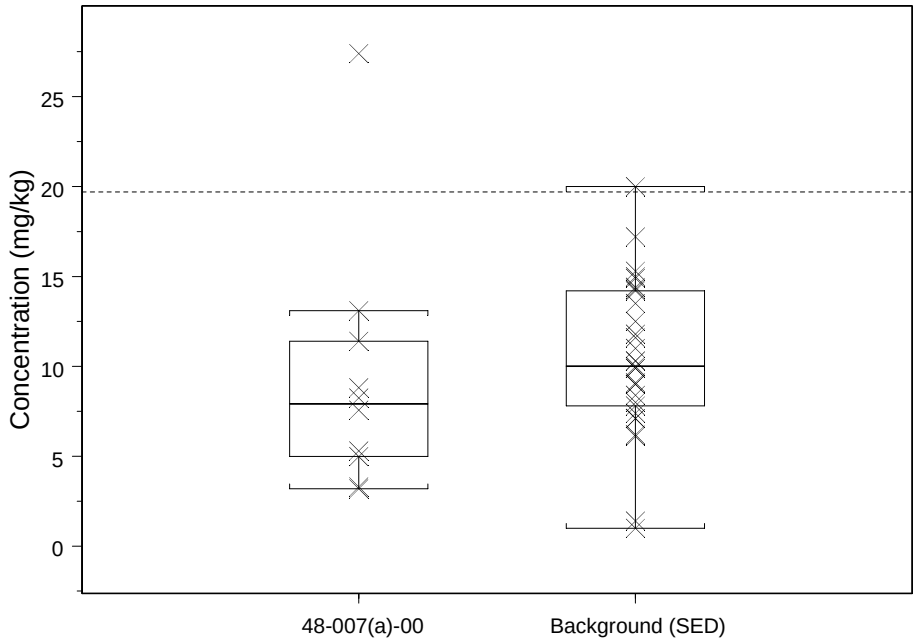


Figure I-5.7-17 Site concentrations of vanadium in sediment at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

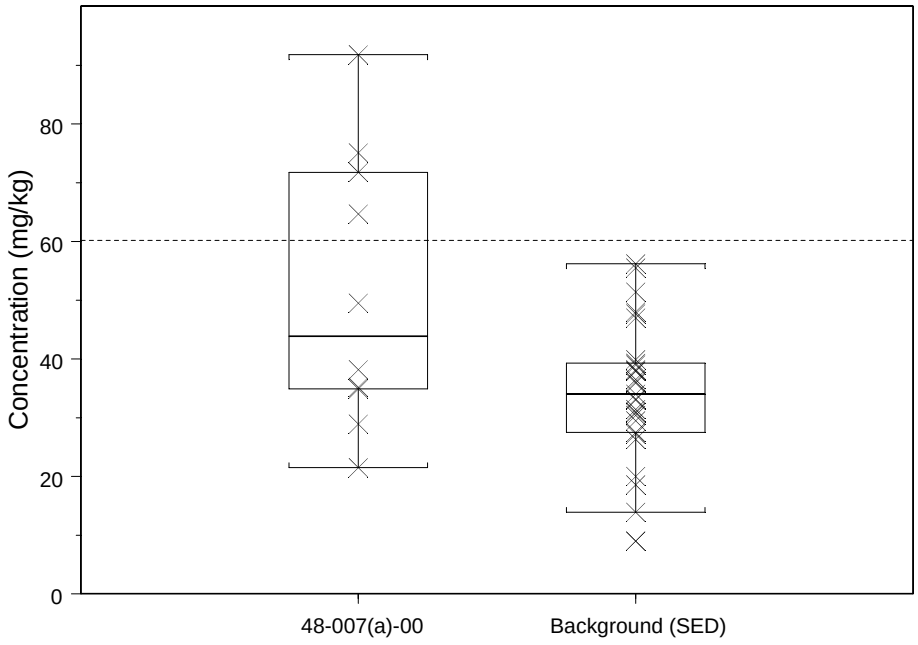


Figure I-5.7-18 Site concentrations of zinc in sediment at Consolidated Unit 48-007(a)-00 compared to background
(× = detect, ○ = nondetect)

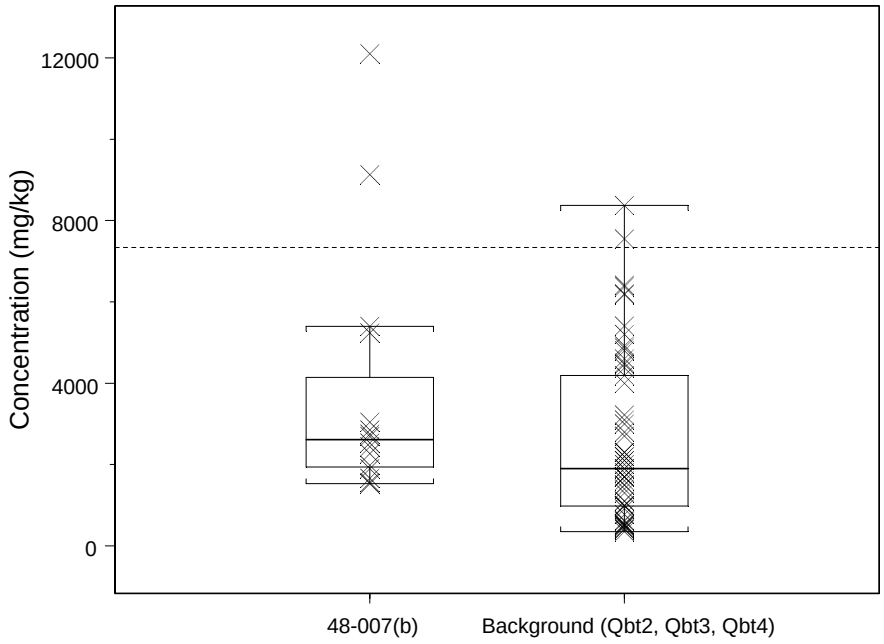


Figure I-5.8-1 Site concentrations of aluminum in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

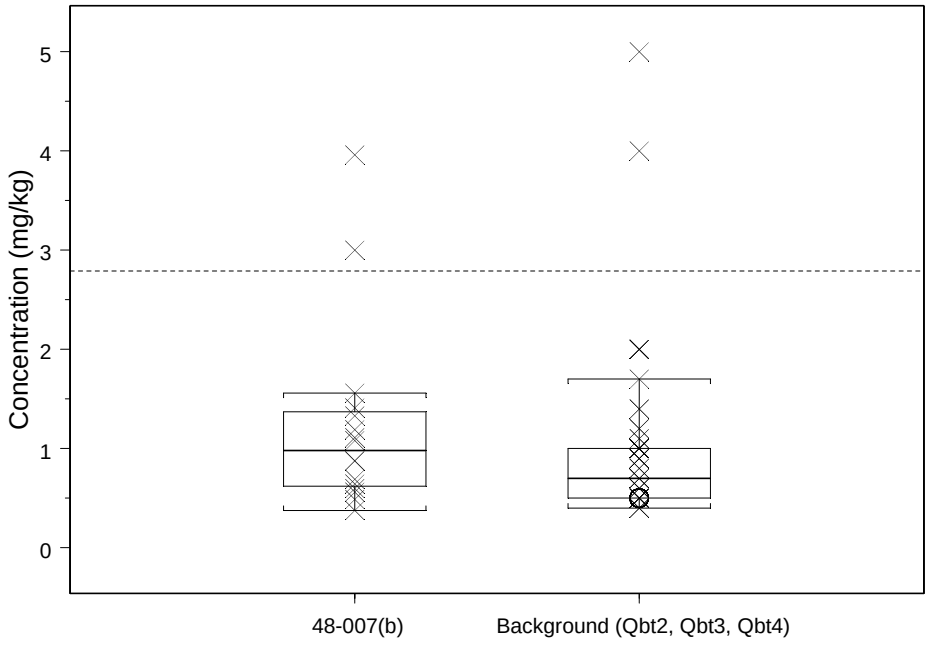


Figure I-5.8-2 Site concentrations of arsenic in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

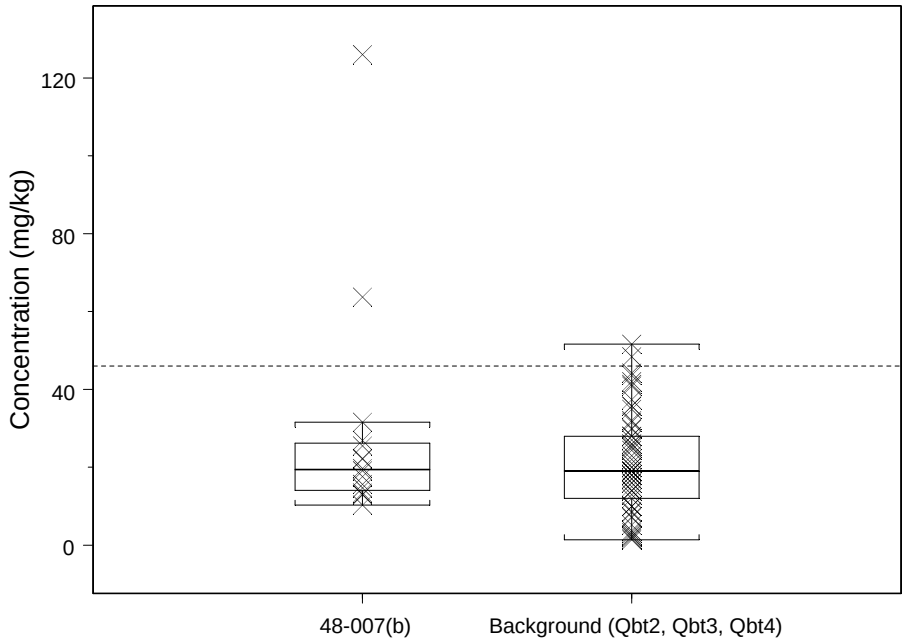


Figure I-5.8-3 **Site concentrations of barium in tuff at SWMU 48-007(b) compared to background** (× = detect, ○ = nondetect)

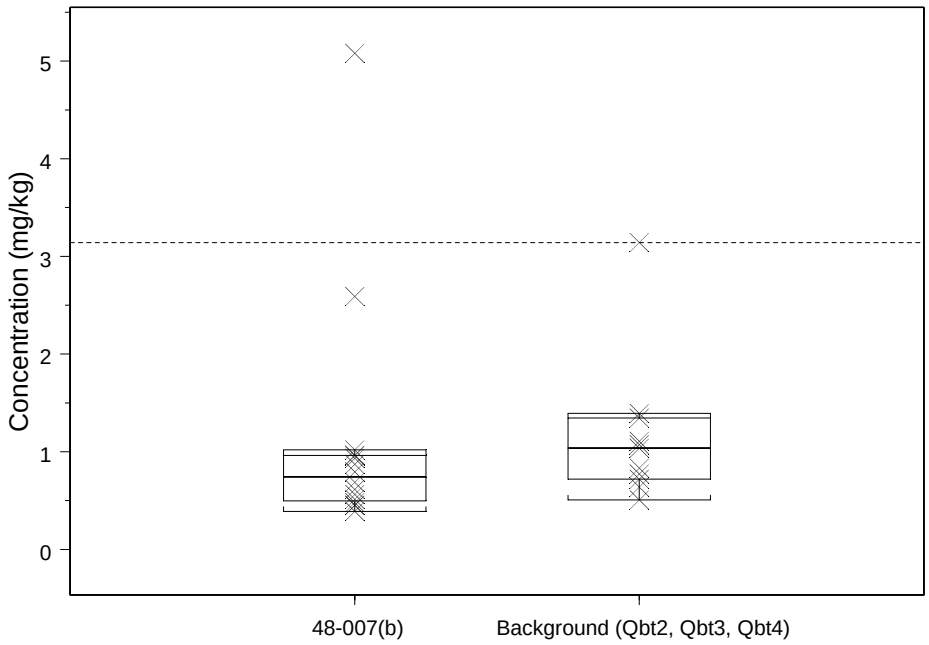


Figure I-5.8-4 **Site concentrations of cobalt in tuff at SWMU 48-007(b) compared to background** (× = detect, ○ = nondetect)

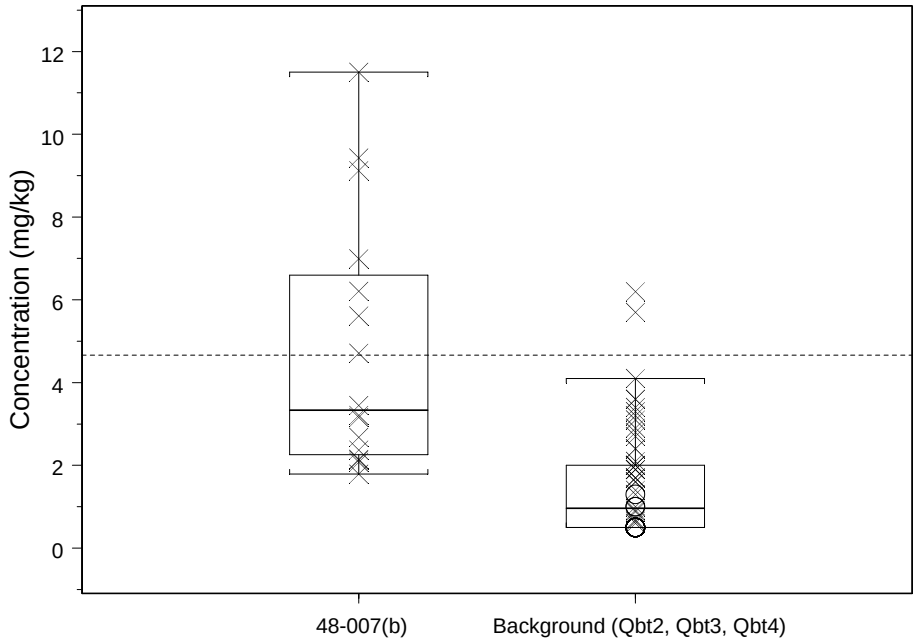


Figure I-5.8-5 Site concentrations of copper in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

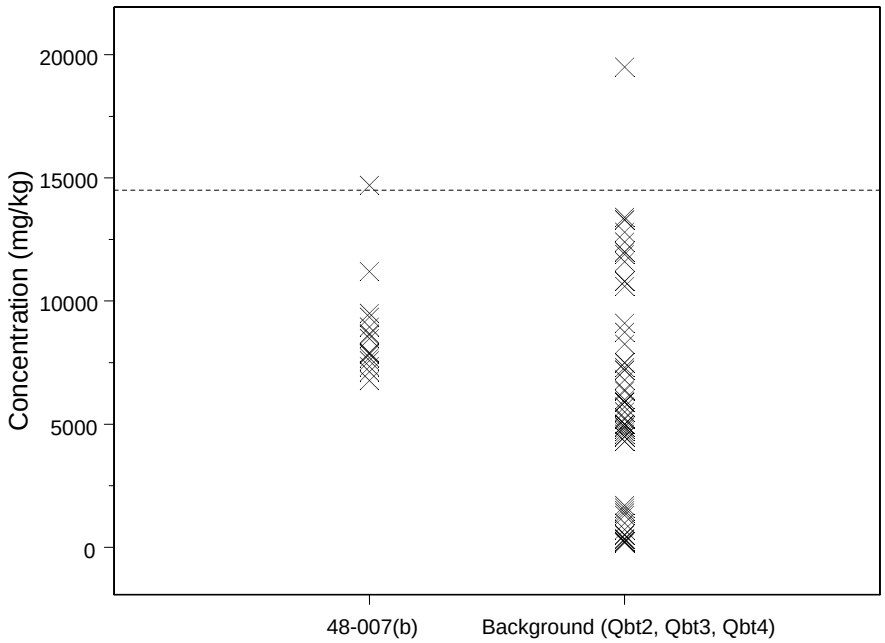


Figure I-5.8-6 Site concentrations of iron in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

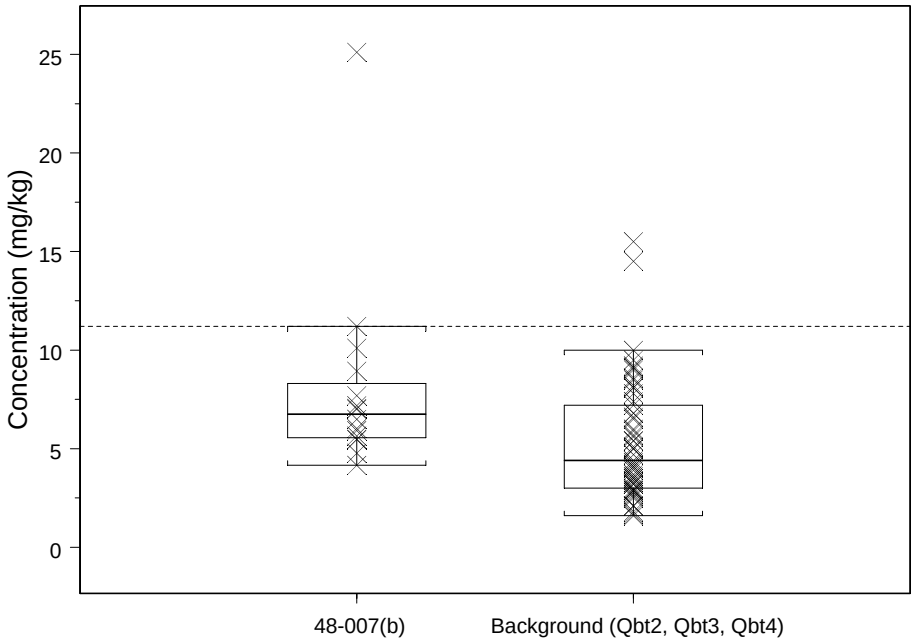


Figure I-5.8-7 Site concentrations of lead in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

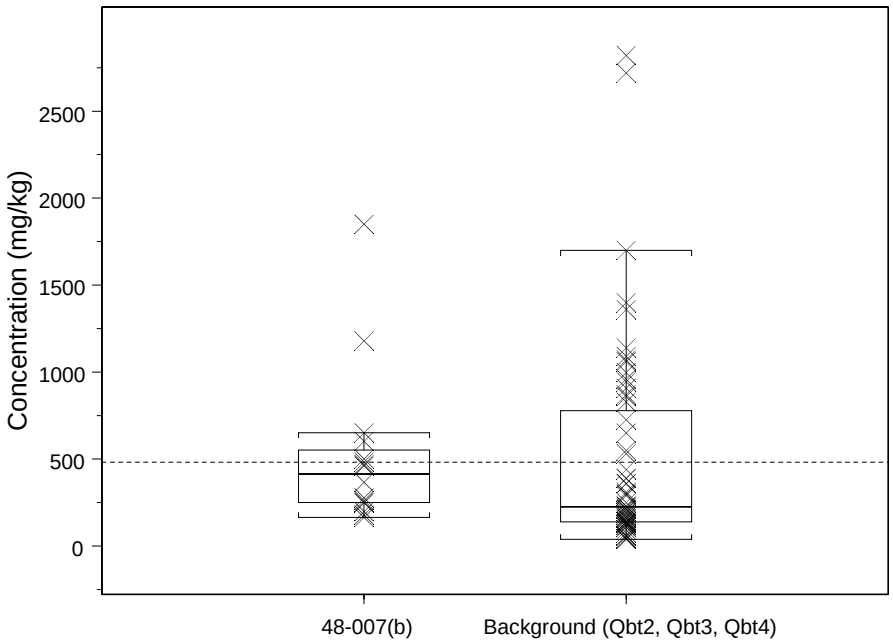


Figure I-5.8-8 Site concentrations of magnesium in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

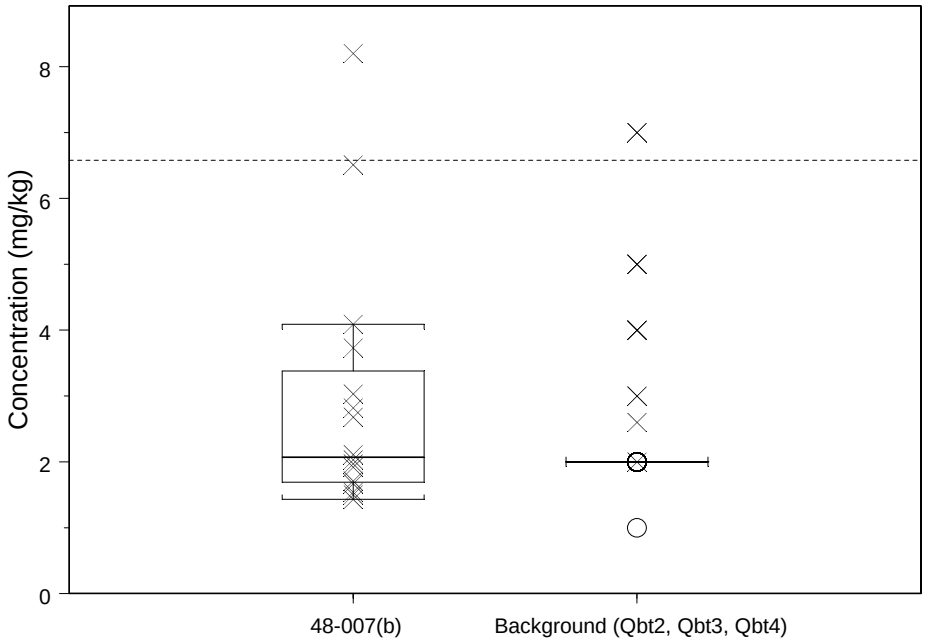


Figure I-5.8-9 Site concentrations of nickel in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

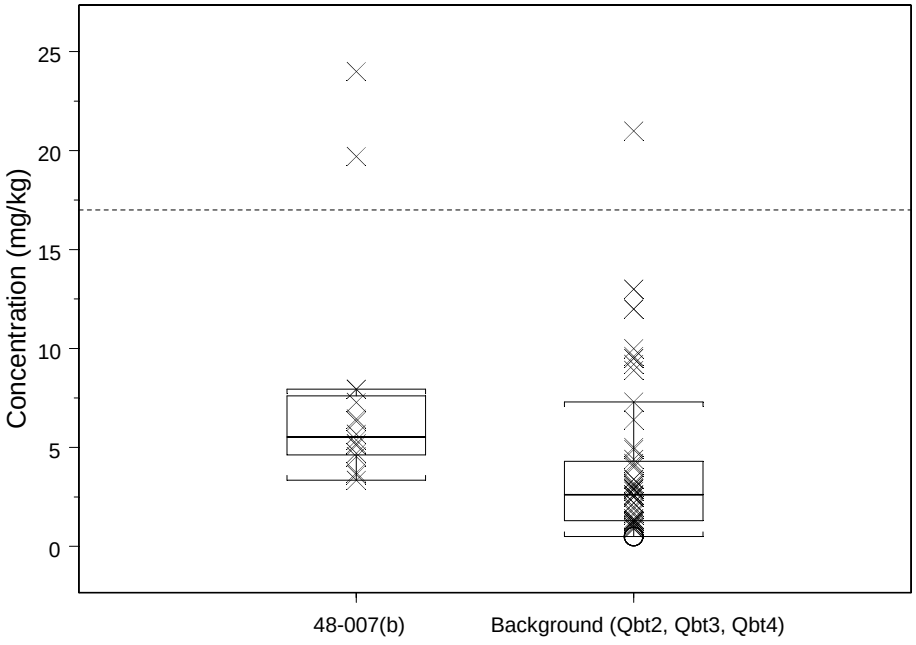


Figure I-5.8-10 Site concentrations of vanadium in tuff at SWMU 48-007(b) compared to background
(× = detect, ○ = nondetect)

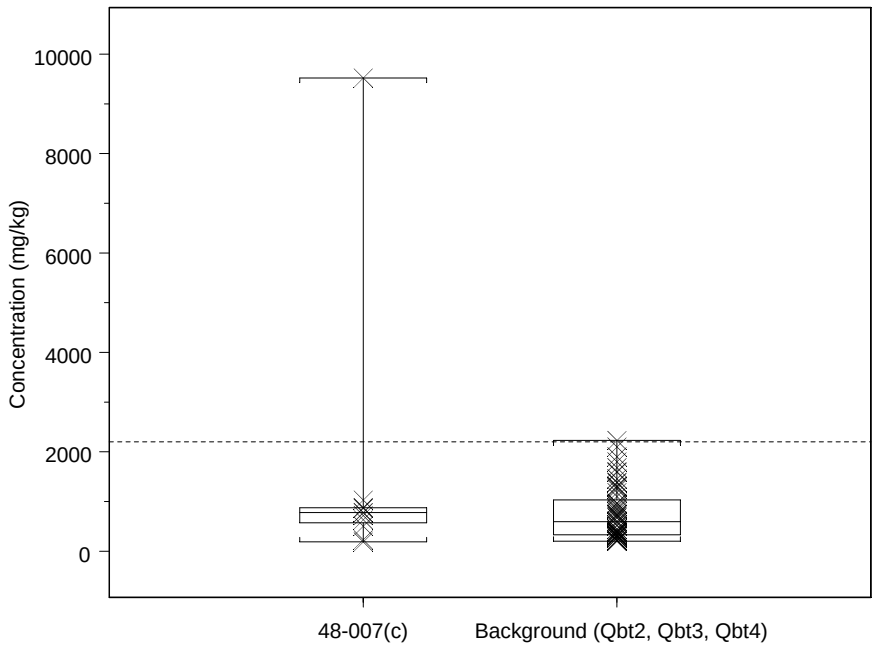


Figure I-5.9-1 Site concentrations of calcium in tuff at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)

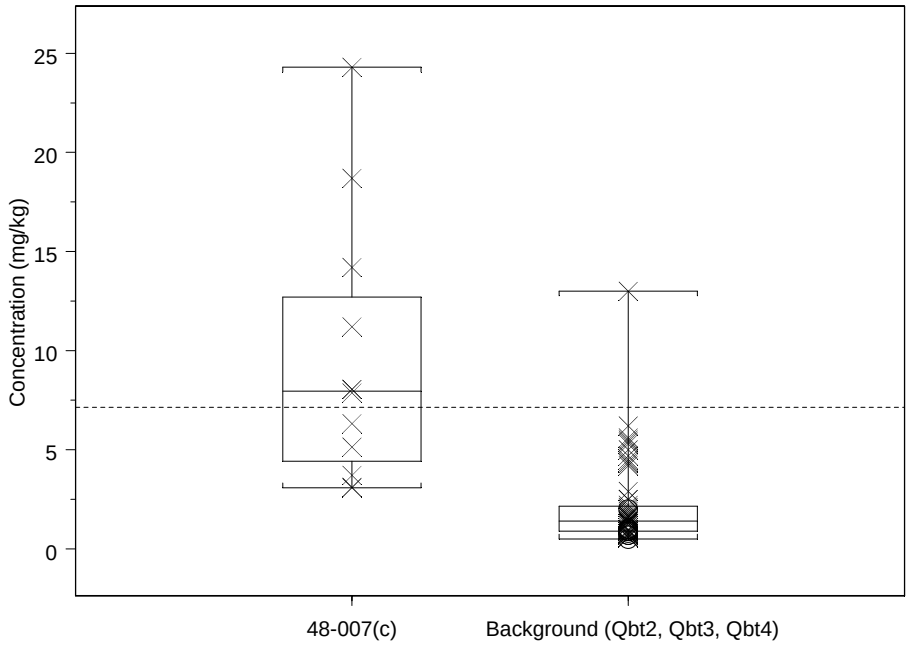


Figure I-5.9-2 Site concentrations of chromium in tuff at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)

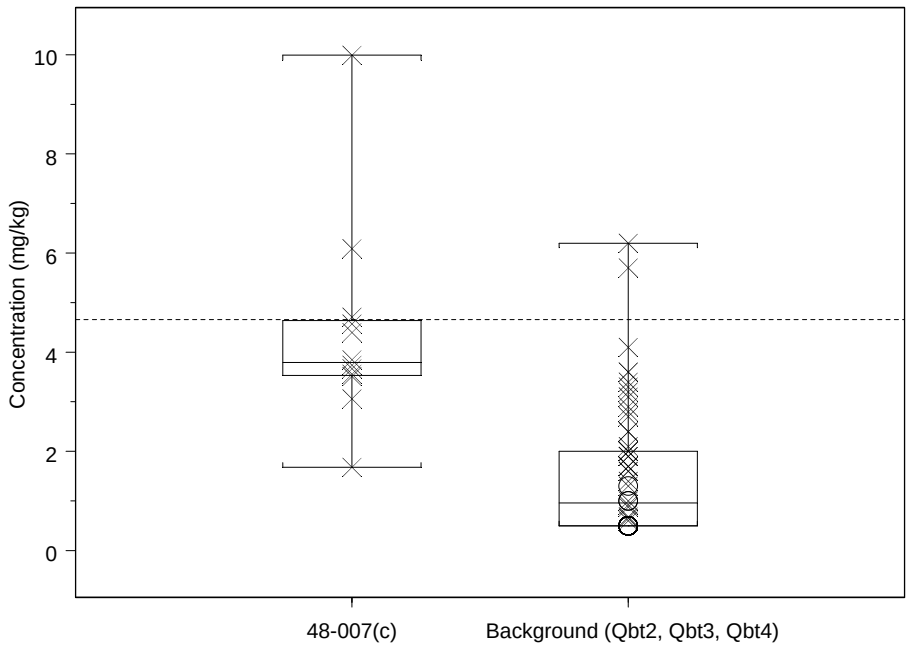


Figure I-5.9-3 Site concentrations of copper in tuff at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)

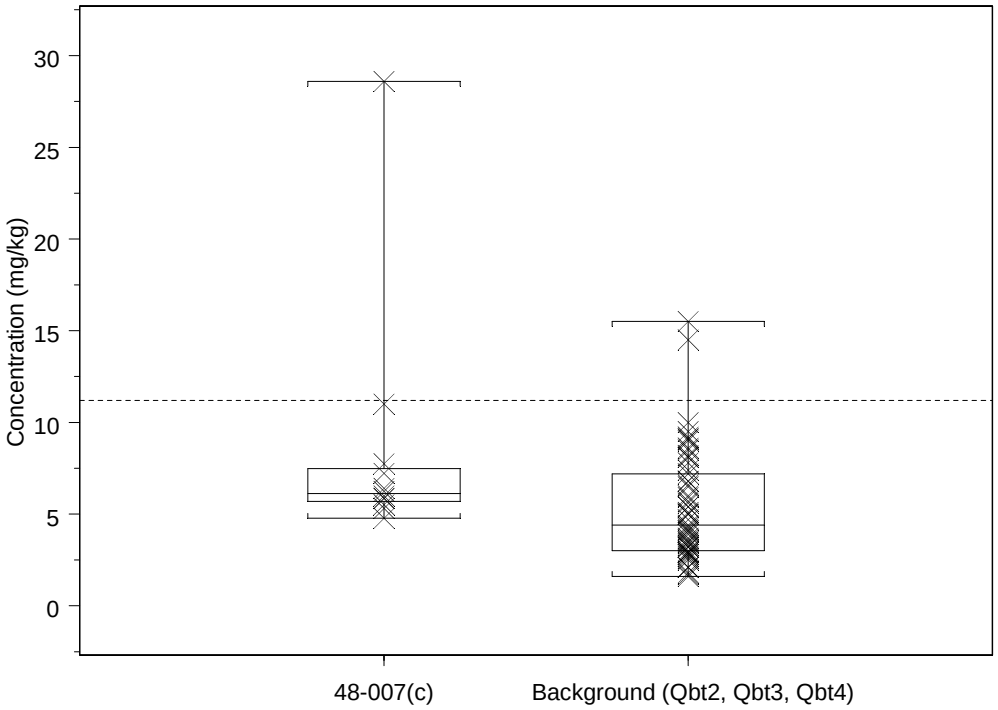


Figure I-5.9-4 Site concentrations of lead in tuff at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)

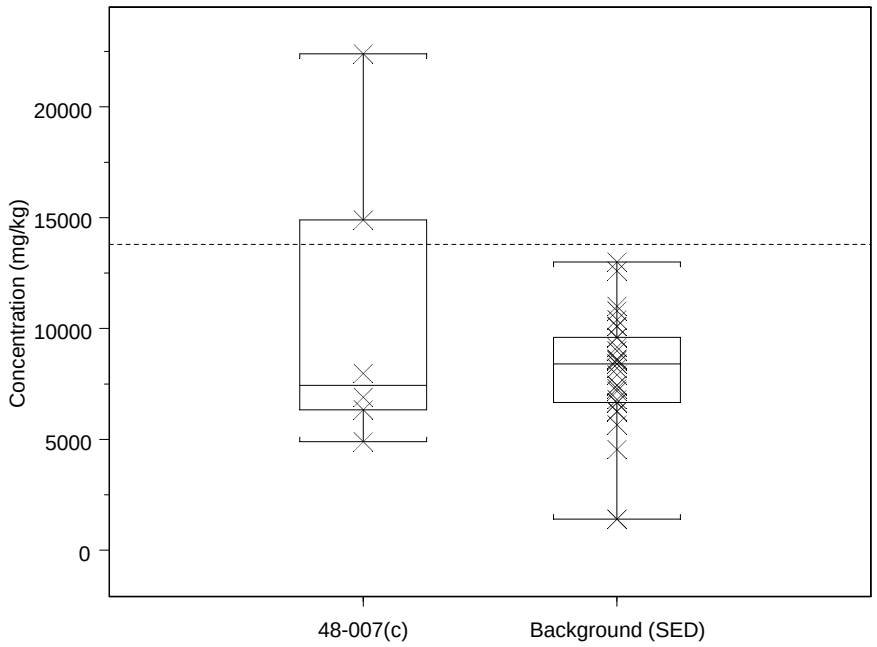


Figure I-5.9-5 Site concentrations of iron in sediment at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)



Figure I-5.9-6 Site concentrations of silver in sediment at SWMU 48-007(c) compared to background
(× = detect, ○ = nondetect)

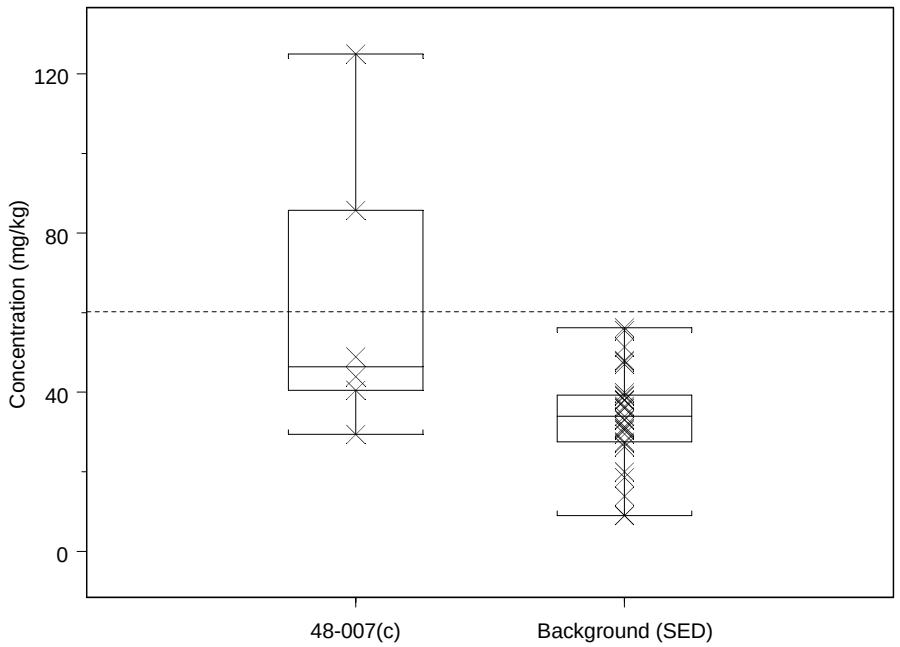


Figure I-5.9-7 Site concentrations of zinc in sediment at SWMU 48-007(c) compared to background

(× = detect, ○ = nondetect)

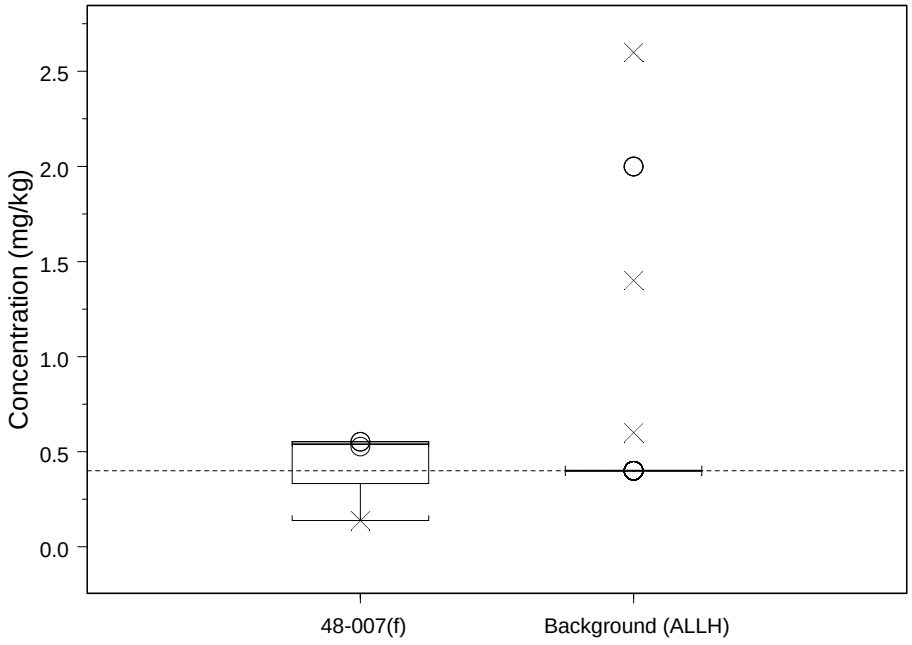


Figure I-5.10-1 Site concentrations of cadmium in soil at SWMU 48-007(f) compared to background

(× = detect, ○ = nondetect)

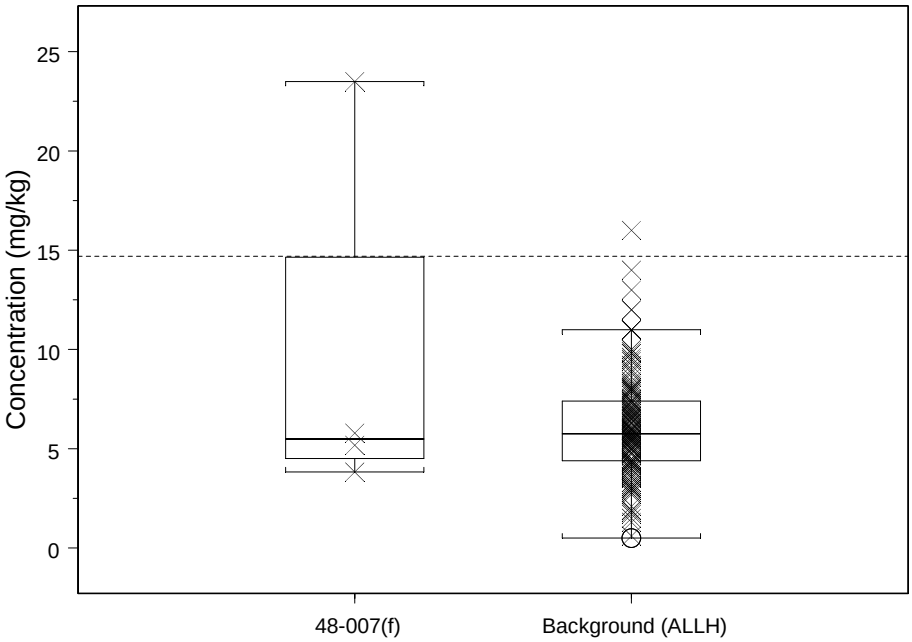


Figure I-5.10-2 Site concentrations of copper in soil at SWMU 48-007(f) compared to background
(× = detect, ○ = nondetect)

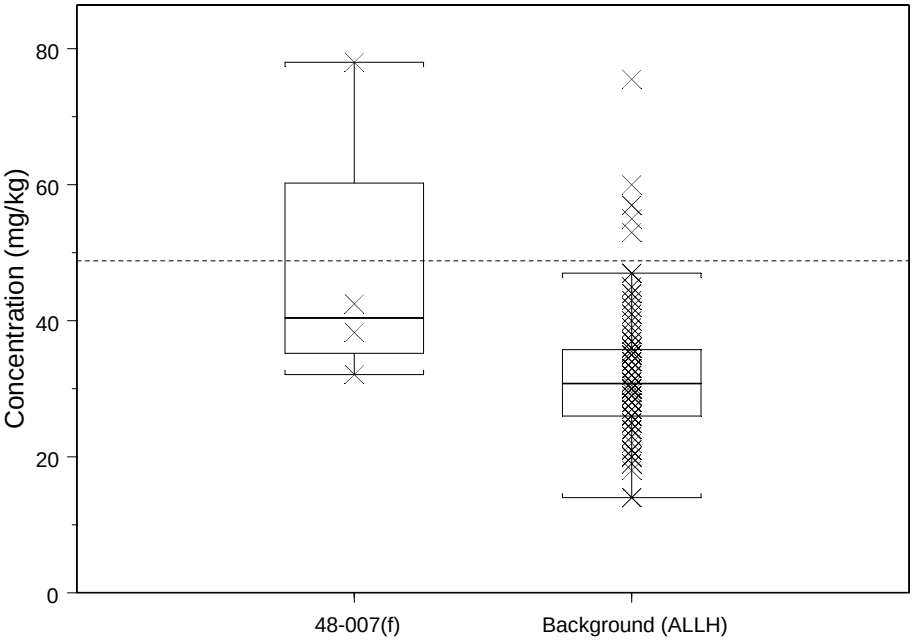


Figure I-5.10-3 Site concentrations of zinc in soil at SWMU 48-007(f) compared to background
(× = detect, ○ = nondetect)

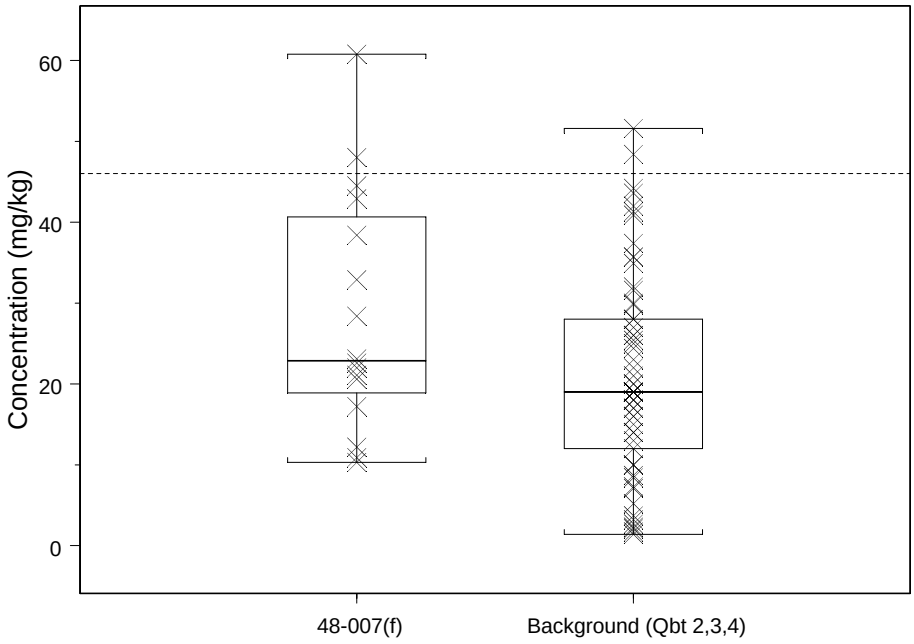


Figure I-5.10-4 Site concentrations of barium in tuff at SWMU 48-007(f) compared to background
(× = detect, ○ = nondetect)

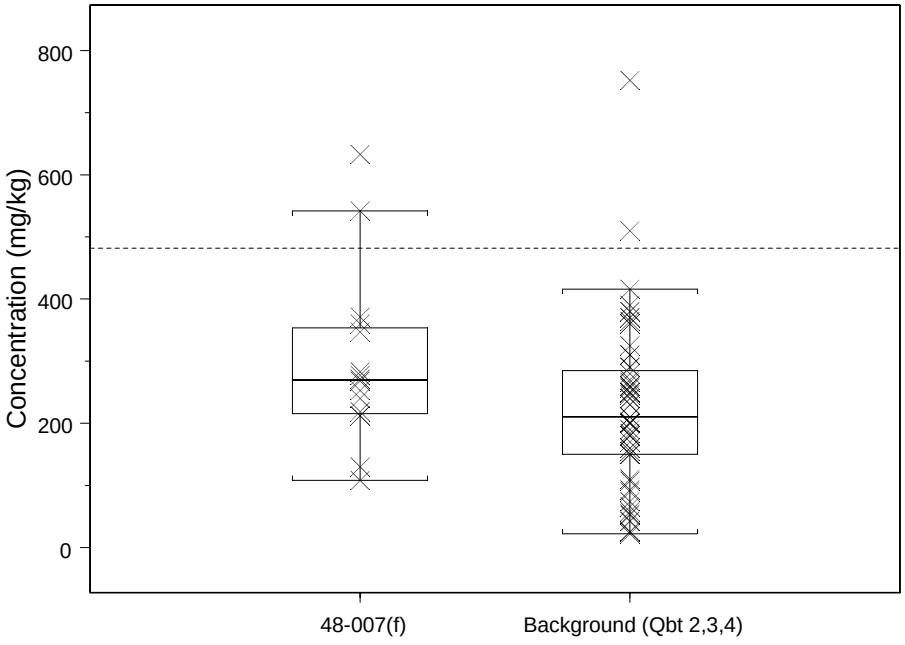


Figure I-5.10-5 Site concentrations of manganese in tuff at SWMU 48-007(f) compared to background
(× = detect, ○ = nondetect)

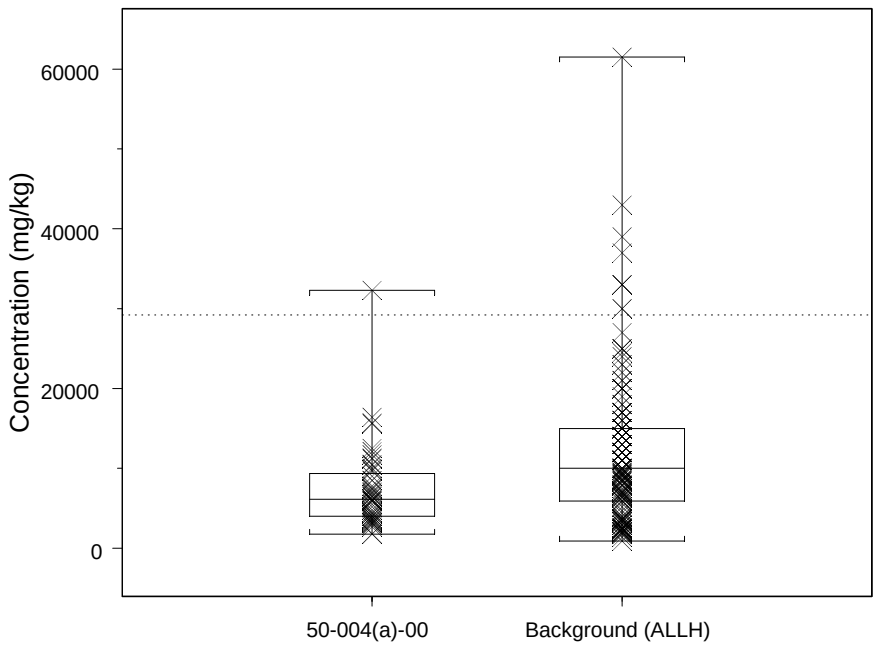


Figure I-6.7-1 Site concentrations of aluminum in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

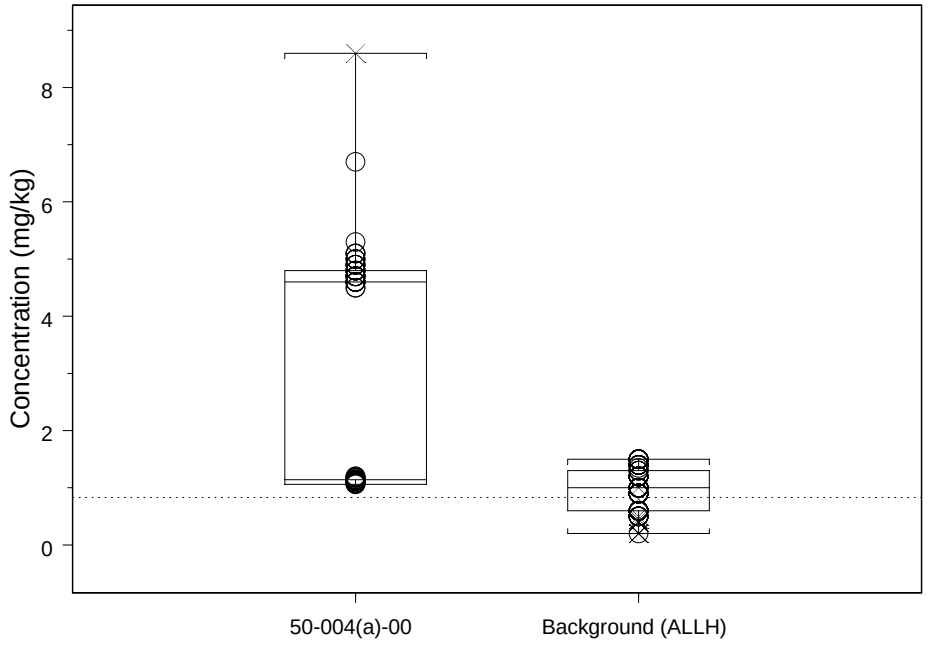


Figure I-6.7-2 Site concentrations of antimony in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

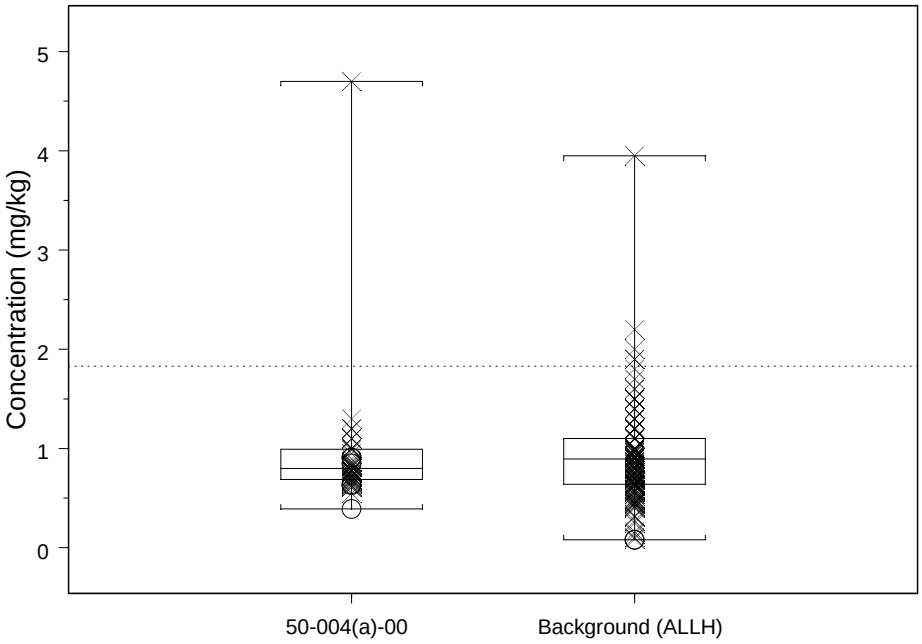


Figure I-6.7-3 Site concentrations of beryllium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

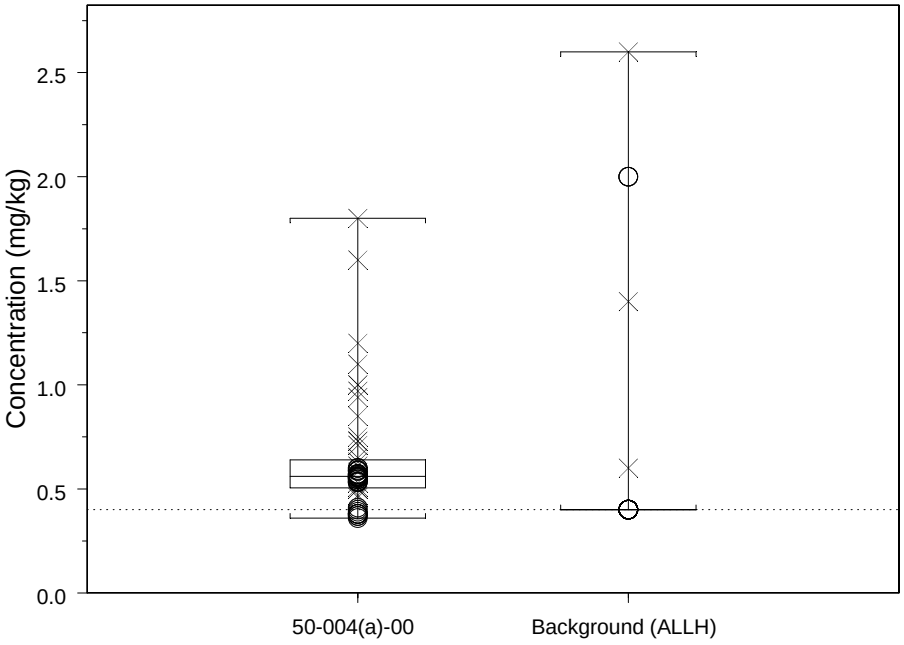


Figure I-6.7-4 Site concentrations of cadmium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

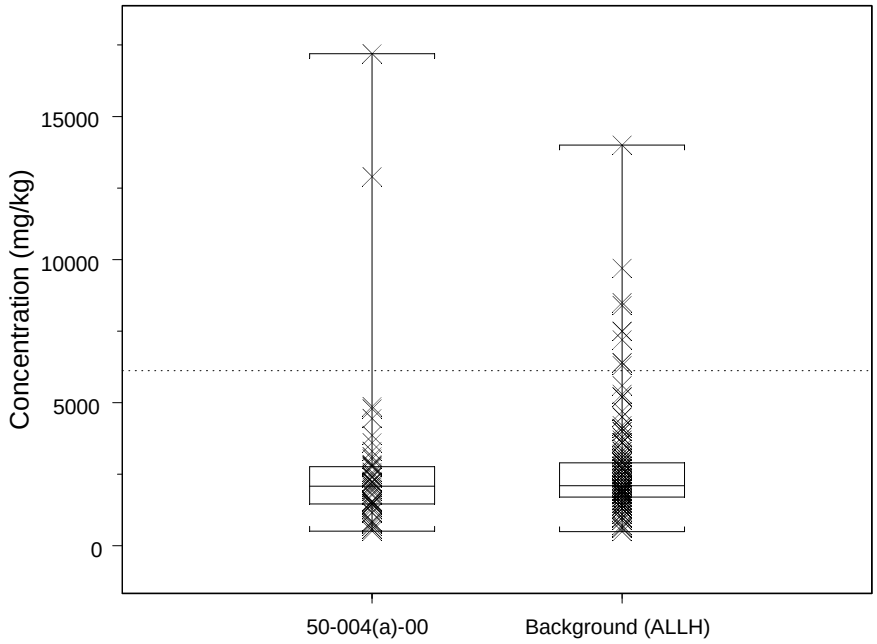


Figure I-6.7-5 Site concentrations of calcium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

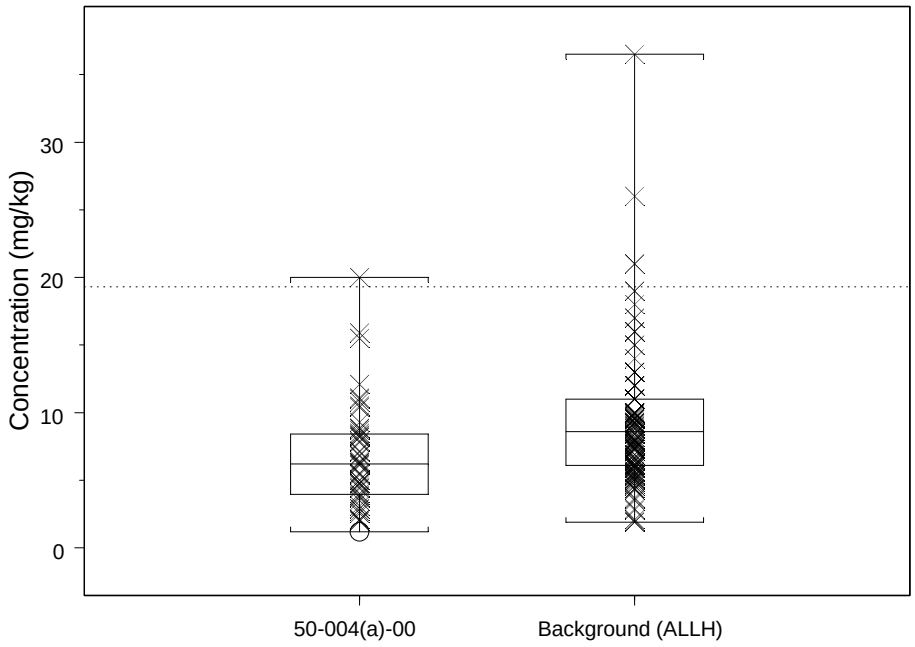


Figure I-6.7-6 Site concentrations of chromium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

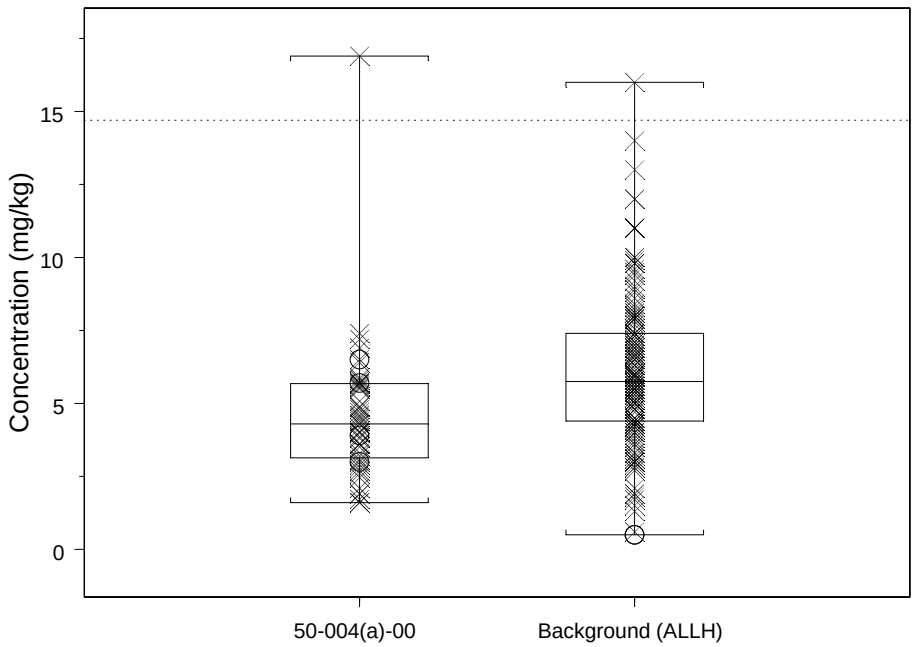


Figure I-6.7-7 Site concentrations of copper in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

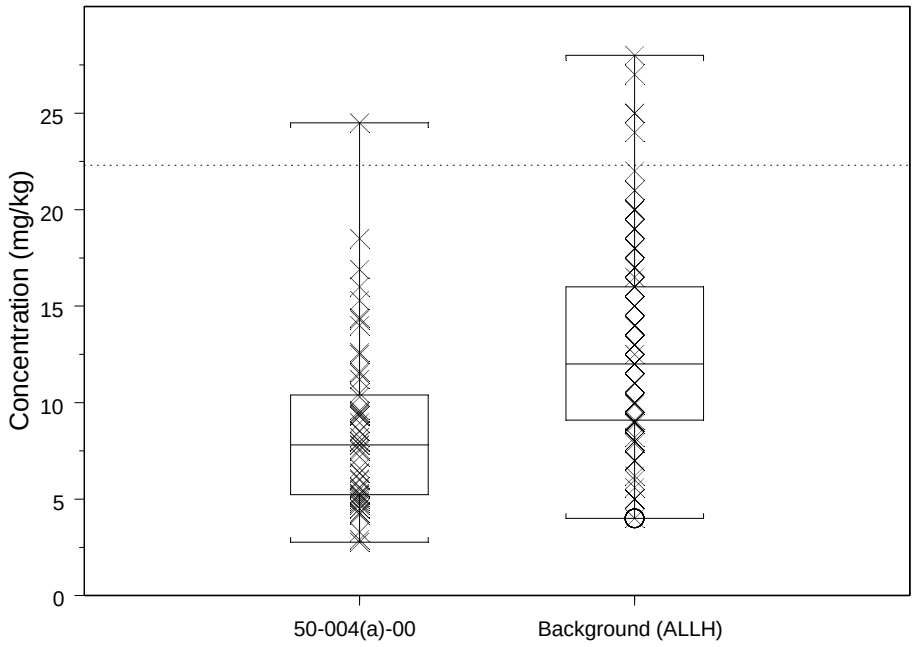


Figure I-6.7-8 Site concentrations of lead in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

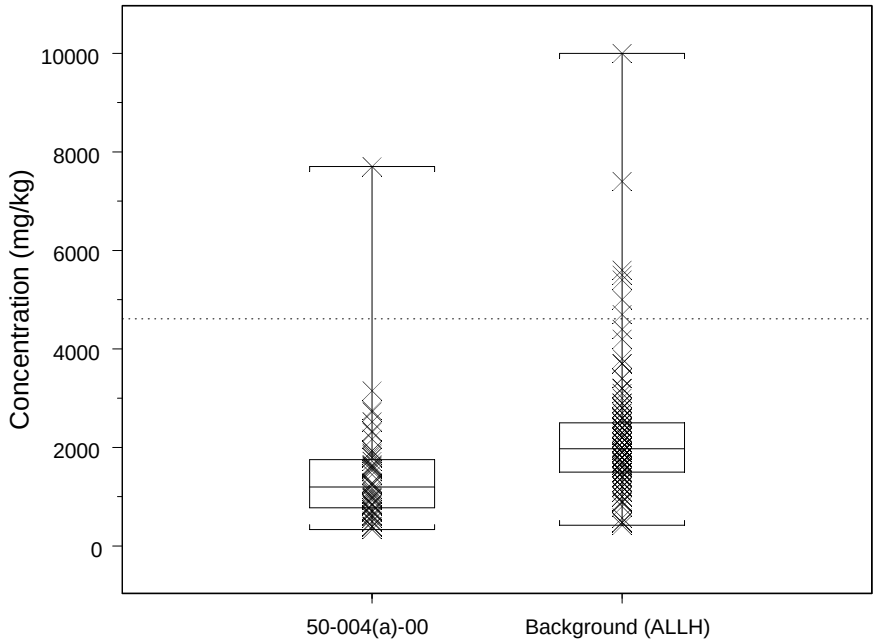


Figure I-6.7-9 Site concentrations of magnesium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

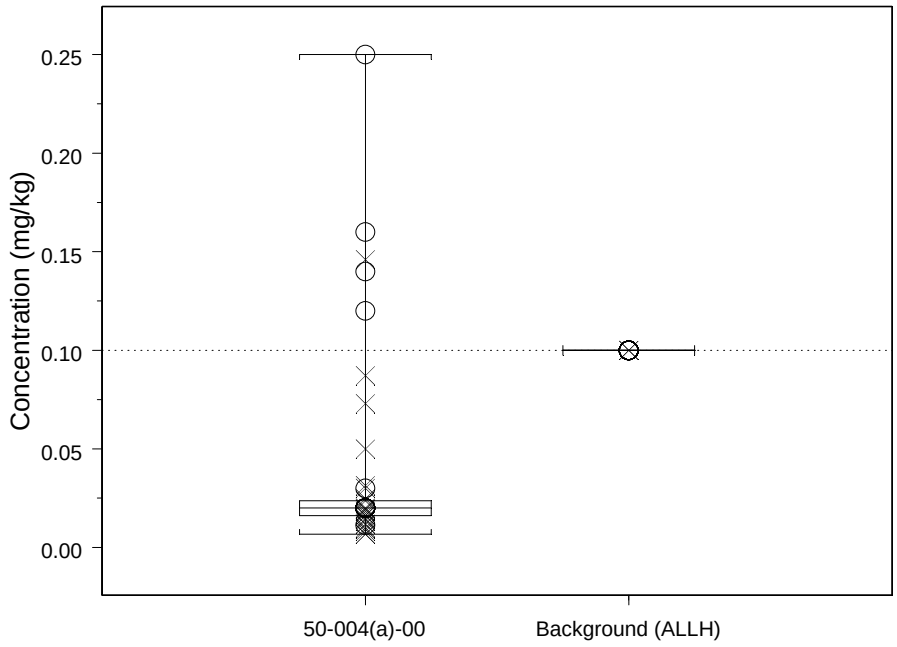


Figure I-6.7-10 Site concentrations of mercury in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

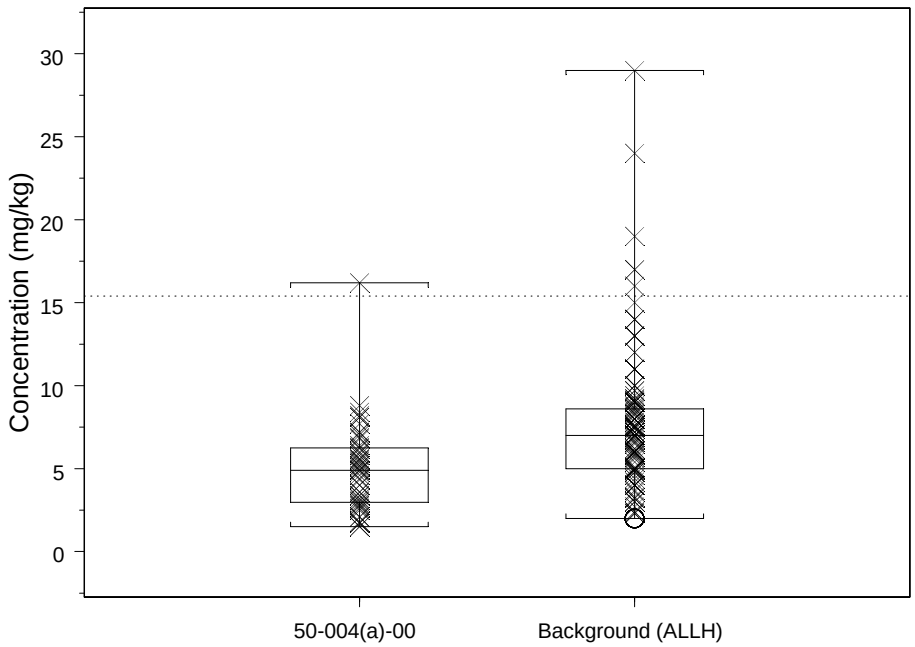


Figure I-6.7-11 Site concentrations of nickel in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

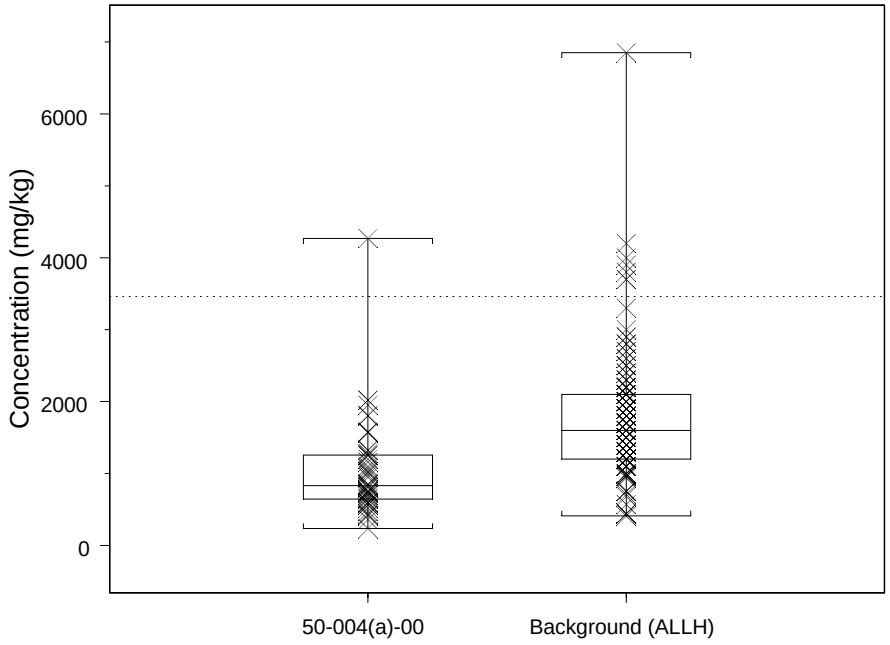


Figure I-6.7-12 Site concentrations of potassium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

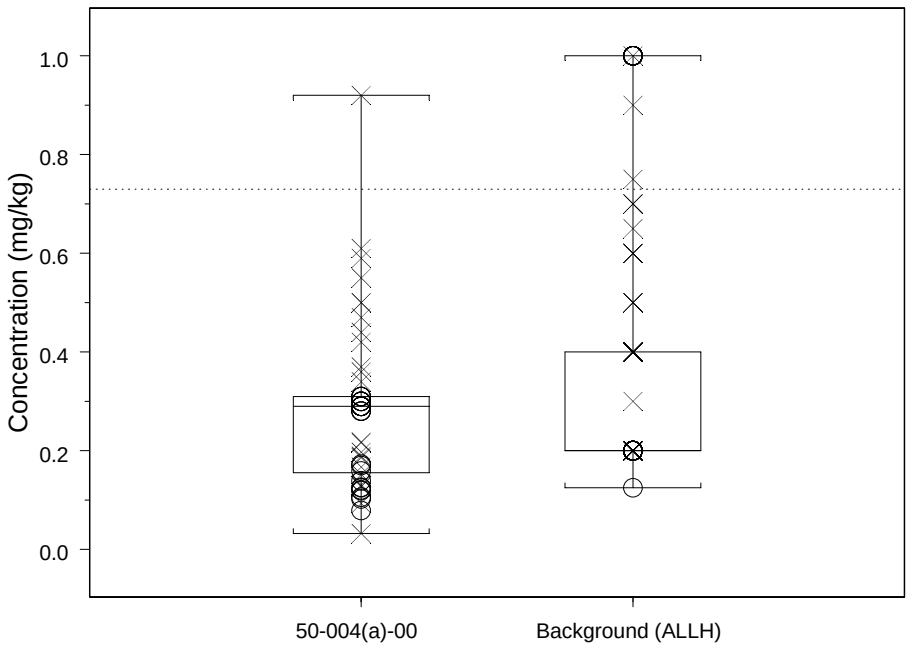


Figure I-6.7-13 Site concentrations of thallium in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

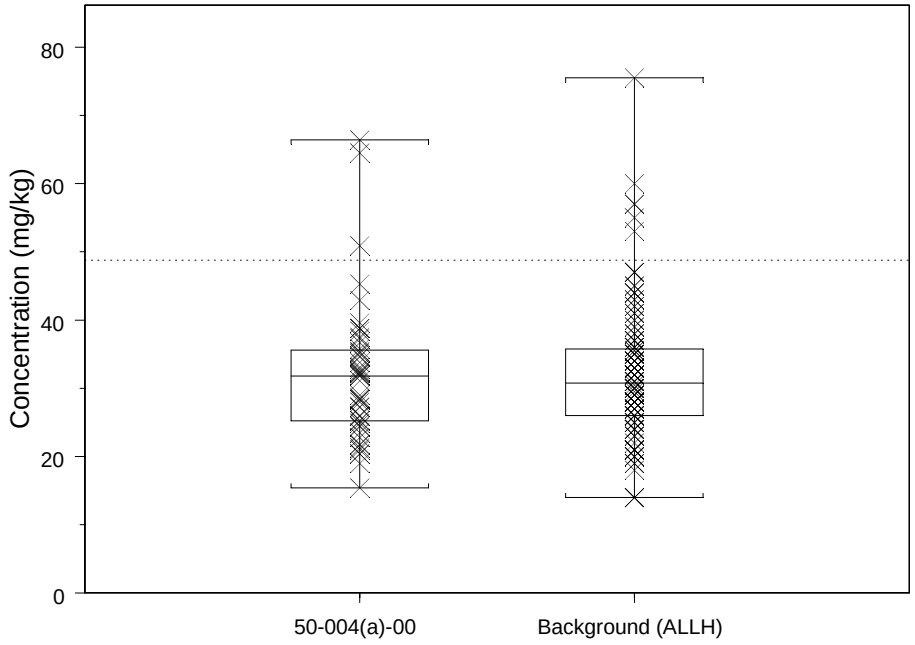


Figure I-6.7-14 Site concentrations of zinc in soil at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

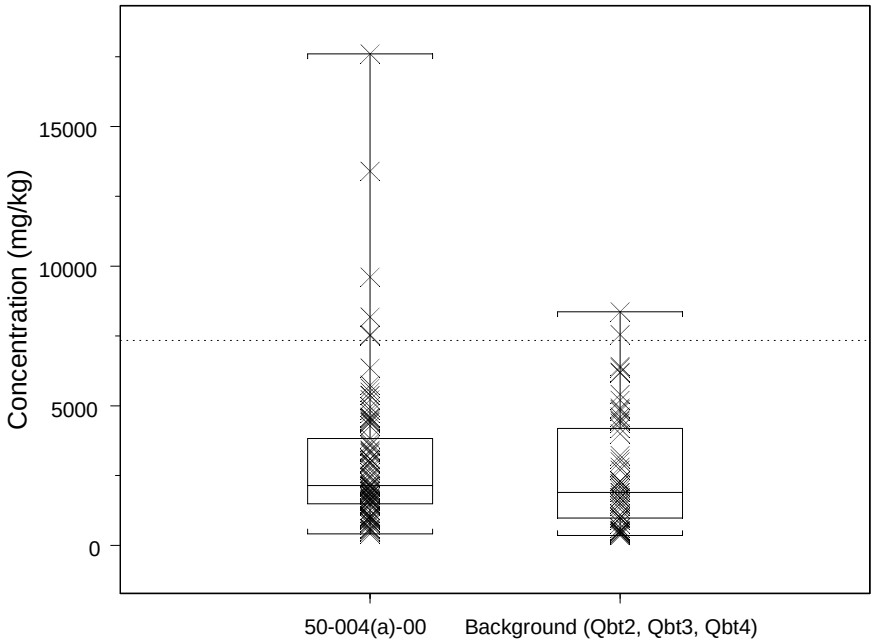


Figure I-6.7-15 Site concentrations of aluminum in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

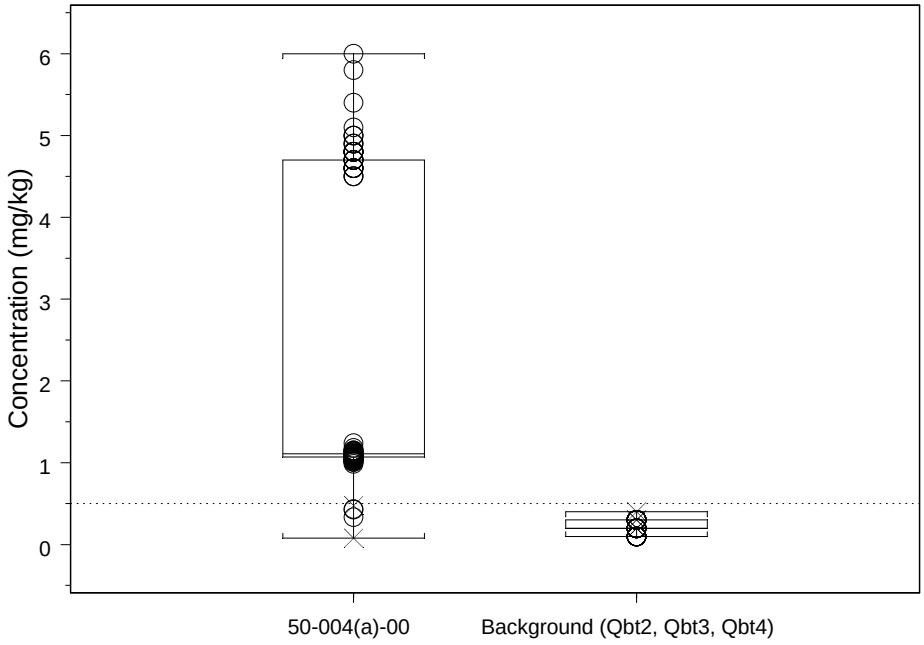


Figure I-6.7-16 Site concentrations of antimony in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

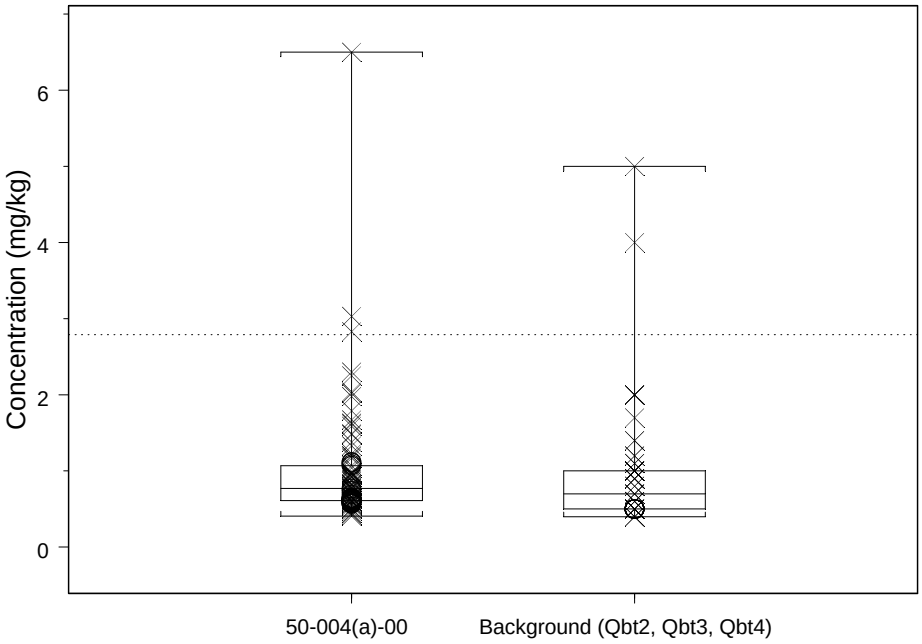


Figure I-6.7-17 Site concentrations of arsenic in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

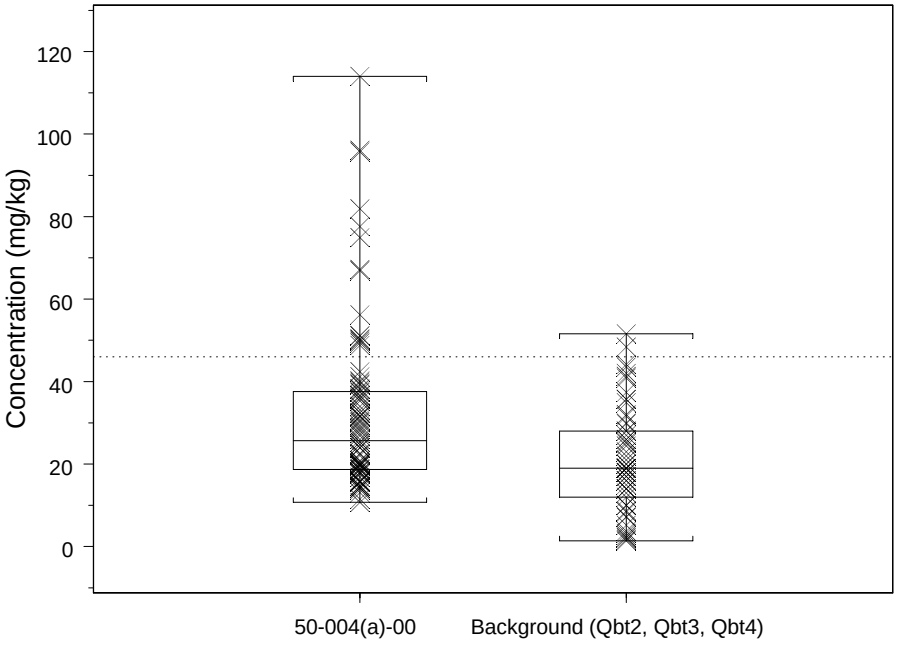


Figure I-6.7-18 Site concentrations of barium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

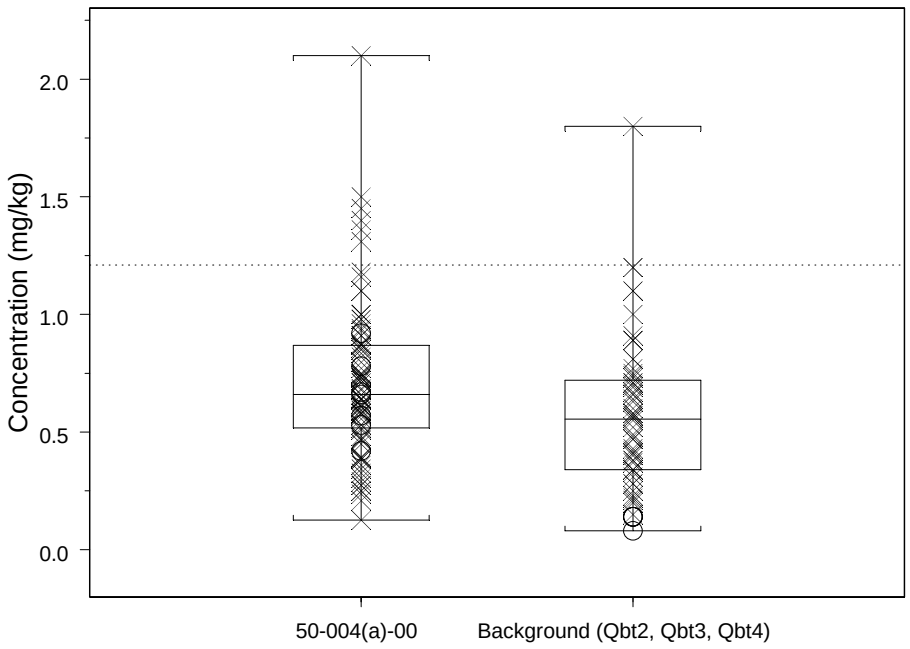


Figure I-6.7-19 Site concentrations of beryllium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

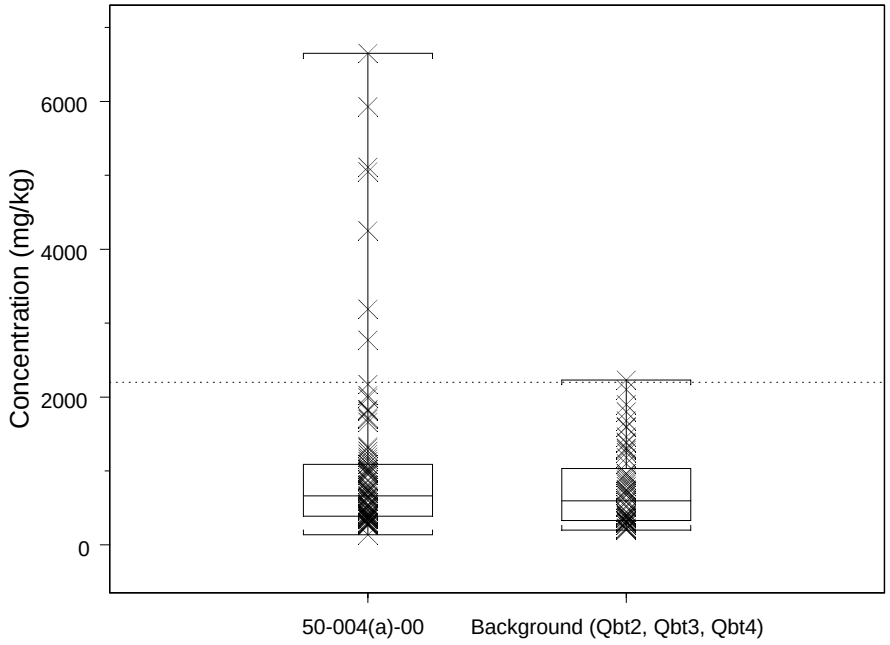


Figure I-6.7-20 Site concentrations of calcium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

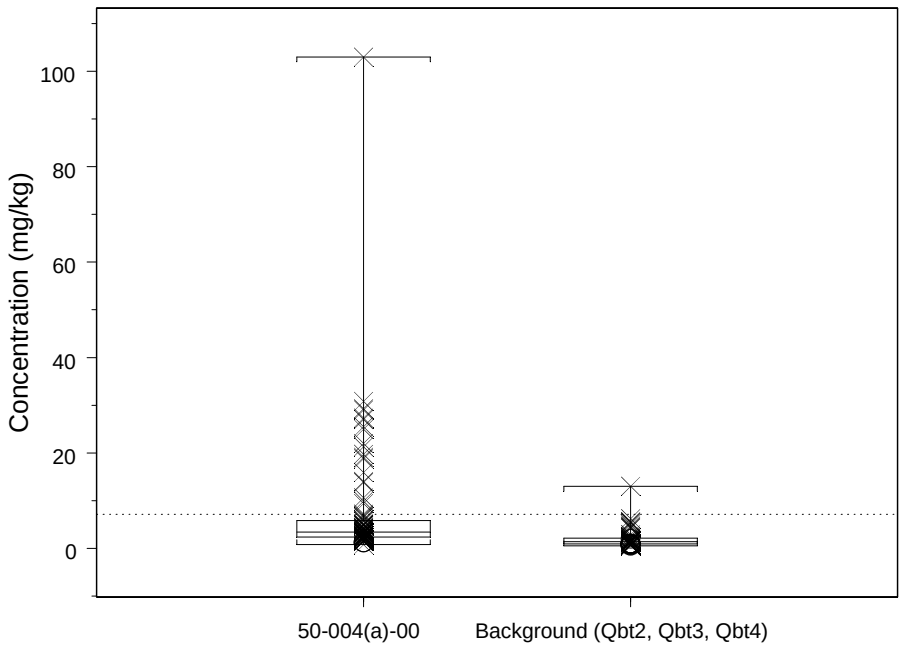


Figure I-6.7-21 Site concentrations of chromium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

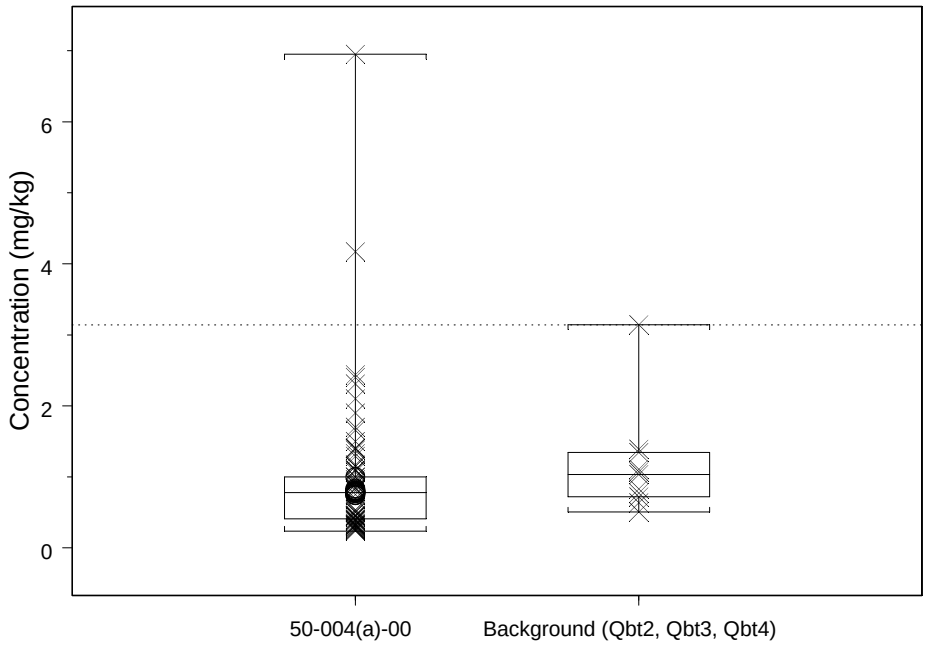


Figure I-6.7-22 Site concentrations of cobalt in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

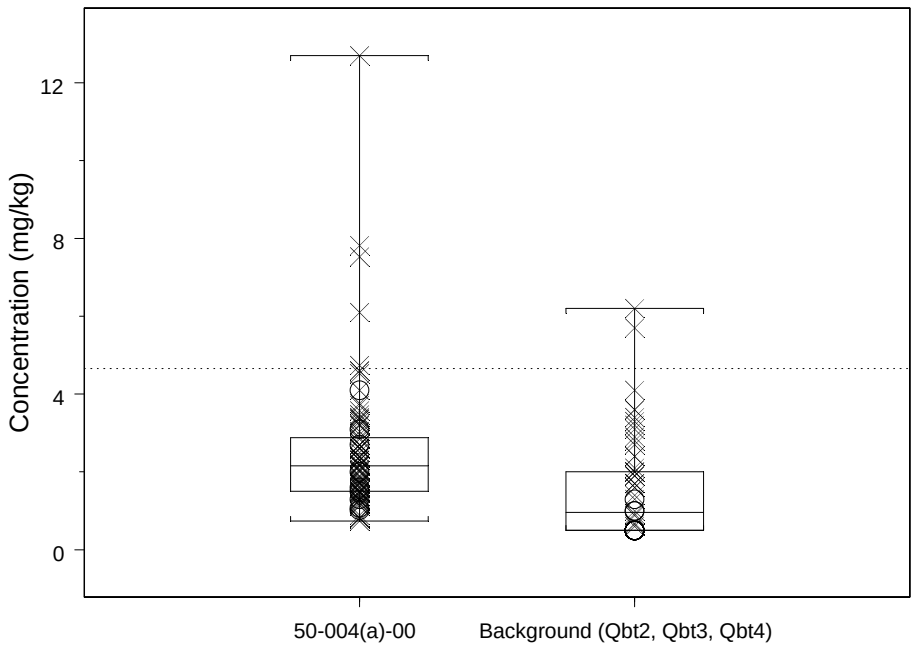


Figure I-6.7-23 Site concentrations of copper in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

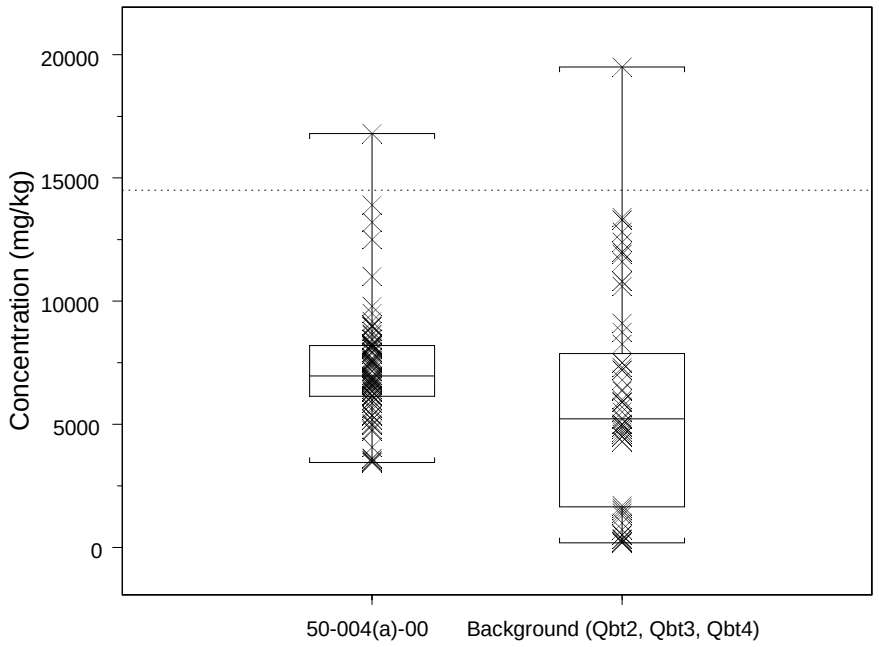


Figure I-6.7-24 Site concentrations of iron in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

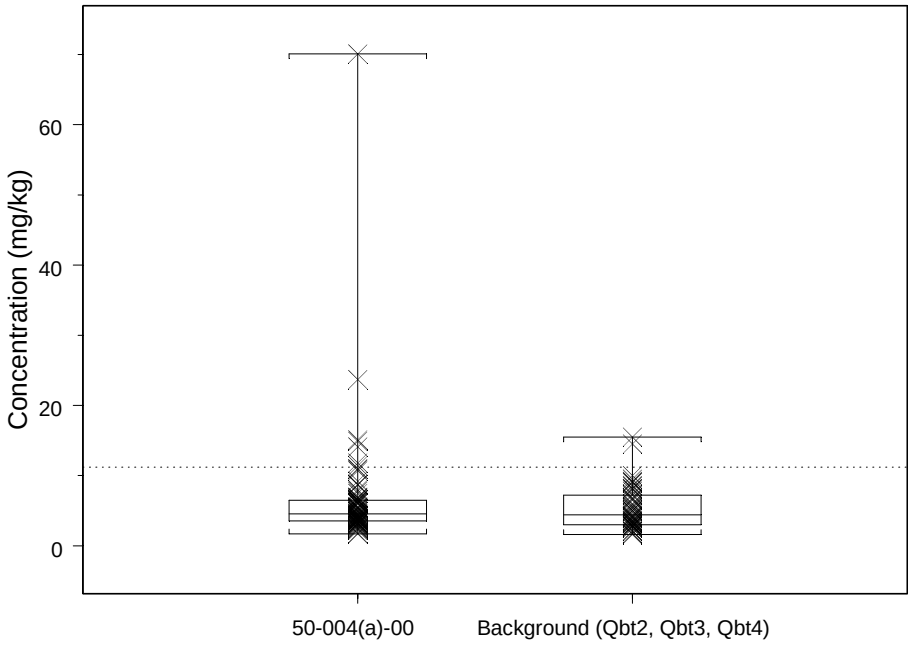


Figure I-6.7-25 Site concentrations of lead in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

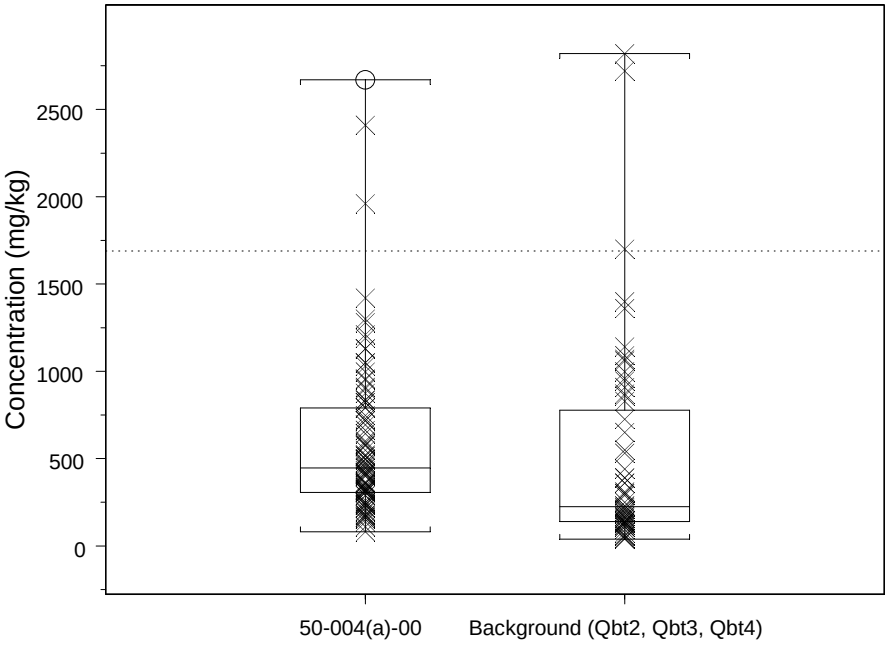


Figure I-6.7-26 Site concentrations of magnesium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

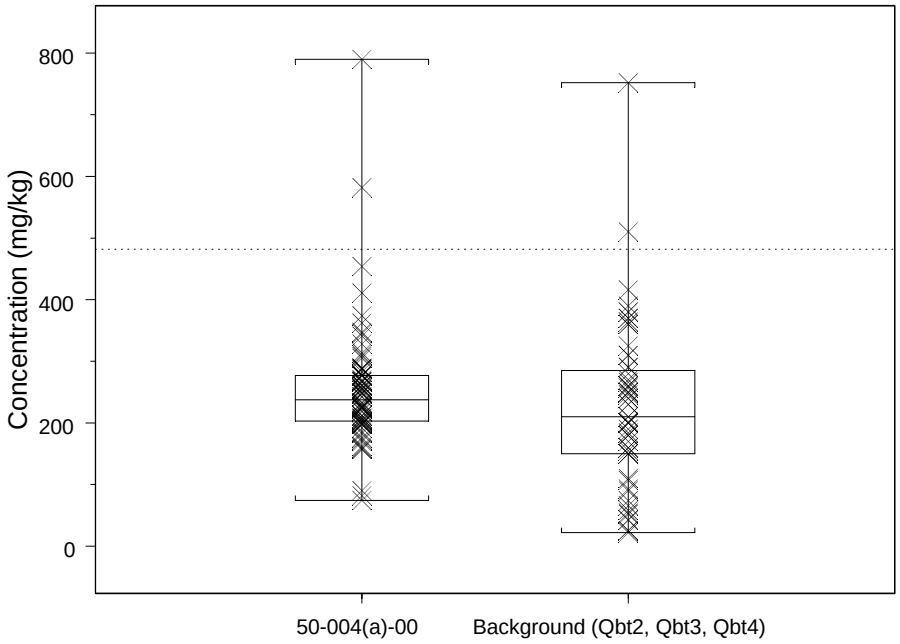


Figure I-6.7-27 Site concentrations of manganese in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

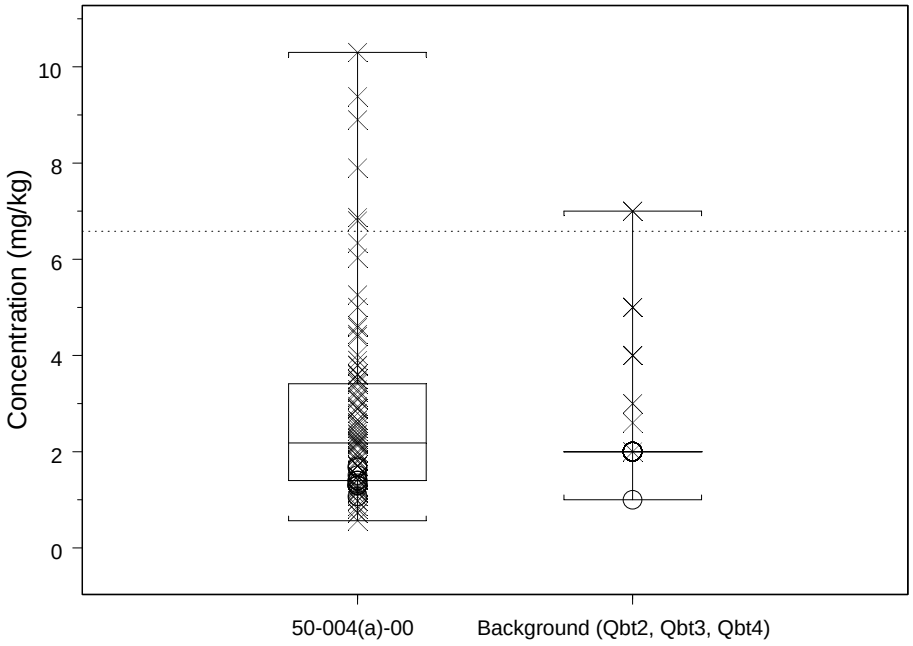


Figure I-6.7-28 Site concentrations of nickel in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

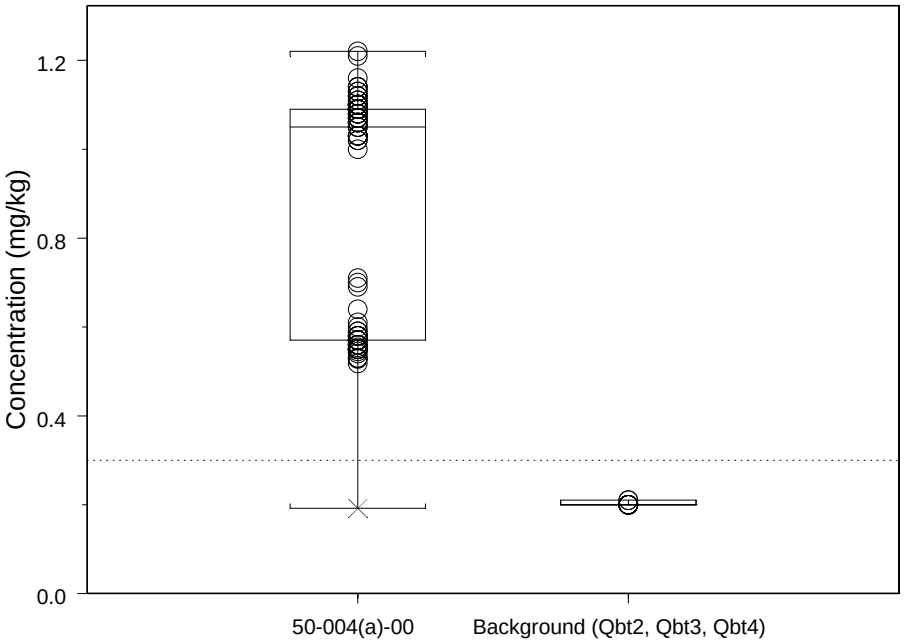


Figure I-6.7-29 Site concentrations of selenium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

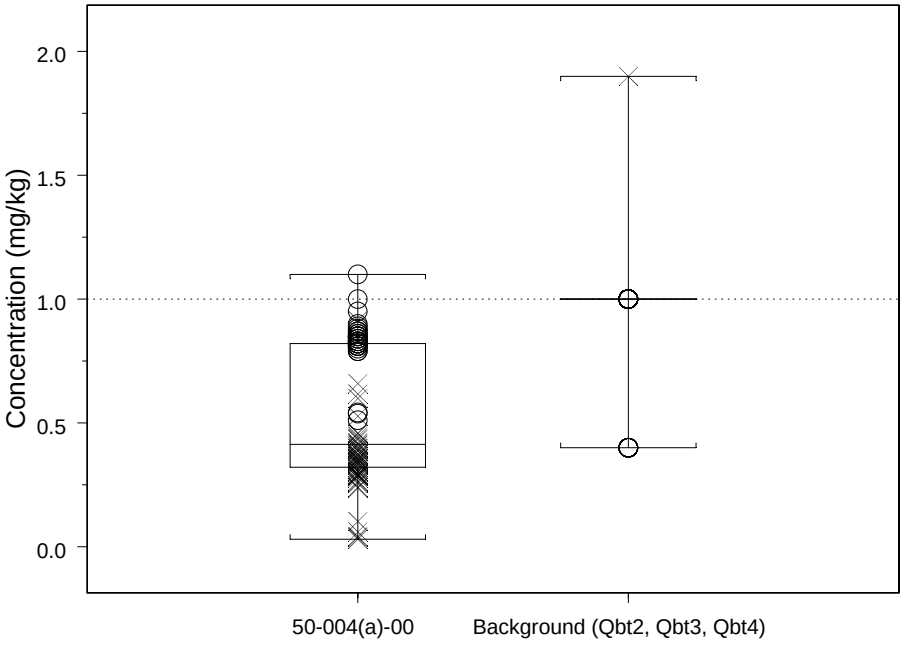


Figure I-6.7-30 Site concentrations of silver in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

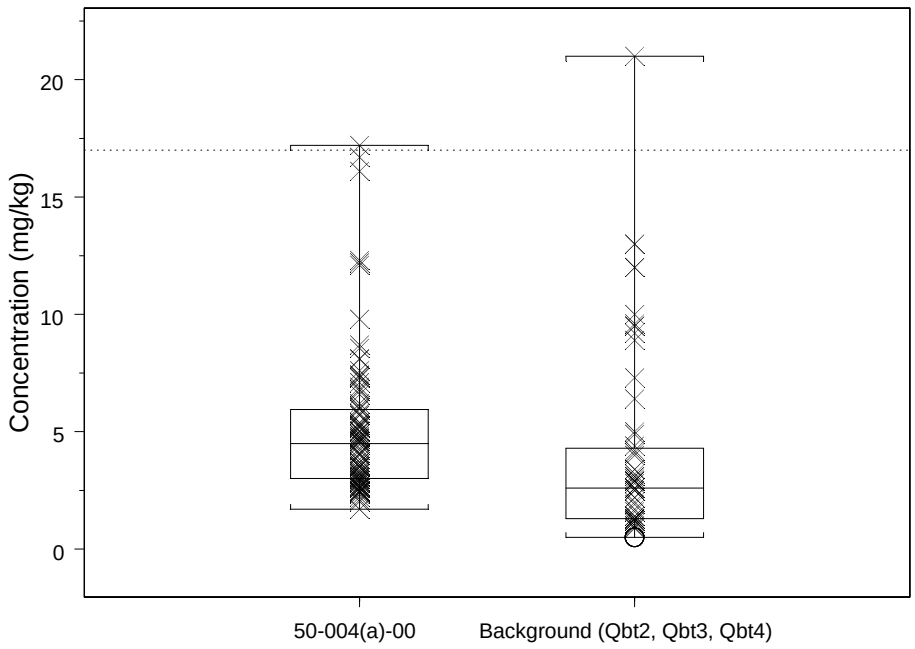


Figure I-6.7-31 Site concentrations of vanadium in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

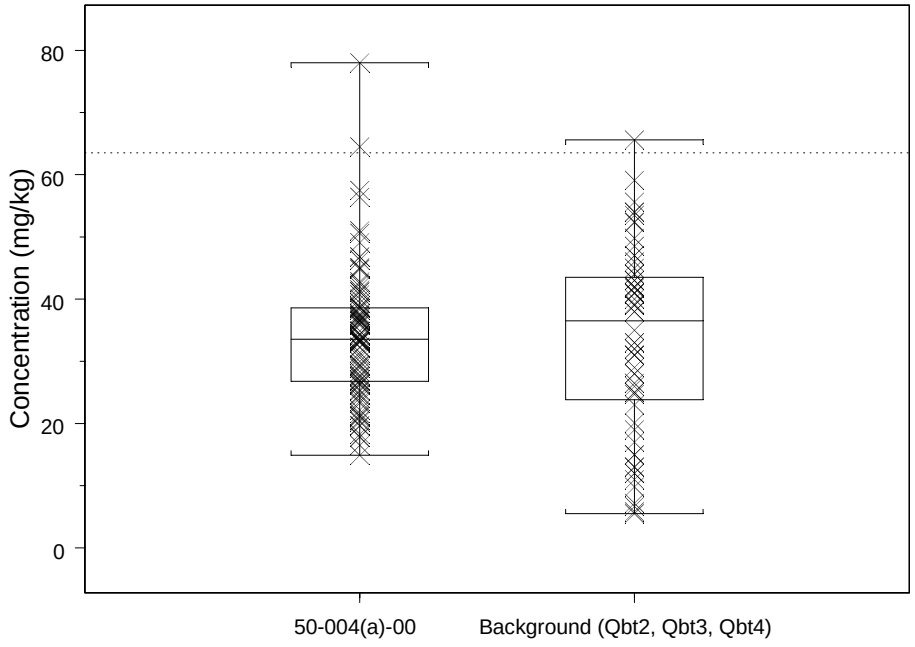


Figure I-6.7-32 Site concentrations of zinc in tuff at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

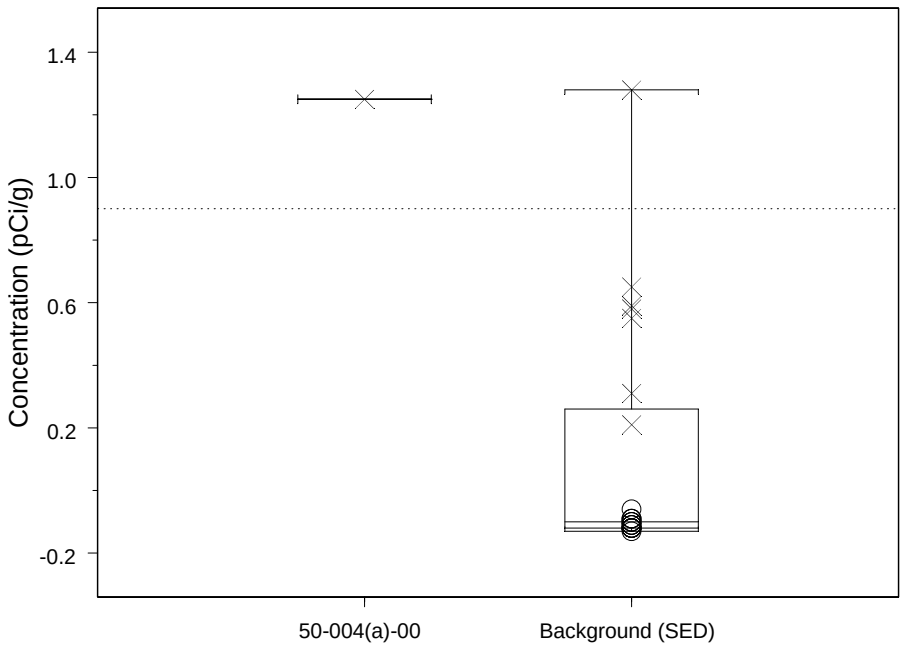


Figure I-6.7-33 Site concentrations of cesium-137 in sediment at Consolidated Unit 50-004(a)-00 compared to background
(× = detect, ○ = nondetect)

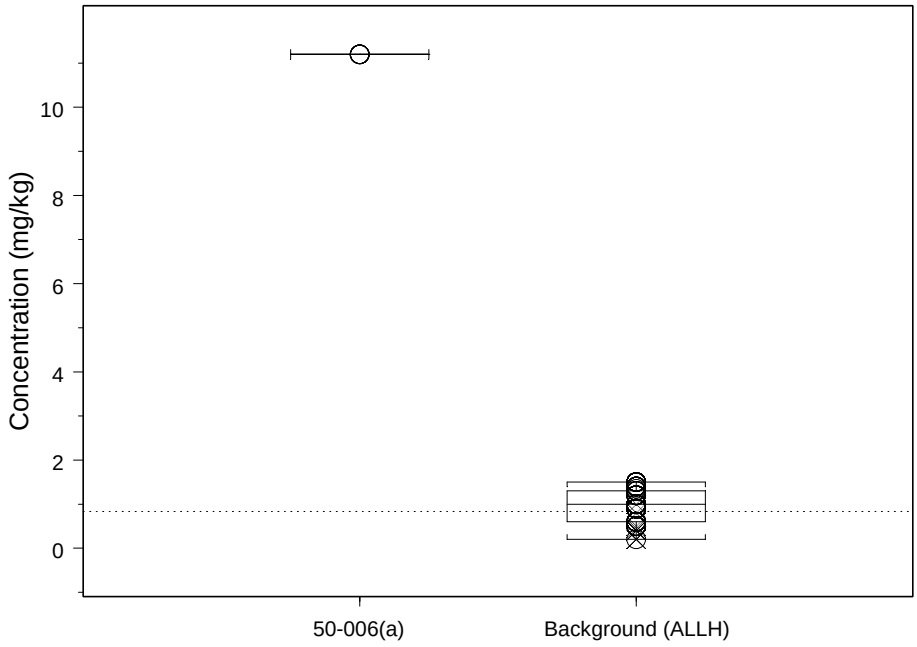


Figure I-6.8-1 Site concentrations of antimony in soil at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

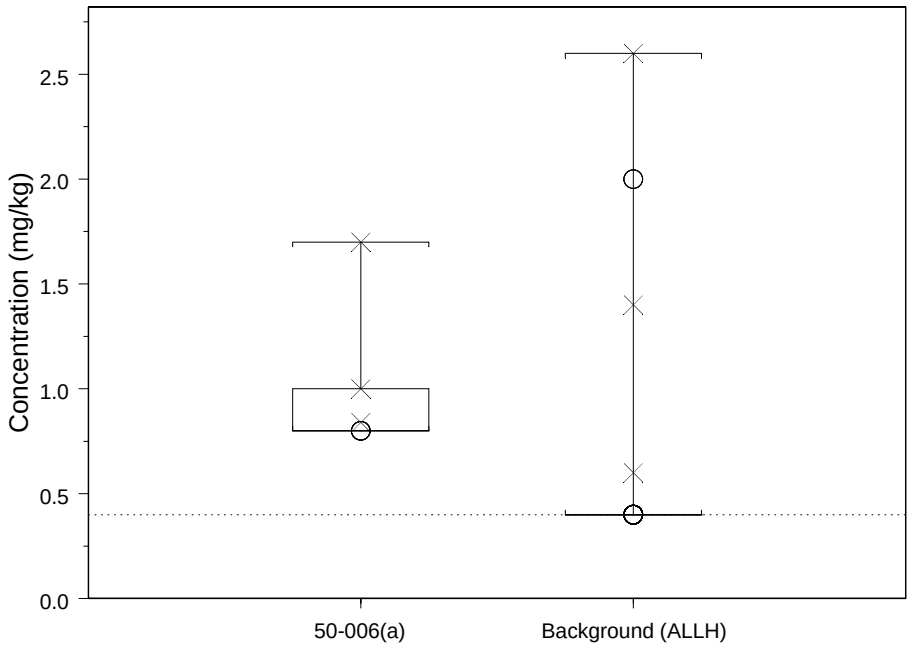


Figure I-6.8-2 Site concentrations of cadmium in soil at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

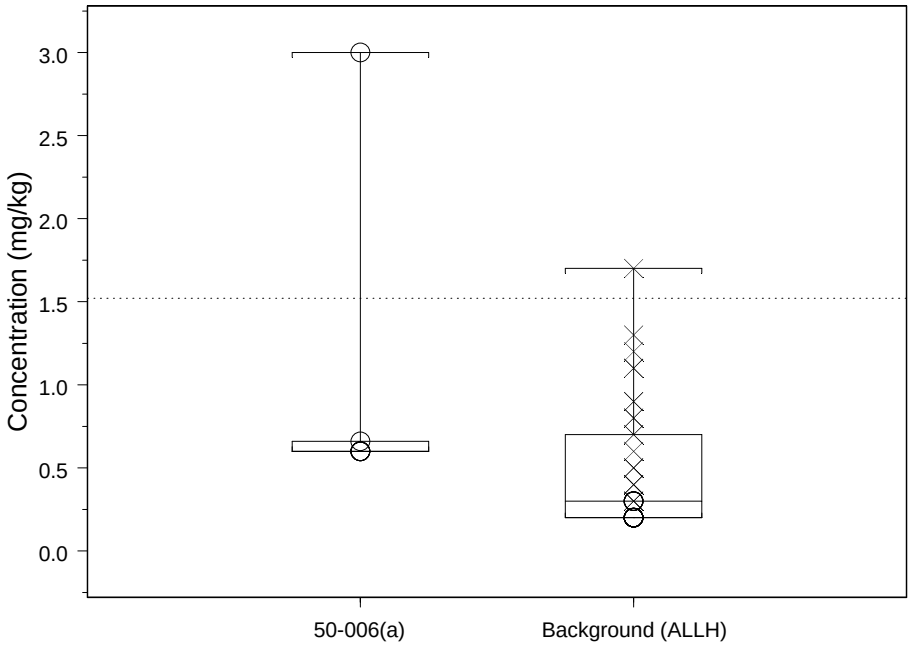


Figure I-6.8-3 Site concentrations of selenium in soil at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

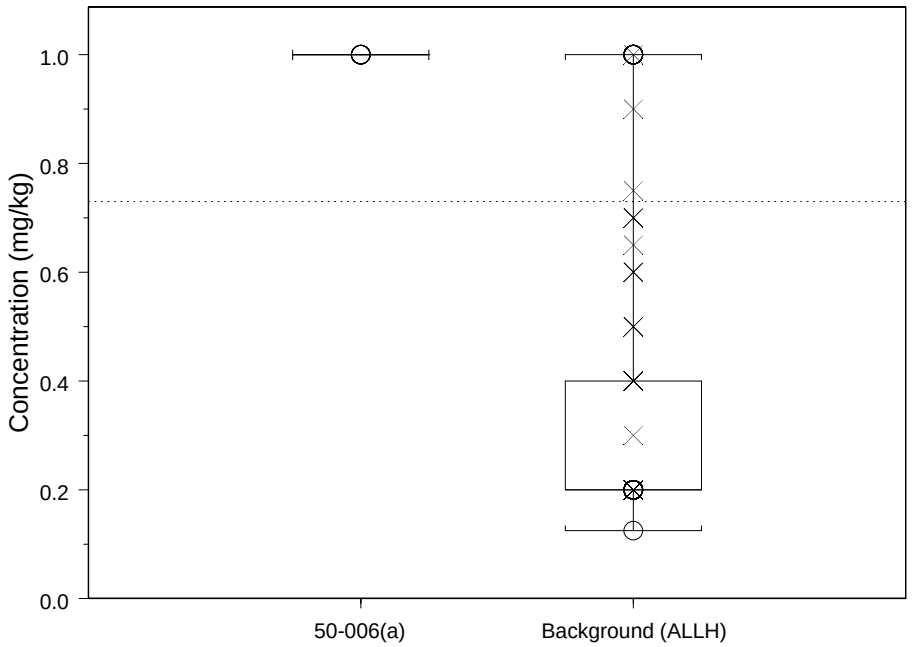


Figure I-6.8-4 Site concentrations of thallium in soil at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

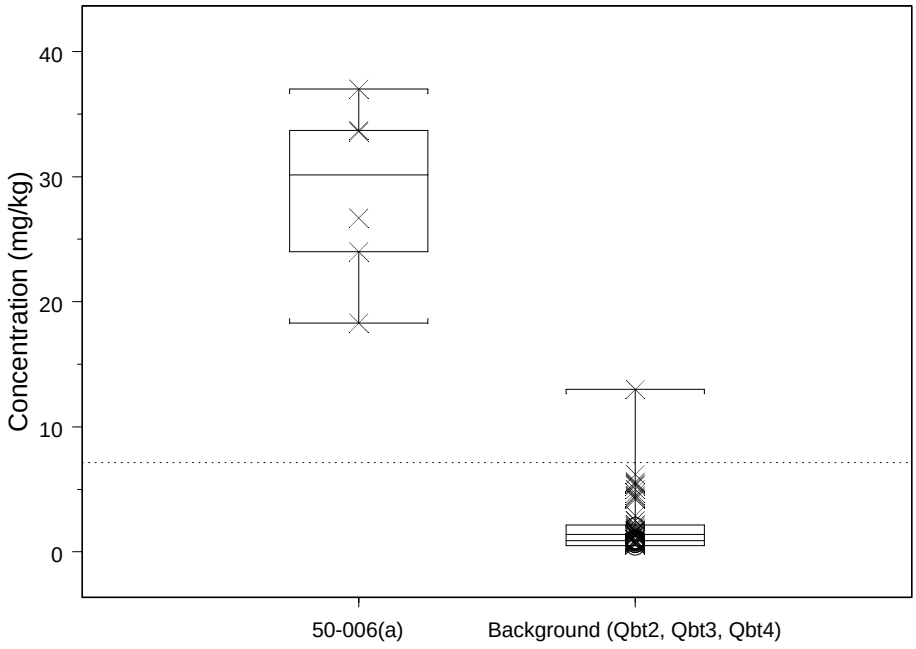


Figure I-6.8-5 Site concentrations of chromium in tuff at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

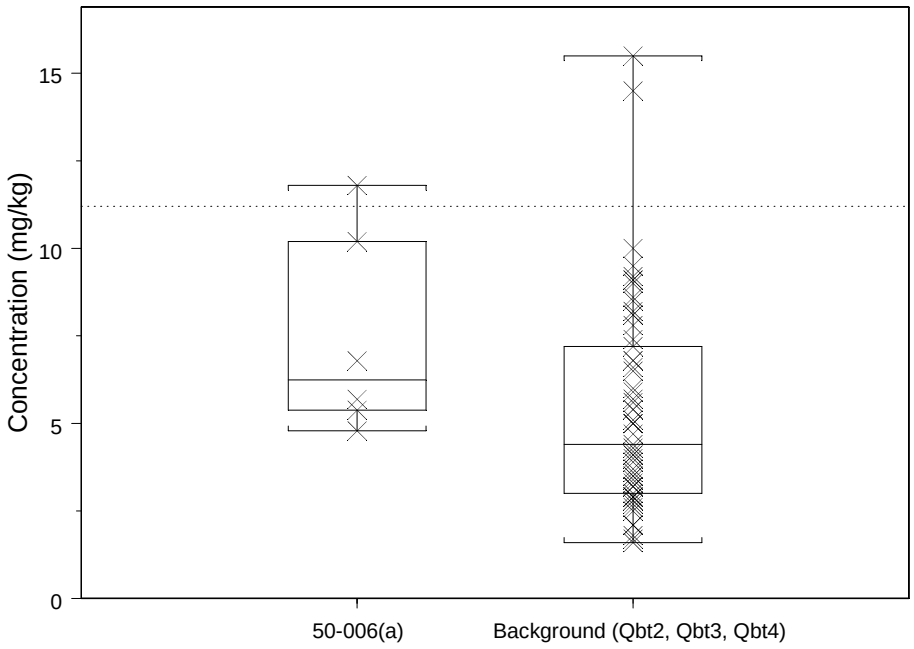


Figure I-6.8-6 Site concentrations of lead in tuff at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

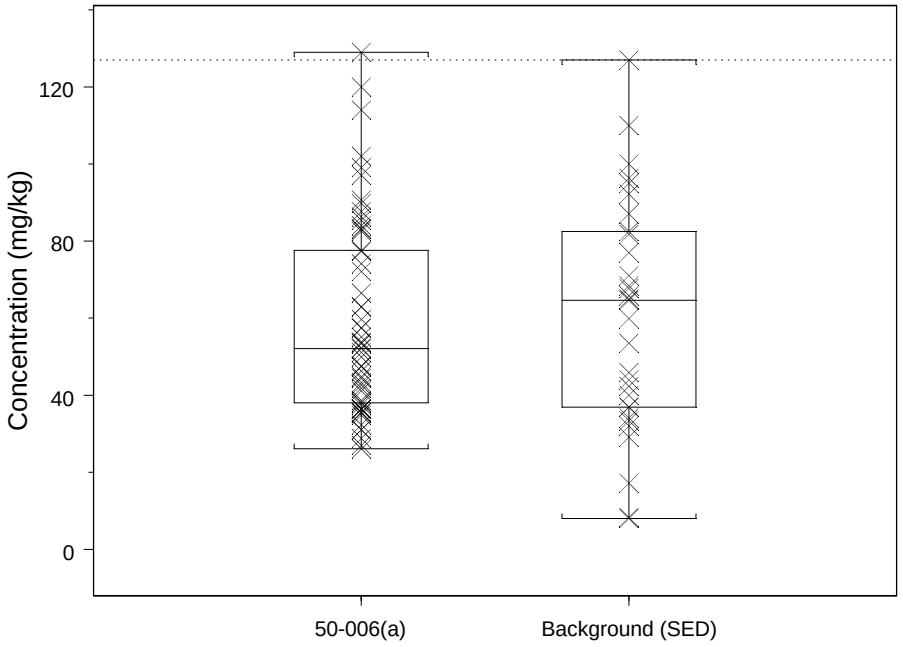


Figure I-6.8-7 Site concentrations of barium in sediment at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

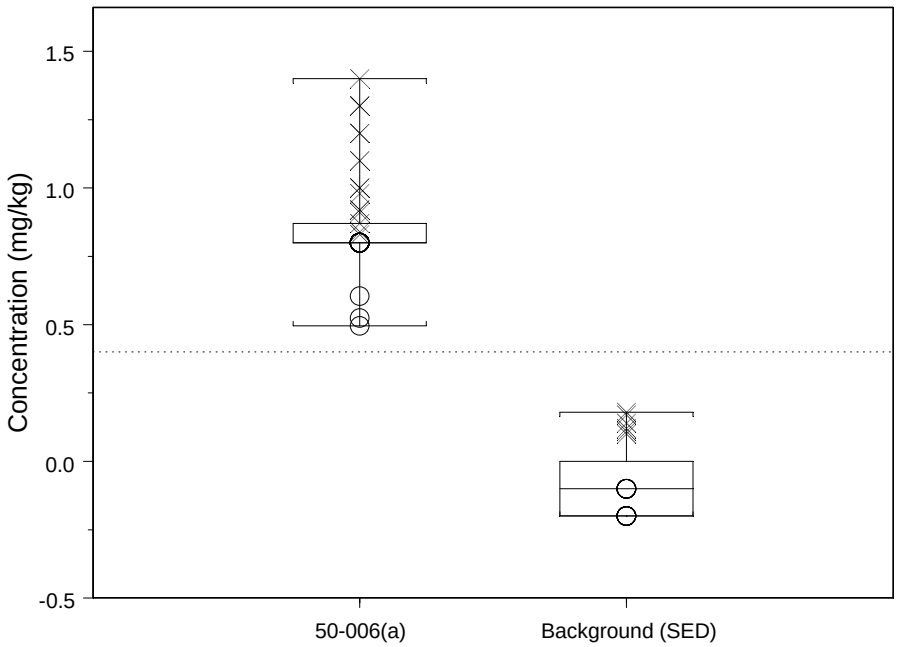


Figure I-6.8-8 Site concentrations of cadmium in sediment at SWMU 50-006(a) compared to background

(× = detect, ○ = nondetect)

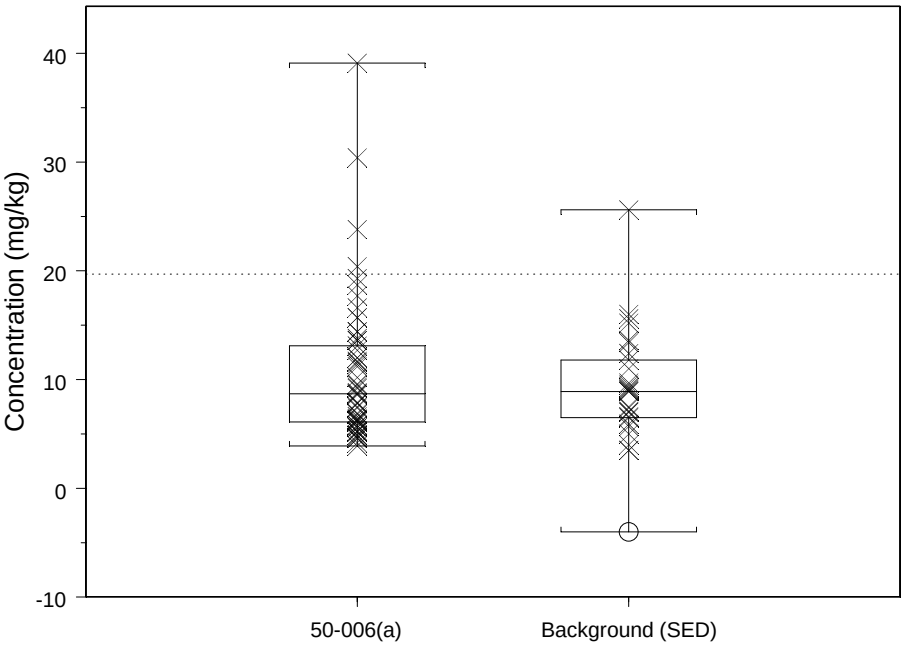


Figure I-6.8-9 Site concentrations of lead in sediment at SWMU 50-006(a) compared to background

(× = detect, ○ = nondetect)

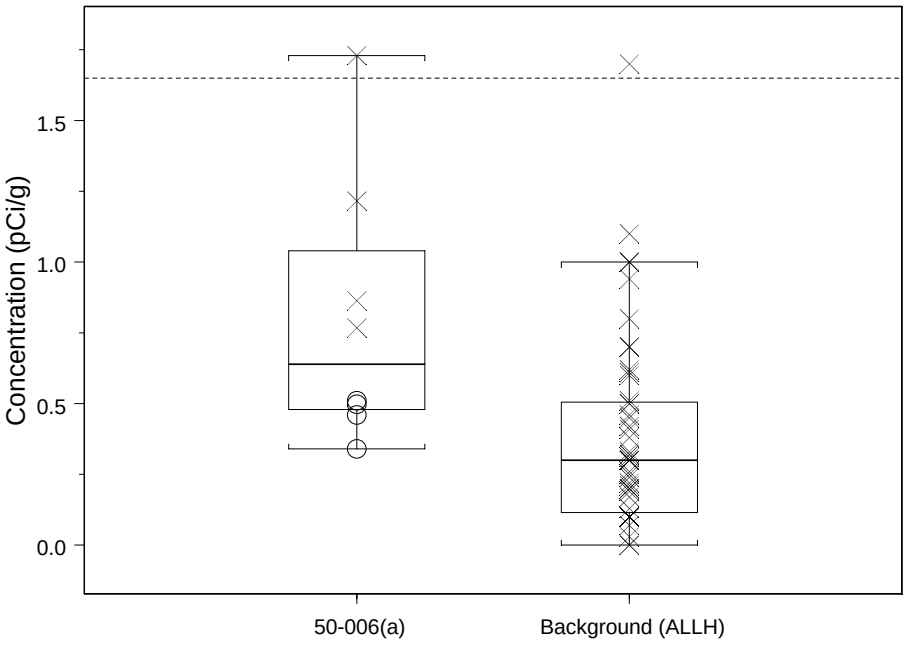


Figure I-6.8-10 Site concentrations of cesium-137 in soil at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

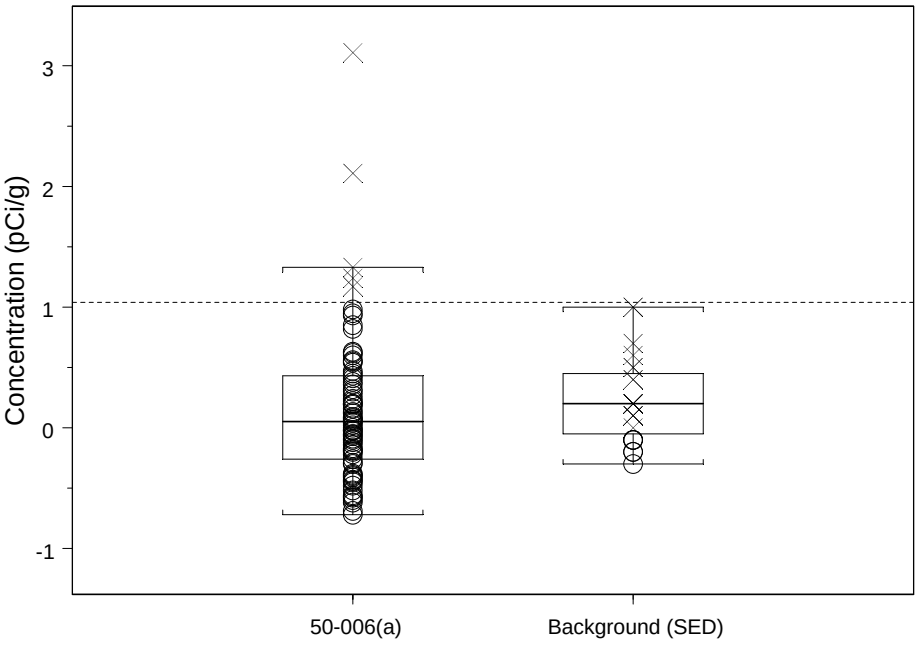


Figure I-6.8-11 Site concentrations of strontium-90 in sediment at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

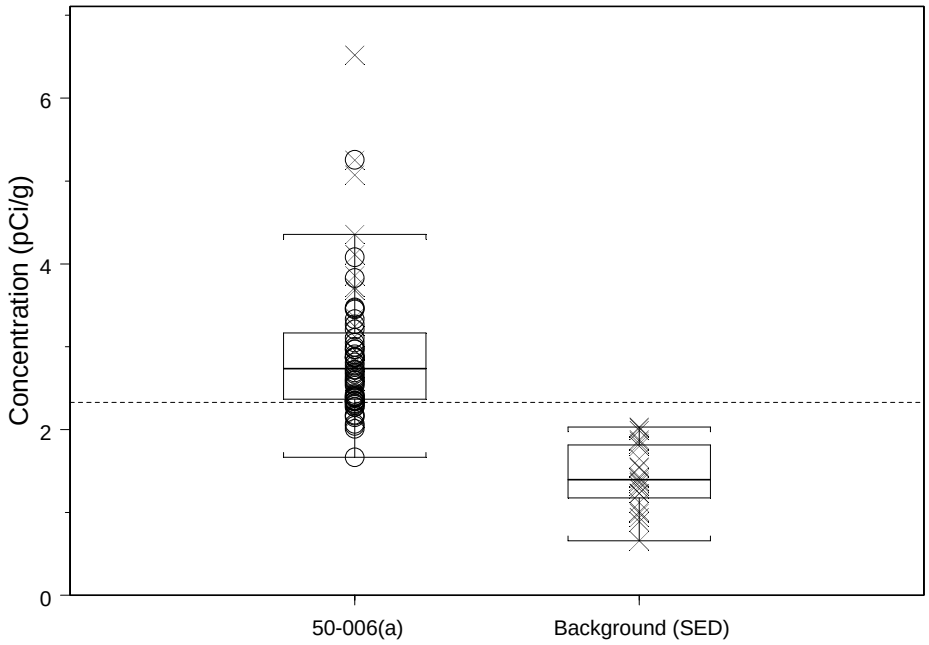


Figure I-6.8-12 Site concentrations of thorium-232 in sediment at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

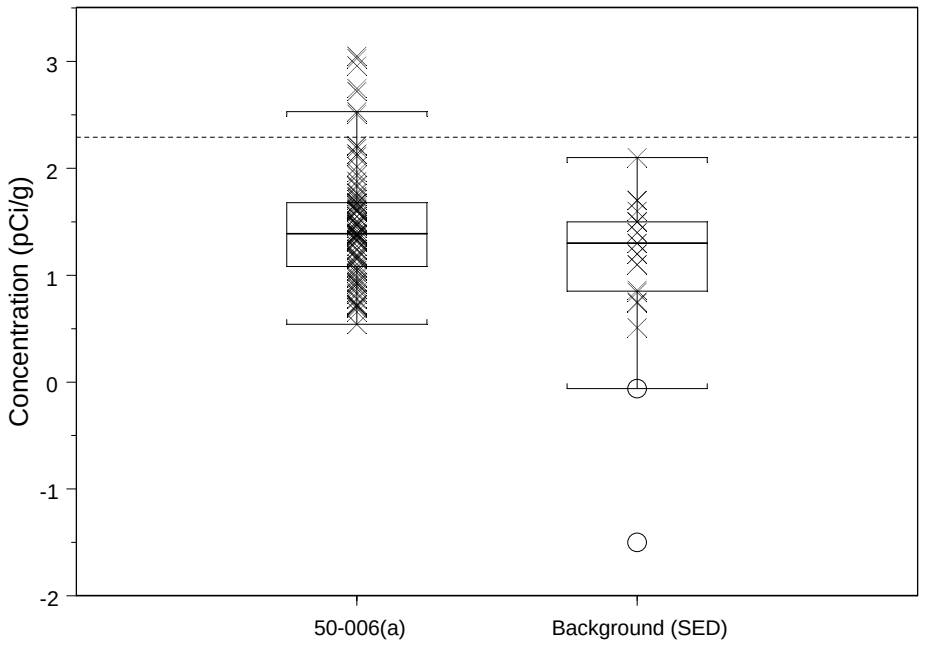


Figure I-6.8-13 Site concentrations of uranium-238 in sediment at SWMU 50-006(a) compared to background
(× = detect, ○ = nondetect)

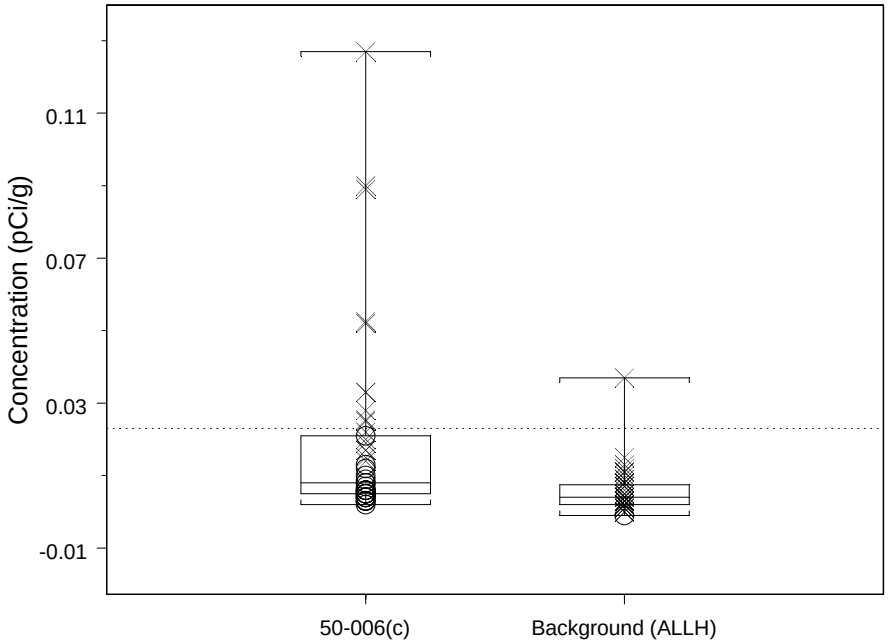


Figure I-6.9-1 Site concentrations of plutonium-238 in soil at SWMU 50-006(c) compared to background
(× = detect, ○ = nondetect)

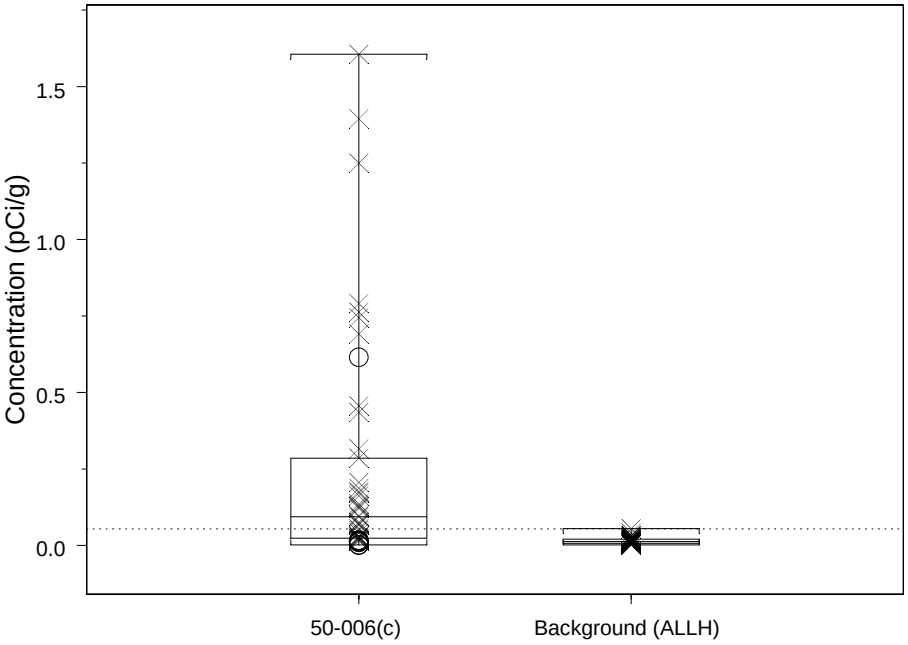


Figure I-6.9-2 Site concentrations of plutonium-239/240 in soil at SWMU 50-006(c) compared to background
(× = detect, ○ = nondetect)

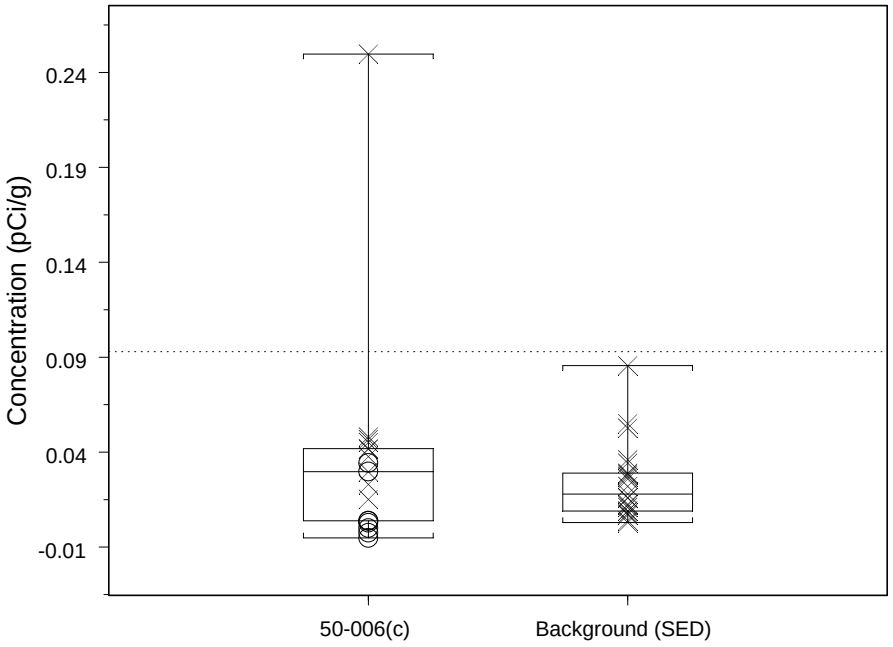


Figure I-6.9-3 Site concentrations of tritium in sediment at SWMU 50-006(c) compared to background
(× = detect, ○ = nondetect)

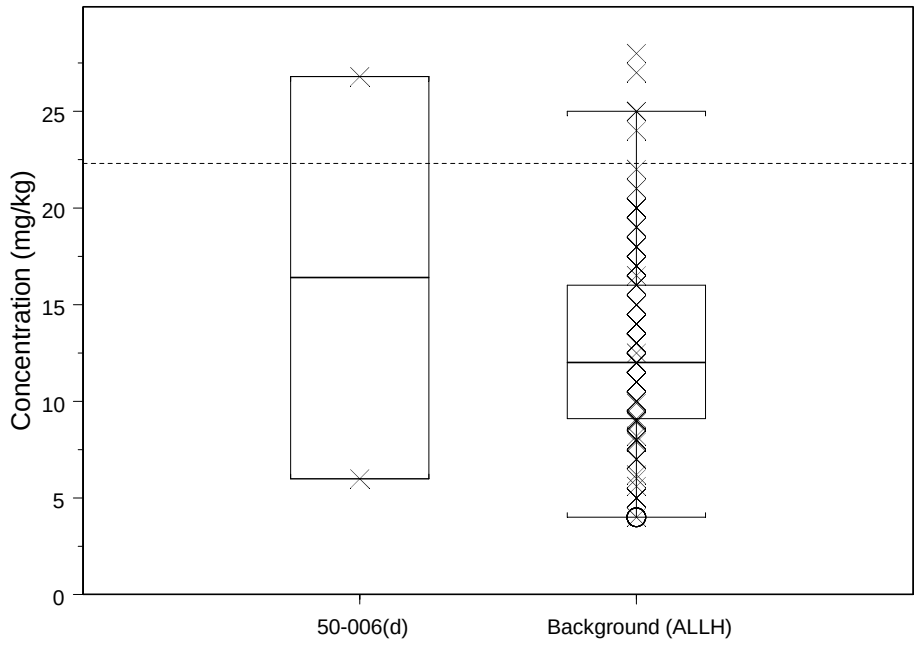


Figure I-6.10-1 Site concentrations of lead in soil at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

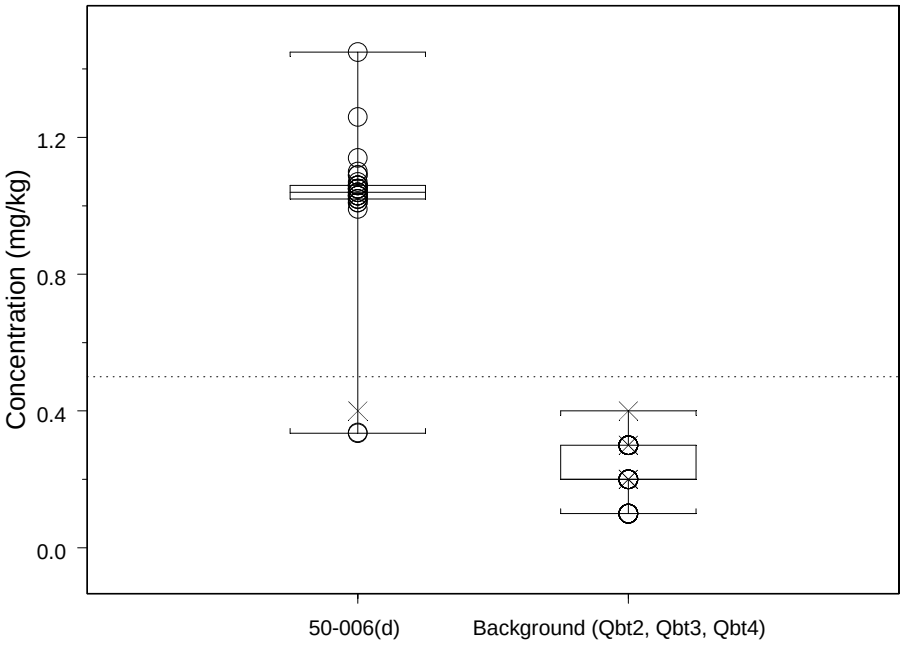


Figure I-6.10-2 Site concentrations of antimony in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

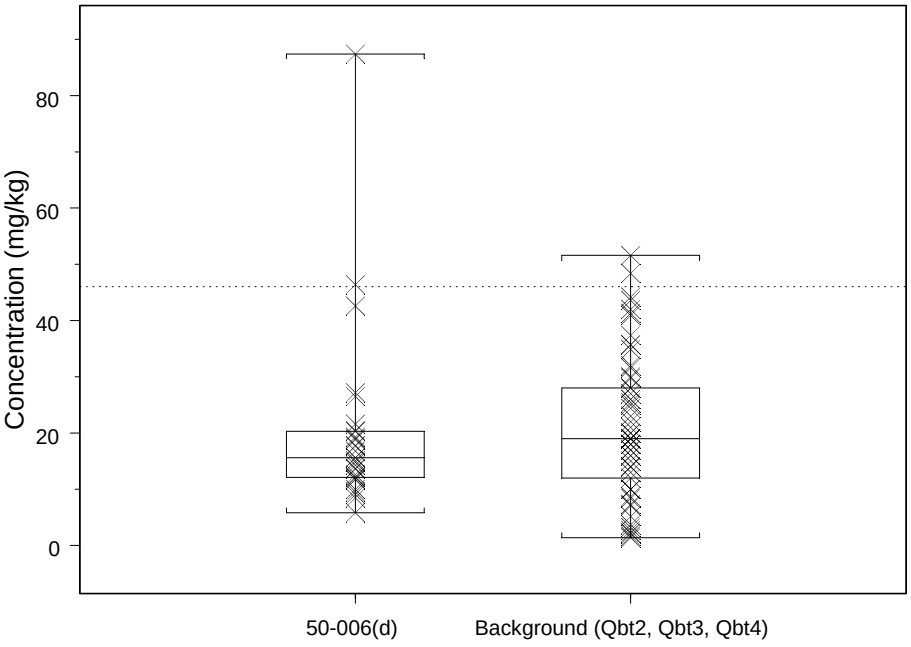


Figure I-6.10-3 Site concentrations of barium in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

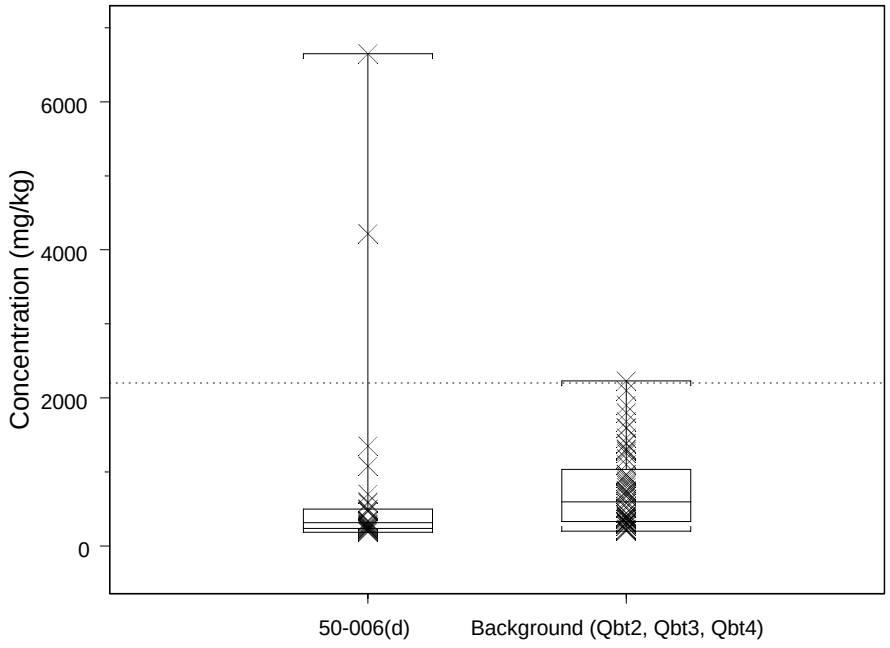


Figure I-6.10-4 Site concentrations of calcium in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

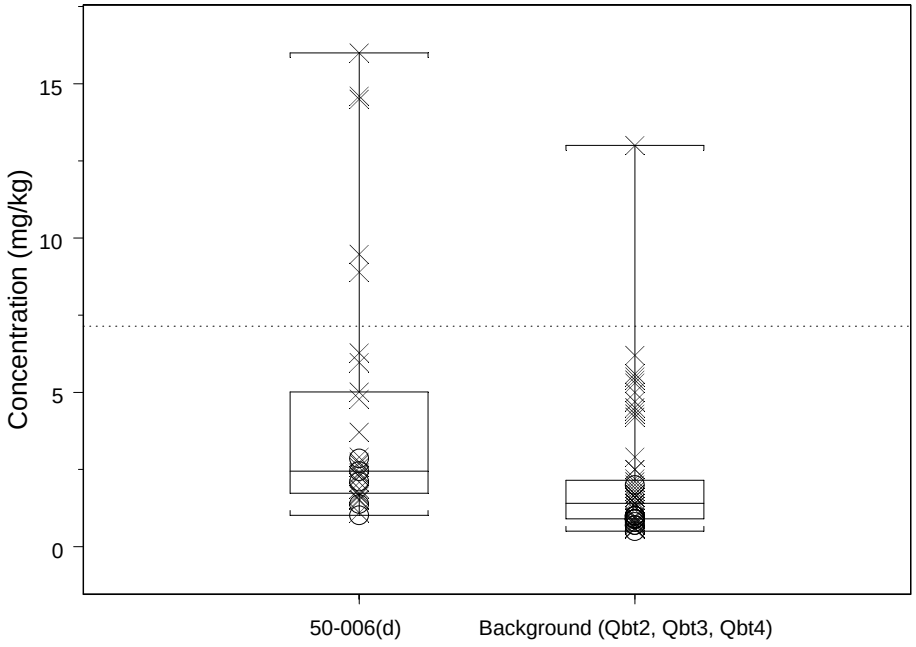


Figure I-6.10-5 Site concentrations of chromium in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

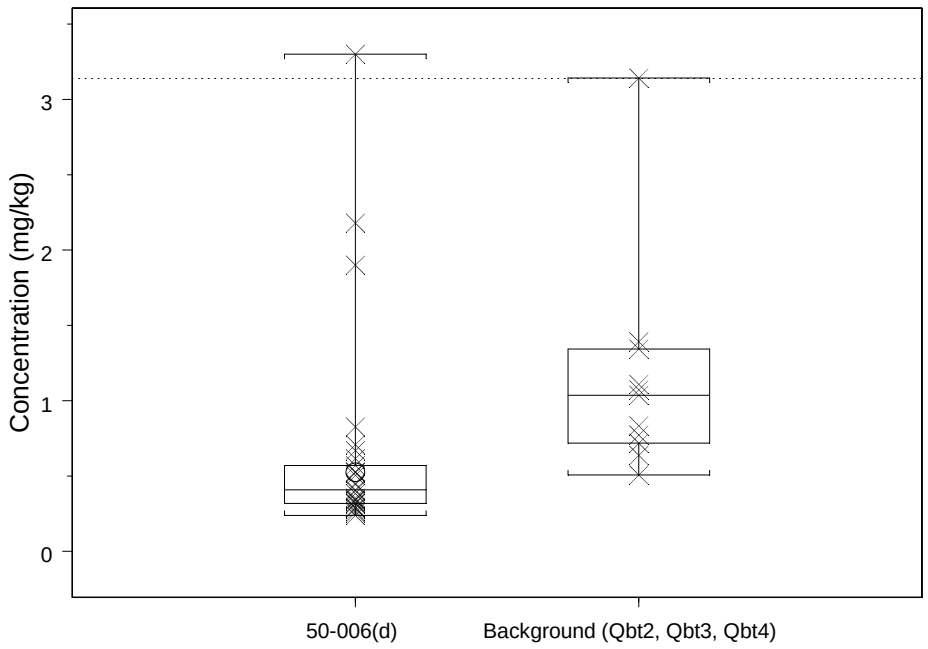


Figure I-6.10-6 Site concentrations of cobalt in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

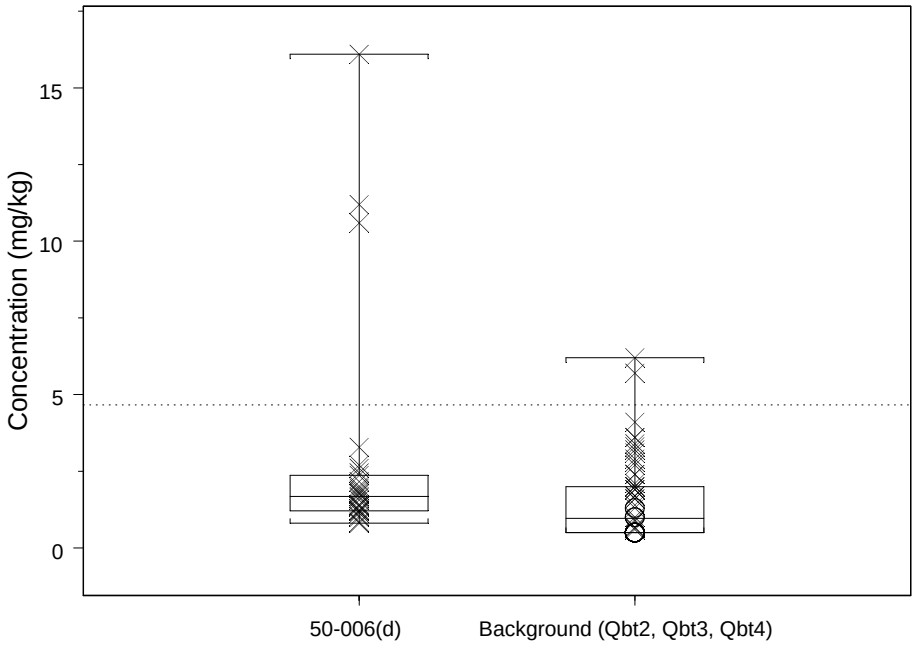


Figure I-6.10-7 Site concentrations of copper in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

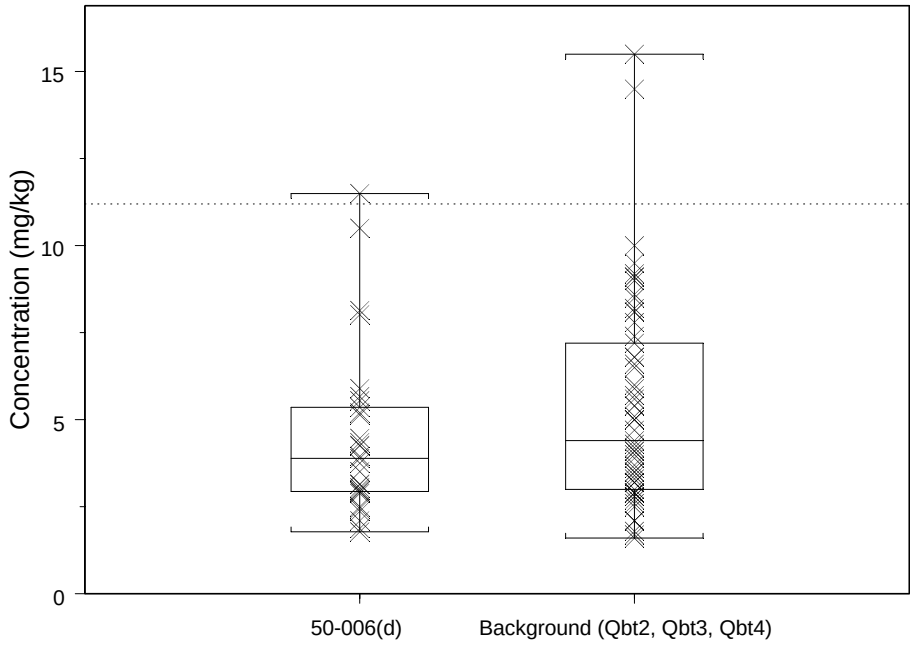


Figure I-6.10-8 Site concentrations of lead in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

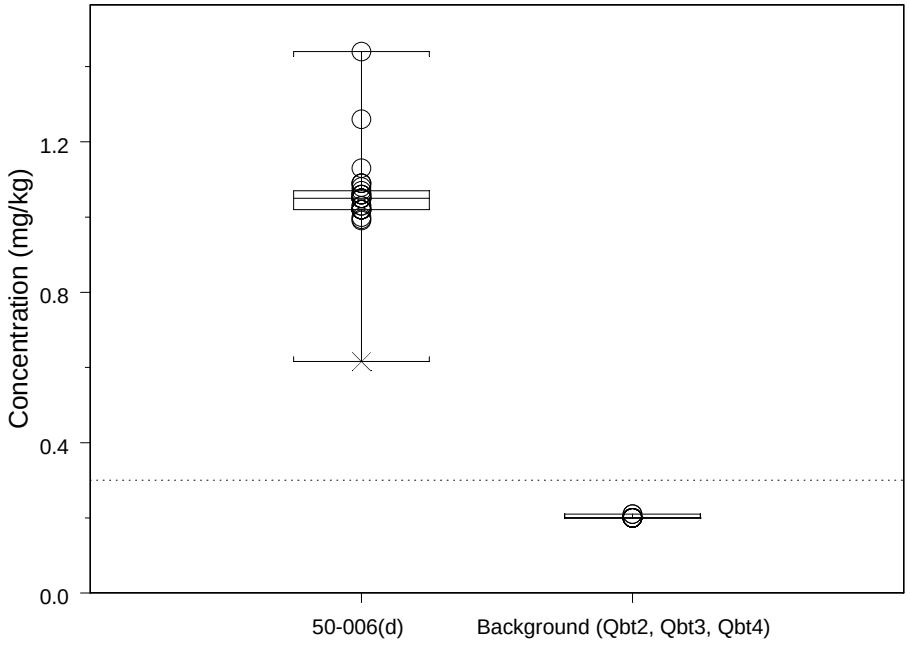


Figure I-6.10-9 Site concentrations of selenium in tuff at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

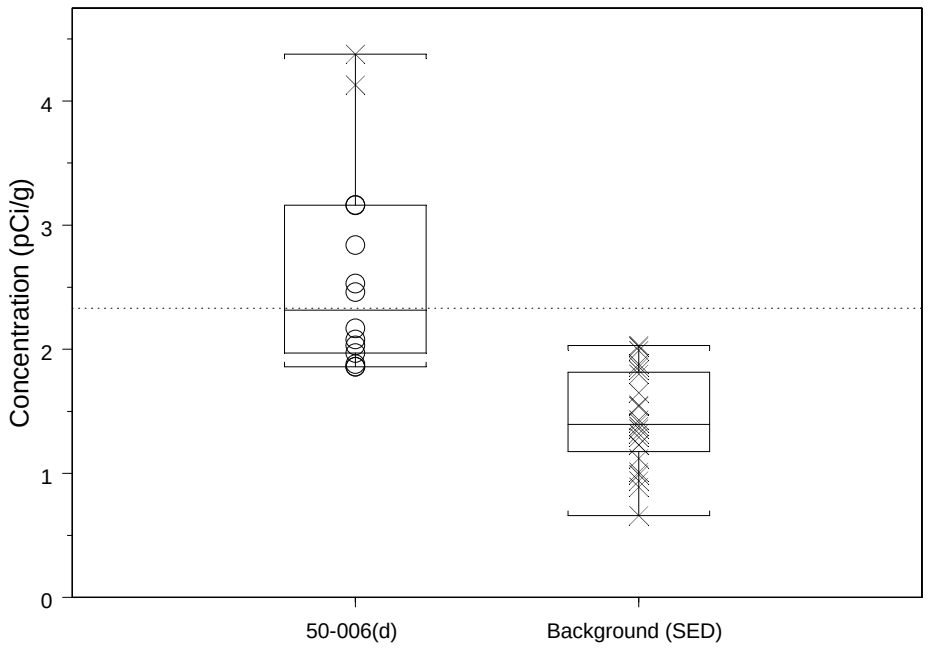


Figure I-6.10-10 Site concentrations of thorium-232 in sediment at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

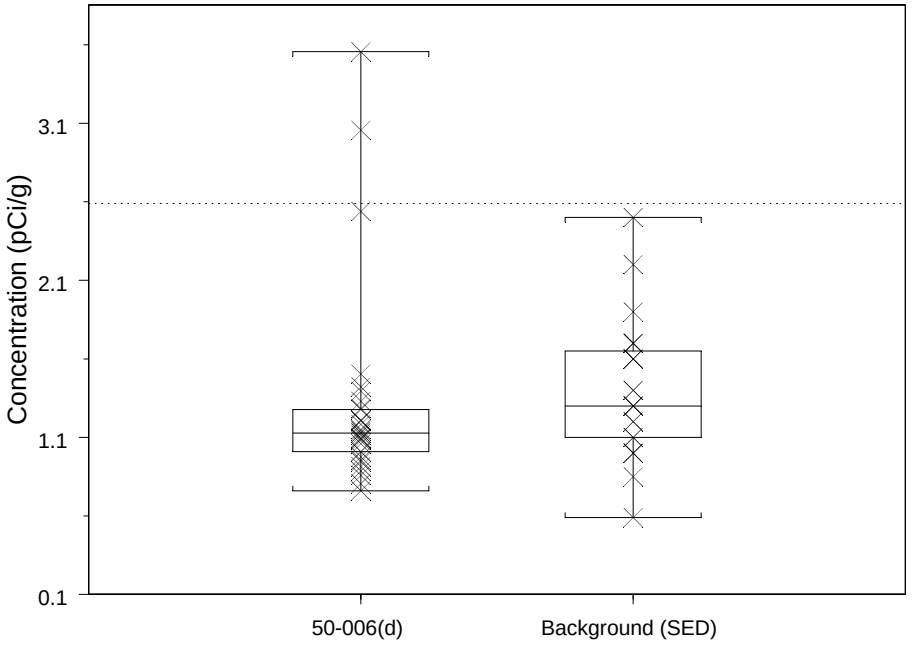


Figure I-6.10-11 Site concentrations of uranium-234 in sediment at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

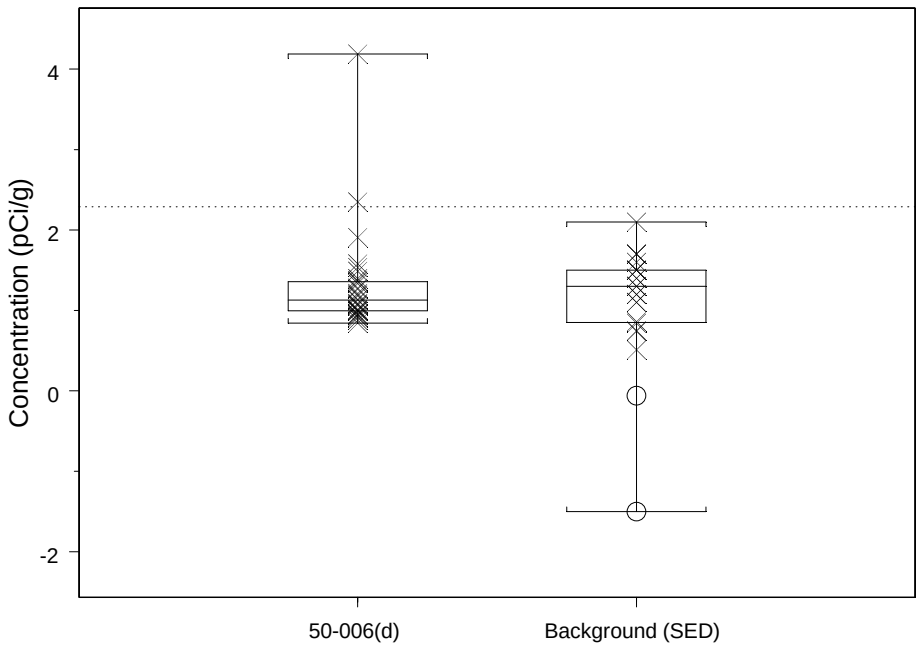


Figure I-6.10-12 Site concentrations of uranium-238 in sediment at SWMU 50-006(d) compared to background
(× = detect, ○ = nondetect)

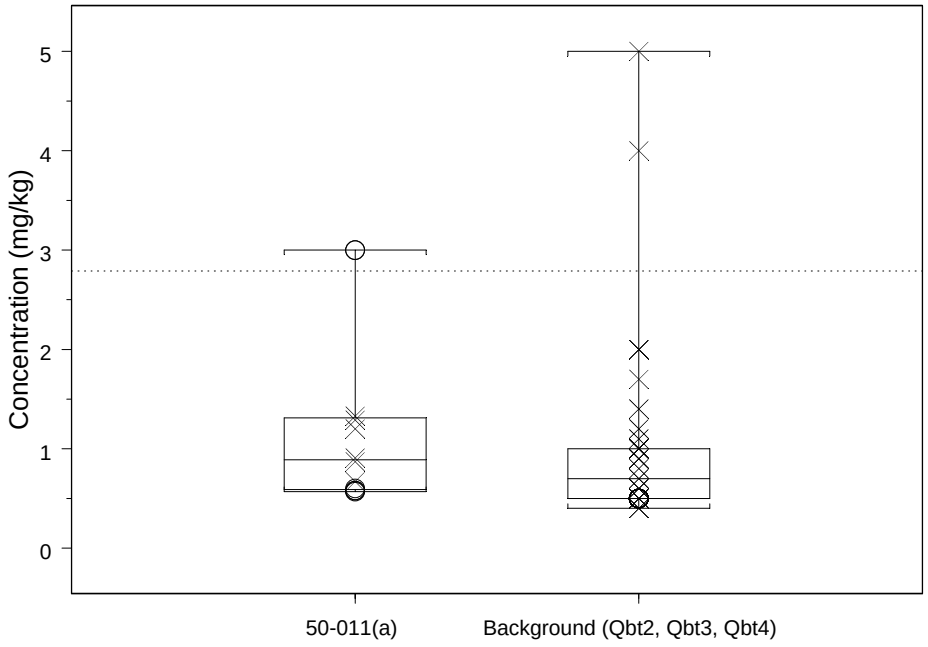


Figure I-6.15-1 Site concentrations of arsenic in tuff at SWMU 50-011(a) compared to background
(× = detect, ○ = nondetect)

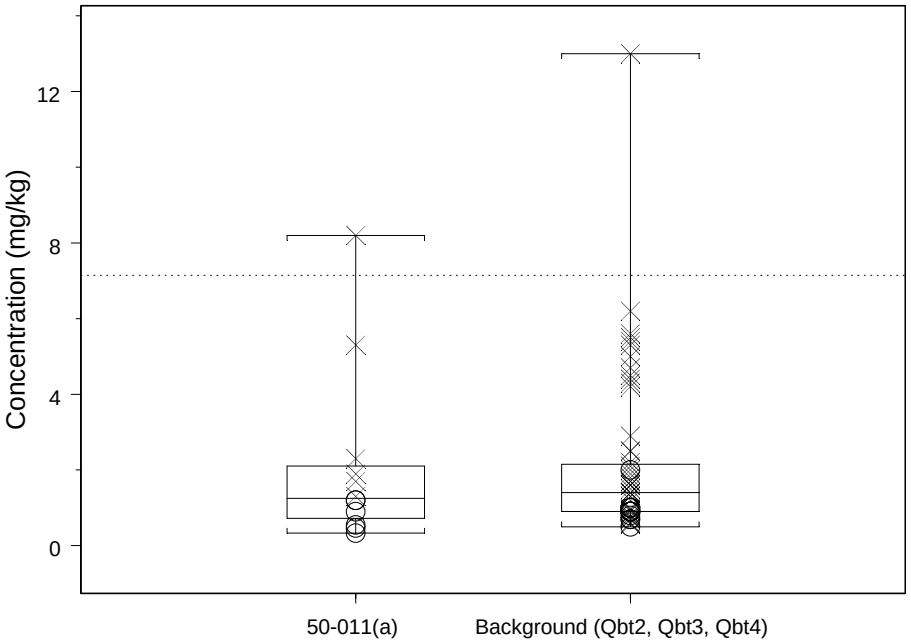


Figure I-6.15-2 Site concentrations of chromium in tuff at SWMU 50-011(a) compared to background
(× = detect, ○ = nondetect)

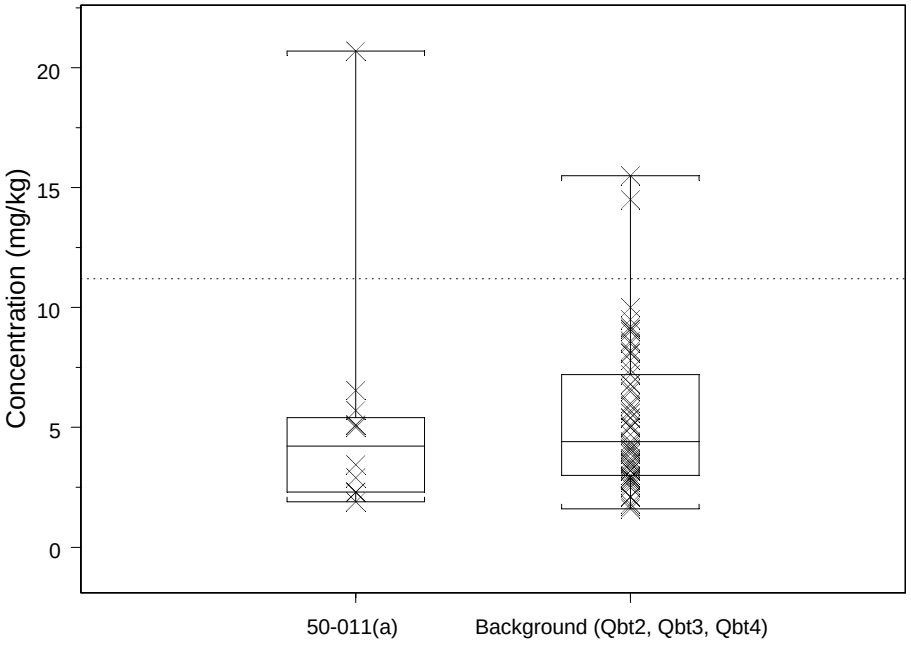


Figure I-6.15-3 Site concentrations of lead in tuff at SWMU 50-011(a) compared to background
(× = detect, ○ = nondetect)

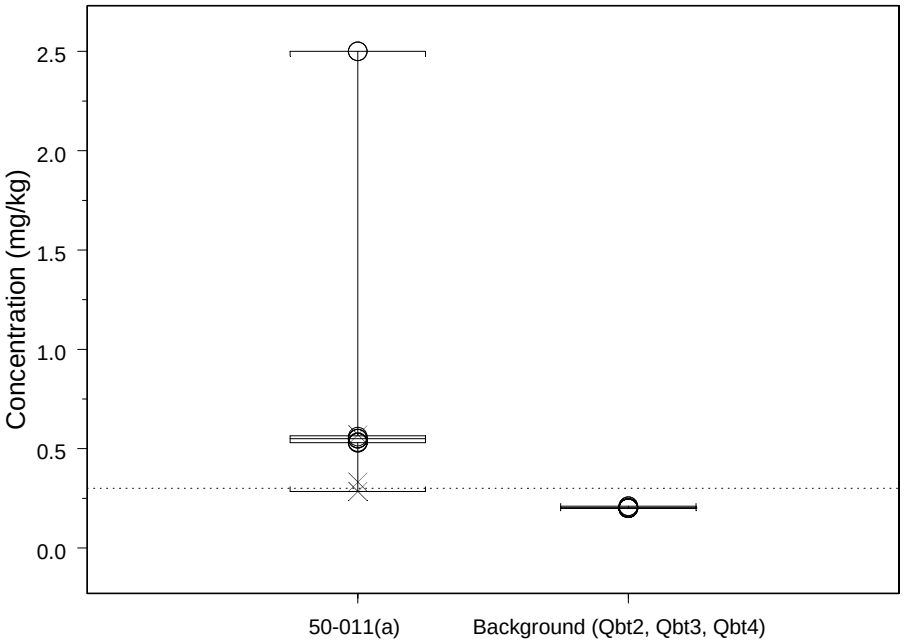


Figure I-6.15-4 Site concentrations of selenium in tuff at SWMU 50-011(a) compared to background

(× = detect, ○ = nondetect)

Table I-2.3-1
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-004(c)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Calcium	0.000999	—*	—	Yes

* — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.3-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at AOC 03-004(c)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	0.256	0.364	n/a[a]	No
Barium	0.0145	—[b]	—	Yes
Beryllium	0.902	0.812	n/a	No
Calcium	0.0122	—	—	Yes
Chromium	9.45×10^{-6}	—	—	Yes
Cobalt	0.155	0.0749	n/a	No
Copper	0.00392	—	—	Yes
Iron	1.65×10^{-6}	—	—	Yes
Lead	0.119	0.980	n/a	No
Magnesium	0.00118	—	—	Yes
Manganese	0.00636	—	—	Yes
Vanadium	2.43×10^{-5}	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.4-1
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-004(d)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Calcium	0.751	0.211	n/a[a]	No
Chromium	0.00220	—[b]	—	Yes
Lead	0.0135	—	—	Yes
Zinc	7.62×10^{-5}	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.4-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at AOC 03-004(d)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Beryllium	0.580	0.812	n/a[a]	No
Chromium	1.48×10^{-6}	—[b]	—	Yes
Nickel	n/a	0.0546	1	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.5-1
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 03-007

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Lead	0.0240	—[a]	—	Yes
Zinc	0.0820	0.124	n/a[b]	No

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-2.5-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at AOC 03-007

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	2.08×10^{-8}	—[a]	—	Yes
Arsenic	5.83×10^{-9}	—	—	Yes
Beryllium	0.000187	—	—	Yes
Calcium	1.01×10^{-9}	—	—	Yes
Chromium	4.57×10^{-14}	—	—	Yes
Cobalt	0.00148	—	—	Yes
Copper	2.27×10^{-10}	—	—	Yes
Iron	2.49×10^{-10}	—	—	Yes
Lead	1.00×10^{-6}	—	—	Yes
Magnesium	1.09×10^{-9}	—	—	Yes
Manganese	0.225	0.532	n/a[b]	No
Nickel	1.33×10^{-11}	—	—	Yes
Silver	n/a	1	0.0995	No
Vanadium	4.96×10^{-11}	—	—	Yes
Zinc	0.167	0.254	n/a	No

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-2.11-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-034(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Beryllium	0.909	0.827	n/a[a]	No
Chromium	4.092×10^{-5}	—[b]	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.14-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-045(h)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	0.00106	—[a]	—	Yes
Arsenic	0.0144	—	—	Yes
Barium	4.46×10^{-5}	—	—	Yes
Beryllium	0.0836	0.242	n/a[b]	No
Calcium	0.000130	—	—	Yes
Chromium	1.33×10^{-7}	—	—	Yes
Cobalt	0.00781	—	—	Yes
Copper	8.88×10^{-5}	—	—	Yes
Iron	2.40×10^{-5}	—	—	Yes
Lead	0.00111	—	—	Yes
Magnesium	0.000111	—	—	Yes
Manganese	0.00641	—	—	Yes
Nickel	1.85×10^{-6}	—	—	Yes
Vanadium	7.98×10^{-6}	—	—	Yes
Zinc	0.00802	—	—	Yes

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-2.15-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-049(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Beryllium	0.759	0.943	n/a[a]	No
Copper	3.28×10^{-7}	—[b]	—	Yes
Lead	0.00576	—	—	Yes
Nickel	n/a	1.49×10^{-5}	—	Yes
Zinc	0.000565	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.15-2
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 03-049(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	0.777	0.587	n/a[a]	No
Barium	0.825	0.935	n/a	No
Cadmium	n/a	1.20×10^{-6}	—[b]	Yes
Calcium	0.0624	0.337	n/a	No
Cobalt	0.303	0.337	n/a	No
Iron	0.0624	0.143	n/a	No
Lead	4.47×10^{-6}	—	—	Yes
Manganese	0.286	0.337	n/a	No
Nickel	7.87×10^{-5}	—	—	Yes
Silver	n/a	2.55×10^{-7}	—	Yes
Vanadium	0.358	0.587	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.15-3
Results of Statistical Tests for Radionuclides in Sediment at SWMU 03-049(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Uranium-234	0.928	0.535	n/a*	No
Uranium-235/-236	0.748	0.843	n/a	No
Uranium-238	0.0525	0.104	n/a	No

* n/a = Not applicable.

Table I-2.16-1
Results of Statistical Tests for Inorganic Chemicals in Soil at Consolidated Unit 03-049(b)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Chromium	0.296	0.375	n/a[a]	No
Cobalt	0.998	0.999	n/a	No
Manganese	0.192	0.973	n/a	No
Zinc	0.037	—[b]	n/a	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.16-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at Consolidated Unit 03-049(b)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	1.87×10^{-6}	—[a]	n/a[b]	Yes
Arsenic	9.38×10^{-10}	—	n/a	Yes
Beryllium	0.0003	—	n/a	Yes
Calcium	4.79×10^{-10}	—	n/a	Yes
Cobalt	0.002	—	n/a	Yes
Copper	2.55×10^{-8}	—	n/a	Yes
Iron	2.36×10^{-10}	—	n/a	Yes
Manganese	0.473	0.543	n/a	No
Thallium	n/a	0.746	1	No
Vanadium	5.24×10^{-11}	—	n/a	Yes

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-2.17-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 03-049(e)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.125	0.051	n/a[a]	No
Cadmium	n/a	0.995	0.444	No
Iron	0.0008	—[b]	n/a	Yes
Manganese	0.104	0.057	n/a	No
Silver	n/a	1	0.158	No
Zinc	0.004	—	n/a	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-2.19-1
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC C-03-006

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Calcium	0.157	0.109	n/a[a]	No
Copper	0.0958	0.0388	n/a	Yes
Lead	0.200	0.0613	n/a	No
Sodium	0.310	0.710	n/a	No
Zinc	8.34×10^{-8}	—[b]	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-3.1-1
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 35-016(g)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Chromium	0.0569	0.997	n/a[a]	No
Copper	0.681	0.678	n/a	No
Lead	0.234	0.907	n/a	No
Mercury	0.0195	—[b]	—	Yes
Silver	0.00281	—	—	Yes
Zinc	0.0278	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-3.2-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 35-016(h)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.171	0.0793	n/a[a]	No
Beryllium	0.714	0.896	n/a	No
Calcium	0.675	0.481	n/a	No
Chromium	2.79×10^{-7}	—[b]	—	Yes
Copper	8.81×10^{-6}	—	—	Yes
Nickel	0.00249	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-3.2-2
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 35-016(h)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Calcium	0.310	0.921	n/a*	No
Chromium	0.0670	0.998	n/a	No
Copper	0.360	0.5	n/a	No
Zinc	0.597	0.758	n/a	No

* n/a = Not applicable.

Table I-4.1-1
Results of Statistical Tests for Inorganic Chemicals in Soil at Consolidated Unit 42-001(a)-99

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Antimony	n/a	0.0003	—[a]	Yes
Barium	n/a	1	1	No
Lead	0.557	0.767	n/a[b]	No
Zinc	0.026	—	n/a	Yes

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-4.1-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at Consolidated Unit 42-001(a)-99

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.221	0.989	n/a[a]	No
Beryllium	0.748	0.786	n/a	No
Calcium	n/a	0.981	0.619	No
Chromium	9.31×10^{-13}	—[b]	n/a	Yes
Copper	n/a	0.0004	—	Yes
Lead	n/a	0.062	0.144	No
Nickel	0.205	1	n/a	No
Silver	n/a	1	1	No
Zinc	n/a	0.076	0.382	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-4.1-3
Results of Statistical Tests for Inorganic Chemicals in Sediment at Consolidated Unit 42-001(a)-99

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.176	0.332	n/a[a]	No
Zinc	0.011	—[b]	n/a	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-4.1-4
Results of Statistical Tests for Radionuclides in Sediment at Consolidated Unit 42-001(a)-99

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Americium-241	0.169	0.117	n/a*	No
Uranium-238	0.606	0.939	n/a	No

* n/a = Not applicable.

Table I-5.1-1
Results of Statistical Tests for Inorganic Chemicals in Soil at AOC 48-001

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Chromium	0.211	0.801	n/a[a]	No
Copper	0.768	0.569	n/a	No
Lead	0.465	0.530	n/a	No
Manganese	0.00141	—[b]	—	Yes
Mercury	n/a	1	6.80×10^{-5}	Yes
Nickel	0.000194	—	—	Yes
Thallium	2.918×10^{-7}	—	—	Yes
Zinc	3.08×10^{-5}	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.1-2
Results of Statistical Tests for Inorganic Chemicals in Sediment at AOC 48-001

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	0.00117	—[a]	—	Yes
Barium	0.00141	—	—	Yes
Chromium	0.322	0.842	n/a[b]	No
Cobalt	0.000209	—	—	Yes
Copper	0.195	0.356	n/a	No
Iron	0.719	0.764	n/a	No
Lead	0.884	0.842	n/a	No
Nickel	1.13×10^{-6}	—	—	Yes
Silver	1.37×10^{-9}	—	—	Yes
Vanadium	0.0380	—	—	Yes
Zinc	0.000324	—	—	Yes

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-5.1-3
Results of Statistical Tests for Radionuclides in Sediment at AOC 48-001

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Cesium-137	0.0478	—[a]	—	Yes
Uranium-234	0.0135	—	—	Yes
Uranium-235/-236	0.0333	—	—	Yes
Uranium-238	0.223	0.986	n/a[b]	No

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-5.2-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMUs 48-002(a and b)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	0.990	0.993	n/a[a]	No
Beryllium	0.995	0.997	n/a	No
Calcium	0.985	0.975	n/a	No
Copper	0.018	—[b]	n/a	Yes
Nickel	0.238	0.088	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.3-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-002(e)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.00357	—[a]	—	Yes
Calcium	0.532	0.632	n/a[b]	No
Chromium	0.000794	—	—	Yes
Lead	0.521	0.953	n/a	No

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-5.4-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-003

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.242	0.993	n/a[a]	No
Beryllium	0.0144	—[b]	—	Yes
Calcium	0.00156	—	—	No[c]
Chromium	1.22×10^{-9}	—	—	Yes
Cobalt	1.09×10^{-5}	—	—	Yes
Copper	0.00648	—	—	Yes
Lead	0.0435	—	—	Yes
Nickel	0.910	1	n/a	No
Zinc	0.251	0.604	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

[c] See section I-5.4.1.2.

Table I-5.4-2
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 48-003

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Copper	0.946	0.728	n/a[a]	No
Lead	0.694	0.925	n/a	No
Zinc	0.00682	—[b]	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.4-3
Results of Statistical Tests for Radionuclides in Sediment at SWMU 48-003

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Cesium-137	0.116	0.00218	n/a*	Yes
Uranium-234	0.0768	0.993	n/a	No
Uranium-238	0.433	0.984	n/a	No

* n/a = Not applicable.

Table I-5.6-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-005

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.0903	0.123	n/a[a]	No
Chromium	8.25×10^{-6}	—[b]	—	Yes
Cobalt	0.944	0.865	n/a	No
Copper	0.00120	—	—	Yes
Lead	0.205	0.350	n/a	No
Manganese	0.0437	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.7-1
Results of Statistical Tests for Inorganic Chemicals in Soil at SWMU 48-007(a)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	n/a[a]	0.870	0.074	No
Cadmium	0.334	0.169	n/a	No
Lead	0.948	0.069	n/a	No
Manganese	0.013	—[b]	—	Yes
Mercury	n/a	1	0.016	Yes
Nickel	0.988	0.998	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.7-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-007(a)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	0.380	0.237	n/a[a]	No
Barium	0.078	0.999	n/a	No
Calcium	n/a	0.999	0.273	No
Copper	0.016	—[b]	—	Yes
Nickel	0.744	0.713	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.7-3
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 48-007(a)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	0.113	0.994	n/a*	No
Lead	0.470	0.326	n/a	No
Nickel	0.079	0.942	n/a	No
Vanadium	n/a	0.942	0.224	No
Zinc	n/a	0.326	0.002	Yes

* n/a = Not applicable.

Table I-5.8-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-007(b)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	0.044	—[a]	n/a[b]	Yes
Arsenic	0.357	0.201	n/a	No
Barium	0.630	0.286	n/a	No
Cobalt	0.103	0.827	n/a	No
Copper	1.208×10^{-6}	—	n/a	Yes
Iron	0.0009	—	n/a	Yes
Lead	0.004	—	n/a	Yes
Magnesium	0.107	0.081	n/a	No
Nickel	0.059	0.015	n/a	Yes
Vanadium	0.0004	—	n/a	Yes

[a] — = Test not performed because the first test indicated site samples are significantly different than background.

[b] n/a = Not applicable.

Table I-5.9-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-007(c)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Calcium	0.569	0.173	n/a[a]	No
Chromium	1.88×10^{-6}	—[b]	—	Yes
Copper	2.59×10^{-6}	—	—	Yes
Lead	0.0192	—	—	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-5.10-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 48-007(f)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.052	0.016	n/a[a]	Yes
Manganese	0.041	—[b]	n/a	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.7-1
Results of Statistical Tests for Inorganic Chemicals
in Soil at Consolidated Unit 50-004(a)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	1.00	1.00	n/a[a]	No
Beryllium	0.166	0.987	n/a	No
Cadmium	n/a	1.76×10^{-8}	—[b]	Yes
Calcium	0.116	0.486	n/a	No
Chromium	1.00	1.00	n/a	No
Copper	5.95×10^{-7}	—	—	Yes
Lead	1.00	1.00	n/a	No
Magnesium	1.00	1.00	n/a	No
Mercury	n/a	1	0.0487	Yes
Nickel	1.00	1.00	n/a	No
Potassium	1.00	1.00	n/a	No
Thallium	n/a	0.000548	—	Yes
Zinc	0.987	0.378	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.7-2
Results of Statistical Tests for Inorganic Chemicals in Tuff at Consolidated Unit 50-004(a)-00

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Aluminum	0.134	0.135	n/a[a]	No
Arsenic	0.478	0.315	n/a	No
Barium	0.000200	—[b]	—	Yes
Beryllium	0.00921	—	—	Yes
Calcium	0.221	0.436	n/a	No
Chromium	1.01×10^{-11}	—	—	Yes
Cobalt	0.0190	—	—	Yes
Copper	3.17×10^{-6}	—	—	Yes
Iron	0.000730	—	—	Yes
Lead	0.508	0.525	n/a	No
Magnesium	0.000813	—	—	Yes
Manganese	0.0678	0.249	n/a	No
Nickel	0.00434	—	—	Yes
Silver	n/a	1	0.605	No
Vanadium	1.10×10^{-5}	—	—	Yes
Zinc	0.617	0.685	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.8-1
Results of Statistical Tests for Inorganic Chemicals in Sediment at SWMU 50-006(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.766	0.907	n/a[a]	No
Cadmium	n/a	3.175×10^{-14}	—[b]	Yes
Lead	0.732	0.811	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.8-2
Results of Statistical Tests for Radionuclides in Sediment at SWMU 50-006(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Strontium-90	n/a[a]	0.995	0.241	No
Thorium-232	n/a	1.52×10^{-9}	—[b]	Yes
Uranium-238	0.068	0.428	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.9-1
Results of Statistical Tests for Radionuclides in Soil at SWMU 50-006(c)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Plutonium-238	0.197	0.0005	n/a[a]	Yes
Plutonium-239/240	9.93×10^{-9}	—[b]	n/a	Yes

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.9-2
Results of Statistical Tests for Radionuclides in Sediment at SWMU 50-006(c)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Tritium	0.913	0.326	n/a*	No

[*] n/a = Not applicable.

Table I-6.10-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 50-006(d)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Barium	0.229	0.980	n/a[a]	No
Calcium	0.999	0.993	n/a	No
Chromium	0.0003	—[b]	n/a	Yes
Copper	0.004	—	n/a	Yes
Lead	0.179	0.810	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.10-2
Results of Statistical Tests for Radionuclides in Sediment at SWMU 50-006(d)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Thorium-232	0.498	1.20×10^{-6}	n/a[a]	Yes
Uranium-234	0.033	—[b]	n/a	Yes
Uranium-238	0.518	0.977	n/a	No

[a] n/a = Not applicable.

[b] — = Test not performed because the first test indicated site samples are significantly different than background.

Table I-6.15-1
Results of Statistical Tests for Inorganic Chemicals in Tuff at SWMU 50-011(a)

Analyte	Gehan p-value	Quantile p-value	Slippage p-value	COPC?
Arsenic	0.988	0.340	n/a*	No
Chromium	0.629	0.827	n/a	No
Lead	0.326	0.603	n/a	No

* n/a = Not applicable.

Appendix J

Risk Assessments

CONTENTS

J-1.0 INTRODUCTION J-1

J-2.0 BACKGROUND J-1

J-2.1 Site Descriptions and Operational History J-1

J-2.1.1 TA-03 ..... J-1

J-2.1.2 TA-48 ..... J-2

J-2.1.3 TA-50 ..... J-3

J-2.2 Investigation Sampling J-4

J-2.3 Determination of Chemicals of Potential Concern J-5

J-3.0 CONCEPTUAL SITE MODEL J-5

J-3.1 Receptors and Exposure Pathways J-6

J-3.2 Environmental Fate and Transport J-6

J-3.2.1 Inorganic Chemicals J-8

J-3.2.2 Organic Chemicals J-9

J-3.2.3 Radionuclides J-11

J-3.2.4 Summary J-11

J-3.3 Exposure Point Concentration Calculations J-12

J-4.0 HUMAN HEALTH RISK SCREENING ASSESSMENTS J-12

J-4.1 Soil Screening Levels J-13

J-4.2 Results of the Human Health Risk Screening Evaluations J-13

J-4.2.1 SWMU 03-034(a) J-13

J-4.2.2 AOC 03-041 ..... J-13

J-4.2.3 AOC 48-002(e) J-14

J-4.2.4 Consolidated Unit 48-007(a)-00 ..... J-14

J-4.2.5 AOC 48-011 ..... J-15

J-4.2.6 AOC 48-012 ..... J-15

J-4.2.7 SWMU 50-006(c) J-15

J-4.2.8 SWMU 50-011(a) J-16

J-4.3 Uncertainty Analysis J-16

J-4.3.1 Data Evaluation and COPC Identification Process J-16

J-4.3.2 Exposure Assessment J-16

J-4.3.3 Toxicity Assessment J-18

J-4.3.4 Lead Toxicity J-19

J-4.3.5 Additive Approach J-19

J-4.4 Interpretation of Human Health Risk Screening Results J-19

J-5.0 ECOLOGICAL RISK SCREENING ASSESSMENTS J-21

J-5.1 Introduction J-21

J-5.2 Scoping Evaluation J-22

J-5.3 Assessment Endpoints J-22

J-5.4 Screening Evaluation J-23

J-5.4.1 AOC 03-034(a) J-24

J-5.4.2 AOC 03-041 ..... J-24
J-5.4.3 AOC 48-002(e) J-24
J-5.4.4 Consolidated Unit 48-007(a)-00 ..... J-24
J-5.4.5 AOC 48-011 ..... J-25
J-5.4.6 AOC 48-012 ..... J-25
J-5.4.7 SWMU 50-006(c) J-25
J-5.4.8 SWMU 50-011(a) J-25
J-5.5 Uncertainty Analysis J-25
J-5.5.1 Chemical Form J-26
J-5.5.2 Exposure Assumptions J-26
J-5.5.3 Toxicity Values J-26
J-5.5.4 Comparison of EPCs with Background Concentrations J-27
J-5.5.5 Area Use Factors J-27
J-5.5.6 Population Area Use Factors J-28
J-5.5.7 Exposure Pathways J-29
J-5.5.8 Comparison with Results of Previous Field and Laboratory Studies J-29
J-5.5.9 COPECs without ESLs J-29
J-5.5.10 DOE Tier I Bioconcentration Guide J-32
J-5.6 Interpretation of Ecological Risk Screening Results J-32
J-5.6.1 Receptor Lines of Evidence J-32
J-5.7 Summary J-36

J-6.0 CONCLUSIONS J-36
J-6.1 Human Health Risk J-36
J-6.2 Ecological Risk J-37

J-7.0 REFERENCES J-37

Figures

Figure J-3.1-1 Conceptual site model for Upper Mortandad Canyon Aggregate Area J-43

Tables

Table J-2.2-1 Exposure Point Concentrations at AOC 03-041 for the Industrial Scenario J-41
Table J-2.2-2 Exposure Point Concentrations at AOC 03-041 for the Ecological Receptors J-43
Table J-2.2-3 Exposure Point Concentrations at AOC 03-041 for the Residential Scenario J-45
Table J-2.2-4 Exposure Point Concentrations at AOC 48-002(e) for the Ecological Receptors J-47
Table J-2.2-5 Exposure Point Concentrations at AOC 48-002(e) for the Residential Scenario J-48
Table J-2.2-6 Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Industrial Scenario J-49
Table J-2.2-7 Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Ecological Receptors J-52

Table J-2.2-8 Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Residential Scenario J-55
Table J-2.2-9 Exposure Point Concentrations at AOC 48-012 for the Residential and Construction Worker Scenarios J-58
Table J-2.2-10 Exposure Point Concentrations at SWMU 50-006(c) for All Scenarios and Ecological J-59
Table J-2.2-11 Exposure Point Concentrations at SWMU 50-011(a) for the Residential Scenario J-61
Table J-3.2-1 Physical and Chemical Properties of Inorganic COPCs at Upper Mortandad Canyon Aggregate Area J-62
Table J-3.2-2 Physical and Chemical Properties of Organic COPCs at Upper Mortandad Canyon Aggregate Area J-63
Table J-3.2-3 Physical and Chemical Properties of Radionuclide COPCS at Upper Mortandad Canyon Aggregate Area J-64
Table J-4.0-1 Risk Scenarios Evaluated for the Upper Mortandad Canyon Aggregate Area Sites J-64
Table J-4.1-1 Exposure Parameter Values Used to Calculate Chemical SSLs for the Industrial and Residential Scenarios J-65
Table J-4.1-2 Parameters Used in the SAL Calculations for Radionuclides, Residential J-66
Table J-4.1-3 Parameter Values Used to Calculate Radionuclide SALs for the Industrial and Construction Worker Scenarios J-66
Table J-4.2-1 Residential Noncarcinogenic Screening Evaluation for SWMU 03-034(a) J-67
Table J-4.2-2 Residential Carcinogenic Screening for SWMU 03-034(a) J-67
Table J-4.2-3 Residential Radionuclide Screening for SWMU 03-034(a) J-67
Table J-4.2-4 Dioxin/Furan TEF Calculations for the Industrial and Residential Scenarios and Ecological at AOC 03-041 ..... J-68
Table J-4.2-5 Industrial Carcinogenic Screening for AOC 03-041 ..... J-68
Table J-4.2-6 Industrial Noncarcinogenic Screening Evaluation for AOC 03-041 ..... J-69
Table J-4.2-7 Residential Noncarcinogenic Screening Evaluation for AOC 03-041 ..... J-69
Table J-4.2-8 Residential Carcinogenic Screening for AOC 03-041 ..... J-70
Table J-4.2-9 Residential Radionuclide Screening for AOC 03-041 ..... J-70
Table J-4.2-10 Dioxin/Furan TEF Calculations for the Residential Scenario at AOC 48-002(e) J-70
Table J-4.2-11 Residential Carcinogenic Screening for AOC 48-002(e) J-71
Table J-4.2-12 Residential Noncarcinogenic Screening Evaluation for AOC 48-002(e) J-71
Table J-4.2-13 Dioxin/Furan TEF Calculations for the Industrial Scenario at Consolidated Unit 48-007(a)-00 ..... J-72
Table J-4.2-14 Industrial Carcinogenic Screening for Consolidated Unit 48-007(a)-00 ..... J-73
Table J-4.2-15 Industrial Noncarcinogenic Screening Evaluation for Consolidated Unit 48-007(a)-00 ..... J-74
Table J-4.2-16 Industrial Radionuclide Screening for Consolidated Unit 48-007(a)-00 ..... J-75
Table J-4.2-17 Dioxin/Furan TEF Calculations for the Residential Scenario at Consolidated Unit 48-007(a)-00 ..... J-75
Table J-4.2-18 Residential Carcinogenic Screening for Consolidated Unit 48-007(a)-00 ..... J-76
Table J-4.2-19 Residential Noncarcinogenic Screening Evaluation for Consolidated Unit 48-007(a)-00 ..... J-77

Table J-4.2-20 Residential Radionuclide Screening for Consolidated Unit 48-007(a)-00 ..... J-78
Table J-4.2-21 Dioxin/Furan TEF Calculations for the Residential Scenario at AOC 48-011 ..... J-78
Table J-4.2-22 Residential Carcinogenic Screening for AOC 48-011 ..... J-78
Table J-4.2-23 Residential Noncarcinogenic Screening Evaluation for AOC 48-011 ..... J-79
Table J-4.2-24 Construction Worker Carcinogenic Screening for AOC 48-012 ..... J-79
Table J-4.2-25 Construction Worker Noncarcinogenic Screening Evaluation for AOC 48-012 ..... J-80
Table J-4.2-26 Residential Carcinogenic Screening for AOC 48-012 ..... J-80
Table J-4.2-27 Residential Noncarcinogenic Screening Evaluation for AOC 48-012 ..... J-81
Table J-4.2-28 Dioxin/Furan TEF Calculations for All Scenarios and Ecological at SWMU 50-006(c) J-81
Table J-4.2-29 Industrial Carcinogenic Screening for SWMU 50-006(c) J-82
Table J-4.2-30 Industrial Noncarcinogenic Screening Evaluation for SWMU 50-006(c) J-82
Table J-4.2-31 Industrial Radionuclide Screening for SWMU 50-006(c) J-83
Table J-4.2-32 Construction Worker Carcinogenic Screening for SWMU 50-006(c) J-83
Table J-4.2-33 Construction Worker Noncarcinogenic Screening Evaluation for SWMU 50-006(c) J-84
Table J-4.2-34 Construction Worker Radionuclide Screening for SWMU 50-006(c) J-84
Table J-4.2-35 Residential Carcinogenic Screening for SWMU 50-006(c) J-85
Table J-4.2-36 Residential Noncarcinogenic Screening Evaluation for SWMU 50-006(c) J-85
Table J-4.2-37 Residential Radionuclide Screening for SWMU 50-006(c) J-86
Table J-4.2-38 Construction Worker Noncarcinogenic Screening Evaluation for SWMU 50-011(a) J-86
Table J-4.2-39 Construction Worker Radionuclide Screening for SWMU 50-011(a) J-86
Table J-4.2-40 Residential Noncarcinogenic Screening Evaluation for SWMU 50-011(a) J-86
Table J-4.2-41 Residential Radionuclide Screening for SWMU 50-011(a) J-87
Table J-4.3-1 Comparison of VOC Concentrations to EPA Region 6 Indoor Worker Values J-87
Table J-5.4-1 Ecological Screening Levels for Terrestrial Receptors J-88
Table J-5.4-2 Minimum ESL Comparison for AOC 03-041 ..... J-91
Table J-5.4-3 Hazard Index Analysis for AOC 03-041 ..... J-92
Table J-5.4.4 Dioxin/Furan TEF Calculations for Ecological Receptors at AOC 48-002(e) J-93
Table J-5.4-5 Minimum ESL Comparison for AOC 48-002(e) J-93
Table J-5.4-6 Hazard Index Analysis for AOC 48-002(e) J-94
Table J-5.4-7 Dioxin/Furan TEF Calculations for Ecological Receptors at Consolidated Unit 48-007(a)-00 ..... J-95
Table J-5.4-8 Minimum ESL Comparison for Consolidated Unit 48-007(a)-00 ..... J-96
Table J-5.4-9 Hazard Index Analysis for Consolidated Unit 48-007(a)-00 ..... J-98
Table J-5.4-10 Minimum ESL Comparison for SWMU 50-006(c) J-99
Table J-5.4-11 Hazard Index Analysis for SWMU 50-006(c) J-100
Table J-5.5-1 Comparison of EPCs to Background Concentrations for AOC 03-041 ..... J-101
Table J-5.5-2 Comparison of EPCs to Background Concentrations for AOC 48-002(e) J-101
Table J-5.5-3 Comparison of EPCs to Background Concentrations for Consolidated Unit 48-007(a)-00 ..... J-101
Table J-5.5-4 Comparison of EPCs to Background Concentrations for SWMU 50-006(c) J-102

Table J-5.5-5 PAUFs and AUFs for Ecological Receptors J-102
Table J-5.5-6 Adjusted HQs and HIs for AOC 03-041 ..... J-103
Table J-5.5-7 Adjusted HQs and HIs for AOC 48-002(e) J-103
Table J-5.5-8 Adjusted HQs and HIs for Consolidated Unit 48-007(a)-00 ..... J-104
Table J-5.5-9 Adjusted HQs and HIs for SWMU 50-006(c) J-105
Table J-6.1-1 Summary of Human Health Risk Screening Assessments Results J-106

J-1.0 INTRODUCTION

This appendix presents the results of the human health and ecological risk-screening assessments conducted in support of environmental characterization of the sites within the Upper Mortandad Canyon Aggregate Area. The solid waste management units (SWMUs), areas of concern (AOCs), and consolidated units investigated are within Technical Area 03 (TA-03), TA-35, TA-48, TA-50, and former TA-42 at Los Alamos National Laboratory (LANL or the Laboratory) (Figure 1.1-1 of the investigation report).

J-2.0 BACKGROUND

J-2.1 Site Descriptions and Operational History

The following information on site descriptions and operational history is for sites where nature and extent have been defined.

J-2.1.1 TA-03

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

SWMU 03-034(a), Radioactive Liquid Waste Tanks

SWMU 03-034(a) consists of four underground radioactive liquid waste (RLW) storage tanks (two stainless-steel tanks and two concrete tanks) located partially beneath the pump house (building 03-154). Building 03-154 was constructed in 1961 to house operating equipment of the four storage tanks that received radioactive waste from Wing 9 of the CMR Building (03-29) (LANL 1995, 057590). The tanks associated with SWMU 03-034(a) are located approximately 65 ft west of Wing 9.

From 1961 to 1983, the underground storage tanks (USTs) received RLW (fission products from the destructive testing of reactor fuel rods) from the hot cell of Wing 9 at the CMR Building. The RLW originally was routed to the stainless-steel tanks and stored to allow decay of short-lived radionuclides. The RLW was pumped through a series of stainless-steel transfer lines into the concrete storage tanks. The liquid was processed through ion exchange columns, which resulted in lower-activity RLW. The two cylindrical stainless-steel storage tanks located belowgrade beneath the northern part of building 03-154 are accessible from individual manholes outside the building. Each tank is 7 ft long and 5 ft in diameter, with a maximum capacity of approximately 1000 gal., and is located inside a concrete vault. The concrete vaults share a common wall, and each concrete vault contains pumps and stainless-steel piping associated with the tanks. Each concrete tank is approximately 17 ft long × 9 ft wide × 6 ft high, with a maximum capacity of 4900 gal. A single gravity-outflow sump pit, which served both concrete tanks, is located on the south side of the tanks and was used to drain liquid waste to the RLW line, which was pumped to TA-50.

The stainless-steel and concrete storage tanks were not used after 1983. Both sets of tanks were taken offline in 1985 when the former waste line was removed. The tanks were not reconnected to the new

waste line installed at that time. There have been no reported releases from the tanks. RLW was documented as having passed through the tanks (LANL 1995, 057590).

AOC 03-041, Underground Tank

AOC 03-041 is an unloading station designed as a holding tank for industrial low-level radioactive wastewater. It is located in a belowgrade concrete-lined vault (building 03-1264), approximately 140 ft southwest of the Sigma Building (03-66). The tank is 15-ft-long × 20-ft-wide × 15-ft-high, constructed of double-walled fiberglass, and has a capacity of 2000 gal. The base of the vault is approximately 15 ft below ground surface (bgs), is corrosion-proof, and has a leak-detection system. The holding tank connects to the industrial waste line. The tank was installed in 1982 to serve as a holding chamber for liquid waste collected from sites not connected to the industrial waste line. Although the unloading station is currently on active status, it has never been used. If used, the unloading station would act as an introduction point for waste into the industrial waste line (LANL 1995, 057590).

J-2.1.2 TA-48

TA-48 is located north of Pajarito Road, northwest of TA-55. The site is situated on Mesita del Buey (the southern finger of South Mesa) between Mortandad Canyon to the north and Twomile Canyon to the south. The site is currently used for chemical and radiochemical analyses, radioactive waste disposal research, and radioisotope production for nuclear medicine.

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

AOC 48-002(e), Container Storage Area

AOC 48-002(e) consists of a storage area located on the east side of the main radiochemistry laboratory in building 48-1. This storage area was located against the east wall of building 48-1, just north of building 48-17. The storage area is almost entirely paved with asphalt, except for one small section (several square feet) of soil left unpaved to allow access to underground utilities. The Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan states that AOC 48-002(e) was used for many years to store solvents (LANL 1992, 007666). The 1990 SWMU report states this area operated as a satellite accumulation area from the late 1980s (LANL 1990, 007513). Solvents were not stored in the area after about 1989 or 1990 (LANL 1992, 007666). Since 1992, the area has been used to store a tank containing liquid nitrogen and cylinders of compressed gas.

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

Consolidated Unit 48-007(a)-00 consists of SWMUs 48-007(a), 48-007(d), and 48-010. These SWMUs include two active stormwater outfalls and a surface impoundment, which receives discharge from the outfalls. These SWMUs previously received wastewater from the main radiochemistry laboratory in building 48-001.

SWMU 48-007(a) is an outfall formerly used to discharge treated cooling tower blowdown from two cooling towers located on the roof of building 48-1. This outfall is located east of building 48-1. Up to 750 gal./h of cooling tower blowdown was discharged from the outfall. Discharge from this outfall flowed to an unlined surface impoundment, SWMU 48-010. Water used in these cooling towers was treated to control scale, corrosion, and biological growth. Additives included Garratt Callahan (G.C.) Formula 227-L, a corrosion and scaling inhibitor, and G.C. Formula 314-T, a biocide. Specific hazardous chemicals present in these additives, if any, are not known. Approximately 60% of the water in the cooling towers was evaporated, causing the chemical additives to be concentrated in the blowdown (LANL 1992, 007666). This outfall formerly operated as a National Pollutant Discharge Elimination System- (NPDES-) permitted outfall (045/046 EPA 03A) but was removed from the NPDES permit on December 6, 1999, because industrial wastewater discharges to the outfall had been discontinued earlier in the year. Stormwater continues to flow through the outfall.

SWMU 48-007(d) is an outfall formerly used to discharge noncontact cooling water that cooled a vacuum pump housed in the southern end of building 48-001. This outfall is located east of building 48-1. Up to 4000 gal./d of cooling water was discharged from the outfall. Discharge from this outfall flowed to SWMU 48-010 (LANL 1992, 007666). This outfall operated as a NPDES-permitted outfall (153 EPA 04A) but was removed from the NPDES permit July 20, 1998, because industrial wastewater discharges to the outfall had been discontinued earlier in the year. Stormwater continues to flow through the outfall.

SWMU 48-010 is an unlined surface impoundment constructed in 1978 by excavating directly into the tuff. The surface impoundment is located approximately 300 ft east of building 48-001 and 150 ft south of building 48-045. The surface impoundment formerly received cooling tower blowdown discharged from SWMU 48-007(a), noncontact cooling water discharged from SWMU 48-007(d), and stormwater runoff from the parking lot for building 48-45. Currently, the impoundment receives only stormwater. The impoundment and surrounding area cover approximately 100 ft × 150 ft. SWMU 48-010 discharges to the east into a side canyon that is a tributary to Mortandad Canyon (LANL 1992, 007666).

AOC 48-011, Radiation Detector Disposal Shaft

AOC 48-011 consists of a 3-ft-diameter × 65-ft-deep shaft reportedly drilled in 1976 or 1977 into the tuff on the east side of building 48-1 for use in radiation-counting experiments. As part of these experiments, a 2-ft-diameter × 3-ft-long stainless-steel cylinder containing a sodium-iodide radiation detector was lowered into the shaft. This cylinder also contained approximately 3000 lb of lead shielding. As the cylinder was being lowered into the shaft, the cable broke and the cylinder fell to the bottom of the shaft. Because efforts to retrieve the cylinder were unsuccessful, it was left in place and covered (LANL 1992, 007666).

AOC 48-012, Soil Contamination

AOC 48-012 is a small area of stained soil discovered in August 2002 during routine trenching operations east of building 48-1. After the stained soil was discovered, trenching operations were shut down in the area, and the site was reported to the New Mexico Environment Department (NMED). A voluntary corrective action (VCA) report was submitted to NMED that details the investigation and the cleanup activities (LANL 2003, 080917).

J-2.1.3 TA-50

TA-50 is located immediately northeast of the intersection of Pajarito Road and Pecos Drive and occupies an area of approximately 21 acres: 11.8 acres are associated with Material Disposal Area (MDA) C, and

8.7 acres are associated with the Radioactive Liquid Waste Treatment Facility (RLWTF). MDA C was used from 1948 until it was decommissioned in 1974 and consists of pits and shafts that received radioactive and hazardous wastes. Treatment facilities include the RLWTF and associated waste-transfer and storage systems, equipment-decontamination areas, and solid-waste volume-reduction facilities.

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

The incinerator complex (building 50-37), built in 1975, and the volume reductions facility (building 50-69), built in 1983, were prototype facilities for developing and testing improved methods of handling and treating certain types of radioactive waste.

SWMU 50-006(c), Operational Release

SWMU 50-006(c) consists of the surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants (primarily plutonium and americium) from historical stack emissions at TA-50. Emission sources included seven exhaust stacks that ventilated hoods for specific operations at the facility. Buildings 50-1, 50-37, and 50-69 are monitored for radioactive emissions, and the results were reported to the U.S. Environmental Protection Agency (EPA) Region 6 (LANL 1992, 007672; LANL 1995, 049925).

SWMU 50-011(a), Septic System

SWMU 50-011(a) is the location of a former septic system installed at TA-50 in 1964 at the southern end of the RLWTF (building 50-1). The septic system consisted of an influent line from building 50-1 that discharged to a manhole (structure 50-9) and to a septic tank (structure 50-10). The effluent line from the tank tied to a distribution box (structure 50-11), which discharged to four parallel perforated pipes traversing a leach field.

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

With the exception of the perforated pipe installed in the leach field in 1978, the entire system was removed in 1983. Currently, a storage building (building 50-83) and an asphalt pad cover the area formerly occupied by the septic system. The 50-ft-deep shaft and perforated pipe remain in place beneath storage building 50-83.

J-2.2 Investigation Sampling

The final data set used to identify chemicals of potential concern (COPCs) and evaluate potential risks to human health and the environment for the Upper Mortandad Canyon Aggregate Area consists of all qualified analytical results compiled from both historical sampling activities and the 2009 investigation. Only those data determined to be of decision-level quality following the data-quality assessment (Appendix G) are included in the final data set evaluated in Appendix I and in this appendix.

Decision-level analytical data used to determine COPCs for the Upper Mortandad Canyon Aggregate Area include results obtained from samples collected during the following investigations/activities:

- In 1993, a Phase I RFI was conducted at AOC 48-002(e) and Consolidated Unit 48-007(a)-00, and results were reported in an RFI report (LANL 1995, 050289).
- In 1993, a Phase I RFI was conducted at SWMU 50-006(c) and SWMU 50-011(a), and results were reported in an RFI report (LANL 1995, 049925).
- In 1994, SWMU 50-011(a) subsurface soil was sampled, and the results were reported in an RFI report (LANL 1996, 054836).
- In 1997, samples were collected at AOC 48-002(e) and reported in the RFI report addendum (LANL 1997, 056565).
- In 2003, a VCA (LANL 1995, 049710) was conducted at AOC 48-012: soil contaminated was removed by excavating and replaced with clean fill.
- The 2009 investigation: surface and subsurface samples were collected to characterize of the nature and extent of contamination associated with the SWMUs or AOCs.

J-2.3 Determination of Chemicals of Potential Concern

Appendix I summarizes the COPC selection process and provides a data summary. Only COPCs identified in Appendix I were retained. The industrial scenario and the ecological screening utilize data for samples collected from 0–1 ft bgs and 0–5 ft bgs, respectively. The construction worker and the residential scenarios utilize data for samples collected from 0–10 ft bgs. However, sampling depths often overlapped because of multiple investigations; therefore, all samples with a starting depth less than the lower bound of the interval for each scenario were included in the risk-screening assessments for a given scenario.

Tables J-2.2-1 to J-2.2-11 summarize the COPCs evaluated for potential risk for each site in the Upper Mortandad Canyon Aggregate Area where the extent of contamination is defined. Some of the COPCs identified in Appendix I may not be evaluated for potential risk under one or more scenarios because they were not within the specified depth intervals associated with a given scenario.

J-3.0 CONCEPTUAL SITE MODEL

The primary mechanisms of release are related to historical contaminant sources described in detail in the historical investigation report (LANL 2005, 089658) and summarized in section 2.3 of the investigation work plan (LANL 2008, 100750). In the source areas, both potential surface and subsurface sources of contamination exist and include

- surface—dispersed contamination associated with air emissions, discharges from cooling towers and outfalls, releases from storage areas, releases from explosives testing at a firing site, and releases from an incinerator; and
- subsurface—releases from septic systems and USTs, releases from waste lines, releases from outfalls, and releases from a disposal shaft.

The lack of saturated conditions in the source areas restricts the vertical migration of contaminants. No zones of perched groundwater have been identified beneath the Upper Mortandad Canyon Aggregate Area.

J-3.1 Receptors and Exposure Pathways

The primary exposure pathway for human receptors is surface soil and subsurface soil/tuff that may be brought to the surface through intrusive activities. Migration of contamination to groundwater through the vadose zone is unlikely given the depth to groundwater (greater than 1000 ft bgs). Human receptors (industrial worker, construction worker, and resident) may be exposed through direct contact with soil or suspended particulates by ingestion, inhalation, dermal contact, and external irradiation pathways. Direct contact exposure pathways from subsurface contamination to human receptors are complete for the resident and the construction worker, where appropriate. The exposure pathways are the same as those for surface soil. Sources, exposure pathways, and receptors are shown in the conceptual site model (CSM) (Figure J-3.1-1).

The sites in the Upper Mortandad Canyon Aggregate Area are industrial areas on Laboratory property. Two of the sites [Consolidated Unit 48-007(a)-00 and AOC 03-041] provide potential habitat for ecological receptors, but the remaining six sites [SWMUs 03-034(a), 50-006(c), and 50-011(a), and AOCs 48-002(e), 48-011, and 48-012] are covered with asphalt, with four of the sites [SWMUs 03-034(a) and 50-011(a), and AOCs 48-011 and 48-012] also being deeper than 5 ft bgs. For unpaved sites or areas where potential habitat is present, exposure pathways are complete to surface soil and tuff for ecological receptors. For the sites covered with asphalt, there are no complete exposure pathways to ecological receptors. However, potential ecological risk was evaluated for SWMU 50-006(c) and AOC 48-002(e). Potential ecological risk was not evaluated for the four deeper sites because not only are the sites covered but they are at depths greater than 0–5 ft. Weathering of tuff is the only viable natural process that may result in the exposure of receptors to COPCs in tuff. However, because of the slow rate of weathering expected for tuff, exposure to COPCs in tuff is negligible, although it is included in the assessments. Exposure pathways to subsurface contamination below 5 ft are not complete unless contaminated soil or tuff were excavated and brought to the surface. The potential pathways are root uptake by plants, inhalation of vapors (burrowing animals only), inhalation of dust, dermal contact, incidental ingestion of soil, external irradiation, and food web transport. Pathways from subsurface releases may be complete for plants. Surface water was not evaluated because of the lack of surface water features. Sources, exposure pathways, and receptors are presented in the CSM (Figure J-3.1-1).

J-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of a chemical in the environment; the evaluation of transport addresses the physical processes affecting mobility of a contaminant along a migration pathway. Migration through soil and tuff depends on properties such as soil pH, rate of precipitation or snowmelt, soil moisture content, soil/tuff hydraulic properties, and properties of the COPCs. Migration into and through tuff also depends on the unsaturated flow properties of the tuff and the presence of joints and fractures.

The most important factor with respect to the potential for COPCs to migrate to groundwater is the presence of saturated conditions. Downward migration in the vadose zone is also limited by a lack of hydrostatic pressure as well as the lack of a source for the continued release of contamination. Without sufficient moisture and a source, little or no potential migration of materials through the vadose zone to groundwater occurs.

Contamination at depth is addressed in the discussion of nature and extent (Appendix I). Results from the deepest samples collected showed either no detected concentrations of COPCs or low/trace-level concentrations of only a few inorganic, radionuclide, and/or organic COPCs in tuff. The limited extent of contamination is related to the absence of the key factors that facilitate migration, as discussed above. Given how long the contamination has been present in the subsurface, physical and chemicals properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to groundwater is very low.

The NMED guidance (NMED 2009, 106420) contains screening levels that consider the potential for contaminants in soil to result in groundwater contamination. These screening levels consider equilibrium partitioning of contaminants among solid, aqueous, and vapor phases and account for dilution and attenuation in groundwater through the use of dilution attenuation factors (DAFs). These DAF soil screening levels (SSLs) can be used to identify chemical concentrations in soil that have the potential to contaminate groundwater (EPA 1996, 059902). Screening contaminant concentrations in soil against these DAF SSLs does not, however, provide an indication of the potential for contaminants to migrate to groundwater. The assumptions used in the development of these DAF SSLs include an assumption of uniform contaminant concentrations from the contaminant source to the water table (i.e., it is assumed that migration to groundwater has already occurred). Furthermore, this assumption is inappropriate for cases such as the Upper Mortandad Canyon Aggregate Area where sampling has shown that contamination is vertically bounded near the surface, and the distance from the surface to the water table is large. For these reasons, screening of contaminant concentrations in soil against the DAF SSLs was not performed.

The best indication of the potential for future contaminant migration to groundwater is the current vertical distribution of contaminants in the subsurface. Most releases at the Upper Mortandad Canyon Aggregate Area are historical (i.e., they occurred decades ago). The regional aquifer beneath the aggregate area is greater than 1000 ft bgs. Therefore, for migration of contaminants to occur from shallow soil to the regional aquifer in a meaningful time frame (e.g., 100 to 1000 yr), significant vertical migration should have already occurred. Sampling has shown that this migration has not occurred, indicating a very low potential for future contaminant migration to groundwater.

The relevant release and transport processes of the COPCs are a function of chemical-specific properties that include the relationship between the physical form of the constituents and the nature of the constituent transport processes in the environment. Specific properties include the degree of saturation, the potential for ion exchange or sorption, and the potential for natural bioremediation. The transport of volatile organic compounds (VOCs) occurs primarily in the vapor phase by diffusion or advection in subsurface air. The chemical and physical properties of the Upper Mortandad Canyon Aggregate Area COPCs are presented in Tables J-3.2-1, J-3.2-2, and J-3.2-3.

The primary release and transport mechanisms that may lead to the potential exposure of receptors in the Upper Mortandad Canyon Aggregate Area include

- dissolution and/or particulate transport of surface contaminants from precipitation and runoff,
- airborne transport of contaminated surface soil or particulates,
- continued dissolution and advective/dispersive transport of chemical and radiological contaminants contained in subsurface soil and bedrock,

- biotic perturbation and/or translocation of contaminants in subsurface contaminated media, and
- uptake of contaminants from soil and water by biota.

Contaminant distributions at the sites indicate that after the initial deposition of contaminants from operational activities and historical remediation efforts, elevated levels of contaminants tend to remain concentrated in the vicinity of the original release points.

J-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate such as that found at the sites within the Upper Mortandad Canyon Aggregate Area, inorganic chemicals are not highly soluble or mobile in the environment. The primary physical and chemical factors that determine and describe the distribution of inorganic COPCs within the soil and tuff are the water solubility of the inorganic chemical and the soil-water partition coefficient (K_d). Other factors besides the K_d values, such as speciation in soil and oxidation/reduction potential (Eh) potential and pH, also play a role in the likelihood that inorganic chemicals will migrate. The K_d values provide a general assessment of the potential for migration through the subsurface; chemicals with higher K_d values are less likely to be mobile than those with lower K_d values. Inorganic chemicals with K_d values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270). Table J-3.2-1 presents the K_d values for the inorganic COPCs identified at the Upper Mortandad Canyon Aggregate Area sites. Based on this criterion, antimony, barium, cadmium, calcium, chromium, cobalt, fluoride, lead, manganese, mercury, nickel, thallium, vanadium, and zinc have a low potential to mobilize and migrate through soil and the vadose zone. The K_d values for chromium hexavalent ion, copper, cyanide, iron, nitrate, perchlorate, and selenium are less than 40 and may indicate that these inorganic chemicals have a greater potential to mobilize and migrate through soil and the vadose zone.

These COPCs are discussed further in the following sections. Information about the fate and transport properties of inorganic chemicals was obtained from individual chemical profiles published by the Agency for Toxic Substances and Disease Registry (ATSDR) (ATSDR 1997, 056531). Information for these inorganic chemicals is also available from the ATSDR website at http://www.atsdr.cdc.gov/toxpro2.html.

- Chromium is a naturally occurring element found in rocks, animals, plants, and soil and in volcanic dust and gases. Chromium is present in the environment in several different forms. The most common forms are chromium(0); trivalent [or chromium(III)], a noncarcinogen; and hexavalent [or chromium(VI)], a carcinogen. Chromium(III) occurs naturally in the environment and is an essential nutrient required by the human body to promote the action of insulin in body tissues so that sugar, protein, and fat can be used by the body. Chromium(VI) and chromium(0) are generally produced by industrial processes. Chromium can attach strongly to soil, and is therefore not very mobile. The movement of chromium in soil depends on the type and condition of the soil and other environmental factors. Organic matter in soil is expected to convert soluble chromate, chromium (VI) to insoluble chromium (III) oxide. The reduction of chromium (VI) to chromium (III) is facilitated by low pH. The extent of chromium is defined.
- Copper movement in soil is determined by physical and chemical interactions with the soil components. Most copper deposited in soil is strongly adsorbed and remains in the upper few centimeters. Copper will adsorb to organic matter, carbonate minerals, clay minerals, hydrous iron, and manganese oxides. In most temperate soil, pH, organic matter, and ionic strength of the soil solutions are the key factors affecting adsorption. Copper binds to soil much more strongly than other divalent cations, and the distribution of copper in the soil solution is less affected by pH than other metals. Copper is expected to be bound to the soil and move in the system by way of

transport of soil particles by water as opposed to movement as dissolved species. The average soil pH is 7.3 in the Upper Mortandad Canyon Aggregate Area, so leaching of copper is unlikely.

- Cyanide tends to adsorb onto various natural media, including clay and sediment; however, sorption is insignificant relative to the potential for cyanide to volatilize and/or biodegrade. At soil surfaces, volatilization of hydrogen cyanide is a significant mechanism for cyanide loss. Cyanide occurring at low concentrations in subsurface soil is likely to biodegrade under both aerobic and anaerobic conditions. The extent of cyanide is defined.

- Iron is naturally occurring in soil and tuff and may be relatively mobile under reducing conditions. Iron is sensitive to soil pH conditions and occurs in two oxidation states: iron(III), the insoluble oxidized form, and iron(II), the reduced soluble form. Most iron in well drained neutral to alkaline soil is present as precipitates of iron(III) hydroxides and oxides. With time, these precipitates are mineralized and form various iron-bearing minerals, such as lepidcrocite, hematite, and goethite. Iron is not expected to be mobile in the neutral soil (average pH = 7.3) in the Upper Mortandad Canyon Aggregate Area. The extent of iron is defined.

- Nitrate (and to a lesser degree perchlorate) is highly soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the Upper Mortandad Canyon Aggregate Area sites has low moisture content, which would inhibit the mobility of nitrate as well as most other inorganic chemicals.

- Perchlorate is soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the Upper Mortandad Canyon Aggregate Area has low moisture content, which would inhibit the mobility of perchlorate as well as most other inorganic chemicals. The extent of perchlorate is defined.

- Selenium is not often found in the environment in its elemental form but is usually combined with sulfide minerals or with silver, copper, lead, and nickel minerals. In soil, pH and Eh are determining factors in the transport and partitioning of selenium. In soil with a pH of greater than 7.5, selenates, which have high solubility and a low tendency to adsorb onto soil particles, are the major selenium species and are very mobile. The average soil pH within the Upper Mortandad Canyon Aggregate Area is 7.3, which indicates that selenium is not likely to migrate.

J-3.2.2 Organic Chemicals

Table J-3.2-2 presents the physical and chemical properties (organic carbon-water partition coefficient [K_{oc}], logarithm to the base 10 octanol/water partition coefficient [log K_{ow}], and solubility) of the organic COPCs identified for the Upper Mortandad Canyon Aggregate Area. Physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following physiochemical property information illustrates some aspects of the fate and transport tendencies of the Upper Mortandad Canyon Aggregate Area COPCs. The information is summarized from Ney (1995, 058210).

Water solubility may be the most important chemical characteristic used to assess mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility greater than 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. Acetone, benzoic acid, butanone[2-], indeno[1,2,3-cd]pyrene, methylene chloride, methylphenol[2-], methylphenol[4-], and trichlorofluoromethane have water solubilities greater than 1000 mg/L.

The lower the water solubility of a chemical, especially below 10 mg/L, the more likely it will be immobilized by adsorption. Chemicals with lower water solubilities are more likely to accumulate or bioaccumulate and persist in the environment, to be slightly prone to biodegradation, and to be metabolized in plants and animals. The COPCs identified as having water solubilities less than 10 mg/L are acenaphthene, anthracene, Aroclor-1254, Aroclor-1260, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, carbazole, chrysene, dibenz[a,h]anthracene, dibenzofuran, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene.

Vapor pressure is a chemical characteristic used to evaluate the tendency of organic chemicals to volatize. Chemicals with vapor pressure greater than 0.01 millimeters of mercury (mm Hg) are likely to volatilize, and therefore, concentrations at the site are reduced over time; vapors of these chemicals are more likely to travel toward the atmosphere and not migrate toward groundwater. Acetone; butanone[2-]; diethylphthalate; dimethylphenol[2,4-]; isopropyltoluene[4-]; methylene chloride; methylnaphthalene[2-]; methylphenol[2-]; methylphenol[4-]; naphthalene; toluene; trichloroethane[1,1,2-]; trichlorofluoromethane; and trimethylbenzene[1,2,4-] have vapor pressures greater than 0.01 mm Hg.

Chemicals with vapor pressures less than 0.000001 mm Hg are less likely to volatilize and, therefore, tend to remain immobile. Benzo[a]pyrene; benzo[b]fluoranthene; benzo[g,h,i]perylene; benzo[k]fluoranthene; bis[2-ethylhexyl]phthalate; carbazole; chrysene; dibenz[a,h]anthracene; and indeno[1,2,3-cd]pyrene have vapor pressures less than 0.000001 mm Hg.

The K_{ow} is an indicator of a chemical's potential to bioaccumulate or bioconcentrate in the fatty tissues of living organisms. The unitless K_{ow} value is an indicator of water solubility, mobility, sorption, and bioaccumulation. The higher the K_{ow} is above 1000, the greater the affinity the chemical has for bioaccumulation in the food chain, the greater its potential for sorption in the soil, and the lower its mobility (Ney 1995, 058210). The COPCs with a K_{ow} greater than 1000 include anthracene; Aroclor-1254; Aroclor-1260; benzo[a]anthracene; benzo[a]pyrene; benzo[b]fluoranthene; benzo[k]fluoranthene; bis[2-ethylhexyl]phthalate; chrysene; dibenz[a,h]anthracene; di-n-butylphthalate; fluoranthene; indeno[1,2,3-cd]pyrene; isopropyltoluene[4-]; phenanthrene; and pyrene. A K_{ow} of less than 500 indicates high water solubility, high mobility, little to no affinity for bioaccumulation, and degradability by microbes, plants, and animals. Acetone, benzoic acid, butanone[2-], methylene chloride, and trichlorofluoromethane have a K_{ow} less than 500.

The K_{oc} measures the tendency of a chemical to adsorb to organic carbon in soil. K_{oc} values above 500 L/kg indicate a strong tendency to adsorb to soil, leading to low mobility (NMED 2009, 106420). Acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo[a]anthracene; benzo[a]pyrene; benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, carbazole, chrysene; dibenz[a,h]anthracene; dibenzofuran; di-n-butylphthalate; fluoranthene; fluorene; indeno[1,2,3-cd]pyrene; methylnaphthalene[2-]; naphthalene; phenanthrene; pyrene; and trimethylbenzene[1,2,4-] have K_{oc} values above 500 L/kg, indicating a very low potential to migrate toward groundwater. The COPCs with K_{oc} values less than 500 L/kg are acetone; benzoic acid; butanone[2-]; diethylphthalate; dimethylphenol[2,4-]; methylene chloride; methylphenol[2-]; methylphenol[4-]; toluene; trichloroethane[1,1,2-]; and trichlorofluoromethane.

Anthracene; Aroclor-1254; Aroclor-1260; benzo[a]anthracene; benzo[a]pyrene; benzo[b]fluoranthene; benzo[k]fluoranthene; bis[2-ethylhexyl]phthalate; chrysene; dibenz[a,h]anthracene; fluoranthene; fluorene; phenanthrene; and pyrene are the least mobile and the most likely to bioaccumulate. The more soluble and volatile COPCs acetone, benzoic acid, butanone[2-], methylene chloride, tetrachloroethene, toluene, and trichlorofluoromethane are more mobile but are also more likely to travel toward the

atmosphere and not migrate toward groundwater. Because the organic COPCs were detected at low concentrations and the extent is defined, they are not likely to migrate to groundwater.

J-3.2.3 Radionuclides

Radionuclides are generally not highly soluble or mobile in the environment, particularly in the semiarid climate of the Laboratory. The physical and chemical factors that determine the distribution of radionuclides within soil and tuff are the K_d, the pH of the soil and other soil characteristics (e.g., sand or clay content), and the Eh. The interaction of these factors is complex, but K_d values provide a general assessment of the potential for migration through the subsurface: chemicals with higher K_d values are less likely to be mobile than those with lower values. Radionuclides with K_d values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270).

Table J-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at the Upper Mortandad Canyon Aggregate Area sites. Based on K_d values, americium-241, cesium-137, cobalt-60, plutonium-238, and plutonium-239 have a very low potential to migrate towards groundwater at the sites within the Upper Mortandad Canyon Aggregate Area. The K_d values for thorium-227, thorum-232, tritium, uranium-234, uranium-235/236, and uranium-238 are less than 40 and indicate a potential to migrate towards groundwater.

- Thorium is a naturally occurring, radioactive metal. Small amounts of thorium are present in all rock, soil, surface water, groundwater, plants, and animals. More than 99% of natural thorium exists in the form thorium-232. Thorium is strongly sorbed to soil and its mobility is very low.

- Uranium is a natural and commonly occurring radioactive element that is present in nearly all rock and soil. The mobility of uranium in soil and its vertical transport to groundwater depend on properties of the soil such as pH, Eh, concentration of complexing anions, porosity of the soil, soil-particle size, and sorption properties as well as the amount of water available. In general, the actinide nuclides form comparatively insoluble compounds in the environment and are therefore not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces; and tend to accumulate in soil and sediment, which ultimately serve as strong reservoirs. Subsequent movement is largely associated with geological processes such as erosion and sometimes leaching.

- Tritium's initial behavior in the environment is determined by the source. If it is released as a gas or vapor to the atmosphere, substantial dispersion can be expected, and the rapidity of deposition is dependent on climatic factors. If tritium is released in liquid form, it is diluted in surface water and is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 058209, p. 147). Tritium concentrations in the subsurface at the area of elevated radioactivity are low (<1 pCi/g), indicating that the area of elevated radioactivity is not a significant source of tritium, although this radionuclide is relatively mobile. Because tritium migrates in association with moisture, the low moisture content of the subsurface limits the potential for tritium to migrate to groundwater.

J-3.2.4 Summary

Saturation is the primary factor in determining the potential for COPCs to migrate to groundwater. Based on investigation results, saturated conditions are not present currently within the Upper Mortandad Canyon Aggregate Area. The lack of saturated conditions and hydrostatic pressure severely limits the

movement of contamination toward groundwater within the Upper Mortandad Canyon Aggregate Area. Without sufficient moisture, little or no potential migration of materials occurs through the vadose zone to groundwater. As a result, the potential for COPC migration to groundwater is very low based on the site conditions, the physical/chemical properties of the COPCs, and the distance to the regional aquifer below the site.

J-3.3 Exposure Point Concentration Calculations

The exposure point concentrations (EPCs) represent upper bound concentrations of COPCs. For comparison to risk-screening levels, the upper confidence limit (UCL) of the arithmetic mean was calculated when possible and used as the EPC. If an appropriate UCL of the mean could not be calculated or if the UCL exceeded the maximum concentration, the maximum detected concentration of the COPC was used as the EPC. The EPCs for dioxin and furan congeners are the sum of the detected congeners weighted by the World Health Organization 1995 toxic equivalent factors (TEFs) (http://www.epa.gov/ncea/pdfs/dioxin/part2/drich9.pdf); the sum is expressed as the TCDD[2,3,7,8-] equivalent. The summary statistics, including the EPC for each COPC for the human health and the ecological risk-screening assessments and the distributions used for the calculations, are presented in Tables J-2.2-1 to J-2.2-11.

Calculation of UCLs of the mean concentrations was done using the EPA ProUCL 4.00.04 (EPA 2009, 106601), which is based on EPA guidance (EPA 2002, 085640). The ProUCL program calculates 95%, 97.5%, and 99% UCLs and recommends a distribution and UCL. The UCL for the recommended calculation method was used as the EPC, unless the recommended value exceeded the maximum detected concentration. The ProUCL software performs distributional tests on the data set for each COPC and calculates the most appropriate UCL based on the distribution of the data set. Environmental data may have a normal, lognormal, or gamma distribution but are often nonparametric (no definable shape to the distribution). Key aspects of the new version of ProUCL are that it tests data against an expanded range of distribution types, contains a larger suite of statistical tests, and can perform analyses on datasets with nondetected values. The ProUCL documentation strongly recommends against using the maximum detected concentration for the EPC. However, it also cautions against using statistical values calculated on less than four to six detected results in a large data set. Therefore, the maximum detected concentration was used to represent the EPC for COPCs with less than five detected concentrations, because the resultant statistical estimate may not be reliable. In these cases, if the observations are highly skewed and result in significant risk because the maximum detected concentration is used, the COPC is further assessed in the uncertainty section. Input and output data files for ProUCL calculations are provided on DVD as Attachment J-1.

J-4.0 HUMAN HEALTH RISK SCREENING ASSESSMENTS

The human health risk-screening assessments were conducted for each site within the Upper Mortandad Canyon Aggregate Area where nature and extent were defined. All sites were screened for the residential scenario using data from 0–10 ft bgs. Individual sites were also screened for the industrial scenario and/or construction worker scenario based on the current and reasonably foreseeable future use. Industrial risk-screening assessments used data from 0–1 ft bgs, while the construction worker risk-screening assessments used data from 0–10 ft bgs. The exposure scenarios evaluated for each site where nature and extent are defined are summarized in Table J-4.0-1.

J-4.1 Soil Screening Levels

Human health risk-screening assessments for nonradiological COPCs were conducted using the residential, construction worker, and industrial SSLs obtained from current NMED guidance (NMED 2009, 106420). If SSLs were not available in current NMED guidance, EPA regional screening levels (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm) or previous NMED guidance (2006, 092513) was used. The EPA SSLs for carcinogens were multiplied by 10 to adjust the screening levels to the NMED target cancer risk level of 1×10^{-5}. Surrogate chemicals were also used for some COPCs without SSLs based on structural similarity or because the COPC is a breakdown product (NMED 2003, 081172). In addition, construction worker SSLs were calculated for methylphenol[2-], methylphenol[4-], and methylnaphthalene[2-] using the exposure parameters and Equation 11 in NMED guidance (NMED 2009, 106420) and the toxicity values from the EPA regional screening tables (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm). Exposure parameters used to calculate the industrial, construction worker, and residential SSLs are presented in Table J-4.1-1.

Radionuclide screening action levels (SALs) are used to compare with radionuclide COPC concentrations and were derived using the residual radioactive (RESRAD) model, Version 6.21 (LANL 2005, 088493). The SALs are based on a 15 mrem/yr dose per DOE guidance (2000, 067489). Exposure parameters used to calculate the industrial, construction worker, and residential SALs are presented in Tables J-4.1-2 and J-4.1-3.

J-4.2 Results of the Human Health Risk Screening Evaluations

The EPC of each COPC was compared with the SSLs/SALs for the appropriate scenario(s). For carcinogenic chemicals, the EPCs were divided by the NMED or adjusted EPA SSL and then multiplied by 1×10^{-5}. The sum of the cancer risks was compared with the NMED target cancer risk level of 1×10^{-5}. For noncarcinogenic chemicals, a hazard quotient (HQ) was generated for each COPC by dividing the EPC by the NMED or EPA SSL. The HQs were summed to generate a hazard index (HI). The HI was compared with the NMED target HI of 1.0. The dose is determined by dividing the EPC by the SAL, multiplying the ratio by 15 mrem/yr, and summing the individual doses to obtain the total dose for the site. The sum of the doses was compared with the DOE target dose level of 15 mrem/yr (DOE 2000, 067489). The results of the human health risk-screening evaluations for the Upper Mortandad Canyon Aggregate Area sites are presented in Tables J-4.2-1 to J-4.2-41.

J-4.2.1 SWMU 03-034(a)

The samples and the potential contamination associated with the storage tanks are deeper than 10 ft. A risk-screening assessment was conducted using maximum detected concentrations of the COPCs from the sampled depths.

The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-1, J-4.2-2, and J-4.2-3. The total excess cancer risk is approximately 3×10^{-8}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.000001, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.0009 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

J-4.2.2 AOC 03-041

The dioxin and furan congener TEF calculations are presented in Table J-4.2-4. The results of the risk-screening assessments for the industrial scenario are presented in Tables J-4.2-5 and J-4.2-6. The total

excess cancer risk is approximately 2×10^{-7}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.05, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). No radionuclide COPCs were identified in the 0–1-ft depth interval.

The dioxin and furan congener TEF calculations are presented in Table J-4.2-4. The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-7, J-4.2-8, and J-4.2-9. The total excess cancer risk is approximately 7×10^{-7}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.4, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.002 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

Calcium was identified as a COPC but does not have a published toxicity value. Calcium is among those elements identified in section 5.9.4 of EPA's Risk Assessment Guidance for Superfund (EPA 1989, 008021) as an essential macronutrient, which can be eliminated as a COPC on the basis of best professional judgment. As an essential nutrient, calcium may be compared to the recommended daily allowance (RDA) for adults and children. The RDA is 1200 mg of calcium per day (mg/d) for an adult and 800 mg/d for a child (National Research Council 1989, 064000). If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at AOC 03-041 of 4250 mg/kg, at the EPA default adult soil ingestion rate of 100 mg of soil per day, an adult would ingest approximately 0.61 mg calcium per day. At the intake level of 0.61 mg/d, the adult's ingestion of calcium is far less than the RDA for calcium of 1200 mg/d. If all the daily incidental ingestion of soil were to occur at the location of the maximum concentration detected at AOC 03-041 of 4250 mg/kg, at the EPA default child soil ingestion rate of 200 mg of soil per day, a child would ingest approximately 1.42 mg/d. At the intake level of 1.42 mg/d, the child's ingestion of calcium is far less than the RDA for calcium of 800 mg/d. Therefore, no adverse health effects are expected from calcium at 4250 mg/kg, and calcium is eliminated as a COPC.

J-4.2.3 AOC 48-002(e)

At AOC 48-002(e), no samples were collected from 0–1 ft because the site is covered with asphalt. All surface samples were collected below the asphalt, which was approximately 1 ft thick.

The dioxin and furan congener TEF calculations are presented in Table J-4.2-10. The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-11 and J-4.2-12. The total excess cancer risk is approximately 3×10^{-8}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.01, which is less than the NMED target HI of 1.0 (NMED 2009, 106420).

J-4.2.4 Consolidated Unit 48-007(a)-00

The dioxin and furan congener TEF calculations are presented in Table J-4.2-13. The results of the risk-screening assessments for the industrial scenario are presented in Tables J-4.2-14, J-4.2-15, and J-4.2-16. The total excess cancer risk is approximately 3×10^{-6}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.02, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.4 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

The dioxin and furan congener TEF calculations are presented in Table J-4.2-17. The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-18, J-4.2-19, and J-4.2-20. The total excess cancer risk is approximately 1×10^{-5}; which is equivalent to the NMED target

risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 2 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

J-4.2.5 AOC 48-011

The samples and the potential contamination associated with the disposal shaft are deeper than 10 ft. A risk-screening assessment was conducted using maximum detected concentrations of the COPCs from the sampled depths.

The dioxin and furan congener TEF calculations are presented in Table J-4.2-21. The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-22 and J-4.2-23. The total excess cancer risk is approximately 9×10^{-9}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2009, 106420).

J-4.2.6 AOC 48-012

The results of the risk-screening assessments for the construction worker scenario are presented in Tables J-4.2-24 and J-4.2-25. The total excess cancer risk is approximately 1×10^{-5}; which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.05, which is less than the NMED target HI of 1.0 (NMED 2009, 106420).

The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-26 and J-4.2-27. The total excess cancer risk is approximately 5×10^{-4}; which is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk for the residential scenario is due primarily to benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; and dibenz(a,h)anthracene. The HI is approximately 0.1, which is less than the NMED target HI of 1.0 (NMED 2009, 106420).

J-4.2.7 SWMU 50-006(c)

The dioxin and furan congener TEF calculations are presented in Table J-4.2-28. The results of the risk-screening assessments for the industrial scenario are presented in Tables J-4.2-29, J-4.2-30, and J-4.2-31. The total excess cancer risk is approximately 5×10^{-6}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.003, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 18 mrem/yr, which is above the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The elevated dose is primarily from thorium-232.

The dioxin and furan congener TEF calculations are presented in Table J-4.2-28. The results of the risk-screening assessments for the construction worker scenario are presented in Tables J-4.2-32, J-4.2-33, and J-4.2-34. The total excess cancer risk is approximately 5×10^{-7}; which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.002, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 15 mrem/yr, which is equivalent to the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

The dioxin and furan congener TEF calculations are presented in Table J-4.2-28. The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-35, J-4.2-36, and J-4.2-37. The total excess cancer risk is approximately 2×10^{-5}; which is slightly above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is approximately 0.01, which is less than the NMED

target HI of 1.0 (NMED 2009, 106420). The total dose is 28 mrem/yr, which is greater than the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The dose is primarily from cobalt-60.

J-4.2.8 SWMU 50-011(a)

The results of the risk-screening assessments for the construction worker scenario are presented in Tables J-4.2-38 and J-4.2-39. Carcinogenic COPCs were not detected; therefore, the cancer risk was not evaluated. The HI is approximately 0.0004, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.04 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

The results of the risk-screening assessments for the residential scenario are presented in Tables J-4.2-40 and J-4.2-41. Carcinogenic COPCs were not detected; therefore, the cancer risk was not evaluated. The HI is approximately 0.001, which is less than the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.06 mrem/yr, which is less than the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

J-4.3 Uncertainty Analysis

The human health risk-screening assessments are subject to varying degrees and types of uncertainty. Aspects of data evaluation and COPC identification, exposure assessment, toxicity assessment, and the additive approach all contribute to uncertainties in the risk-assessment process.

J-4.3.1 Data Evaluation and COPC Identification Process

A primary uncertainty associated with the COPC identification process is the possibility that a chemical may be identified as a COPC when it is actually not a COPC or that a chemical may not be identified as a COPC when it actually should be identified as a COPC. Inorganic chemicals and radionuclides are appropriately identified as COPCs through statistics or maximum detected concentration comparisons. However, established BVs may not accurately represent certain subunits of the Bandelier Tuff (e.g., fractured, clay-rich material) encountered during sampling because such data are not included in the background data set. There are no established BVs for organic chemicals, and all detected organic chemicals are identified as COPCs.

Other uncertainties may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening assessments include detected less than estimated quantitation limits and nondetects above BVs, data evaluation uncertainties have little effect on the risk-screening results.

J-4.3.2 Exposure Assessment

The following exposure assessment uncertainties were identified for the risk assessment: (1) the applicability of the scenarios, (2) the assumptions underlying the exposure pathways, and (3) the derivation of the EPCs.

A worker may be subject to exposures in a different manner than the exposure assumptions used to derive the industrial SSLs. The assumptions for the SSLs are that the potentially exposed individual is outside on-site for a full work day, for 225 d/yr and 25 yr (NMED 2009, 106420). The construction worker scenario is based on exposure of 8 h/d, 250 d/y, and 1 yr (NMED 2009, 106420). For the sites evaluated, workers are not on-site for that frequency and duration. This assumption is particularly true of the hillslope

areas and areas outside of the security fences. As a result, the industrial and construction worker scenarios overestimate the potential exposure and risk/dose. The residential scenario is based on exposure of 24 h/d, 350 d/yr, and 30 yr (NMED 2009, 106420) and also overestimates the potential exposure and risk/dose.

Six sites [SWMUs 03-034(a), 50-006(c), and 50-011(a), and AOCs 48-002(e), 48-011, and 48-012] are covered by asphalt. The asphalt cover will likely remain in place for the reasonably foreseeable future and acts as a barrier for exposure and complete pathways to receptors. However, potential human health risks and doses were evaluated for these sites despite the lack of complete exposure pathways.

A number of assumptions are made relative to exposure pathways, including input parameters, whether or not a given pathway is complete, the contaminated media to which an individual may be exposed, and intake rates for different routes of exposure. In the absence of site-specific data, the exposure assumptions used were consistent with default (NMED 2009, 106420). When several upper-bound values (as are found in NMED [2009, 106420] or EPA regional screening tables) are combined to estimate exposure for any one pathway, the resulting risk can exceed the 99th percentile and, therefore, can exceed the range of risk that may be reasonably expected. Also, the assumption that residual concentrations of chemicals in the tuff are available and result in exposure in the same manner as if they were in soil overestimates the potential exposure and risk to receptors.

Uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at a site. The use of a UCL is intended to provide a protective, upper-bound estimate of the COPC concentration and is assumed to be representative of the average exposure to a COPC across the entire site. Potential risk and exposure from a single location or area with relatively high COPC concentrations may be underestimated if a representative, site-wide value is used. The use of the maximum detected concentration for the EPC overestimates the exposure to contamination because receptors are not consistently exposed to the maximum detected concentration across the site.

Some VOCs were detected in soil and tuff at a few sites. The primary sources of VOCs were the stormwater outfalls that discharged treated cooling-tower blowdown and currently discharge stormwater runoff from parking lots. The NMED SSLs do not include an evaluation of VOCs migration into indoor air. However, the EPA Region 6 had screening levels for an indoor worker that included a pathway for inhalation of VOCs volatilized from soil (EPA 2007, 099314). The maximum VOC concentrations detected in soil/tuff across the aggregate area were compared with the EPA Region 6 indoor worker screening values, and VOC concentrations were found to be substantially less than the screening values (from 3 to 6 orders of magnitude less than the screening value) (Table J-4.3-1). Based on this evaluation, the vapor intrusion into buildings within the Upper Mortandad Canyon Aggregate Area is an unlikely pathway for exposure. In addition, the EPA's draft guidance (EPA 2002, 094114, p. 2) for evaluating subsurface vapor intrusion specifically states that the approaches are primarily designed to ensure protection in residential settings. The possible adjustment for other land uses, in this case industrial, is discussed in the document (EPA 2002, 094114, p. 3). The draft guidance indicates that the Occupational Safety and Health Administration (OSHA) generally take the lead in addressing occupational exposures (EPA 2002, 094114, p. 3). The document further states that workers generally understand the workplace regulations (and monitoring, as needed) that already apply and are provided for their protection. In general, therefore, EPA does not expect this guidance to be used for settings that are primarily occupational.

SWMU 50-006(c)

The total doses for the industrial, construction worker, and residential scenarios were 18 mrem/yr, 15 mrem/yr, and 28 mrem/yr, respectively. All the total doses were influenced to varying degrees by

thorium-232, a naturally occurring isotope of thorium. The soil background value for thorium-232 is 2.33 pCi/g (LANL 1998, 059730). The background for thorium-232 should be subtracted from the EPC (4.03 pCi/g) and the dose recalculated using the portion of thorium-232 above background (1.7 pCi/g). Dividing 1.7 pCi/g by the industrial SAL (5 pCi/g) and multiplying by 15 mrem/yr results in a thorium-232 dose of 5 mrem/yr and a total dose for this SWMU of 11 mrem/yr, which is below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). Similarly, by dividing 1.7 pCi/g by the construction worker and residential SAL (15 pCi/g) and multiplying by 15 mrem/yr, the thorium-232 doses are 1.7 pCi/g. The total doses for the construction worker and residential scenarios are now 12 mrem/yr and 26 mrem/yr, respectively, for this SWMU.

J-4.3.3 Toxicity Assessment

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (slope factors [SFs] and reference doses [RfDs]) were used to derive the risk-based screening values used in the screening evaluation (NMED 2009, 106420). Uncertainties were identified in five areas with respect to the toxicity values: (1) extrapolation from other animals to humans, (2) interindividual variability in the human population, (3) the derivation of RfDs and SFs, (4) the chemical form of the COPC, and (5) the use of surrogate chemicals.

Extrapolation from Animals to Humans: The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in each of these steps, resulting in the overestimation of potential risk.

Individual Variability in the Human Population: For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no-observed-adverse-effect level (NOAEL). The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment. This factor of 10 is generally considered to result in a conservative estimate of risk to noncarcinogenic COPCs.

Derivation of RfDs and SFs: The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist between other animals and humans in chemical absorption, metabolism, excretion, and toxic response. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated into each of these steps, resulting in the overestimation of potential risk.

Chemical Form of the COPC: COPCs may be bound to the environmental matrix and not available for absorption into the human body. However, the exposure scenarios default to the assumption that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

Use of Surrogate Chemicals: The use of surrogates for chemicals that do not have EPA-approved or provisional toxicity values also contributes to uncertainty in risk assessment. Surrogates were used to provide SSLs for benzo[g,h,i]perylene and isopropyltoluene[4-] based on structural similarity. The overall impact of surrogates on the risk assessment is minimal because these COPCs were generally detected at low concentrations (less than 1 mg/kg).

J-4.3.4 Lead Toxicity

The lead SSLs are based on a blood level of 10 µg/dL using EPA's Integrated Exposure Uptake Biokinetic model. Lead is a COPC for two sites evaluated for risk in the Upper Mortandad Canyon Aggregate Area. The ratios of the lead EPCs to the SSLs were 0.1 or less and the HIs were all less than 1.0 for all scenarios evaluated at these sites. Thus, lead is not driving a hazard, and the concentrations do not exceed a blood lead level of 10 µg/dL for any receptors. Therefore, an independent assessment of lead is not warranted.

J-4.3.5 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally not known, and possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms and on different target organs but are addressed additively.

J-4.4 Interpretation of Human Health Risk Screening Results

SWMU 03-034(a)

The total excess cancer risk for the residential scenario is 3×10^{-8}, which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.000001, which is below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose for the residential scenario is 0.0009 mrem/yr, which is below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 2×10^{-8}, based on a comparison with EPA's residential preliminary remediation goals (PRGs) for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the preliminary risk-screening assessment results, there are no potential unacceptable risks or doses from COPCs for the residential scenario.

AOC 03-041

The total excess cancer risks for the industrial and residential scenarios are 2×10^{-7} and 7×10^{-7}, respectively. These risks are below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.05 and 0.4, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total dose is 0.002 mrem/yr for the residential scenario, which is below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the residential scenario is equivalent to a total risk of 3×10^{-8}, based on a comparison with EPA's residential PRGs for radionuclides (http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). No radionuclide COPCs were identified for the industrial scenario.

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

AOC 48-002(e)

The total excess cancer risk for the residential scenario is 3×10^{-8}; which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.01, which is below the NMED target HI of 1.0 (NMED 2009, 106420).

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

Consolidated Unit 48-007(a)-00

The total excess cancer risks for the industrial and residential scenarios are 3×10^{-6} and 1×10^{-5}, respectively. These risks are below or equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.02 and 0.1, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 0.4 mrem/yr and 2 mrem/yr, respectively, which are below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the industrial scenario is equivalent to a total risk of 6×10^{-7}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 1×10^{-6}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

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

AOC 48-011

The total excess cancer risk for the residential scenario is 9×10^{-9}; which is below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HI is 0.002, which is below the NMED target HI of 1.0 (NMED 2009, 106420).

Based on the preliminary risk-screening assessment results, there are no potential unacceptable risks from COPCs for the residential scenario.

AOC 48-012

The total excess cancer risks for the construction worker and residential scenarios are 1×10^{-5} and 5×10^{-4}, respectively. The risk for the construction worker scenario is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420), while the risk for the residential scenario is above the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.05 and 0.1, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420).

Based on the risk-screening assessment results, there are no potential unacceptable risks from COPCs for the construction worker scenario, but there are potential unacceptable risks from COPCs for the residential scenario.

SWMU 50-006(c)

The total excess cancer risks for the industrial, construction worker, and residential scenarios are 5×10^{-6}, 5×10^{-7}, and 2×10^{-5}, respectively. The risks for the industrial and construction worker scenarios are below the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The elevated cancer risk for the

residential scenario is from polycyclic aromatic hydrocarbons (PAHs) from the asphalt roads and parking lots. If PAHs are eliminated from the risk-assessment calculations, the excess cancer risk is reduced to 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2009, 106420). The HIs are 0.003, 0.002, and 0.01, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 18 mrem/yr, 15 mrem/yr, and 28 mrem/yr, respectively, which are above the DOE target dose of 15 mrem/yr (DOE 2000, 067489) for the industrial and residential scenarios. However, as discussed in the uncertainty analysis (section 4.3.2, p. J-17), the doses are in part influenced by thorium-232, which is naturally occurring. By subtracting the background concentration (2.33 pCi/g) for thorium-232 from the EPC, the total doses are 11 mrem/yr, 12 mrem/yr, and 26 mrem/yr for the industrial, construction worker, and residential scenarios, respectively. The elevated dose for the residential scenario is primarily from cobalt-60. The total doses for the industrial scenario are below the DOE target dose of 15 mrem/yr (DOE 2000, 067489).

The total dose for the industrial scenario is equivalent to a total risk of 3×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the construction worker scenario is equivalent to a total risk of 3×10^{-5}, based on a comparison with EPA's industrial PRGs for radionuclides. The total dose for the residential scenario is equivalent to a total risk of 5×10^{-5}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

Based on the risk-screening assessment results, there are no potential unacceptable risks from COPCs for the industrial, construction worker, and residential scenarios. Based on the risk-screening assessment results, there are no potential unacceptable doses from COPCs for the industrial and construction worker scenarios, but there is potential unacceptable dose from COPCs for the residential scenario.

SWMU 50-011(a)

No carcinogenic COPCs were found at this site. The HIs for the construction worker and residential scenarios are 0.0004 and 0.001, respectively, which are below the NMED target HI of 1.0 (NMED 2009, 106420). The total doses are 0.04 mrem/yr and 0.06 mrem/yr, respectively, which are below the DOE target dose of 15 mrem/yr (DOE 2000, 067489). The total dose for the construction worker scenario is equivalent to a total risk of 8×10^{-6}, based on a comparison with EPA's industrial PRGs for radionuclides (available at http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls). The total dose for the residential scenario is equivalent to a total risk of 5×10^{-7}, based on a comparison with EPA's residential PRGs for radionuclides (available http://epa-prgs.ornl.gov/radionuclides/download/rad_master_prg_table_pci.xls).

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

J-5.0 ECOLOGICAL RISK SCREENING ASSESSMENTS

J-5.1 Introduction

The approach for conducting ecological assessments is described in the "Screening Level Ecological Risk Assessment Methods, Revision 2" (LANL 2004, 087630). The assessment consists of the following four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

J-5.2 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening assessment. The ecological scoping checklists are useful tools for organizing existing ecological information (Attachment J-2). The information in the scoping checklists is used to determine whether ecological receptors might be affected, identify the types of receptors that might be present, and develop the ecological conceptual site model for each site. All of the sites are in an industrial area; some sites are in undeveloped areas, while other sites are in developed areas with pavement overlying the site. For the sites that are undeveloped, the area typically provides minimal potential habitat for ecological receptors. However, because of the presence of Laboratory facilities, the quality of the habitat varies.

The scoping portion of the assessment indicated that terrestrial receptors were appropriate for evaluating the concentrations of contaminants in soil and tuff samples. Aquatic receptors were not evaluated because no aquatic communities and no aquatic habitat or perennial source of water exist at any of the sites within the aggregate area. The depth of the regional aquifer (greater than 1000 ft bgs) and the semiarid climate limit transport to groundwater. The potential exposure pathways for terrestrial receptors in soil and tuff are root uptake, inhalation, soil ingestion, dermal contact, external irradiation, and food-web transport (Figure J-3.1-1). The weathering of tuff is the only viable natural process that may result in the exposure of receptors to contaminants in tuff. Because of the slow rate of weathering expected for tuff, exposure in tuff is negligible, although it is included in the assessment. Plant exposure in tuff is largely limited to fractures near the surface, which does not produce sufficient biomass to support an herbivore population. Consequently, the contaminants in tuff are unavailable to receptors. Much of the area on the mesa tops in the Upper Mortandad Canyon Aggregate Area is developed with buildings, parking lots, and roads. At these sites there are currently no complete pathways to ecological receptors.

The potential risk was evaluated in the risk-screening assessments for the following ecological receptors representing several trophic levels:

- a plant,
- soil-dwelling invertebrates (represented by the earthworm),
- the deer mouse (mammalian omnivore),
- the montane shrew (mammalian insectivore),
- the desert cottontail (mammalian herbivore),
- the red fox (mammalian carnivore),
- the American robin (avian insectivore, avian omnivore, and avian herbivore), and
- the American kestrel (avian intermediate carnivore and avian carnivore (surrogate for threatened and endangered [T&E] species [primarily the Mexican spotted owl]).

The rationale for these receptors is presented in “Screening Level Ecological Risk Assessment Methods, Revision 2” (LANL 2004, 087630).

J-5.3 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. The endpoints are ecologically relevant and help sustain the natural structure, function, and biodiversity of an

ecosystem or its components (EPA 1998, 062809). In a screening-level ecological evaluation, receptors represent the populations and/or communities, and assessment endpoints are any adverse effects on the chosen ecological receptors. The purpose of the ecological evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species and treaty-protected species, when individuals must be protected (EPA 1999, 070086) because populations of protected species tend to be small and the loss of an individual adversely affects the species as a whole (EPA 1997, 059370).

In accordance with this guidance, the Laboratory has developed generic assessment endpoints (LANL 1999, 064137) to ensure that values at all levels of ecological organization are considered in the ecological screening process. These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each functional group. The receptor species were chosen because of their presence at the site, their sensitivity to the chemicals of potential ecological concern (COPECs), and their potential for exposure to those COPECs. These categories of effects and the chosen receptor species were used to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values (TRVs). Toxicity studies used in the development of TRVs included only studies in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is designed to be protective of both the representative species used as screening receptors and the other species within their feeding guilds and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures the applicability to the ecosystem of concern.

J-5.4 Screening Evaluation

The ecological risk-screening assessments identify COPECs and are based on the comparison of EPCs (UCLs or maximum detected concentrations) to ecological screening levels (ESLs) in accordance with Laboratory guidance (LANL 2004, 087630). Ecological risk-screening assessments were conducted for Consolidated Unit 48-007(a)-99, SWMU 50-006(c), AOC 03-041, and AOC 48-002(e), but were not conducted for the other four sites because samples were below 5 ft bgs. The EPCs used in the ecological risk-screening assessments are presented in Tables J-2.2-2, J-2.2-4, J-2.2-7, and J-2.2-10. Input and output data files for ProUCL calculations are provided on a DVD as Attachment J-1. The ESLs obtained from the ECORISK Database, Version 2.3 (LANL 2008, 103352) are presented in Table J-5.4-1. The ESLs are based on similar species and are derived from experimentally determined NOAELs, lowest-observed-adverse-effect levels (LOAELs), or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and TRVs, is presented in the ECORISK Database, Version 2.3 (LANL 2008, 103352).

The HQ calculated for each COPEC and screening receptor is the ratio of the EPC to the ESLs for each ecological receptor. The higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. The analysis begins with a comparison of the minimum ESL for each COPC with the EPC. HQs greater than 0.3 are used to identify COPECs (LANL 2004, 087630). Individual HQs for a receptor are summed to derive an HI; an HI greater than 1.0 is an indication that further assessment may be needed to be sure that exposure to multiple COPECs at a site will not lead to potential adverse impacts to

a given receptor population. COPCs without ESLs are retained as COPECs and evaluated further in the uncertainty section. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

J-5.4.1 AOC 03-034(a)

The samples and the potential contamination associated with the waste tanks are at 16 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted.

J-5.4.2 AOC 03-041

The dioxin and furan congener TEF calculations are presented in Table J-4.2-4. The results of the minimum ESL comparisons are presented in Table J-5.4-2. Antimony, lead, and TCDD[2,3,7,8-] equivalent are retained as COPECs because the HQs are greater than 0.3. Calcium, iron, nitrate, and perchlorate do not have ESLs and are retained as COPECs.

An HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. Table J-5.4-3 presents the HQs and HIs for each receptor/COPEC at AOC 03-041. The HI analysis indicates that the shrew, deer mouse, and plant have HIs greater than 1.0, while the kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), cottontail, red fox, and earthworm have HIs less than or equivalent to 1.0. The COPECs and receptors are discussed in the uncertainty section.

J-5.4.3 AOC 48-002(e)

The dioxin and furan congener TEF calculations are presented in Table J-5.4-4. The results of the minimum ESL comparisons are presented in Table J-5.4-5. Barium, chromium, and cyanide are retained as COPECs because the HQs were greater than 0.3. Nitrate and perchlorate do not have ESLs and are retained as COPECs.

An HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. Table J-5.4-6 presents the HQs and HIs for each receptor/COPEC at AOC 48-002(e). The HI analysis indicates that the kestrel (intermediate carnivore), the kestrel (top carnivore), robin (all feeding guilds), earthworm, and plant have HIs greater than 1.0, while the deer mouse, shrew, cottontail, and red fox have HIs less than 1.0. The COPECs and receptors are discussed in the uncertainty section.

J-5.4.4 Consolidated Unit 48-007(a)-00

The dioxin and furan congener TEF calculations are presented in Table J-5.4-7. The results of the minimum ESL comparisons are presented in Table J-5.4-8. Cadmium, hexavalent chromium, chromium (total), copper, cyanide, manganese, mercury, selenium, thallium, zinc, Aroclor-1254, bis(2-ethylhexyl)phthalate, and TCDD[2,3,7,8-] equivalent are retained as COPECs because the HQs were greater than 0.3. Carbazole, isopropyltoluene[4-], trichlorofluoromethane, trimethylbenzene[1,2,4-], and thorium-227 do not have ESLs and are retained as COPECs.

An HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, that nonradionuclides have common toxicological effects and that HQs may be added. Table J-5.4-9 presents the HQs and HIs for each receptor/COPEC at Consolidated Unit 48-007(a)-00. The HI analysis indicates that all receptors, except the cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

J-5.4.5 AOC 48-011

The samples and the potential contamination associated with the disposal shaft are at 65 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted.

J-5.4.6 AOC 48-012

One sample was collected from 4–5 ft bgs but had no detections. The remaining samples and the potential contamination associated with the soil contamination are 6 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted.

J-5.4.7 SWMU 50-006(c)

The dioxin and furan congener TEF calculations are presented in Table J-4.2-28. The results of the minimum ESL comparisons are presented in Table J-5.4-10. Chromium, selenium, zinc, acenaphthalene, bis[2-ethylhexyl]phthalate, di-n-butylphthalate, TCDD[2,3,7,8-] equivalent, and thorium-232 are retained as COPECs because the HQs were greater than 0.3. Nitrate and perchlorate do not have ESLs and are retained as COPECs.

An HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor. The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening that nonradionuclides have common toxicological effects and that HQs may be added. Table J-5.4-11 presents the HQs and HIs for each receptor/COPEC at SWMU 50-006(c). The HI analysis indicates that all receptors, except the red fox and cottontail, have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

J-5.4.8 SWMU 50-011(a)

The samples and the potential contamination associated with the septic system are 6 ft bgs or deeper. Therefore, no complete exposure pathways to receptors are present at this site, and an ecological risk-screening assessment was not conducted.

J-5.5 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening evaluations. This analysis can result in either adding or removing chemicals from the list of COPECs. This section contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at each site.

J-5.5.1 Chemical Form

The assumptions used in the ESL derivations are conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. These factors tend to result in conservative ESL estimates, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an over- or underestimation of the potential risk to receptors.

The chemical form of the individual COPCs was not determined as part of the investigation. Toxicological data are typically based on the most toxic and bioavailable chemical species, which are not typically found in the environment. Inorganic, radionuclide, and organic COPECs are generally not 100% bioavailable to receptors in the natural environment because of interference from other natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil) or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2004, 087630), and the values are biased toward overestimating the potential risk to receptors.

J-5.5.2 Exposure Assumptions

The EPCs used in the calculations of HQs are UCLs or the maximum detected concentration to depths of 5 ft bgs and are conservative estimates of exposure to each COPEC. At SWMUs 03-034(a) and 50-011(a) and AOC 48-011, samples were collected at depths below 5 ft bgs; shallower samples were not collected. At AOC 48-012, one sample was collected from 4–5 ft bgs but had no detections. All other samples were collected from below 5 ft bgs. Therefore, there is no exposure to contaminants at these sites, and risk-screening assessments were not conducted. The sampling efforts focused on areas of suspected contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. These assumptions regarding the exposure for terrestrial receptors in the Upper Mortandad Canyon Aggregate Area are likely to result in an overestimation of potential ecological exposure and risk.

J-5.5.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels; actual risk for a given COPEC/receptor combination occurs at a higher level, somewhere between the NOAEL-based threshold and the threshold based on the LOAEL. The use of NOAELs leads to an overestimation of potential risk to ecological receptors. ESLs are based on laboratory studies requiring extrapolation to wildlife receptors. Laboratory studies are typically based on “artificial” and maintained populations with genetically similar individuals and are limited to single chemical exposures in isolated and controlled conditions using a single exposure pathway. Wild species are concomitantly exposed to a variety of chemical and environmental stressors, potentially rendering them more susceptible to chemical stress. On the other hand, wild populations are likely more genetically diverse than laboratory populations, making wild populations, as a whole, less sensitive to chemical exposure than laboratory populations. The uncertainties associated with the ESLs tend to lead to an overestimation of potential risk.

J-5.5.4 Comparison of EPCs with Background Concentrations

J-5.5.4.1 AOC 03-041

The ecological risk-screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of antimony and lead are similar to background concentrations for soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table J-5.5-1). Antimony and lead are not retained as COPECs because the EPCs are similar to background.

J-5.5.4.2 AOC 48-002(e)

The ecological risk-screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of barium and chromium are similar to background concentrations for soil and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table J-5.5-2). Barium and chromium are not retained as COPECs because the EPCs are similar to background. Cyanide is retained as a COPEC for further evaluation.

J-5.5.4.3 Consolidated Unit 48-007(a)-00

The ecological risk-screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of cadmium, cyanide, manganese, mercury, selenium, thallium, and zinc are similar to background concentrations for soil, sediment, and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table J-5.5-3). Cadmium, cyanide, manganese, mercury, selenium, thallium, and zinc are not retained as COPECs because the EPCs are similar to background. Chromium, hexavalent chromium, and copper are retained as COPECs for further evaluation.

J-5.5.4.4 SWMU 50-006(c)

The ecological risk-screening assessments for this site are based on the exposure of ecological receptors to contamination to a depth of 5 ft bgs. The EPCs of chromium, selenium, and zinc are similar to background concentrations for soil, sediment, and/or tuff, indicating that exposure of receptors to these inorganic chemicals is similar to background (Table J-5.5-4). Chromium, selenium, and zinc are not retained as COPECs because the EPCs are similar to background.

J-5.5.5 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUFs) are used to account for the amount of time that a receptor is likely to spend within the contaminated areas based on the size of the receptor's home range (HR). The AUFs for individual organisms were developed by dividing the size of the site by the HR for that receptor. Because T&E species must be assessed on an individual basis (EPA 1999, 070086), the AUF is used for the Mexican spotted owl. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl. The unadjusted HIs for the kestrel (top carnivore) are above 1.0 for all sites, except AOC 03-041.

The HR for the Mexican spotted owl is 366 ha, and the site areas are presented in Table J-5.5-5. The AUFs for the Mexican spotted owl range from 0.00000002 to 0.008. Application of the AUFs for the Mexican spotted owl to the HQs for the kestrel (top carnivore) results in adjusted HIs from 0.0000000004 to 0.2. Therefore, there are no potential adverse impacts to the Mexican spotted owl at AOCs 03-041 and

48-002(e), Consolidated Unit 48-007(a)-00, and SWMU 50-006(c) because the AUF-adjusted HIs are less than 1.0.

J-5.5.6 Population Area Use Factors

EPA guidance is to manage the ecological risk to populations rather than to individuals, with the exception of T&E species (EPA 1999, 070086). One approach to address the potential effects on populations is to estimate the spatial extent of the area inhabited by the local population that overlaps with the contaminated area. The population area for a receptor is based on the individual receptor HR and its dispersal distance (Bowman et al. 2002, 073475). Bowman et al. estimate that the median dispersal distance for mammals is 7 times the linear dimension of the HR, which is equivalent to the square root of the HR area. If only the dispersal distances for the mammals with HRs within the range of the screening receptors are used, the median dispersal distance becomes 3.6 times the square root of the HR ($R^2 = 0.91$) (Bowman et al. 2002, 073475). If it is assumed that the receptors can disperse the same distance in any direction, the population area is circular and the dispersal distance is the radius of the circle. Therefore, the population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40 HR.

The population area use factors (PAUFs) are calculated by dividing the site area by the population area of each receptor (Table J-5.5-5). The HQs are adjusted by multiplying by the PAUFs. The HIs are recalculated minus the COPECs eliminated based on similarity to background (section J-5.5.4) and using the PAUF-adjusted HQs. If the PAUF is greater than 1, the HQs are not adjusted for that receptor. The HQs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs. The adjusted HQs are summed for each receptor to calculate the adjusted HIs (Tables J-5.5-6 to J-5.5-9).

AOC 03-041

The adjusted HQs and HIs are presented in Table J-5.5-6. The adjusted HIs are less than 1.0 for all the ecological receptors. Therefore, no COPECs are retained at this site.

AOC 48-002(e)

The adjusted HQs and HIs are presented in Table J-5.5-7. The adjusted HIs are less than 1.0 for all the ecological receptors. Therefore, no COPECs are retained at this site.

Consolidated Unit 48-007(a)-00

The adjusted HQs and HIs are presented in Table J-5.5-8. The adjusted HIs are less than 1.0 for all the ecological receptors, except the earthworm and the plant. The elevated HIs for both receptors are from chromium. Field observations made during the site visit, and field activities found no indication of adverse impacts on the plant community (Attachment J-2). The health of the plant community is representative of the health of the earthworm community. The chromium ESLs for the earthworm and plant (2.3 mg/kg and 2.4 mg/kg, respectively) are less than background concentrations and substantially overestimates potential risk to these receptors. If the maximum soil background concentration for chromium (36.5 mg/kg) is used, the HIs are reduced by over an order of magnitude (HIs = 13 to 14). In addition, because the plant community does not appear affected by the COPECs, the earthworm population is also likely not affected. Therefore, no COPECs are retained at this site.

SWMU 50-006(c)

The adjusted HQs and HIs are presented in Table J-5.5-9. The adjusted HIs are less than or equivalent to 1.0 for all the receptors, except the robin (omnivore and insectivore). The elevated HIs are from bis(2-ethylhexyl)phthalate and di-n-butylphthalate. Both COPECs are detected infrequently (two samples and one sample, respectively) and the EPCs are the maximum detected concentrations. Therefore, the potential risk is overestimated for the robin and does not reflect the actual risk to the receptors. In addition, field observations made during the site visit and field activities found no pathway for ecological receptors because the site is covered by asphalt roads and parking lots.

J-5.5.7 Exposure Pathways

Much of the area on the mesa tops within the Upper Mortandad Canyon Aggregate Area is developed with office buildings, parking lots, and roads. Because AOC 48-002(e) and SWMU 50-006(c) are completely under asphalt roads and parking lots, there are no complete pathways to ecological receptors. The asphalt roads and parking lots will remain for the reasonably foreseeable future.

J-5.5.8 Comparison with Results of Previous Field and Laboratory Studies

Biota investigations have been conducted in canyon reaches in Los Alamos and Pueblo Canyons (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon(LANL 2008, 104909; LANL 2009, 106771). Field and laboratory studies included collection and analysis of soil, sediment, and water samples; cavity-nesting bird monitoring and analysis of eggs; small-mammal trapping and analysis of whole organisms; earthworm bioaccumulation tests (measures of growth and survival, and analysis of whole organisms); laboratory testing of sensitive organisms; and seedling-germination tests.

The field and laboratory results on small mammals, birds, earthworms, and plants included reaches with similar COPEC concentrations as the EPCs for the sites within the Upper Mortandad Canyon Aggregate Area [particularly for bis(2-ethylhexyl)phthalate and di-n-butylphthalate at SWMU 50-006(c)]. The studies found no effects from exposure to COPECs in any of the canyon reaches supporting the conclusion that there is no potential ecological risk at these sites.

J-5.5.9 COPECs without ESLs

Several COPECs do not have ESLs for any receptor in Version 2.3 of the ECORISK Database (LANL 2008, 103352) because literature searches for relevant toxicity data for these chemicals has not been completed. In an effort to address this uncertainty and to provide a quantitative assessment of potential ecological risk, several on-line toxicity databases have been searched to determine if any relevant toxicity information are available. The online databases searched were EPA Ecotox Database; EPA Office of Pesticide Programs Aquatic Life Benchmarks; U.S. Army Corps of Engineers/EPA Environmental Residue-Effects; California Cal/Ecotox Database; Pesticide Action Network Pesticide Database; U.S. Army Wildlife Toxicity Assessment Program; U.S. Department of Agriculture; Integrated Pesticide Management Database; American Bird Conservancy Pesticide Toxicity Database; and Oak Ridge National Laboratory Risk Assessment Information System. Toxicity data was obtained for several COPECs and receptors as a result of this online database search and interim ESLs were calculated. The ESLs are termed interim because the information and calculations are still undergoing review, and documentation required for the ECORISK Database has not yet been completed. As a result, the ESLs are not yet in the ECORISK Database. Once the development process is completed, the interim ESLs will be finalized and included in the appropriate revision to the ECORISK Database. Although the majority of

the COPECs listed did not have any relevant toxicity data in the online databases listed above, a search of the literature continues in an effort to determine if any relevant toxicity information exists.

In the absence of chemical-specific ESLs, COPEC concentrations can be compared to ESLs for a surrogate chemical. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted.

Some COPECs without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk. These COPECs are often infrequently detected across the site. In these cases, comparisons to residential human health SSLs are presented as part of a qualitative assessment. The comparison of COPEC concentrations with residential human health SSLs is a viable alternative for several reasons. Animal studies are used to infer effects on humans and is the basic premise of modern toxicology (EPA 1989, 008021). In addition, toxicity values derived for the calculation of human health SSLs are often based on potential effects that are more sensitive than the ones used to derive ESLs (e.g., cellular effects for humans versus survival or reproductive effects for terrestrial animals). The EPA also applies uncertainty factors or modifying factors to ensure the toxicity values are protective (i.e., they are adjusted by uncertainty factors to values much lower than the study results). COPEC concentrations compared with these values are an order of magnitude or more below the SSLs, which corresponds to uncertainty factors of 10 or more. Therefore, it is assumed the differences in toxicity would not be more than an order of magnitude for any given chemical. The relative difference between values provides a weight of evidence that the potential toxicity of the COPC is likely to be low or very low to the receptor(s). The COPECs without ESLs were common to many of the sites and are discussed below for each site.

AOC 03-041

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for calcium, iron, nitrate, and perchlorate. Calcium, iron, nitrate, and perchlorate do not have interim or surrogate ESLs and are assessed qualitatively.

Calcium was detected in four samples with a maximum detected concentration of 4250 mg/kg. The maximum detected concentration is the only concentration above background and is less than two times the maximum background concentration for Qbt 2,3,4 (2230 mg/kg) and less than the soil background value (6120 mg/kg). Calcium concentrations are, therefore, similar to background; it is infrequently detected above background; and is an essential nutrient (EPA 1989, 008021). Calcium is not retained as a COPEC.

Iron was detected in four samples, with maximum detected concentration of 14,100 mg/kg. All concentrations were similar to background for soil and Qbt 2, 3, 4. Iron is not retained as a COPEC.

Nitrate was detected in four samples with a maximum detected concentration of 4.6 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is not retained as a COPEC.

Perchlorate was detected in one sample with a maximum detected concentration of 0.00162 mg/kg. No background data are available for perchlorate. The NMED residential SSL is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potentially low toxicity and infrequent detection, perchlorate is not retained as a COPEC.

AOC 48-002(e)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate and perchlorate. Nitrate and perchlorate do not have interim or surrogate ESLs and are assessed qualitatively.

Nitrate was detected in six with a maximum detected concentration of 1.55 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is not retained as a COPEC.

Perchlorate was detected in seven with a maximum detected concentration of 0.0056 mg/kg. No background data are available for perchlorate. The NMED regional residential SSL is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potentially low toxicity, perchlorate is not retained as a COPEC.

Consolidated Unit 48-007(a)-00

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate, perchlorate, carbazole, isopropyltoluene[4-], trichlorofluoromethane, trimethylbenzene[1,2,4-], and thorium-227. However, isopropyltoluene[4-] and trimethylbenzene[1,2,4-] have surrogate ESLs for structurally related compounds (toluene and benzene, respectively), in the current version of the ECORISK Database. Thorium-227 also has surrogate ESLs for a structurally related compound (thorium-228) in the current version of the ECORISK Database. Carbazole and trichlorofluoromethane do not have surrogate ESLs and are assessed qualitatively.

Isopropyltoluene[4-] was detected in one sample with a maximum detected concentration of 0.067 mg/kg. The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the isopropyltoluene[4-] EPC (0.067 mg/kg) and results in a maximum HQ of 0.003. Because this HQ is less than 0.3, isopropyltoluene[4-] is not retained as a COPEC.

Trimethylbenzene[1,2,4-] was detected in one sample with a maximum detected concentration of 0.004 mg/kg. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the trimethylbenzene[1,2,4-] EPC (0.004 mg/kg) and results in a maximum HQ of 0.0002. Because this HQ is less than 0.3, trimethylbenzene[1,2,4-] is not retained as a COPEC.

Thorium-227 was detected in three samples with a maximum detected concentration of 0.085 pCi/g. The minimum ESL for thorium-228 (43 mg/kg for the earthworm) is used to screen the thorium-227 EPC (0.085 mg/kg) and results in a maximum HQ of 0.002. Because this HQ is less than 0.3, thorium-227 is not retained as a COPEC.

Nitrate was detected in six samples with a maximum detected concentration of 2.76 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in 15 samples with a maximum detected concentration of 0.0187 mg/kg. No background data are available for perchlorate. The NMED residential SSL is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potentially low toxicity, perchlorate is not retained as a COPEC.

Carbazole was detected in one sample at a maximum detected concentration of 0.12 mg/kg. The EPA regional residential SSL for carbazole is 1500 mg/kg, indicating that potential toxicity is low. Because of the potentially low toxicity and the infrequent detection, carbazole is not retained as a COPEC.

Trichlorofluoromethane was detected in three samples at a maximum detected concentration of 0.014 mg/kg. The NMED residential SSL for trichlorofluoromethane is 588 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity and the infrequent detection, trichlorofluoromethane is eliminated as a COPEC.

SWMU 50-006(c)

No ESLs are available in the ECORISK Database, Version 2.3 (LANL 2008, 103352) for nitrate and perchlorate. Nitrate and perchlorate do not have interim or surrogate ESLs and are assessed qualitatively.

Nitrate was detected in nine samples with a maximum detected concentration of 2.08 mg/kg. Nitrate is naturally occurring, and the detected concentrations likely reflect natural levels. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because of the potential very low toxicity and the naturally occurring concentrations, nitrate is eliminated as a COPEC.

Perchlorate was detected in four samples with a maximum detected concentration of 0.00474 mg/kg. No background data are available for perchlorate. The NMED residential SSL is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potentially low toxicity, perchlorate is not retained as a COPEC.

J-5.5.10 DOE Tier I Bioconcentration Guide

The DOE Tier I Biota Concentration Guide (BCG) is a lower value for cesium-137 (20.8 pCi/g) than the ECORISK Database final ESL (680 pCi/g). Cesium-137 was a COPC at two sites: Consolidated Unit 48-007(a)-00 and SWMU 50-006(c). Using the EPC for cesium-137 for each of these sites and the DOE Tier I BCG, the HQs for these sites are 0.01 and 0.02, respectively. These HQs are too small to impact the HIs for these sites. In addition, the DOE BCG incorporates bioaccumulation factors that are orders of magnitude higher than those in the ECORISK Database. Environmental surveillance and monitoring at the Laboratory indicate that bioaccumulation factors are not as high as those used by DOE (Bennett et al. 1996, 056035). Therefore, the ESL comparison is more representative than the BCG comparison.

J-5.6 Interpretation of Ecological Risk Screening Results

J-5.6.1 Receptor Lines of Evidence

Based on the ecological risk-screening assessments, several COPECs (including COPECs without an ESL) were identified within the Upper Mortandad Canyon Aggregate Area. Receptors were evaluated using several lines of evidence: minimum ESL comparisons, HI analyses, comparison to background concentrations, potential effects to populations (individuals for T&E species), and comparisons to previous field and laboratory canyon investigations.

Red Fox (Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.

- The HI analysis eliminated the red fox at several sites because the HI was less than or equivalent to 1.0 [AOC 03-041, AOC 48-002(e), and SWMU 50-006(c)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than 1.0 for the red fox [Consolidated Unit 48-007(a)-00].

These lines of evidence support the conclusion that no potential ecological risk to the red fox exists within the Upper Mortandad Canyon Aggregate Area.

Kestrel (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the kestrel (top carnivore) because the HI was less than 1.0 [AOC 03-041].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than or equivalent to 1.0 for the kestrel (top carnivore) [AOC 48-002(e), Consolidated Unit 48-007(a)-00, and SWMU 50-006(c)].
- The kestrel (top carnivore) is a surrogate for the Mexican spotted owl. The HIs were adjusted by the AUF. The adjusted HIs are less than 1.0 for all sites.

These lines of evidence support the conclusion that no potential ecological risks to the kestrel (top carnivore) and the Mexican spotted owl exist within the Upper Mortandad Canyon Aggregate Area.

Kestrel (Intermediate Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the kestrel (intermediate carnivore) because the HI was less than 1.0 [AOC 03-041].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than 1.0 for the kestrel (intermediate carnivore) [AOC 48-002(e), Consolidated Unit 48-007(a)-00 and SWMU 50-006(c)].

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (intermediate carnivore) exists within the Upper Mortandad Canyon Aggregate Area.

Robin (All Feeding Guilds)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the robin because the HI was less than or equivalent to 1.0 [AOC 03-041].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than 1.0 for the robin [AOC 48-002(e) and Consolidated Unit 48-007(a)-00].
- Field studies in Los Alamos and Pueblo Canyons (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104919; LANL 2009, 106771) included reaches with similar or higher COPEC concentrations and found no effects from exposure to birds [SWMU 50-006(c)].

These lines of evidence support the conclusion that no potential ecological risk to the robin exists within the Upper Mortandad Canyon Aggregate Area.

Desert Cottontail (Herbivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the cottontail because the HI was less than or equivalent to 1.0 [AOC 03-041, AOC 48-002(e), Consolidated Unit 48-007(a)-00, SWMU 50-006(c)].

These lines of evidence support the conclusion that no potential ecological risk to the desert cottontail exists within the Upper Mortandad Canyon Aggregate Area.

Montane Shrew (Insectivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the shrew because the HI was less than 1.0 [AOC 48-002(e)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HI was less than 1.0 for the shrew [AOC 03-041, Consolidated Unit 48-007(a)-00, and SWMU 50-006(c)].

These lines of evidence support the conclusion that no potential ecological risk to the montane shrew exists within the Upper Mortandad Canyon Aggregate Area.

Deer Mouse (Omnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the deer mouse because the HI was less than 1.0 [AOC 48-002(e)].
- Several COPECs were eliminated because their EPCs were similar to background concentrations.
- The HIs were adjusted by comparisons to background and the PAUF. The adjusted HIs were less than or equivalent to 1.0 for the deer mouse [AOC 03-041, SWMU 50-006(c), Consolidated Unit 48-007(a)-00].

These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists within the Upper Mortandad Canyon Aggregate Area.

Earthworm (Invertebrate)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- The HI analysis eliminated the earthworm because the HI was less than or equivalent to 1 [AOC 03-041].
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than 1.0 for the earthworm [AOC 48-002(e) and SWMU 50-006(c)].
- The chromium ESL (2.3 mg/kg) for the earthworm is less than background and overestimates potential risk. If the maximum chromium background concentration for soil of 36.5 mg/kg is used, the HI is reduced by over an order of magnitude (HI = 14). In addition, because the plant community does not appear affected by the COPECs, the earthworm population is also likely not affected.

These lines of evidence support the conclusion that no potential ecological risk to the earthworm exists within the Upper Mortandad Canyon Aggregate Area.

Plant

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs were less than 0.3.
- Several COPECs were eliminated because their EPCs were similar to background concentrations. The HIs were less than or equivalent to 1.0 for the plant [AOC 03-041, AOC 48-002(e), and SWMU 50-006(c)].
- The chromium ESL (2.4 mg/kg) for the plant is less than background and overestimates potential risk. If the maximum chromium background concentration for soil of 36.5 mg/kg is used, the HI is reduced by over an order of magnitude (HI = 13). In addition, the plant communities were evaluated during site visits. No evidence of adverse impacts of contamination to the plant

communities based on field observations was found during site visits; the plant community was typical of the surrounding area and appears healthy [Consolidated Unit 48-007(a)-00].

These lines of evidence support the conclusion that no potential ecological risk to the plant exists within the Upper Mortandad Canyon Aggregate Area.

J-5.7 Summary

No potential ecological risks were found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, potential effects to populations (individuals for T&E species), and previous field and laboratory studies in the canyons. These lines of evidence, discussed above for each receptor, and the analysis of COPECs with no ESLs support the conclusion that there is no potential ecological risk within the Upper Mortandad Canyon Aggregate Area.

J-6.0 CONCLUSIONS

J-6.1 Human Health Risk

The human health risk-screening assessments indicated no potential unacceptable risks or doses from COPCs for the industrial scenario for three of the sites evaluated in the Upper Mortandad Canyon Aggregate Area (Table J-6.1-1). The human health risk-screening assessments indicated no potential unacceptable risks or doses from COPCs for the construction worker scenario for three of the sites evaluated in the Upper Mortandad Canyon Aggregate Area (Table J-6.1-1). The human health risk-screening assessments indicated no potential unacceptable risks or doses for the residential scenario for six of the sites evaluated in the Upper Mortandad Canyon Aggregate Area (Table J-6.1-1).

The total excess cancer risks were below or equivalent to the NMED target risk level of 1×10^{-5} (NMED 2009, 106420) for the construction worker scenarios at all sites where evaluated. The total excess cancer risks for the industrial scenario were below the NMED target risk level at all sites where evaluated. The total excess cancer risks for the residential scenario were below or equivalent to the NMED target risk level, except at AOC 48-012 and SWMU 50-006(c). Total excess cancer risks at these sites were 5×10^{-4} and 2×10^{-5}, respectively, from PAHs.

The HIs for the construction worker, industrial, and residential scenarios were less than the NMED target HI of 1.0 –NMED 2009, 106420) for all sites evaluated.

The total doses for the industrial and construction worker scenarios are below the DOE target dose of 15 mrem/yr at all sites where evaluated. The total doses for the residential scenario are below the DOE target dose of 15 mrem/yr at all sites evaluated, except SWMU 50-006(c) from americium-241, cobalt-60, and thorium-232.

The equivalent total risks for radionuclides were estimated using EPA's radionuclide PRGs for an outdoor worker and a resident (http://epa-orgs.ornl.gov/cgi-bin/radionuclides/rprg_search). The total risks from radionuclides for the industrial scenario ranged from 6×10^{-7} at Consolidated Unit 48-007(a)-00 to 3×10^{-5} at SWMU 50-006(c). The total risks for the construction worker scenario using EPA's outdoor worker radionuclide PRGs ranged from 8×10^{-6} at SWMU 50-011(a) to 3×10^{-5} at SWMU 50-006(c). The total risks for the residential scenario ranged from 2×10^{-8} at SWMU 03-034(a) to 5×10^{-5} at SWMU 50-006(c).

Sites at TA-03, TA-48, and TA-50 are inaccessible to the public and are not planned for release by DOE in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for

radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time. It should be noted that the Laboratory addresses considerations for radiation exposures to workers under the Laboratory's occupational radiological protection program in compliance with 10 Code of Federal Regulations 835. The Laboratory's radiation protection program implements ALARA and consists of the following elements: management commitment, training, design review, radiological work review, performance assessments, and documentation.

J-6.2 Ecological Risk

No potential ecological risk was found for any receptor following evaluations based on minimum ESL, HI analyses, comparisons to background, and potential effects to populations (individuals for T&E species). In addition, field and laboratory studies conducted and reported as part of the ecological investigations in Los Alamos and Pueblo Canyons (LANL 2004, 087390), Mortandad Canyon (LANL 2006, 094161; LANL 2007, 098279), and Pajarito Canyon (LANL 2008, 104909; LANL 2009, 106771) have found that similar concentrations of COPECs have not adversely impacted small mammal, bird, earthworm, and plant populations, and individual Mexican spotted owls. These lines of evidence, discussed for each receptor, and the analysis of COPECs with no ESLs support the conclusion that there is no potential ecological risk within the Upper Mortandad Canyon Aggregate Area.

J-7.0 REFERENCES

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

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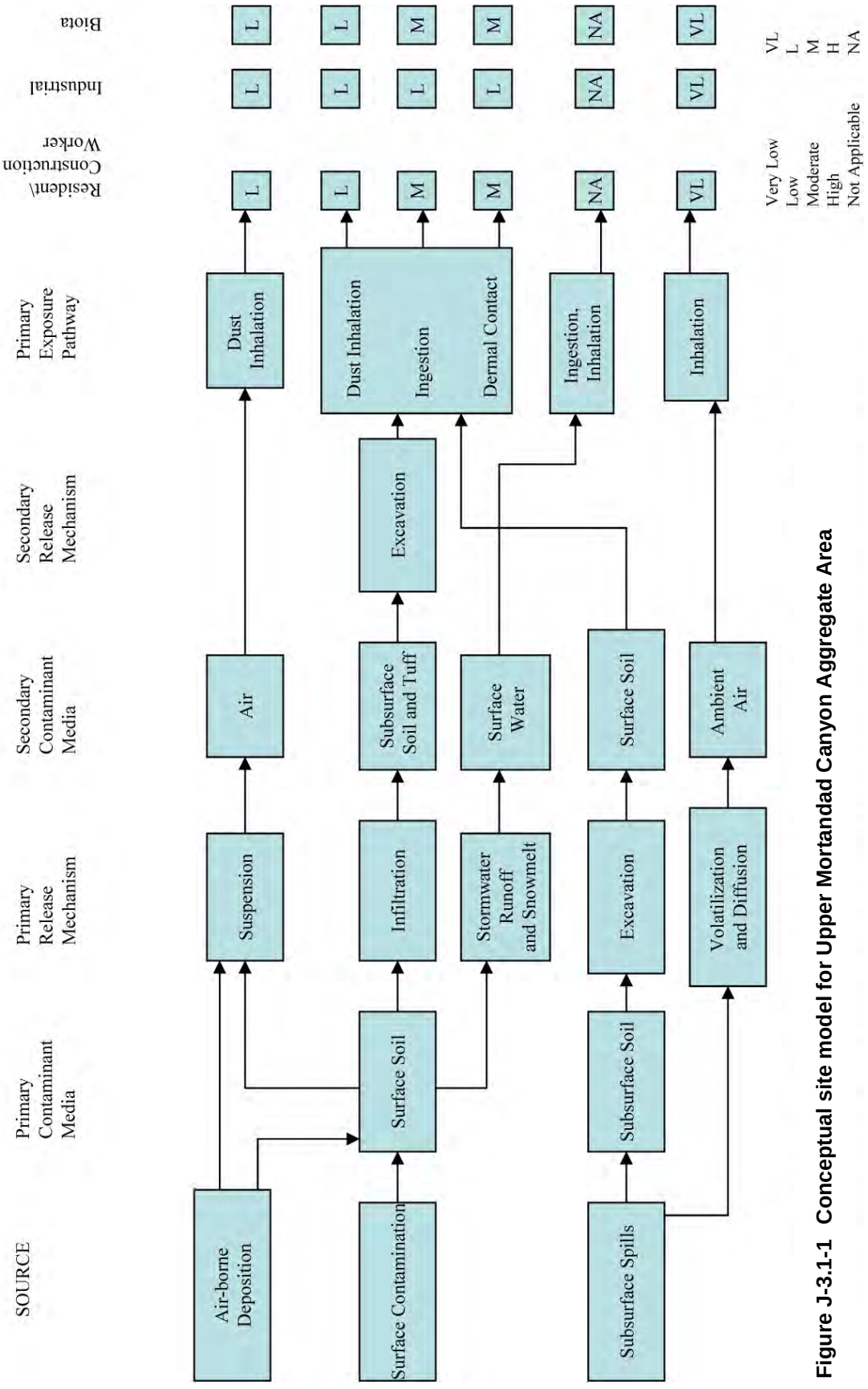


Figure J-3.1-1 Conceptual site model for Upper Mortandad Canyon Aggregate Area

Table J-2.2-1
Exposure Point Concentrations at AOC 03-041 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	3	2	0.371 (J)	1.09 (U)	n/a*	0.54	Maximum detected concentration
Calcium	3	3	1480	2150	n/a	2150	Maximum detected concentration
Iron	3	3	11600	14100	n/a	14100	Maximum detected concentration
Lead	3	3	6.92	17.6	n/a	17.6	Maximum detected concentration
Nitrate	3	3	1.17	4.6	n/a	4.6	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.0054	0.0054	n/a	0.0054	Maximum detected concentration
Aroclor-1260	1	1	0.0072 (J+)	0.0072 (J+)	n/a	0.0072	Maximum detected concentration
Benzo(a)anthracene	3	1	0.0203 (J)	0.0381 (U)	n/a	0.020	Maximum detected concentration
Benzo(a)pyrene	3	1	0.0205 (J)	0.0381 (U)	n/a	0.020	Maximum detected concentration
Benzo(b)fluoranthene	3	1	0.0335 (J)	0.0381 (U)	n/a	0.034	Maximum detected concentration
Benzo(g,h,i)perylene	3	1	0.0128 (J)	0.0381 (U)	n/a	0.013	Maximum detected concentration
Chrysene	3	1	0.0238 (J)	0.0381 (U)	n/a	0.024	Maximum detected concentration
Fluoranthene	3	2	0.0114 (J)	0.0409	n/a	0.041	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	3	3	0.00000294	0.0000124	n/a	1.24E-05	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	3	2	0.000000533 (U)	0.00000231 (J)	n/a	2.31E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	3	1	0.0000000968 (U)	0.000000325 (J)	n/a	3.25E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	3	1	0.000000157 (J)	0.000000225 (U)	n/a	1.57E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	3	1	0.000000191 (U)	0.000000429 (J)	n/a	4.29E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	3	1	0.000000189 (U)	0.000000322 (J)	n/a	3.22E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	3	1	0.0000000791 (U)	0.000000409 (J)	n/a	4.09E-07	Maximum detected concentration

Table J-2.2-1 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Hexachlorodibenzofuran[1,2,3,6,7,8-]	3	1	0.0000000761 (U)	0.000000255 (J)	n/a	2.55E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	3	1	0.0000000833 (U)	0.00000035 (J)	n/a	3.50E-07	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	3	1	0.0116 (J)	0.0381 (U)	n/a	0.012	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3	3	0.0000206 (J)	0.0000948 (J)	n/a	9.48E-05	Maximum detected concentration
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3	3	0.000000986 (J)	0.00000451 (J)	n/a	4.51E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	3	1	0.000000191 (U)	0.000000273 (U)	n/a	2.0E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	3	1	0.000000187 (U)	0.000000281 (J)	n/a	2.81E-07	Maximum detected concentration
Phenanthrene	3	1	0.0224 (J)	0.0381 (U)	n/a	0.022	Maximum detected concentration
Pyrene	3	1	0.037 (U)	0.0422	n/a	0.042	Maximum detected concentration
Tetrachlorodibenzodioxin[2,3,7,8-]	3	1	0.0000000905 (U)	0.000000111 (J)	n/a	1.11E-07	Maximum detected concentration

* n/a = Not applicable.

Table J-2.2-2
Exposure Point Concentrations at AOC 03-041 for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	4	3	0.371 (J)	1.09 (U)	n/a*	0.59	Maximum detected concentration
Calcium	4	4	1480	4250	n/a	4250	Maximum detected concentration
Iron	4	4	11600	14100	n/a	14100	Maximum detected concentration
Lead	4	4	5.1	17.6	n/a	17.6	Maximum detected concentration
Nitrate	4	4	0.804 (J)	4.6	n/a	4.6	Maximum detected concentration
Perchlorate	4	1	0.00162 (J)	0.00229 (U)	n/a	1.62E-03	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.0054	0.0054	n/a	0.0054	Maximum detected concentration
Aroclor-1260	1	1	0.0072 (J+)	0.0072 (J+)	n/a	0.0072	Maximum detected concentration
Benzo(a)anthracene	4	1	0.0203 (J)	0.0394 (U)	n/a	0.020	Maximum detected concentration
Benzo(a)pyrene	4	1	0.0205 (J)	0.0394 (U)	n/a	0.020	Maximum detected concentration
Benzo(b)fluoranthene	4	1	0.0335 (J)	0.0394 U)	n/a	0.034	Maximum detected concentration
Benzo(g,h,i)perylene	4	1	0.0128 (J)	0.0394 (U)	n/a	0.013	Maximum detected concentration
Chrysene	4	1	0.0238 (J)	0.0394 (U)	n/a	0.024	Maximum detected concentration
Fluoranthene	4	2	0.0114 (J)	0.0409	n/a	0.041	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4	3	0.000000187 (U)	0.0000124	n/a	1.24E-05	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4	2	0.0000000904 (U)	0.00000231 (J)	n/a	2.31E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4	1	0.0000000968 (U)	0.000000325 (J)	n/a	3.25E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4	1	0.000000157 (J)	0.000000225 (U)	n/a	1.57E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4	1	0.000000179 (U)	0.000000429 (J)	n/a	4.29E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4	1	0.000000161 (U)	0.000000322 (J)	n/a	3.22E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4	1	0.0000000559 (U)	0.000000409 (J)	n/a	4.09E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4	1	0.0000000576 (U)	0.000000255 (J)	n/a	2.55E-07	Maximum detected concentration

Table J-2.2-2 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4	1	0.0000000642 (U)	0.00000035 (J)	n/a	3.50E-07	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	4	1	0.0116 (J)	0.0394 (U)	n/a	0.012	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	4	4	0.00000205 (J)	0.0000948 (J)	n/a	9.48E-05	Maximum detected concentration
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	4	3	0.000000197 (U)	0.00000451 (J)	n/a	4.51E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	4	1	0.000000131 (U)	0.000000273 (U)	n/a	2.0E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	4	1	0.000000142 (U)	0.000000281 (J)	n/a	2.81E-07	Maximum detected concentration
Phenanthrene	4	1	0.0224 (J)	0.0394 (U)	n/a	0.022	Maximum detected concentration
Pyrene	4	1	0.037 (U)	0.0422	n/a	0.042	Maximum detected concentration
Tetrachlorodibenzodioxin[2,3,7,8-]	4	1	0.0000000905 (U)	0.000000131 (U)	n/a	1.11E-07	Maximum detected concentration

* n/a = Not applicable.

Table J-2.2-3
Exposure Point Concentrations at AOC 03-041 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	6	4	0.371 (J)	1.09 (U)	n/a*	0.59	Maximum detected concentration
Calcium	6	6	800	4250	Normal	2904	Student's t
Iron	6	6	11200	22200	Approximate Gamma	17854	95% Approximate Gamma
Lead	6	6	5.1	17.6	Gamma	13.77	95% Approximate Gamma
Nitrate	6	6	0.804 (J)	4.6	Normal	2.97	95% KM (t)
Perchlorate	6	6	0.00162 (J)	0.00482	n/a	4.82E-03	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.00344 (U)	0.0054	n/a	0.0054	Maximum detected concentration
Aroclor-1260	2	1	0.00344 (U)	0.0072 (J+)	n/a	0.0072	Maximum detected concentration
Benzo(a)anthracene	6	1	0.0203 (J)	0.0394 (U)	n/a	0.020	Maximum detected concentration
Benzo(a)pyrene	6	1	0.0205 (J)	0.0394 U)	n/a	0.020	Maximum detected concentration
Benzo(b)fluoranthene	6	1	0.0335 (J)	0.0394 U)	n/a	0.034	Maximum detected concentration
Benzo(g,h,i)perylene	6	1	0.0128 (J)	0.0394 (U)	n/a	0.013	Maximum detected concentration
Chrysene	6	1	0.0238 (J)	0.0394 (U)	n/a	0.024	Maximum detected concentration
Fluoranthene	6	2	0.0114 (J)	0.0409	n/a	0.041	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	6	4	0.000000187 (U)	0.0000124	n/a	1.24E-05	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	6	2	0.0000000679 (U)	0.00000231 (J)	n/a	2.31E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	6	1	0.0000000582 (U)	0.000000325 (J)	n/a	3.25E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6	1	0.00000011 (U)	0.000000225 (U)	n/a	1.57E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	6	1	0.000000113 (U)	0.000000429 (J)	n/a	4.29E-07	Maximum detected concentration

Table J-2.2-3 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	6	1	0.000000105 (U)	0.000000322 (J)	n/a	3.22E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	6	1	0.0000000465 (U)	0.000000409 (J)	n/a	4.09E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	6	1	0.0000000454 (U)	0.000000255 (J)	n/a	2.55E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	6	1	0.0000000524 (U)	0.00000035 (J)	n/a	3.50E-07	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	6	1	0.0116 (J)	0.0394 (U)	n/a	0.012	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	6	6	0.000000582 (J)	0.0000948 (J)	n/a	9.48E-05	Maximum detected concentration
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	6	4	0.000000197 (U)	0.00000451 (J)	n/a	4.51E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	6	1	0.000000106 (U)	0.000000273 (U)	n/a	2.0E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	6	1	0.000000109 (U)	0.000000281 (J)	n/a	2.81E-07	Maximum detected concentration
Phenanthrene	6	1	0.0224 (J)	0.0394 (U)	n/a	0.022	Maximum detected concentration
Pyrene	6	1	0.0343 (UJ)	0.0422	n/a	0.042	Maximum detected concentration
Tetrachlorodibenzodioxin[2,3,7,8-]	6	1	0.0000000684 (UJ)	0.000000131 (U)	n/a	1.11E-07	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	6	2	-0.010969 (U)	0.083	n/a	0.083	Maximum detected concentration

* n/a = Not applicable.

Table J-2.2-4
Exposure Point Concentrations at AOC 48-002(e) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	10	10	38	218	Gamma	127.8	95% Approximate Gamma
Chromium	10	10	2.56 (J)	10.9 (J)	Normal	8.01	95% Student's t
Cyanide (total)	10	1	0.226 (U)	1.01	n/a*	1.01	Maximum detected concentration
Nitrate	10	6	1.11 (J)	2.02 (U)	Normal	1.37	95% KM (t)
Perchlorate	10	7	0.00181 (J)	0.00562	Normal	3.57E-03	95% KM (t)
Organic Chemicals (mg/kg)							
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10	3	0.0000000716 (U)	0.0000025	n/a	2.50E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10	1	0.0000000471 (U)	0.000000456 (J)	n/a	4.56E-07	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	10	8	0.000000351 (J)	0.0000258	Nonparametric	1.92E-05	97.5% KM (Chebyshev)
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	10	2	0.0000000916 (U)	0.00000113 (J)	n/a	1.13E-06	Maximum detected concentration

* n/a = Not applicable.

Table J-2.2-5
Exposure Point Concentrations at AOC 48-002(e) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	15	15	20.4	218	Gamma	96.66	95% Approximate Gamma
Chromium	15	15	2.43	10.9 (J)	Lognormal	6.59	95% Student's t
Cyanide (total)	15	1	0.226 (U)	1.01	n/a*	1.01	Maximum detected concentration
Nitrate	15	10	1.05 (J)	2.02 (U)	Normal	1.3	95% KM (t)
Perchlorate	15	12	0.00108 (J)	0.00562	Normal	3.00E-03	95% KM (t)
Organic Chemicals (mg/kg)							
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	15	3	0.0000000559 (U)	0.0000025	n/a	2.50E-06	Maximum detected concentration
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	15	1	0.0000000352 (U)	0.000000456 (J)	n/a	4.56E-07	Maximum detected concentration
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	15	12	0.000000297 (U)	0.0000258	Nonparametric	1.30E-05	97.5% KM (Chebyshev)
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	15	2	0.0000000807 (U)	0.00000113 (J)	n/a	1.13E-06	Maximum detected concentration

* n/a = Not applicable.

Table J-2.2-6
Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	20	5	0.06 (U)	0.73 (U)	n/a[a]	0.25[b]	Maximum detected concentration
Chromium	20	20	2.55	789	Approximate Gamma	233.8	95% Adjusted Gamma
Hexavalent chromium	13	5	0.168 (U)	11.8 (U)	Gamma	2.62	95% KM (t)
Copper	20	20	1.84	177	Gamma	59.1	95% Approximate Gamma
Cyanide (total)	13	7	0.0838 (J)	0.571	Normal	0.26	95% KM (t)
Manganese	20	20	29.9	1340	Approximate Gamma	381.2	95% Approximate Gamma
Mercury	22	18	0.00461 (J)	0.2	Gamma	0.072	95% KM (BCA)
Nitrate	13	5	0.852 (J)	2.76	Normal	1.7	95% KM (t)
Perchlorate	13	10	0.000965 (J)	0.0132	Gamma	5.70E-03	95% KM (BCA)
Selenium	20	2	0.29 (UJ)	1.17 (U)	n/a	0.74	Maximum detected concentration
Thallium	20	2	0.0695 (U)	1.3 (U)	n/a	0.089	Maximum detected concentration
Zinc	20	20	21.5	140	Gamma	67.1	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	20	9	0.0114 (J)	0.62 (U)	Normal	0.07	95% KM (t)
Anthracene	20	11	0.0141 (J)	0.62 (U)	Normal	0.12	95% KM (t)
Aroclor-1254	5	4	0.00365 (U)	0.0196	n/a	1.96E-02	Maximum detected concentration
Aroclor-1260	5	3	0.00365 (U)	0.0177 (U)	n/a	0.013	Maximum detected concentration
Benzo(a)anthracene	20	15	0.0188 (J)	1.04	Gamma	0.36	95% KM (Percentile Bootstrap)
Benzo(a)pyrene	20	16	0.0164 (J)	1.02	Gamma	0.38	95% KM (BCA)
Benzo(b)fluoranthene	20	16	0.0315 (J)	1.55	Normal	0.56	95% KM (t)

Table J-2.2-6 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(g,h,i)perylene	20	10	0.0348	0.62 (U)	Normal	0.22	95% KM (t)
Benzo(k)fluoranthene	16	6	0.0332 (U)	0.685	Normal	0.25	95% KM (t)
Benzoic acid	20	1	0.665 (UJ)	4.4 (U)	n/a	0.7	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	20	0	0.11 (U)	0.62 (U)	n/a	n/a	Not a COPC at this depth
Butanone[2-]	10	1	0.005 (UJ)	0.089 (J+)	n/a	0.089	Maximum detected concentration
Carbazole	7	1	0.12 (J)	0.62 (U)	n/a	0.12	Maximum detected concentration
Chrysene	20	15	0.0191 (J)	1.14	Normal	0.42	95% KM (t)
Dibenz(a,h)anthracene	20	3	0.0267 (J)	0.62 (U)	n/a	0.072	Maximum detected concentration
Fluoranthene	20	16	0.0341 (J)	2.58	Gamma	1.18	95% KM (Chebyshev)
Fluorene	20	8	0.0186 (J)	0.62 (U)	Normal	0.062	95% KM (t)
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5	5	0.00000123 (J)	0.000384	Normal	3.26E-04	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5	5	0.000000224 (J)	0.0000608	Normal	5.43E-05	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5	3	0.000000122 (U)	0.0000049	n/a	4.90E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5	4	0.000000327 (U)	0.00000636	n/a	6.36E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5	4	0.000000323 (U)	0.0000116	n/a	1.16E-05	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5	4	0.000000305 (U)	0.0000118	n/a	1.18E-05	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5	4	0.0000000934 (U)	0.00000276	n/a	2.76E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5	3	0.0000000905 (U)	0.00000312	n/a	3.12E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5	1	0.00000013 (U)	0.000000526 (J)	n/a	5.26E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5	3	0.0000000959 (U)	0.0000046	n/a	4.60E-06	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	20	10	0.0284 (J)	0.62 (U)	Normal	0.21	95% KM (t)
Isopropyltoluene[4-]	10	1	0.001 (U)	0.067 (J+)	n/a	6.70E-02	Maximum detected concentration
Methylene chloride	10	1	0.004 (J)	0.023 (U)	n/a	4.00E-03	Maximum detected concentration
Methylnaphthalene[2-]	20	4	0.0121 (J)	0.62 (U)	n/a	2.60E-02	Maximum detected concentration
Naphthalene	24	5	0.006 (UJ)	0.62 (U)	Normal	4.20E-02	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5	5	0.00000845 (J)	0.00346 (J)	Normal	2.79E-03	95% Student's t

Table J-2.2-6 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5	5	0.000000655 (J)	0.000185	Normal	1.52E-04	95% Student's t
Pentachlorodibenzodioxin[1,2,3,7,8-]	5	4	0.000000106 (U)	0.00000189 (J)	n/a	1.89E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	5	2	0.000000142 (U)	0.000000627 (J)	n/a	6.27E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	5	3	0.000000133 (U)	0.00000166 (J)	n/a	1.66E-06	Maximum detected concentration
Phenanthrene	20	15	0.0167 (J)	1.37	Gamma	0.65	95% KM (Chebyshev)
Pyrene	20	16	0.0337 (J)	2.1	Normal	0.83	95% KM (t)
Tetrachlorodibenzofuran[2,3,7,8-]	5	3	0.000000116 (U)	0.00000167	n/a	1.67E-06	Maximum detected concentration
Toluene	10	2	0.000369 (J)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Trichlorofluoromethane	10	2	0.001 (U)	0.014	n/a	1.40E-02	Maximum detected concentration
Trimethylbenzene[1,2,4-]	10	1	0.001 (U)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	20	9	0.000635 (U)	0.93	Normal	0.26	95% KM (t)
Plutonium-238	21	1	-0.00972 (U)	0.5	n/a	0.50	Maximum detected concentration
Plutonium-239/240	21	7	-0.009 (U)	0.0736	Normal	3.50E-02	95% KM (t)
Thorium-227	3	1	0.02 (U)	0.046	n/a	4.60E-02	Maximum detected concentration
Tritium	13	6	-0.0233 (U)	0.1	Normal	4.20E-02	95% KM (t)
Uranium-234	21	21	0.141	3.17	Nonparametric	1.64	95% Chebyshev (Mean, Sd)
Uranium-235/236	21	10	0.007 (U)	0.154 (U)	Gamma	6.20E-02	95% KM (t)
Uranium-238	21	21	0.095	3.11	Gamma	1.34	95% Approximate Gamma

[a] n/a = Not applicable.

[b] Recommended UCL exceeds the maximum concentration; the maximum detected concentration is used.

Table J-2.2-7
Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	32	8	0.05 (U)	0.73 (U)	Gamma	0.22	95% KM (t)
Chromium	32	32	2.4 (J)	1080	Nonparametric	554	99% Chebyshev (Mean, Sd)
Hexavalent chromium	19	7	0.145 (U)	11.8 (U)	Gamma	1.94	95% KM (t)
Copper	32	31	1.36 (U)	177	Gamma	59.35	95% KM (Chebyshev)
Cyanide (total)	19	7	0.0838 (J)	0.571	Normal	0.23	95% KM (t)
Manganese	32	32	29.9	1340	Lognormal	301.3	95% H
Mercury	34	26	0.00461 (J)	0.2	Gamma	0.055	95% KM (BCA)
Nitrate	19	6	0.639 (J)	2.76	Normal	1.39	95% KM (t)
Perchlorate	19	15	0.000939 (J)	0.0187	Gamma	6.40E-03	95% KM (BCA)
Selenium	32	2	0.29 (UJ)	1.17 (U)	n/a*	0.74	Maximum detected concentration
Thallium	32	2	0.061 (U)	1.3 (U)	n/a	0.089	Maximum detected concentration
Zinc	32	32	21.5	140	Approximate Gamma	58.77	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	32	9	0.0114 (J)	0.62 (U)	Normal	0.057	95% KM (t)
Acetone	22	1	0.003 (U)	0.047 (U)	n/a	7.95E-03	Maximum detected concentration
Anthracene	32	12	0.00885 (J)	0.62 (U)	Normal	0.09	95% KM (t)
Aroclor-1254	5	4	0.00365 (U)	0.0196	n/a	1.96E-02	Maximum detected concentration
Aroclor-1260	5	3	0.00365 (U)	0.0177 (U)	n/a	0.013	Maximum detected concentration
Benzo(a)anthracene	32	18	0.0188 (J)	1.04	Gamma	0.26	95% KM (t)
Benzo(a)pyrene	32	17	0.0164 (J)	1.02	Gamma	0.28	95% KM (BCA)
Benzo(b)fluoranthene	32	17	0.0315 (J)	1.55	Gamma	0.39	95% KM (t)
Benzo(g,h,i)perylene	32	10	0.0348	0.62 (U)	Normal	0.16	95% KM (t)

Table J-2.2-7 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(k)fluoranthene	24	6	0.0332 (U)	0.685	Normal	0.19	95% KM (t)
Benzoic acid	32	1	0.665 (UJ)	4.6 (U)	n/a	0.7	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	32	2	0.091 (J)	0.62 (U)	n/a	0.19	Maximum detected concentration
Butanone[2-]	22	1	0.005 (UJ)	0.089 (J+)	n/a	0.089	Maximum detected concentration
Carbazole	13	1	0.12 (J)	0.62 (U)	n/a	0.12	Maximum detected concentration
Chrysene	32	18	0.0191 (J)	1.14	Gamma	0.3	95% KM (t)
Dibenz(a,h)anthracene	32	3	0.0267 (J)	0.62 (U)	n/a	0.072	Maximum detected concentration
Fluoranthene	32	19	0.0341 (J)	2.58	Gamma	0.57	95% KM (BCA)
Fluorene	32	8	0.0186 (J)	0.62 (U)	Normal	0.051	95% KM (t)
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5	5	0.00000123 (J)	0.000384	Normal	3.26E-04	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5	5	0.000000224 (J)	0.0000608	Normal	5.43E-05	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5	3	0.000000122 (U)	0.0000049	n/a	4.90E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5	4	0.000000327 (U)	0.00000636	n/a	6.36E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5	4	0.000000323 (U)	0.0000116	n/a	1.16E-05	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5	4	0.000000305 (U)	0.0000118	n/a	1.18E-05	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5	4	0.0000000934 (U)	0.00000276	n/a	2.76E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5	3	0.0000000905 (U)	0.00000312	n/a	3.12E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5	1	0.00000013 (U)	0.000000526 (J)	n/a	5.26E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5	3	0.0000000959 (U)	0.0000046	n/a	4.60E-06	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	32	10	0.0284 (J)	0.62 (U)	Normal	0.15	95% KM (t)
Isopropyltoluene[4-]	22	1	0.001 (U)	0.067 (J+)	n/a	0.067	Maximum detected concentration
Methylene chloride	22	1	0.004 (J)	0.023 (U)	n/a	0.004	Maximum detected concentration
Methylnaphthalene[2-]	32	4	0.0121 (J)	0.62 (U)	n/a	0.026	Maximum detected concentration
Naphthalene	40	5	0.006 (U)	0.62 (U)	Normal	0.038	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5	5	0.00000845 (J)	0.00346 (J)	Normal	2.79E-03	95% Student's t
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5	5	0.000000655 (J)	0.000185	Normal	1.52E-04	95% Student's t

Table J-2.2-7 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Pentachlorodibenzodioxin[1,2,3,7,8-]	5	4	0.000000106 (U)	0.00000189 (J)	n/a	1.89E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	5	2	0.000000142 (U)	0.000000627 (J)	n/a	6.27E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	5	3	0.000000133 (U)	0.00000166 (J)	n/a	1.66E-06	Maximum detected concentration
Phenanthrene	32	18	0.0167 (J)	1.37	Gamma	0.32	95% KM (BCA)
Pyrene	32	19	0.0337 (J)	2.1	Normal	0.60	95% KM (t)
Tetrachlorodibenzofuran[2,3,7,8-]	5	3	0.000000116 (U)	0.00000167	n/a	1.67E-06	Maximum detected concentration
Toluene	22	3	0.000369 (J)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Trichlorofluoromethane	22	3	0.001 (U)	0.014	n/a	1.40E-02	Maximum detected concentration
Trimethylbenzene[1,2,4-]	22	1	0.001 (U)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	32	11	-0.0595 (U)	0.93	Normal	0.26	95% KM (t)
Plutonium-238	33	1	-0.0149 (U)	0.5	n/a	0.50	Maximum detected concentration
Plutonium-239/240	33	8	-0.009 (U)	0.448	Nonparametric	0.18	99% KM (Chebyshev)
Thorium-227	5	3	0.02 (U)	0.085	n/a	0.085	Maximum detected concentration
Tritium	19	6	-0.0233 (U)	0.1	Normal	0.034	95% KM (t)
Uranium-234	33	33	0.141	3.17	Gamma	1.23	95% Approximate Gamma
Uranium-235/236	33	16	0 (U)	0.236	Gamma	0.069	95% KM (t)
Uranium-238	33	33	0.095	3.11	Gamma	1.24	95% Approximate Gamma

* n/a = Not applicable.

Table J-2.2-8
Exposure Point Concentrations at Consolidated Unit 48-007(a)-00 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	34	8	0.05 (U)	0.73 (U)	Gamma	0.22	95% KM (t)
Chromium	34	34	2.4 (J)	1080	Nonparametric	525.2	99% Chebyshev (Mean, Sd)
Hexavalent chromium	20	7	0.145 (U)	11.8 (U)	Gamma	1.85	95% KM (t)
Copper	34	33	1.36 (U)	177	Approximate Gamma	56.53	99% KM (Chebyshev)
Cyanide (total)	20	8	0.0838 (J)	0.571	Gamma	0.23	95% KM (t)
Manganese	34	34	29.9	1340	Lognormal	287.2	95% H
Mercury	36	26	0.00461 (J)	0.2	Gamma	0.052	95% KM (Percentile Bootstrap)
Nitrate	20	6	0.639 (J)	2.76	Normal	1.36	95% KM (t)
Perchlorate	20	15	0.000939 (J)	0.0187	Gamma	6.10E-03	95% KM (BCA)
Selenium	34	2	0.29 (UJ)	1.18 (U)	n/a*	0.74	Maximum detected concentration
Thallium	34	2	0.061 (U)	1.3 (U)	n/a	0.089	Maximum detected concentration
Zinc	34	34	21.5	140	Lognormal	57.52	95% Student's t
Organic Chemicals (mg/kg)							
Acenaphthene	34	9	0.0114 (J)	0.62 (U)	Normal	0.055	95% KM (t)
Acetone	24	1	0.003 (U)	0.047 (U)	n/a	7.95E-03	Maximum detected concentration
Anthracene	34	12	0.00885 (J)	0.62 (U)	Normal	0.087	95% KM (t)
Aroclor-1254	6	4	0.00365 (U)	0.0196	n/a	1.96E-02	Maximum detected concentration
Aroclor-1260	6	3	0.00365 (U)	0.0177 (U)	n/a	0.013	Maximum detected concentration
Benzo(a)anthracene	34	19	0.0188 (J)	1.04	Gamma	0.24	95% KM (t)
Benzo(a)pyrene	34	18	0.0164 (J)	1.02	Gamma	0.26	95% KM (BCA)

Table J-2.2-8 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(b)fluoranthene	34	18	0.0315 (J)	1.55	Lognormal	0.4	95% KM (BCA)
Benzo(g,h,i)perylene	34	10	0.0348	0.62 (U)	Normal	0.15	95% KM (t)
Benzo(k)fluoranthene	26	6	0.0332 (U)	0.685	Normal	0.18	95% KM (t)
Benzoic acid	34	1	0.665 (UJ)	4.6 (U)	n/a	0.7	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	34	2	0.063 (U)	0.62 (U)	n/a	0.19	Maximum detected concentration
Butanone[2-]	24	1	0.005 (UJ)	0.089 (J+)	n/a	0.089	Maximum detected concentration
Carbazole	14	1	0.12 (J)	0.62 (U)	n/a	0.12	Maximum detected concentration
Chrysene	34	19	0.0191 (J)	1.14	Gamma	0.28	95% KM (t)
Dibenz(a,h)anthracene	34	3	0.0267 (J)	0.62 (U)	n/a	0.072	Maximum detected concentration
Fluoranthene	34	20	0.0341 (J)	2.58	Gamma	0.53	95% KM (BCA)
Fluorene	34	8	0.0186 (J)	0.62 (U)	Normal	0.05	95% KM (t)
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	6	6	0.00000123 (J)	0.000384	Normal	2.76E-04	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	6	6	0.000000224 (J)	0.000061	Normal	4.62E-05	95% Student's t
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	6	3	0.000000122 (U)	0.0000049	n/a	4.90E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6	4	0.000000241 (U)	0.00000636	n/a	6.36E-06	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	6	4	0.000000312 (U)	0.0000116	n/a	1.16E-05	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	6	4	0.000000224 (U)	0.0000118	n/a	1.18E-05	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	6	4	0.0000000617 (U)	0.0000028	n/a	2.76E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	6	3	0.0000000597 (U)	0.0000031	n/a	3.12E-06	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,7,8,9-]	6	1	0.0000000871 (U)	0.00000053 (J)	n/a	5.26E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	6	3	0.0000000603 (U)	0.0000046	n/a	4.60E-06	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	34	10	0.0284 (J)	0.62 (U)	Normal	0.22	95% KM (Chebyshev)
Isopropyltoluene[4-]	24	1	0.001 (U)	0.067 (J+)	n/a	0.067	Maximum detected concentration
Methylene chloride	24	1	0.004 (J)	0.023 (U)	n/a	4.00E-03	Maximum detected concentration
Methylnaphthalene[2-]	34	4	0.0121 (J)	0.62 (U)	n/a	0.026	Maximum detected concentration
Naphthalene	42	5	0.006 (U)	0.62 (U)	Normal	0.037	95% KM (t)

Table J-2.2-8 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	6	6	0.00000845 (J)	0.00346 (J)	Normal	2.36E-03	95% Student's t
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	6	6	0.000000655 (J)	0.000185	Normal	1.28E-04	95% Student's t
Pentachlorodibenzodioxin[1,2,3,7,8-]	6	4	0.000000106 (U)	0.00000189 (J)	n/a	1.89E-06	Maximum detected concentration
Pentachlorodibenzofuran[1,2,3,7,8-]	6	2	0.000000127 (U)	0.000000627 (J)	n/a	6.27E-07	Maximum detected concentration
Pentachlorodibenzofuran[2,3,4,7,8-]	6	3	0.000000125 (U)	0.00000166 (J)	n/a	1.66E-06	Maximum detected concentration
Phenanthrene	34	19	0.0167 (J)	1.37	Gamma	0.31	95% KM (BCA)
Pyrene	34	20	0.0337 (J)	2.1	Normal	0.57	95% KM (t)
Tetrachlorodibenzofuran[2,3,7,8-]	6	3	0.000000116 (U)	0.00000167	n/a	1.67E-06	Maximum detected concentration
Toluene	24	3	0.000369 (J)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Trichlorofluoromethane	24	4	0.001 (U)	0.014	n/a	1.40E-02	Maximum detected concentration
Trimethylbenzene[1,2,4-]	24	1	0.001 (U)	0.009 (U)	n/a	4.00E-03	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	34	11	-0.0595 (U)	0.93	Normal	0.26	95% KM (t)
Plutonium-238	35	1	-0.0149 (U)	0.5	n/a	0.50	Maximum detected concentration
Plutonium-239/240	35	8	-0.009 (U)	0.448	Normal	0.17	99% KM (Chebyshev)
Thorium-227	6	4	0.02 (U)	0.085	n/a	0.09	Maximum detected concentration
Tritium	20	6	-0.0233 (U)	0.1	Normal	0.033	95% KM (t)
Uranium-234	35	35	0.141	3.17	Gamma	1.20	95% Approximate Gamma
Uranium-235/236	35	17	0 (U)	0.236	Gamma	0.066	95% KM (t)
Uranium-238	35	35	0.095	3.11	Gamma	1.21	95% Approximate Gamma

* n/a = Not applicable.

Table J-2.2-9
Exposure Point Concentrations at AOC 48-012 for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	14	1	0.0334 (U)	10.67	n/a*	10.67	Maximum detected Concentration
Anthracene	14	2	0.0334 (U)	11.04	n/a	11.04	Maximum detected Concentration
Benzo(a)anthracene	14	2	0.0334 (U)	17.37	n/a	17.37	Maximum detected Concentration
Benzo(a)pyrene	14	1	0.0334 (U)	10.55	n/a	10.55	Maximum detected Concentration
Benzo(b)fluoranthene	14	2	0.0334 (U)	12.3	n/a	12.3	Maximum detected Concentration
Benzo(g,h,i)perylene	14	1	0.0357 (U)	3.23	n/a	3.23	Maximum detected Concentration
Chrysene	14	2	0.0334 (U)	11.79	n/a	11.79	Maximum detected Concentration
Dibenz(a,h)anthracene	14	1	0.0357 (U)	9.68	n/a	9.68	Maximum detected Concentration
Dibenzofuran	14	1	0.0334 (U)	5.34	n/a	5.34	Maximum detected Concentration
Dimethylphenol[2,4-]	14	1	0.0334 (U)	0.395 (U)	n/a	0.31	Maximum detected Concentration
Fluoranthene	14	4	0.0336 (U)	26.06	n/a	26.06	Maximum detected Concentration
Fluorene	14	1	0.0334 (U)	9.31	n/a	9.31	Maximum detected Concentration
Indeno(1,2,3-cd)pyrene	14	1	0.0357 (U)	1.02	n/a	1.02	Maximum detected Concentration
Methylnaphthalene[2-]	14	1	0.0334 (U)	3.7	n/a	3.7	Maximum detected Concentration
Methylphenol[2-]	14	1	0.0334 (U)	0.395 (U)	n/a	0.2	Maximum detected Concentration
Methylphenol[4-]	14	1	0.0334 (U)	0.442	n/a	0.44	Maximum detected Concentration
Naphthalene	24	3	0.0253 (U)	13.65	n/a	13.65	Maximum detected Concentration
Phenanthrene	14	3	0.0334 (U)	37.23	n/a	37.23	Maximum detected Concentration
Pyrene	14	4	0.0336 (U)	34.75	n/a	34.75	Maximum detected Concentration

* n/a = Not applicable.

Table J-2.2-10
Exposure Point Concentrations at SWMU 50-006(c) for All Scenarios and Ecological

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium	13	13	1.02	18.3	Gamma	6.91	95% Approximate Gamma
Fluoride	3	3	0.5 (J)	0.651 (J)	n/a*	0.65	Maximum detected concentration
Nitrate	13	9	0.703 (J)	2.08	Normal	1.37	95% KM (t)
Perchlorate	13	4	0.000655 (J)	0.00474	n/a	4.74E-03	Maximum detected concentration
Selenium	13	1	0.53 (J)	1.2 (U)	n/a	0.53	Maximum detected concentration
Zinc	13	13	32	81.5	Approximate Gamma	48.61	95% Approximate Gamma
Organic Chemicals (mg/kg)							
Acenaphthene	56	3	0.0354 (U)	0.39 (U)	n/a	0.26	Maximum detected concentration
Anthracene	56	6	0.011 (J)	0.41	Normal	0.094	95% KM (t)
Aroclor-1254	11	1	0.0027 (J-)	0.041 (U)	n/a	2.70E-03	Maximum detected concentration
Aroclor-1260	11	6	0.0018 (J)	0.041 (U)	Normal	9.37E-03	95% KM (t)
Benzo(a)anthracene	56	12	0.0354 (U)	1.8	Normal	0.26	95% KM (t)
Benzo(a)pyrene	56	15	0.0181 (J)	2.4	Gamma	0.29	95% KM (t)
Benzo(b)fluoranthene	56	15	0.0129 (J)	2.2	Gamma	0.3	95% KM (t)
Benzo(g,h,i)perylene	56	13	0.0133 (J)	1.4	Gamma	0.21	95% KM (t)
Benzo(k)fluoranthene	56	9	0.0354 (U)	1.4	Normal	0.25	95% KM (t)
Bis(2-ethylhexyl)phthalate	56	2	0.33 (UJ)	0.7 (J)	n/a	0.7	Maximum detected concentration
Chrysene	56	14	0.0178 (J)	2.9	Gamma	0.31	95% KM (t)
Dibenz(a,h)anthracene	56	4	0.0354 (U)	0.69	n/a	0.69	Maximum detected concentration
Diethyl phthalate	56	1	0.21 (J)	0.41 (U)	n/a	0.21	Maximum detected concentration
Di-n-butylphthalate	56	1	0.33 (U)	1.8	n/a	1.8	Maximum detected concentration

Table J-2.2-10 (continued)

COPC	Number of Analyses	Number of Detects	Min of Minimum Concentration	Max of Maximum Concentration	Distribution	EPC	EPC Method
Fluoranthene	56	19	0.0139 (J)	4.1	Gamma	0.54	95% KM (t)
Fluorene	56	1	0.0354 (U)	0.39 (U)	n/a	0.23	Maximum detected concentration
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	9	7	0.00000035 (U)	0.0000176	Normal	1.06E-05	95% KM (t)
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	9	5	0.000000107 (U)	0.00000161 (J)	Normal	1.12E-06	95% KM (t)
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	9	2	0.0000000968 (U)	0.00000092 (U)	n/a	3.05E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	9	3	0.000000174 (J)	0.000000931 (U)	n/a	5.40E-07	Maximum detected concentration
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	9	1	0.0000000722 (U)	0.000000869 (U)	n/a	3.78E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,4,7,8-]	9	2	0.0000000599 (U)	0.000000358 (U)	n/a	2.03E-07	Maximum detected concentration
Hexachlorodibenzofuran[1,2,3,6,7,8-]	9	1	0.0000000643 (U)	0.000000363 (U)	n/a	1.06E-07	Maximum detected concentration
Hexachlorodibenzofuran[2,3,4,6,7,8-]	9	1	0.000000068 (U)	0.000000372 (U)	n/a	1.3E-07	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	56	13	0.0223 (J)	1.6	Gamma	0.21	95% KM (t)
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	9	9	0.00000112 (J)	0.000244	Gamma	1.57E-04	95% Approximate Gamma
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9	7	0.000000224 (U)	0.00000565	Normal	3.94E-06	95% KM (t)
Pentachlorodibenzofuran[2,3,4,7,8-]	9	1	0.0000000754 (U)	0.000000351 (U)	n/a	1.93E-07	Maximum detected concentration
Phenanthrene	56	15	0.0247 (J)	2.1	Gamma	0.34	95% KM (t)
Pyrene	56	17	0.0214 (J)	4.8	Gamma	0.56	95% KM (t)
Radionuclides (pCi/g)							
Americium-241	64	4	-0.175 (U)	10	n/a	10	Maximum detected concentration
Cesium-137	61	5	-0.0105 (U)	4.16	Gamma	0.33	95% KM (t)
Cobalt-60	64	1	-0.0679 (U)	1.52	n/a	1.52	Maximum detected concentration
Plutonium-238	64	26	-0.0115 (U)	2.7	Nonparametric	0.37	97.5% KM (Chebyshev)
Plutonium-239/240	64	50	0.001 (U)	14.8	Lognormal	0.47	95% KM (Chebyshev)
Thorium-232	43	1	2.15 (U)	4.61 (U)	n/a	4.03	Maximum detected concentration
Tritium	64	51	-0.00511 (U)	0.323	Nonparametric	0.09	97.5% KM (Chebyshev)

* n/a = Not applicable.

Table J-2.2-11
Exposure Point Concentrations at SWMU 50-011(a) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Min of Minimum Concentration	Max of Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Selenium	7	1	0.53 (U)	0.57 (J)	n/a*	0.57	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-238	5	3	0 (U)	0.03	n/a	0.03	Maximum detected concentration
Plutonium-239/240	6	3	0 (U)	0.06	n/a	0.06	Maximum detected concentration
Tritium	7	7	0.294	1.42	Normal	1.11	95% Student's t

* n/a = Not applicable.

Table J-3.2-1
Physical and Chemical Properties of Inorganic COPCs
at Upper Mortandad Canyon Aggregate Area

COPC	K_d[a] (cm^3/g)	Water Solubility[a,b] (g/L)
Antimony	45	Insoluble
Barium	41	Insoluble
Cadmium	75	Insoluble
Chromium	850[c]	Insoluble
Hexavalent chromium	19	Insoluble
Cobalt	45	Insoluble
Copper	35	Insoluble
Cyanide (total)	9.9	na[d]
Lead	900	Insoluble
Manganese	65	Insoluble
Mercury	52	Insoluble
Nitrate	0.0356	na
Perchlorate	na	245000
Selenium	5	Insoluble
Thallium	71[e]	Insoluble
Zinc	62	Insoluble

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad.

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] As chromium salts.

[d] na = Not available.

[e] As thallium salts.

Table J-3.2-2
Physical and Chemical Properties of Organic COPCs
at Upper Mortandad Canyon Aggregate Area

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Acenaphthene	3.6E+00[b]	6.12E+03	3.92E+00[b]	2.5E-03[b]
Acetone	1.00E+06[b]	1.98E+00	-2.40E-01[b]	2.31E+02[b]
Anthracene	4.34E-02[b]	2.04E+04	4.45E+00[b]	2.67E-06[b]
Aroclor-1254	3.40E-03[b]	5.30E+05[c]	6.79E+00[b]	6.53E-06[b]
Aroclor-1260	2.84E-04[b]	5.30E+05[c]	8.27E+00[b]	4.05E-05[b]
Benzo(a)anthracene	9.40E-03[b]	2.31E+05	5.76+00[b]	1.90E-06[b]
Benzo(a)pyrene	1.62E-03[b]	7.87E+05	6.13E+00[b]	5.49E-09[b]
Benzo(b)fluoranthene	1.50E-03[b]	8.03E+05	5.78E+00[b]	5.00E-07[b]
Benzo(g,h,i)perylene	2.60E-04[b]	2.68E+06	6.63E+00[b]	1.00E-10[b]
Benzoic acid	3.40E+03[b]	1.45E+01	1.87E+00[b]	7.00E-04[b]
Benzo(k)fluoranthene	8.00E-04[b]	7.87E+05	6.1E+00[b]	9.65E-10[b]
Bis(2-ethylhexyl)phthalate	2.70E-01[b]	1.65E+05	7.60E+00[b]	1.42E-07[b]
Butanone[2-]	2.23E+05	3.83E+00	2.9E-01	9.06E+01
Carbazole	1.8E+00	1.13E+04	3.72E+00	7.5E-07
Chrysene	6.30E-03[b]	2.36E+05	5.81E+00[b]	6.23E-09[b]
Dibenz(a,h)anthracene	1.03E-03	2.62E+06	6.54E+00	1.39E-11
Dibenzofuran	3.1E+00	1.13E+04	4.12E+00	2.48E-03
Diethyl phthalate	1.25E+02	4.34E+02	3.53E+00	2.15E+00
Dimethylphenol[2,4-]	2.80E+02	4.86E+01	2.16E+00	4.85E+03
Di-n-butylphthalate	1.12E+01	1.46E+03	4.50E+00	2.01E-05
Fluoranthene	2.06E-01[c]	7.09E+04[c]	5.16E+00[c]	9.22E-06[c]
Fluorene	1.89E+00[b]	1.13E+04	4.18E+00[b]	8.42E-04[b]
Indeno(1,2,3-cd)pyrene	1.90E-04[b]	2.68E+06	6.70E+00[b]	1.25E-10[b]
Isopropyltoluene[4-]	2.34E+01[b]	na[e]	4.10E+00[b]	1.64E+00[b]
Methylene chloride	1.30E+04[b]	2.37E+01	1.30E+00b	4.30E+02[b]
Methylnaphthalene[2-]	2.46E+01	2.98E+03	3.86E+00	5.50E-02
Methylphenol[2-]	2.59E+04	4.43E+02	1.95E+00	1.70E-01
Methylphenol[4-]	2.15E+04	4.34E+02	1.94E+00	1.10E-01
Naphthalene	3.1E+01	1.84E+03	3.30E+00	8.5E-02
Phenanthrene	1.15E+00[b]	2.08E+04	4.46E+00[b]	1.12E-04[b]
Pyrene	1.35E-01b	6.94E+04	4.88E+00[b]	4.50E-06[b]
Toluene	5.26E+02	2.68E+02	2.73E+00	2.84E+01

Table J-3.2-2 (continued)

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Trichloroethane[1,1,2-]	1.70E+02	2.25E+02	3.16E+00	3.63E+02
Trichlorofluoromethane	1.10E+03	4.86E+01	2.53E+00	8.03E+02
Trimethylbenzene[1,2,4-]	5.70E+01	7.18E+02	3.63E+00	2.1E+00

[a] Information from http://rais.ornl.gov/cgi-bin/tox/TOX_select?select=nrad, unless noted otherwise.

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] Information from NMED 2009, 106420.

[d] Phenol used as a surrogate.

[e] na = Not available.

Table J-3.2-3
Physical and Chemical Properties of Radionuclide COPCS
at Upper Mortandad Canyon Aggregate Area

COPC	Soil-Water Partition Coefficient, K_d[a] (cm^3/g)	Water Solubility[b] (g/L)
Americium-241	680	Insoluble
Cesium-137	1000	Insoluble
Cobalt-60	45	Insoluble
Plutonium-238	4500	Insoluble
Plutonium-239/240	4500	Insoluble
Thorium-227	20	Insoluble
Thorium-232	20	Insoluble
Tritium	9.9	Soluble
Uranium-234	0.4	Insoluble
Uranium-235/236	0.4	Insoluble
Uranium-238	0.4	Insoluble

[a] Denotes reference information from Superfund Chemical Data Matrix (EPA 1996, 064708).

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

Table J-4.0-1
Risk Scenarios Evaluated for the Upper Mortandad Canyon Aggregate Area Sites

Site	Industrial Scenario	Construction Worker Scenario	Residential Scenario
SWMU 03-034(a)	No	No	Yes
AOC 03-041	Yes	No	Yes
AOC 48-002(e)	No	No	Yes
Consolidated Unit 48-007(a)-00	Yes	No	Yes
AOC 48-011	No	No	Yes
AOC 48-012	No	Yes	Yes
SWMU 50-006(c)	Yes	Yes	Yes
SWMU 50-011(a)	No	Yes	Yes

Table J-4.1-1
Exposure Parameter Values Used to Calculate
Chemical SSLs for the Industrial and Residential Scenarios

Parameters	Residential Values	Industrial Values	Construction Worker Values
Target HQ	1	1	1
Target cancer risk	10^{-5}	10^{-5}	10^{-5}
Averaging time (carcinogen)	70 yr x 365 days	70 yr x 365 days	70 yr x 365 days
Averaging time (noncarcinogen)	ED x 365 days	ED x 365 days	ED x 365 days
Skin absorption factor	Semivolatile organic compound (SVOC) = 0.1	SVOC = 0.1	SVOC = 0.1
	Chemical-specific	Chemical-specific	Chemical-specific
Adherence factor–child	0.2 mg/cm^2	n/a[a]	n/a
Body weight–child	15 kg (0–6 years of age)	n/a	n/a
Cancer slope factor–oral (chemical-specific)	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$
Cancer slope factor–inhalation (chemical-specific)	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$
Exposure frequency	350 day/yr	225 day/yr	250 day/yr
Exposure duration–child	6 yr	n/a	n/a
Age-adjusted ingestion factor	114 mg-yr/kg-day	n/a	n/a
Age-adjusted inhalation factor	11 m^3-yr/kg-day	n/a	n/a
Inhalation rate–child	10 m^3/day	n/a	n/a
Soil ingestion rate–child	200 mg/day	n/a	n/a
Particulate emission factor	6.61 x 10^9 m^3/kg	6.61 x 10^9 m^3/kg	2.1 x 10^6 m^3/kg
Reference dose–oral (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Reference dose–inhalation (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Exposed surface area–child	2800 cm^2/day	n/a	n/a
Age-adjusted skin contact factor for carcinogens	361 mg-yr/kg-day	n/a	n/a
Volatilization factor for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Body weight–adult	70 kg	70 kg	70 kg
Exposure duration[b]	30 yr	25 yr	1 yr
Adherence factor–adult	0.07 mg/cm^2	0.2 mg/cm^2	0.3 mg/cm^2
Soil ingestion rate–adult	100 mg/day	100 mg/day	330 mg/day
Exposed surface area–adult	5700 cm^2/day	3300 cm^2/day	3300 cm^2/day
Inhalation rate–adult	20 m^3/day	20 m^3/day	20 m^3/day

Note: Parameter values from NMED 2009, 106420.

[a] n/a = Not applicable.

[b] Exposure duration for lifetime resident is 30 years. For carcinogens, the exposures are combined for child (6 yr) and adult (24 yr).

Table J-4.1-2
Parameters Used in the SAL Calculations for Radionuclides, Residential

Parameters	Residential, Child	Residential, Adult
Inhalation rate (m^3/yr)	3652.5[a]	7305[b]
Mass loading (g/m^3)	1.5×10^{-7}[c]	1.5×10^{-7}[c]
Outdoor time fraction	0.2236[d]	0.0599[e]
Indoor time fraction	0.7347[f]	0.8984[g]
Soil ingestion (g/yr)	73[h]	36.5[i]

[a] Calculated as (10 m^3/d × 350 d/yr] / (indoor + outdoor time fractions], where 10 m^3/d is the daily inhalation rate of a child (NMED 2009, 106420).

[b] Calculated as (20 m^3/d × 350 d/yr] / (indoor + outdoor time fractions], where 20 m^3/d is the daily inhalation rate of an adult (NMED 2009, 106420).

[c] Calculated as (1/ $6.6 \times 10^{+9}$ m^3/kg) x 1000 g/kg, where $6.6 \times 10^{+9}$ m^3/kg is the particulate emission factor (NMED 2009, 106420).

[d] Calculated as (5.6 hr/d × 350 d/yr] / 8766 hr/yr, where 5.6 hr/dis an estimate of time spent outdoors for a 3- to 11-yr-old child (EPA 1997, 066598, section 15.4-1).

[e] Calculated as (1.5 hr/d × 350 d/yr] / 8766 hr/yr, where 1.5 hr/d is an estimate of time spent outdoors for an adult 12 yr and older (EPA 1997, 066598, section 15.4-1).

[f] Calculated as [(24–5.6 hr/d × 350 d/yr] / 8766 hr/yr.

[g] Calculated as [(24–1.5 hr/d × 350 d/yr] / 8766 hr/yr.

[h] Calculated as [0.2 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.2 g/d is the child soil-ingestion rate (NMED 2009, 106420).

[i] Calculated as [0.1 g/d × 350 d/yr] / [indoor + outdoor time fractions], where 0.1 g/d is the adult soil-ingestion rate (NMED 2009, 106420).

Table J-4.1-3
Parameter Values Used to Calculate Radionuclide SALs
for the Industrial and Construction Worker Scenarios

Parameters	Industrial, Adult	Construction Worker, Adult
Inhalation rate (m^3/yr)	19,481[a]	19,478[b]
Mass loading (g/m^3)	1.5 x 10-7[c]	0.0004[d]
Outdoor time fraction	0.2053[e]	0.2567[f]
Indoor time fraction	0	0
Soil ingestion (g/yr)	97.4[g]	321[h]

[a] Calculated as [20 m^3/day x 225 day/yr] / [indoor + outdoor time fractions], where 20 m^3/day is the daily inhalation rate of an adult and 225 days/yr is the exposure frequency (NMED 2009, 106420).

[b] Calculated as [20 m^3/day x 250 day/yr] / [indoor + outdoor time fractions], where 20 m^3/day is the daily inhalation rate of an adult and 250 days/yr is the exposure frequency (NMED 2009, 106420).

[c] Calculated as [1/ $6.6 \times 10^{+9}$ m^3/kg) x 1000 g/kg, where $6.6 \times 10^{+9}$ m^3/kg is the particulate emission factor (NMED 2009, 106420).

[d] Calculated as [1/ $2.1 \times 10^{+6}$ m^3/kg) x 1000 g/kg, where $2.1 \times 10^{+6}$ m^3/kg is the particulate emission factor (NMED 2009, 106420).

[e] Calculated as [8 hr/day x 225 day/yr] / 8766 hr/yr, where 8 hr/day is an estimate of the average length of the work day.

[f] Calculated as [9 hr/day x 250 day/yr] / 8766 hr/yr, where 9 hr/day is an estimate of the average length of the work day.

[g] Calculated as [0.1 g/day x 225 day/yr] / [indoor + outdoor time fractions], where 0.1 g/day is the adult soil ingestion rate (NMED 2009, 106420).

[h] Calculated as [0.33 g/day x 250 day/yr] / [indoor + outdoor time fractions], where 0.33 g/day is the adult soil ingestion rate NMED 2009, 106420).

Table J-4.2-1
Residential Noncarcinogenic Screening Evaluation for SWMU 03-034(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Benzoic acid	0.32	240000	1E-06
		HI	**0.000001**

* EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-2
Residential Carcinogenic Screening for SWMU 03-034(a)

COPC	EPC (mg/kg)	Residential SSL (mg/kg)	Cancer Risk
Chromium	7.57	2800[a]	3E-08
Methylene chloride	0.004	199[b]	2E-010
		Total Excess Cancer Risk	**3E-08**

[a] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[b] SSL from NMED 2009, 106420.

Table J-4.2-3
Residential Radionuclide Screening for SWMU 03-034(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Tritium	0.05	750	9.0E-04
		Total Dose	**0.0009**

* SAL from LANL 2005, 088493.

Table J-4.2-4
Dioxin/Furan TEF Calculations for the Industrial and Residential Scenarios and Ecological at AOC 03-041

COPC	EPC (mg/kg)	TEFs*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1.24E-05	0.001	1.2E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.57E-07	0.1	1.6E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.29E-07	0.1	4.3E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	3.22E-07	0.1	3.2E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	9.48E-05	0.0003	2.8E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	1.11E-07	1	1.1E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.31E-06	0.01	2.3E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	3.25E-07	0.01	3.3E-09
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.09E-07	0.1	4.1E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	2.55E-07	0.1	2.6E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	3.50E-07	0.1	3.5E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	4.51E-06	0.0003	1.4E-09
Pentachlorodibenzofuran[1,2,3,7,8-]	2.00E-07	0.03	6.0E-09
Pentachlorodibenzofuran[2,3,4,7,8-]	2.81E-07	0.3	8.4E-08
		2,3,7,8-TCDD Equivalent	**4.6E-07**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-5
Industrial Carcinogenic Screening for AOC 03-041

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0054	8.26	7E-09
Aroclor-1260	0.0072	8.26	9E-09
Benzo(a)anthracene	0.02	23.4	9E-09
Benzo(a)pyrene	0.02	2.34	9E-08
Benzo(b)fluoranthene	0.03	23.4	1E-08
Chrysene	0.02	2340	1E-10
Indeno(1,2,3-cd)pyrene	0.01	23.4	5E-09
TCDD[2,3,7,8-] equivalent	0.00000046	0.000204	2E-08
		Total Excess Cancer Risk	**2E-07**

*SSLs from NMED 2009, 106420.

Table J-4.2-6
Industrial Noncarcinogenic Screening Evaluation for AOC 03-041

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Antimony	0.54	454	1E-03
Iron	14100	795000	2E-02
Lead	17.60	800	2E-02
Nitrate	4.60	1820000	3E-06
Aroclor-1254	0.0054	1.12	5E-03
Benzo(g,h,i)perylene	0.01	18300[b]	7E-07
Fluoranthene	0.04	24400	2E-06
Phenanthrene	0.02	20500	1E-06
Pyrene	0.04	18300	2E-06
		HI	**0.05**

[a] SSLs from NMED 2009, 106420.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table J-4.2-7
Residential Noncarcinogenic Screening Evaluation for AOC 03-041

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Antimony	0.59	31.3	2E-02
Iron	17854	54800	3E-01
Lead	13.77	400	3E-02
Nitrate	2.97	125000	2E-05
Perchlorate	0.00482	54.8	9E-05
Aroclor-1254	0.0054	1.12	5E-03
Benzo(g,h,i)perylene	0.01	1720[b]	8E-06
Fluoranthene	0.04	2290	2E-05
Phenanthrene	0.02	1830	1E-05
Pyrene	0.04	1720	2E-05
		HI	**0.4**

[a] SSLs from NMED 2009, 106420.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table J-4.2-8
Residential Carcinogenic Screening for AOC 03-041

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.0054	2.2[b]	2E-08
Aroclor-1260	0.0072	1.7	4E-08
Benzo(a)anthracene	0.02	4.81	4E-08
Benzo(a)pyrene	0.02	0.481	4E-07
Benzo(b)fluoranthene	0.03	4.81	7E-08
Chrysene	0.02	481	5E-10
Indeno(1,2,3-cd)pyrene	0.01	4.81	2E-08
TCDD[2,3,7,8-] equivalent	0.00000046	0.0000414	1E-07
		Total Excess Cancer Risk	**7E-07**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-9
Residential Radionuclide Screening for AOC 03-041

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Tritium	0.08	750	0.0017
		Total Dose	**0.002**

* SAL from LANL 2005, 088493.

Table J-4.2-10
Dioxin/Furan TEF Calculations for the Residential Scenario at AOC 48-002(e)

COPC	EPC (mg/kg) 0-10 ft	TEF*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.50E-06	0.001	2.5E-09
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.30E-05	0.0003	3.9E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.56E-07	0.01	4.6E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.13E-06	0.0003	3.4E-10
		2,3,7,8-TCDD Equivalent	**1.1E-08**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-11
Residential Carcinogenic Screening for AOC 48-002(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	6.59	2800[b]	2E-08
TCDD[2,3,7,8-] equivalent	0.000000011	0.0000414	3E-09
		Total Excess Cancer Risk	**3E-08**

[a] SSL from NMED 2009, 106420, unless otherwise noted.
[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-12
Residential Noncarcinogenic Screening Evaluation for AOC 48-002(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Barium	96.66	15600	6E-03
Cyanide (total)	1.01	1560	6E-04
Nitrate	1.30	125000	1E-05
Perchlorate	0.003	54.8	5E-05
		HI	**0.01**

[a] SSLs from NMED 2009, 106420.

Table J-4.2-13
Dioxin/Furan TEF Calculations for the Industrial Scenario at Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg) 0–1 ft	TEFs*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	3.26E-04	0.001	3.3E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6.36E-06	0.1	6.4E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.16E-05	0.1	1.2E-06
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.18E-05	0.1	1.2E-06
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.79E-03	0.0003	8.4E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	1.89E-06	1	1.9E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.43E-05	0.01	5.4E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.90E-06	0.01	4.9E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	2.76E-06	0.1	2.8E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	3.12E-06	0.1	3.1E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.26E-07	0.1	5.3E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.60E-06	0.1	4.6E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.52E-04	0.0003	4.6E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.66E-06	0.3	5.0E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.67E-06	0.1	1.7E-07
		2,3,7,8-TCDD Equivalent	**8.4E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-14
Industrial Carcinogenic Screening for Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Chromium	233.8	14000 [b]	2E-07
Aroclor-1254	0.02	8.26	2E-08
Aroclor-1260	0.01	8.26	2E-08
Benzo(a)anthracene	0.36	23.4	2E-07
Benzo(a)pyrene	0.38	2.34	2E-06
Benzo(b)fluoranthene	0.56	23.4	2E-07
Benzo(k)fluoranthene	0.25	234	1E-08
Chrysene	0.42	2340	2E-09
Dibenz(a,h)anthracene	0.07	2.34	3E-07
Indeno(1,2,3-cd)pyrene	0.21	23.4	9E-08
Methylene chloride	0.004	1090	4E-11
Naphthalene	0.04	252	2E-09
TCDD[2,3,7,8-] equivalent	0.0000084	0.000204	4E-07
Total Excess Cancer Risk			**3E-06**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-15
Industrial Noncarcinogenic Screening Evaluation for Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Cadmium	0.25	1120	2E-04
Hexavalent chromium	2.62	2920	9E-04
Copper	59.18	45400	1E-03
Cyanide (total)	0.26	22700	1E-05
Manganese	381.2	145000	3E-03
Mercury	0.07	310[b]	2E-04
Nitrate	1.7	1820000	9E-07
Perchlorate	0.01	795	7E-06
Selenium	0.74	5680	1E-04
Thallium	0.09	74.9	1E-03
Zinc	67.1	341000	2E-04
Acenaphthene	0.07	36700	2E-06
Anthracene	0.12	183000	7E-07
Aroclor-1254	0.02	1.12	2E-02
Benzo(g,h,i)perylene	0.22	18300[c]	1E-05
Benzoic acid	0.7	2500000 [b]	3E-07
Butanone[2-]	0.09	369000	2E-07
Carbazole	0.12	15000[b]	8E-06
Fluoranthene	1.18	24400	5E-05
Fluorene	0.06	24400	3E-06
Isopropyltoluene[4-]	0.07	389 [d]	2E-04
Methylnaphthalene[2-]	0.03	4100 [b]	6E-06
Phenanthrene	0.65	20500	3E-05
Pyrene	0.83	18300	5E-05
Toluene	0.004	57900	7E-08
Trichlorofluoromethane	0.01	6760	2E-06
Trimethylbenzene[1,2,4-]	0.004	280 [b]	1E-05
		HI	**0.02**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening levels (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for pyrene used as a surrogate based on structural similarity.

[d] SSL for isopropylbenzene used as a surrogate based on structural similarity.

Table J-4.2-16
Industrial Radionuclide Screening for Consolidated Unit 48-007(a)-00

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.26	23	0.17
Plutonium-238	0.50	240	0.03
Plutonium-239/240	0.04	210	0.003
Thorium-227	0.05	9	0.08
Tritium	0.04	440000	0.000001
Uranium-234	1.64	1500	0.02
Uranium-235/236	0.06	87	0.01
Uranium-238	1.34	430	0.05
		Total Dose	**0.4**

*SALs from LANL 2005, 088493.

Table J-4.2-17
Dioxin/Furan TEF Calculations for the Residential Scenario at Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg) 0-10 ft	TEFs*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.76E-04	0.001	2.8E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6.36E-06	0.1	6.4E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.16E-05	0.1	1.2E-06
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.18E-05	0.1	1.2E-06
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.36E-03	0.0003	7.1E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	1.89E-06	1	1.9E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.62E-05	0.01	4.6E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.90E-06	0.01	4.9E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	2.76E-06	0.1	2.8E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	3.12E-06	0.1	3.1E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.26E-07	0.1	5.3E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.60E-06	0.1	4.6E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.28E-04	0.0003	3.8E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.66E-06	0.3	5.0E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.67E-06	0.1	1.7E-07
		2,3,7,8-TCDD Equivalent	**8.2E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-18
Residential Carcinogenic Screening for Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	525.2	2800 [b]	2E-06
Aroclor-1254	0.02	2.2 [b]	9E-08
Aroclor-1260	0.01	1.7	8E-08
Benzo(a)anthracene	0.24	4.81	5E-07
Benzo(a)pyrene	0.26	0.481	5E-06
Benzo(b)fluoranthene	0.4	4.81	8E-07
Benzo(k)fluoranthene	0.18	48.1	4E-08
Bis(2-ethylhexyl)phthalate	0.19	280	7E-09
Chrysene	0.28	481	6E-09
Dibenz(a,h)anthracene	0.07	0.481	1E-06
Indeno(1,2,3-cd)pyrene	0.22	4.81	5E-07
Methylene chloride	0.004	199	2E-10
Naphthalene	0.04	45	9E-09
TCDD[2,3,7,8-] equivalent	0.0000082	0.0000414	2E-06
Total Excess Cancer Risk			**1E-05**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-19
Residential Noncarcinogenic Screening Evaluation for Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Cadmium	0.22	77.9	3E-03
Hexavalent chromium	1.85	219	8E-03
Copper	56.53	3130	2E-02
Cyanide (total)	0.23	1560	1E-04
Manganese	287.2	10700	3E-02
Mercury	0.05	23 [b]	2E-03
Nitrate	1.36	125000	1E-05
Perchlorate	0.01	54.8	1E-04
Selenium	0.74	391	2E-03
Thallium	0.09	5.16	2E-02
Zinc	57.52	23500	2E-03
Acenaphthene	0.06	3440	2E-05
Acetone	0.00795	67500	1E-07
Anthracene	0.09	17200	5E-06
Aroclor-1254	0.02	1.12	2E-02
Benzo(g,h,i)perylene	0.15	1720 [c]	9E-05
Benzoic acid	0.70	240000 [b]	3E-06
Butanone[2-]	0.09	39600	2E-06
Carbazole	0.12	1500 [b]	8E-05
Fluoranthene	0.53	2290	2E-04
Fluorene	0.05	2290	2E-05
Isopropyltoluene[4-]	0.07	3210 [d]	2E-05
Methylnaphthalene[2-]	0.03	310 [b]	8E-05
Phenanthrene	0.31	1830	2E-04
Pyrene	0.57	1720	3E-04
Toluene	0.004	5570	7E-07
Trichlorofluoromethane	0.01	2010	7E-06
Trimethylbenzene[1,2,4-]	0.004	67[b]	6E-05
		HI	**0.1**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

[c] SSL for pyrene used as a surrogate based on structural similarity.

[d] SSL for isopropylbenzene used as a surrogate based on structural similarity.

Table J-4.2-20
Residential Radionuclide Screening for Consolidated Unit 48-007(a)-00

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Cesium-137	0.26	5.6	0.70
Plutonium-238	0.50	37	0.20
Plutonium-239/240	0.17	33	0.08
Thorium-227	0.09	2.3	0.55
Tritium	0.033	750	0.0007
Uranium-234	1.20	170	0.11
Uranium-235/236	0.07	17	0.06
Uranium-238	1.21	86	0.21
		Total Dose	**2**

*SALs from LANL 2005, 088493.

Table J-4.2-21
Dioxin/Furan TEF Calculations for the Residential Scenario at AOC 48-011

COPC	EPC (mg/kg) 0-10 ft	TEF*	Toxic Equivalency Calculation
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	9.49E-07	0.0003	2.8E-10
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.34E-07	0.01	1.3E-09
		2,3,7,8-TCDD Equivalent	**1.6E-09**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-22
Residential Carcinogenic Screening for AOC 48-011

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.0018	2.2[b]	8E-09
TCDD[2,3,7,8-] equivalent	0.0000000016	0.0000414	4E-10
Trichloroethane[1,1,2-]	0.000424	17.2	2E-10
		Total Excess Cancer Risk	**9E-09**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.
[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-23
Residential Noncarcinogenic Screening Evaluation for AOC 48-011

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Nitrate	0.98	125000	8E-06
Perchlorate	0.0059	54.8	1E-04
Aroclor-1254	0.0018	1.12	2E-03
Benzoic acid	0.26	240000[b]	1E-06
		HI	**0.002**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.
[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-24
Construction Worker Carcinogenic Screening for AOC 48-012

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Benzo(a)anthracene	17.37	213	8E-07
Benzo(a)pyrene	10.55	21.3	5E-06
Benzo(b)fluoranthene	12.30	213	6E-07
Chrysene	11.79	20600	6E-09
Dibenz(a,h)anthracene	9.68	21.3	5E-06
Indeno(1,2,3-cd)pyrene	1.02	213	5E-08
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED 2009, 106420.

Table J-4.2-25
Construction Worker Noncarcinogenic Screening Evaluation for AOC 48-012

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Hazard Quotients
Acenaphthene	10.67	18600	6E-04
Anthracene	11.04	66800	2E-04
Benzo(g,h,i)perylene	3.23	6680[b]	5E-04
Dibenzofuran	5.34	552[c]	1E-02
Dimethylphenol[2,4-]	0.31	4760	7E-05
Fluoranthene	26.06	8910	3E-03
Fluorene	9.31	8910	1E-03
Methylphenol[2-]	0.20	155000[d]	1E-06
Methylphenol[4-]	0.44	15500[d]	3E-05
Methylnaphthalene[2-]	3.70	12400[d]	3E-04
Naphthalene	13.65	702	2E-02
Phenanthrene	37.23	7150	5E-03
Pyrene	34.75	6680	5E-03
		HI	**0.05**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] SSL for pyrene used as a surrogate based on structural similarity.

[c] SSL from NMED 2006, 092513.

[d] SSLs calculated using parameters and Equation 11 from NMED 2009, 106420 and toxicity values from EPA regional screening tables (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-26
Residential Carcinogenic Screening for AOC 48-012

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Benzo(a)anthracene	17.37	4.81	4E-05
Benzo(a)pyrene	10.55	0.481	2E-04
Benzo(b)fluoranthene	12.30	4.81	3E-05
Chrysene	11.79	481	2E-07
Dibenz(a,h)anthracene	9.68	0.481	2E-04
Indeno(1,2,3-cd)pyrene	1.02	4.81	2E-06
Naphthalene	13.65	45	3E-06
		Total Excess Cancer Risk	**5E-04**

*SSLs from NMED 2009, 106420.

Table J-4.2-27
Residential Noncarcinogenic Screening Evaluation for AOC 48-012

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Acenaphthene	10.67	3440	3E-03
Anthracene	11.04	17200	6E-04
Benzo(g,h,i)perylene	3.23	1720 [b]	2E-03
Dibenzofuran	5.34	142 [c]	4E-02
Dimethylphenol[2,4-]	0.31	1220	3E-04
Fluoranthene	26.06	2290	1E-02
Fluorene	9.31	2290	4E-03
Methylphenol[2-]	0.20	3100 [d]	6E-05
Methylphenol[4-]	0.44	310 [d]	1E-03
Methylnaphthalene[2-]	3.70	310 [d]	1E-02
Phenanthrene	37.23	1830	2E-02
Pyrene	34.75	1720	2E-02
		HI	**0.1**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] SSL for pyrene used as a surrogate based on structural similarity.

[c] SSL from NMED 2006, 092513.

[d] EPA regional screening levels (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-28
Dioxin/Furan TEF Calculations for All Scenarios and Ecological at SWMU 50-006(c)

COPC	EPC (mg/kg) 0-1 ft	TEFs*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1.06E-05	0.001	1.1E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	3.05E-07	0.1	3.1E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.40E-07	0.1	5.4E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	3.78E-07	0.1	3.8E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.57E-04	0.0003	4.7E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.12E-06	0.01	1.1E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	2.03E-07	0.1	2.0E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.06E-07	0.1	1.1E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.30E-07	0.1	1.3E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3.94E-06	0.0003	1.2E-09
Pentachlorodibenzofuran[2,3,4,7,8-]	1.93E-07	0.3	5.8E-08
		2,3,7,8-TCDD Equivalent	**2.9E-07**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-4.2-29
Industrial Carcinogenic Screening for SWMU 50-006(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Chromium	6.91	14000[b]	5E-09
Aroclor-1254	0.0027	8.26	3E-09
Aroclor-1260	0.00937	8.26	1E-08
Benzo(a)anthracene	0.26	23.4	1E-07
Benzo(a)pyrene	0.29	2.34	1E-06
Benzo(b)fluoranthene	0.3	23.4	1E-07
Benzo(k)fluoranthene	0.25	234	1E-08
Bis(2-ethylhexyl)phthalate	0.70	1370	5E-09
Chrysene	0.31	2340	1E-09
Dibenz(a,h)anthracene	0.69	2.34	3E-06
Indeno(1,2,3-cd)pyrene	0.21	23.4	9E-08
TCDD[2,3,7,8-] equivalent	0.00000029	0.000204	1E-08
		Total Excess Cancer Risk	**4E-06**

[a] SSL from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-30
Industrial Noncarcinogenic Screening Evaluation for SWMU 50-006(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Hazard Quotients
Fluoride	0.65	68100	1E-05
Nitrate	1.37	182000	8E-07
Perchlorate	0.00474	795	6E-06
Selenium	0.53	5680	9E-05
Zinc	48.61	341000	1E-04
Acenaphthene	0.26	36700	7E-06
Anthracene	0.094	183000	5E-07
Aroclor-1254	0.0027	1.12	2E-03
Benzo(g,h,i)perylene	0.21	18300[b]	1E-05
Diethyl phthalate	0.21	547000	4E-07
Di-n-butylphthalate	1.80	68400	3E-05
Fluoranthene	0.54	24400	2E-05
Fluorene	0.23	24400	9E-06
Phenanthrene	0.34	20500	2E-05
Pyrene	0.56	18300	3E-05
		HI	**0.001**

[a] SSLs from NMED 2009, 106420.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table J-4.2-31
Industrial Radionuclide Screening for SWMU 50-006(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	10	180	0.83
Cesium-137	0.33	23	0.22
Cobalt-60	1.52	5.1	4.47
Plutonium-238	0.37	240	0.02
Plutonium-239/240	0.47	210	0.03
Thorium-232	4.03	5	12.1
Tritium	0.09	440000	0.0000031
		Total Dose	**18**

*SALs from LANL 2005, 088493.

Table J-4.2-32
Construction Worker Carcinogenic Screening for SWMU 50-006(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium	6.91	14000[b]	5E-09
Aroclor-1260	0.00937	75.8	1E-09
Benzo(a)anthracene	0.26	213	1E-08
Benzo(a)pyrene	0.29	21.3	1E-07
Benzo(b)fluoranthene	0.3	213	1E-08
Benzo(k)fluoranthene	0.25	2060	1E-09
Bis(2-ethylhexyl)phthalate	0.70	4760	1E-09
Chrysene	0.31	20600	2E-10
Dibenz(a,h)anthracene	0.69	21.3	3E-07
Indeno(1,2,3-cd)pyrene	0.21	213	1E-08
TCDD[2,3,7,8-] equivalent	0.00000029	28400	1E-08
		Total Excess Cancer Risk	**5E-07**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional Industrial screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-33
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 50-006(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Hazard Quotients
Fluoride	0.65	18600	3E-05
Nitrate	1.37	496000	3E-06
Perchlorate	0.00474	217	2E-05
Selenium	0.53	1550	3E-04
Zinc	48.61	92900	5E-04
Acenaphthene	0.26	18600	1E-05
Anthracene	0.094	66800	1E-06
Aroclor-1254	0.0027	4.36	6E-04
Benzo(g,h,i)perylene	0.21	6680[b]	3E-05
Diethyl phthalate	0.21	191000	1E-06
Di-n-butylphthalate	1.80	23800	8E-05
Fluoranthene	0.54	8910	6E-05
Fluorene	0.23	8910	3E-05
Phenanthrene	0.34	7150	5E-05
Pyrene	0.56	6680	8E-05
		HI	**0.002**

[a] SSLs from NMED 2009, 106420.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table J-4.2-34
Construction Worker Radionuclide Screening for SWMU 50-006(c)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	10	34	4.41
Cesium-137	0.33	18	0.28
Cobalt-60	1.52	4.1	5.56
Plutonium-238	0.37	40	0.14
Plutonium-239/240	0.47	36	0.2
Thorium-232	4.03	15	4.03
Tritium	0.09	320000	0.0000042
		Total Dose	**15**

*SALs from LANL 2005, 088493.

Table J-4.2-35
Residential Carcinogenic Screening for SWMU 50-006(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	6.91	2800[b]	2E-08
Aroclor-1254	0.0027	2.2[b]	1E-08
Aroclor-1260	0.00937	1.7	6E-08
Benzo(a)anthracene	0.26	4.81	5E-07
Benzo(a)pyrene	0.29	0.481	6E-06
Benzo(b)fluoranthene	0.3	4.81	6E-07
Benzo(k)fluoranthene	0.25	48.1	5E-08
Bis(2-ethylhexyl)phthalate	0.70	280	3E-08
Chrysene	0.31	481	6E-09
Dibenz(a,h)anthracene	0.69	0.481	1E-05
Indeno(1,2,3-cd)pyrene	0.21	4.81	4E-07
TCDD[2,3,7,8-] equivalent	0.00000029	0.0000414	7E-08
		Total Excess Cancer Risk	**2E-05**

[a] SSLs from NMED 2009, 106420, unless otherwise noted.

[b] EPA regional screening level (http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm).

Table J-4.2-36
Residential Noncarcinogenic Screening Evaluation for SWMU 50-006(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Hazard Quotients
Fluoride	0.65	4690	1E-04
Nitrate	1.37	125000	1E-05
Perchlorate	0.00474	54.8	9E-05
Selenium	0.53	391	1E-03
Zinc	48.61	23500	2E-03
Acenaphthene	0.26	3440	8E-05
Anthracene	0.094	17200	5E-06
Aroclor-1254	0.0027	1.12	2E-03
Benzo(g,h,i)perylene	0.21	1720[b]	1E-04
Diethyl phthalate	0.21	48900	4E-06
Di-n-butylphthalate	1.80	6110	3E-04
Fluoranthene	0.54	2290	2E-04
Fluorene	0.23	2290	1E-04
Phenanthrene	0.34	1830	2E-04
Pyrene	0.56	1720	3E-04
		HI	**0.01**

[a] SSL from NMED 2009, 106420.

[b] SSL for pyrene used as a surrogate based on structural similarity.

Table J-4.2-37
Residential Radionuclide Screening for SWMU 50-006(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Americium-241	10	30	5.0
Cesium-137	0.33	5.6	0.9
Cobalt-60	1.52	1.3	17.5
Plutonium-238	0.37	37	0.2
Plutonium-239/240	0.47	33	0.2
Thorium-232	4.03	15	4.03
Tritium	0.09	750	0.0018
		Total Dose	**28**

*SALs from LANL 2005, 088493.

Table J-4.2-38
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 50-011(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Hazard Quotients
Selenium	0.57	1500	4E-04
		HI	**0.0004**

* SSL from NMED 2009, 106420.

Table J-4.2-39
Construction Worker Radionuclide Screening for SWMU 50-011(a)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.03	40	0.01
Plutonium-239/240	0.06	36	0.02
Tritium	1.11	320000	0.00005
		Total Dose	**0.04**

* SALs from LANL 2005, 088493.

Table J-4.2-40
Residential Noncarcinogenic Screening Evaluation for SWMU 50-011(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Hazard Quotients
Selenium	0.57	391	0.001
		HI	**0.001**

* SSL from NMED 2009, 106420.

Table J-4.2-41
Residential Radionuclide Screening for SWMU 50-011(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Total Dose (mrem/yr)
Plutonium-238	0.03	37	0.01
Plutonium-239/240	0.06	33	0.03
Tritium	1.11	750	0.02
		Total Dose	**0.06**

*SALs from LANL 2005, 088493.

Table J-4.3-1
Comparison of VOC Concentrations to EPA Region 6 Indoor Worker Values

COPC	Maximum Concentration (mg/kg)	Indoor Worker SSL[a] (mg/kg)
Acetone	0.0332	56000
Butanone[2-]	0.089	130000
Isopropyltoluene[4-]	0.067	520[b]
Methylene chloride	0.004	210
Toluene	0.004	22000
Trichloroethane[1,1,2-]	0.000424	19
Trichlorofluoromethane	0.014	1300
Trimethylbenzene[1,2,4-]	0.004	170

[a] SSLs from EPA 2007, 099314.

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

Table J-5.4-1
Ecological Screening Levels for Terrestrial Receptors

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Inorganic Chemicals (mg/kg)											
Antimony	45	na	na	na	na	na	2.9	0.26	0.48	78	5.00E-02
Barium	41000	37000	11000	820	930	1000	3300	1300	1800	330	110
Cadmium	510	580	2	4.4	0.54	0.29	9.9	0.27	0.51	140	32
Chromium	30000	37000	7700	1900	1100	830	13000	750	1900	2.3	2.4
Hexavalent chromium	7200	5400	2200	280	220	190	3200	280	860	0.34	0.35
Copper	3800	1600	110	38	22	15	270	38	64	80	70
Cyanide (total)	2200	0.58	0.47	0.1	0.1	0.1	740	310	340	na	na
Fluoride	4600	1000	210	210	54	31	3500	120	240	na	na
Lead	3700	810	120	21	16	14	370	72	120	1700	120
Manganese	41000	90000	35000	1400	1900	3100	2000	1500	1400	450	220
Mercury	46	0.28	8.20E-02	7.00E-02	2.20E-02	1.3E-02	22	1.7	3	0.05	34
Nitrate	na	na	na	na	na	na	na	na	na	na	na
Perchlorate	na	na	na	na	na	na	na	na	na	na	na
Selenium	84	97	5.6	1	0.87	0.75	2.1	0.66	0.83	4.1	0.52
Thallium	2.8	75	6.6	9.2	1.6	0.9	2.8	3.20E-02	6.80E-02	na	0.10
Zinc	6000	3300	320	350	85	48	1800	98	170	120	160

Table J-5.4-1 (continued)

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Organic Chemicals (mg/kg)											
Acenaphthene	6.2E+03	na	na	na	na	na	4.9E+02	1.2E+02	1.6E+02	na	2.5E-01
Acetone	2900	30000	1200	7.5	14	170	1.4	15	1.2	na	na
Anthracene	5800	na	na	na	na	na	1100	210	310	na	6.8
Aroclor-1254	1.5E-01	2.2E-01	1.7E-01	1.3E+00	8.0E-02	4.0E-02	5.2E+01	4.4E-01	8.8E-01	na	1.6E+02
Aroclor-1260	1.4E-01	4.6E+00	3.7E+00	4.6E+01	1.7E+00	8.8E-01	3.0E+03	1.0E+01	2.0E+01	na	na
Benzo(a)anthracene	32	na	na	na	na	na	6.2	3	3.4	na	18
Benzo(a)pyrene	380	na	na	na	na	na	280	53	85	na	na
Benzo(b)fluoranthene	250	na	na	na	na	na	130	38	52	na	18
Benzo(g,h,i)perylene	94	na	na	na	na	na	540	24	47	na	na
Benzo(k)fluoranthene	400	na	na	na	na	na	350	62	100	na	na
Benzoic acid	350	na	na	na	na	na	4.2	1.0	1.3	na	na
Bis(2-ethylhexyl)phthalate	1.2	3.30E-02	4.5E-02	20	0.04	0.02	2700	0.59	1.1	na	na
Butanone[2-]	4.20E+05	na	na	na	na	na	420	2600	360	na	na
Chrysene	25	na	na	na	na	na	6.5	2.4	3.1	na	na
Dibenz(a,h)anthracene	54	na	na	na	na	na	95	12	22	na	na
Dibenzofuran	na	na	na	na	na	na	na	na	na	na	6.1
Diethyl phthalate	650000	na	na	na	na	na	8000	3600	3600	na	100
Di-n-butylphthalate	5000	0.24	6.8E-02	0.39	2.10E-02	1.10E-02	16000	180	370	na	160
Fluoranthene	360	na	na	na	na	na	260	22	38	10	na
Fluorene	9300	na	na	na	na	na	1100	250	340	3.7	na
Indeno(1,2,3-cd)pyrene	270	na	na	na	na	na	590	62	110	na	na
Methylene chloride	1700	na	na	na	na	na	3.4	9	2.6	na	1600
Methylnaphthalene[2-]	130	na	na	na	na	na	16	2.5	3.8	na	na

Table J-5.4-1 (continued)

Analyte	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Methylphenol[2-]	63000	na	na	na	na	na	240	1300	210	na	na
Naphthalene	1200	590	100	3.4	5.7	16	12	27	9.7	na	1
Phenanthrene	290	na	na	na	na	na	59	10	15	5.5	na
Pyrene	360	na	na	na	na	na	110	22	32	10	na
TCDD[2,3,7,8-] equivalent	1.2E-06	na	na	na	na	na	4.8E-05	2.9E-07	5.8E-07	5	na
Toluene	3100	na	na	na	na	na	61	23	25	na	200
Radionuclides (pCi/g)											
Americium-241	2.6E+04	6.2E+04	3.5E+04	1.3E+04	4000	4000	3.2E+04	3.1E+04	3.2E+04	44	2.1E+04
Cesium-137	680	2900	3700	4200	3700	3800	2300	2400	2400	1700	2300
Cobalt-60	700	1500	1500	1500	1500	1500	760	760	760	550	750
Plutonium-238	3.0E+04	1.3E+05	3.2E+04	8.3E+03	2100	2000	1.2E+05	9.2E+04	1.1E+05	44	1.1E+05
Plutonium-239/240	3.3E+04	1.6E+05	3.4E+04	8.6E+03	2100	2100	1.7E+05	1.1E+05	1.5E+05	47	1.6E+05
Strontium-90	560	1900	2400	600	930	1500	1300	1700	1700	1200	1300
Thorium-232	4600	25000	4600	1100	280	280	31000	20000	29000	6.2	3900
Tritium	1.9E+05	5.8E+05	6.3E+05	3.0E+05	4.4E+05	6.0E+05	2.3E+05	3.4E+05	3.3E+05	4.8E+04	3.6E+04
Uranium-234	45000	1.9E+05	1.2E+05	4.8E+04	1.4E+04	1.4E+04	9.6E+04	9.4E+04	9.1E+04	51	1.4E+04
Uranium-235/236	4800	10000	10000	9000	6400	6400	5100	5100	5100	55	4000
Uranium-238	2000	4200	4100	3900	3400	3400	2100	2100	2100	55	1800

Note: Values from ECORISK Database, Version 2.3 (LANL 2008, 103352).

* na = Not available.

Table J-5.4-2
Minimum ESL Comparison for AOC 03-041

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC?
Inorganic Chemicals (mg/kg)					
Antimony	0.59	0.05	Plant	**12**	**Yes**
Lead	17.60	14	Robin	**1.26**	**Yes**
Organic Chemicals (mg/kg)					
Aroclor-1254	0.0054	0.041	Robin	0.13	No
Aroclor-1260	0.0072	0.14	Red fox	0.05	No
Benzo(a)anthracene	0.02	3	Shrew	0.01	No
Benzo(a)pyrene	0.02	53	Shrew	0.0004	No
Benzo(b)fluoranthene	0.034	18	Plant	0.002	No
Benzo(g,h,i)perylene	0.013	24	Shrew	0.0005	No
Chrysene	0.024	2.4	Shrew	0.01	No
Fluoranthene	0.041	10	Earthworm	0.004	No
Indeno(1,2,3-cd)pyrene	0.012	62	Shrew	0.0002	No
Phenanthrene	0.022	5.5	Earthworm	0.004	No
Pyrene	0.042	10	Earthworm	0.004	No
TCDD[2,3,7,8-] equivalent	0.00000046	0.00000029	Shrew	**1.59**	**Yes**

Note: Bolded values indicate HQ greater than 0.3.

Table J-5.4-3
Hazard Index Analysis for AOC 03-041

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Antimony	0.59	0.01	na*	na	na	na	na	0.2	**2.27**	**1.2**	0.01	**12**
Lead	17.6	0.005	0.02	0.15	**0.84**	**1.1**	**1.3**	0.05	0.24	0.15	0.01	0.15
TCDD[2,3,7,8-] equivalent	4.6E-07	**0.38**	na	na	na	na	na	0.01	**1.59**	**0.79**	<0.0001	na
HI		0.4	0.02	0.2	0.8	1	1	0.3	**4**	**2**	0.02	**12**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table J-5.4.4
Dioxin/Furan TEF Calculations for Ecological Receptors at AOC 48-002(e)

COPC	EPC (mg/kg) 0-5 ft	TEFs*	Toxic Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.50E-06	0.001	2.5E-09
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.92E-05	0.0003	5.8E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.56E-07	0.01	4.6E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.13E-06	0.0003	3.4E-10
2,3,7,8-TCDD Equivalent			**1.3E-08**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-5.4-5
Minimum ESL Comparison for AOC 48-002(e)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC?
Inorganic Chemicals (mg/kg)					
Barium	127.8	110	Plant	**1.16**	**Yes**
Chromium	8.01	2.3	Earthworm	**3.48**	**Yes**
Cyanide (total)	1.01	0.1	Robin	**10**	**Yes**
Organic Chemicals (mg/kg)					
TCDD[2,3,7,8-] equivalent	0.000000013	0.00000029	Shrew	0.04	No

Note: Bolded values indicate HQ greater than 0.3.

Table J-5.4-6
Hazard Index Analysis for AOC 48-002(e)

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Barium	127	0.003	0.003	0.01	0.15	0.14	0.13	0.04	0.10	0.07	**0.38**	**1.15**
Chromium	8.01	0.0003	0.0002	0.001	0.004	0.01	0.01	0.001	0.01	0.004	**3.48**	**3.34**
Cyanide (total)	1.01	0.0005	**1.74**	**2.15**	**10**	**10**	**10**	0.001	0.003	0.003	na*	na
	HI	0.03	**2**	**2**	**10**	**10**	**10**	0.04	0.1	0.08	**4**	**49**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table J-5.4-7
Dioxin/Furan TEF Calculations for Ecological Receptors at Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg) 0–5 ft	TEFs*	Toxicity Equivalency Calculation
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	3.26E-04	0.001	3.3E-07
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	6.36E-06	0.1	6.4E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.16E-05	0.1	1.2E-06
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.18E-05	0.1	1.2E-06
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.79E-03	0.0003	8.4E-07
Pentachlorodibenzodioxin[1,2,3,7,8-]	1.89E-06	1	1.9E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.43E-05	0.01	5.4E-07
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.90E-06	0.01	4.9E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	2.76E-06	0.1	2.8E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	3.12E-06	0.1	3.1E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.26E-07	0.1	5.3E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.60E-06	0.1	4.6E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.52E-04	0.0003	4.6E-08
Pentachlorodibenzofuran[1,2,3,7,8-]	6.27E-07	0.03	1.9E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.66E-06	0.3	5.0E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.67E-06	0.1	1.7E-07
2,3,7,8-TCDD Equivalent			**8.4E-06**

*TEFs from www.who.int/ipcs/assessment/tef_update/en/print.html.

Table J-5.4-8
Minimum ESL Comparison for Consolidated Unit 48-007(a)-00

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC?
Inorganic Chemicals (mg/kg)					
Cadmium	0.22	0.27	Shrew	**0.81**	**Yes**
Chromium	554	2.3	Earthworm	**241**	**Yes**
Hexavalent chromium	1.94	0.34	Earthworm	**6**	**Yes**
Copper	59.35	15	Robin	**4**	**Yes**
Cyanide (total)	0.23	0.1	Robin	**2.30**	**Yes**
Manganese	301.3	220	Plant	**1.37**	**Yes**
Mercury (inorganic)	0.06	0.013	Robin	**4**	**Yes**
Selenium	0.74	0.52	Plant	**1.42**	**Yes**
Thallium	0.09	0.032	Shrew	**2.78**	**Yes**
Zinc	58.77	48	Robin	**1.22**	**Yes**
Organic Chemicals (mg/kg)					
Acenaphthene	0.057	0.25	Plant	0.23	No
Acetone	0.00795	1.2	Deer mouse	0.01	No
Anthracene	0.09	6.8	Plant	0.01	No
Aroclor-1254	0.02	0.041	Robin	**0.49**	**Yes**
Aroclor-1260	0.013	0.14	Red fox	0.09	No
Benzo(a)anthracene	0.26	3	Shrew	0.09	No
Benzo(a)pyrene	0.28	53	Shrew	0.01	No
Benzo(b)fluoranthene	0.39	18	Plant	0.02	No
Benzo(g,h,i)perylene	0.16	24	Shrew	0.01	No
Benzo(k)fluoranthene	0.19	62	Shrew	0.003	No
Benzoic acid	0.7	1	Deer mouse	0.70	No
Bis(2-ethylhexyl)phthalate	0.19	0.02	Robin	**9.50**	**Yes**
Butanone(2-)	0.089	360	Deer mouse	0.0002	No
Chrysene	0.3	2.4	Shrew	0.13	No
Dibenz(a,h)anthracene	0.072	12	Shrew	0.01	No
Fluoranthene	0.57	10	Earthworm	0.06	No
Fluorene	0.051	3.7	Earthworm	0.01	No
Indeno(1,2,3-cd)pyrene	0.15	62	Shrew	0.002	No
Methylene chloride	0.004	2.6	Deer mouse	0.002	No
Methylnaphthalene(2-)	0.026	2.5	Shrew	0.01	No
Naphthalene	0.038	1	Plant	0.04	No
Phenanthrene	0.32	5.5	Earthworm	0.06	No
Pyrene	0.6	10	Earthworm	0.06	No
TCDD[2,3,7,8-] equivalent	0.0000081	0.00000029	Shrew	**28**	**Yes**
Toluene	0.004	23	Shrew	0.0002	No

Table J-5.4-8 (continued)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC?
Radionuclides (pCi/g)					
Cesium-137	0.26	680	Red fox	3.8E-04	No
Plutonium-238	0.5	44	Earthworm	1.1E-02	No
Plutonium-239	0.18	47	Earthworm	3.8E-03	No
Tritium	0.034	36000	Plant	9.4E-07	No
Uranium-234	1.23	51	Earthworm	2.4E-02	No
Uranium-235	0.069	55	Earthworm	1.3E-03	No
Uranium-238	1.24	55	Earthworm	2.3E-02	No

Note: Bolded values indicate HQ greater than 0.3.

Table J-5.4-9
Hazard Index Analysis for Consolidated Unit 48-007(a)-00

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Cadmium	0.22	0.0004	0.0004	0.11	0.05	**0.41**	**0.76**	0.02	**0.81**	**0.43**	0.002	0.01
Chromium	554	0.02	0.01	0.07	0.29	**0.5**	**0.67**	0.04	**0.74**	0.29	**241**	**231**
Copper	59.35	0.02	0.04	**0.54**	**1.56**	**2.7**	**4**	0.22	**1.56**	**0.93**	**0.74**	**0.85**
Cyanide (total)	0.23	0.0001	**0.4**	**0.49**	**2.3**	**2.3**	**2.30**	0.0003	0.001	0.001	na*	na
Manganese	301.3	0.01	0.003	0.01	0.22	0.16	0.1	0.15	0.2	0.22	**0.67**	**1.37**
Mercury (inorganic)	0.06	0.001	0.21	**0.73**	**0.86**	**2.73**	**5**	0.003	0.04	0.02	**1.2**	0.002
Selenium	0.74	0.01	0.01	0.13	**0.74**	**0.85**	**0.99**	**0.35**	**1.12**	**0.89**	0.18	**1.42**
Thallium	0.09	0.03	0.001	0.01	0.01	0.06	0.1	0.03	**2.81**	**1.32**	na	**0.9**
Zinc	58.77	0.01	0.02	0.18	0.17	**0.69**	**1.22**	0.03	**0.6**	**0.35**	**0.49**	**0.37**
Aroclor-1254	0.02	0.13	0.09	0.12	0.02	0.25	**0.49**	0.0004	0.05	0.02	na	0.0001
Bis(2-ethylhexyl)phthalate	0.19	0.16	**6**	**4**	0.01	**5**	**10**	0.0001	**0.32**	0.17	na	na
TCDD[2,3,7,8-] equivalent	8.1E-06	**7**	na	na	na	na	na	0.17	**28**	**14**	<0.0001	na
HI		**7**	**7**	**7**	**6**	**15**	**25**	1	**36**	**19**	**244**	**236**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table J-5.4-10
Minimum ESL Comparison for SWMU 50-006(c)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	Hazard Quotient	COPEC
Inorganic Chemicals (mg/kg)					
Chromium	6.91	2.3	Earthworm	**3.0**	**Yes**
Fluoride	0.65	31	Robin	0.02	No
Selenium	0.53	0.52	Plant	**1.02**	**Yes**
Zinc	48.61	48	Robin	**1.01**	**Yes**
Organic Chemicals (mg/kg)					
Acenaphthene	0.26	0.25	Plant	**1.04**	**Yes**
Anthracene	0.094	6.8	Plant	0.01	No
Aroclor-1254	0.0027	0.041	Robin	0.07	No
Aroclor-1260	0.00937	0.14	Red fox	0.07	No
Benzo(a)anthracene	0.26	3	Shrew	0.09	No
Benzo(a)pyrene	0.29	53	Shrew	0.01	No
Benzo(b)fluoranthene	0.3	18	Plant	0.02	No
Benzo(g,h,i)perylene	0.21	24	Shrew	0.01	No
Benzo(k)fluoranthene	0.25	62	Shrew	0.004	No
Bis(2-ethylhexyl)phthalate	0.7	0.02	Robin	**35**	**Yes**
Chrysene	0.31	2.4	Shrew	0.13	No
Dibenz(a,h)anthracene	0.69	12	Shrew	0.06	No
Diethyl phthalate	0.21	100	Plant	0.002	No
Di-n-butylphthalate	1.8	0.011	Robin	**164**	**Yes**
Fluoranthene	0.54	10	Earthworm	0.05	No
Fluorene	0.23	3.7	Earthworm	0.06	No
Indeno(1,2,3-cd)pyrene	0.21	62	Shrew	0.003	No
Phenanthrene	0.34	5.5	Earthworm	0.06	No
Pyrene	0.56	10	Earthworm	0.06	No
TCDD[2,3,7,8-] equivalent	0.00000029	0.00000029	Shrew	**1**	**Yes**
Radionuclides (pCi/g)					
Americium-241	10	44	Earthworm	0.23	No
Cesium-137	0.33	680	Red fox	0.000485	No
Cobalt-60	1.52	550	Earthworm	0.003	No
Plutonium-238	0.37	44	Earthworm	0.008	No
Plutonium-239	0.47	47	Earthworm	0.01	No
Thorium-232	4.03	6.2	Earthworm	**0.65**	**Yes**
Tritium	0.09	36000	Plant	0.0000025	No

Note: Bolded values indicate HQ greater than 0.3.

Table J-5.4-11
Hazard Index Analysis for SWMU 50-006(c)

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Chromium	6.91	0.0002	0.0002	0.001	0.004	0.01	0.01	0.001	0.01	0.004	**3.0**	**2.88**
Selenium	0.53	0.01	0.01	0.09	**0.53**	**0.61**	**0.71**	0.25	**0.80**	**0.64**	0.13	**1.02**
Zinc	48.61	0.01	0.02	0.15	0.14	**0.57**	1.01	0.03	**0.50**	0.29	**0.41**	0.30
Acenaphthene	0.26	0.00004	na*	na	na	na	na	0.001	0.002	0.002	na	**1.04**
Bis(2-ethylhexyl)phthalate	0.7	**0.58**	**21**	**16**	0.04	**18**	**35**	0.0003	**1.19**	**0.64**	na	na
Di-n-butylphthalate	1.8	0.0004	**8**	**26**	**5**	**86**	**164**	0.0001	0.01	0.005	na	0.01
TCDD[2,3,7,8-] equivalent	2.9E-07	0.24	na	na	na	na	na	0.006	**1**	**0.5**	<0.0001	na
Thorium-232	4.03	0.001	0.0002	0.001	0.004	0.01	0.01	0.0001	0.0002	0.0001	**0.65**	0.001
HI		0.8	**29**	**42**	**6**	**104**	**200**	0.3	**4**	**2**	**4**	**5**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table J-5.5-1
Comparison of EPCs to Background Concentrations for AOC 03-041

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Antimony	0.59	0.1–1	0.05–0.4
Lead	17.6	2–28	1.6–15.5

Note: From LANL 1998, 059730.

Table J-5.5-2
Comparison of EPCs to Background Concentrations for AOC 48-002(e)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Barium	127	21–410	1.4–51.6
Chromium	8.01	1.9–36.5	0.25–13
Cyanide (total)	1.01	0.5*	0.5*

Note: From LANL 1998, 059730.

* Value is the BV.

Table J-5.5-3
Comparison of EPCs to Background Concentrations for Consolidated Unit 48-007(a)-00

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Cadmium	0.22	0.2–2.6	0.05–0.18	0.1–1.5
Chromium	554	1.9–36.5	0.8–9.2	0.25–13
Copper	59.35	0.25–16	0.77–12	0.25–6.2
Hexavalent chromium	1.94	na[a]	na	na
Cyanide (total)	0.23	0.5[b]	0.075–0.63	0.5[b]
Manganese	301.3	76–1,100	46–517	22–752
Mercury (inorganic)	0.06	0.1[b]	0.1[b]	0.1[b]
Selenium	0.74	0.1–1.7	0.1–0.1	0.1–0.105
Thallium	0.09	0.063–1	0.73[b]	0.05–1.7
Zinc	58.77	14–75.5	9–56.2	5.5–65.6

Note: From LANL 1998, 059730.

[a] na = Not available.

[b] Value is the BV.

Table J-5.5-4
Comparison of EPCs to Background Concentrations for SWMU 50-006(c)

COPEC	EPC (mg/kg)	Soil Background Concentrations (mg/kg)	Sediment Background Concentrations (mg/kg)	Tuff Background Concentrations (mg/kg)
Chromium	6.91	1.9–36.5	0.8–9.2	0.25–13
Selenium	0.53	0.1–1.7	0.3*	0.3*
Zinc	48.61	14–75.5	9–56.2	5.5–65.6

Note: From LANL 1998, 059730.

* Value is the BV.

Table J-5.5-5
PAUFs and AUFs for Ecological Receptors

Receptor	Home Range[a] (ha)	Population Area[a] (ha)	PAUF[b] AOC 03-041	PAUF[c] AOC 48-002(e)	PAUF[d] Consolidated Unit 48-007(a)-00	PAUF[e] SWMU 50-006(c)
American robin	0.42	16.8	0.0000004	0.0005	0.006	0.2
American kestrel	106	4240	0.000000002	0.000002	0.00002	0.0007
Deer mouse	0.077	3.0	0.000002	0.003	0.03	1
Desert cottontail	3.1	124	0.00000006	0.00007	0.0008	0.03
Montane shrew	0.39	15.6	0.0000005	0.0005	0.006	0.2
Red fox	1038	41,520	0.0000000002	0.0000002	0.000002	0.00007
Mexican spotted owl	366[g]	n/a[f]	0.00000002	0.00002	0.0003	0.008

[a] Values from EPA 1993, 059384.

[b] PAUF is calculated as the area of the site (7E-06 ha) divided by the population area.

[c] PAUF is calculated as the area of the site (0.0082 ha) divided by the population area.

[d] PAUF is calculated as the area of the site (0.1 ha) divided by the population area.

[e] PAUF is calculated as the area of the site (3.1 ha) divided by the population area.

[f] n/a = Not applicable.

[g] Value for Mexican spotted owl is the AUF based on individual HR.

Table J-5.5-6
Adjusted HQs and HIs for AOC 03-041

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
TCDD[2,3,7,8-] equivalent	4.4E-07	<0.0001	na*	na	na	na	na	<0.0001	<0.0001	<0.0001	<0.0001	na
HI		7E-11	na	na	na	na	na	6E-10	7E-07	2E-06	9E-08	na

* na = Not available

Table J-5.5-7
Adjusted HQs and HIs for AOC 48-002(e)

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Cyanide (total)	1.01	<0.0001	<0.0001	<0.0001	0.005	0.005	0.005	<0.0001	<0.0001	<0.0001	na*	na
HI		9E-11	3E-06	4E-06	0.005	0.005	0.005	9E-08	2E-06	8E-06	na	na

* na = Not available

Table J-5.5-8
Adjusted HQs and HIs for Consolidated Unit 48-007(a)-00

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Hexvalent chromium	1.94	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**6**	**6**
Chromium	554	<0.0001	<0.0001	<0.0001	0.002	0.003	0.004	<0.0001	0.005	0.009	**241**	**231**
Copper	59.35	<0.0001	<0.0001	<0.0001	0.009	0.02	0.02	0.0002	0.01	0.03	**0.74**	**0.85**
Aroclor-1254	0.02	<0.0001	<0.0001	<0.0001	<0.0001	0.001	0.003	<0.0001	0.0003	0.0007	na*	0.0001
Bis(2-ethylhexyl)phthalate	0.19	<0.0001	0.0001	0.0001	<0.0001	0.03	0.06	<0.0001	0.002	0.006	na	na
TCDD[2,3,7,8-] equivalent	8.1E-06	<0.0001	na	na	na	na	na	0.0001	0.18	**0.45**	<0.0001	na
HI		0.00002	0.0001	0.0001	0.01	0.05	0.09	0.0003	0.2	0.5	**248**	**238**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.0.

* na = Not available.

Table J-5.5-9
Adjusted HQs and HIs for SWMU 50-006(c)

COPEC	EPC (mg/kg)	Red fox	Carnivorous Kestrel	Omnivorous Kestrel	Herbivorous Robin	Omnivorous Robin	Insectivorous Robin	Cottontail	Shrew	Deer Mouse	Earthworm	Plant
Acenaphthene	0.26	<0.00001	na	na	na	na	na	0.00001	0.0004	0.002	na	**1.04**
Bis(2-ethylhexyl)phthalate	0.7	0.00004	0.02	0.01	0.006	**3**	**6**	<0.00001	0.24	**0.64**	na	na
Di-n-butylphthalate	1.8	<0.00001	0.005	0.02	**0.85**	**16**	0.03	<0.00001	0.002	0.005	na	0.01
TCDD[2,3,7,8-] equivalent	2.9E-07	0.00002	na	na	na	na	na	0.0002	0.2	**0.5**	<0.00001	na
Thorium-232	4.03	<0.00001	<0.00001	<0.00001	0.0007	0.003	0.003	<0.00001	0.00004	0.0001	**0.65**	0.001
HI		0.00006	0.02	0.03	0.9	**19**	**6**	0.0002	0.4	1	0.7	1

* na = Not available.

Table J-6.1-1
Summary of Human Health Risk Screening Assessments Results

Site	HI	Cancer Risk	Dose (mrem/yr)
Residential Scenario			
SWMU 03-034(a)	0.000001	3×10^{-8}	0.0009
AOC 03-041	0.4	7×10^{-7}	0.002
AOC 48-002(e)	0.01	3×10^{-8}	—[a]
Consolidated Unit 48-007(a)-00	0.1	1×10^{-5}	2.0
AOC 48-011	0.002	9×10^{-9}	—
AOC 48-012	0.1	5×10^{-4}	—
SWMU 50-006(c)	0.01	2×10^{-5}	26[b]
SWMU 50-011(a)	0.001	—	0.06
Industrial Scenario			
AOC 03-041	0.5	2×10^{-7}	—
Consolidated Unit 48-007(a)-00	0.02	3×10^{-6}	0.4
SWMU 50-006(c)	0.001	4×10^{-6}	11[b]
Construction Worker Scenario			
AOC 48-012	0.05	1×10^{-5}	—
SWMU 50-006(c)	0.002	5×10^{-7}	12[b]
SWMU 50-011(a)	0.0004	—	0.04

[a] — = No COPCs identified for the risk type.

[b] Doses are based on subtraction of thorium-232 background from the EPC.

Attachment J-1

ProUCL Files
(on DVD included with this document)

Attachment J-2

Ecological Scoping Checklists

J2-1.0 AOC 03-041

Part A—Scoping Meeting Documentation

Site ID	AOC 03-041
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	AOC 03-041 is located adjacent to the Sigma facility at TA-03. The Sigma Building (building 03-0066) was completed in 1959 and is located at the eastern end of TA-03. The building houses a complex array of equipment and activities concerned with metallurgical and ceramics research and fabrication. AOC 03-041 is an unloading station designed as a holding tank for industrial low-level radioactive wastewater. Form of site releases would be liquid for this site and the most likely mechanism of release would be spills or leaks during low-level radioactive waste storage. Potential areas of release are surface and subsurface media.
List of Primary Impacted Media (Indicate all that apply.)	**Surface soil –** Applicable **Surface water/sediment –** NA **Subsurface –** Applicable **Groundwater –** NA **Other, explain –** NA
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	**Water –** NA **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** NA **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Paved roads, fences and buildings
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	NA
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	The CMR building and Sigma Facility of TA-03 are neighboring, contiguous, and/or up-gradient sites. Releases from these sites include hazardous constituents and radionuclides in liquid, vapor, and solid forms through the mechanisms of spills, dumping, drainages, outfalls, material disposal/storage and test firing. The COPCs for the up-gradient sites include but are not limited to VOCs, SVOCs, inorganics, chemicals and radionuclides.
Surface Water Erosion Potential Information	Run-on to site occurs from storm water. Run-off from site may infiltrate into the surface and subsurface media or move as sheet flow down into Mortandad Canyon.

Part B—Site Visit Documentation

Site ID	AOC 03-041
Date of Site Visit	6/24/2009
Site Visit Conducted by	T. McFarland, J. Branch, A. Goumas

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = medium Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = low
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The AOC exhibits a moderate amount of variable vegetative cover from a transitional vegetative zone between the piñon-juniper and ponderosa pine zone. The locations also exhibit a moderate amount of native bunch grasses and shrub species.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	NA
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. AOC 03-041contains terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The quality of habitat at the sites is ideal for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	AOC 03-041 does have the potential for surface water transport of contaminants due to its physical location. The vegetation in the areas is conducive to limiting the amount of erosion that occurs in the area with large Ponderosa pine trees maintaining the integrity of the surface media. The transport of surface water terminates at the bottom of Mortandad Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. AOC 03-041 has the potential for surface water transport off-site due to the physical location of the sites.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The contaminants for these areas are at low levels and the erosion potential for the area is low.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The AOC contains physical disturbances resulting from the development of buildings and paved roads.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No. Only effects are the result of the physical disturbances from development.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area remains developed.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The nature and extent of potential contamination has been defined.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The extent of contamination has been defined.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Most volatile organic compounds are not frequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of ground water is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on of near these sites. There is no evidence of mass wasting events in the area and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Low percentage of vegetative ground cover, along with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surficial soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Gamma-emitting rad were detected at low concentrations.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no active aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

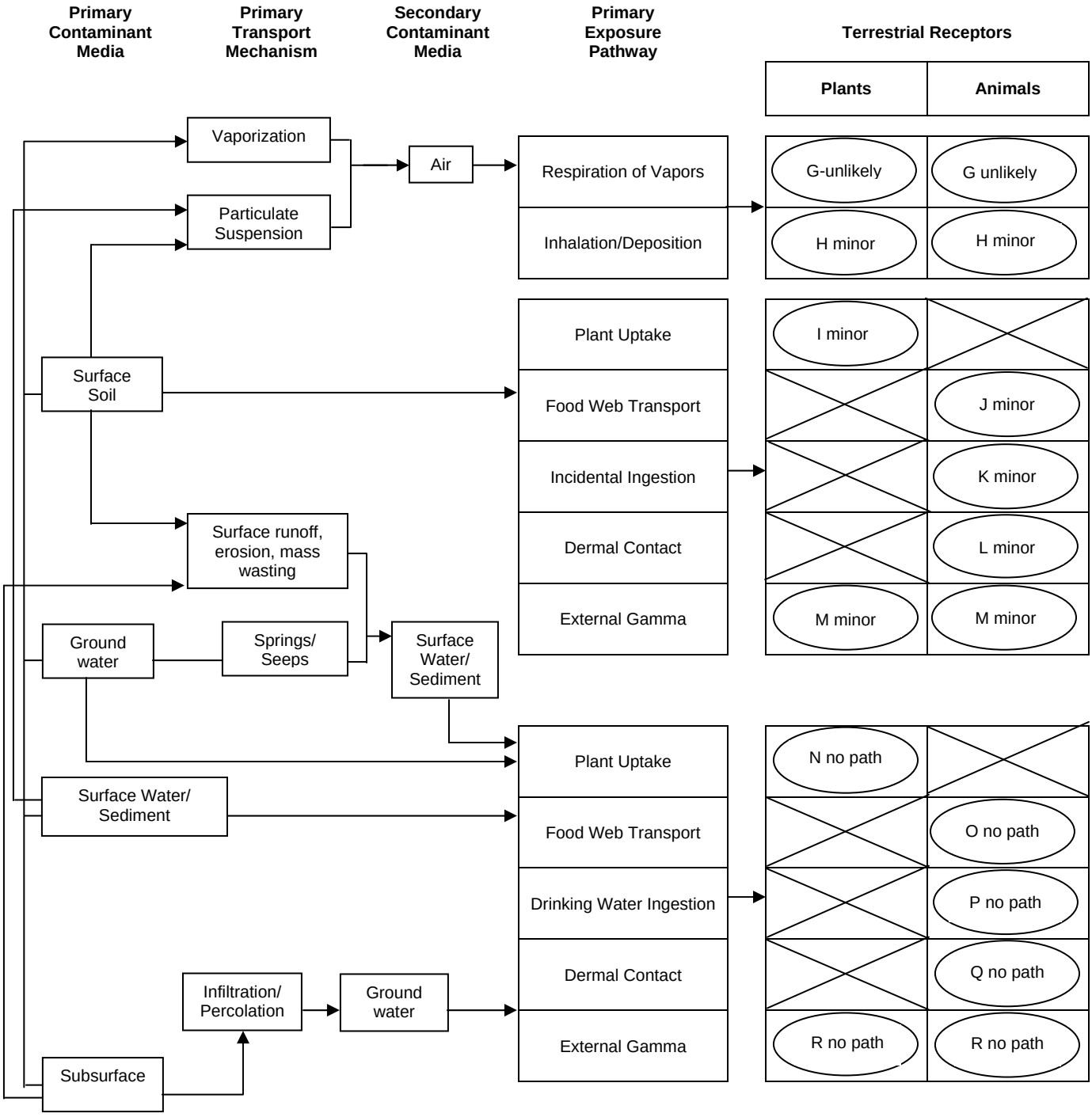
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

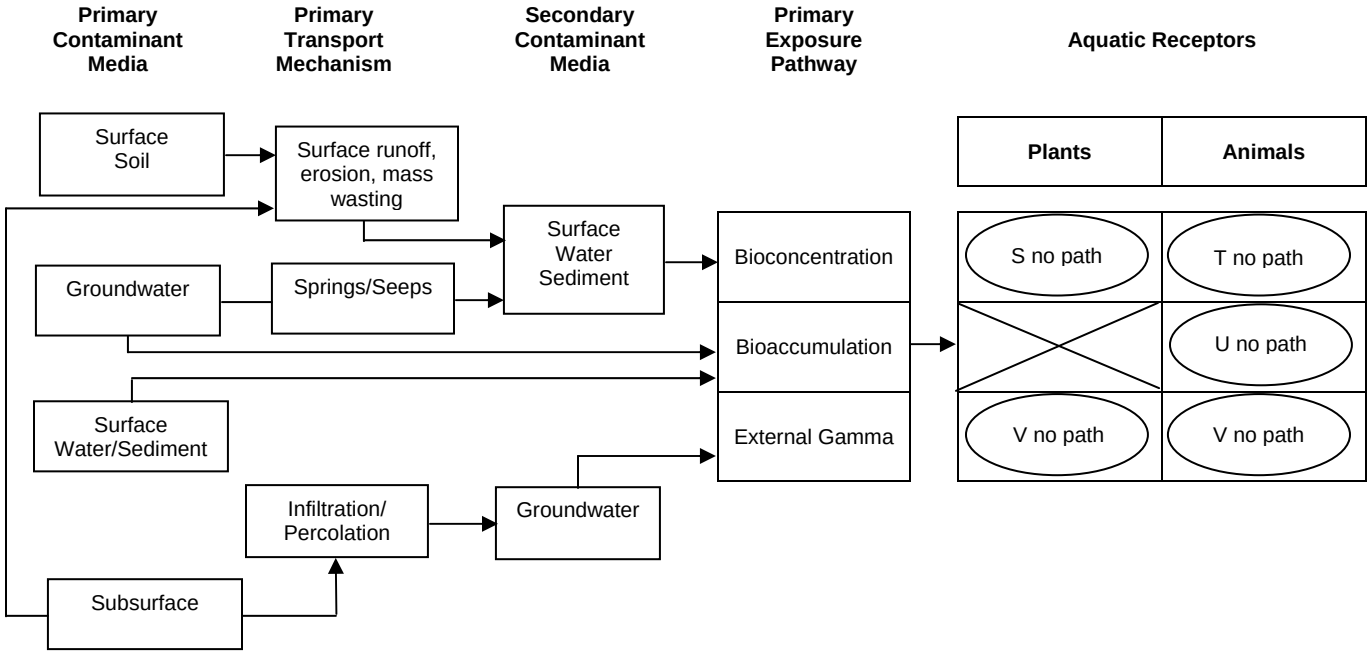
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): John P. Branch
Name (signature): John Branch
Organization: Los Alamos Technical Associates
Phone number: 505-662-1822
Date Completed: 09/17/2009

Verification by another party (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

J2-2.0 AOC 48-002(e)

Part A—Scoping Meeting Documentation

Site ID	AOC 48-002(e)
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-48 is located north of Pajarito Road between Mortandad Canyon on the north and Two Mile Canyon on the south. TA-48 was established in 1957 and is currently used for chemical and radiochemical analyses, radioactive waste disposal research, and radioisotope production for nuclear medicine. AOC 48-002(e) consists of a storage area located on the east side of the main radiochemistry laboratory in building 48-001. The RFI work plan states that AOC 48-002(e) was used for many years to store solvents (LANL 1992, 007666). The form of site release in this AOC is liquid by accidental spills or leaks. Subsurface media within the AOC are the potential areas of release.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil –** NA **Surface water/sediment –** NA **Subsurface –** Applicable **Groundwater –** NA **Other, explain –** None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water –** NA **Bare Ground/Unvegetated –** NA **Spruce/fir/aspen/mixed conifer –** NA **Ponderosa pine –** NA **Piñon juniper/juniper savannah –** NA **Grassland/shrubland –** NA **Developed –** Buildings, paved roads, fences
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E habitat is present.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	The CMR building and Sigma Facility of TA-03 are neighboring, contiguous and/or up-gradient sites from AOC 48-002(e). Releases from these sites include hazardous constituents and radionuclides in liquid, vapor, and solid forms through the mechanisms of spills, dumping, drainages, outfalls, material disposal/storage and test firing. The COPCs for the up-gradient sites include but are not limited to VOCs, SVOCs, inorganics, chemicals and radionuclides.
Surface Water Erosion Potential Information	Run-on to site occurs from storm water. Run-off from site may infiltrate into the surface and subsurface media or move as sheet flow down into Mortandad Canyon.

Part B—Site Visit Documentation

Site ID	AOC 48-002(e)
Date of Site Visit	06/24/2009
Site Visit Conducted by	T. McFarland, J. Branch

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = none Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = high
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	AOC 48-002(e) is located within the security fence at TA-48. The locations within the AOC are located beneath asphalt in highly developed areas. These areas have a very low percentage of naturally occurring vegetation.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	na
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. AOC 48-002(e) does contain a small amount of terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The quality of habitat within the AOC is not ideal for the ecological receptors present at the site due to the high amount of development at TA-48.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	There is a low potential for surface water transport of contaminants in the AOC due to the extent of development in the area. The development in the area also contributes to stabilization of surface media thus lowering the erosion potential.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	No. Locations under asphalt.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. Area remains highly developed.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The AOC contains physical disturbances resulting from the development of buildings, paved roads, and fences.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No. Only effects are the result of the development.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area remains developed.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The nature and extent of potential contamination has been defined for the AOC.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The extent of contamination has been defined.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Most volatile organic compounds are not frequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Potential of soil contaminants reaching receptors through fugitive dust is not very likely due to the asphalt in the highly developed area of TA-48.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of ground water is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on of near these sites. There is no evidence of mass wasting events in the area and the erosion potential is very low.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently, and at low concentrations. Also, sample locations are located beneath asphalt.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: The amount of development in and around TA-48 minimizes the potential for particulates and dust.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Provide explanation: There is no vegetative cover on these sites due to the amount of development within them.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Some bioaccumulating contaminants are present but at low concentrations so the viable transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Most contaminants are located beneath asphalt, subsurface contaminants are minor and at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 1

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites, which are all located beneath asphalt.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Gamma-emitting rad was detected at low concentrations.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.
- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.

- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

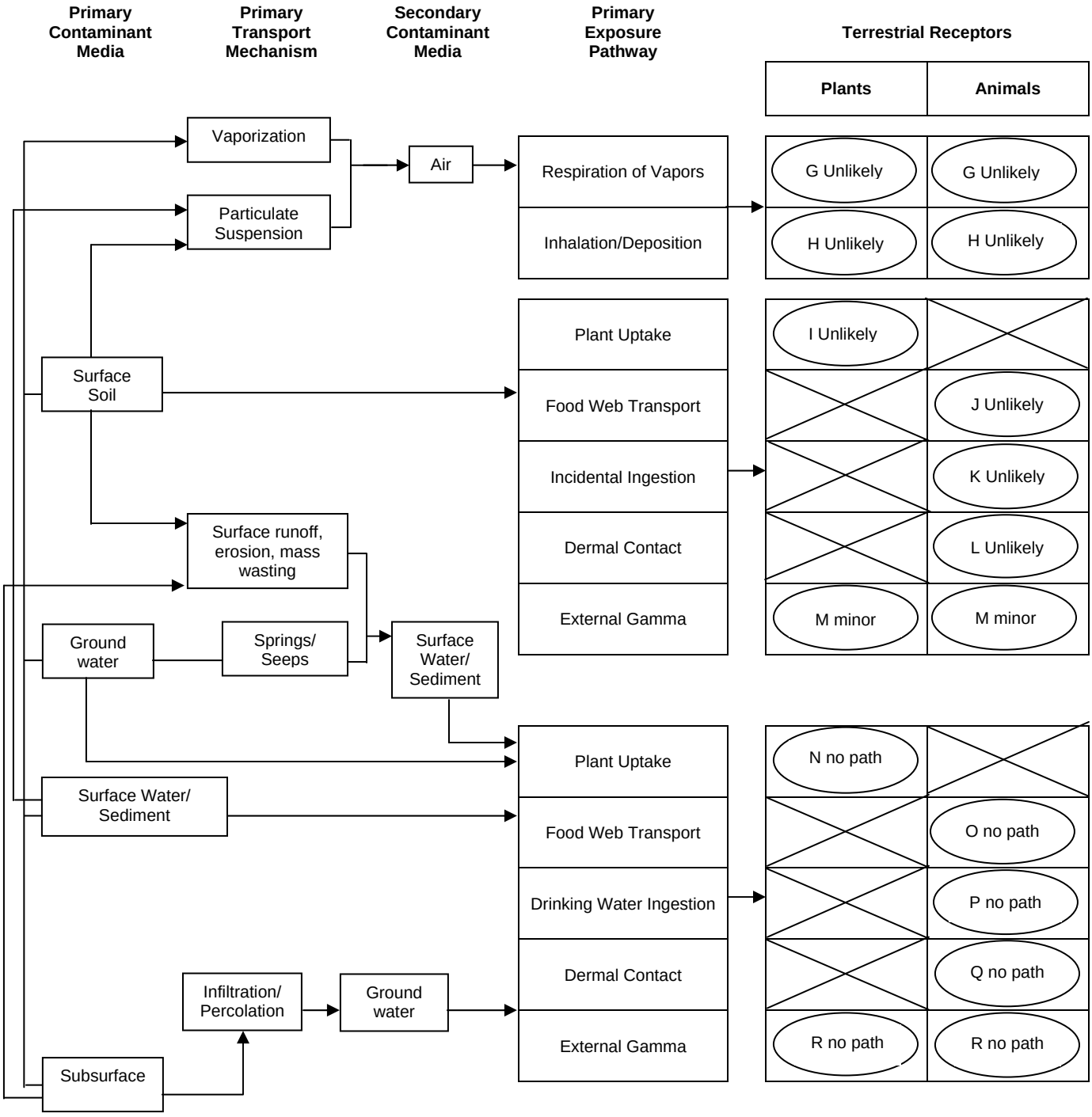
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

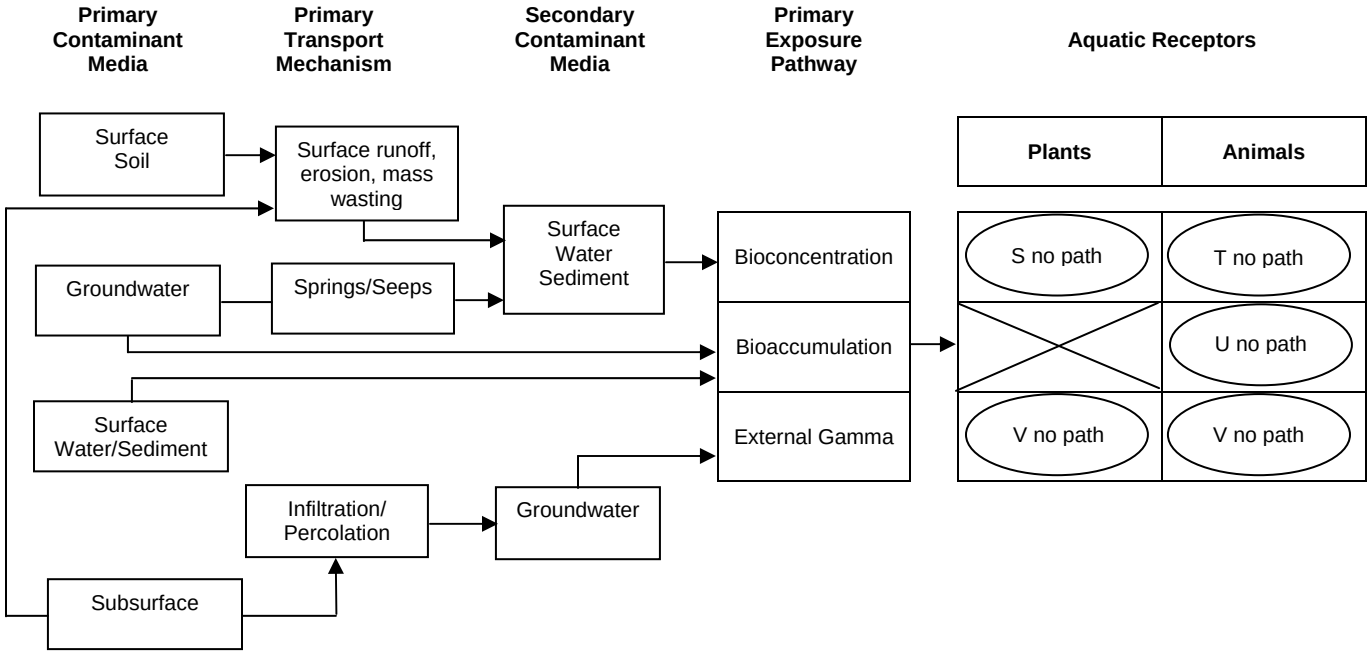
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model

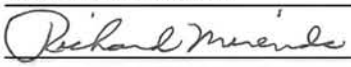


Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): John P. Branch
Name (signature): 
Organization: Los Alamos Technical Associates
Phone number: 505-662-1822
Date Completed: 08/30/2009

Verification by another party (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): 
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

J2-3.0 CONSOLIDATED UNIT 48-007(a)-00

Part A—Scoping Meeting Documentation

Site ID	Consolidated Unit 48-007(a)-00
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-48 is located north of Pajarito Road between Mortandad Canyon on the north and Two Mile Canyon on the south. TA-48 was established in 1957 and is currently used for chemical and radiochemical analyses, radioactive waste disposal research, and radioisotope production for nuclear medicine. Consolidated Unit 48-007(a)-00 consists of SWMUs 48-007(a), 48-007(d), and 48-010. These SWMUs include two active stormwater outfalls and a surface impoundment that receives discharge from the outfalls. These SWMUs formerly received wastewater from the main radiochemistry laboratory in building 48-001. The form of site release is liquid stormwater and wastewater from outfalls and discharges from the associated SWMUs. Potential areas of release are surface and subsurface media.
List of Primary Impacted Media (Indicate all that apply.)	**Surface soil –** Applicable **Surface water/sediment –** Applicable (sediment) **Subsurface –** Applicable **Groundwater –** NA **Other, explain –** NA
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	**Water –** NA **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** NA **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Fence, hiking trail, power lines
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	Yes. Location information maintained by the FIMAD was intersected with T&E species habitat using GIS databases. The sites are within Mexican spotted owl nesting habitat and within an area where the owl can conservatively be assumed to forage at a high frequency. The sites are also entirely within an area where the peregrine falcon can conservatively be assumed to forage at a relatively high frequency.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	The CMR building and Sigma Facility of TA-03 are neighboring, contiguous and/or up-gradient sites. Releases from these sites include hazardous constituents and radionuclides in liquid, vapor, and solid forms through the mechanisms of spills, dumping, drainages, outfalls, material disposal/storage and test firing. The COPCs for the up-gradient sites include but are not limited to VOCs, SVOCs, inorganics, chemicals, and radionuclides.
Surface Water Erosion Potential Information	Run-on to site occurs from storm water. Run-off from site may infiltrate into the surface and subsurface media and move as sheet flow or through storm drain down into Mortandad Canyon.

Part B—Site Visit Documentation

Site ID	Consolidated Unit 48-007(a)-00
Date of Site Visit	06/24/2009
Site Visit Conducted by	T. McFarland, J. Branch, A. Goumas

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = medium Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = low
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The majority of the locations are located on the mesa top just east of the TA-48 fence; the other locations are located within Mortandad Canyon. The only slight difference in vegetative distribution between the two areas is density, with the locations inside of the canyon having a slightly higher vegetative density. Vegetation from the ponderosa pine zone and piñon/juniper zone is established throughout the locations, there are also limited amounts of secondary successional grass and shrub species in the areas resulting from disturbances and erosion.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	The area in and around the sites may provide an ideal foraging habitat for the Mexican spotted owl and the peregrine falcon. The area in and around the Consolidated Unit may also provide a suitable nesting and mating habitat for the two T&E species present in the area.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. The site contains terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The quality of habitat at the sites is sustainable for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	During events that create a significant amount of storm water, the sites do have the potential for surface water transport due to the physical nature of their geographical location. The areas on the mesa top have minimal potential for erosion but the locations that are situated within the canyon have a high potential for erosion and transport to a point much further downgradient than the original contamination. The terminal point of the surface water is the bottom of Mortandad Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. A portion of the sites do have the potential for off-site surface water transport. The physical location of this portion contributes to the pathway of off-site transport due to storm water run-off.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The contaminants for these areas are at low levels and the erosion potential for the area is low.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The sites do have a very low amount of physical disturbance. This disturbance is mainly the result of erosion and the installation of dirt roads, trails, a fence and power lines.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No. The only obvious ecological effects are the result of the minimal development in the area.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area remains in use and effects do not warrant any action.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The nature and extent of potential contamination has been defined.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The extent of contamination has been defined.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Most volatile organic compounds are not frequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no active aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of ground water is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers on of near these sites. There is no evidence of mass wasting events in the area and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 1

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Low percentage of vegetative ground cover, along with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surficial soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Gamma-emitting rad were detected at low concentrations.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no active aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no active aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

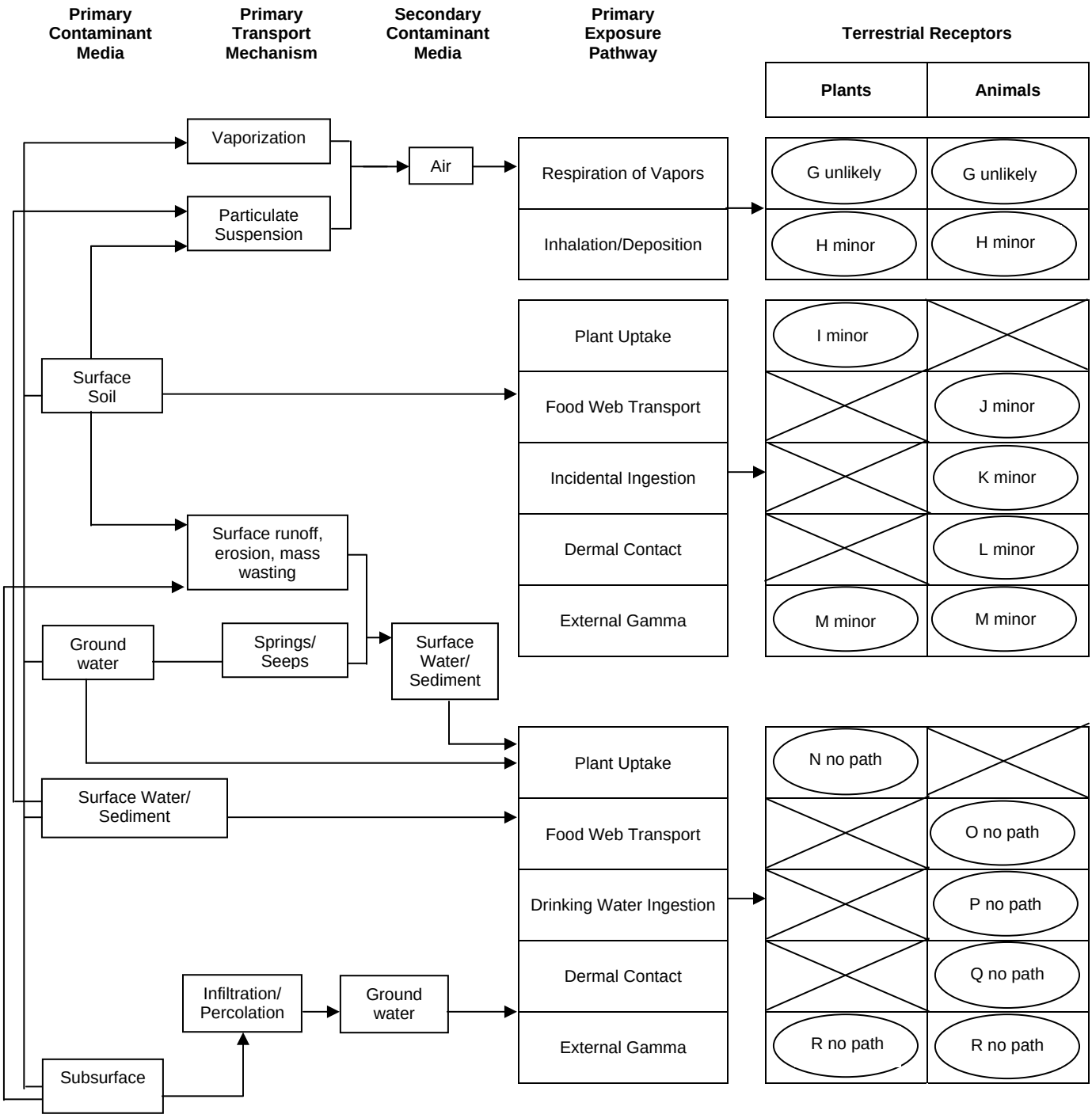
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no active aquatic environments onsite.

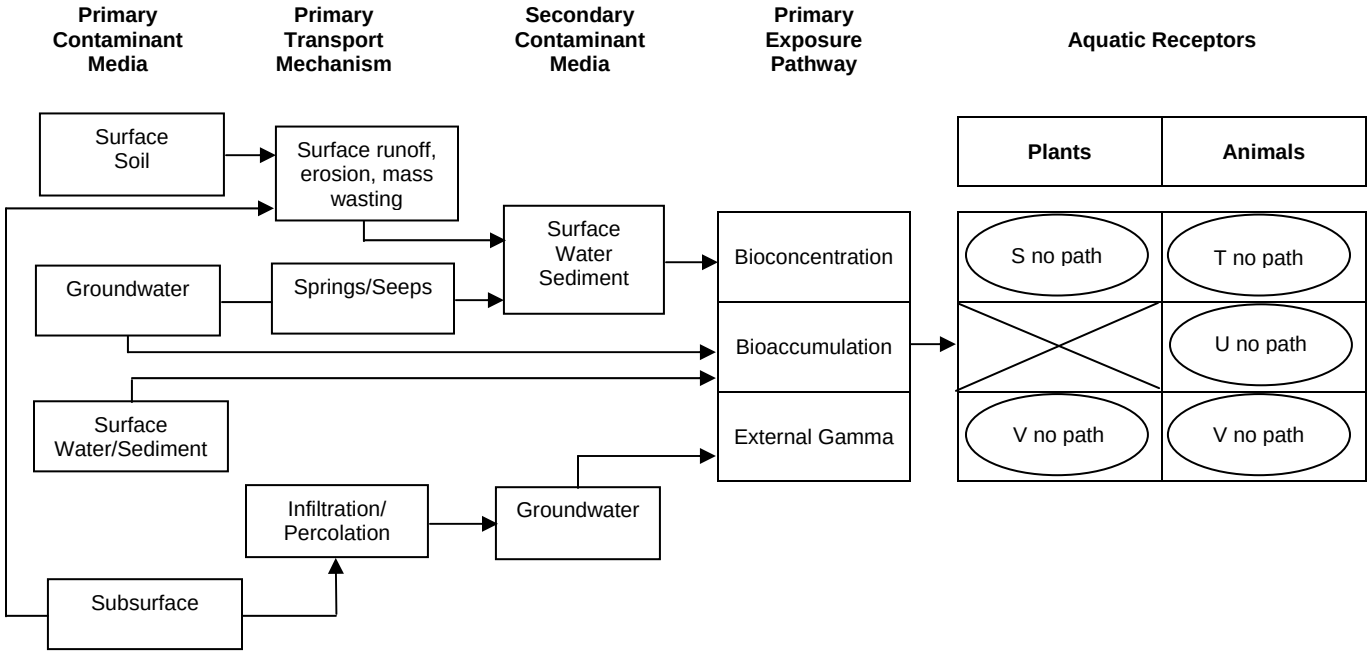
NOTE:
Letters in circles refer to questions on the Scoping Checklist

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Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): John P. Branch
Name (signature): John P. Branch
Organization: Los Alamos Technical Associates, Inc.
Phone number: 505-662-1822
Date Completed: 08/28/2009

Verification by another party (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): Richard J. Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953

J2-4.0 SWMU 50-006(c)

Part A—Scoping Meeting Documentation

Site ID	SWMU 50-006(c)
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-50 is located immediately northeast of the intersection of Pajarito Road and Pecos Drive and occupies an area of approximately 21 acres: 11.8 acres are associated with MDA C, and 8.7 acres are associated with the RLWTF. Treatment facilities include the RLWTF and associated waste transfer and storage systems, equipment decontamination areas, and solid waste volume-reduction facilities. This treatment plant treats low level wastewater from various areas of the Laboratory. SWMU 50-006(c) consists of the surface soil contamination at TA-50 resulting from the deposition of radioactive contaminants (primarily plutonium and americium) from historical stack emissions at TA-50. Emission sources included seven exhaust stacks that ventilated hoods for specific operations at the facility. The form of site release at this site is vapor and deposition is the suspected mechanism of release. Surface media are the potential areas of release.
List of Primary Impacted Media (Indicate all that apply.)	**Surface soil –** Applicable **Surface water/sediment –** Applicable (sediment) **Subsurface –** Applicable **Groundwater –** NA **Other, explain –** None
FIMAD vegetation class based on Arcview vegetation coverage (Indicate all that apply.)	**Water –** NA **Bare Ground/Unvegetated –** Applicable **Spruce/fir/aspen/mixed conifer –** NA **Ponderosa pine –** Applicable **Piñon juniper/juniper savannah –** Applicable **Grassland/shrubland –** Applicable **Developed –** Paved roads, buildings, construction areas, and fences.
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E habitat is present.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	The CMR building and Sigma Facility of TA-03, TA-48, TA-55, and former TA-42 are neighboring, contiguous, and/or up-gradient sites from. Releases from these sites include hazardous constituents and radionuclides in liquid, vapor, and solid forms through the mechanisms of spills, dumping, drainages, outfalls, material disposal/storage and test firing. The COPCs for the up-gradient sites include but are not limited to VOCs, SVOCs, inorganics, chemicals and radionuclides.
Surface Water Erosion Potential Information	Run-on to site occurs from storm water. Run-off from site may infiltrate into the surface and subsurface media or move as sheet flow down into Mortandad Canyon.

Part B—Site Visit Documentation

Site ID	SWMU 50-006(c)
Date of Site Visit	06/24/2009
Site Visit Conducted by	T. McFarland, J. Branch

Receptor Information:

Estimate cover	Relative vegetative cover (high, medium, low, none) = low Relative wetland cover (high, medium, low, none) = none Relative structures/asphalt, etc. cover (high, medium, low, none) = high
Field notes on the FIMAD vegetation class to assist in ground-truthing the Arcview information	The areas in and around the SWMU has a relatively low amount of naturally occurring vegetation and they are limited to a small area at the head of Ten Site Canyon. The vegetation in this area is from a transitional zone between the Ponderosa Pine and Piñon/Juniper zone. The remainder of the SWMU in TA-50 contains a small amount of secondary successional bunch grasses and shrubs resulting from physical disturbances at TA-50.
Field notes on T&E Habitat, if applicable. Consider the need for a site visit by a T&E subject matter expert to support the use of the site by T&E receptors.	na
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. SWMU 50-006(c) contains terrestrial biota such as reptiles, small mammals, insects, birds, and plants. The quality of habitat at the sites is not ideal for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	SWMU 50-006(c) has a small potential for surface water transport. Although much of the area is highly developed, there is a major amount of active construction disturbance in the area which contributes to poor stabilization of surface media resulting in a higher potential for erosion and surface water transport. The head of Ten Site Canyon is on the southern side of TA-50 and is the gathering point for the majority of surface water collected in the SWMU. Ten Site Canyon eventually flows into Mortandad Canyon which would be the terminal point of the surface water transport.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Yes. SWMU 50-006(c) does have the potential for surface water transport off-site due to the physical location of the sites.
Interim action needed to limit off-site transport? **(yes/no/uncertain)** **Provide explanation/ recommendation to project lead for IA SMDP.**	No. The area is developed.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	There is a high amount of physical disturbance in and around the SWMU. There is a high amount of development in the area and a very high amount of active construction projects making the physical disturbance of the area quite substantial.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No. Only effects are the result of the physical disturbances from development.
Interim action needed to limit apparent ecological effects? **(yes/no/uncertain)** **Provide explanation and recommendations to mitigate apparent exposure pathways to project lead for IA SMDP.**	No. The area remains developed.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	Yes. The nature and extent of potential contamination has been defined for the SWMU.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The extent of contamination has been defined.

Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant $>10^{-5}$ atm-me/mol and molecular weight <200 g/mol).

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: All samples collected were from the surface soil. Volatile chemical samples not collected.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- Soil contamination would have to be on the actual surface of the soil to become available for dust.
- In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- Known or suspected presence of contaminants in groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no seeps, springs or perched groundwater present on or near the sites. The depth of ground water is greater than 1000 ft below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- Suspected ability of contaminants to migrate to groundwater.
- The potential for contaminants to migrate via groundwater and discharge into habitats and/or surface waters.
- Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1 m depth).
- Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Contaminants are unlikely to migrate to the regional aquifer given the depth to groundwater. The lack of a significant hydraulic driver (e.g., no standing surface water) facilitating infiltration also mitigates the potential for contaminants reaching groundwater.

Question F:

Might erosion or mass wasting events be a potential release mechanism for contaminants from subsurface materials or perched aquifers to the surface?

- This question is only applicable to release sites located on or near the mesa edge.
- Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no perched aquifers near these sites. There is no evidence of mass wasting events in the area and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- Contaminants must be present as volatiles in the air.
- Consider the importance of inhalation of vapors for burrowing animals.
- Foliar uptake of organic vapors is typically not a significant exposure pathway.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: VOCs not analyzed for in the samples collected.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.
- Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Low percentage of vegetative ground cover, along with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- Contaminants in bulk soil may partition into soil solution, making them available to roots.
- Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surface soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- The chemicals may bioaccumulate in animals.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the viable transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface are detected infrequently.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Gamma-emitting rad were detected infrequently.

Stream Channel

Question N:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.

- Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.
- Contaminants in sediment may partition into soil solution, making them available to roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: There are no aquatic environments onsite.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- The chemicals may bioconcentrate in food items.
- Animals may ingest contaminated food items.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.
- Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.
- Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- Burial of contamination attenuates radiological exposure.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- Aquatic plants are in direct contact with water.
- Contaminants in sediment may partition into pore water, making them available to submerged roots.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There are no aquatic environments onsite.

Question T:

Could contaminants bioconcentrate in sedimentary or water column organisms?

- Aquatic receptors may actively or incidentally ingest sediment while foraging.
- Aquatic receptors may be directly exposed to contaminated sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.
- Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question U:

Could contaminants bioaccumulate in sedimentary or water column organisms?

- Lipophilic organic contaminants and some metals may concentrate in an organism's tissues
- Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- External irradiation effects are most relevant for gamma emitting radionuclides.
- The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

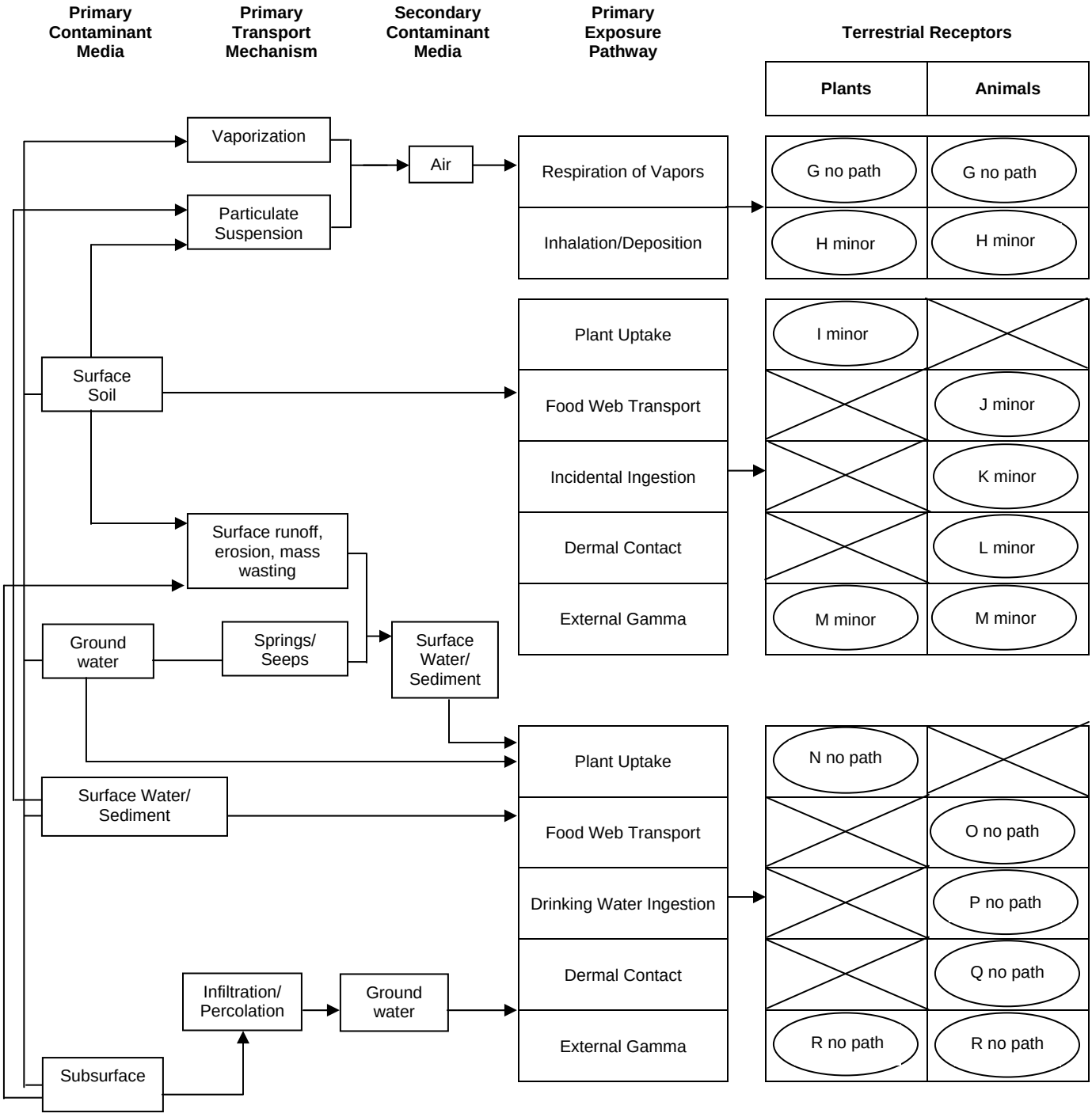
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There are no aquatic environments onsite.

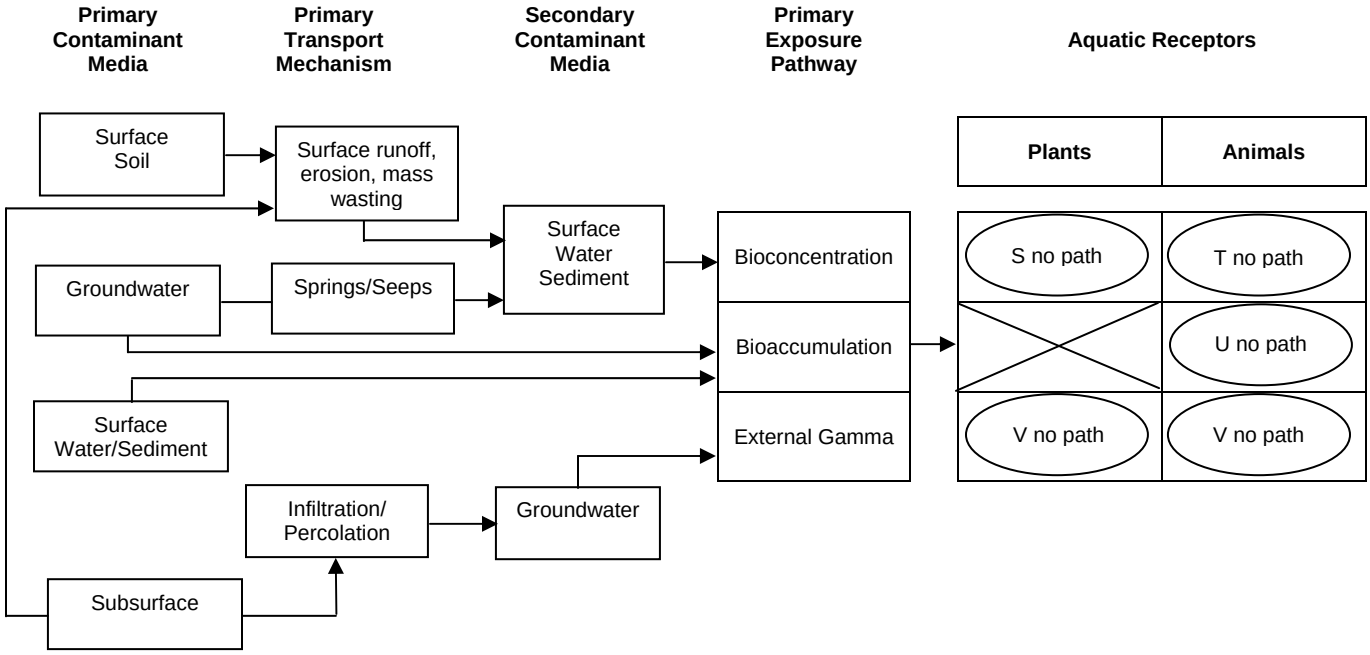
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



NOTE:
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Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



Signatures and certifications:

Checklist completed by (provide name, organization and phone number):

Name (printed): John Branch
Name (signature): John Branch
Organization: Los Alamos Technical Associates
Phone number: 505-662-1822
Date Completed: 08/30/2009

Verification by another party (provide name, organization and phone number):

Name (printed): Richard J. Mirenda
Name (signature): Richard Mirenda
Organization: Los Alamos National Laboratory, EP-WES-EDA
Phone number: 505-665-6953