DRAFT

RESOURCE CONSERVATION AND RECOVERY ACT PERMIT

EPA ID No. NM 2750211235

for the

UNITED STATES DEPARTMENT OF ARMY

WHITE SANDS MISSILE RANGE

Located in

DOÑA ANA, LINCOLN, OTERO, SIERRA AND SOCORRO COUNTIES, NEW MEXICO

March 2023

Prepared by the

New Mexico Environment Department

Hazardous Waste Bureau

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1 Part 1 General Permit Conditions 15
1.1 Authority 15
1.2 Permittee 15
1.3 Permitted Activity 15
1.4 Citations 15
1.5 Effect of Permit 16
1.6 Effect of Inaccuracies in Permit Application 16
1.7 Enforcement 16
1.8 Permit Components 16
1.9 Permit Actions 17
1.9.1 Duration of Permit 17
1.9.2 Permit Modification 17
1.9.3 Unclassified Permit Modifications 17
1.9.4 Permit Modification, Suspension, Revocation, or Termination 17
1.9.5 Permit Renewal Application 17
1.9.6 Continuation of Expiring Permit 17
1.9.7 Transfer of Land Ownership 18
1.10 Permit Construction 18
1.10.1 Severability 18
1.10.2 Conflict in Language 18
1.11 Definitions 19
1.12 Duties and Requirements 22
1.12.1 Duty to Comply 22
1.12.2 Duty to Reapply 22
1.12.3 Transfer of Permit 22
1.12.4 Need to Halt or Reduce Activity Not a Defense 23
1.12.5 Duty to Mitigate 23
1.12.6 Proper Operation and Maintenance 23
1.12.7 Duty to Provide Information 23
1.12.8 Inspection and Entry 23
1.12.9 Monitoring and Records 24
1.12.9.1 Representative Sampling 24
1.12.9.2 Record Retention 24
1.12.9.3 Monitoring Records 24
1.12.9.4 Reporting Requirements 25

1.12.9.5 Reporting planned changes 25
1.12.9.6 Reporting anticipated noncompliance 25
1.12.9.7 Certification of construction or modification 25
1.12.9.8 Submittal of statement 25
1.12.9.9 Inspection by the NMED 25
1.12.9.10 24-Hour and Subsequent Reporting 25
1.12.9.11 24 Hour Oral Report 25
1.12.9.12 Contingency Plan Implementation 26
1.12.9.13 Manifest discrepancy report 26
1.12.9.14 Biennial report 26
1.12.9.15 Other noncompliance 27
1.12.9.16 Other Information 27
1.13 Confidential Information 27
1.14 Quarterly Environmental Monitoring Reports 27
1.15 Signatory requirement 27
1.15.1 Submissions to the NMED 27
1.16 Approval of Submittals 28
1.17 Extensions of Time 28
1.18 Property Rights 28
2 Part 2 General Facility Conditions 29
2.1 Operation and Maintenance of the Facility 29
2.2 Authorized Wastes 29
2.2.1 Permitted Waste 29
2.2.2 Prohibited Waste 29
2.3 Land Disposal Restrictions 29
2.3.1 Storage of Land Disposal Restricted Waste 29
2.3.2 Storage of PCB Contaminated Waste 29
2.3.3 Waste Dilution 30
2.4 Waste Characterization 30
2.4.1 General Requirements 30
2.4.2 General Waste Characterization Methods 31
2.4.2.1 Sampling and Analysis 31
2.4.2.2 Acceptable Knowledge Hazardous Wastes 32
2.4.2.3 Waste Characterization Documentation 32
2.5 Waste Characterization Review 33

2.6 Characterization of Air Emissions from Containers 34
2.7 Compliance With Land Disposal Restriction 34
2.7.1 Hazardous Waste Analysis 34
2.7.2 Prohibition on Dilution as a Substitute for Treatment 34
2.8 Waste Shipped to an Off-Site Facility 34
2.9 Waste Minimization 34
2.10 Dust Suppression 35
2.11 Security 35
2.12 Inspection Requirements 35
2.13 Personnel Training 35
2.14 Waste Sources 36
2.14.1 Ignitable, Reactive, or Incompatible Waste 36
2.14.2 Waste Generated During Emergency Explosives or Munitions Emergency Response 36
2.14.3 Waste Military Munitions 36
2.15 Transport, Storage, Treatment, and Disposal of Waste Military Munitions 36
2.15.1 Transport of Waste Military Munitions 37
2.15.2 Storage of Waste Military Munitions 37
2.15.3 Treatment and Disposal of Waste Military Munitions 37
2.16 Preparedness and Prevention 38
2.16.1 Maintenance and Operation of Facility 38
2.16.2 Required Equipment 38
2.16.3 Testing and Maintenance of Equipment 38
2.16.4 Access to Communications or Alarm System 38
2.16.5 Coordination Arrangements 38
2.16.6 Required Aisle Space 38
2.17 Contingency Plan 39
2.17.1 Provisions of Plan 39
2.17.2 Implementation 39
2.17.3 Content of Contingency Plan 39
2.17.4 Copies of Plan 39
2.17.5 Amendments to Plan 39
2.17.6 Emergency Coordinator 39
2.18 Recordkeeping and Reporting 39
2.18.1 Operating Record 39
2.18.2 Manifest System 40

2.18.3 Record Retention 40
2.19 General Closure Requirements 40
2.19.1 Performance Standard 40
2.19.2 Amendment to Closure Plan 40
2.19.3 Notification of Closure 40
2.19.4 Time Allowed for Closure 40
2.19.5 Disposal or Decontamination of Equipment, Structures, and Soils 40
2.19.6 Certification of Closure 41
2.19.7 Survey Plat 41
2.20 Post-Closure Care Requirements 41
3 Part 3 Container Storage Area/Hazardous Waste Storage Facility 42
3.1 Hazardous Waste Storage Facility 42
3.1.1 Storage Locations and Quantities 42
3.1.2 Storage Time Limit 42
3.1.3 Minimum Aisle Space and Container Spacing 42
3.2 Permitted and Prohibited Wastes 43
3.2.1 Permitted Wastes 43
3.2.2 Prohibited Wastes 43
3.3 Condition of Containers 43
3.4 Storage Container Types 43
3.5 Compatibility of Waste with Containers 43
3.6 Management of Containers 43
3.7 Secondary Containment System 43
3.8 Inspection Schedules and Procedures 44
3.9 Record Keeping 44
3.10 Closure 44
3.11 Special Provisions for Ignitable or Reactive Waste 44
3.11.1 Location of Ignitable and Reactive Waste 44
3.11.2 Procedures to Prevent Ignition/Reaction 44
3.11.3 Storage of Ignitable and Reactive Waste Containers 44
3.11.4 Separation of Incompatible Wastes 44
3.11.5 Separation of Incompatible Waste Containers 44
3.11.6 Management of Unwashed Containers 44
4 Part 4 Closure of Hazardous Waste Management Units 45
4.1 General 45

4.2 Closure Plan Submittals 45
4.3 Closure Unit Evaluation 45
4.4 Closure Plan 45
4.5 Amendment of the Closure Plan 46
4.6 Closure Report 46
5 Part 5 Post-Closure Care of Hazardous Waste Management Units 47
5.1 General 47
5.2 Corrective Action to Complete Closure 47
5.3 Post-Closure Care Plan 47
5.4 Post-Closure Care Plan Amendment 48
5.5 Inspections 48
5.6 Notices and Certifications 48
5.6.1 Notification Filing 48
5.6.2 Record Keeping Requirements 48
5.6.3 Certification 49
5.7 Completion of Post-Closure Requirements 49
6 Part 6 Corrective Action for Solid Waste Management Units and Areas of Concern 50
6.1 Applicability 50
6.2 Contamination Beyond the Facility Boundary 50
6.3 Corrective Action Already Completed 50
6.4 Newly Discovered SWMUs and AOCs 50
6.5 Facility-Wide Groundwater Monitoring Program 51
6.5.1 Groundwater Monitoring Plans 51
6.5.2 Groundwater Monitoring Reports 51
6.6 Cleanup Levels 51
6.6.1 Groundwater Cleanup Levels 52
6.6.2 Soil and Sediment Cleanup Levels 52
6.6.2.1 Soil Cleanup Levels 52
6.6.3 Surface Water Cleanup Levels 53
6.6.4 Vapor Intrusion Cleanup Levels 53
6.7 Ecological Risk Evaluation 53
6.8 Background Concentrations 53
6.9 Variance from Cleanup Levels 53
6.10 Newly Identified SWMUs and AOCs 54
6.10.1 Notification of Newly Discovered SWMUs and AOCs 54

6.10.2 Notification of Release 54
6.10.3 SWMU Assessment Report 55
6.11 Interim Measures 55
6.11.1 Interim Measures Required by NMED 55
6.11.2 Permittee-Initiated Interim Measures 55
6.11.3 Emergency Interim Measures 56
6.11.4 Interim Measures Work Plan Requirements 56
6.11.5 Interim Measures Work Plan Approval 56
6.11.6 Interim Measures Implementation 56
6.11.6.1 Notification of Changes to Interim Measures 56
6.11.7 Interim Measures Reporting 56
6.11.7.1 Progress Reports 56
6.11.7.2 Final Interim Measures Report 57
6.12 Corrective Action Investigations 57
6.12.1 Investigation Work Plan 57
6.12.2 Historical Documents 57
6.12.3 Investigation Report 58
6.12.3.1 Cleanup Levels 58
6.12.3.2 Requirement to Proceed 58
6.13 Risk Assessment 58
6.14 Corrective Measures Evaluation 58
6.14.1 Corrective Measures Evaluation Report 58
6.14.2 Cleanup Standards 59
6.14.3 Remedy Evaluation Criteria 59
6.14.3.1 Threshold Criteria 59
6.14.3.2 Remedial Alternative Evaluation Criteria 60
6.14.4 Corrective Measures Evaluation Report Approval 60
6.14.5 Relationship to Corrective Measures Requirements 61
6.15 Remedy Approvals and Permit Modifications 61
6.15.1 Remedy Selection 61
6.16 Corrective Measure Implementation 61
6.16.1 Corrective Measure Implementation Work Plan 61
6.16.2 Approval of Corrective Measures Implementation Plan 62
6.16.3 Health and Safety Plan 62
6.16.4 Progress Reports 62

6.16.5 Remedy Completion 62
6.16.5.1 Remedy Completion Report 62
6.17 Accelerated Cleanup Process 63
6.17.1 Accelerated Corrective Measures Work Plan 63
6.17.2 Accelerated Corrective Measures Implementation 64
6.18 Approval of Corrective Action Work Plans and Other Documents 64
6.18.1 Provisions Governing Extensions of Time 64
7 Part 7 Investigation and Sampling Methods and Procedures 66
7.1 Highlights 66
7.1.1 Standard Operating Procedures 66
7.2 Investigation, Sampling, and Analyses Methods 66
7.2.1 Field Exploration Activities 66
7.2.2 Subsurface Features/Utility Geophysical Surveys 66
7.2.3 Drilling and Soil Sampling 67
7.2.3.1 Drilling 67
7.2.3.2 Exploratory Excavations 68
7.2.3.3 Soil Sampling 68
7.2.3.4 Surface Sampling 69
7.2.3.5 Drill Cuttings (Investigation Derived Waste) 69
7.2.4 Logging of Soil, Rock and Sediment Samples 69
7.2.5 Soil Sample Field Screening 69
7.2.6 Soil Sample Types 71
7.2.7 Sample Point and Structure Location Surveying 71
7.2.8 Subsurface Vapor-phase Monitoring and Sampling 71
7.3 Groundwater Monitoring 72
7.3.1 Groundwater Levels 72
7.3.2 Groundwater Sampling 73
7.3.3 Well Purging 73
7.3.4 Groundwater Sample Collection 74
7.3.5 Groundwater Sample Types 75
7.3.6 Sample Handling 76
7.3.6.1 Sample Shipment Procedures 76
7.3.7 In-situ Testing 77
7.3.8 Decontamination Procedures 77
7.3.9 Field Equipment Calibration Procedures 78

7.3.10 Collection and Management of Investigation Derived Waste 78
7.4 Documentation of Field Activities 78
7.4.1 Sample Custody 79
7.5 Chemical Analyses 79
7.5.1 Laboratory QA/QC Requirements 80
7.5.2 Quality Assurance Procedures 80
7.5.3 Equipment Calibration Procedures and Frequency 80
7.5.4 Laboratory QA/QC Samples 80
7.5.5 Laboratory Deliverables 80
7.5.6 Review of Field and Laboratory QA/QC Data 82
7.5.7 Blanks, Field Duplicates, Reporting Limits and Holding Times 83
7.5.7.1 Blanks 83
7.5.7.2 Field Duplicates 83
7.5.7.3 Method Reporting Limits 83
7.5.7.4 Holding Times 83
7.5.8 Representativeness and Comparability 84
7.5.8.1 Representativeness 84
7.5.8.2 Comparability 84
7.5.9 Laboratory Reporting, Documentation, Data Reduction, and Corrective Action 84
8 Part 8 Monitoring Well Construction Requirements 85
8.1 Drilling Methods 85
8.1.1 Hollow Stem Auger 86
8.1.2 Air Rotary/Air Down-The-Hole Hammer/ODEX 86
8.1.3 Resonant Sonic 87
8.2 Well Construction/Completion Techniques 87
8.2.1 Well Construction Materials 87
8.2.2 Well Construction Techniques 87
8.2.2.1 Single Cased Wells 87
8.2.2.2 Double Cased Wells 88
8.2.2.3 Bedrock Wells 89
8.2.3 Well Screen and Filter Pack Design 89
8.2.4 Annular Seal 90
8.2.5 Groundwater Well Development 91
8.2.6 Surface Completion 92
8.3 Well Abandonment 93

8.4 Documentation 93
9 Part 9 Reporting Requirements 95
9.1 Highlights 95
9.2 Investigation Work Plan 95
9.2.1 Title Page 95
9.2.2 Executive Summary 96
9.2.3 Table of Contents 96
9.2.4 Introduction 96
9.2.5 Background 96
9.2.6 Site Conditions 96
9.2.6.1 Surface Conditions 96
9.2.6.2 Subsurface Conditions 96
9.2.7 Scope of Activities 97
9.2.8 Investigation Methods 97
9.2.9 Monitoring and Sampling Program 97
9.2.10 Schedule 97
9.2.11 Tables 97
9.2.12 Figures 98
9.2.13 Appendices 99
9.3 Investigation Report 99
9.3.1 Title Page 99
9.3.2 Executive Summary 99
9.3.3 Table of Contents 99
9.3.4 Introduction 99
9.3.5 Background 99
9.3.6 Scope of Activities 100
9.3.6.1 Exploratory Drilling or Excavation Investigations 100
9.3.6.2 Monitoring Well Construction, Boring, or Excavation Abandonment 100
9.3.7 Field Investigation Results 100
9.3.7.1 Surface Conditions 100
9.3.7.2 Subsurface Conditions 101
9.3.7.3 Groundwater Conditions 101
9.3.7.4 Surface Water Conditions 101
9.3.7.5 Subsurface Air and Soil Moisture Conditions 101
9.3.7.6 Materials Testing Results 101

9.3.7.7 Pilot Testing Results 101
9.3.8 Regulatory Criteria 101
9.3.9 Site Contamination 102
9.3.9.1 Soil, Rock, and Sediment Sampling 102
9.3.9.2 Sample Field Screening Results 102
9.3.9.3 Soil, Rock, and Sediment Sampling Chemical Analytical Results 102
9.3.9.4 Subsurface Vapor Sampling 102
9.3.9.5 Subsurface Vapor Field Screening Results 102
9.3.9.6 Air and Subsurface Vapor Laboratory Analytical Results 103
9.3.10 Conclusions 103
9.3.11 Recommendations 103
9.3.12 Tables 103
9.3.13 Figures 104
9.3.14 Appendices 105
9.3.14.1 Field Methods 105
9.3.14.2 Boring/Test Pit Logs and Well Construction Diagrams 105
9.3.14.3 Chemical Analytical Program 105
9.3.14.4 Chemical Analytical Reports 105
9.3.14.5 Other Appendices 105
9.4 Periodic Monitoring Report 105
9.4.1 Title Page 106
9.4.2 Executive Summary 106
9.4.3 Table of Contents 106
9.4.4 Introduction 106
9.4.5 Scope of Activities 106
9.4.6 Regulatory Criteria 106
9.4.7 Monitoring Results 106
9.4.8 Chemical Analytical Data Results 107
9.4.9 Remediation System Monitoring 107
9.4.10 Summary 107
9.4.11 Tables 107
9.4.12 Figures 108
9.4.13 Appendices 108
9.4.13.1 Field Methods 108
9.4.13.2 Chemical Analytical Program 109

9.4.13.3 Chemical Analytical Reports 109
9.5 Risk Assessment Report 109
9.5.1 Title Page 109
9.5.2 Executive Summary 109
9.5.3 Table of Contents 109
9.5.4 Introduction 109
9.5.5 Background 110
9.5.5.1 Site Description 110
9.5.5.2 Sampling Results 110
9.5.6 Conceptual Site Model 110
9.5.7 Risk Screening Levels 111
9.5.8 Risk Assessment Results 111
9.5.8.1 Uncertainty Analysis 111
9.5.9 Conclusions and Recommendations 111
9.5.10 Tables 111
9.5.11 Figures 112
9.5.12 Appendices 112
9.6 Corrective Measure Evaluation 112
9.6.1 Title Page 112
9.6.2 Executive Summary 112
9.6.3 Table of Contents 113
9.6.4 Introduction 113
9.6.5 Background 113
9.6.6 Site Conditions 113
9.6.6.1 Surface Conditions 113
9.6.6.2 Subsurface Conditions 113
9.6.7 Potential Receptors 114
9.6.7.1 Sources 114
9.6.7.2 Pathways 114
9.6.7.3 Receptors 114
9.6.8 Regulatory Criteria 114
9.6.9 Identification of Corrective Measures Options 114
9.6.10 Evaluation of Corrective Measures Options 114
9.6.10.1 Applicability 115
9.6.10.2 Technical Feasibility 115

9.6.10.3 Effectiveness 115
9.6.10.4 Implementability 115
9.6.10.5 Human Health and Ecological Protectiveness 115
9.6.10.6 Cost 115
9.6.11 Selection of Preferred Corrective Measure 115
9.6.12 Design Criteria to Meet Cleanup Objectives 116
9.6.13 Schedule 116
9.6.14 Tables 116
9.6.15 Figures 116
9.6.16 Appendices 117

1 Part 1 General Permit Conditions

1.1 Authority

This Permit is issued pursuant to the authority of the New Mexico Environment Department (NMED) under the New Mexico Hazardous Waste Act (HWA), NMSA 1978, 74-4-1 through 74-4- 14, in accordance with the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 New Mexico Administrative Code (NMAC).

Pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 to 6992k, and 40 Code of Federal Regulations (CFR) Part 271 and Part 272 Subpart GG, the State of New Mexico, through the NMED, is authorized to administer and enforce the state hazardous waste management program under the HWA in lieu of the federal program.

This Permit contains terms and conditions that the NMED has determined are necessary to protect human health and the environment in accordance with 20.5.1.900 NMAC incorporating 40 CFR 270.32 (b) (2) and 20.4.500 NMAC incorporating 40 CFR 264.101.

1.2 Permittee

The NMED issues this Permit to the United States, Department of the Army, hereinafter referred to as the Permittee, the owner and operator of White Sands Missile Range (WSMR; the Facility), with EPA ID No. NM2750211235, located in Doña Ana, Otero, Sierra, Lincoln, and Socorro Counties, New Mexico.

1.3 Permitted Activity

This Permit authorizes the Permittee to store hazardous waste at WSMR at the Permitted Storage Unit (also referred to as the Hazardous Waste Storage Facility). This Permit requires the Permittee to conduct closure and, if necessary, post-closure activities at the units listed in Attachment 8, Table 8.3 (Hazardous Waste Management Units). This Permit also requires the Permittee to conduct corrective action activities at the units listed in Attachment 8, Table 8.1 (Solid Waste Management Units and Areas of Concern Requiring Corrective Action) and to conduct tasks in accordance with a schedule of compliance. This Permit establishes the general and specific standards for these activities, as required pursuant to the HWA and HWMR.

1.4 Citations

Whenever the Permit cites a provision of 20.4.1 NMAC or 40 CFR, the Permit shall be deemed to incorporate the citation by reference, including all subordinate provisions of the cited provision, and make binding the full text of the cited provision.

Hazardous waste management regulations are frequently cited throughout this Permit. The federal Hazardous Waste Management Regulations, 40 CFR Parts 260 through 273, are generally cited rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of this Permit, and enforcement of its terms and conditions, all references to provisions of federal regulations that have been incorporated into the State regulations shall be deemed to include the State incorporation of those provisions.

1.5 Effect of Permit

Compliance with this Permit during its term constitutes compliance, for purposes of enforcement, with 20.4.1.500, 700 and 800 NMAC (incorporating 40 CFR parts 264, 266 and 268), except for those requirements not included in this Permit under 40 CFR 270.4(a), only for those management practices specifically authorized by this Permit. The Permittee must also comply with all applicable self-implementing provisions imposed by statute or rule, including 20.4.1.100, 200, 300, 400, 500, 700, 800, and 900 NMAC (incorporating 40 CFR parts 260, 261, 262, 263, 264, 266, 268, and 900).

Compliance with this Permit shall not constitute a defense to any order issued or any action brought under Sections 74-4-10, 74-4-10.1 or 74-4-13 of the HWA; Sections 3008(a), 3008(h), 3013, 7002(a) or 7003 of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. 6901 to 6922k; Sections 104, 106(a), 107, and 196 (a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601 to 9675; or any other law providing for protection of public health or the environment.

This Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulation. Compliance with this Permit does not relieve the Permittee from the responsibility of complying with all applicable state or federal laws and regulations. (20.4.1.900 NMAC [incorporating 40 CFR 270.4, 270.30(g) and 270.32(b)(1)]; 20.4.1.901.A(11); and 1100 NMAC)

1.6 Effect of Inaccuracies in Permit Application

This Permit is based on the information submitted in the Permit Application dated August 2020. Any inaccuracies found in the Application may be grounds for the termination, revocation and reissuance, or modification of this Permit pursuant to 40 CFR 270.43(a)(2). Where and when the Permittee becomes aware that it failed to submit any relevant facts in the Application or submitted incorrect information in the Application or in any report to the NMED, it shall promptly submit such facts or information pursuant to 40 CFR 270.30(l)(11).

1.7 Enforcement

Any violation of a condition of this Permit may subject the Permittee, and its officers, employees, successors, and assigns, to a compliance order under section 74-4-10 of the HWA or section 3008(a) of RCRA, 42 U.S.C. 6928(a); to an injunction under section 74-4-10 of the HWA, section 3008(a) of RCRA, 42 U.S.C. 6928(a), or section 7002(a) of RCRA, 42 U.S.C. 6972(a); to civil penalties under section 74-4-10 of the HWA, section 3008(a) and (g) of RCRA, 42 U.S.C. 6928(a) and (g), or section 7002(a) of RCRA, 42 U.S.C. 6972(a), to criminal penalties under section 74-4-11 of the HWA or section 3008(d), (e), and (f) of RCRA, 42 U.S.C. 6928(d), (e), and (f), or to some combination of the foregoing. The list of authorities in this Paragraph is not exhaustive, and the NMED reserves the right to take any action authorized by law to enforce the requirements of this Permit.

1.8 Permit Components

This Permit consists of the regulations incorporated by reference into this Permit, Parts 1 through 9, and Attachments 1 through 11.

1.9 Permit Actions

1.9.1 Duration of Permit

This Permit shall be effective for a period of ten years from the effective date in accordance with 40 CFR 270.50(a), except as provided by 40 CFR 270.51. The effective date of this Permit shall be 30 calendar days after notice of the NMED's decision has been served on the Permittee, or such later time as the NMED may specify. (20.4.1.901.A(10) NMAC)

1.9.2 Permit Modification

This Permit may be modified for both routine and significant changes as specified in 40 CFR 270.41 through 270.43, and any modification shall conform to the requirements specified in those regulations. The filing of a permit modification request by the Permittee, or the notification by the Permittee of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (40 CFR 270.30(f))

If at any time, for any of the reasons specified in 40 CFR 270.41, the NMED determines that modification of this Permit is necessary, the NMED may initiate a Permit modification. The Permittee may request a permit modification in accordance with 40 CFR 270.42. Modifications to the Permit only reopen the permit conditions subject to the modification and do not constitute a reissuance of the Permit.

1.9.3 Unclassified Permit Modifications

Unless a permit modification is explicitly listed in Appendix I of 40 CFR 270.42 as a Class 1 or 2 permit modification, the Permittee shall not submit the proposed permit modification as a Class 1 or 2 permit modification. The Permittee may only make such permit modification as a Class 3 modification or may request a determination from the NMED that the proposed permit modification is reviewed and approved as a Class 1,2, or 3 modification, in accordance with the requirements of 20.4.1.901 NMAC and 40 CFR 270.42(d)(1).

1.9.4 Permit Modification, Suspension, Revocation, or Termination

This Permit may be modified, suspended, revoked and reissued, or terminated for cause as specified in Section 74-4-4.2 of the HWA, 40 CFR 270.41 through 270.43, and 20.4.1.901.B NMAC. The filing of a request by the Permittee for a permit modification, or the notification of planned changes or anticipated noncompliance, shall not stay the applicability and enforceability of any permit part [40 CFR 270.30(f)].

1.9.5 Permit Renewal Application

The Permittee shall submit an application for a new permit at least one hundred eighty (180) calendar days before the expiration date of this Permit, unless permission for a later date has been granted by the NMED, pursuant to 40 CFR 270.10(h)(1) and 270.30(b). When reviewing the renewal application, the NMED will consider improvements in the state of control and measurement technology and changes in applicable regulations.

1.9.6 Continuation of Expiring Permit

Pursuant to 40 CFR 270.51(a), the conditions in this Permit shall continue in force and effect until the effective date of a new permit if:

1. the Permittee has submitted a timely application for renewal of this Permit in compliance with 40 CFR 270.13 and 270.14, and the applicable sections in 40 CFR 270.15 through 270.28, which is a complete application under 40 CFR 270.10(c) for a new permit in accordance with 40 CFR 270.51(a)(1); and

2. the NMED, through no fault of the Permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit (40 CFR 270.51(a)(2)).

1.9.7 Transfer of Land Ownership

The Permittee shall submit a permit modification request, in compliance with all requirements of 20.4.1.901 NMAC and 40 CFR 270.42, at least 180 calendar days prior to the proposed effective date of transfer of ownership of any land that is part of the Facility. The permit modification request may be submitted as a Class 3 permit modification, or the Permittee may request a determination as to whether the modification is a Class 1 or 2 pursuant to the requirements of 20.4.1.901 NMAC and 40 CFR 270.42(d). A permit modification request for transfer of land that is part of the Facility shall:

- Identify the boundaries of the land proposed for transfer;
- Identify the new owner;
- Describe the location and identity of any existing or prior solid waste management unit (SWMU), area of concern (AOC), or hazardous waste management unit (HAMU) on the land proposed for transfer;
- Describe any known or suspected presence of hazardous waste or hazardous constituents in soil or ground water at any depth within the boundaries of the land proposed for transfer;
- Describe the status of any past, present, or planned investigations or remediation of any release of hazardous waste or hazardous constituents within the boundaries of the land proposed for transfer;
- Include a revised map of the Facility;
- Propose and describe all provisions necessary to ensure that the Permittee can meet the corrective action obligations of the HWA and the Hazardous Waste Management Regulations (HWMR) (e.g., survey plats, covenants, deed restrictions, proposed replacement of monitoring wells or enforceable agreements for access to monitoring wells on transferred land). (40 CFR 264.101, 40 CFR 270.30(l)(1), 270.32(b) and 270.42); and 20.4.1.901 NMAC; and
- Describe all measures taken to comply with Section 120(h) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 USC 9629(h).

1.10 Permit Construction

1.10.1 Severability

The provisions of this Permit are severable, and if any provision of this Permit, or any application of any provision of this Permit due to any circumstance is held invalid, then the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

1.10.2 Conflict in Language

If there is a conflict between the language of a Permit Condition and the language of a Permit Attachment, where the Attachment includes text provided by the Permittee that is not expressly written by the NMED, then the language of the Permit Condition shall control the language in the Permit Attachment. This Permit and 40 CFR 264, 266 and 268 establish the minimum requirements for the design, construction, operation, and maintenance of the Facility. Any language in an attachment, which states or implies discretion to not comply with the minimum requirements of this Permit or 40 CFR 270.32(b)(1) and (2) is not effective and the requirements of this Permit and 40 CFR 270.32(b)(1) and (2) shall control.

1.11 Definitions

For the purposes of this Permit, terms used herein shall have the same meanings as those in the Hazardous Waste Act, the Resource Conservation and Recovery Act and their implementing regulations, unless this Permit specifically provides otherwise. Where a term is not defined in the Hazardous Waste Act, RCRA, or pursuant regulations, United States Environmental Protection Agency (EPA) guidelines or publications, or this Permit, the meaning associated with such a term shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

Acceptable Knowledge is defined in Permit Attachment 3 (Waste Analysis Plan).

Active Portion means that portion of a facility where treatment, storage, or disposal operations are being or have been conducted after the effective date of 40 CFR Part 261 and which is not a closed portion as defined in 40 CFR 260.10.

Administrative Record means the administrative record supporting and otherwise relating to the requirements of this Permit, compiled as of the effective date of this Permit, which forms the basis for the terms of this Permit. The Administrative Record includes the full record and those documents submitted in writing by the NMED, the Permittee, EPA or the public, as of the effective date of the Permit for inclusion in the Administrative Record.

Area of Concern (AOC) means any area having a known or suspected release of hazardous waste, hazardous constituents or contaminants that is not from a solid waste management unit and that the NMED has determined may pose a current or potential threat to human health or the environment. An area of concern may include buildings, structures at which releases of hazardous waste or constituents have not been remediated, including releases resulting from one time and accidental events.

Contaminant means any hazardous constituent listed in 40 CFR Part 261, Appendix VIII and 40 CFR Part 264, Appendix IX; any groundwater contaminant listed in the New Mexico WQCC Regulations at 20.6.2.3103 NMAC; any toxic pollutant listed in the New Mexico WQCC Regulations at 20.6.2.7.T(2) NMAC; methyl tertiary-butyl ether; perchlorate; polychlorinated biphenyls (PCBs); dioxin, furans; total petroleum hydrocarbons, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances, rocket fuel constituents, waste military munitions, and munitions constituents as defined in 10 U.S.C. 2710(e)(3); and any other substance present in soil, sediment, rock, surface water, groundwater, or air for which the NMED determines that monitoring, other investigation, or a remedy is necessary to carry out the purposes of this Permit.

Corrective Action means all corrective action, as defined in 20.4.2.7.C(3) NMAC, necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents, or other contaminants defined by this Permit Part (1.11), to the environment as required under HWA 74-4-4.2 (B), 40 CFR 264.101 and 40 CFR 270.32(b)(2). Corrective action may address releases to air, soil, sediment, surface water, or groundwater.

Corrective Action Complete means the requirements for corrective action have been satisfied by the Permittee as determined by the NMED.

Discharge means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of solid waste or hazardous waste into or onto any land or water.

Disposal means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any

constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater.

Extent of contamination means the horizontal and vertical area in which the concentrations of hazardous waste or constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate, as determined by the NMED.

Facility means White Sands Missile Range, EPA ID Number NM 2750211235, owned by the United States, Department of the Army and located in Doña Ana, Socorro, Lincoln, Otero, and Sierra Counties, New Mexico, including all contiguous land, and structures, other appurtenances, and improvements on the land, used for storage or disposal of hazardous waste. For the purpose of implementing corrective action, "Facility" means all contiguous property under the control of the owner or operator.

Groundwater means interstitial water, which occurs in saturated earth material.

Hazardous Constituent or Hazardous Waste Constituent means: 1) any constituent identified in40 CFR Part 261 Appendix VII that causes EPA to list a hazardous waste in 40 CFR Part 261Subpart D; or 2) any constituent identified in 40 CFR Part 261, Appendix VIII and any constituent identified in 40 CFR Part 264 Appendix IX.

Hazardous Waste, for the purposes of corrective action for solid waste management units and areas of concern conducted pursuant to 74-4-4.2(B) of the HWA, 40 CFR Part 264, Subpart F, or 40 CFR 270.32(b)(2), means a hazardous waste as defined in 74-4-3(K) of the HWA. Hazardous waste, for the purposes of corrective action, includes, without limitation any hazardous waste as defined in 40 CFR 261.3, any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations in 20.6.2.3103 NMAC, any toxic pollutant listed in 20.6.2.7.T(2) NMAC, any contaminant or constituent defined in this Permit Part (1.11) or for which the EPA has promulgated a maximum contaminant level (MCL) at 40 CFR parts 141 and 143, perchlorate, total petroleum hydrocarbons, methyl tertiary butyl ether, polychlorinated biphenyls (PCBs), dioxins, furans, per- and polyfluoroalkyl substances, rocket fuel constituents, waste military munitions, and munitions constituents as defined in 10 U.S.C. 2710(e)(3).

Hazardous Waste, for all other purposes of this Permit, means a hazardous waste as defined in 40 CFR 261.3.

Hazardous Waste Management Regulations (HWMR) means the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC and all provisions of 40 CFR Parts 260 through 273 incorporated therein.

Hazardous Waste Storage Facility means the Hazardous Waste Management Unit authorized for operations as identified in Attachment 1 (Site Identification).

Maximum Contaminant Level (MCL) means a maximum contaminant level under the Federal Safe Drinking Water Act, 42 U.S.C. 300f to 300j-26, and the drinking water regulations promulgated thereunder.

Military Range means designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordinance, or weapons systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver

areas, firing lanes, test pads, detonation pads, impact areas, and buffer zone with restricted access and exclusionary areas.

NMED means the New Mexico Environment Department.

Off-site source means a generator of hazardous waste located within the United States of America, but outside the Permittee's Facility boundary.

Operator means the person responsible for the overall operation of WSMR. The U.S. Army is the operator of White Sands Missile Range.

Owner means the person who owns the Facility. The U.S. Army is the owner of White Sands Missile Range.

Permittee means the U.S. Army White Sands Missile Range.

Post-Closure Care Unit means any hazardous waste management unit subject to the post-closure care requirements of 40 CFR Part 264, Subpart G

RCRA means the Federal Resource Conservation and Recovery Act, 42 U.S.C. 6901 to 6992k

Release, for the purposes of this Permit, means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous waste (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other receptacles containing hazardous waste or hazardous constituents).

Secretary means the Secretary of the New Mexico Environment Department or his or her designee or authorized representative.

Solid Waste Management Unit (SWMU) means any discernable unit or area at the Facility at which solid waste has been placed at any time, and from which NMED determines there may be a risk of a release of hazardous waste or constituents, irrespective of whether the unit was intended for the management of solid waste. Such units include any area at which solid waste has been routinely or systematically placed.

Target Analyte List (TAL) Metals means the list of 23 inorganic target analytes defined by the EPA Contract Laboratory Program Statement of Work. The list consists of the following: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Unexploded Ordinance (UXO) means military munitions that have been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation properties, personnel, or material and remain unexploded either by malfunction, design, or any other cause (10 U.S.C. 101(e) (5) (A) through (C)).

Waste Military Munitions (WMM) includes military munitions as defined in 40 CFR 260.10,which are solid waste as described in 40 CFR 266.202.

Watercourse shall have the meaning defined in 20.6.2.7 NMAC.

Water Quality Control Commission (WQCC) means the New Mexico Water Quality Control Commission, and any successor agencies, boards, or commissions.

Water Quality Control Commission Regulations means the regulations at 20.6.2 NMAC promulgated by the New Mexico Water Quality Control Commission governing the Quality of Ground Water and Surface Water in New Mexico.

1.12 Duties and Requirements

1.12.1 Duty to Comply

The Permittee shall comply with all sections in this Permit, except to the extent and for the duration such noncompliance is authorized in an emergency permit, in accordance with the requirements of 40 CFR 270.61. Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the HWA and RCRA and may subject the Permittee, its successors and assigns, officers, directors, employees, parents, or subsidiaries, to an administrative or civil enforcement action [40 CFR 270.30(a)], including civil penalties and injunctive relief, as provided in Permit Part 1.7, or permit modification request under 74-4- 4.2 of the HWA and 40 CFR 270.41 and 270.43. No delegation or assignment of the Permittee's responsibilities under this permit can be made to any person or entity, including a separately organized agency, without the written permission of the NMED; this prohibition does not preclude the Permittee's use of contractors for remediation.

The Permittee shall not allow any person or entity which currently exists or may be created, including a separately organized agency, to interfere with the performance of its obligations or responsibilities under this Permit.

1.12.2 Duty to Reapply

If the Permittee wishes or is required to continue an activity regulated by this permit after the expiration date of this permit, then the Permittee shall apply for a new permit at least 180 calendar days before the expiration date of this permit, unless permission for a later date has been granted by the NMED, pursuant to 40 CFR 270.10(h)(1) and 270.30(b).

1.12.3 Transfer of Permit

The Permittee shall not transfer this permit to any person except after prior written notice and receipt of approval from the NMED in accordance with 40 CFR 270.40(b).

This Permit may be transferred by the Permittee to a new owner or operator only if the Permit has been modified or revoked and reissued, in accordance with the requirements of 40 CFR 270.40(b) or 270.41(b)(2), to identify the new Permittee and incorporate such other requirements as may be necessary under HWA and RCRA (40 CFR 270.30(l)(3) and 270.40(a)).

The Permittee may make changes in ownership or operational control of the Facility as a Class 1 modification after obtaining prior written approval from the NMED in accordance with 40 CFR 270.42(a)(2). The new owner or operator must submit a revised permit application no later than 90 calendar days prior to the scheduled change including a written agreement containing a specific date for transfer of permit responsibility between the current and new Permittee.

1.12.4 Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit. [40 CFR 270.30(c)]

1.12.5 Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures, as are reasonable to prevent significant adverse impacts on human health or the environment. [40 CFR 270.30(d)]

1.12.6 Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment, control, and related appurtenances which are installed or used by the Permittee to achieve compliance with the sections of this Permit. Proper operation and maintenance include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance and quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. [40 CFR 270.30(e)].

1.12.7 Duty to Provide Information

The Permittee shall furnish to the NMED, within a reasonable time as specified by the NMED, any relevant information which the NMED may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit.

The Permittee shall also furnish to the NMED, upon request, copies of records required to be kept by this Permit. Information and records requested by the NMED pursuant to this condition shall be provided in paper form or in an electronic format acceptable to the NMED or both as the NMED may specify (40 CFR 264.74(a) and 40 CFR 270.30(h)).

This Permit condition shall not be construed to limit in any manner the NMED's authority under 74-4-4.3 of the HWA, 3007(a) of RCRA, or any other applicable law or regulation (40 CFR 264.74(a) and 270.30(h)).

1.12.8 Inspection and Entry

Pursuant to 40 CFR 270.30(i) and NMSA 1978, 74-4-4.3(A) the Permittee shall allow authorized representatives of the NMED, upon the presentation of credentials and at reasonable times, and under the conditions of this Permit, to:

1. enter upon the Permittee' premises where the permitted unit or activity is located or conducted or where records must be kept;

2. have access to and photograph any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;

3. inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;

4. have access to, and copy, any records that must be kept; and

5. sample or monitor, for the purposes of ensuring Permit compliance or as otherwise authorized by the HWA or RCRA, any substances or parameters at any location.

This Permit Condition shall not be construed to limit in any manner the NMED's authority under 74-4-4.3 of HWA, 3007(a) of RCRA, or any other applicable law or regulation.

1.12.9 Monitoring and Records

1.12.9.1 Representative Sampling

For purposes of monitoring, the Permittee shall take samples and measurements representative of the monitored activity at the time of sampling in accordance with the procedures included in Permit Part 5 (Post Closure Care of Hazardous Waste Management Units) and Permit Part 6 (Corrective Action). All samples and measurements of waste streams obtained by the Permittee under any condition in this Permit must be discrete, unless prior approval has been received from NMED for an alternate sample type, and shall be representative of the waste, media, equipment or structure being sampled. To obtain a representative sample of a waste stream, the Permittee shall use an appropriate method from Appendix I of 40 CFR Part 261 or an equivalent method approved by the NMED. Laboratory methods must be those specified in the current edition of Test Methods for Evaluating Solid Waste Physical/Chemical Methods SW-846, or an equivalent method (40 CFR 270.30(j)(1).

1.12.9.2 Record Retention

The Permittee shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports and records required by this Permit, the waste minimization certification required by 40 CFR 264.73(b)(9), and records of all data used to complete the permit application for a period of at least three (3) years from the date of the sample, measurement, report, record, certification, or application, in accordance with the requirements of 40 CFR 270.30(j)(2). This period may be extended by the NMED at any time and is automatically extended during the course of any unresolved enforcement action regarding this Facility. The Permittee shall also maintain records from all groundwater monitoring wells and associated groundwater surface elevations, and any investigation and cleanup activities for the life of the Facility including any post-closure care period or period during which institutional or engineering controls are in effect.

1.12.9.3 Monitoring Records

Pursuant to 40 CFR 270.30(j)(3), records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurement;

2. The name and qualification of the individual(s) who performed the sampling or measurements;

3. The name and address of the laboratory that performed the analysis;

4. The date(s) analyses were performed;

5. The name and qualification of the individual(s) who performed the analyses;

6. The measuring techniques, analytical techniques or methods used;

7. The results of such analysis including units of measurement;

8. Calibration data;

9. Quality control data;

10. Detection limits;

11. Data qualifiers; and

12. Data validation results.

1.12.9.4 Reporting Requirements

1.12.9.5 Reporting planned changes

The Permittee shall give notice to NMED as soon as possible of any planned physical alterations or additions to any unit listed on the Permit at the Facility, in accordance with 40 CFR 270.30(l)(1).

1.12.9.6 Reporting anticipated noncompliance

The Permittee shall give a minimum of 60 calendar days advance to NMED of any planned changes to any unit listed on the Permit at the Facility or any activities, that may result in noncompliance with Permit requirements, in accordance with 40 CFR 270.30(l)(2)

1.12.9.7 Certification of construction or modification

For a new or modified portion of the permitted unit, the Permittee shall not treat, store, or dispose of hazardous waste in the newly constructed or modified portion, until the conditions specified in 40 CFR 270.30(l)(2) have been satisfied.

1.12.9.8 Submittal of statement

The Permittee has submitted to the NMED, by certified mail or hand delivery, a letter signed by the Permittee and a professional engineer registered in New Mexico stating that the permitted unit has been constructed or modified in compliance with the Permit; and

1.12.9.9 Inspection by the NMED

The NMED has inspected the modified or newly constructed portion of the permitted unit and finds it is in compliance with the conditions of this Permit, or waived the inspection, or within 15 calendar days from the date of submission of the letter required by this Section, has not notified the Permittee of its intent to inspect.

1.12.9.10 24-Hour and Subsequent Reporting

The Permittee shall report to the NMED, both orally and in writing, any noncompliance that may result in a release of contaminants may endanger human health or the environment (40 CFR270.30(l)(6) and 270.32(b)(2)).

1.12.9.11 24 Hour Oral Report

The Permittee shall orally report to the NMED any noncompliance that may endanger human health or the environment within 24 hours from the time that the Permittee becomes aware of the circumstances in accordance with 40 CFR 270.30(1)(6)(i). The report shall include the following:

1. Information concerning any release of any hazardous waste that may cause an endangerment to drinking water supplies; and

2. Information of a release or discharge of hazardous waste, or of a fire or explosion at the permitted unit, that could threaten the environment or human health.

1.12.9.11.1 Content of Description

In accordance with 40 CFR 270.30(1)(6)(ii), the description of the occurrence and its cause shall include:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of incident;
4. Name and quantity of materials involved;
5. The extent of injuries, if any;
6. An assessment of actual or potential hazards to the environment and human health outside the Facility, where this is applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.

1.12.9.11.2 Five Day Written Report

The Permittee shall submit a written report to the NMED within five calendar days from the time the Permittee becomes aware of the noncompliance [40 CFR 270.30(l)(6)(iii)]. The written report shall contain the following:

1. A description of the noncompliance and its cause;
2. The period of the occurrence including exact date and time, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
3. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

The Permittee shall include in the report all records of spill response activities as required by this Permit. The NMED may waive the five-day written notice requirement in favor of a written report within 15 calendar days.

1.12.9.12 Contingency Plan Implementation

If the Contingency Plan (Permit Attachment 4) is implemented, then the Permittee shall the reporting requirements of 40 CFR 264.56(i).

1.12.9.13 Manifest discrepancy report

If a significant discrepancy in a manifest is discovered, then the Permittee must attempt to reconcile the discrepancy. If not resolved within 15 days, then the Permittee must submit a letter report, including a copy of the manifest, to the NMED [40 CFR 270.30(l)(7) and 40 CFR 264.72].

1.12.9.14 Biennial report

In accordance 40 CFR 262.41 and 40 CFR 264.75 the Permittee must prepare and submit a copy of a Biennial Report to the NMED by March 1 of each even numbered year. The Biennial Report must be submitted on EPA Form 8700-13A (as it may be updated), must cover generator activities during the previous calendar year and must include the following information:

1. the EPA identification number, name, and address of the generator;
2. the calendar year covered by the report;
3. the EPA identification number, name, and address for each off-site treatment, storage, or disposal facility in the United States to which waste was shipped during the year;

4. the name and EPA identification number of each transporter used during the reporting year for shipments to a treatment, storage, or disposal facility within the United States;
5. the description, hazardous waste numbers, DOT hazard class, and quantity of each hazardous waste shipped off-site for shipments to a treatment, storage or disposal facility within the United States;
6. a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated;
7. a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent such information is available; and
8. the certification signed by the generator or authorized representative.

1.12.9.15 Other noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported under Permit Part 1.12.9.10 at the time monitoring reports are submitted as required by Permit Part 1.15 (40 CFR 270.30(l)(10)).

1.12.9.16 Other Information

Whenever the Permittee becomes aware that he failed to submit any relevant facts in the Permit Application or submitted incorrect information in the Permit Application or in any report to the NMED, the Permittee shall promptly submit such facts or information in writing to the NMED [40 CFR 270.30(l)(11)].

1.13 Confidential Information

The Permittee may claim that specific information required by this Permit or otherwise submitted to the NMED is confidential pursuant to the provisions of 74-4-4.3(D) and (F) of the HWA and 40 CFR 260.2 and 270.12. Any claim must include justification satisfactory to NMED that such records, reports or information, or a particular part thereof, if made public, would divulge information entitled to protection under Section 1905 of Title 18 of the United States Code. Such information deemed by NMED to be confidential information may be disclosed to officers, employees or authorized representatives of NMED or the United States concerned with carrying out the Resource Conservation and Recovery Act of 1976, or when relevant in any proceedings under the Hazardous Waste Act.

1.14 Quarterly Environmental Monitoring Reports

If required by the NMED, the Permittee shall submit to the NMED quarterly environmental activities reports that briefly describe the waste management, monitoring, and corrective action activities; list documents submitted; and identify any noncompliance required to be reported under Permit Part 1.12.10 for the previous reporting period. The reports shall also describe scheduled monitoring activities and sampling notifications for the upcoming reporting period. The reports shall be submitted at times specified by NMED.

1.15 Signatory requirement

The Permittee shall sign and certify all applications, reports, or information submitted to or requested by NMED or required by this Permit in accordance with 40 CFR 270.11 and 270.30(k).

1.15.1 Submissions to the NMED

The Permittee shall submit by certified mail or hand delivery all reports, notifications, or other submissions that are required by this Permit to be sent or given to the New Mexico Environment Department. The submittals shall be in the form of two paper copies and also two electronic copies or

other format acceptable to the NMED. The submissions should be sent by certified mail or hand delivered to:

Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313

1.16 Approval of Submittals

All documents that the Permittee prepares under the terms of this Permit and submits to the NMED that are subject to the requirements of 20.4.2 NMAC shall be subject to the procedures set forth therein. Documents requiring NMED approval that are subject to the requirements of 20.4.2 NMAC will be reviewed and approved, approved with modifications, disapproved, denied, or rejected by the NMED.

Upon the NMED's written approval, all submittals and associated schedules are incorporated into this permit and shall become enforceable as part of this Permit in accordance with the terms of the NMED's written approval, and such documents, as approved, shall control over any contrary or conflicting requirements of this Permit. This provision does not affect any public process that is otherwise required by this Permit, the HWA, or its implementing regulations.

Failure to submit any of the work plans, schedules, reports, or other deliverable documents that the Permittee is required to prepare under this Permit according to the established schedules or deadlines in this Permit, may subject the Permittee to enforcement action under 74-4-10 of the HWA, or other applicable provisions of law, which may include fines, civil penalties, or suspension or revocation of the Permit. Failure to submit any of the required items, the submission of inadequate or insufficient information, or failure to comply with NMED direction or with the approved work plans or schedules is a violation of this Permit and may subject the Permittee to enforcement action.

Any noncompliance with approved plans and schedules shall cause the Permittee to be in noncompliance with this Permit. The NMED may grant extensions of written requests for due dates for submittals of reports and other deliverables, provided that the Permittee includes a written justification showing good cause and a proposed schedule for submittal in accordance with Permit Part 1.17 (Extensions of Time).

1.17 Extensions of Time

The Permittee may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for an extension of time and a proposed revised schedule to the NMED. The request shall state the length of the requested extension and describe the basis for the request. Failure by the Permittee to procure or fund a contract to accomplish required work shall not constitute just cause for a time extension. The NMED will respond in writing to any request for extension following receipt of the request. If the NMED denies the request for extension, it will state, in writing, the reasons for the denial.

1.18 Property Rights

This Permit does not convey any property rights of any sort, or any exclusive privilege, pursuant to 40 CFR 270.30(g).

2 Part 2 General Facility Conditions

2.1 Operation and Maintenance of the Facility

The Permittee shall design, construct, maintain, and operate the Facility to minimize the possibility of fire, explosion, or any unplanned, sudden, or non-sudden release of hazardous waste or hazardous constituents to air, soil, groundwater, or surface water that could threaten human health or the environment (40 CFR 264.31). The Permittee shall maintain and provide to the NMED a current list and map of the hazardous waste generation locations at the Facility.

The Permittee shall comply with all applicable hazardous waste generator standards in 40 CFR Part 262 including the requirements for off-Facility shipment of hazardous waste pursuant to 40 CFR 262.10(h) and 40 CFR 264.71(c).

2.2 Authorized Wastes

2.2.1 Permitted Waste

The Permittee shall store for subsequent transfer to a treatment, storage, or disposal facility only the hazardous wastes specified in Permit Attachment 1 (Site Identification and Authorized Wastes).

2.2.2 Prohibited Waste

The Permittee shall not accept hazardous waste from an off-site source. “Off-site” source refers to waste generated by sources other than the Permittee, its tenants or contractor(s) on-site. If the Permittee is to receive hazardous waste from an off-site source, the Permittee shall apply for a permit modification pursuant to 40 CFR 270.42 prior to accepting such waste.

2.3 Land Disposal Restrictions

40 CFR Part 268 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be placed on or in a storage unit. The Permittee shall maintain compliance with the requirements of 40 CFR Part 268. Where the Permittee has applied for an extension, waiver, or variance in accordance with 40 CFR Part 268, the Permittee shall comply with all restrictions on land disposal under this Permit Part once the effective date for the waste has been reached pending final approval of such application.

2.3.1 Storage of Land Disposal Restricted Waste

The Permittee is prohibited by 40 CFR 268.50 from storing hazardous waste restricted from land disposal pursuant to 40 CFR Part 268 Subpart C for more than one year from the date such waste was first placed into storage. If the Permittee requests an extension to the one-year limitation, the Permittee must submit a request for the extension in writing to NMED no less than 30 days prior to reaching the one-year limit.

2.3.2 Storage of PCB Contaminated Waste

The Permittee is prohibited from storing liquid hazardous wastes containing polychlorinated biphenyls (PCBs) at concentrations greater than 50 parts per million (ppm) unless such storage complies with all requirements of 40 CFR 761.65(b). The Permittee is prohibited from storing liquid hazardous wastes containing PCBs at concentrations greater than 50 ppm for more than one year from the date such waste was first placed into storage, in accordance with the requirements of 40 CFR 268.50(f).

2.3.3 Waste Dilution

The Permittee shall not dilute in any way a restricted waste or residue, as a substitute for treatment as specified at 40 CFR 268.3. Dilution to avoid an applicable treatment standard includes, but is not limited to, the addition of solid waste or other materials to reduce a hazardous constituent's concentration or ineffective treatment that does not destroy, remove, or permanently immobilize hazardous constituents. Aggregating or mixing wastes as part of a legitimate treatment process is not prohibited dilution for purposes of this Permit.

2.4 Waste Characterization

2.4.1 General Requirements

The Permittee shall not store any hazardous waste at the permitted Hazardous Waste Storage Facility unless the hazardous waste has been fully characterized in accordance with the requirements of this Permit Part and Permit Attachment 3 (Waste Analysis Plan (WAP)), to demonstrate compliance with all requirements of 40 CFR Part 264, including 264.13 and 40 CFR Part 268. At a minimum, this waste characterization process must produce all of the information necessary to treat, store and dispose of the waste in compliance with 40 CFR Parts 264 and 268. All information required in this Permit Part (2) shall be maintained in the Facility Operating Record. [40 CFR 264.13(a)(1)]

The Permittee shall document the following waste characterization information prior to acceptance of a hazardous or non-hazardous waste for storage at the Hazardous Waste Storage Facility in accordance with 40 CFR 264.13(a)(1):

1. Characterization to determine whether a solid waste is a hazardous waste in accordance with 40 CFR 262.11;
2. All applicable EPA Hazardous Waste Numbers (waste codes), in accordance 40 CFR 261 subparts Cand D, 264.13 and 40 CFR 268.9(a);
3. Whether the waste is listed as an authorized waste in Permit Attachment 1 (Part A of Permit Application) and is not otherwise prohibited by this Permit;
4. Whether the waste contains free liquids, as defined at 40 CFR 260.10;
5. The waste characterization data necessary to prevent the mixing or placing of incompatible wastes in the same container in accordance with 40 CFR 264.17, 264.177, Permit Attachment 3 (Waste Analysis Plan), or in a tank system in accordance with 40 CFR 264.199. The Permittee also shall characterize the waste sufficiently to prevent the impairment of containers by associated wastes, in accordance with 40 CFR 264.172, and to prevent the impairment of secondary containment systems by associated wastes, in accordance with 40 CFR 264.175 and 264.193(c)(1); and
6. Characterization sufficient to prevent accidental ignition or reaction of ignitable or reactive wastes in accordance with 40 CFR 264.17, in containers in accordance with 40 CFR 264.177, and tank systems in accordance with 40 CFR 264.198.

For a new waste generated at the Hazardous Waste Storage Facility, the Permittee shall obtain the above waste characterization information within thirty (30) days of when the waste is first generated.

2.4.2 General Waste Characterization Methods

The Permittee must follow the sections in the Permit Attachment 3 (WAP) that are applicable to the waste management activities addressed under this Permit. The procedures that the Permittee must carry out to comply with 40 CFR 264.13(a) and (b), apply to, but are not limited to:

1. The ten waste generating activity groups at the Facility;
2. The parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters;
3. All analytical methods that will be used to test for these parameters;
4. All sampling methods that will be used to obtain representative samples of the waste to be analyzed; and
5. The waste characterization recordkeeping commitments.

The Permittee shall characterize waste by using either current sampling and analysis, acceptable knowledge, or a combination of the two methods as described in the Permit Attachment 3 (WAP) and this Permit, consistent with 40 CFR 262.11, 264.13 and EPA Guidance Waste Analysis at Facilities that Generate, Treat and Dispose of Hazardous Wastes (OSWER 9938.4-03, April 1994, as updated). All characterization methods must be approved by the NMED. The Permittee shall maintain a copy of the WAP at the Hazardous Waste Storage Facility and in the Facility Operating Record.

2.4.2.1 Sampling and Analysis

The Permittee shall perform all sampling and analytical procedures used for waste characterization, with the exception of hydrazine wastes, in accordance with the most recent version of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, (U.S. EPA Publication SW-846) or an equivalent method with prior NMED approval.

The Permittee shall ensure that samples collected and analyzed for waste characterization are representative of both the nature and the entire volume of the waste under consideration.

The Permittee shall ensure that the sampling procedures used to collect a representative sample of a waste preserve its original physical form and composition to ensure prevention of cross-contamination or changes in concentration of the constituents to be analyzed. The Permittee shall conduct a quality assurance program to ensure that sample collection and analytical procedures used to support waste characterization required under this Permit are technically accurate and statistically valid. This quality assurance program must comply with the quality assurance requirements in SW-846 and this Permit. The Permittee shall identify and perform the appropriate number of control samples associated with each sample collected (e.g., trip and field blanks, field duplicates, and field spikes).

When performing laboratory analysis, the Permittee or the independent laboratory shall analyze the appropriate number of method blanks, laboratory duplicates, and laboratory control samples to assess the quality of the data resulting from laboratory analytical programs. The Permittee shall maintain a record of these quality assurance procedures in the Facility Operating Record in accordance with 40 CFR 264.73.

The Permittee shall use independent contract laboratories to perform analyses and shall enter into a written contract with the laboratory, which requires the analytical laboratory to comply with the waste analysis conditions set forth in this Permit. Copies of all such contracts with independent contract laboratories shall be kept in the Facility Operating Record.

If the Permittee chooses to propose an analytical method that deviates from an established method in SW-846, the Permittee must demonstrate and document to NMED that the proposed analytical procedure is

equal to or superior to the corresponding method in SW-846 in terms of its sensitivity, accuracy, and precision. The Permittee must submit a written request to the NMED no less than 90 days prior to using the proposed sampling or analytical procedure, which includes the following information:

1. A statement of the need and justification for the proposed action;
2. A full description of the proposed method, including all procedural steps and equipment to be used in the method;
3. A description of the types of wastes or waste matrices for which the proposed method may be used;
4. Performance data;
5. Comparative results obtained from using the proposed method with those obtained from using the relevant or corresponding methods prescribed in SW-846 and 40 CFR Parts 261 and 264;
6. An assessment of any factors which may interfere with or limit the use of the proposed method; and
7. A description of the quality control procedures necessary to ensure the sensitivity, accuracy and precision of the proposed method.

The NMED must approve of the alternative method, in writing, before the Permittee may substitute it for an approved method under this Permit.

2.4.2.2 Acceptable Knowledge Hazardous Wastes

The Permittee may use acceptable knowledge to characterize waste in lieu of sampling and analysis or to supplement sampling and analysis. The Permittee shall include in the acceptable knowledge documentation all of the background information assembled and used in the characterization process, whether or not the information supports the decision to use acceptable knowledge. The acceptable knowledge record must document the resolution of any data discrepancies between different acceptable knowledge sources. The Permittee shall provide additional waste characterization information if requested by NMED. Such information shall be provided within the time specified by NMED.

2.4.2.3 Waste Characterization Documentation

The Permittee shall include in the acceptable knowledge documentation a report summarizing the supporting documentation and waste characterization conclusions. Appropriate acceptable knowledge documentation includes, but is not limited to:

1. Standard operating procedures and detailed operating procedures, which includes a list of raw materials and reagents, a listing of all material the raw materials or reagents come in contact with, and descriptions of the wastes generated and how they were handled;
2. Test plans or research project reports that describe the reagents and other raw materials used in an experiment;
3. Documented interviews with site personnel that were directly involved in the waste generation process;
4. Vendor and other standard industry practice documents;
5. Industry reports on a similar process when there is a clear connection between the industrial process or experiment and the Permittee's process or experiment;
6. Previous (pre-RCRA) analytical data relevant to the waste stream;
7. Analytical data from studies of common industry processes that are similar to the Permittee's processes;
8. Material safety data sheets, product labels and other product packaging information;
9. Sampling and analysis data from comparable waste streams;

10. Documented visual inspections that were performed to confirm or identify the physical characteristics and packaging of a waste;
11. Laboratory notebooks that detail the research processes and raw materials used in an experiment; Environmental site characterization data, waste characterization data, waste characterization strategy documentation and RCRA Facility Investigation documentation; and
12. Waste stream laboratory analytical data.

Acceptable knowledge documentation must be maintained in an auditable record for a minimum of three years from the date the waste was last managed at the Hazardous Waste Storage Facility. The three-year record retention period is automatically extended during the course of any unresolved enforcement action or as requested by the NMED. The Permittee shall assign a traceable identification number at the point of generation to this documentation to facilitate access to this information by the Permittee and NMED.

2.5 Waste Characterization Review

The Permittee shall comply with the following conditions to ensure that characterization of regularly or routinely delivered wastes to the HWSF is accurate and up to date in accordance with 40 CFR 264.13(b)(4):

1. Review hazardous waste characterization annually, at a minimum, to verify the accuracy of initial characterization results. This annual re-characterization shall be performed by reviewing waste characterization data with the waste generator to determine if the process generating the waste has undergone a significant change. A significant change is any change that constitutes a change in the composition of the waste or causes a change to the regulatory status of the waste under the HWA, including changes that affect management of the waste with regard to land disposal restrictions (LDR). If particular wastes are received at a waste management unit less frequently than once each calendar year, this review process shall occur before each delivery of the wastes to the waste management unit. This annual review of the waste generating process, or less frequent review for the waste described above, shall be documented in the Operating Record. For wastes originally characterized through sampling and analysis, verification shall be achieved using the same sampling and analysis methods used in the initial analysis or other methods approved by the NMED. For wastes characterized through acceptable knowledge, verification may be achieved through a review of acceptable knowledge information and/or sampling and analysis;
2. Re-characterize a waste whenever there is a change in waste-generating processes that may affect the physical or chemical properties or listed status of the waste; and
3. Re-characterize a waste whenever the Permittee is notified by an off-site facility that has received a hazardous waste from the facility that the characterization of the waste received at the receiving facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittee shall notify the NMED in writing within three days of receipt of such a discrepancy notice from a receiving facility.

Unique wastes that are generated on a one-time basis, or wastes listed at 40 CFR 261.33 and for which the Permittee possesses a Safety Data Sheet (SDS) or equivalent information from the manufacturer identifying chemical content, are exempt from the re-evaluation requirements of this permit section.

The Permittee shall comply with the frequency required for initial analysis of the waste and the frequency that the analysis will be reviewed and/or repeated to ensure that the analysis is accurate and up to date as specified in Attachment 3 (Waste Analysis Plan).

2.6 Characterization of Air Emissions from Containers

The Permittee shall not be required to determine the volatile organic concentration of hazardous wastes in containers for the purpose of complying with this Permit if the Permittee controls air pollution emissions from all hazardous waste in containers in accordance with the container construction specifications and operation requirements specified at 40 CFR 264.1086(b).

2.7 Compliance With Land Disposal Restriction

2.7.1 Hazardous Waste Analysis

The Permittee shall determine if a hazardous waste managed under this Permit must be treated before it may be land disposed in accordance with 40 CFR 268.40, 268.45, and 268.49. The Permittee shall make this determination by sampling and analyses of a representative sample of the waste, acceptable knowledge, or a combination of the two methods.

When using laboratory analysis as part of a hazardous waste characterization, the Permittee shall require the laboratory to report concentrations of all hazardous constituents listed at 40 CFR 268.48, *Table of Universal Treatment Standards* that the analytical test method used is capable of measuring. When performing or obtaining laboratory analysis to demonstrate that a waste meets its applicable LDR treatment standard concentrations specified in 40 CFR 268.40, *Treatment Standards for Hazardous Wastes*, in compliance with 40 CFR 268.7(a) and (b), the Permittee shall ensure that analytical method detection limits are less than the treatment standard.

The Permittee shall characterize treatment-derived wastes, including wastes that are de-characterized and are no longer hazardous waste, to determine whether the waste meets the applicable LDR treatment standards specified at 40 CFR 268.40, 268.45, and 268.49, in accordance with 40 CFR 268.7(b).

2.7.2 Prohibition on Dilution as a Substitute for Treatment

The Permittee shall not dilute a waste that is restricted from land disposal, or the residue from treatment of a restricted waste, as a substitute for treatment in accordance with 40 CFR 268.3. Dilution to avoid an applicable treatment standard includes, but is not limited to, the addition of solid waste to reduce a hazardous constituent's concentration or ineffective treatment that does not destroy, remove, or permanently immobilize hazardous constituents. The Permittee shall not aggregate a waste that is restricted from land disposal with other waste streams or materials in order to comply with Land Disposal Restrictions. Aggregating or mixing wastes as part of a legitimate treatment process is considered permissible dilution for purposes of this Permit.

2.8 Waste Shipped to an Off-Site Facility

The Permittee shall conduct the waste characterization necessary to facilitate appropriate packaging for transportation, including the U.S. Department of Transportation Shipping Name, Hazard Class, and an ID Number for each waste. The Permittee shall maintain in the Operating Record all off-site Facility pre-qualification acceptance characterization information.

2.9 Waste Minimization

The Permittee shall institute a waste minimization program to reduce the volume and toxicity of hazardous wastes generated by the Facility's operation to the degree determined by the Permittee to be economically practicable; and the proposed method of treatment, storage, or disposal that is the practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment, in compliance with 40 CFR 264.73(b)(9).

Certification of the waste minimization program shall include each of the following items:

1. Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the Facility;
2. Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities for all hazardous/mixed wastes;
3. Any source reduction or recycling measures implemented in the last five years or planned for the next federal fiscal year;
4. An estimate of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;
5. Factors that have prevented implementation of source reduction or recycling;
6. Sources of information on source reduction and/or recycling received at the Facility (e.g., local government, trade associations, suppliers);
7. An investigation of additional waste minimization efforts, which could be implemented at the Facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;
8. A flow chart or matrix detailing all hazardous wastes the Facility produces, by quantity and type, including mixed waste, and by building or area and program; and
9. Demonstration of the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes, available technology, or available alternative processes that would produce less volume of toxic waste.

2.10 Dust Suppression

The Permittee shall not use waste or used oil or any other material, which is contaminated with dioxin, PCB, or any other hazardous waste, for dust suppression or road treatment, in accordance with the requirements of 40 CFR 266.23(b).

2.11 Security

To prevent the unknowing entry and to minimize the possibility of unauthorized entry of persons into the HWSF, the Permittee shall comply with the security provisions in accordance with 40 CFR 264.14 and the procedures specified in Permit Attachment 4 (Contingency Plan).

2.12 Inspection Requirements

The Permittee shall follow the inspection schedule specified in Permit Attachment 6 (Inspection Plan). The Permittee shall inspect the Hazardous Waste Management Units and remedy any deterioration or malfunction discovered by an inspection, in accordance with the requirements of 40 CFR 264.15. The Permittee shall remedy any such deterioration or malfunction, operator error, or discharge, as required by 40 CFR 264.15(c). Inspections shall be conducted at a frequency sufficient to identify problems in time to correct them before they can cause harm human health or the environment. Records of inspection shall be kept, as required by 40 CFR 264.15 and maintained in the Facility Operating Record.

2.13 Personnel Training

In order to reduce the potential for incidents related to hazardous waste and remediation waste management, which may pose a threat to human health and the environment, the Permittee shall comply with the applicable personnel training requirements 40 CFR 262.17(a)(7) and 264.16. The Permittee shall maintain training documents in the Facility Operating Record, as applicable, for at least three years from

the date the employee last worked at the Facility in accordance with 40 CFR 262.17(a)(7)(v) and 264.16(d) and (e) and Permit Attachment 5 (Training Plan).

2.14 Waste Sources

2.14.1 Ignitable, Reactive, or Incompatible Waste

The Permittee shall comply with the requirements for handling ignitable, reactive, and incompatible wastes as required in 40 CFR 264.17. In doing so the Permittee must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated from sources of ignition or reaction including, but not limited to open flames, smoking, cutting and welding, hot surfaces, frictional heat, parks, spontaneous ignition, and radiant heat.

2.14.2 Waste Generated During Emergency Explosives or Munitions Emergency Response

If munitions or explosive of concern are discovered that require treatment in place, the Permittee shall comply with the requirements specified in 40 CFR 270.61 (Emergency permits) if such treatment is not part of range clearance. [40 CFR 264.1(g)(8)]

If a release of contaminants or a waste or is generated as a result of explosives or munitions at the Facility, or beyond the Facility boundary in response to a waste military munition (WMM) release from the Facility, the Permittee must comply with the applicable corrective action requirements included in this Permit.

2.14.3 Waste Military Munitions

The Permittee shall identify and manage waste military munitions in accordance with 40 CFR 266 subpart M. The Permittee shall not treat, store, or dispose of waste military munitions without first acquiring a Permit in accordance with 40 CFR 270, with the exception of storage conducted in accordance with 40 CFR 266.205.

2.15 Transport, Storage, Treatment, and Disposal of Waste Military Munitions

The transport, storage, treatment, and disposal of WMM are subject to the applicable permitting, procedural, and technical standards in 40 CFR Part 260 through 40 CFR Part 270. Pursuant to 40 CFR 266.202(b), an unused military munition is a solid waste when the following conditions have been met:

1. the munition is abandoned by being disposed of, burned, detonated (except during intended use), incinerated, or treated prior to disposal; or
2. the munition is removed from storage in a military magazine or other storage area for the purpose of being disposed of, burned or incinerated, or treated prior to disposal; or
3. the munition is deteriorated or damaged (e.g., the integrity of the munition is compromised by cracks, leaks, or other damage) to the point that it cannot be put into serviceable condition, and cannot reasonably be recycled or used for other purposes; or
4. the munition has been declared a solid waste by an authorized military official; or
5. pursuant to 40 CFR 266.202(c), a used or fired military munition is a solid waste when the following conditions have been met:
   a. when transported off-range or from the site of use, where the site of use is not a range, for the purposes of storage, reclamation, treatment, disposal, or treatment prior to disposal; or
   b. if recovered, collected, and then disposed of by burial, or landfilling either on or off a range.

2.15.1 Transport of Waste Military Munitions

WMM that are being transported for treatment and disposal which exhibit a hazardous waste characteristic under 40 CFR 261 Subpart C or are listed as hazardous waste under 40 CFR Part 261 Subpart D, are subject to regulation under 40 CFR Parts 260 through 270 unless the Permittee has demonstrated that all conditions listed in 40 CFR 266.203(a) have been met.

2.15.2 Storage of Waste Military Munitions

Should the Permittee identify a need for storage of non-chemical WMM prior to destruction and disposal, WMM shall be stored in suitable conditions at the Facility such as storage igloos or magazines as deemed appropriated by the Permittee and as governed by Department of Defense Explosives Safety Board standards, 40 CFR 266.205 and 40 CFR 264.1201, which describe the design and operating standards for hazardous waste munitions and explosives storage.

WMM in storage that exhibit a hazardous waste characteristic or are listed as a hazardous waste under 40 CFR Part 261 are subject to regulation as a hazardous waste under 40 CFR Parts 260 through 279 unless the conditions of 40 CFR 266.205(a)(1) have been met as follows:

1. the waste military munitions are not chemical agents or chemical munitions;
2. the waste military munitions must be subject to the jurisdiction of the Department of Defense Explosives Safety Board (DDESB);
3. the waste military munitions must be stored in accordance with the DDESB storage standards applicable to waste military munitions;
4. within 90 days of August 12, 1997 or within 90 days of when a storage unit is first used to store WMM, whichever is later, the owner or operator must notify the NMED of the location of any waste storage unit used to store waste military munitions for which the conditional exemption in 40 CFR 266.205 (a)(1) is claimed;
5. the Permittee must provide the NMED oral notice within 24 hours from the time the Permittee becomes aware of any loss or theft of the waste military munitions, or any failure to meet a condition of 40 CFR 266.205 (a)(1) that may endanger health or the environment. In addition, a written submission describing the circumstances shall be provided within five days from the time the Permittee becomes aware of any loss or theft of the WMM or any failure to meet a condition of 40 CFR 266.205 (a)(1);
6. the Permittee must inventory the WMM at least annually, must inspect the WMM at least quarterly for compliance with the conditions of paragraph 40 CFR 266.205 (a)(1), and must maintain records of the findings of these inventories and inspections in the Facility Operating Record for at least three years after corrective action is complete at the Facility; and
7. access to the stored waste military munitions must be limited to appropriately trained and authorized personnel.

2.15.3 Treatment and Disposal of Waste Military Munitions

Pursuant to 40 CFR 266.206, the treatment and disposal of hazardous WMM are subject to the applicable permitting procedural and technical standards in 40 CFR Parts 260 through 270. This Permit does not authorize treatment or disposal of hazardous WMM at any location at the Facility.

2.16 Preparedness and Prevention

2.16.1 Maintenance and Operation of Facility

The Permittee shall design, construct, maintain, and operate the HWSF to minimize the possibility of a fire, explosion, or any unplanned, sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, ground water, or surface water that could threaten human health and the environment in accordance with the requirements of 40 CFR 264.31.

2.16.2 Required Equipment

At a minimum, the Permittee shall maintain at the operating permitted unit the communication, spill control, decontamination, and fire control equipment set forth in Permit Attachment 4 (Contingency Plan) in accordance with the requirements of 40 CFR 264.32.

2.16.3 Testing and Maintenance of Equipment

The Permittee shall test and maintain equipment as necessary to ensure its proper operation in time of emergency in accordance with the requirements of 40 CFR 264.33. The Permittee shall ensure that the external communication equipment is compatible with the equipment used by the local authorities, emergency response organizations, medical providers and contractors that are identified in Attachment 4 (Contingency Plan).

The Permittee shall ensure that if testing identifies any communication equipment, alarm system component or fire protection, spill control or decontamination equipment that is not functioning properly it is promptly repaired. The Permittee shall immediately provide substitute equipment or systems while the repairs are ongoing. The Permittee shall ensure that employees and contractors working at the HWSF are notified of the presence of substitute equipment and, if necessary, trained in its use. The Permittee shall ensure that malfunctioning equipment is clearly marked as "Inoperable" and the location of the substitute equipment is posted adjacent to the malfunctioning equipment.

2.16.4 Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system in accordance with the requirements of 40 CFR 264.34.

2.16.5 Coordination Arrangements

The Permittee shall maintain Coordination Arrangements to familiarize the White Sands Missile Range Fire Department, Fire and Emergency Services Division, White Sands Security Office, White Sands Medical Clinic, and the Installation Safety Office with the layout and potential hazards at the Facility in accordance with 40 CFR 264.37.

The Permittee shall provide these organizations with a copy of their Contingency Plan. Copies and descriptions of coordination agreements between the various White Sands Missile Range departments shall be maintained in the operating record.

If other state or local authorities are contacted for inclusion in the arrangements made through the Contingency Plan, and such state or local authorities contacted decline to enter into such an arrangement, the Permittee must document the refusal in the operating record in accordance with the requirements of 40 CFR 264.37(b).

2.16.6 Required Aisle Space

The Permittee must maintain aisle space in all areas where hazardous waste is stored in accordance with 40 CFR 262 and 264.35 to allow the unobstructed movement of personnel, fire protection equipment,

spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to NMED that aisle space is not needed for any of these purposes.

2.17 Contingency Plan

2.17.1 Provisions of Plan

The Permittee shall develop a Contingency Plan designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, ground water, or surface water in accordance with the requirements 40 CFR 264.51(a).

2.17.2 Implementation

The Permittee shall immediately implement the Contingency Plan (Permit Attachment 4) whenever there is a fire, explosion, or release of hazardous waste or constituents at the HWSF that threatens human health or the environment in accordance with the requirements of 40 CFR 264.51(b). The Permittee shall ensure that an adequate number of trained emergency response personnel are available at all times including, but not limited to, holidays, evenings and weekends.

2.17.3 Content of Contingency Plan

The contingency plan must describe the actions Permittee personnel must take to comply with 40 CFR 264.51 and 264.56 in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility in accordance with the requirements of 40 CFR 264.52.

2.17.4 Copies of Plan

The Permittee shall maintain and distribute copies of the Contingency Plan (Permit Attachment 4) in accordance with the requirements of 40 CFR 264.53. The Permittee shall provide copies of the Contingency Plan, as modified, to the NMED and to the WSMR Directorate of Emergency Services.

2.17.5 Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan (Permit Attachment 4) in accordance with the requirements of 40 CFR 264.54.

2.17.6 Emergency Coordinator

The Permittee shall designate an Emergency Coordinator as required by 40 CFR 264.55, who shall be responsible for coordinating all emergency response measures related to the HWSF. The Emergency Coordinator or designated alternate specified in the Contingency Plan, shall be on call at all times, be familiar with the Contingency Plan, and shall have the authority to commit promptly the personnel and financial resources needed to implement the Contingency Plan in accordance with 40 CFR 264.55.

2.18 Recordkeeping and Reporting

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit and at 40 CFR 264.73, the Permittee shall comply with the requirements specified in this Permit Part (2). All documents required to be maintained at the Facility shall be readily available at all times and shall be made available to NMED or EPA personnel upon request.

2.18.1 Operating Record

The Permittee shall maintain a written operating record at the Facility in accordance with the requirements of 40 CFR 264.73. The operating record must include a description of the type and quantity

of each hazardous waste received at each individual hazardous waste management unit at the Facility, the date of its receipt, and the method of its treatment, storage, or disposal. The operating record shall also include all items identified in the applicable provisions of 40 CFR 264.73, and all items otherwise required to be kept in the operating record under the terms of this Permit. All documents must be made available to the NMED upon request pursuant to 40 CFR 264.74.

An electronic database containing inspection and tracking documents in a format acceptable to the NMED and capable of producing a paper copy or being transferred to an external data storage device (e.g., DVD, thumb drive) upon demand with identifiable columns and data sorting, may be deemed to be a written record. Electronic records shall be maintained at the Facility as part of the Facility Operating Record.

2.18.2 Manifest System

The Permittee shall comply with all applicable manifest requirements 40 CFR 264.71, 264.72, and 264.76.

2.18.3 Record Retention

The Permittee shall retain all records required by this Permit during the course of any unresolved enforcement action regarding the Facility or as required by the NMED in accordance with 40 CFR 264.74.

2.19 General Closure Requirements

2.19.1 Performance Standard

The Permittee shall clean close the HWSF in accordance with all the requirements of 40 CFR264.111 and with Permit Attachment 7 (Closure Plan for the Hazardous Waste Storage Facility).

2.19.2 Amendment to Closure Plan

The Permittee shall amend Permit Attachment 7 (Closure Plan for the Hazardous Waste Storage Facility) before implementing the plan unless the Permittee demonstrates conclusively by direct measurements and HWSF records that the Facility meets the requirements for clean closure. The Permittee shall amend the Permit Attachment 7 (Closure Plan for the Hazardous Waste Storage Facility) for any other reasons set forth in 40 CFR 264.112(c). The Permittee shall comply with all the requirements of 40 CFR 264.112(c) if the Closure Plan is amended.

2.19.3 Notification of Closure

The Permittee shall notify the NMED in writing at least 45 calendar days prior to the date on which it expects to begin closure of the HWSF and shall otherwise comply with the requirements of 40 CFR 264.112(d).

2.19.4 Time Allowed for Closure

Within 90 calendar days after receiving the final volume of hazardous waste at any permitted unit, the Permittee shall remove all hazardous waste from the unit for transfer to an appropriate permitted facility, and shall complete closure activities, in accordance with the requirements of 40 CFR 264.113 and Permit Attachment 7 (Closure Plan for the Hazardous Waste Storage Facility).

2.19.5 Disposal or Decontamination of Equipment, Structures, and Soils

The Permittee shall decontaminate or dispose of all contaminated equipment, structures, and soils, in accordance with all the requirements 40 CFR 264.114 and Permit Attachment 7 (Closure Plan for the Hazardous Waste Storage Facility)

2.19.6 Certification of Closure

Within 60 calendar days from the date of completion of closure of the HWSF, the Permittee shall submit to the NMED a final closure report and written closure certification, signed by an independent professional engineer registered in New Mexico, that the HWSF was closed in accordance with their approved Closure Plan for the Hazardous Waste Storage Facility. The Permittee shall comply with all the requirements of 40 CFR 264.115 in submitting the certification.

2.19.7 Survey Plat

If any waste or contaminated media is left in place, the Permittee shall submit a survey plat to the federal land authority and the NMED, no later than the submission of certification of closure of each hazardous waste disposal unit, in accordance with the requirements of 40 CFR 264.116.

2.20 Post-Closure Care Requirements

If the Permittee does not meet the requirements for clean closure of the HWSF as specified in 40 CFR 264.111, the Facility shall be subject to post-closure permitting requirements pursuant to 40 CFR 270.1(c)(6)(iii). The Permittee shall submit a Class 3 Permit Modification Request pursuant to 40 CFR 270.42(c) that includes a Post-Closure Care Plan, no later than 90 calendar days from the date of completion of closure in accordance with 40 CFR 264.117 and 264.118.

3 Part 3 Container Storage Area/Hazardous Waste Storage Facility

Part 3 specifies the regulatory requirements that the Permittee shall follow when managing and storing hazardous wastes at the Hazardous Waste Storage Facility. The Permittee is authorized to store only those hazardous wastes listed in Part A of the Permit Application included in Permit Attachment 1. Specific Facility and process information for the management, storage and transfer of hazardous waste in the Permittee's container storage area known as the Hazardous Waste Storage Facility are provided in Permit Attachment 2 (Facility Description) and Permit Attachment 3 (Waste Analysis Plan).

The Permittee may store containerized wastes in the appropriate storage buildings known as the Hazardous Waste Storage Facility (HWSF), located in a fenced area of approximately 151,700 square feet. The Permittee's known hazardous waste streams are described in Permit Attachment 3 (Waste Analysis Plan).

The Permittee shall store no more than 13,200 gallons of hazardous waste in 55-gallon drums and smaller containers in Buildings S22895 A through D and Building S22895 at any time. The Permittee may store only those hazardous wastes generated within the Facility boundaries and must transfer all wastes to permitted off-site facilities for treatment or disposal.

Figures 2-1 and 2-2 in Permit Attachment 2 (Facility Description) depict the location of White Sands Missile Range, the HWSF within the missile range, and the location of the structures at the HWSF. Topographic maps in Permit Attachment 9 (Solid Waste Management Unit Location Maps) show surrounding land use. Additional details on the construction and design of the HWSF are included in Permit Attachment 2 (Facility Description).

3.1 Hazardous Waste Storage Facility

The Permittee shall manage and store hazardous waste in the HWSF in accordance with the following conditions:

3.1.1 Storage Locations and Quantities

The Permittee shall manage and store hazardous waste containers located in the HWSF as described in Permit Attachment 2 (Facility Description). The Permittee shall not manage and/or store hazardous waste at the HWSF in excess of the maximum capacities specified in Permit Attachment 1 (Part A Permit Application) and Attachment 2 (Facility Description).

3.1.2 Storage Time Limit

The Permittee shall not store any hazardous waste in the HWSF for more than one (1) year, in accordance with 40 CFR 268.50(b).

3.1.3 Minimum Aisle Space and Container Spacing

The Permittee shall maintain sufficient aisle space between storage drums in the storage bays to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area within the HWSF, in accordance with the requirements of 40 CFR 264.35.

The Permittees shall store containers in a manner that allows the containers to be inspected for leaks, corrosion, deterioration, and for container labels to be read without moving them in accordance with 40 CFR 264.174.

3.2 Permitted and Prohibited Wastes

3.2.1 Permitted Wastes

The Permittee shall store and otherwise manage containers of hazardous waste in accordance with 40 CFR 264, Subpart I. The Permittee shall store for subsequent transfer to a treatment, storage, or disposal facility only the hazardous wastes listed in the Permit Attachment 1 (Site Identification and Authorized Wastes).

3.2.2 Prohibited Wastes

The Permittee is prohibited from managing and storing in the HWSF any hazardous waste that is not identified in Attachment 1 (Part A Permit Application).

3.3 Condition of Containers

If a container holding hazardous waste is not in good condition (e.g., has severe rusting, apparent structural defects) or if it begins to leak, then the Permittee shall transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in accordance with this Permit and 40 CFR 264.171.

3.4 Storage Container Types

The Permittee shall only use containers that comply with 40 CFR Part 264 Subpart I (Use and Management of Containers) for storage of hazardous waste at permitted units.

Prior to shipment of hazardous waste, containers must comply with Department of Transportation (DOT) shipping container regulations in accordance with 49 CFR 173 - Shippers - General Requirements for Shipment and Packaging, and 49 CFR 178 - Specifications for Packaging.

3.5 Compatibility of Waste with Containers

The Permittee shall use containers made of, or lined with, materials that will not react with, and are otherwise compatible with the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired, in accordance with 40 CFR 264.172. The Permittee shall ensure compliance with this requirement by conducting pre-acceptance characterization of waste.

3.6 Management of Containers

The Permittee shall keep all hazardous waste containers closed during storage, except when it is necessary to add or remove waste, and shall not open, handle, or store containers in a manner which may rupture the container or cause it to leak, in accordance with at 40 CFR 264.173.

3.7 Secondary Containment System

The Permittee shall maintain secondary containment systems for all hazardous waste containers containing free liquids in accordance with the requirements of 40 CFR 264.175. All containers containing free liquids must be labeled as containing free liquids. For storage of containers that do not contain free liquids the Permittee shall ensure that:

a. the storage areas are sloped or otherwise designed and operated to drain and remove liquid resulting from storm water run-on, precipitation or other liquids in accordance with 40 CFR 264.175(c)(1); or
b. the containers are elevated or otherwise protected.

3.8 Inspection Schedules and Procedures

The Permittee shall inspect the HWSF for the condition of containers and secondary containment systems, safety equipment, and aisle space at least weekly to detect leaking containers, deterioration of containers and the containment system caused by corrosion and other factors, in accordance with the Permit Attachment 6 (Inspection Plan) and in accordance with the requirements of 40 CFR 264.174.

3.9 Record Keeping

The Permittee shall place the results of all waste analyses and any other documentation showing compliance with Permit Section 2.18 in the Operating Record, in accordance with the requirements of 40 CFR 264.73.

3.10 Closure

During closure of the HWSF, the Permittee shall remove all hazardous waste and hazardous waste residues, remaining containers, liners, bases and soils containing or contaminated with hazardous waste or hazardous waste residues, from the containment system in accordance with the requirements of 40 CFR 264.178.

3.11 Special Provisions for Ignitable or Reactive Waste

3.11.1 Location of Ignitable and Reactive Waste The Permittee shall not locate containers holding ignitable or reactive hazardous waste within 15 meters (50 feet) of the Facility's property line (the WSMR boundary), in accordance with the requirements of 40 CFR 264.176.

3.11.2 Procedures to Prevent Ignition/Reaction

The Permittee shall take all appropriate precautions to prevent accidental ignition or reaction of ignitable or reactive waste in accordance with 40 CFR 264.17(a).

3.11.3 Storage of Ignitable and Reactive Waste Containers

The Permittee shall not stack containers of ignitable and reactive wastes more than two high, in order to comply with the National Fire Protection Association's *Flammable and Combustible Liquids Code.*

3.11.4 Separation of Incompatible Wastes

The Permittee shall not place incompatible wastes in the same containers in accordance with 40 CFR 264.177(a), unless the Permittee complies with all provisions included in 40 CFR 264.17(b).

3.11.5 Separation of Incompatible Waste Containers

The Permittee shall separate containers of incompatible wastes in accordance with 40 CFR 264.177(c).

3.11.6 Management of Unwashed Containers

The Permittee shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material, in accordance with the requirements of 40 CFR 264.177(b).

4 Part 4 Closure of Hazardous Waste Management Units

4.1 General

Forty-one hazardous waste management units are listed in Table 8-3 of Permit Attachment 8 (List of Units). The HWSF is the only active hazardous waste management unit. The Permittee shall submit a closure plan for each unit that addresses all closure activities that have not yet been completed. The status of each unit is identified in Permit Attachment 8 (List of Units). The closure plans shall be submitted in accordance with Table 8-5 (Closure Plan Submittal Schedule) in Permit Attachment 8 (Closure Plan Submittal Schedule).

The Permittee shall close the HWMUs in accordance with 40 CFR Subpart G (Closure and Post-Closure Care). The Permittee shall close each HWMU in a manner that: 1) minimizes the need for the further maintenance; and 2) controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste or hazardous constituents to the ground, surface water, or air; and 3) complies with the applicable specific closure requirements in Subparts K (Surface Impoundments), L (Waste Piles), M (Land Treatment), N (Landfills), or X (Miscellaneous Units).

4.2 Closure Plan Submittals

Each closure plan shall consist of two phases. The first phase shall consist of evaluation of the waste historically managed at the unit, the waste currently in place in the unit, and an assessment of the nature and extent of any releases from the unit. The second phase shall consist of the activities required to complete closure, including remediation of any contaminated media, in accordance with the requirements of 40 CFR 264.111 through 264.116 and the applicable closure requirements of 40 CFR 264 subpart K, 264 subpart N, 264 subpart O, and 264 subpart X.

4.3 Closure Unit Evaluation

Prior to submittal of a Closure Plan, the Permittee shall evaluate each HWMU to characterize the waste managed at the unit and evaluate any release from the unit. At a minimum, the Permittee shall provide an assessment that includes:

1. A summary of the waste historically managed at the unit, including dates, volumes, and types of waste disposed and treated;
2. Waste disposal practices (e.g., burial, burning)
3. The methods for removal of wastes and decontamination or dismantling of equipment;
4. The volume of residual waste that remains in place; and
5. Whether corrective action is necessary at the unit.

If corrective action to investigate the nature and extent of releases is necessary, then the Permittee must include a scope of work for corrective action in the Closure Plan. By removing hazardous waste and hazardous constituents, the Permittee may become a generator of hazardous waste and must handle the waste in accordance with all applicable requirements of 40 CFR 262 as specified by 40 CFR 264.114.

4.4 Closure Plan

The Permittee shall submit a Closure Plan for units listed in Table 8-3 of Permit Attachment 8 (List of Units) in accordance with 40 CFR 264.112. The Permittee shall identify and present the steps necessary to perform closure for each unit. The Closure Plan shall present the closure performance standards

specified in 40 CFR 264.111 and Permit Section 6.6. The format shall generally follow the Investigation Work Plan format presented in Permit Part 9 (Reporting Requirements).

The Closure Plan shall provide information regarding the HWMU including a description, location, and background to include, is not limited to:

1. Figures, maps, site plans, and photographs of the HWMU;
2. Hazardous waste codes managed at the site;
3. Hazardous constituents or other contaminants managed or released at the site;
4. Maximum inventory of waste, dimensions, types of waste (e.g., solid, liquid, types of containers) managed at the unit.
5. A detailed description of the proposed closure methods, including waste removal and site decontamination;
6. Description of any other required steps, including, but not limited to, soil sample collection, groundwater monitoring, soil removal, leachate collection, run-on and run-off control, institutional or engineering controls; and
7. A schedule of closure activities.

4.5 Amendment of the Closure Plan

The Permittee may amend the Closure Plan by submitting a written request for a Permit Modification to NMED that includes the proposed changes to the Closure Plan in accordance with the requirements of 40 CFR 270.42.

4.6 Closure Report

Within 90 days, or other date established by NMED, after the completion of closure of any permitted unit, the Permittee shall submit a Closure Report for Department review and approval in accordance with Permit Section 1.15.1. The Report shall document that the hazardous waste unit has been closed in compliance with the specifications in this Permit Part 4 and the approved Closure Plan. The Closure Report shall summarize all activities conducted during closure and follow the general format for reports provided in Permit Section 9.3. The NMED may require interim reports that document the progress of closure.

The Permittee shall submit a closure certification signed by the Permittee and by an independent professional engineer registered in the State of New Mexico (see 40 CFR 264.115). If the Permittee leaves waste in place, they shall submit to the NMED a survey plat as required by 40 CFR 264.116 in conjunction with the Closure Report. If the Permittee is unable to clean close any Hazardous Waste Management Unit, the Permittee shall submit a permit modification request to add post closure care for the unit to the Permit that includes a post closure care plan that provides all proposed activities for post closure care of the unit as described in Permit Part 5 (Post Closure Care of Hazardous Waste Management Units).

5 Part 5 Post-Closure Care of Hazardous Waste Management Units

5.1 General

The Permittee shall comply with post-closure care requirements for 30 years after completion of closure of each regulated unit, unless the NMED approves shortening or lengthening the post-closure care period pursuant to 40 CFR 264.117(a)(2). Post-closure care shall be conducted in accordance with 40 CFR Part 264, Subpart G, and the Post-Closure Plans included in Permit Attachment 10 (Post-Closure Care Plans) and subject to the terms and conditions of this Permit (40 CFR 264.117). All post-closure care activities must be conducted in accordance with the provisions of the Post-Closure Plan pursuant to 40 CFR 264.117(d) and 264.118(b) and the requirements of this Permit.

5.2 Corrective Action to Complete Closure

The Permittee shall submit to the NMED investigation work plans to determine the extent of releases from each post-closure care unit where corrective action was not completed during closure. The units currently in post-closure that require corrective action are identified in Permit Attachment 8 (List of Units).

5.3 Post-Closure Care Plan

All hazardous waste management units that are not clean closed shall have a written Post-Closure Care Plan. The Facility shall submit a Post-Closure Care Plan to the NMED within 90 days, or other date established by NMED, from the date that the Facility or the NMED determines that the hazardous waste management unit required post closure care, subject to the requirements of 40 CFR 264.117 through 264.120. The Permittee shall submit a permit modification request to add post closure care for the unit to the Permit that includes a post closure care plan that provides all proposed activities for post closure care of the unit as described in this Permit Part (5). The permit modification shall be submitted to NMED as a class 3 permit modification request in accordance with 40 CFR 270.42(c) and 20.4.1.901 NMAC. In accordance with 40 CFR 270.32, the approved Post-Closure Care Plan, once added as a permit modification, shall become a condition of this Permit.

The Permittee shall ensure that the Post-Closure Care Plan identifies all activities to be conducted after closure of each permitted unit for which clean closure is not achieved including but not limited to:

1. A description of the planned monitoring activities and frequencies at which they will be performed to comply with 40 CFR Part 264;
2. A description of the planned inspection and maintenance activities, and frequencies at which they will be performed to ensure:
    a. the integrity of caps and final covers or other containment systems in accordance with the requirements of 40 CFR Part 264;
    b. the function of monitoring equipment in accordance with the requirements of 40 CFR Part 264;
3. The name, address and phone number of the person(s) or office to contact regarding the unit during the post-closure care period;
4. Sampling and analysis of waste and media sampled for the purpose of compliance and detection monitoring, during the post-closure period;
5. Security requirements during the post-closure period;
6. Inspection requirements, including schedules;

7. Alternative requirements, if any, in accordance with 40 CFR 264.110(c), that apply to the closed unit.

5.4 Post-Closure Care Plan Amendment

In accordance with 40 CFR 264.118(d), the Permittee must request a permit modification to authorize a change to the Post-Closure Care Plan. This request must be in accordance with applicable requirements of 40 CFR Part 270 and 20.4.1.901 NMAC, and must include a copy of the proposed amended Post-Closure Care Plan for approval by the NMED. The Permittee shall request a permit modification whenever:

1. Changes in operating plans or facility design affect any part of the Post-Closure Care Plan, or
2. There is a change in the expected year of final closure, or
3. Events which occur during the active life of the facility, including partial and final closures, affect the approved Post-Closure Plan.

The Permittee must submit a written request for a permit modification to the NMED at least sixty (60) days prior to the proposed change in design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure care requirements.

5.5 Inspections

The Permittee shall inspect the components, structures, and equipment at the HWMU in accordance with the NMED-approved Post-Closure Care Plan in accordance with 40 CFR 264.117(a)(1) and 264.118(b)(1) and (2).

5.6 Notices and Certifications

5.6.1 Notification Filing

The Permittee shall maintain copies of documentation that they have submitted to the local zoning authority or the authority with jurisdiction over local land use, and to the NMED that record the type, location, and quantity of hazardous wastes disposed of within each cell or other disposal unit of the Facility. For hazardous wastes disposed of before January 12, 1981, the Permittee shall have identified the type, location, and quantity of the hazardous wastes in accordance with any records retained [40 CFR 264.119(a)].

5.6.2 Record Keeping Requirements

The Permittee shall maintain documentation of certification of closure of for all hazardous waste management unit. The Permittee shall record, in accordance with the State of New Mexico law, a notation on the deed to the Facility or property or on some other instrument that is normally examined during the property title search will in perpetuity notify any reviewer:

1. The land has been used to manage hazardous wastes;
2. Its use is restricted under 40 CFR 264 Subpart G; and
3. The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the Facility have been filed with the NMED, and the authority with jurisdiction over local land use [40 CFR 264.119(b)(1)].

5.6.3 Certification

The Permittee shall maintain copies of the certification submitted to the NMED, signed by the Permittee, wherein he has recorded the notation specified in Permit Part 5.6.1, including a copy of the document in which the notation has been placed in accordance with 40 CFR 264.119(b)(2).

5.7 Completion of Post-Closure Requirements

No later than 60 days after completion of the approved post-closure care period for each hazardous waste disposal unit, the Permittee shall submit to the NMED, by registered mail, a certification that the post-closure care for the hazardous waste disposal unit was performed in accordance with the specifications in the approved Post-Closure Plan. The certification must be signed by the Permittee and an independent, registered professional engineer. Documentation supporting the engineer's certification must be furnished to the NMED in conjunction with the certification. [40 CFR 264.120]

6 Part 6 Corrective Action for Solid Waste Management Units and Areas of Concern

6.1 Applicability

Sections 3004(u) and 3013 of the Resource Conservation and Recovery Act (RCRA), Sections 74-4-4.A.5.h and 74-4-4.2 of the New Mexico Hazardous Waste Act (HWA), and 40 CFR 264.101, require that RCRA permits address corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents at a treatment, storage, or disposal facility, regardless of the time at which the release occurred.

Section 3004(v) of RCRA, Section 74-4-4.A.5.i of the HWA, and 40 CFR 264.101(c), require corrective action beyond the Facility property boundary, where necessary to protect human health and the environment unless the Permittee demonstrates to the satisfaction of the NMED that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the Facility boundary where such off-site access is denied.

The conditions of this Section apply to all Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified in Permit Attachment 8 (Corrective Action Unit Identification) and any newly identified SWMUs and AOCs identified after the issuance of this Permit, and any releases of hazardous waste or hazardous constituents from SWMUs and AOCs.

6.2 Contamination Beyond the Facility Boundary

The Permittee shall implement corrective action beyond the Facility boundary where necessary to protect human health and the environment; unless the Permittee demonstrates to the satisfaction of the NMED that, despite the Permittee's best efforts, as determined by the NMED, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to cleanup a release that has migrated beyond the Facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. [40 CFR 264.101(c)]

6.3 Corrective Action Already Completed

Any corrective action tasks required under this Section that the Permittee has already completed may be used to meet the requirements of this Permit Part, in whole or in part, as determined by the NMED. The Permittee may submit prior work to meet these requirements for the NMED's approval. A written Notice of Approval, either with or without conditions, or a Notice of Disapproval (NOD) will be issued by the NMED.

6.4 Newly Discovered SWMUs and AOCs

The Permittee shall notify the NMED in writing, within 15 calendar days of discovery of any potential newly discovered SWMU or AOC. As used in this Permit Part (6), the terms "discover", "a discovery", or "discovered" refer to the date on which the Permittee: (1) visually or otherwise observes evidence of a new SWMU or AOC, (2) visually or otherwise observes evidence of a previously unidentified release of hazardous waste or hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment.

The notification shall include, at a minimum, the location of the newly discovered SWMU or AOC and the available information pertaining to the site history and nature of the release (e.g., media affected, hazardous waste, hazardous constituents, or contaminants released, magnitude of release). At the time of

notification, the NMED may require the Permittee to submit a Release Assessment Report in accordance with Permit Part 9 (Reporting Requirements) to determine if the area in question is a potential newly discovered SWMU or AOC. Alternatively, the NMED may require an Investigation Work Plan for the newly discovered SWMU or AOC in accordance with Permit Part 9 (Reporting Requirements) without requiring a Release Assessment. If the NMED determines that an Investigation Work Plan for a newly discovered SWMU or AOC is required, the Permittee shall modify this Permit to add the SMWU or AOC to Permit Attachment 8 (Corrective Action Unit Identification) in accordance with 40 CFR 270.42.

If the Permittee conducts an explosives or munitions emergency response at the Facility, or beyond the Facility boundary, in response to discovery of a waste explosive, the Permittee shall treat that response location as a newly discovered AOC, unless the response is conducted within the boundaries of an existing AOC or SWMU.

6.5 Facility-Wide Groundwater Monitoring Program

Groundwater monitoring shall be conducted at the Facility in accordance with site- and area-specific work plans identified and approved by NMED and the post-closure plans included in Permit Attachment 10.

6.5.1 Groundwater Monitoring Plans

For each SWMU, AOC or area that combines SWMUs and AOCs that require groundwater monitoring as identified by NMED, the Permittee shall submit a groundwater monitoring plan for NMED approval that proposes groundwater monitoring and sampling specific to the SWMU, AOC or area that combines SWMUs and AOCs. At a minimum, the plans shall propose the methods and procedures used to monitor and sample groundwater in accordance with the requirements of Permit Part 7 and in accordance with the format described in Permit Part 9.2. The plans also shall include the proposed frequency of monitoring that shall not be less than semi-annually unless an alternate longer frequency is approved by NMED. The groundwater monitoring plans shall be updated annually to include any proposed changes to the site- or area-specific monitoring plan no later than March 31 of each calendar year beginning the first year after the effective date of this Permit. If no changes are proposed for a site- or area-specific plan, the Permittee shall submit a letter stating as such for each plan that will not be changed by March 31 of each year.

6.5.2 Groundwater Monitoring Reports

For each SWMU, AOC or area that combines SWMUs and AOCs that require groundwater monitoring as identified by NMED, the Permittee shall submit an annual groundwater monitoring report for NMED approval that meets the requirements of Permit Section 9.4. Annual reports shall be submitted no later than April 30 of each calendar year. NMED may require reports to be submitted on an alternate frequency or submittal date specific to monitoring conducted at a SWMU, AOC or area that combines SWMUs and AOCs.

6.6 Cleanup Levels

The NMED's cleanup levels for protection of human health are based on excess lifetime cancer risk levels and hazard index levels that are consistent with the EPA's National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR 300.430(e)(2)(i)(A)(2). EPA recommends a range of 10^{-4} to 10^{-6} lifetime excess cancer risk as acceptable. In general, the NMED has selected a target risk level of 10^{-5} for establishing cleanup levels for regulated substances. NMED has generally selected a target hazard quotient (HQ) of 1.0 for individual non-carcinogenic regulated compounds. For contamination involving two or more non-carcinogenic regulated substances, the NMED has generally selected a target hazard index (HI) of 1.0.

Unless otherwise specifically provided in this Permit, the Permittee shall follow the cleanup and screening levels described in this Permit in implementing the corrective action requirements of this Permit. The Permittee shall comply with the adopted and established cleanup and reporting requirements described in this Permit. In addition, cleanup levels for the protection of the environment shall address ecological risk consistent with the NMED's guidance for assessing ecological risk. In accordance with 40 CFR 270.32(b)(2), this Permit part contains terms and conditions to protect human health and the environment as determined by the NMED. The Permittee shall attain the cleanup levels specified below when implementing the closure, post-closure and corrective action requirements of this Permit.

6.6.1 Groundwater Cleanup Levels

The cleanup levels for all contaminants in groundwater shall be the New Mexico Water Quality Control Commission (WQCC) groundwater quality standards, 20.6.2.3103 NMAC, the cleanup levels calculated for toxic pollutants listed in 20.6.2.7.T(2) NMAC, and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the federal Safe Drinking Water Act (42 U.S.C. 300f to 300j-26). If both a WQCC groundwater quality standard and an MCL have been established for an individual substance, then the lower of the levels shall be the cleanup level for that substance.

The most recent version of the NMED's Tap Water Screening Levels listed in Table A-1 or as specified in other sections of the 2022 NMED Risk Assessment Guidance for Site Investigation and Remediation (SSG, as updated) shall be used to establish the cleanup level if neither a WQCC standard or an MCL has been established for a specific substance. In the absence of an NMED tap water screening level or other cleanup level listed in the SSG, the EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs, as updated) for tap water shall be used. If no WQCC groundwater standard, MCL, NMED tap water or other screening level or EPA RSL has been established for a contaminant for which toxicological information is published, the Permittee shall use a target excess cancer risk level of 10^{-5} for carcinogenic substances and a HI of 1.0 for non-carcinogenic substances as the basis for proposing a groundwater cleanup level for the contaminant. If the background concentration of an inorganic constituent exceeds the standard, then the cleanup level is the background concentration for that specific substance. Any cleanup level based on a risk assessment must be submitted to the NMED for review and approval.

6.6.2 Soil and Sediment Cleanup Levels

The cleanup levels for soil and sediments shall be the cleanup levels for soil set forth in this Permit Part (6). If the Permittee is unable to achieve the Soil Cleanup Levels established under Permit Part 6.2.2.1, the Permittee may request a variance in accordance with Permit Part 6.9. Any cleanup level established based on a risk assessment must be submitted to the NMED for its review and approval.

6.6.2.1 Soil Cleanup Levels

The NMED has specified soil-screening levels that are based on a target total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 for the residential land use, industrial land use, and construction worker scenarios. If the potential for migration to groundwater is applicable for a site, the NMED may determine that a dilution attenuation factor (DAF), as listed in the most recent version of the SSG or as calculated using the NMED-approved methods described in the SSG (as updated) for contaminated soils, is appropriate to achieve clean closure. This approach may apply at sites where the migration of contaminants through the soil column to groundwater has occurred or when the NMED determines that the potential exists for migration of contaminants through the soil column to groundwater. Soil cleanup levels shall be the target soil screening levels listed in the SSG. If a NMED soil screening level has not been established for a substance for which toxicological information is published, the soil cleanup level shall be established using the most recent version of the EPA RSL for residential and industrial soil for compounds designated as "n" (non-

carcinogen effects) or ten times the EPA RSL for compounds designated "c" (carcinogen effects). The cumulative risk shall not exceed a total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 at sites where multiple contaminants are present. If the current and reasonably foreseeable future land use is one for which the NMED has not established soil screening levels, the Permittee may propose cleanup levels to the NMED based on a risk assessment and a target excess cancer risk level of 10^{-5} for carcinogenic substances or an HI of 1.0 for NMED review and approval. Petroleum hydrocarbons or per- and polyfluorinated alkyl substances may be detected in environmental media as the result of contaminant releases where individual hazardous constituents are not present at significant concentrations. In these cases, the Permittee shall use the most recent version of the SSG for cleanup of petroleum hydrocarbons or per- and polyfluorinated alkyl substances in soil.

6.6.3 Surface Water Cleanup Levels

The Permittee shall comply with the surface water quality standards outlined in the Clean Water Act (33U.S.C. 1251 to 1387), the New Mexico WQCC Regulations (20.6.2 NMAC), the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

6.6.4 Vapor Intrusion Cleanup Levels

The NMED has specified vapor intrusion screening levels for volatile organic compounds that are based on a target total excess cancer risk of 10^{-5} and, for noncarcinogenic contaminants, a target HI of one (1.0) for residential and industrial land use scenarios. The target residential and industrial vapor intrusion screening levels for selected substances are listed in NMED's SSG (as updated). Vapor intrusion shall be evaluated for sites that meet the criteria specified in the SSG. If a contaminant is not listed in NMED's SSG, the Permittee shall calculate the vapor intrusion screening level following the methodology specified in the SSG.

6.7 Ecological Risk Evaluation

The Permittee shall derive cleanup levels for each hazardous waste and hazardous constituent for each ecological zone at the Facility using the methods specified in NMED's SSG (as it may be updated). If the ecological risk evaluation indicates that a lower cleanup level for a hazardous waste or hazardous constituent in groundwater, soil, or surface water is sufficient and acceptable to protect environmental receptors, the NMED may establish cleanup levels based on ecological risk for hazardous waste or hazardous constituents in groundwater, soil, or surface water that are lower than levels that are solely protective of human health.

6.8 Background Concentrations

If the naturally occurring (background) concentration of a hazardous waste or hazardous constituent in ground water, soil, or surface water exceeds the standards specified above, then the cleanup level shall be the background concentration. To use background concentration as a cleanup level, the Permittee must submit a site-specific background concentration investigation work plan for NMED review and approval and a subsequent background investigation report summarizing the results of the investigation. All background concentrations must be approved by NMED in writing.

6.9 Variance from Cleanup Levels

If attainment of the established cleanup level is demonstrated to be technically infeasible, the Permittee may perform a risk-based evaluation to establish alternative cleanup levels for specific media at individual corrective action units. The risk-based evaluation must be conducted in accordance with the most recent version of NMED's SSG. For groundwater, if the Permittee proposes to demonstrate the technical infeasibility of achievement of a specific groundwater cleanup level that is a WQCC standard, the applicable requirements of the WQCC Regulations, 20.6.2.4103.E NMAC, shall be followed.

For all other instances in which the Permittee seeks a variance from a cleanup level, the Permittee shall submit a demonstration to the NMED that achievement of the cleanup level is impracticable. In making such demonstration, the Permittee may consider such things as technical or physical impracticability of the project, the effectiveness of proposed solutions, the cost of the project, hazards to workers or to the public, and any other basis that may support a finding of impracticability at a particular SWMU or AOC. The Permittee may also refer to all applicable guidance concerning impracticability. In addition to demonstrating the basis for the impracticability request, the Permittee's written submission shall propose the action to be taken by the Permittee, if the NMED approves the impracticability demonstration. Such action shall include, but is not limited to, completion of a site-specific risk assessment and identification of alternate cleanup levels.

The NMED will review the Permittee's written submission concerning impracticability and determine whether achievement of the cleanup level is impracticable. The NMED may consider such things as technical or physical feasibility of the project, the effectiveness of proposed solutions, the cost of the project, hazards to workers or to the public, and any other basis that may support or refute a finding of impracticability at a particular SWMU or AOC. If the NMED approves or disapproves the Permittee's impracticability demonstration, it will notify the Permittee in writing, and such notice will describe the specific actions to be taken by the Permittee.

6.10 Newly Identified SWMUs and AOCs

6.10.1 Notification of Newly Discovered SWMUs and AOCs

Within fifteen days after the discovery of any newly identified potential SWMU or AOC, the Permittee shall notify the NMED in writing of such discovery. As used in this Permit Part, the terms "discover", "a discovery", or "discovered" refer to the date on which the Permittee: (1) visually or otherwise observes evidence of a new SWMU or AOC, (2) visually or otherwise observes evidence of a previously unidentified release of hazardous waste or hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment. The notification shall include, at a minimum, the location of the SWMU or AOC and all available information pertaining to the nature of any release of contaminants from the SWMU or AOC, including the contaminants released, the magnitude of the release, and the media affected by the release.

At the time of notification, the NMED may require the Permittee to submit a Release Assessment Report prepared in general accordance with Permit Part 9 (Reporting Requirements) to determine if the area in question is a potential newly discovered SWMU or AOC. Alternatively, the NMED may require an Investigation Work Plan for the newly discovered SWMU or AOC in accordance with Permit Part 9.2 without requiring a Release Assessment. If the NMED determines that an Investigation Work Plan for a newly discovered SWMU or AOC is required, the Permittee shall submit a permit modification request to add the SMWU or AOC to Permit Attachment 8 (Corrective Action Unit Identification) in accordance with 40 CFR 270.42(a).

If the Permittee conducts an explosives or munitions emergency response at the Facility, or beyond the Facility boundary, in response to a waste explosive released from the Facility, the Permittee shall treat that response location as a newly discovered AOC, unless the response is conducted within the boundaries of an existing AOC or SWMU.

6.10.2 Notification of Release

The Permittee shall notify the NMED orally of the discovery of a SWMU or AOC and its associated release within 24 hours and shall notify the NMED in writing, within 5 calendar days of discovery of any

contamination identified at a newly discovered SWMU or suspected AOC in accordance with Permit Section 1.12.9.10 and 1.12.9.11 (24 Hour and Subsequent Reporting).

6.10.3 SWMU Assessment Report

Within 90 days, or other time period established by the NMED, after submitting such notification, the Permittee shall submit to the NMED for review and written approval a SWMU Assessment Report or a Release Assessment Report for each newly identified potential SWMU or AOC. At a minimum, such Report shall include the following information, to the extent available:

1. Location of unit(s) on a topographic map of appropriate scale, as required under 40 CFR 270.14(b)(19);
2. Designation of type and function of unit(s);
3. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);
4. Dates of operation for each unit;
5. Available site history information;
6. Available specifications of wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous waste, hazardous constituents, or other contaminants; and,
7. Available information pertaining to any release of hazardous waste, hazardous constituents, or other contaminants from such unit(s) (to include ground water data, soil analyses, air, and surface water data). The acquisition of new groundwater, soil, air and surface water data is not required for the release assessment.

Based on the results of the SWMU or Release Assessment Report, the NMED will determine the need for further investigations at the SWMUs or AOCs identified in the SWMU or Release Assessment Report, including the need for submittal of an investigation work plan in accordance with the requirements in Permit Part 9.2 (Investigation Work Plan).

6.11 Interim Measures

6.11.1 Interim Measures Required by NMED

Upon written notification by the NMED, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan at any SWMU or AOC where the NMED determines that interim measures are necessary to minimize or prevent the migration of hazardous waste, hazardous constituents or other contaminants and limit actual or potential human and environmental exposure while long term corrective action remedies are evaluated and implemented. The Permittee shall submit its IM Work Plan to the NMED within 30 calendar days of NMED's notification unless another time period is specified by the NMED. Such interim measures may be conducted concurrently with any required corrective action.

6.11.2 Permittee-Initiated Interim Measures

The Permittee may initiate interim measures at a SWMU or AOC by notifying the NMED, in writing, at least 30 calendar days prior to beginning the Interim Measures. The NMED will approve the Permittee-initiated IM, conditionally approve the IM, or require submittal of an IM work plan for the NMED approval prior to implementation of the Interim Measure. Upon approval, NMED will establish a schedule for the submittal of a report(s) summarizing the actions and results of the interim measure implementation and the progress in achieving cleanup.

6.11.3 Emergency Interim Measures

The Permittee may determine, during implementation of site investigation activities, that emergency interim measures are necessary to address an immediate threat of harm to human health or the environment. The Permittee shall notify the NMED within one business day of discovery of the facts giving rise to the threat and shall propose emergency interim measures to address the threat. If the NMED approves the emergency interim measures in writing, the Permittee may implement the proposed emergency interim measures without submitting an IM Work Plan. If circumstances arise resulting in an immediate threat to human health or the environment such that initiation of emergency interim measures are necessary prior to obtaining written approval from the NMED, the Permittee shall notify the NMED within one business day of taking the emergency interim measure. The notification shall contain a description of the emergency situation, the types and quantities of contaminants involved, the emergency interim measures taken, and contact information for the emergency coordinator who handled the situation. The notification shall also include a written statement justifying the need to take the emergency action without prior written approval from the NMED. This requirement shall not be construed to conflict with 40 CFR 264.1(g)(8) or 40 CFR 270.61.

6.11.4 Interim Measures Work Plan Requirements

The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with, and integrated into, any final corrective measures at the Facility. The IM Work Plan shall include the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

6.11.5 Interim Measures Work Plan Approval

The IM Work Plan imposed under Permit Condition 6.11.1 or initiated by the Permittee under Permit Condition 6.11.2 must be approved by the NMED in writing prior to implementation. The NMED will specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. The IM Work Plan will be reviewed and approved, approved with modifications, or disapproved, by the NMED in accordance with Permit Part 1.16 (Approval of Submittals).

6.11.6 Interim Measures Implementation

The Permittee shall implement and complete interim measures within 180 days of the start of implementation of the interim measure. The Permittee may submit a written request to the NMED to extend the period for implementation of the interim measure. The request must provide justification for the extension and a proposed schedule for completion of the interim measure. The NMED will notify the Permittee, in writing, of the approval or disapproval of the request.

6.11.6.1 Notification of Changes to Interim Measures

The Permittee shall give notice to the NMED as soon as possible of the planned changes, reductions or additions to the IM Work Plan required by the NMED under Permit Section 6.11.1 or initiated by the Permittee in accordance with Permit Section 6.11.2.

6.11.7 Interim Measures Reporting

6.11.7.1 Progress Reports

If the time required for completion of IM is greater than 180 days, the Permittee shall provide the NMED with Progress Reports at intervals specified in the approved IM Work Plan. The progress reports shall generally comply with the requirements of Permit Section 6.11.7.2 (Final Interim Measures Report).

6.11.7.2 Final Interim Measures Report

The Permittee shall submit to the NMED for review and approval, within 90 calendar days, or other date established by NMED, of completion of interim measures, an IM Report for each interim measure taken. The IM Report shall contain, at a minimum, the following information:

1. A description of interim measures implemented, including all methods and procedures employed to construct, operate, and assess the progress of the IM;
2. Summaries of results;
3. Summaries of all problems encountered during IM investigations including deviations from the IM Work Plan;
4. Summaries of accomplishments and/or effectiveness of interim measures; and,
5. Copies of all relevant laboratory/monitoring data, maps, logs, and other related information.

6.12 Corrective Action Investigations

6.12.1 Investigation Work Plan

The Permittee shall submit to the NMED Investigation Work Plans in accordance with the Permit for the SWMUs and AOCs identified in Permit Attachment 8 (Corrective Action Unit Identification).

Investigation Work Plans shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and ground water. The Permittee shall provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a media/pathway associated with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in an Investigation Work Plan. Such deletions of a medium, or pathway from the work plan(s) are subject to the approval of the NMED.

The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements specified in Permit Part 9 (Reporting Requirements). Such omissions or deviations are subject to the approval of the NMED. In addition, Investigation Work Plans shall include all investigations necessary to ensure compliance with 40 CFR 264.101. The Permittee shall submit Investigation Work Plans by the dates specified by the NMED. All monitoring, sampling, and analysis shall be conducted in accordance with the investigation methods and procedures set forth in Permit Part 7 (Investigation and Sampling Methods and Procedures).

The Permittee shall implement Investigation Work Plans as approved by the NMED. The Permittee shall notify the NMED at least 30 calendar days prior to any permit or corrective action-related field activity (e.g., drilling, sampling).

6.12.2 Historical Documents

The Permittee shall submit to the NMED a summary of the historical information and assessment of potential contaminant releases relating to each SWMU or AOC in conjunction with the unit-specific Investigation Work Plan if the site has not been previously investigated under the 2009 WSMR RCRA Permit. The summary shall include complete, legible copies of all associated photographic imprints, maps, figures, drawings, tables, attachments, enclosures, appendices and other relevant supporting documentation.

6.12.3 Investigation Report

The Permittee shall prepare and submit to the NMED Investigation Reports for the investigations conducted in accordance with Investigation Work Plans submitted under Permit Part 6.12.1. The Permittee shall submit the Investigation Reports to the NMED for review and approval in accordance with the schedules included in its approved Investigation Work Plans.

The Investigation Reports shall include an analysis and summary of the results of all required investigations of SWMUs, HWMUs and AOCs. The summary shall describe the type and extent of contamination at each SWMU, HWMU and AOC investigated, including sources and migration pathways, and identify known and/or presumed hazardous waste or constituents present in affected media. The Investigation Report shall also describe the extent of contamination (qualitative and quantitative) in relation to background levels of the area. If the Investigation Report concludes that further work is necessary, the report shall include a proposed schedule for submission of a work plan for the next phase of investigation.

6.12.3.1 Cleanup Levels

The Investigation Reports shall identify the applicable cleanup levels in accordance with Permit Part 6.6 (Cleanup Levels) for each hazardous waste, hazardous constituent or other contaminant found at each SWMU and AOC. The Permittee shall propose in the Investigation Report or in a subsequent Risk Assessment or Corrective Measures Evaluation appropriate cleanup levels for those hazardous wastes, hazardous constituents or other contaminants without established cleanup levels based upon human and ecological risk.

6.12.3.2 Requirement to Proceed

Based upon the NMED's review of the Investigation Report, the NMED will notify the Permittee of the need for further investigative action, if necessary, or inform the Permittee of the need for a Corrective Measures Evaluation. If the NMED determines that further investigation is necessary, the NMED will require the Permittee to submit a work plan for approval that includes a proposed schedule for additional investigation(s).

6.13 Risk Assessment

The Permittee shall attain the cleanup goals outlined in Permit Part 6.6 (Cleanup Levels) at each site. The Permittee shall submit to the NMED for approval a Risk Assessment Report in the format included in the Permit Part 9 (Reporting Requirements) in accordance with this Permit part for sites where risk analyses are conducted.

6.14 Corrective Measures Evaluation

The NMED will require a corrective measures evaluation at a SWMU or AOC if the NMED determines, based on the Investigation Reports and other relevant information available to the NMED, that there has been a release of contaminants into the environment at the SWMU or AOC and that corrective action is necessary to protect human health or the environment. Upon making such a determination, the NMED will notify the Permittee in writing. The NMED will specify a date for the submittal of the necessary reports and evaluations in the written notification.

6.14.1 Corrective Measures Evaluation Report

Following written notification from the NMED that a corrective measures evaluation is required, the Permittee shall submit to the NMED for approval a Corrective Measures Evaluation Report. The Permittee shall follow the Corrective Measures Evaluation Report format outlined in Permit Part 9 (Reporting Requirements). The corrective measures evaluation shall evaluate potential remedial

alternatives and shall recommend a preferred remedy that will be protective of human health and the environment and that will attain the appropriate cleanup goals.

The Corrective Measures Evaluation Report shall, at a minimum, comply with Permit Part 9.6 (Corrective Measures Evaluation) and include the following:

1. A description of the location, status, and current use of the site;
2. A description of the history of site operations and the history of releases of contaminants;
3. A description of site surface conditions;
4. A description of site subsurface conditions;
5. A description of on- and off-site contamination in all affected media;
6. An identification and description of all sources of contaminants;
7. An identification and description of contaminant migration pathways;
8. An identification and description of potential receptors;
9. A description of cleanup standards or other applicable regulatory criteria;
10. An identification and description of a range of remedy alternatives;
11. Remedial alternative pilot or bench scale testing results;
12. A detailed evaluation and rating of each of the remedy alternatives, applying the criteria set forth in Permit Part 9.6 (Corrective Measures Evaluation);
13. An identification of a proposed preferred remedy or remedies;
14. Preliminary design criteria of the selected remedy or remedies; and
15. A proposed schedule for implementation of the preferred remedy.

6.14.2 Cleanup Standards

The Permittee shall select corrective measures that are capable of achieving the cleanup standards and goals outlined in Permit Part 6.6 (Cleanup Levels) of this Permit including, as applicable, approved alternate cleanup goals established by a risk assessment.

6.14.3 Remedy Evaluation Criteria

6.14.3.1 Threshold Criteria

The Permittee shall evaluate each of the remedy alternatives for the following threshold criteria. To be selected, the remedy alternative must:

1. Be protective of human health and the environment;
2. Attain media cleanup standards;
3. Control the source or sources of releases so as to reduce or eliminate, to the extent practicable, further releases of contaminants that may pose a threat to human health and the environment; and
4. Comply with applicable standards for management of wastes.

6.14.3.2 Remedial Alternative Evaluation Criteria

The Permittee shall evaluate each of the remedy alternatives for the factors described below. These factors shall be balanced in proposing a preferred alternative.

6.14.3.2.1 Long-term Reliability and Effectiveness

The remedy shall be evaluated for long-term reliability and effectiveness. This factor includes consideration of the magnitude of risks that will remain after implementation of the remedy; the extent of long-term monitoring, or other management that will be required after implementation of the remedy; the uncertainties associated with leaving contaminants in place; and the potential for failure of the remedy. The Permittee shall give preference to a remedy that reduces risks with little long-term management, and that has proven effective under similar conditions.

6.14.3.2.2 Reduction of Toxicity, Mobility, or Volume

The remedy shall be evaluated for its reduction in the toxicity, mobility, and volume of contaminants. Permittee shall give preference to remedy that uses treatment to reduce the toxicity, mobility, and volume of contaminants more completely and permanently.

6.14.3.2.3 Short-term Effectiveness

The remedy shall be evaluated for its short-term effectiveness. This factor includes consideration of the short-term reduction in existing risks that the remedy would achieve; the time needed to achieve that reduction; and the short-term risks that might be posed to the community, workers, and the environment during implementation of the remedy. The Permittee shall give preference to a remedy that quickly reduces short-term risks, without creating significant additional risks.

6.14.3.2.4 Implementability

The remedy shall be evaluated for its implementability or the difficulty of implementing the remedy. This factor includes consideration of difficulties related to installation and construction; operation and maintenance; cleanup technology; permitting and approvals; and the availability of necessary equipment, services, expertise, and storage and disposal capacity. The Permittee shall give preference to a remedy that can be implemented quickly and easily and poses fewer and lesser difficulties.

6.14.3.2.5 Cost

The remedy shall be evaluated for its cost. This factor includes a consideration of both capital costs, and operation and maintenance costs. Capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. Operation and maintenance costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances. All costs shall be calculated based on their net present value. A remedy that is less costly but does not sacrifice protection of health and the environment, shall be preferred.

6.14.4 Corrective Measures Evaluation Report Approval

The NMED will review the Corrective Measures Evaluation (CME) Report and notify the Permittee in writing of approval, approval with modifications, or disapproval of the report in accordance with Permit Part 1.16 (Approval of Submittals). The NMED's approval of the CME Report shall not be construed to mean that the NMED agrees with the recommended or preferred remedy. Based on preliminary results

and the CME Final Report, the NMED may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

6.14.5 Relationship to Corrective Measures Requirements

The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes of RCRA compliance. See 55 Fed. Reg. 30875-77 (July 27, 1990) (proposed 40 CFR 264.520–264.524).

6.15 Remedy Approvals and Permit Modifications

6.15.1 Remedy Selection

Upon approval of the Corrective Measures Evaluation Report, the NMED will select a remedy or remedies for the SWMU or AOC. The NMED may choose a different remedy from that recommended by the Permittee. The NMED will issue a Statement of Basis for selection of the remedy and will issue a draft of the decision for public comment in accordance with the public participation requirements applicable to permit modification under 40 CFR 270.42(c) and 20.4.1.901 NMAC, including the opportunity for commenters to request a public hearing. The NMED will issue a response to public comments received at the time of the NMED's final decision and modification of the Permit to incorporate the selected remedy.

6.16 Corrective Measure Implementation

The Permittee shall implement the final remedy selected by the NMED.

6.16.1 Corrective Measure Implementation Work Plan

Within 90 days after the NMED's selection of a final remedy, or as otherwise specified by NMED, the Permittee shall submit to the NMED for review and approval a Corrective Measures Implementation Work Plan describing the design, construction, operation, maintenance, and performance monitoring for the selected remedy, and a schedule for its implementation. The NMED will review the Corrective Measures Implementation Plan and notify the Permittee in writing of approval, approval with modifications, or disapproval of the plan. The Corrective Measures Implementation Plan shall, at a minimum, include the following elements:

1. A description of the selected final remedy;
2. A description of the cleanup goals and remediation system objectives;
3. An identification and description of the qualifications of all persons, consultants, and contractors that will be implementing the remedy;
4. Detailed engineering design drawings and systems specifications for all elements of the remedy signed and stamped by a registered New Mexico professional engineer;
5. A construction work plan;
6. An operation and maintenance plan;
7. The results of any remedy pilot tests;
8. A plan for monitoring the performance of the remedy, including sampling and laboratory analysis of all affected media;
9. A waste management plan;

10. A proposed schedule for submission to the NMED of periodic progress reports; and
11. A proposed schedule for implementation of the remedy.

6.16.2 Approval of Corrective Measures Implementation Plan

The NMED will review the Corrective Measures Implementation Plan and notify the Permittee in writing of approval, approval with modifications, or disapproval of the plan in accordance with Permit Part 1.16 (Approval of Submittals).

6.16.3 Health and Safety Plan

The Permittee shall conduct all activities in accordance with a site-specific or Facility-wide Health and Safety Plan during all construction, operation, maintenance, and monitoring activities conducted during corrective measures implementation.

6.16.4 Progress Reports

The Permittee shall submit to the NMED progress reports in accordance with the schedule in the approved Corrective Measures Implementation Plan. The progress reports shall, at a minimum, include the following information:

1. A description of the work completed during the reporting period;
2. A summary of problems, potential problems, or delays encountered during the reporting period;
3. A description of actions taken to eliminate or mitigate the problems, potential problems, or delays;
4. A discussion of the work projected for the next reporting period, including all sampling events;
5. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the reporting period; and
6. Copies of all waste disposal records generated during the reporting period.

6.16.5 Remedy Completion

6.16.5.1 Remedy Completion Report

Within 90 days, or other time specified by NMED, after completion of remedy, the Permittee shall submit to the NMED a Remedy Completion Report. The report shall, at a minimum, include the following items:

1. A summary of the work completed;
2. A statement, signed by a professional engineer, registered in the State of New Mexico, that the remedy has been completed in accordance with the NMED approved work plan for the remedy;
3. As-built drawings and specifications signed and stamped by professional engineer, registered in the state of New Mexico;

4. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the remedy implementation, if not already submitted in a progress report;

5. Copies of all waste disposal records, if not already submitted in a progress report; and

6. A certification, signed by a responsible official of White Sands Missile Range (owner), stating:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

6.17 Accelerated Cleanup Process

If the Permittee identifies a corrective action or measure that, if implemented voluntarily, will reduce risks to human health and the environment to levels acceptable to the NMED, will reduce cost and/or will achieve cleanup of a SWMU or AOC ahead of schedule, the Permittee may implement the corrective measure as provided in this Permit Part (6.17), in lieu of the process established in Permit Part 6.11 through 6.16. The accelerated cleanup process shall be used at sites to implement presumptive remedies at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the field work will be accomplished within 180 days of the commencement of field activities. The proposed accelerated cleanup will be documented in an ACMWP, which shall include:

1. A description of the site history including historical site use, a description of contaminant releases and the results of all site investigations and any remedial actions;

2. A description of the proposed remedial action, including details of the unit or activity that is subject to the requirements of this Permit;

3. An explanation of how the proposed cleanup action is consistent with the overall corrective action objectives and requirements of this Permit;

4. The methods and procedures for characterization and remediation sample collection and analyses;

5. A schedule for implementation and reporting on the proposed cleanup action.

6.17.1 Accelerated Corrective Measures Work Plan

The Permittee shall obtain approval of an Accelerated Corrective Measures Work Plan (ACMWP) prior to implementation. The Permittee shall prepare the Work Plan in general accordance with the requirements of Permit Part 9.2 (Investigation Work Plan) of this Permit. The ACMWP shall be submitted to the NMED for review in accordance with the requirements of this Permit. NMED will approve, approve with modifications, or disapprove the Accelerated Corrective Measures Work Plan in writing. If disapproved, the NMED will notify the Permittee in writing of the Plan's deficiencies and specify a due date for submission of a revised ACMWP. The Permittee shall include a proposed implementation schedule in the ACMWP.

6.17.2 Accelerated Corrective Measures Implementation

The Permittee shall implement the accelerated corrective measures in accordance with the approved ACMWP and 20.4.27(2). Within 90 days of completion of the accelerated corrective measures, or other date established by NMED, the Permittee shall submit to the NMED for approval an Accelerated Corrective Measures Report in a format approved by the NMED and in accordance with Permit Part 9 (Reporting Requirements) of this Permit. NMED will approve, approve with modifications, or disapprove the Accelerated Corrective Measures Report in writing. If disapproved, the NMED will notify the Permittee in writing of the Plan's deficiencies and specify a due date for submission of a revised report.

6.18 Approval of Corrective Action Work Plans and Other Documents

All corrective action documents requiring NMED approval, including, but not limited to, monitoring plans, work plans, Investigation Work Plans, Interim Measures Work Plans, Accelerated Corrective Measures Work Plans, and Corrective Measures Implementation Plans, Corrective Measures Evaluation Reports, and all associated schedules that the Permittee prepares under the terms of this Permit must be approved by the NMED prior to their implementation. Upon receiving a work plan or other document for approval, the NMED will review the document and either approve the document, approve it with modifications, disapprove, deny, or reject the document in accordance with 20.4.2.201.B(4). The NMED may require resubmittal of the document and specify a due date for such submittal. Each work plan shall meet or address the requirements of this Permit in one or more of the following ways:

1. The work plan shall provide for performance of the work in full compliance with the requirements of this Permit;

2. The work plan shall state that work meeting the requirements of this Permit has been completed. The background section of the work plan shall summarize the data or other information used to satisfy the investigation requirements of this Permit. The summaries shall cite supporting documents with corresponding page numbers; and

3. The work plan shall propose to the NMED alternate requirements that differ from those in this Permit. Any such proposal shall be in writing, shall specifically identify each proposed alternate requirement and how it differs from the requirement in the Permit, and shall be accompanied by a detailed written justification. Alternate requirements may be satisfied by previous work that is documented in the work plan as described in Paragraph 2 above. If the NMED approves in writing a work plan with alternate requirements, the alternate requirements of the work plan, rather than the requirements of the Permit, shall be applicable and enforceable.

Upon NMED approval, all monitoring plans, work plans, corrective measures evaluation reports, and associated schedules are incorporated herein by reference, including any approved extensions and required modifications, and become an enforceable part of this Permit. Work plans and reports subject to this Permit Part (6) shall not be considered modifications of this Permit. Any noncompliance with approved plans and schedules shall be noncompliance with this Permit.

Failure to submit any of the required items in plans, reports or other documents or in response to related NMED direction, the submission of inadequate or insufficient information, or failure to comply with the approved work plans or schedules are a violation of this Permit and are subject to enforcement action.

6.18.1 Provisions Governing Extensions of Time

The Permittee may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for extension of time and proposed revised schedule to the NMED.

Failure to obtain adequate funding or a contract for completing the work shall not constitute good cause. The request shall be submitted prior to the due date for the submittal and state the length of the requested extension and describe the basis for the request. The NMED will respond in writing to any request for extension following receipt of the request. If the NMED denies the request for extension, it will state the reasons for the denial.

7 Part 7 Investigation and Sampling Methods and Procedures

7.1 Highlights

The Permittee must submit to the NMED, for review and written approval, site-specific work plans for sites where a release(s) of contaminants has occurred prior to the commencement of field activities where environmental investigation, corrective action, sampling, or monitoring is required. The site-specific work plans shall include all methods to be used to conduct all activities at each site or unit and shall be prepared in accordance with the format described in Permit Part 9. The Permittee shall provide notification to the NMED of corrective action field activities a minimum of 20 days prior to commencing the activity.

The methods used to conduct investigation, remediation, and monitoring activities shall be sufficient to fulfill the requirements of this Permit and provide accurate and valid data for the evaluation of site conditions, to determine the nature and extent of contamination and contaminant migration, and for remedy selection and implementation, where necessary. The methods presented in this Permit Part (7) are minimum requirements for environmental investigation and sampling and are not intended to include all methods that may be necessary to fulfill the requirements of this Permit. The methods for conducting investigations, corrective actions, and monitoring at the Facility must be determined based on the conditions and contaminants that exist at each site.

The Permittee may propose alternate methods for data collection from those included in this Permit for NMED approval. Such alternate methods must be approved by the NMED prior to implementation and, if approved, supersede the corresponding requirements described in this Permit.

7.1.1 Standard Operating Procedures

The Permittee shall provide brief descriptions of investigation, sampling, or analytical methods and procedures in documents submitted to the NMED that include sufficient detail to evaluate the adequacy of the method and the quality of the acquired data. The Permittee may not rely on references to Standard Operating Procedures (SOPs) or references to previous documents as a substitute for providing descriptions of the methods and procedures either proposed or used in corrective action activities.

7.2 Investigation, Sampling, and Analyses Methods

This section of the Permit provides minimum requirements for field investigations, sample collection, handling, and screening procedures, field and laboratory sample analysis, and quality assurance/quality control (QA/QC) procedures for samples of the medium being investigated or tested at the Facility. The requirements addressed in this Permit Part (7) include: 1) minimum requirements for drilling and sample collection in exploratory borings and other excavations; 2) minimum requirements for sampling of the target media; 3) minimum requirements for monitoring of groundwater and vadose zone conditions; and 4) minimum required screening, analytical, and QA procedures that shall be implemented during field sampling activities and laboratory analyses.

7.2.1 Field Exploration Activities

The NMED may require subsurface explorations to fulfill the requirements of this Permit. Any boring locations, if required, shall be determined, or approved by the NMED. The depths and locations of all exploratory and monitoring well borings shall be specified in the unit-specific work plans submitted to the NMED for approval prior to the start of the respective field activities.

7.2.2 Subsurface Features/Utility Geophysical Surveys

The Permittee shall conduct surveys, where appropriate, to locate underground utilities, pipelines, structures, drums, debris, and other buried features in the shallow subsurface prior to the start of field

exploration activities. The methods used to conduct the surveys, such as magnetometer, ground penetrating radar, resistivity, or other methods, shall be selected based on the unique characteristics of the site and the possible or suspected underground structures. The results of the surveys shall be included in the investigation reports submitted to the NMED. The Permittee is responsible for locating and clearing all aboveground and underground utilities or other hazards at any site prior to conducting field work.

7.2.3 Drilling and Soil Sampling

7.2.3.1 Drilling

Exploratory and monitoring well borings shall be drilled using the most effective, proven, and practicable method for recovery of undisturbed samples and potential contaminants. The NMED shall approve the drilling methods selected for advancement of each boring prior to the start of field activities. Based on the drilling conditions, the borings shall be advanced using one of the following methods:

1. hollow-stem auger;
2. air rotary/air down-the-hole hammer/ODEX;
3. direct push technology (DPT);
4. resonant sonic; or
5. other methods approved by the NMED.

Hollow-stem auger or DPT drilling methods are preferred if vapor-phase or VOC contamination is known or suspected to be present. The type of drilling fluid used, if necessary, shall be approved by the NMED prior to the start of drilling activities or prior to use at any site.

All drilling equipment shall be in good working condition and capable of performing the assigned task. Drilling rigs and equipment shall be operated by properly trained, experienced, and responsible crews. The Permittee is responsible for ensuring that contaminants from another site or facility are not introduced into the site under investigation due to malfunctioning equipment or poor site maintenance. The drilling equipment shall be properly decontaminated before drilling each boring.

Exploratory borings shall be advanced to unit- and location-specific depths specified or approved by the NMED. The Permittee shall propose drilling depths in the site-specific work plans submitted for each subject area. Unless otherwise specified in this Permit or an approved work plan, the borings shall be advanced to the following minimum depths:

1. five feet below the deepest detected contamination;
2. five feet below the base of structures such as piping, building sumps, footings or other building structures;
3. at least ten feet below the water table; and
4. depths specified by the NMED based on regional or unit specific data needs.

The Permittee shall notify the NMED as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the depths specified by the NMED or proposed in an approved work plan so that alternative actions may be discussed. Precautions shall be taken to prevent the migration of contaminants between geologic, hydrologic, or other identifiable zones during drilling and well installation activities. Contaminant zones shall be isolated from other zones encountered in the borings.

The drilling and sampling shall be accomplished under the direction of a qualified engineer or geologist who shall maintain a detailed log of the materials and conditions encountered in each boring. Both sample information and visual observations of the cuttings and core samples shall be recorded on the boring log. Known site features and/or site survey grid markers shall be used as references to locate each boring prior to surveying the location. The boring locations shall be measured to the nearest foot, and locations shall be recorded on a scaled site map upon completion of each boring.

7.2.3.2 Exploratory Excavations

Trenching and other exploratory excavation methods shall follow the applicable general procedures outlined herein. The particular methods proposed for use by the Permittee for exploratory excavation and sampling at any specific unit shall be included in the site-specific investigation work plan submitted to the NMED. The NMED will include any changes or additional requirements for conducting exploratory excavation and sampling activities at the subject unit in its response to the Permittee after review of the investigation work plans.

7.2.3.3 Soil Sampling

Relatively undisturbed discrete soil and rock samples shall be obtained, where possible, during the advancement of each boring for the purpose of logging, field screening, and analytical testing. Generally, the samples shall be collected at the following intervals and depths:

1. continuously, at 2.5 or 5-foot intervals, at 5 or 10-foot intervals, or as approved by the NMED;
2. at the depth immediately below the base of the unit structures and at the fill-native soil interface;
3. at the maximum depth of each boring;
4. at the depth of encounters, during drilling, with perched saturated zones;
5. at the water table;
6. from soil types relatively more likely to sorb or retain contaminants than the surrounding lithologies;
7. at intervals suspected of being source or contaminated zones; and
8. at other intervals approved or required by the NMED.

The sampling interval for the borings may be modified, or samples may be obtained from a specific depth, based on field observations. A decontaminated split-barrel sampler lined with brass sleeves, a coring device, or other method approved by the NMED shall be used to obtain samples during the drilling of each boring.

A split barrel sampler or coring device which produces a continuous relatively undisturbed sample is the preferred sampling method for borehole soil, rock, and sediment sampling. The recovered sample shall be directly placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. The use of an Encore® Sampler or other similar device is required during collection of soil samples for VOC analysis. The remaining portions of the sample shall be used for logging and field screening.

Discrete samples shall be collected for field screening and laboratory analyses. Homogenization of discrete samples collected for analyses other than for VOC and SVOC analyses shall be performed by the analytical laboratory, if necessary. The Permittee may submit site-specific, alternative methods for homogenization of samples in the field to the NMED for review and written approval.

Samples to be submitted for laboratory analyses shall be selected based on: 1) the results of the field screening or mobile laboratory analyses; 2) the position of the sample relative to groundwater, suspected

releases, or site structures; 3) the sample location relative to former or altered site features or structures; 4) suspected migration pathways and the stratigraphy encountered in the boring; and 5) the specific objectives and requirements of this Permit and the approved site-specific work plan. The proposed number of samples and analytical parameters shall be included as part of the site-specific work plan submitted to the NMED for approval prior to the start of field investigation activities at each unit. The work plans shall allow for flexibility in modifying the project-specific tasks based on information obtained during the course of the investigation. Modifications to site-specific work plan tasks must be pre-approved in writing by the NMED if data quality or investigation objectives will be affected.

7.2.3.4 Surface Sampling

Surface samples shall be collected using decontaminated, hand-held stainless steel coring device, shelby tube, thin-wall sampler, or other device approved by the NMED. The samples shall be transferred to pre-cleaned laboratory prepared containers for submittal to the laboratory. Samples obtained for volatiles analysis shall be collected using Encore® Sampler or other similar device, shelby tubes, thin-wall samplers, or other device approved by the NMED. With the exception of Encore® Sampler or other similar devices, the ends of the samplers shall be lined with Teflon tape or aluminum foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical laboratory.

The physical characteristics of the sediment (such as mineralogy, ASTM soil classification, AGI [American Geological Institute] rock classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations shall be recorded in the field log.

7.2.3.5 Drill Cuttings (Investigation Derived Waste)

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) shall be contained and characterized using methods based on the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. An IDW management plan shall be included with the unit-specific investigation work plan submitted to the NMED for approval prior to the start of field investigations. The method of containment for drill cuttings must be approved by the NMED prior to the start of drilling activities. Borings not completed as groundwater or vadose zone monitoring wells shall be properly abandoned in accordance with the methods listed in Permit Section 8.3 (Well Abandonment). Borings completed as groundwater monitoring wells shall be constructed in accordance with the requirements described in Permit Section 8.2 (Well Construction/Completion Techniques).

7.2.4 Logging of Soil, Rock and Sediment Samples

Samples obtained from all exploratory borings and excavations shall be visually inspected and the soil or rock type classified in general accordance with ASTM (American Society for Testing and Materials) D2487 (Unified Soil Classification System) and D2488 and/or AGI (American Geological Institute) Methods for soil and rock classification. Detailed logs of each boring shall be completed in the field by a qualified geologist or engineer. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling shall be recorded on the logs. Field boring logs, test pit logs, and field well construction diagrams shall be converted to the format acceptable for use in final reports submitted to the NMED if data quality or investigation objectives will be affected.

7.2.5 Soil Sample Field Screening

Samples obtained from the borings shall be screened in the field for evidence of the presence of contaminants. Field screening results shall be recorded on the exploratory boring and excavation logs. Field screening results are used as a general guideline to determine the nature and extent of possible

contamination. In addition, screening results shall be used to aid in the selection of soil samples for laboratory analysis. Field screening alone will not detect the possible presence or full nature and extent of all contaminants that may be encountered at the site and shall not be used to determine compliance with risk-based cleanup levels.

The primary screening methods to be used shall include one or more of the following: (1) visual examination; (2) headspace vapor screening for volatile organic compounds; and (3) metals screening using X-ray fluorescence. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits shall be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds.

Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container shall be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container shall be allowed to rest for a minimum of five minutes while vapors equilibrate. Vapors present within the sample bag's headspace shall then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature shall be recorded on the field boring or test pit log for each sample. The monitoring instruments shall be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 9.5 or higher electron volt (eV) lamp, flame ionization detector, combustible gas indicator, or other instrument approved by the NMED shall be used for VOC field screening. The lamp strength of the PID used for field screening shall be recorded in the field logs. The limitations, precision, and calibration of the instrument to be used for VOC field screening shall be included in the site-specific investigation work plan prepared for each unit.

X-ray fluorescence (XRF) may be used to screen soil samples for the presence of metals. XRF screening requires proper sample preparation and proper instrument calibration. Sample preparation and instrument calibration procedures shall be documented in the field logs. The methods and procedures for sample preparation and calibration shall be approved by the NMED prior to the start of field activities. Field XRF screening results for selected metals may be used in lieu of laboratory analyses upon approval by the NMED; however, the results shall, at a minimum, be confirmed by laboratory analyses at a frequency of 20 percent (1 sample per every five analyzed by field XRF analysis).

Field screening results are site- and boring-specific and the results vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant; therefore, all conditions capable of influencing the results of field screening shall be recorded on the field logs. The conditions potentially influencing field screening results shall be submitted to the NMED as part of the site-specific investigation, remediation, and/or monitoring reports.

At a minimum, samples with the greatest apparent degree of contamination, based on field observations and field screening, shall be submitted for laboratory analysis. The location of the sample relative to groundwater, stratigraphic units, and/or contacts and the proximity to significant site or subsurface features or structures also shall be used as a guideline for sample selection. In addition, samples with no or low apparent contamination, based on field screening, shall be submitted for laboratory analysis, if the intention is to confirm that the base (or other depth interval) of a boring or other sample location is not contaminated.

7.2.6 Soil Sample Types

The Permittee shall collect soil samples at the frequencies stated in the approved site-specific investigation work plans for each unit. The samples collected shall be representative of the media and site conditions being investigated or monitored. QA/QC samples shall be collected to monitor the validity of the soil sample collection procedures and shall follow the following sampling protocols:

1. field duplicates shall be collected at a rate of 10 percent;
2. equipment blanks shall be collected from all sampling apparatus at a frequency of 10 percent for chemical analysis;
3. equipment blanks shall be collected at a frequency of one per day if disposable sampling equipment is used;
4. field blanks shall be collected at a frequency of one per day for each media (with the exception of air samples) at each unit; and
5. reagent blanks shall be used if chemical analytical procedures requiring reagents are employed in the field as part of the investigation or monitoring program.

The blanks and duplicates shall be submitted for laboratory analyses associated with the project specific contaminants, data quality concerns, and media being sampled. The resulting data shall provide information on the variability associated with sample collection, sample handling, and laboratory analysis operations.

7.2.7 Sample Point and Structure Location Surveying

The horizontal coordinates and elevation of each surface sampling location, the surface coordinates and elevation of each boring or test pit, the top of each monitoring well casing, the ground surface at each monitoring well location, and the locations of all other pertinent structures shall be determined by a registered New Mexico professional land surveyor in accordance with the State Plane Coordinate System (NMSA 1978, 47-1-49 through 56 (Repl. Pamp. 1993)).

Alternate survey methods may be proposed by the Permittee in site specific work plans. Any proposed survey method must be approved by the NMED prior to implementation. The surveys shall be conducted in accordance with Sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions shall be measured to the nearest 0.1-ft, and vertical elevations shall be measured to the nearest 0.01-ft. The Permittee shall prepare site map(s), certified by a registered New Mexico professional land surveyor, presenting all surveyed locations and elevations including relevant site features and structures for submittal with all associated reports to the NMED.

7.2.8 Subsurface Vapor-phase Monitoring and Sampling

Samples of subsurface vapors shall be collected from vapor monitoring points from discrete zones, selected based on investigation and field screening results, and as total well subsurface vapor samples as required by the NMED.

The Permittee shall, at a minimum, collect field measurements of the following:

1. organic vapors (using a photo-ionization detector with a 10.6 or higher eV (electron volt) lamp, a flame ionization detector, a combustible gas indicator, or other method approved by the NMED) and, if applicable;
2. percent oxygen;

3. percent carbon dioxide;
4. static subsurface pressure; and
5. other parameters (e.g., carbon monoxide, hydrogen sulfide) as required by the NMED.

The Permittee also shall collect vapor samples for laboratory analysis of the following as required:

1. percent moisture;
2. VOCs; and
3. other analytes required by the NMED.

Vapor samples analyzed by the laboratory for percent moisture and VOCs shall be collected using SUMMA canisters or other sample collection method approved by the NMED. The samples shall be analyzed for VOC concentrations by EPA Method TO-15, as updated, or equivalent VOC analytical method and any other analytical methods specified by NMED.

Field vapor measurements, the date and time of each measurement, and the instrument used, shall be recorded on a vapor monitoring data sheet. The instruments used for field measurements shall be calibrated daily in accordance with the manufacturer's specifications and as described in Permit Section 7.5.3. The methods used to obtain vapor-phase field measurements and samples must be approved by the NMED in writing prior to the start of air monitoring at each Facility site where vapor-phase monitoring is conducted.

Total well vapor sampling and vapor monitoring shall be conducted by sealing the top of the well with a cap containing a sample port. Polyethylene, Teflon or other nonreactive tubing shall be used to connect the sample port to a low-velocity pump not associated with a field instrument. The well shall be purged of a minimum of three to five well volumes prior to collection of samples or field measurements. The full well boring annulus, complete filter pack and the above-ground sampling train tubing shall be included when calculating purge volumes. If a sample is not being obtained for laboratory analysis, the well may be purged using the field instrument pump. Purge flow rates shall be determined based on the well casing diameter and shall be in the range of 200 mL to 500 mL per minute. Purge flow rates for large diameter wells (2-inch or greater) shall not exceed 1500 mL per minute. SUMMA canisters, other NMED-approved sample containers, or field instruments shall draw vapor from the pump discharge either directly or through polyethylene, Teflon, or other nonreactive tubing upstream of the pump and sample collection flow rates shall not exceed the purge flow rate. All connections between the wellhead, the instruments, and sample containers must be airtight. The connections must be tested prior to sampling and the results of the equipment testing must be documented in the field notes.

7.3 Groundwater Monitoring

7.3.1 Groundwater Levels

Groundwater level measurements shall be obtained at intervals required by the NMED. Groundwater levels also shall be obtained prior to purging in preparation for a sampling event. Measurement data and the date and time of each measurement shall be recorded on a site monitoring data sheet. The depth to groundwater shall be measured to the nearest 0.01 ft. The depth to groundwater shall be recorded relative to the surveyed well casing rim or other surveyed datum.

The Permittee shall conduct periodic measuring events, the schedule for which shall be provided in the groundwater monitoring work plans. Groundwater levels shall be measured in all wells at the Facility (or the number of wells otherwise specified in the NMED approved groundwater monitoring work plan) within 14 days of the commencement of the monitoring activities.

7.3.2 Groundwater Sampling

Groundwater samples shall initially be obtained from newly constructed monitoring wells no later than five days after the completion of well development. All monitoring wells scheduled for sampling during a groundwater sampling event shall be sampled within 15 days of the start of the monitoring and sampling event. The Permittee shall sample all saturated zones screened to allow entry of groundwater into each monitoring well during each sampling event. All requests for variances from the groundwater sampling schedule shall be submitted to the NMED, in writing, at least 30 days prior to the start of scheduled monitoring and sampling events. Groundwater samples shall be collected from all exploratory borings not intended to be completed as monitoring wells prior to abandonment of the borings, where practicable, unless otherwise specified in a NMED-approved work plan.

Water samples shall be analyzed for one or more of the following general chemistry parameters as required by the NMED:

nitrate/nitrite	sulfate	chloride	dissolved CO2
alkalinity	carbonate/bicarbonate	fluoride	manganese
calcium	biological activity testing	ferric/ferrous iron	ammonia
potassium	magnesium	phosphate	sodium
methane	pH	total organic carbon (TOC)	total kjeldahl nitrogen (TKN)
dissolved oxygen (DO)	Oxidation-reduction potential (ORP)	total suspended solids (TSS)	Electrical conductivity (EC)
temperature	total dissolved solids (TDS)	stable isotopes	Any additional analytes required by the NMED

7.3.3 Well Purging

All zones in each monitoring well shall be purged by removing groundwater prior to sampling and in order to ensure that formation water is being sampled. A minimum of three well volumes shall be purged prior to sampling. Purge volumes shall be determined by monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen concentrations, turbidity, oxidation-reduction potential and temperature during purging of volumes and at measurement intervals approved by the NMED in writing.

The groundwater quality parameters shall be measured using a flow- through cell and instruments approved by the NMED in writing. The volume of groundwater purged, the instruments used, and the readings obtained at each interval shall be recorded on the field monitoring log. In general, water samples may be obtained from the well after the measured parameters of the purge water have stabilized to within ten percent for three consecutive measurements. Field water quality parameters shall be compared to historical data to ensure that the measurements are indicative of formation water.

The Permittee may submit to the NMED for approval a written request for a variance from the described methods of well purging for individual wells no later than 90 days prior to scheduled sampling activities.

7.3.4 Groundwater Sample Collection

Groundwater samples shall be obtained from each well after a sufficient amount of water has been removed from the well casing to ensure that the sample is representative of formation water. Groundwater samples shall be obtained using methods approved by the NMED within twenty-four hours of the completion of well purging. Sample collection methods shall be documented in the field monitoring reports. The samples shall be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory.

All purged groundwater and decontamination water shall be characterized prior to disposal. The methods for disposal of purge/decontamination water must be approved by the NMED prior to disposal. Disposable materials shall be handled as described in Permit Part 7.3.10 (Collection and Management of Investigation Derived Waste).

Groundwater samples intended for metals analysis shall be submitted to the laboratory as total metals samples. If required by the NMED, the Permittee shall obtain groundwater samples for dissolved metals analysis to be filtered using disposable in-line filters with a 0.10 micron, 0.45 micron, or other mesh size approved by the NMED.

PFAS sampling and analytical methods are evolving. As a result, more effective and precise field and laboratory analytical methods will likely be developed in the future. As improved methods become accepted, the NMED will require use of such methods as applicable. At a minimum, the following practices shall be followed until improved methods become available.

The EPA SW-846 methods under development utilize PFAS-free, high-density polyethylene containers; whole sample preparation; and sample holding times of 28 days. EPA has also developed guidelines for field sampling, to minimize sample contamination, and optimize data quality for site characterization and remediation. (USEPA, September 2018, Technical Brief, Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), EPA/600/F-17/022d)

Due to the widespread use of PFAS, many materials normally used in field and laboratory operations contain PFAS. For example, polytetrafluoroethylene products (tubing, sample containers, and sampling tools) are often used in sampling; however, since these products can contain PFAS, they cannot be used in sampling for PFAS. In addition, many consumer goods, such as water-resistant jackets or fast food wrappers, brought to a sampling site may contain PFAS that can contaminate samples. Proper field sampling and laboratory hygiene protocols are critical to ensuring that testing results reflect actual PFAS levels in the analyzed media. (USEPA, September 2018, Technical Brief, Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), EPA/600/F-17/022d)

EPA developed Analytical Method 537 and has since developed more accurate methods for the determination of selected perfluorinated alkyl acids in in media. Specific methods are required for PFAS sampling to avoid cross contamination and to collect representative samples. For example, Section 8, Sample Collection, Preservation, and Storage, of Method 537 describes the field sample collection procedure as follows (USEPA, September 2009, Method 537. Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), EPA/600/R-08/092):

Samples must be collected in a 250-mL polypropylene bottle fitted with a polypropylene screw-cap. Five (5) grams/ liter of the preservation reagent TrizmaÒ must be added to each sample bottle as a solid prior to shipment to the field. The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles. PFAS contamination during sampling can occur from a number of common sources, such as food packaging and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples. Fill sample bottles, taking care not to flush out the sample preservation reagent. Samples do not need to be collected headspace free.

After collecting the sample, cap the bottle and agitate by hand until the preservative is dissolved. Keep the sample sealed from time of collection until extraction. A laboratory-supplied field reagent blank and an empty sample bottle must accompany the sample containers. At the sampling site, the sampler must transfer the preserved reagent water into the empty shipped sample bottle, seal and label this bottle as the field reagent blank (FRB). The FRB must be shipped to the laboratory along with the samples and analyzed to ensure that PFAAs were not introduced into the sample during sample collection or handling. Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory.

Since PFAS sampling and analysis techniques are evolving, the Permittee must use the most updated methods when proposing and implementing PFAS sampling.

7.3.5 Groundwater Sample Types

Groundwater samples shall be collected from each monitoring well, and remediation system samples shall be collected as required by the NMED. Field duplicates, field blanks, equipment rinsate blanks, reagent blanks, if necessary, and trip blanks shall be obtained for quality assurance during groundwater and surface water sampling activities.

Field duplicate surface water and groundwater samples shall be obtained at a frequency of ten percent. At a minimum, one duplicate sample per sampling event shall always be obtained.

Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater or surface water samples, to the analytical laboratory for the appropriate analyses.

Equipment rinsate blanks shall be obtained for chemical analysis at the rate of ten percent but no fewer than one rinsate blank per sampling day. Equipment rinsate blanks shall be collected at a rate of one per sampling day if disposable sampling apparatus is used. Rinsate samples shall be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample then shall be placed in the appropriate sample container and submitted with the groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of twenty percent but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during water sampling activities.

Trip blanks shall accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks shall consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an appropriate sample container. The trip blank shall be prepared by the analytical laboratory prior to the sampling event and shall be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks shall be analyzed at a frequency of one for each shipping container of samples.

7.3.6 Sample Handling

At a minimum, the following procedures shall be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves shall be worn when collecting samples. New disposable gloves shall be used to collect each sample;

2. All samples collected of each medium for chemical analysis shall be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in brass sleeves, shelby tubes, thin wall samplers, or in Encore™, or equivalent, samplers. Upon recovery of the sample collected using split barrel samplers with brass sleeves, the brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves shall be lined with Teflon tape or foil and sealed with plastic caps. The caps shall be fastened to the sleeve with tape for storage and shipment to the analytical laboratory. Samples collected in shelby tubes or thin wall samplers shall be capped in a similar fashion. The sample depth and the top of the sample shall be clearly marked. Sample container volumes and preservation methods shall be in accordance with EPA SW-846 and established industry practices for use by accredited analytical laboratories. Sufficient sample volume shall be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and

3. Sample labels and documentation shall be completed for each sample following procedures included in the site-specific work plans approved by the NMED. Immediately after the samples are collected, they shall be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures described herein shall be followed for all samples collected. All samples shall be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times. At a minimum, all samples shall be submitted to the laboratory within 48 hours after their collection.

7.3.6.1 Sample Shipment Procedures

1. Individual sample containers shall be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler shall be sealed and secured in case of sample container leakage. Temperature blanks shall be included with each shipping container;

2. Each cooler or other container shall be delivered directly to the analytical laboratory;

3. Glass bottles shall be separated in the shipping container by cushioning material to prevent breakage;

4. Plastic containers shall be protected from possible puncture during shipping using cushioning material;

5. The chain-of-custody form and sample request form shall be shipped inside the sealed storage container to be delivered to the laboratory;

6. Chain-of-custody seals shall be used to seal the sample-shipping container in conformance with EPA protocol; and

7. Signed and dated chain-of-custody seals shall be applied to each cooler prior to transport of samples from the site.

7.3.7 In-situ Testing

In-situ permeability tests, remediation system pilot tests, stream flow tests, and other tests conducted to evaluate site and subsurface conditions shall be designed to accommodate specific site conditions and to achieve the test objectives. The testing methods shall be approved, in writing, by the NMED prior to implementation. The tests shall be conducted in order to appropriately represent site conditions and in accordance with EPA, USGS, ASTM or other methods generally accepted by the industry. Detailed logs of all relevant site conditions and measurements shall be maintained during the testing events. If requested, a summary of the general test results, including unexpected or unusual test results and equipment failures or testing limitations shall be reported to the NMED within 30 days of completion of the test. The summary shall be presented in a format acceptable to the NMED and in general accordance with the report formats outlined herein. A report summarizing the results of each test shall be submitted to the NMED within one hundred and twenty (120) days of completion of each test.

7.3.8 Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. A designated decontamination area shall be established for decontamination of drilling equipment, reusable sampling equipment and well materials. The drilling rig shall be decontaminated prior to entering the site or unit. Drilling equipment or other exploration equipment that may come in contact with the borehole shall be decontaminated by steam cleaning, by hot-water pressure washing, or by other methods approved by the NMED prior to drilling each new boring.

Sampling or measurement equipment, including but not limited to, stainless steel sampling tools, split-barrel or core samplers, well developing or purging equipment, groundwater quality measurement instruments, and water level measurement instruments, shall be decontaminated in accordance with the following procedures or other methods approved by the NMED before each sampling attempt or measurement:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. Rinse with potable tap water;
3. Wash with non-phosphate detergent or other detergent approved by the NMED (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
4. Rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;

5. Rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. Rinse with potable tap water; and
7. Double rinse with deionized water.

Specific decontamination measures for PFAS sampling must be approved by NMED prior to implementation.

All decontamination solutions shall be collected and stored temporarily as described in Permit Section 7.3.10. Decontamination procedures and the cleaning agents used shall be documented in the daily field log.

7.3.9 Field Equipment Calibration Procedures

Field equipment requiring calibration shall be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks shall be conducted daily, or at other intervals approved by the NMED, and the instruments shall be recalibrated, if necessary. Calibration measurements shall be recorded in the daily field logs. If field equipment becomes inoperable, its use shall be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument shall be used.

7.3.10 Collection and Management of Investigation Derived Waste

Investigation derived waste (IDW) includes general refuse, drill cuttings, excess sample material, water (decontamination, development and purge), and disposable equipment generated during the course of investigation, corrective action, or monitoring activities. All IDW shall be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The Permittee shall submit an IDW management and disposal plan as part of all work plans submitted to the NMED for approval prior to disposal of any IDW produced during investigation, corrective action, or monitoring activities.

All water generated during sampling and decontamination activities shall either be temporarily stored at satellite accumulation areas or transfer stations in labeled 55-gallon drums or other containers approved by the NMED until proper characterization and disposal can be arranged. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste. The methods for waste characterization and disposal of IDW must be approved by the NMED prior to disposal.

7.4 Documentation of Field Activities

Daily field activities, including observations and field procedures, shall be recorded on appropriate forms. The original field forms shall be maintained at the Facility. Copies of the completed forms shall be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink shall be used to record all field activities. Photographic documentation of field activities shall be performed, as appropriate. At t minimum, the daily record of field activities shall include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;

6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log;
10. Field monitoring data, including health and safety monitoring if conditions arise that require modification of required work;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

7.4.1 Sample Custody

All samples collected for analysis shall be recorded in the field report or data sheets. Chain-of-custody forms shall be completed at the end of each sampling day, prior to the transfer of samples off site, and shall accompany the samples during shipment to the laboratory. A signed and dated custody seal shall be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form shall be signed as received by the laboratory, and the conditions of the samples shall be recorded on the form. The original chain-of-custody form shall remain with the laboratory and copies shall be returned to the relinquishing party. The Permittee shall maintain copies of all chain-of- custody forms generated as part of sampling activities. Copies of the chain-of-custody records (either paper copies or electronically scanned in PDF format) shall be included with all draft and final laboratory reports submitted to the NMED.

7.5 Chemical Analyses

The Permittee shall submit all samples for laboratory analysis to accredited contract laboratories. The laboratories shall use the most recent EPA and industry-accepted extraction and analytical methods for chemical analyses for target analytes as the testing methods for each medium sampled. The Permittee shall use the most sensitive laboratory methods (with the lowest detection limits) available unless specific conditions preclude their use.

The Permittee shall submit a list of analytes and analytical methods to the NMED, for review and written approval as part of each site-specific investigation, corrective action, or monitoring work plan. The detection limits for each method shall be less than applicable background, screening, and regulatory cleanup levels. The preferred method (practical quantitation) limits are a maximum of 20 percent of the cleanup, screening, or background levels. Analyses conducted with detection limits that are greater than applicable background, screening, and regulatory cleanup levels shall be considered data quality exceptions and the reasons for the elevated detection limits shall be reported to the NMED. These data cannot be used for statistical analyses. All analytical data (non-detects, estimated blanks, and detects) shall be included in the electronic copy of the investigation report in Microsoft™ Excel format with qualifiers as attached from the analytical laboratory. The summary tables shall include only detects of the data based on the corresponding qualifiers and results where data quality exceptions may mask detections above applicable screening levels. The Permittee shall not censor the data based on detection limits, quantitation limits, or measurement uncertainty.

7.5.1 Laboratory QA/QC Requirements

The following requirements for laboratory QA/QC procedures shall be considered the minimum QA/QC standards for the laboratories employed by the Permittee that provide analytical services for environmental investigation, corrective action, and monitoring activities conducted at the Facility. The Permittee shall provide the names of the contract analytical laboratories and copies of the laboratory quality assurance manuals to the NMED, if requested, within 180 days of awarding a contract for analytical services to any contract laboratory.

7.5.2 Quality Assurance Procedures

Contract analytical laboratories shall maintain internal quality assurance programs in accordance with EPA, NELAP and industry-wide accepted practices and procedures. At a minimum, the laboratories shall use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories shall establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories shall establish internal QA/QC that meets EPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

7.5.3 Equipment Calibration Procedures and Frequency

The laboratories' equipment calibration procedures, calibration frequency, and calibration standards shall be in accordance with the EPA test methodology requirements and documented in the laboratories' quality assurance and SOP manuals. All instruments and equipment used by the laboratory shall be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Operation, calibration, and maintenance shall be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance shall be kept on file at the laboratory.

7.5.4 Laboratory QA/QC Samples

Analytical procedures shall be evaluated by analyzing reagent or method blanks, surrogates, LCS, MS/MSDs, BS/BSDs, and laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed shall be documented in the cited EPA or DOE test methodologies. At a minimum, the laboratory shall analyze laboratory blanks, MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs requiring EPA test methods and at a frequency of one in ten for non-EPA test methods. Laboratory batch QA/QC samples shall be specific to the project.

7.5.5 Laboratory Deliverables

The analytical data package submitted to the NMED shall be prepared in accordance with EPA established Level II analytical support protocol. The laboratory analytical data package shall be prepared in accordance with EPA-established Level III or IV analytical support protocol, which must be kept on file by the contract laboratory and submitted to the Permittee upon request. Any or all of the following items also shall be made available to the NMED upon request:

1. Transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report.
2. Sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; soil, rock, or sediment

sample results in consistent units (mg/kg) or micrograms per kilogram in dry-weight basis; water sample results in consistent units (milligrams per liter or micrograms per liter (µg/L)); vapor sample results in consistent units (ppmv or $\mu g/m^3$); and detection limits for undetected analytes. Results shall be reported for all field samples, including field duplicates and blanks, submitted for analysis.

3. Method blank results, including detection limits for undetected analytes.
4. Surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only).
5. MS/MSD and/or BS/BSD spike concentrations, percent recoveries, relative percent differences (RPDs), and corresponding control limits.
6. Laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits.
7. Sample chain-of-custody documentation.
8. Holding times and conditions.
9. Conformance with required analytical protocol(s).
10. Instrument calibration.
11. Blanks.
12. Detection/quantitation limits.
13. Recoveries of surrogates.
14. Variability for duplicate analyses.
15. Completeness.
16. Data report formats.
17. The following data deliverables for organic compounds shall be required from the laboratory:

    a. A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported;
    b. Report of sample collection, extraction, and analysis dates, including sample holding conditions;
    c. Tabulated results for samples in units as specified, including data qualification in conformance with EPA protocol, and definition of data descriptor codes;
    d. Reconstructed ion chromatograms for gas chromatograph/mass spectrometry (GC/MS) analyses for each sample and standard calibration;
    e. Selected ion chromatograms and mass spectra of detected target analytes (GC/MS) for each sample and calibration with associated library/reference spectra;
    f. Gas chromatograph/electron capture device (GC/ECD) and/or gas chromatograph/flame ionization detector (GC/FID) chromatograms for each sample and standard calibration;
    g. Raw data quantification reports for each sample and calibrations, including areas and retention times for analytes, surrogates, and internal standards;
    h. A calibration data summary reporting calibration range used and a measure of linearity [include decafluorotriphenylphosphine (DFTPP) and p-bromofluorobenzene (BFB) spectra and compliance with tuning criteria for GC/MS];
    i. Final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitation limit for each analyte;
    j. Analyte concentrations with reporting units identified, including data qualification in conformance with the CLP Statement of Work (SOW) (include definition of data descriptor codes);

k. Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample;
l. Recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts); and
m. Report of tentatively identified compounds with comparison of mass spectra to library/reference spectra.

18. The following data deliverables for inorganic compounds shall be required from the laboratory:

a. A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications; including signature from authority representative certifying to the quality and authenticity of data as reported;
b. Report of sample collection, digestion, and analysis dates, with sample holding conditions;
c. Tabulated results for samples in units as specified, including data qualification in conformance with the CLP SOW (including definition of data descriptor codes);
d. Results of all method QA/QC checks, including inductively coupled plasma (ICP) Interference Check Sample and ICP serial dilution results;
e. Tabulation of instrument and method practical detection/quantitation limits;
f. Raw data quantification report for each sample;
g. A calibration data summary reporting calibration range used and a measure of linearity, where appropriate;
h. Final digestate volumes (and dilutions required), sample size, and wet-to-dry weight ratios;
i. Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample; and
j. Recovery assessments and a replicate sample summary, including post-digestate spike analysis; all MS data (including spike concentrations) for each sample, if accomplished; all MS results (recoveries and spike amounts); and laboratory control sample analytical results).

The Permittee shall present summary tables of these data in the general format to the NMED in the formats described herein. The raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory support data for samples from this project, shall be compiled and kept on file at the Facility for reference. The Permittee shall make the data available to the NMED upon request.

7.5.6 Review of Field and Laboratory QA/QC Data

The Permittee shall evaluate the sample data, field, and laboratory QA/QC results for acceptability with respect to the data quality objectives (DQOs). Each group of samples shall be compared with the DQOs and evaluated using data validation guidelines contained in EPA guidance documents, the latest version of SW- 846, and industry-accepted QA/QC methods and procedures.

The Permittee shall require the laboratory to notify the Facility project manager of data quality exceptions within one business day of discovery in order to allow for sample re-analysis, if possible. The Facility project manager shall contact the NMED within one business day of receipt of laboratory notification of data quality exceptions in order to discuss the implications and determine whether the data will still be

considered acceptable or if sample re-analysis or resampling is necessary. The Facility project manager shall summarize the results of the discussion with the NMED project leader regarding the data quality exceptions in a memorandum or email. The Permittee shall submit the memorandum to the NMED electronic mail within three business days of the conclusion of the data quality discussion.

7.5.7 Blanks, Field Duplicates, Reporting Limits and Holding Times

7.5.7.1 Blanks

The analytical results of field blanks and field rinseate blanks shall be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks shall be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample transport containers. The analytical results of laboratory blanks shall be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If contaminants are detected in field or laboratory blanks, the sample data shall be qualified, as appropriate.

7.5.7.2 Field Duplicates

Field duplicates shall consist of two samples either split from the same sample device or collected sequentially. Field duplicate samples shall be collected at a minimum frequency of ten percent of the total number of samples submitted for analysis. Relative percent differences (RPDs) for field duplicates shall be calculated. A precision of no more than 20 percent for duplicates shall be considered acceptable for soil, rock, and sediment sampling conducted at the Facility. The analytical DQO for precision shall be used for water duplicates.

7.5.7.3 Method Reporting Limits

Method reporting limits (PQLs, LOQs) for sample analyses for each medium shall be established at the lowest level practicable for the method and analyte concentrations and shall not exceed soil, groundwater, surface water, or vapor emissions background levels, cleanup standards, and screening levels. The preferred method detection limits are a maximum of 20 percent of the background, screening, or cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air emissions cleanup standards, screening levels, or background levels and are reported as “not detected” or “estimated” shall be considered data quality exceptions and an explanation for the exceedance and its acceptability for use shall be provided.

7.5.7.4 Holding Times

The Permittee shall review the sampling, extraction, and analysis dates to confirm that extraction and analyses were completed within the recommended holding times, as specified by EPA protocol. Appropriate data qualifiers shall be noted if holding times were exceeded.

7.5.8 Representativeness and Comparability

7.5.8.1 Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. The Permittee shall implement procedures to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. The Permittee shall note any procedures or variations that may affect the collection or analysis of representative samples and shall qualify the data.

7.5.8.2 Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, the Permittee shall report analytical results in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and shall implement standard collection and analytical procedures. Any procedure or variation that may affect comparability shall be noted and the data shall be qualified.

7.5.9 Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

Upon receipt of each laboratory data package, data shall be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria shall be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers shall be submitted as appendices or attachments to investigation and monitoring reports. Data validation procedures for all samples shall include checking the following, when appropriate:

1. Holding times;
2. Detection limits;
3. Field equipment rinsate blanks;
4. Field blanks;
5. Field duplicates;
6. Trip blanks;
7. Reagent blanks;
8. Laboratory duplicates;
9. Laboratory blanks;
10. Laboratory matrix spikes;
11. Laboratory matrix spike duplicates;
12. Laboratory blank spikes;
13. Laboratory blank spike duplicates; and
14. Surrogate recoveries.

If significant quality assurance problems are encountered, appropriate corrective action shall be implemented. All corrective action shall be defensible, and the corrected data shall be qualified.

8 Part 8 Monitoring Well Construction Requirements

Vadose zone or groundwater monitoring wells required to be constructed at the Facility must be installed in accordance with this Permit Part. General drilling procedures and monitoring well construction requirements are presented in this Permit Part.

8.1 Drilling Methods

Vadose zone and groundwater monitoring wells and piezometers must be designed and constructed in a manner which will yield high quality samples, ensure that the well will last the duration of the project, and ensure that the well will not serve as a conduit for contaminants to migrate between different stratigraphic units or aquifers. The design and construction of groundwater monitoring wells shall comply with the guidelines established in various EPA RCRA guidance, including, but not limited to:

1. U.S. EPA, *RCRA Groundwater Monitoring: Draft Technical Guidance*, EPA/530-R-93-001, November, 1992;

2. U.S. EPA, RCRA Groundwater Monitoring Technical Enforcement Guidance Document, OSWER-9950.1, September, 1986; and

3. Aller, L., Bennett, T.W., Hackett, G., Petty, R.J., Lehr, J.H., Sedoris, H., Nielsen, D.M., and Denne, J.E., *Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells*, EPA 600/4-89/034, 1989.

A variety of methods are available for drilling monitoring wells. While the selection of the drilling procedure is usually based on the site-specific geologic conditions, the following issues shall also be considered:

4. Drilling shall be performed in a manner that minimizes impacts to the natural properties of the subsurface materials.

5. Contamination and cross-contamination of groundwater and aquifer materials during drilling shall be avoided.

6. The drilling method shall allow for the collection of representative samples of rock, unconsolidated materials, and soil.

7. The drilling method shall allow the Permittee to determine when the appropriate location for the screened interval(s) has been encountered.

8. The drilling method shall allow for the proper placement of the filter pack and annular sealants. The borehole diameter shall be at least four inches larger in diameter than the nominal diameter of the well casing and screen to allow adequate space for placement of the filter pack and annular sealants.

9. The drilling method shall allow for the collection of representative groundwater samples. Drilling fluids (which includes air) shall be used only when minimal impact to the surrounding formation and groundwater can be ensured.

A brief description of the different drilling methods that may be appropriate for the construction of monitoring wells at the Facility follows. Many of these methods may be used alone, or in combination, to

install monitoring wells at the Facility. While the selection of the specific drilling procedure will usually depend on the site-specific geologic conditions, justification for the method selected must be provided to the NMED.

8.1.1 Hollow Stem Auger

The hollow-stem continuous flight auger consists of a hollow, steel shaft with a continuous, spiraled steel flight welded onto the exterior site of the stem. The stem is connected to an auger bit and, when rotated, transports cuttings to the surface. The hollow stem of the auger allows drill rods, split- spoon core barrels, Shelby tubes, and other samplers to be inserted through the center of the auger so that samples may be retrieved during the drilling operations. The hollow stem also acts to temporarily case the borehole, so that the well screen and casing (riser) may be inserted down through the center of the augers once the desired depth is reached, minimizing the risk of possible collapse of the borehole.

A bottom plug or pilot bit can be fastened onto the bottom of the augers to keep out most of the soils and/or water that have a tendency to clog the bottom of the augers during drilling. Drilling without a center plug is acceptable provided that the soil plug, formed in the bottom of the auger, is removed before sampling or installing well casings. The soil plug can be removed by washing out the plug using a side discharge rotary bit or drilling out the plug with a solid-stem auger bit sized to fit inside the hollow-stem auger. In situations where heaving sands are a problem, potable water may be poured into the augers to equalize the pressure so that the inflow of formation materials and water shall be held to a minimum when the bottom plug is removed. The hollow-stem auger method is best suited for drilling in relatively shallow soils and unconsolidated sediments.

8.1.2 Air Rotary/Air Down-The-Hole Hammer/ODEX

The air rotary method consists of a drill pipe or drill stem coupled to a drill bit that rotates and cuts through soils and rock. The cuttings produced from the rotation of the drilling bit are transported to the surface by compressed air, which is forced down the borehole through the drill pipe and returns to the surface through the annular space (between the drill pipe and the borehole wall). The circulation of the compressed air not only removes the cuttings from the borehole but also helps to cool the drill bit. The use of air rotary drilling is best suited for hard-rock formations. In soft unconsolidated formations, casing is driven to keep the formation from caving. When using air rotary, the air compressor shall have an in-line filter system to filter the air coming from the compressor. The filter system shall be inspected regularly to ensure that the system is functioning properly. In addition, a cyclone velocity dissipator or similar air containment/dust- suppression system shall be used to funnel the cuttings to one location instead of allowing the cuttings to discharge uncontrolled from the borehole. Air rotary that employs the dual-tube (reverse circulation) drilling system is acceptable because the cuttings are contained within the drill stem and are discharged through a cyclone velocity dissipator to the ground surface.

The injection of air into the borehole during air rotary drilling has the potential to alter the natural properties of the subsurface. This can occur through air-stripping of the VOCs in both soil and groundwater in the vicinity of the borehole, altering the groundwater geochemical parameters (e.g., pH and redox potential), and potentially increasing biodegradation of organic compounds in the aquifer near the borehole. These factors may prevent the well from yielding groundwater samples that are representative of in-situ conditions.

In hard, abrasive, consolidated rock, a down-the-hole hammer may be more appropriate than the air rotary method. In this method, compressed air is used to actuate and operate a pneumatic hammer as well as lift the cuttings to the surface and cool the hammer bit. One drawback of the down-the-hole hammer is that oil is required in the air stream to lubricate the hammer-actuating device, and this oil could potentially contaminate the soil in the vicinity of the borehole and the aquifer.

The ODEX method is a variation of the air rotary method in which a casing-driving technique is used in combination with air rotary drilling. With the ODEX system, the drill bit extends outward and reams a pilot hole large enough for a casing assembly to slide down behind the drill bit assembly. As a result, casing is advanced simultaneously while drilling the hole.

8.1.3 Resonant Sonic

Resonant sonic drilling is a method that uses a sonic drill head to produce high-frequency, high-force vibrations in a steel drill pipe. The vibrations in the pipe create a cutting action at the bit face, which allows a continuous core of the formation to move into a core barrel. The method requires no drilling fluid, drills very fast (up to one ft/sec in certain formations), drills at any angle through all formations (rock, clay, sand, boulders, permafrost, glacial till), and yields virtually no cuttings in the drilling process. While there are numerous advantages to this process, the primary disadvantage is the cost of the method. This drilling method has been proven and used at various facilities.

8.2 Well Construction/Completion Techniques

8.2.1 Well Construction Materials

Well construction materials shall be selected based on the goals and objectives of the proposed monitoring program and the geologic conditions at the site. When selecting well construction materials, the primary concern shall be selecting materials that will not contribute foreign constituents or remove contaminants from the groundwater. Other factors to be considered include the tensile strength, compressive strength, and collapse strength of the materials; length of time the monitoring well will be in service; and the material's resistance to chemical and microbiological corrosion. Generally, if the monitoring program requires the analysis of organic constituents, stainless steel or fluoropolymer materials should be used. However, if the monitoring program requires only inorganic constituent analyses, polyvinyl chloride (PVC) materials may be used. PVC should not be used for monitoring wells where organic constituents will be analyzed due to its potential for sorption and leaching of contaminants. If stainless steel is used for groundwater monitoring wells where low levels of metals may be present, the steel must be passivated to minimize sorption and leaching of metals.

8.2.2 Well Construction Techniques

Well screen and casing materials acceptable for the construction of RCRA monitoring wells include stainless steel (304 or 316), rigid PVC (meeting American National Standards Institute/National Sanitation Foundation Standard 14), and fluoropolymer materials (polytetrafluoroethylene, fluorinated ethylene propylene, and polyvinylidene). In addition, there are other materials available for the construction of monitoring wells including acrylonitrile butadiene styrene (ABS), fiberglass- reinforced plastic (FRP), black iron, carbon steel, and galvanized steel, but these materials are not recommended for use in long term monitoring wells due to their low resistance to chemical attack and potential contribution of contamination to the groundwater. However, these materials may be used in the construction of monitoring wells where they will not be in contact with the groundwater that will be sampled (e.g., carbon steel pipe used as surface casing).

8.2.2.1 Single Cased Wells

The borehole shall be bored, drilled, or augered as close to vertical as possible, and checked with a plumb bob, level, or appropriate downhole logging tool. Slanted boreholes shall not be acceptable unless specified in the design. The borehole shall be of sufficient diameter so that well construction can proceed without major difficulties. To assure an adequate size, a minimum two-inch annular space is required between the casing and the borehole wall (or the hollow-stem auger wall). The two-inch annular space

around the casing will allow the filter pack, bentonite seal, and annular grout to be placed at an acceptable thickness. Also, the two-inch annular space will allow up to a 1.5-inch outer diameter tremie pipe to be used for placing the filter pack, bentonite seal, and grout at the specified intervals.

It may be necessary to overdrill the borehole so that any soils that have not been removed (or that have fallen into the borehole during augering or drill stem retrieval) will fall to the bottom of the borehole below the depth where the filter pack and well screen are to be placed. Normally, three to five ft is sufficient for overdrilling shallow wells. Deep wells may require deeper overdrilling. The borehole can also be overdrilled to allow for an extra space for a well sump to be installed. If the borehole is overdrilled deeper than desired, it can be backfilled to the designated depth with bentonite pellets or the filter pack.

The well casings (riser assembly) should be secured to the well screen by flush-jointed threads or other appropriate connections and placed into the borehole and plumbed by the use of centralizers, a plumb bob, or a level. No petroleum-based lubricating oils or grease shall be used on casing threads. Teflon tape can be used to wrap the threads to ensure a tight fit and minimize leakage, if per-and poly-fluorinated alkyl substances are not a contaminant of concern. No glue of any type shall be used to secure casing joints. Teflon "O" rings can be used to ensure a tight fit and minimize leakage if per-and poly-fluorinated alkyl substances are not a contaminant of concern. "O" rings made of Teflon are not acceptable if the well will be sampled for organic compound or per-and poly-fluorinated alkyl substances analyses.

Before the well screen and casings are placed at the bottom of the borehole, at least six inches of filter material shall be placed at the bottom to serve as a firm footing. The string of well screen and casing should then be placed into the borehole and plumbed. If centralizers are used, they shall be placed below the well screens and above the bentonite annular seals so that the placement of the filter pack, overlying bentonite seal, and annular grout will not be hindered. Centralizers placed in the wrong locations can cause bridging during material placement. If installing the well screen and casings through hollow-stem augers, the augers shall be slowly extracted as the filter pack, bentonite seal, and grout are tremied or poured into place. The gradual extraction of the augers will allow the materials being placed in the augers to flow out of the bottom of the augers into the borehole. If the augers are not gradually extracted, the materials will accumulate at the bottom of the augers causing potential bridging problems. After the string of well screen and casing is plumb, the filter material shall be placed around the well screen (preferably by the tremie pipe method) up to the designated depth. After the filter pack has been installed, the bentonite seal shall be placed directly on top of the filter pack up to the designated depth or a minimum of two ft above the filter pack, whichever is greater. After the bentonite seal has hydrated for the specified time, the annular grout shall be pumped by the tremie method into the annular space around the casings (riser assembly) up to within two ft of the ground surface or below the frost line, whichever is greater. The grout shall be allowed to cure for a minimum of 24 hours before the surface pad and protective casing are installed. After the surface pad and protective casing are installed, bumper guards (guideposts) shall be installed (if necessary).

8.2.2.2 Double Cased Wells

Double-cased wells should be constructed when there is reason to believe that interconnection of two aquifers by well construction may cause cross contamination, or when flowing sands make it impossible to install a monitoring well using conventional methods. A pilot borehole should be advanced through the overburden and the contaminated zone into a clay, confining layer, or bedrock. An outer casing (surface or pilot casing) shall be placed into the borehole and sealed with grout. The borehole and outer casing should extend into tight clay a minimum of two ft or into competent bedrock a minimum of one foot. The total depth into the clay or bedrock will vary depending upon the plasticity of the clay and the extent of weathering and fracturing of the bedrock. The size of the outer casing shall be of sufficient

inside diameter to contain the inner casing and the two-inch annular space. In addition, the borehole shall be of sufficient size to contain the outer casing and the two-inch minimum outer annular space, if applicable.

The outer casing shall be grouted by the tremie method from the bottom of the borehole to within two ft of the ground surface. The grout shall be pumped into the annular space between the outer casing and the borehole wall. This can be accomplished by either placing the tremie pipe in the annular space and pumping the grout from the bottom of the borehole to the surface, or placing a grout shoe or plug inside the casing at the bottom of the borehole and pumping the grout through the bottom grout plug and up the annular space on the outside of the casing. The grout shall consist of a Type I Portland cement and bentonite or other approved grout to provide a rigid seal. A minimum of 24 hours shall be allowed for the grout plug (seal) to cure before attempting to drill through it. When drilling through the seal, care shall be taken to avoid cracking, shattering, and washing out of the seal. If caving conditions exist so that the outer casing cannot be sufficiently sealed by grouting, the outer casing shall be driven into place and a grout seal placed in the bottom of the casing.

8.2.2.3 Bedrock Wells

The installation of monitoring wells into bedrock can be accomplished in two ways. The first method is to drill or bore a pilot borehole through the soil overburden into the bedrock. An outer casing is installed into the borehole by setting it into the bedrock, and grouting it into place. After the grout has set, the borehole can be advanced through the grout seal into the bedrock. The preferred method of advancing the borehole into the bedrock is rock coring. Rock coring makes a smooth, round hole through the seal and into the bedrock without cracking or shattering the seal. Roller cone bits are used in soft bedrock, but extreme caution should be taken when using a roller cone bit to advance through the grout seal in the bottom of the borehole because excessive water and bit pressure can cause cracking, eroding (washing), and/or shattering of the seal. Low volume air hammers may be used to advance the borehole, but they have a tendency to shatter the seal because of the hammering action. If the structural integrity of the grout seal is in question, a pressure test can be utilized to check for leaks. If the seal leaks, the seal is not acceptable. When the drilling is complete, the finished well will consist of an open borehole from the ground surface to the bottom of the well. The major limitation of open borehole bedrock wells is that the entire bedrock interval serves as the monitoring zone.

The second method is to install the outer surface casing and drill the borehole into bedrock, and then install an inner casing and well screen with the filter pack, bentonite seal, and annular grout. The well is completed with a surface protective casing and concrete pad. This well installation method gives the flexibility of isolating the monitoring zone(s) and minimizing inter-aquifer flow. In addition, it gives structural integrity to the well, especially in unstable areas (e.g., steeply dipping shales) where the bedrock has a tendency to shift or move when disturbed.

8.2.3 Well Screen and Filter Pack Design

Well screens and filter packs shall be designed to accurately sample the aquifer zone that the well is intended to sample, minimize the passage of formation materials (turbidity) into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure. The selection of the well screen length depends upon the objective of the well. Piezometers and wells where only a discrete flow path is monitored are generally completed with short screens (two ft or less). While monitoring wells are usually constructed with longer screens (usually five to twenty ft), they shall be kept to the minimum length appropriate for intercepting a contaminant plume. The screen slot size shall be selected to retain from 90 to 100 percent of the filter pack material in artificially filter packed wells, and from 50 to 100 percent of the formation material in naturally packed wells. All well screens shall be factory wire-wrapped or machine slotted.

A filter pack shall be used when: 1) the natural formation is poorly sorted; 2) a long screen interval is required or the screen spans highly stratified geologic materials of widely varying grain sizes; 3) the natural formation is uniform fine sand, silt, or clay, 4) the natural formation is thin-bedded; 5) the natural formation is poorly cemented sandstone; 6) the natural formation is highly fractured or characterized by relatively large solution channels; 7) the natural formation is shale or coal that will act as a constant source of turbidity to groundwater samples; or 8) the diameter of the borehole is significantly greater than the diameter of the screen. The use of natural formation material as a filter pack is only recommended when the natural formation materials are relatively coarse-grained, permeable, and uniform in grain size.

Filter pack materials shall consist of clean, rounded to well-rounded, hard, insoluble particles of siliceous composition (industrial grade quartz sand or glass beads). The required grain-size distribution or particle sizes of the filter pack materials shall be selected based upon a sieve analysis of the aquifer materials or the formation to be monitored, or the characteristics of the aquifer materials using information acquired during previous investigations.

Where sieve analyses are used to select the appropriate filter pack particle size, the results of a sieve analysis of the formation materials are plotted on a grain-size distribution graph, and a grain-size distribution curve is generated. The 70 percent retained grain size value should be multiplied by a factor between four and six (four for fine, uniform formations and six for coarse, non-uniform formations). A second grain-size distribution curve is then drawn on the graph for this new value, ensuring that the uniformity coefficient does not exceed 2.5. The filter pack that shall be used will fall within the area defined by these two curves.

Once the filter pack size is determined, the screen slot size shall be selected to retain at least 90 percent of the filter pack material. The Permittee may propose the use of a pre-determined well screen slot size and filter pack for monitoring wells in the site-specific work plans submitted to the NMED.

The filter pack shall be installed in a manner that prevents bridging and particle-size segregation. Filter packs placed below the water table shall be installed by the tremie pipe method. Filter pack materials shall not be poured into the annular space unless the well is shallow (e.g., less than 30 ft deep) and the filter pack material can be poured continuously into the well without stopping. At least two inches of filter pack material shall be installed between the well screen and the borehole wall, and two ft of material shall extend above the top of the well screen. A minimum of six-inches of filter pack material shall also be placed under the bottom of the well screen to provide a firm footing and an unrestricted flow under the screened area. In deep wells (e.g., greater than 200 ft deep), the filter pack may not compress when initially installed. As a result, filter packs may need to be installed as high as five ft above the screened interval in these situations. The precise volume of filter pack material required shall be calculated and recorded before placement, and the actual volume used shall be determined and recorded during well construction. Any significant discrepancy between the calculated and actual volume shall be explained. Prior to installing the filter pack annular seal, a one to two-ft layer of chemically inert fine sand shall be placed over the filter pack to prevent the intrusion of annular sealants into the filter pack.

8.2.4 Annular Seal

The annular space between the well casing and the borehole must be properly sealed to prevent cross-contamination of samples and the groundwater. The materials used for annular sealants shall be chemically inert with respect to the highest anticipated concentration of chemical constituents expected in the groundwater at the Facility. In general, the permeability of the sealing material shall be one to two orders of magnitude lower than the least permeable parts of the formation in contact with the well. The precise volume of annular sealants required shall be calculated and recorded before placement, and the

actual volume shall be determined and recorded during well construction. Any significant discrepancy between the calculated volume and the actual volume shall be explained.

During well construction, an annular seal shall be placed on top of the filter pack. This seal shall consist of a high solids (10-30 percent) bentonite material in the form of bentonite pellets, granular bentonite, or bentonite chips. The bentonite seal shall be placed in the annulus through a tremie pipe if the well is deep (greater than 30 ft), or by pouring directly down the annulus in shallow wells (less than 30 ft). If the bentonite materials are poured directly down the annulus (which is an acceptable method only in wells less than 30 feet deep), a tamping device shall be used to ensure that the seal is emplaced at the proper depth and the bentonite has not bridged higher in the well casing. The bentonite seal shall be placed above the filter pack a minimum of two ft vertical thickness. The bentonite seal shall be allowed to completely hydrate in conformance with the manufacturer's specifications prior to installing the overlying annular grout seal. The time required for the bentonite seal to completely hydrate will differ with the materials used and the specific conditions encountered, but is generally a minimum of four to 24 hours.

A grout seal shall be installed on top of the filter pack annular seal. The grout seal may consist of a high solids (30 percent) bentonite grout, a neat cement grout, or a cement/bentonite grout. The grout shall be pumped under pressure (not gravity fed) into the annular space by the tremie pipe method, from the top of the filter pack annular seal to within a few ft of the ground surface. The tremie pipe shall be equipped with a side discharge port (or bottom discharge for grouting at depths greater than 100 feet) to minimize damage to the filter pack or filter pack annular bentonite seal during grout placement. The grout seal shall be allowed to cure for a minimum of 24 hours before the concrete surface pad is installed. All grouts shall be prepared in accordance with the manufacturer's specifications. High solids (30 percent) bentonite grouts shall have a minimum density of ten pounds per gallon (as measured by a mud balance) to ensure proper setup. Cement grouts shall be mixed using six and one-half to seven gallons of water per 94-pound bag of Type I Portand cement. Bentonite (five to ten percent) may be added to delay the setting time and reduce the shrinkage of the grout.

8.2.5 Groundwater Well Development

All monitoring wells shall be developed to create an effective filter pack around the well screen, correct damage to the formation caused by drilling, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development stresses the formation around the screen, as well as the filter pack, so that mobile fines, silts, and clays are pulled into the well and removed. Development is also used to remove any foreign materials (e.g., water, drilling mud) that may have been introduced into the borehole during the drilling and well installation activities; and to aid in the equilibration that will occur between the filter pack, well casing, and the formation water. The development of a well is extremely important to ensuring the collection of representative groundwater samples.

Newly installed monitoring wells shall not be developed for at least 48 hours after the surface pad and outer protective casing are installed. This will allow sufficient time for the well materials to cure before the development procedures are initiated. Newly installed groundwater monitoring wells shall be developed no later than 30 calendar days after installation is complete. A new monitoring well shall be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. In most cases, the above requirements can be satisfied. However, in some cases, the pH, temperature, and specific conductivity may stabilize but the water remains turbid. In this case, the well may still contain well construction materials, such as drilling mud in the form of a mud cake or formation soils that have not been washed out of the borehole. Thick drilling mud cannot be flushed out of a borehole with one or two well volumes of flushing. Instead, continuous flushing over a period of several days may be necessary to complete the well development. If

the well is pumped dry, the water level shall be allowed to sufficiently recover before the next development period is initiated. The common methods used for developing wells include:

1. Pumping and over-pumping;
2. Backwashing;
3. Surging (with a surge block);
4. Bailing;
5. Jetting; and
6. Airlift pumping.

These development procedures can be used, either individually or in combination, to achieve the most effective well development. However, the most favorable well development methods include pumping, over-pumping, bailing, surging, or a combination of these methods. Well development methods and equipment that alter the chemical composition of the groundwater shall not be used. Development methods that involve adding water or other fluids to the well or borehole, or that use air to accomplish well development should be avoided, if possible. Approval shall be obtained from the NMED prior to introducing air, water, or other fluids into the well for the purpose of well development. If water is introduced to a borehole during well drilling and completion, then the same or greater volume of water shall be removed from the well during development. In addition, the volume of water withdrawn from a well during development shall be recorded.

8.2.6 Surface Completion

Monitoring wells may be completed either as flush-mounted wells, or as above-ground completions. A surface seal shall be installed over the grout seal and extended vertically up the well annulus to the land surface. The lower end of the surface seal shall extend a minimum of one foot below the frost line to prevent damage from frost heaving. The composition of the surface seal shall be neat cement or concrete. In above-ground completions, a three-foot wide, four-inch thick concrete surface pad shall be installed around the well at the same time the protective casing is installed. The surface pad shall be sloped so that drainage will flow away from the protective casing and off the pad. In addition, a minimum of one inch of the finished pad shall be below grade or ground elevation to prevent washing and undermining by soil erosion.

A locking protective casing shall be installed around the well casing (riser) to prevent damage or unauthorized entry. The protective casing shall be anchored in the concrete surface pad below the frost line and extend several inches above the well riser stickup. A weep hole shall be drilled into the protective casing just above the top of the concrete surface pad to prevent water from accumulating and freezing inside the protective casing around the well riser. A cap shall be placed on the well riser to prevent tampering or the entry of foreign materials, and a lock shall be installed on the protective casing to provide security. If the wells are located in an area that receives traffic, a minimum of three bumper guards (bollards) consisting of steel pipes three to four inches in diameter and a minimum of five-foot length should be installed. The bumper guards (bollards) should be installed to a minimum depth of two feet below the ground surface in a concrete footing and extend a minimum of three feet above ground surface. The pipes should be filled with concrete to provide additional strength. The pipes should be painted a bright color to reduce the possibility of vehicular damage.

If flush-mounted completions are required (e.g., in active roadway areas), a protective structure such as a utility vault or meter box should be installed around the well casing. In addition, measures should be taken to prevent the accumulation of surface water in the protective structure and around the well intake. These measures should include outfitting the protective structure with a steel lid or manhole cover that

has a rubber seal or gasket and ensuring that the bond between the cement surface seal and the protective structure is watertight.

8.3 Well Abandonment

Wells deleted from the facility monitoring program or that have been damaged beyond repair shall be plugged and abandoned. Well plugging and abandonment methods and certification shall be conducted in accordance with Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells (19.27.4 NMAC). The Permittee shall notify the NMED and submit a well abandonment plan to the New Mexico State Engineers Office and to the NMED no less than 30 days prior to the date the wells are removed from the monitoring program. The goal of well abandonment is to seal the borehole in such a manner that the well cannot act as a conduit for migration of contaminants from the ground surface to the aquifer or between aquifers. To properly abandon a well, the preferred method is to completely remove the well casing and screen from the borehole, clean out the borehole, and backfill with a cement or bentonite grout, neat cement, or concrete.

For wells with small diameter casing, abandonment shall be accomplished by over-drilling the well with a larger diameter bit appropriate for the subsurface conditions. After the well has been over-drilled, the well casing, grout and filter pack could be lifted out of the ground with a drill rig, and the remaining filter pack can be drilled out. The open borehole can then be pressure grouted (via the tremie pipe method) from the bottom of the borehole to the ground surface. After the grout has cured a minimum of 24 hours, the top two feet of the borehole shall be filled with concrete to insure a secure surface seal.

Several other well abandonment procedures are available for wells with larger diameter screens and casings. One method is to force a drill stem with a tapered wedge assembly or a solid-stem auger into the well casing and pull the casing out of the ground. However, if the casing breaks or the well cannot be pulled from the ground, the well will have to be grouted in place. To abandon a well in place, a tremie pipe shall be placed at the lowest point in the well (at the bottom of the screen or in the well sump). The entire well is then pressure grouted from the bottom of the well upward. The pressurized grout will be forced out through the well screen into the filter pack and up the inside of the well casing sealing off all breaks and holes in the casing. Once the well is grouted, the casing is should be terminated approximately two feet below ground surface, and the remaining depth back-filled with concrete. Again, a marker should be placed at the abandoned well location for future reference. This marker should be placed at the approximate northeast corner and referenced by survey-grade GPS methods.

If a PVC well cannot be abandoned due to internal casing damage (e.g., the tremie pipe cannot be extended to the bottom of the screen), it may be necessary to drill out the casing, using the most-appropriate, and NMED-approved method Once the casing is removed, the open borehole can be cleaned out and pressure grouted from the bottom of the borehole upward.

8.4 Documentation

All information on the design, construction, and development of each monitoring well shall be recorded and presented on a boring log, a well construction log, and well construction diagram. The well construction log and well construction diagram shall include the following information:

1. Well name/number;
2. date/time of well construction;
3. Borehole diameter and well casing diameter;
4. Well depth;

5. Casing length;
6. Casing materials;
7. Casing and screen joint type;
8. Screened interval(s);
9. Screen materials, slot size and design;
10. Filter pack material, size and volume;
11. Filter pack placement method;
12. Filter pack interval(s);
13. Annular sealant composition;
14. Annular sealant placement method;
15. Annular sealant volume (calculated and actual);
16. Annular sealant interval(s);
17. Surface sealant composition;
18. Surface seal placement method;
19. Surface sealant volume (calculated and actual);
20. Surface sealant interval;
21. Surface seal and well apron design and construction;
22. Well development procedure and turbidity measurements;
23. Well development purge volume(s) and stabilization parameter measurements;
24. Type and design and construction of protective casing;
25. Well cap and lock;
26. Ground surface elevation;
27. Survey reference point elevation on well casing;
28. Top of monitoring well casing elevation; and,
29. Top of protective steel casing elevation.

9 Part 9 Reporting Requirements

9.1 Highlights

The purpose of this Permit Part is to provide the general reporting requirements and report formats for corrective action activities required under this Permit. This Permit Part is not intended to provide reporting requirements for every potential corrective action conducted at the Facility; therefore, the formats for all types of reports are not presented below. The formats described in this Permit Part include the general reporting requirements and formats for site specific investigation work plans, investigation reports, routine monitoring reports, risk assessment reports, and corrective measures evaluations. The Permittee shall generally consider the investigation work plan and reports to be the equivalents of RFI work plans, RFI reports, periodic monitoring reports, risk assessments, and CMS reports, respectively, for the purposes of RCRA compliance. The Permittee shall include detailed, site-specific requirements in all interim status unit, SWMU, and AOC investigation work plans, investigation reports, monitoring reports, and corrective measures evaluations. All plans and reports shall be prepared with technical and regulatory input from the NMED. All work plans and reports shall be submitted to the NMED in the form of two paper copies and two electronic copies.

The reporting requirements listed in this Part do not include all sections that may be necessary to complete each type of report listed. The Permittee or the NMED may determine that additional sections are required to address additional site-specific issues or information collected during corrective action or monitoring activities not listed below. However, the Permittee must submit variations of the general report format and the formats for reports not listed in this Permit Part (9) in outline form to the NMED for approval prior to submittal of the reports. The NMED will approve or disapprove, in writing, the proposed outline after receipt of the outline. If the NMED disapproves the report outline, the NMED will notify the Permittee, in writing, of the outline's deficiencies and will specify a date for submittal of a revised report outline. All reports submitted by the Permittee shall follow the general approach and limitations for data presentation described in this Permit Part.

References to information in other documents cited in work plans and reports shall include specific page, table, and figure numbers for the information referenced in the cited documents.

All documents required by this Permit shall include a statement on the signature page that meets the requirements of 40 CFR 270.11(d)(1).

9.2 Investigation Work Plan

The Permittee shall fulfill the requirements acceptable to the NMED for preparation of work plans for unit-specific or corrective action activities at the Facility using the general outline below. The minimum requirements for describing proposed activities within each section are included. All research, locations, depths and methods of exploration, field procedures, analytical methods, data collection methods, and schedules shall be included in each work plan. In general, interpretation of data acquired during previous investigations shall be presented only in the background sections of the work plans. The other text sections of the work plans shall be reserved for presentation of anticipated site-specific activities and procedures relevant to the project. The general work plan outline is provided below.

9.2.1 Title Page

The title page shall include the type of document, Facility name and the unit, SWMU, or AOC name(s) and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the Facility shall be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

9.2.2 Executive Summary

The executive summary (or abstract) shall provide a brief summary of the purpose and scope of the investigation to be conducted at the subject site. The Facility, unit, SWMU, or AOC name, revision number if applicable, and location shall be included in the executive summary.

9.2.3 Table of Contents

The table of contents shall list all text sections and subsections, tables, figures, and appendices or attachments included in the work plan. The corresponding page numbers for the titles of each section of the work plan shall be included in the table of contents.

9.2.4 Introduction

The introduction shall include the Facility name, unit name and location, and unit status (e.g., active operations, closed, corrective action). General information on the current site usage and status shall be included in this section. A brief description of the purpose of the investigation and the type of site investigation to be conducted shall be provided in this section.

9.2.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of pertinent subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background summary and labeled on the site plan.

This section shall identify potential receptors, including groundwater, and include a brief summary of the type and characteristics of all waste and all contaminants, the known and possible sources of contamination, the history of releases or discharges of contamination, and the known extent of contamination. This section shall include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. At a minimum, detections of contaminants encountered during previous investigations shall be presented in table format, with an accompanying figure showing sample locations. References to previous reports shall include page, table, and figure numbers for referenced information. Summary data tables and site plans showing relevant investigation locations shall be included in the Tables and Figures sections of the document, respectively.

9.2.6 Site Conditions

9.2.6.1 Surface Conditions

A section on surface conditions shall provide a detailed description of current site topography, features, and structures including a description of drainages, vegetation, erosional features, and a detailed description of current site uses and operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water runoff, or contaminant fate and transport shall be included in this section.

9.2.6.2 Subsurface Conditions

A section on subsurface conditions shall provide a brief, detailed description of the site conditions observed during previous subsurface investigations, including relevant soil horizons, stratigraphy,

presence of vadose zone fluids and groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during previous investigations shall be included in the Figures section of the work plan. A brief description of the anticipated stratigraphic units that may be encountered during the investigation may be included in this section if no previous investigations have been conducted at the site.

9.2.7 Scope of Activities

A section on the scope of activities shall briefly describe a list of all anticipated activities to be performed during the investigation, including background information research, health and safety requirements that may affect or limit the completion of tasks, drilling, test pit or other excavations, well construction, field data collection, survey data collection, chemical analytical testing, aquifer or other pilot testing, and IDW storage, disposal, and reporting.

9.2.8 Investigation Methods

A section on investigation methods shall provide a description of all anticipated locations and methods for conducting the activities to be performed during the investigation. This section shall include, but is not limited to, research methods, health and safety practices that may affect the completion of tasks, drilling methods, test pit or other excavation methods, sampling intervals and methods, well construction methods, field data collection methods, geophysical and land survey methods, field screening methods, chemical analytical testing, materials testing, aquifer testing, pilot testing, and other proposed investigation and testing methods.

9.2.9 Monitoring and Sampling Program

A section on monitoring and sampling shall describe the anticipated monitoring and sampling program to be implemented after the initial investigation activities are completed. This section shall provide a description of the anticipated vadose zone fluids, groundwater, vadose zone vapor, vadose zone moisture, and other monitoring and sampling programs to be implemented at the unit.

9.2.10 Schedule

A section shall provide the anticipated schedule for completion of field investigation, pilot testing, and monitoring and sampling activities. In addition, this section shall provide a schedule for submittal of reports and data to the NMED including a schedule for submitting status reports, preliminary data, and the final investigation report.

9.2.11 Tables

The following summary tables may be included in the investigation work plans if previous investigations have been conducted at the unit. Data presented in the tables shall include information on dates of data collection, analytical methods, detection limits, and significant data quality exceptions. All data tables shall include only detected analytes and data quality exceptions that could potentially mask detections. The following tables shall be included in investigation work plans, as applicable:

1. summaries of regulatory criteria, background, and applicable cleanup levels (may be included in the analytical data tables instead of as separate tables);
2. summaries of historical field survey location data;
3. summaries of historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality;

4. summaries of historical soil, rock, or sediment laboratory analytical data shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
5. summaries of historical groundwater elevation and depth to groundwater data. The table shall include the monitoring well depths, the screened intervals in each well, and the dates and times measurements were taken;
6. summaries of historical groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
7. summary of historical surface water laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
8. summary of historical air sample screening and chemical analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data; and
9. summary of historical pilot test or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements.

9.2.12 Figures

The following figures shall be included with each investigation work plan for each site, including presentation of data where previous investigations have been conducted. All figures must include an accurate bar scale and a north arrow. An explanation shall be included on each figure for all abbreviations, symbols, acronyms, and qualifiers. The following figures shall be included in investigation work plans, as applicable:

1. a vicinity map showing topography and the general location of the site relative to surrounding features and properties;
2. a unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features shall be included on the site plan, if appropriate; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. figures showing historical and proposed soil boring locations, excavation locations, and sampling locations;
4. figures presenting historical soil sample field screening and laboratory analytical data;
5. figures presenting the locations of all existing and proposed borings and vapor monitoring point locations;
6. figures presenting historical vadose zone organic vapor data;
7. figures showing all existing and proposed monitoring wells and piezometers;
8. figures presenting historical groundwater and vadose zone fluid elevation data, and indicating groundwater flow directions;
9. figures presenting historical groundwater and vadose zone fluid laboratory analytical data, if applicable; the chemical analytical data corresponding to each sampling location can be presented in tabular form on the figure or as an isoconcentration map;
10. figures presenting historical and proposed vadose zone fluid neutron probe access tube locations and field measurement data for soil moisture, if applicable;
11. figures presenting historical surface water laboratory analytical data, if applicable;

12. figures showing historical and proposed air sampling locations and presenting historical air quality data, if applicable;
13. figures presenting historical pilot testing locations and data, where applicable, including site plans and graphic data presentation; and
14. figures presenting geologic cross-sections based on outcrop and borehole data acquired during previous investigations, if applicable.

9.2.13 Appendices

An IDW management plan shall be included as an appendix to the investigation work plan. Additional appendices may be necessary to present additional data or documentation not listed above.

9.3 Investigation Report

The Permittee shall prepare investigation reports at the Facility using the general outline below. The Investigation Report shall be the reporting mechanism for presenting the results of completed Investigation Work Plans. This Section describes the minimum requirements for reporting on site investigations. All data collected during each site investigation event in the reporting period shall be included in the reports. In general, interpretation of data shall be presented only in the background, conclusions, and recommendations sections of the reports. The other text sections of the reports shall be reserved for presentation of facts and data without interpretation or qualifications.

9.3.1 Title Page

The title page shall include the type of document and version number, Facility name, the unit, SWMU, or AOC, and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible Facility representative shall be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

9.3.2 Executive Summary

The executive summary shall provide a brief summary of the purpose, scope, and results of the investigation conducted at the subject site during the reporting period. In addition, this section shall include a brief summary of conclusions based on the investigation data collected and recommendations for future investigation, monitoring, remedial action, or site closure.

9.3.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

9.3.4 Introduction

The introduction section shall include the Facility name, unit name and location, and unit status (e.g., active operations, closed, corrective action). General information on the site use and status shall be included in this section. A brief description of the purpose of the investigation, the type of site investigation conducted, and the type of results presented in the report also shall be provided in this section.

9.3.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses including the locations of current and former site structures and features. A

labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background summary and labeled on the figure. In addition, this section shall include a brief summary of the possible sources of contamination, the history of releases or discharges of contamination, the known extent of contamination, and the results of previous investigations including references to previous reports. The references to previous reports shall include page, table, and figure numbers for referenced information. A site plan showing relevant investigation locations and summary data tables shall be included in the Figures and Tables sections of the document, respectively.

9.3.6 Scope of Activities

This section on the scope of activities shall briefly describe all activities performed during the investigation event including background information research, implemented health and safety measures that affected or limited the completion of tasks, drilling, test pit or other excavation methods, well construction methods, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot testing, and IDW storage or disposal.

9.3.6.1 Exploratory Drilling or Excavation Investigations

A section shall describe the locations, methods, and depths of subsurface explorations. The description shall include the types of equipment used, the logging procedures, exploration equipment, decontamination procedures, and conditions encountered that may have affected or limited the investigation. A description of the site conditions observed during subsurface investigation activities shall be included in this section, including soil horizon and stratigraphic information. Site plans showing the locations of all borings and excavations shall be included in the Figures section of the report. Boring and test pit logs for all exploratory borings and test pits shall be presented in an appendix or attachment to the report.

9.3.6.2 Monitoring Well Construction, Boring, or Excavation Abandonment

A section shall describe the methods and details of monitoring well construction and the methods used to abandon or backfill exploratory borings and excavations. The description shall include the dates of well construction, boring abandonment, or excavation backfilling. In addition, boring logs, test pit logs, and well construction diagrams shall be included in an attachment or appendix. Well construction diagrams shall be included with the associated boring logs for borings that are converted to monitoring wells.

9.3.7 Field Investigation Results

A section shall provide a summary of the procedures used and the results of all field investigation activities conducted at the site including, but not limited to, the dates that investigation activities were conducted, the type and purpose of field investigation activities performed, field screening measurements, logging and sampling results, pilot test results, construction details, and conditions observed. Field observations or conditions that altered the planned work or may have influenced the results of sampling, testing, and logging shall be reported in this section. At a minimum, the following subsections shall be included, where appropriate.

9.3.7.1 Surface Conditions

A section on surface conditions shall describe current site topography, features, and structures including topographic drainages, man-made drainages, vegetation, and erosional features. It shall also include a description of current site uses and any operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water runoff, or contaminant transport shall be included in this section.

9.3.7.2 Subsurface Conditions

A section on subsurface conditions shall describe known subsurface lithology and structures based on observations made during the current and previous subsurface investigations, including interpretation of geophysical logs and as-built drawings of man-made structures. A description of the known locations of pipelines, utility lines, and observed geologic structures shall also be included in this section. A site plan showing boring and excavation locations and the locations of the site's above- and below-ground structures shall be included in the Figures section of the report. In addition, cross-sections shall be constructed, if appropriate, to provide additional visual presentation of site or regional subsurface conditions.

9.3.7.3 Groundwater Conditions

A section shall describe groundwater conditions observed beneath the subject site and relate local groundwater conditions to regional groundwater conditions. A description of the depths to water, aquifer thickness, and groundwater flow directions shall be included in this section for alluvial groundwater, shallow perched groundwater, intermediate perched groundwater, and regional groundwater, as appropriate to the investigation. Figures showing well locations, surrounding area, groundwater elevations, and flow directions for each hydrologic zone shall be included in the Figures section of the report.

9.3.7.4 Surface Water Conditions

A section shall describe surface water conditions and include a description of surface water runoff, surface water drainage, surface water sediment transport, and contaminant transport in surface water as suspended load and as a dissolved phase in surface water via natural and manmade drainages, if applicable. A description of contaminant fate and transport shall be included, if appropriate.

9.3.7.5 Subsurface Air and Soil Moisture Conditions

A section shall describe subsurface air monitoring and sampling methods used during the site investigation. It shall also describe observations made during the site investigation regarding subsurface flow pathways and the subsurface air-flow regime.

9.3.7.6 Materials Testing Results

A section shall discuss the materials testing results, such as core permeability testing, grain size analysis, or other materials testing results. Sample collection methods, locations, and depths shall also be included. Corresponding summary tables shall be included in the Tables section of the report.

9.3.7.7 Pilot Testing Results

A section shall discuss the results of any pilot testing. Pilot testing is typically conducted after initial subsurface investigations are completed and the need for additional investigation or remediation has been evaluated. Pilot testing, including aquifer testing and remediation system pilot testing, shall be addressed through separate pilot test work plans and reports. The format for pilot test work plans and reports shall be approved by the NMED prior to submittal.

9.3.8 Regulatory Criteria

A section shall set forth the applicable cleanup standards, screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site shall be included if site-specific levels have been established at separate Facility sites or units. A table summarizing the applicable cleanup standards shall be included as part of the document. Alternately, the report may include applicable cleanup standards as a column in the data tables. Risk-based evaluation procedures, if used to calculate cleanup levels, shall be presented in a separate document or in an

appendix to this report. If cleanup levels calculated in a risk evaluation are employed, the risk evaluation document shall be referenced and shall include pertinent page numbers for referenced information.

9.3.9 Site Contamination

A section shall provide a description of sampling intervals and methods for detection of surface and subsurface contamination in soils, rock, sediments, groundwater, surface water, and as vapor-phase contamination. Only factual information shall be included in this section. Interpretation of the data shall be reserved for the summary and conclusions sections of the report. Tables summarizing all sampling, testing, and screening results for detected contaminants shall be prepared in a format approved by the NMED. The tables shall be presented in the Tables section of the report.

9.3.9.1 Soil, Rock, and Sediment Sampling

A section shall describe the sampling of soil, rock and sediment. It shall include the dates, locations, and methods of sample collection, sampling intervals, sample logging methods, screening sample selection methods, and laboratory sample selection methods including the collection depths for samples submitted for laboratory analyses. A site plan showing the sample locations shall be included in the Figures section of the report.

9.3.9.2 Sample Field Screening Results

A section shall describe the field screening methods used during the investigation and the field screening results. Field screening results also shall be presented in summary tables in the Tables section of the document. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this subsection.

9.3.9.3 Soil, Rock, and Sediment Sampling Chemical Analytical Results

A section shall briefly summarize the laboratory analyses conducted, the analytical methods and results and provide a comparison of the data to cleanup standards or established cleanup levels for the site. The laboratory results also shall be presented in summary tables in the Tables section of the document. Field conditions and sample collection methods that could potentially affect the analytical results shall be described in this section. If appropriate, soil analytical data shall be presented with sample locations on a site plan and included in the Figures section of the report.

9.3.9.4 Subsurface Vapor Sampling

A section shall describe the air and subsurface vapor sampling. It shall describe the dates, locations, methods of sample collection, methods for sample logging, and methods for laboratory sample selection. A site plan showing all air and subsurface vapor sampling locations shall be provided in the Figures section of the report.

9.3.9.5 Subsurface Vapor Field Screening Results

A section shall describe the subsurface vapor field screening results. It shall describe the field screening methods used for ambient air and subsurface vapors during the investigation and the field screening results. Field screening results shall also be presented in summary tables in the Tables section of the report. The locations of ambient air and subsurface vapor screening sample collection shall be presented on a site plan included in the Figures section of the report. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this section.

9.3.9.6 Air and Subsurface Vapor Laboratory Analytical Results

This section shall describe the results of air and subsurface vapor laboratory analyses. It shall describe the air sampling laboratory analytical methods and analytical results and provide a comparison of the data to applicable cleanup levels for the site. The rationale or purpose for altering or modifying the subsurface vapor sampling program outlined in the site investigation work plan also shall be provided in this section. Field conditions that may have affected the analytical results during sample collection shall be described in this section. Tables summarizing the air sample laboratory, field, and analytical QA/QC data; applicable cleanup levels; and modifications to the air sampling program shall be provided in the Tables section of the report. Contaminant concentrations shall be presented as data tables or as isoconcentration contours on a map included in the Figures section of the report.

9.3.10 Conclusions

A conclusions section shall provide a brief summary of the investigation activities and a discussion of the conclusions of the investigation conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup levels, and to relevant historical investigation results and analytical data. Potential receptors, including groundwater, shall be identified and discussed. An explanation shall be provided with regard to data gaps and conditions that may have influenced or biased the investigation results. A risk assessment may be included as an appendix to the investigation report; however, the risk analysis shall be presented in the Risk Assessment format described in Permit Section 9.5. References to the risk analysis shall be presented only in the summary and conclusions sections of the Investigation Report.

9.3.11 Recommendations

A section shall discuss the need for further investigation, corrective measures, risk assessment, monitoring, or recommendations for corrective action completed based on the conclusions provided in the Conclusions section. It shall include explanations regarding additional sampling, monitoring, and site closure. A corresponding schedule for further action regarding the site shall also be provided.

9.3.12 Tables

This section shall provide the following summary tables. Data presented in the tables shall include the current data, dates of data collection, analytical methods, detection limits, and significant data quality exceptions. All summary data tables shall include only detected analytes and data quality exceptions that could potentially mask detections. The following tables shall be included in investigation reports, as applicable:

1. tables summarizing regulatory criteria, background levels, and applicable cleanup levels; this information may be included in the analytical data tables instead of as separate tables;
2. tables summarizing field survey location data; separate tables shall be prepared for well locations and individual medium sampling locations except where the locations are the same for more than one medium;
3. tables summarizing field screening and field parameter measurements of soil, sediment, vadose zone fluid, vadose zone vapor, vadose zone moisture, and groundwater, surface water, and air quality;
4. a table summarizing soil laboratory analytical data; it shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
5. a table summarizing the groundwater elevations and depth-to-water data; the table shall include the monitoring well depths and the screened intervals in each well;

6. a table summarizing the groundwater laboratory analytical data; the analytical data tables shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
7. a table summarizing the surface water laboratory analytical data; the analytical data tables shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
8. a table summarizing the air sample screening and laboratory analytical data; the data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
9. tables summarizing the pilot testing data, if applicable, including units of measurement and types of instruments used to obtain measurements; and
10. a table summarizing the materials testing data, if applicable.

9.3.13 Figures

Figures shall be included with each investigation report, as appropriate. All figures must include a scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps shall have a date. A section shall provide the following figures:

1. a vicinity map showing topography and the general location of the site relative to surrounding features and properties;
2. a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features shall be included on the site plan; additional site plans may be required to present the locations of relevant off-site well locations, structures and features;
3. figures showing boring, excavation, and sampling locations;
4. figures presenting soil sample field screening and laboratory analytical data;
5. figures displaying the locations of all newly installed and existing wells and borings;
6. figures presenting monitoring well locations, groundwater elevation data, and groundwater flow directions;
7. figures presenting groundwater laboratory analytical data, including any past data requested by the NMED; the chemical analytical data corresponding to each sampling location may be presented in table form on the figure and as an isoconcentration map;
8. figures presenting surface water sample locations and field measurement data including any past data requested by the NMED;
9. figures presenting surface water laboratory analytical data including any past data, if applicable; the laboratory analytical data corresponding to each sampling location may be presented in tabular form on the figure;
10. figures showing air or subsurface vapor sampling locations and presenting air and subsurface vapor quality data; the field screening or laboratory analytical data corresponding to each sampling location may be presented in tabular form on the figure or as an isoconcentration map;
11. figures presenting geologic cross-sections based on outcrop and borehole data; and
12. figures presenting pilot testing locations and data, where applicable, including site plans or graphic data presentation.

9.3.14 Appendices

Each investigation report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

9.3.14.1 Field Methods

An appendix shall provide detailed descriptions of the methods used to acquire field measurements of each media that was surveyed or tested during the investigation. Methods shall include, but are not limited to, exploratory drilling or excavation methods, the methods and types of instruments used to obtain field screening, field analytical or field parameter measurements, instrument calibration procedures, sampling methods for each medium investigated, decontamination procedures, sample handling procedures, documentation procedures, and a description of field conditions that affected procedural or sample testing results. Methods of measuring and sampling during pilot testing shall be reported in this appendix, if applicable. References to SOPs shall not substitute for such investigation methods descriptions. Copies of IDW disposal documentation shall be provided in a separate appendix.

9.3.14.2 Boring/Test Pit Logs and Well Construction Diagrams

An appendix shall provide boring logs, test pit or other excavation logs, and well construction details. In addition, a key to symbols and a soil or rock classification system shall be included in this appendix. Geophysical logs shall be provided in a separate section of this appendix.

9.3.14.3 Chemical Analytical Program

Chemical analytical methods, a summary of data quality objectives, and a summary of data quality review procedures shall be reported in an appendix . A summary of data quality exceptions and their effect on the acceptability of the field and laboratory analytical data with regard to the investigation and the site status shall be included in this appendix, along with references to case narratives provided in the laboratory reports.

9.3.14.4 Chemical Analytical Reports

A section shall include all laboratory chemical analytical data generated for the reporting period. The reports must include all chain-of-custody records and Level II QA/QC results provided by the laboratory. The laboratory reports may be provided electronically in a format approved by the NMED and shall be in the form of a final laboratory report. Laboratory report data tables may be submitted in Microsoft Excel format. Hard (paper) copies of the chain-of-custody forms shall be submitted with the reports regardless of whether the final laboratory report is submitted electronically or in hard copy.

9.3.14.5 Other Appendices

Other appendices containing additional information shall be included as required by the NMED or as otherwise appropriate.

9.4 Periodic Monitoring Report

The Permittee shall use the following guidance for preparing periodic monitoring reports. The reports shall present the results of periodic or routine groundwater and remediation system monitoring at the Facility. The following sections provide a general outline for monitoring reports and the minimum requirements for reporting of periodic monitoring conducted at the Facility. All data collected during each monitoring and sampling event in the reporting period shall be included in a periodic monitoring report. In general, interpretation of data should be presented only in the background, conclusions, and recommendations sections of a report. The other text sections of a report should be reserved for presentation of facts and data without interpretation or qualifications.

9.4.1 Title Page

The title page shall include the type of document, revision number if applicable, the facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the Facility shall be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

9.4.2 Executive Summary

The executive summary shall provide a brief summary of the purpose, scope, and results of the monitoring conducted at the subject site during the reporting period. The facility, unit, SWMU, and AOC name(s) and location(s) shall be included in the executive summary. In addition, this section shall include a brief summary of conclusions based on the monitoring data collected.

9.4.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

9.4.4 Introduction

The introduction section shall include the Facility name and the unit name(s), location(s), and status (e.g., active operations, closed, corrective action). General information on the site usage and status shall be included in this section. A brief description of the purpose of the monitoring, type of monitoring conducted, and the type of results presented in the report also shall be provided in this section.

9.4.5 Scope of Activities

A section on the scope of activities shall briefly describe all activities performed during the monitoring event or reporting period including field data collection, analytical testing, if applicable, and purge/decontamination water storage and disposal.

9.4.6 Regulatory Criteria

A section on regulatory criteria shall provide information regarding applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for the site. A table summarizing the applicable cleanup standards, or inclusion of applicable cleanup standards as a column in the data tables, can be substituted for this section. The appropriate cleanup levels for each site shall be included if site-specific levels have been established at separate sites. Risk-based evaluation procedures, if used to calculate cleanup levels, must either be included as an attachment or submitted as a separate document and referenced. The specific document and page numbers must be included for all referenced materials.

9.4.7 Monitoring Results

A section shall provide a summary of the results of monitoring conducted at the site. This section shall include the dates and times that monitoring was conducted, the measured depths to groundwater, directions of groundwater and vadose zone fluids flow, field air and water quality measurements, static pressures, field measurements, and a comparison to previous monitoring results. Field observations or conditions that may influence the results of monitoring shall be reported in this section. Tables summarizing leachate and vapor-monitoring parameters, groundwater and vadose zone fluid elevations, depth-to-water measurements, and other field measurements may be substituted for this section. The tables shall include all information required by this Permit Section (9.4.7).

9.4.8 Chemical Analytical Data Results

A section shall discuss the results of the chemical analyses. It shall provide the dates of sampling and the analytical results. It shall also provide a comparison of the data to previous results and to any cleanup standards or established cleanup levels for the site and discuss any conditions that may have influenced the analytical results. The rationale or purpose for altering or modifying the sampling program shall be provided in this section. A table summarizing the laboratory analytical data, QA/QC data, applicable cleanup levels, and modifications to the sampling program may be substituted for this section.

9.4.9 Remediation System Monitoring

A section shall discuss remediation system monitoring. It shall summarize the remediation system's capabilities and performance. It shall also provide monitoring data, treatment system discharge sampling requirements, and system influent and effluent sample analytical results. The dates of operation, system failures, and modifications made to the remediation system during the reporting period shall also be included in this section. A summary table may be substituted for this section.

9.4.10 Summary

A summary section shall provide a discussion and conclusions of the monitoring conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup levels and to relevant historical monitoring and chemical analytical data. An explanation shall be provided with regard to data gaps or conditions that may have influenced the results. A discussion of remediation system performance, monitoring results, modifications if applicable, and compliance with discharge requirements shall be provided in this section. Recommendations and explanations regarding future monitoring, remedial actions, or site closure shall also be included in this section.

9.4.11 Tables

A section shall provide the following summary tables for the media sampled. With prior approval from the NMED, the Permittee may combine one or more of the tables. Data presented in the tables shall include the current sampling and monitoring data, as well as data from the three previous monitoring events or, if data from less than three monitoring events is available, data acquired during previous investigations. Remediation system monitoring data also shall be presented. The dates of data collection shall be included in the tables. Summary tables may be substituted for portions of the text. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections. The following tables shall be included, as applicable:

1. a table summarizing the regulatory criteria (a regulatory criteria text section may be substituted for this table or the applicable cleanup levels may be included in the analytical data tables);
2. a table summarizing groundwater and vadose zone fluid elevations, and depths to water data; the table shall include the monitoring well depths, casing elevations, the screened intervals in each well, and the dates and times of measurements;
3. a table summarizing field measurements of surface water quality data, if applicable;
4. table summarizing field measurements of subsurface vapor monitoring and soil moisture data (including historical vapor monitoring data as described above);
5. a table summarizing field measurements of groundwater and vadose zone fluid quality data (including historical water quality data as described above);
6. a table summarizing subsurface vapors chemical analytical data, if applicable (including historical analytical data as described above);
7. a table summarizing surface water chemical analytical data, if applicable (including historical surface water analytical data as described above);

8. a table summarizing groundwater and vadose zone fluid chemical analytical data (including historical groundwater analytical data as described above); and
9. a table summarizing remediation system monitoring data, if applicable (including historical remediation system monitoring data as described above).

9.4.12 Figures

A section shall include the following figures. All figures shall include a scale and north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date. The following figures must be included, as applicable:

1. a vicinity map showing topography and the general location of the site relative to surrounding features or properties;
2. a facility site plan that presents pertinent site features and structures, well and piezometer locations and remediation system location(s) and features; off-site well locations and pertinent features shall be included on the site plan, if practical; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. figures presenting the locations of monitoring and other well locations, groundwater and vadose zone fluid elevation data, and groundwater flow directions;
4. figures presenting groundwater and vadose zone fluid analytical data for the current monitoring event; the analytical data corresponding to each sampling location may be presented in tabular form on the figure or as an isoconcentration map;
5. figures presenting surface water sampling locations and analytical data for the current monitoring period;
6. figures presenting subsurface vapor sampling locations and analytical data for the current monitoring event; the analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map; and
7. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable.

9.4.13 Appendices

Each monitoring report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

9.4.13.1 Field Methods

The report shall include a section that describes the methods used to acquire field measurements of groundwater and vadose zone fluid elevations, subsurface vapor, soil moisture, water quality data, subsurface vapor samples, vadose zone fluid samples, and groundwater samples. It shall include the methods and types of instruments used to measure depths to water, air, headspace, or subsurface vapor parameters, soil moisture information, and water quality parameters. In addition, decontamination, well purging techniques, well sampling techniques, and sample handling procedures shall be provided in this appendix. Methods of measuring and sampling remediation systems shall be reported in this section, if applicable. Purge and decontamination water storage and disposal methods shall also be presented in this appendix. References to SOPs shall not substitute for such descriptions. Copies of purge and decontamination water disposal documentation shall be provided in a separate appendix.

9.4.13.2 Chemical Analytical Program

An appendix shall discuss the analytical program. It shall include the analytical methods, a summary of data quality objectives, and data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the analytical data with regard to the monitoring event and the site status shall be included in this appendix along with references to case narratives provided in the laboratory reports.

9.4.13.3 Chemical Analytical Reports

An appendix shall include all laboratory chemical analytical data generated for the reporting period. The level II laboratory analytical report shall be provided. The data may be submitted electronically on a compact disc in Microsoft Excel or other format acceptable to the NMED. The reports shall include all chain-of-custody records and QA/QC results provided by the laboratory. Hard (paper) copies of all chain-of-custody records shall be submitted as part of this appendix.

9.5 Risk Assessment Report

The Permittee shall prepare risk assessment reports for sites requiring corrective action at the Facility, as necessary, using the format described below. This Section provides a general outline for risk assessments and also sets forth the minimum requirements for describing risk assessment elements. In general, interpretation of data shall be presented only in the background, conceptual site model, and conclusions and recommendations sections of the reports. The other text sections of the Risk Assessment report shall be reserved for presentation of sampling results from all investigations, conceptual and mathematical elements of the risk assessment, and presentations of toxicity information and screening values used in the risk assessment. Human health and ecological risk assessment results should be presented separately. The general outline applicable to both human health and ecological risk assessment is provided below.

9.5.1 Title Page

The title page shall include the type of document, revision number if applicable, the facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible representative of the Facility shall be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

9.5.2 Executive Summary

The executive summary section shall provide a brief summary of the purpose and scope of the risk assessment of the subject site. The executive summary shall also briefly summarize the conclusions of the risk assessment. The Facility, unit, SWMU, or AOC name(s) and location(s) shall be included in the executive summary.

9.5.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the risk assessment. The corresponding page numbers for the titles of each unit of the report shall be included in the table of contents.

9.5.4 Introduction

The introduction section shall include the Facility name, unit name(s) and location(s), and unit status (e.g., active operations, closed, corrective action). General information on the current site use and status shall be included in this section.

9.5.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features.

9.5.5.1 Site Description

A section shall provide a description of current site topography, features, and structures including a description of drainages, erosional features, current site uses, and other data relevant to assessing risk at the site. Depth to groundwater, vadose zone fluids, and directions of groundwater and vadose zone fluids flow shall be included in this section. The presence and location of surface water bodies such as springs or wetlands shall be noted in this section. Photos of the site may be incorporated into this section, if desired. Ecological features of the site should be described here, including type and amount of vegetative cover, observed and expected wildlife receptors, and level of disturbance of the site. A topographical map of the site and general vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features shall be included in the Figures section of the document.

9.5.5.2 Sampling Results

A section shall include a summary of the history of releases of contaminants, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each media. This section shall include summaries of sampling results of all investigations, including site plans (included in the Figures section of the document), showing locations of detected contaminants. This section shall reference pertinent figures, data summary tables, and citations for references to previous reports. References to previous reports shall include page, table, and figure numbers for referenced information. Summaries of sampling data for each constituent shall include the maximum value detected, the detection limit, the 95% UCL of the mean value detected (if applicable to the data set) and whether that 95% UCL of the mean was calculated based on a normal or lognormal distribution. Background values used for comparison to inorganic constituents at the site shall be presented in this subsection. The table of background values should appear in the Tables section of the document and include actual values used as well as the origin of the values (facility-wide, site-specific, UCL, UTL). This section shall also include a discussion of how “non-detect” sample results were handled in the averaging of data.

9.5.6 Conceptual Site Model

A section shall present the conceptual site model. It shall include information on the expected fate and transport of contaminants detected at the site. This section shall provide a list of all sources of contamination at the site. Sources that are no longer considered to be ongoing but represent the point of origination for contaminants transported to other locations shall be included. The discussion of fate and transport shall address potential migration of each contaminant in each medium, potential breakdown products and their migration, and anticipated pathways of exposure for human or ecological receptors. Diagrammatic representations of the conceptual site model shall appear in the Figures section of the document.

For human health risk assessments, the conceptual site model shall include residential land use as the future land use for all risk assessments. In addition, site-specific anticipated future land use may be included, provided that written approval to consider a site-specific future land use has been obtained from the NMED prior to inclusion in the risk assessment. If a site-specific future land use scenario appears in the risk assessment, all values for exposure parameters and the source of those values shall be included in table format and presented in the Tables section of the document.

Conceptual site models presented for ecological risk assessments shall identify assessment endpoints and measurement receptors for the site. The discussion of the model shall explain how the measurement receptors for the site are protective of the wildlife receptors identified by the Permittee in the site description.

9.5.7 Risk Screening Levels

A section shall present the actual screening values used for each contaminant for comparison to all human health and ecological risk screening levels. A discussion of the methods used to calculate screening levels in accordance with Permit Part 6.6 and any variances from those procedures shall be included in this Section. If no valid toxicological studies exist for the receptor or contaminant, the contaminant and receptor combination shall be addressed using qualitative methods. If an approved site-specific risk scenario is used for the human health risk assessment, this section shall include all toxicity information and exposure assessment equations used for the site-specific scenario, as well as the sources for that information. Other regulatory levels applicable to screening the site, such as drinking water MCLs, shall also be included in this section.

9.5.8 Risk Assessment Results

This section shall present all risk values, Hazard Quotients (HQs), and Hazard Indices (HIs) for human health under projected future residential scenario and any site-specific scenarios. This section shall also present the HQ and HI for each contaminant for each ecological receptor.

9.5.8.1 Uncertainty Analysis

This section shall include discussion of qualitative, semi-quantitative, and quantitative uncertainty in the risk assessment and estimate the potential impact of the various uncertainties.

9.5.9 Conclusions and Recommendations

This section shall include an interpretation of the results of the risk assessment and any recommendations for future disposition of the site. This section may include additional information and considerations that the Permittee believes are relevant to the analysis of the site.

9.5.10 Tables

Data presented in the summary tables shall include information on detection limits and significant data quality exceptions. All data tables shall include only detected analytes and data quality exceptions that could potentially mask detections. A section shall provide the following summary tables, as appropriate. With prior approval from the NMED, the Permittee may combine one or more of the tables:

1. a table presenting background values used for comparison to inorganic constituents at the site; the table shall include actual values used as well as the origin of the values (Facility-wide, site-specific, UCL, UTL, or maximum);
2. a table summarizing sampling data shall include, for each constituent, all detected values above background, the maximum value detected, the 95 percent UCL of the mean value detected (if applicable to the data set), and whether that 95 percent UCL of the mean was calculated based on a normal or lognormal distribution;
3. a table of all screening values used and the sources of those values;
4. a table presenting all risk values, HQs, and HIs under projected future residential scenario;
5. a table presenting all risk values, HQs, and HIs under approved additional site-specific future land use scenario; and
6. a table presenting the HQ and HI for each contaminant for each ecological receptor.

9.5.11 Figures

This section shall present the following figures for each site, as appropriate. With prior approval from the NMED, the Permittee may combine one or more of the figures. All figures shall include a scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. The following figures shall be included, as applicable:

1. vicinity map showing topography and the general location of the site relative to surrounding features or properties;
2. for human health risk assessments, a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and its details; off-site well locations and other relevant features shall be included on the site plan if practical; additional site plans may be required to present the locations of relevant off-site wells, structures, and features;
3. for ecological risk assessments, a topographical map of the site and general vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features; and
4. conceptual site model diagrams for both human health and ecological risk assessments.

9.5.12 Appendices

Appendices may be included to present additional relevant information for the risk analysis such as the results of statistical analyses of data sets and comparisons of data, ecological checklists for the site, full sets of results of all sampling investigations at the site, or other data as appropriate.

9.6 Corrective Measure Evaluation

The Permittee shall prepare corrective measures evaluations for sites requiring corrective measures using the format described below, of required by NMED. This Permit Section provides a general outline for corrective measures evaluations and sets forth the minimum requirements for describing corrective measures when preparing these documents. All investigation summaries, site condition descriptions, corrective action goals, corrective action options, remedial options selection criteria, and schedules shall be included in the corrective measures evaluations. In general, interpretation of historical investigation data shall be presented only in the background sections of corrective measures evaluations. Investigation information not previously reviewed and approved by NMED shall not be included in a corrective measures evaluation. At a minimum, detections of contaminants encountered during previous site investigations shall be presented in the corrective measures evaluations in table format with an accompanying site plan depicting sample locations. The other text sections of the corrective measures evaluations shall be reserved for presentation of corrective action-related information regarding anticipated or potential site-specific corrective action options and methods relevant to the project. The general corrective measures evaluation outline is provided below.

9.6.1 Title Page

The title page shall include the type of document, revision number if applicable, the Facility name, the unit, SWMU, or AOC name(s), and the submittal date. A signature block providing spaces for the name, title, and organization of the preparer and the responsible Facility representative shall be provided on the title page in accordance with the signature requirements in 40 CFR 270.11(b).

9.6.2 Executive Summary

The executive summary shall provide a brief summary of the purpose and scope of the corrective measures evaluation to be conducted at the site. The executive summary or abstract shall also briefly

summarize the conclusions of the evaluation. The Facility, unit, SWMU, or AOC name(s) and location(s) shall be included in the executive summary.

9.6.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the corrective measures evaluation. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

9.6.4 Introduction

The introduction section shall include the Facility name, unit name(s) and location(s) and unit status (e.g., active operations, closed, corrective action). General information on the current site use and status shall be included in this section. A brief description of the purpose of the corrective measures evaluation and the corrective action objectives for the project also shall be provided in this section.

9.6.5 Background

The background section shall describe the relevant background information. This section shall briefly summarize historical site activities including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background section and labeled on the site plan.

This section shall include contaminant and waste characteristics, a brief summary of the history of contaminant releases, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each medium. This section shall include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. References to previous reports shall include page, table, and figure numbers for referenced information. Summary tables and site plans showing relevant investigation locations shall be referenced and included in the Tables and Figures sections of the document, respectively.

9.6.6 Site Conditions

9.6.6.1 Surface Conditions

A section on surface conditions shall describe current and historic site topography, features, and structures, including a description of topographic drainages, man-made drainages, vegetation, and erosional features. It shall also include a description of current uses of the site and any current operations at the site. This section shall also include a description of those features that could potentially influence corrective action option selection or implementation such as archeological sites, wetlands, or other features that may affect remedial activities. In addition, descriptions of features located in surrounding sites that may effect the subject site regarding sediment transport, surface water runoff, or contaminant transport shall be included in this section. A site plan displaying the locations of all pertinent surface features and structures shall be included in the Figures section of the corrective measures evaluation.

9.6.6.2 Subsurface Conditions

A section on subsurface conditions shall describe the site conditions observed during previous subsurface investigations. It shall include relevant soil horizon and stratigraphic information, groundwater and vadose zone fluid conditions, fracture data, and subsurface vapor information. A site plan displaying the locations of all borings and excavations advanced during previous investigations shall be included in the Figures section of the corrective measures evaluation.

9.6.7 Potential Receptors

9.6.7.1 Sources

A section shall provide a list of all sources of contamination at the site where corrective measures are to be considered or are required. Sources that are no longer considered to be releasing contaminants at the site but may be the point of origination for contaminants transported to other locations, shall be included in this section.

9.6.7.2 Pathways

A section shall describe potential migration pathways that could result in either acute or chronic exposures to contaminants. It shall include such pathways as utility trenches, paleochannels, surface exposures, surface drainages, stratigraphic units, fractures, structures, and other features. The migration pathways for each contaminant and each medium should be tied to the potential receptors for each pathway. A discussion of contaminant characteristics relating to fate and transport of contaminants through each pathway shall also be included in this section.

9.6.7.3 Receptors

A section shall provide a listing and description of all anticipated potential receptors that could possibly be affected by the contamination present at the site. Potential receptors shall include human and ecological receptors, groundwater, and other potential receptors. This section shall identify relevant pathways, such as pathways that could divert or accelerate the transport of contamination to human receptors, ecological receptors, and/or groundwater.

9.6.8 Regulatory Criteria

A section shall set forth the applicable cleanup standards, risk-based screening levels, and risk- based cleanup goals for each medium at the site. The appropriate cleanup levels for each site shall be included if site-specific levels have been established. A table summarizing the applicable cleanup standards shall be included as part of the document. Alternately, the report may include applicable cleanup standards as a column in the data tables. If cleanup levels calculated in a risk evaluation are employed, the risk evaluation document shall be referenced including pertinent page numbers for referenced information.

9.6.9 Identification of Corrective Measures Options

A section shall identify and describe potential corrective measures for source, pathway, and receptor controls. Corrective measures options shall include the range of available options including, but not limited to, a no action alternative, institutional controls, engineering controls, in-situ and onsite remediation alternatives, complete removal, and any combination of alternatives that would potentially achieve cleanup goals.

9.6.10 Evaluation of Corrective Measures Options

A section shall provide an evaluation of the corrective measures options identified in the preceding Section. The evaluation shall be based on the applicability, technical feasibility, effectiveness, implementability, impacts to human health and the environment, and cost of each option. A table summarizing the corrective measures alternatives and the criteria listed below shall be included in the Tables section of this document. The general basis for evaluation of corrective measures options is described below.

9.6.10.1 Applicability
A section shall discuss applicability, which addresses the overall suitability for the corrective action option for containment or remediation of the contaminants in the relevant media with regard to protection of human health and the environment.

9.6.10.2 Technical Feasibility
Technical feasibility describes the uncertainty in designing, constructing, and operating a specific remedial alternative. The description shall include an evaluation of historical applications of the remedial alternative including performance, reliability, and minimization of hazards.

9.6.10.3 Effectiveness
Effectiveness assesses the ability of the corrective measure to mitigate the measured or potential impact of contamination in a medium under the current and projected site conditions. The assessment also shall include the anticipated duration for the technology to attain regulatory compliance. In general, all corrective measures described above will have the ability to mitigate the impacts of contamination at the site, but not all remedial options will be equally effective at achieving the desired cleanup goals to the degree and within the same time frame as other options. Each remedy shall be evaluated for both short-term and long-term effectiveness.

9.6.10.4 Implementability
Implementability characterizes the degree of difficulty involved during the installation, construction, and operation of the corrective measure. Operation and maintenance of the alternative shall be addressed in this section.

9.6.10.5 Human Health and Ecological Protectiveness
This category evaluates the short-term (remedy installation-related) and long-term (remedy operation-related) hazards to human health and the environment of implementing the corrective measure. The assessment shall include whether the technology will create a hazard or increase existing hazards and the possible methods of hazard reduction.

9.6.10.6 Cost
A section shall discuss the anticipated cost of implementing the corrective measure. The costs shall be divided into: 1) capital costs associated with construction, installation, pilot testing, evaluation, permitting, and reporting of the effectiveness of the alternative; and 2) continuing costs associated with operating, maintaining, monitoring, testing, and reporting on the use and effectiveness of the technology.

9.6.11 Selection of Preferred Corrective Measure
The Permittee shall propose the preferred corrective measures at the site and provide a justification for the selection in this section. The proposal shall be based upon the ability of the remedial alternative to: 1) achieve cleanup standard objectives in a timely manner; 2) protect human and ecological receptors; 3) control or eliminate the sources of contamination; 4) control migration of released contaminants; and 5) manage remediation waste in accordance with State and Federal regulations. The justification shall include the supporting rationale for the remedy selection, based on the factors listed in Permit Part 9.6.10, and a discussion of short- and long-term objectives for the site. The benefits and possible hazards of each potential corrective measure alternative shall be included in this section.

9.6.12 Design Criteria to Meet Cleanup Objectives

The Permittee shall present descriptions of the preliminary design for the selected corrective measures in this section. The description shall include appropriate preliminary plans and specifications to effectively illustrate the technology and the anticipated implementation of the remedial option at the site. The preliminary design shall discuss the design life of the alternative and provide engineering calculations for proposed remediation systems.

9.6.13 Schedule

A section shall set forth a proposed schedule for completion of remedy-related activities such as bench testing, pilot testing, construction, installation, remedial excavation, cap construction, installation of monitoring points, and other remedial actions. The anticipated duration of corrective action operations and the schedule for conducting monitoring and sampling activities shall also be presented. In addition, this section shall provide a schedule for submittal of reports and data to the NMED, including a schedule for submitting all status reports and preliminary data.

9.6.14 Tables

A section shall present the following summary tables, as appropriate. Data presented in the summary tables shall include information on dates of sample collection, analytical methods, detection limits, and significant data quality exceptions. All data tables shall include only detected analytes and data quality exceptions that could potentially mask detections. The following summary tables shall be included in the corrective measures evaluations, as appropriate:

1. a table summarizing regulatory criteria, background, and the applicable cleanups standards;
2. a table summarizing historical field survey location data;
3. tables summarizing historical field screening and field parameter measurements for each media;
4. tables summarizing historical soil, rock, or sediment laboratory analytical data; the summary tables shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
5. a table summarizing historical groundwater elevation and depth to water data; the table shall include the monitoring well depths and the screened intervals in each well;
6. tables summarizing historical groundwater and vadose zone laboratory analytical data; the analytical data tables shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
7. tables summarizing historical surface water laboratory analytical data; the analytical data tables shall include the analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
8. tables summarizing historical air sample screening and analytical data; the data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and data quality exceptions that would influence interpretation of the data;
9. tables summarizing historical pilot or other testing data, if applicable, including units of measurement and types of instruments used to obtain measurements;
10. a table summarizing the corrective measures alternatives and evaluation criteria; and
11. a table presenting the schedule for installation, construction, implementation, and reporting of selected corrective measures.

9.6.15 Figures

This section shall present the following figures for each site, as appropriate. All figures shall include a scale. All plan view figures also shall include a north arrow. An explanation shall be provided on each

figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall contain a date. The following figures shall be included, as applicable:

1. a vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;
2. a unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details; off-site well locations and other relevant features shall be included on the site plan if practical; additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. figures showing historical soil boring locations, excavation locations, and sampling locations;
4. figures presenting historical soil sample field screening and laboratory analytical data, if appropriate;
5. figures showing all existing wells including vapor monitoring wells and piezometers; the figures shall present historical groundwater elevation data and indicate groundwater flow directions;
6. figures presenting historical groundwater laboratory analytical data including past data, if applicable; the analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure, or as an isoconcentration map;
7. figures presenting historical surface water sample locations and analytical data including past data, if applicable; the laboratory analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure;
8. figures presenting historical air sampling locations and presenting air quality data; the field screening or laboratory analytical data corresponding to each sampling location maybe presented as individual concentrations, in table form on the figure or as an isoconcentration map;
9. figures presenting historical pilot or other test locations and data, where applicable, including site plans or graphic data presentation;
10. figures presenting geologic cross-sections based on outcrop and borehole data, if applicable;
11. figures presenting the locations of existing and proposed remediation systems;
12. figures presenting existing remedial system design and construction details; and
13. figures presenting preliminary design and construction details for preferred corrective measures.

9.6.16 Appendices

Each corrective measures evaluation shall include, as appropriate as an appendix, a management plan for waste, including investigation derived waste, generated as a result of construction, installation, or operation of remedial systems or activities conducted. Each corrective measures evaluation shall include additional appendices presenting relevant additional data, such as pilot or other test or investigation data, remediation system design specifications, system performance data, or cost analyses as necessary.

Attachment 1

Part A Permit Application

(EPA Form)

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT PART A FORM

1. Facility Permit Contact

First Name	**Brian**	MI	**D**	Last Name	**Knight**
Title	**Chief Environmental Division**				
Email	**brian.d.knight.civ@mail.mil**				
Phone	**575-678-2225**	Ext		Fax	**575-678-4028**

2. Facility Permit Contact Mailing Address

Street Address	**100 Headquarters Ave (bldg 163)**	
City, Town, or Village	**White Sands Missile Range**	
State **NM**	Country United States	Zip Code 88002-5048

3. Facility Existence Date (mm/dd/yyyy)

7/9/1945

4. Other Environmental Permits

A. Permit Type	B. Permit Number	C. Description
R	**NM275021123 5**	**Hazardous Waste Storage Facility**
E	**PO85**	**Title V Operating Permit**

5. Nature of Business

WSMR is a National Research and Testing Range which supports missile development and test programs for the Army, Navy, Air Force and other government agencies.

6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity (1) Amount	B. Process Design Capacity (2) Unit of Measure	C. Process Total Number of Units	D. Unit Name
1		S	0	1	15000	P	1	Hazardous Waste Storage Facility

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes (1) Process Codes								D. Processes (2) Process Description (if code is not entered in 7.D1))
0	1	D	0	0	1	35,000	P	S	0	1						"Container Storage"
0	2	D	0	0	2	16,500	P	S	0	1						"Container Storage"
0	2	D	0	0	3	5,000	P	S	0	1						"Container Storage"
0	4	D	0	0	4	10,000	P	S	0	1						"Container Storage"
0	5	D	0	0	5	10,000	P	S	0	1						"Container Storage"
0	6	D	0	0	6	10,000	P	S	0	1						"Container Storage"
0	7	D	0	0	7	60,000	P	S	0	1						"Container Storage"
0	8	D	0	0	8	70,000	P	S	0	1						"Container Storage"
0	9	D	0	0	9	25,000	P	S	0	1						"Container Storage"
1	0	D	0	1	0	10,000	P	S	0	1						"Container Storage"
1	1	D	0	1	1	16,500	P	S	0	1						"Container Storage"

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

Items 8, 9 and 10 are included in this permit application.

7cont. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes								
								(1) Process Codes								(2) Process Description (if code is not entered in 7.D1))
1	2	D	0	1	2	10,000	P*	S	0	1						"Container Storage"
1	3	D	0	1	3	10,000	P*	S	0	1						"Container Storage"
1	4	D	0	1	4	10,000	P*	S	0	1						"Container Storage"
1	5	D	0	1	5	10,000	P*	S	0	1						"Container Storage"
1	6	D	0	1	6	10,000	P*	S	0	1						"Container Storage"
1	7	D	0	1	7	10,000	P*	S	0	1						"Container Storage"
1	8	D	0	1	8	10,000	P*	S	0	1						"Container Storage"
1	9	D	0	1	9	10,000	P*	S	0	1						"Container Storage"
2	0	D	0	2	0	10,000	P*	S	0	1						"Container Storage"
2	1	D	0	2	1	10,000	P*	S	0	1						"Container Storage"
2	2	D	0	2	2	10,000	P*	S	0	1						"Container Storage"
2	3	D	0	2	3	10,000	P*	S	0	1						"Container Storage"
2	4	D	0	2	4	10,000	P*	S	0	1						"Container Storage"
2	5	D	0	2	5	10,000	P*	S	0	1						"Container Storage"
2	6	D	0	2	6	10,000	P*	S	0	1						"Container Storage"
2	7	D	0	2	7	10,000	P*	S	0	1						"Container Storage"
2	8	D	0	2	8	10,000	P*	S	0	1						"Container Storage"
2	9	D	0	2	9	10,000	P*	S	0	1						"Container Storage"
3	0	D	0	3	0	10,000	P*	S	0	1						"Container Storage"
3	1	D	0	3	1	10,000	P*	S	0	1						"Container Storage"
3	2	D	0	3	2	10,000	P*	S	0	1						"Container Storage"
3	3	D	0	3	3	10,000	P*	S	0	1						"Container Storage"
3	4	D	0	3	4	10,000	P*	S	0	1						"Container Storage"
3	5	D	0	3	5	16,500	P*	S	0	1						"Container Storage"
3	6	D	0	3	6	10,000	P*	S	0	1						"Container Storage"
3	7	D	0	3	7	10,000	P*	S	0	1						"Container Storage"
3	8	D	0	3	8	10,000	P*	S	0	1						"Container Storage"
3	9	D	0	3	9	16,500	P*	S	0	1						"Container Storage"
4	0	D	0	4	0	16,500	P*	S	0	1						"Container Storage"
4	1	D	0	4	1	10,000	P*	S	0	1						"Container Storage"
4	2	D	0	4	2	10,000	P*	S	0	1						"Container Storage"
4	3	D	0	4	3	10,000	P*	S	0	1						"Container Storage"
4	4	F	0	0	1	20,000	P*	S	0	1						"Container Storage"

7cont. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes								
								(1) Process Codes								(2) Process Description (if code is not entered in 7.D1))
4	5	F	0	0	2	35,000	P*	S	0	1						"Container Storage"
4	6	F	0	0	3	20,000	P*	S	0	1						"Container Storage"
4	7	F	0	0	4	16,500	P*	S	0	1						"Container Storage"
4	8	F	0	0	5	16,500	P*	S	0	1						"Container Storage"
4	9	P	0	0	6	10,000	P*	S	0	1						"Container Storage"
5	0	P	0	1	5	10,000	P*	S	0	1						"Container Storage"
5	1	P	0	6	8	10,000	P*	S	0	1						"Container Storage"
5	2	P	0	7	5	10,000	P*	S	0	1						"Container Storage"
5	3	P	0	9	8	10,000	P*	S	0	1						"Container Storage"
5	4	P	1	1	0	10,000	P*	S	0	1						"Container Storage"
5	5	U	0	0	1	10,000	P*	S	0	1						"Container Storage"
5	6	U	0	0	2	10,000	P*	S	0	1						"Container Storage"
5	7	U	0	4	4	10,000	P*	S	0	1						"Container Storage"
5	8	U	0	7	5	10,000	P*	S	0	1						"Container Storage"
5	9	U	0	7	6	10,000	P*	S	0	1						"Container Storage"
6	0	U	0	8	0	10,000	P*	S	0	1						"Container Storage"
6	1	U	0	9	8	10,000	P*	S	0	1						"Container Storage"
6	2	U	1	1	2	10,000	P*	S	0	1						"Container Storage"
6	3	U	1	2	2	10,000	P*	S	0	1						"Container Storage"
6	4	U	1	2	5	10,000	P*	S	0	1						"Container Storage"
6	5	U	1	3	3	10,000	P*	S	0	1						"Container Storage"
6	6	U	1	3	5	10,000	P*	S	0	1						"Container Storage"
6	7	U	1	4	4	10,000	P*	S	0	1						"Container Storage"
6	8	U	1	5	1	10,000	P*	S	0	1						"Container Storage"
6	9	U	1	5	4	10,000	P*	S	0	1						"Container Storage"
7	0	U	1	6	1	10,000	P*	S	0	1						"Container Storage"
7	1	U	1	8	2	10,000	P*	S	0	1						"Container Storage"
7	2	U	1	8	8	10,000	P*	S	0	1						"Container Storage"
7	3	U	2	0	5	10,000	P*	S	0	1						"Container Storage"
7	4	U	2	1	1	10,000	P*	S	0	1						"Container Storage"
7	5	U	2	2	0	10,000	P*	S	0	1						"Container Storage"
7	6	U	2	2	3	10,000	P*	S	0	1						"Container Storage"
7	7	U	2	2	6	10,000	P*	S	0	1						"Container Storage"

7cont. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes									
								(1) Process Codes									(2) Process Description (if code is not entered in 7.D1))
7	8	U	2	2	7	10,000	P*	S	0	1							"Container Storage"

OMB# 2050-0024; Expires 05/31/2020

United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

☐	Obtaining or updating an EPA ID number for an on-going regulated activity that will continue for a period of time. (Includes HSM activity)
☐	Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year)
	☐ Site was a TSD facility and/or generator of > 1,000 kg of hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations)
☐	Notifying that regulated activity is no longer occurring at this Site
☐	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
☑	Submitting a new or revised Part A Form

2. Site EPA ID Number

N	M	2	7	5	0	2	1	1	2	3	5

3. Site Name

White Sands Missile Range

4. Site Location Address

Street Address **U.S. Hwy 70**		
City, Town, or Village **White Sands Missile Range**		County **Dona Ana**
State **NM**	Country **United States**	Zip Code **88002-5048**

5. Site Mailing Address

☐ Same as Location Address

Street Address **100 Headquarters Ave (Bldg 163)**		
City, Town, or Village **White Sands Missile Range**		
State **NM**	Country **United States**	Zip Code **88002-5048**

6. Site Land Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary) **928110**	C.
B.	D.

8. Site Contact Information

☐ Same as Location Address

First Name **Brian**	MI **D**	Last Name **Knight**
Title **Chief Environmental Division**		
Street Address **100 Headquarters Ave (Bldg 163)**		
City, Town, or Village **White Sands Missile Range**		
State **NM**	Country **United States**	Zip Code **88002-5048**
Email **brian.d.knight.civ@mail.mil**		
Phone **575-678-2225**	Ext	Fax **575-678-4028**

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name US Army White Sands Missile Range	Date Became Owner (mm/dd/yyyy) 7/9/1945

Owner Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address 100 Headquarters Ave (Bldg 163)		
City, Town, or Village White Sands Missile Range		
State NM	Country **United States**	Zip Code 88002-5048
Email brian.d.knight.civ@mail.mil		
Phone 575-678-2225	Ext	Fax 575-678-4028
Comments		

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name US Army White Sands Missile Range	Date Became Operator (mm/dd/yyyy) 7/9/1945

Operator Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address **100 Headquarters Ave (bldg 163)**		
City, Town, or Village **White Sands Missile Range**		
State **NM**	Country **United States**	Zip Code **88002-5048**
Email brian.d.knight.civ@mail.mil		
Phone **575-678-2225**	Ext	Fax **575-678-4028**
Comments		

10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

☑ Y ☐ N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c		
	☑	a. LQG	-Generates, in any calendar month (includes quantities imported by importer site) 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste; or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material.
	☐	b. SQG	100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
	☐	c. VSQG	Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste.
If "Yes" above, indicate other generator activities in 2 and 3, as applicable.			
☐ Y ☑ N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.		
☐ Y ☑ N	3. Mixed Waste (hazardous and radioactive) Generator		
☑ Y ☐ N	4. Treater, Storer or Disposer of Hazardous Waste—Note: A hazardous waste Part B permit is required for these activities.		
☐ Y ☑ N	5. Receives Hazardous Waste from Off-site		
☐ Y ☑ N	6. Recycler of Hazardous Waste		
	☐	a. Recycler who stores prior to recycling	
	☐	b. Recycler who does not store prior to recycling	
☐ Y ☑ N	7. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.		
	☐	a. Small Quantity On-site Burner Exemption	
	☐	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

See item 7 on attached Hazardous Waste Part A Permit Application						

C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

☐ Y ☑ N	1. Transporter of Hazardous Waste—If "Yes", mark all that apply.
☐	a. Transporter
☐	b. Transfer Facility (at your site)
☐ Y ☑ N	2. Underground Injection Control
☐ Y ☑ N	3. United States Importer of Hazardous Waste
☐ Y ☑ N	4. Recognized Trader—If "Yes", mark all that apply.
☐	a. Importer
☐	b. Exporter
☐ Y ☑ N	5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply.
☐	a. Importer
☐	b. Exporter

B. Universal Waste Activities

☑ Y ☐ N	1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated.
☑	a. Batteries
☑	b. Pesticides
☑	c. Mercury containing equipment
☑	d. Lamps
☐	e. Other (specify) _____
☐	f. Other (specify) _____
☐	g. Other (specify) _____
☐ Y ☑ N	2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

☐ Y ☑ N	1. Used Oil Transporter—If "Yes", mark all that apply.
☐	a. Transporter
☐	b. Transfer Facility (at your site)
☐ Y ☑ N	2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply.
☐	a. Processor
☐	b. Re-refiner
☐ Y ☑ N	3. Off-Specification Used Oil Burner
☐ Y ☑ N	4. Used Oil Fuel Marketer—If "Yes", mark all that apply.
☐	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
☐	b. Marketer Who First Claims the Used Oil Meets the Specifications

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR 262 Subpart K.

☐ Y ☑ N	A. Opting into or currently operating under 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories—If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.
☐	1. College or University
☐	2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university
☐	3. Non-profit Institute that is owned by or has a formal written affiliation with a college or univer-
☐ Y ☑ N	B. Withdrawing from 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories.

13. Episodic Generation

☐ Y ☑ N	Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator.

14. LQG Consolidation of VSQG Hazardous Waste

☐ Y ☑ N	Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQGs hazardous waste.

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

☐ Y ☑ N	LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.
	A. ☐ Central Accumulation Area (CAA) ☐ Entire Facility
	B. Expected closure date: _____ mm/dd/yyyy
	C. Requesting new closure date: _____ mm/dd/yyyy
	D. Date closed : _____ mm/dd/yyyy ☐ 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8) ☐ 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)

16. Notification of Hazardous Secondary Material (HSM) Activity

☐ Y ☑ N	A. Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.
☐ Y ☑ N	B. Are you notifying under 40 CFR 260.43(a)(4)(iii) that the product of your recycling process has levels of hazardous constituents that are not comparable to or unable to be compared to a legitimate product or intermediate but that the recycling is still legitimate? If "Yes", you may provide explanation in Comments section. You must also document that your recycling is still legitimate and maintain that documentation on site.

17. Electronic Manifest Broker

☐ Y ☑ N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?

18. Comments (include item number for each comment)

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11)**.

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
	07/09/2019
Printed Name (First, Middle Initial Last) **Christopher J. Ward, COL FA**	Title **Garrison Commander WSMR**
Email **christopher.j.ward.mil@mail.mil**	

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Printed Name (First, Middle Initial Last)	Title
Email	

ATTACHMENT 2

FACILITY DESCRIPTION

2. Facility Description

2.1. Introduction

The White Sands Missile Range (WSMR) is a U.S. Army installation that supports missile development and test programs for the Army, Navy, Air Force, other government agencies, and foreign allies.

WSMR is the largest land-area military installation in the United States, comprised of nearly 3,200 square (sq.) mi (5,631 sq. km) of land. The installation is approximately 99 mi (159 km) long and 25 to 40 mi (40 to 64 km) wide. The installation is comprised of a large complex of test ranges, launch sites, impact areas, and instrumentation sites required to develop and test tactical and strategic weapons and weapons systems. WMSR is located in Doña Ana, Socorro, Lincoln, Otero, and Sierra Counties, New Mexico. The headquarters (Main Post) area is located at the southwestern corner of the installation, approximately 27 miles (mi) (43.4 kilometers (km)) east-northeast of Las Cruces, New Mexico and 45 mi (72.4 km) north of El Paso, Texas.

Wastes are generated at multiple locations across the installation and initially managed at waste accumulation points without a Permit, in accordance with the requirements specified in 20 NMAC 4.1.300 incorporating 40 CFR 262.34.

To facilitate disposal, the Hazardous Waste Storage Facility or HWSF is used for storage of containers prior to off-site transportation and disposal.

2.2. Unit Location

The HWSF is located 8 miles east of the Main Post, approximately 1600 feet from the southern Facility (WSMR) boundary. A map showing the location and the surrounding area is presented in Figure 2-1 in accordance with 40 CFR 270.14.).

2.3. Unit Boundaries

The HWSF boundary is defined as the chain link security fence shown on Figure 2-2.

2.4. Unit Description

The HWSF is comprised of multiple indoor and outdoor container storage areas. Figure 2-2 shows the unit and surrounding land. The following features are indicated as specified by 40 CFR 270.14(b):

- Map scale and date
- Orientation of map
- Unit boundaries
- Distance to nearest residential buildings.

A Solid Waste Management Unit (SWMU) is located adjacent to the PSU. It is listed as SWMU 89, Former Acid Neutralization Unit at Hazardous Waste Storage Facility. The open-topped concrete tank was used to evaporate liquid chemical wastes generated at the WSMR photo labs. When not being used for evaporation, the unit was sometimes used as a storage pad for damaged polychlorinated biphenyl (PCB) transformers.

2.5. Surrounding Land Uses

Surrounding areas are controlled by the US Army. No other facilities, military housing, or public roads are located within 1,600 feet from the HWSF.

2.6. Road Systems

The traffic system serving White Sands consists of approximately 800 miles of motor vehicle roads including paved and graveled roads. The HWSF is located off a paved road approximately 1,500 feet south of Range Road 2. The road is approximately 20 feet wide with a 2 feet wide gravel shoulder. Range Road 2 is the main east-west military route in the south Range area. It extends from Range Road 1 in the Main Post area to the east range boundary for a distance of approximately 24 mi. Range Road 2 is approximately 22 feet wide two-lane, two- way all weather paved road with 6 feet shoulders. Range Road 2 is lightly travelled by WSMR personnel driving between Headquarters and the test areas. The Road to the HWSF dead ends at the unit and is only traveled by personnel working at the unit.

2.7. Geology

The geology of WSMR consists predominantly of the Tularosa Basin and the surrounding mountain ranges. The San Andres, San Augustin, and the Oscura Mountains border the Tularosa Basin on the west while the Sacramento Mountains form the eastern border. The average elevation of the Tularosa Basin is 4,000 feet above mean sea level. The majority of WSMR property, including the area around the HWSF, is located within the Tularosa Basin. The Tularosa Basin contains thick sequences of Tertiary and Quaternary age alluvial and bolson fill deposits. These sediments, more than 5,000 feet thick in some areas, consist mainly of silt, sand, gypsum, and clay weathered from the surrounding mountains.

2.8. Geohydrology

The WSMR Main Post obtains its potable water supply from an aquifer located in the upper bolson deposits. The majority of ground water recharge to this aquifer occurs through the coarse, unconsolidated Tertiary/Quaternary alluvial fan deposits and arroyos along the eastern flank of the Organ, San Augustin, and San Andres Mountains. Ground water flow direction is generally toward the center of the Tularosa Basin. To the east, near the HWSF, ground water becomes more mineralized, primarily with sulfate and chloride.

Four monitoring wells are located in the vicinity of the PSU. These four wells penetrated very similar lihthologies consisting primarily of heterogeneous bolson-fill deposits of interbedded sand gravel, silt and clay. Depth to groundwater is approximately 230 feet below ground surface (bgs) and groundwater generally flows south-southeast. The groundwater is highly saline and nonpotable and has a total dissolved solids (TDS) concentration of greater than 15,000 milligrams per liter (mg/L). The nearest production well yielding potable water is in the Main Post area, more than 8 miles west of the PSU.

2.9. Seismic Standards

The HWSF is not located in a county designated in 40 CFR 264 Appendix VI for seismic considerations; therefore, the HWSF is exempt from seismic considerations.

2.10. Flood Plain Standards

The HWSF is located above the 100-year flood plain boundaries. No permanent surface water of constant flow conditions is located in the area. The HWSF is located on relatively flat terrain. Topographic contours are illustrated on Figure 2-1. No permanent surface water of constant flow conditions is located in the area.

2.11. Container Storage Procedures

When containers are received at the unit, they are unloaded and handled in a manner to minimize potential damage to the container and potential hazards to the workers. A forklift is used for most

container handling operations. Containers are also inspected, weighed, and recorded on a log. Doing so ensures that the waste is held in the appropriate container and the integrity of the container has not been compromised.

Containers holding hazardous waste will be kept closed, except when it is necessary to add or remove waste. Aisle space will be maintained for unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in case of emergency.

Incompatible wastes will be segregated to ensure that they cannot mix in the event of a leak or accidental release. Containers will be compatible with the waste to be stored as required by this Permit.

2.12. Container Storage Area

The HWSF consists of indoor and outdoor container storage areas (Figures 2-2 through 2-5), including a large metal building, multiple portable storage units, concrete pads, and gravel parking areas. Containers may be stored outdoors, inside of building S22895, or inside of the portable storage units.

Building S22895 provides approximately 1,760 sq feet of enclosed floor space that will be used for container storage. Five portable metal storage units are also located at the HWSF. The storage units vary in size, approximately 7 feet by 8 feet and 15 feet by 8 feet.

A concrete pad extends outside surrounding the north, east, and south sides of building S22985. This area may also be used for container storage.

A dirt and gravel parking area extends outside of the buildings and concrete pad within the boundary of the HWSF. The ground surface in the area is level suitable for safe vehicular movement and may also be used for container storage.

2.13. Spill Containment

Containers that contain free liquids will be stored using secondary containment in accordance with Permit conditions. Containment methods include the use of portable spill containment pallets, temporary berms, the built-in containment of the storage units, or the concrete containment area inside of building S22895.

Building S22895 has a built-in containment area consisting of a reinforced pit measuring 47 feet by 11 feet by 15 in. deep. The concrete will be maintained free of cracks or gaps and are sufficiently impervious to contain liquids until the collected material is detected and removed.

The portable metal storage units have floors that are continuously welded and coated to provide corrosion resistance. The internal spill containment systems within the portable storage units have a capacity exceeding 25% of the total storage capacity.

Spilled or leaked material will be removed from the secondary containment systems as needed to prevent overflow. Spill cleanup supplies will be kept at the facility.

Containers that do not contain free liquids may be stored on the concrete pads or on the soil parking areas within the HWSF. Surface features in the vicinity of the HWSF consist of sandy areas and sand dunes. Terrain surrounding the storage areas is graded to prevent stormwater run-on and promote adequate drainage during precipitation events.

2.14. Security and Access

The HWSF is enclosed with a chain-link fence with barbed wire on top and may be entered only through two gates. The gates are locked when the facility is not in use. Signs are posted near each gate that read as follows in both English and in Spanish: "DANGER, UNAUTHORIZED PERSONNEL KEEP OUT."

Additional signs may be posted when appropriate such as "POLYCHLORINATED BIPHENYLS (PCB'S), DANGER!, CANCER SUSPECT AGENT, AUTHORIZED PERSONNEL ONLY".

Warning will be legible from a distance of at least 25 feet (8 m).

2.15. Precautions and Emergency Preparedness

Precautions will be taken to mitigate hazards to workers and to minimize potential damage to the facility or waste storage containers. Building S22895 and the portable storage units are placarded to identify hazards associated with each building.

Waste will be protected from sources of ignition or reaction. Signs are posted on three outside walls of Building S22895 that read as follows: "NO SMOKING WITHIN 100 FEET OF BUILDING".

The storage buildings are electrically grounded and have explosion proof lighting.

Building S22985 is equipped a spill kit, portable fire extinguishers, emergency shower and eyewash, and water hose. The building also has two roll-up doors that accommodate vehicle entry into the building if needed.

The portable storage units are equipped with ventilation systems, explosion proof lighting, fire protection systems, and electrical grounding systems. Hold-down brackets for wind bracing are provided and rated for winds up to 110 miles per hour.

A landline telephone is provided in Building S22985. In the event of an emergency, personnel will dial 911 to directly contact WSMR Emergency Services. The Emergency Services dispatcher will ask the nature of the emergency and will activate the appropriate emergency personnel (Ambulance, Fire, Police, HAZMAT, etc.).

2.16. Inspection Schedule

Inspections will be conducted weekly as described in Permit Attachment 5 to ensure safety and emergency equipment are in proper working order, containers are structurally sound, and the communication and alarm systems are operable. Deficiencies shall be documented.

If an inspection reveals that non-emergency repair or maintenance is needed, the remedial action will be accomplished on a schedule that ensures that the problem does not lead to an environmental or human health hazard. If the deficiency constitutes an emergency involving hazard to human health or the environment, the remedial action shall be initiated immediately.

2.17. Traffic Patterns

Waste is transported to and from the HWSF via Range Road 2 and 15. Traffic density ranges from 200 to 1,000 motor vehicles per day. About 95 percent of this traffic consists of cars and pickups. The rest of the time, traffic is light. There is no traffic within the HWSF area other than the occasional motor vehicle transporting hazardous waste to and from the HWSF.

Figure 2-1. Location of the Permitted Container Storage Unit

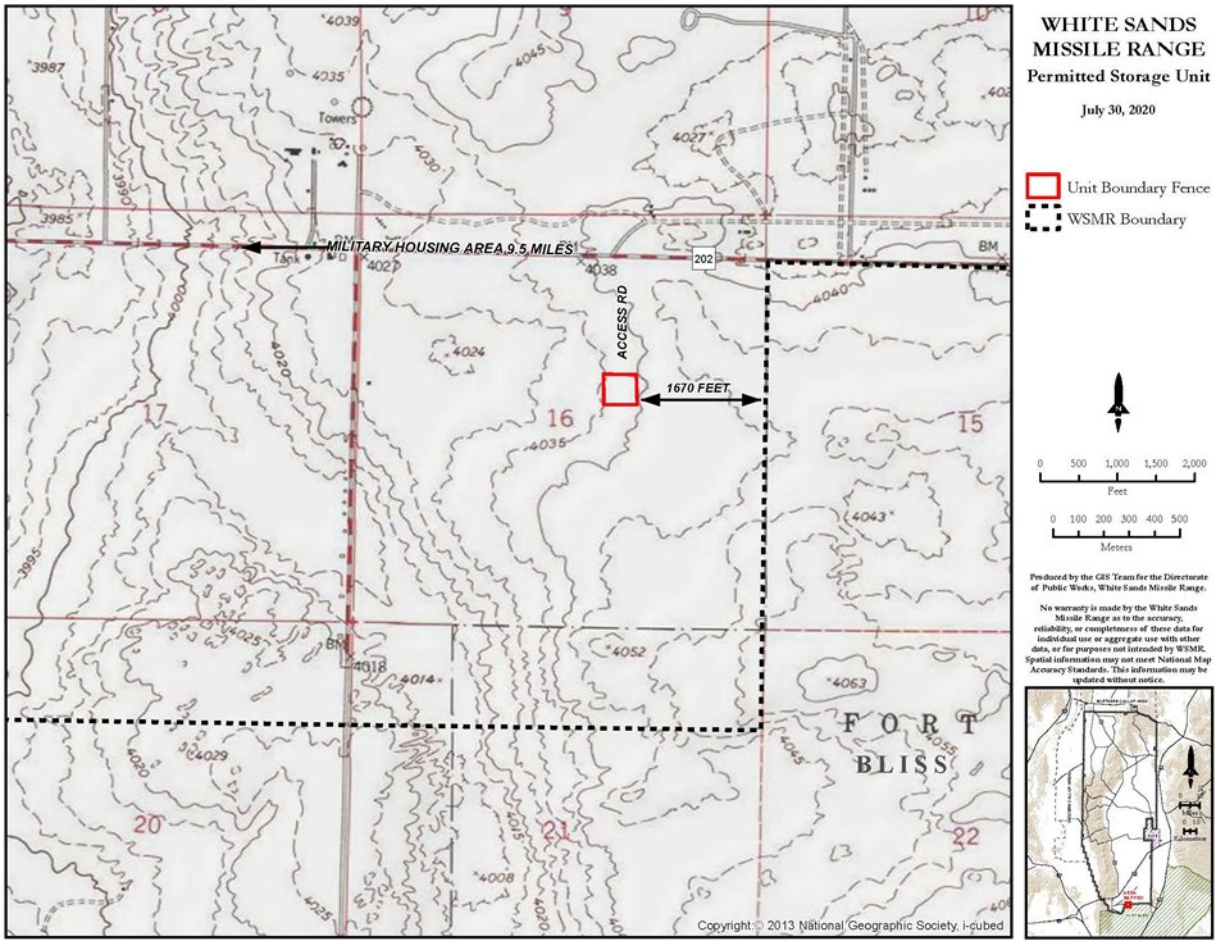


Figure 2-2. Configuration of the Permitted Container Storage Unit

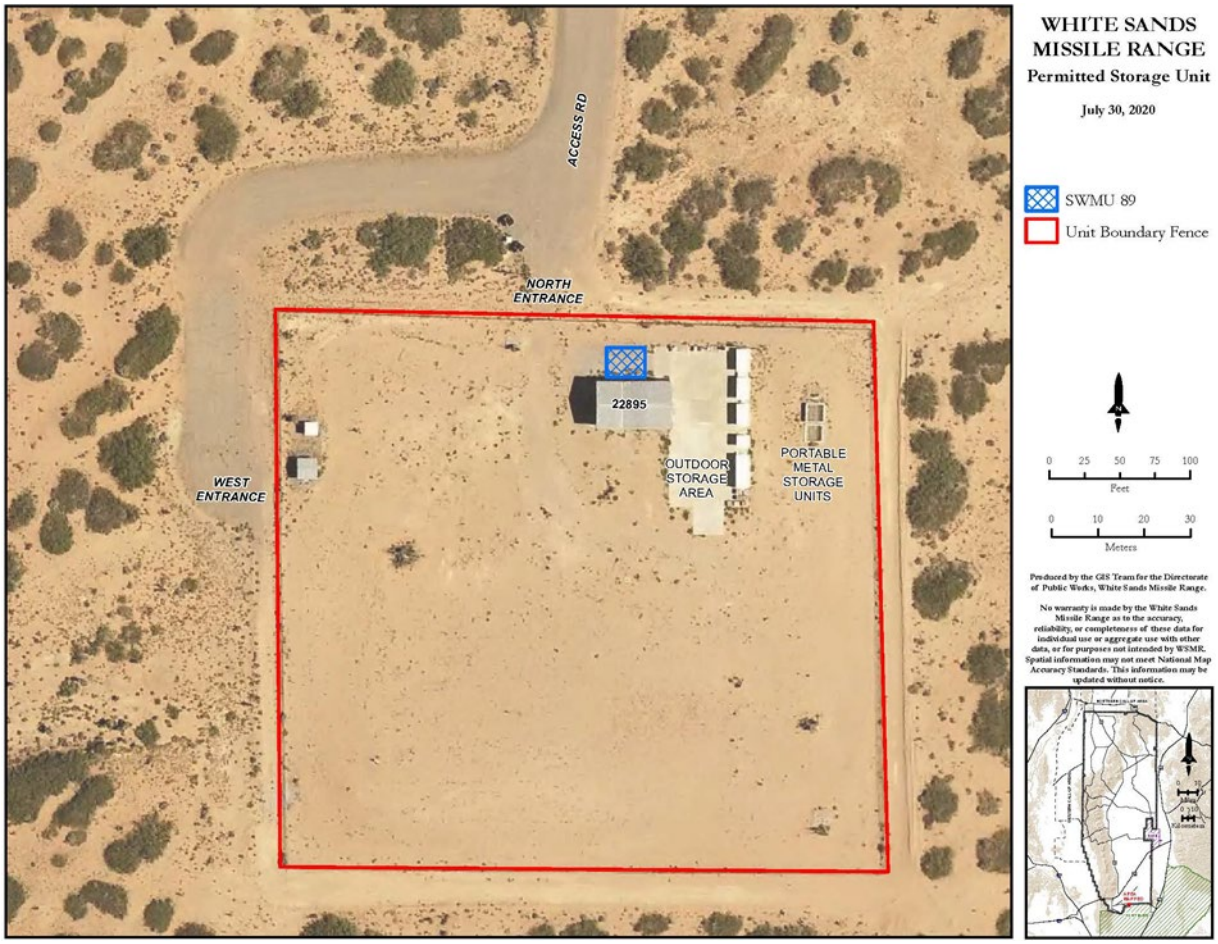


Figure 2-3 Containment area in Building S22895 at the HWSF

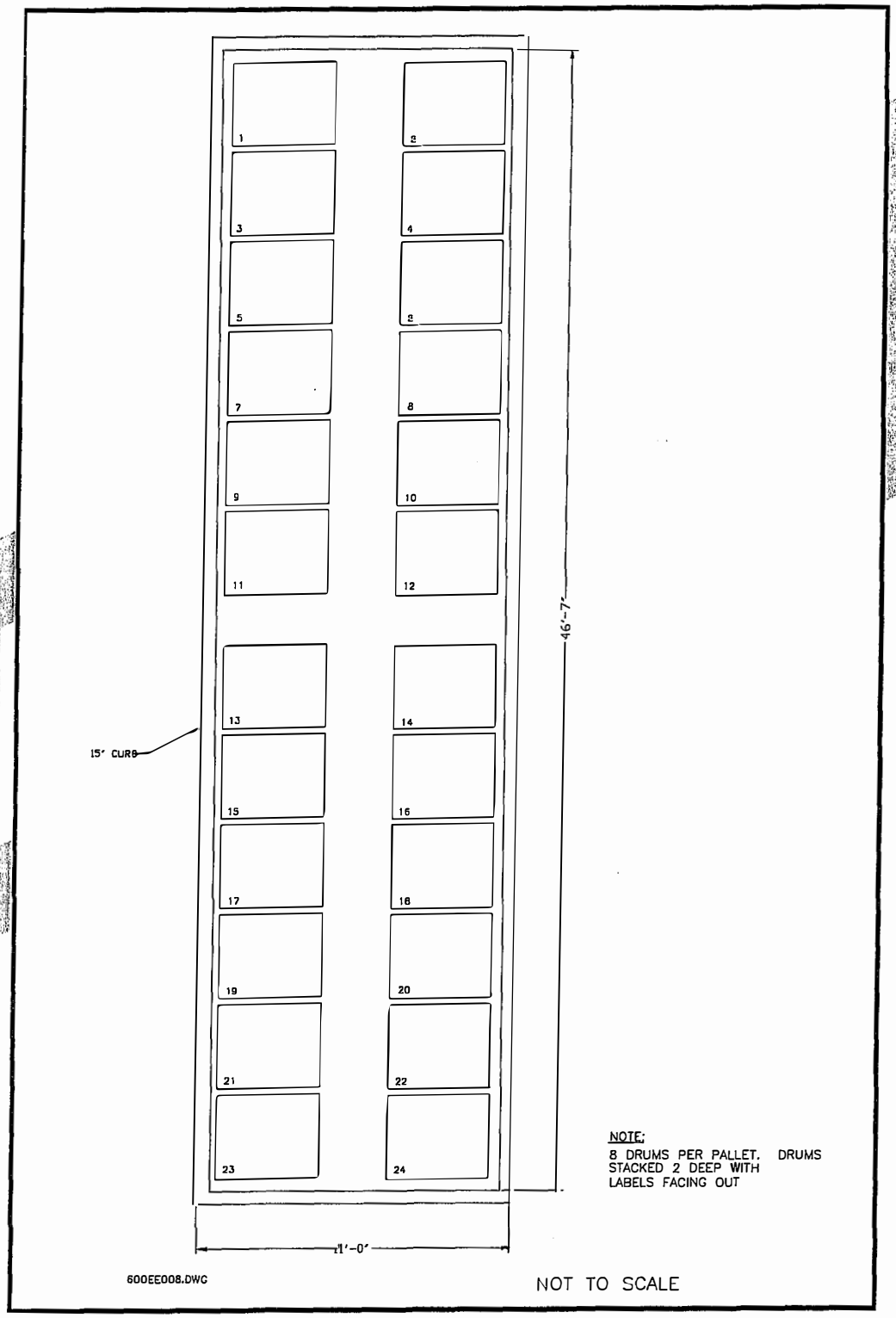


Figure 2-4 Containment Area in Buildings S22903(A), 22904 (B)& 22905 (C)

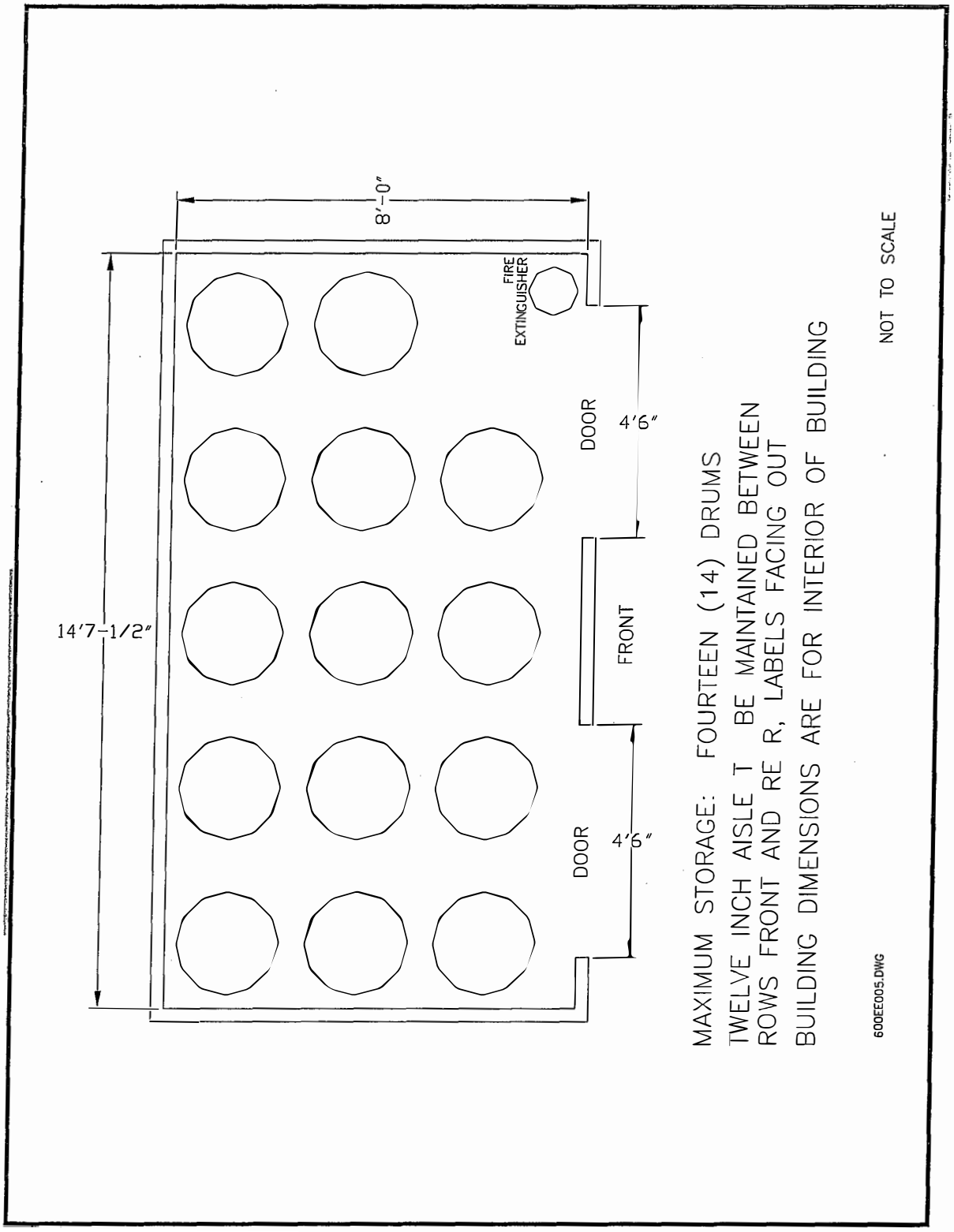
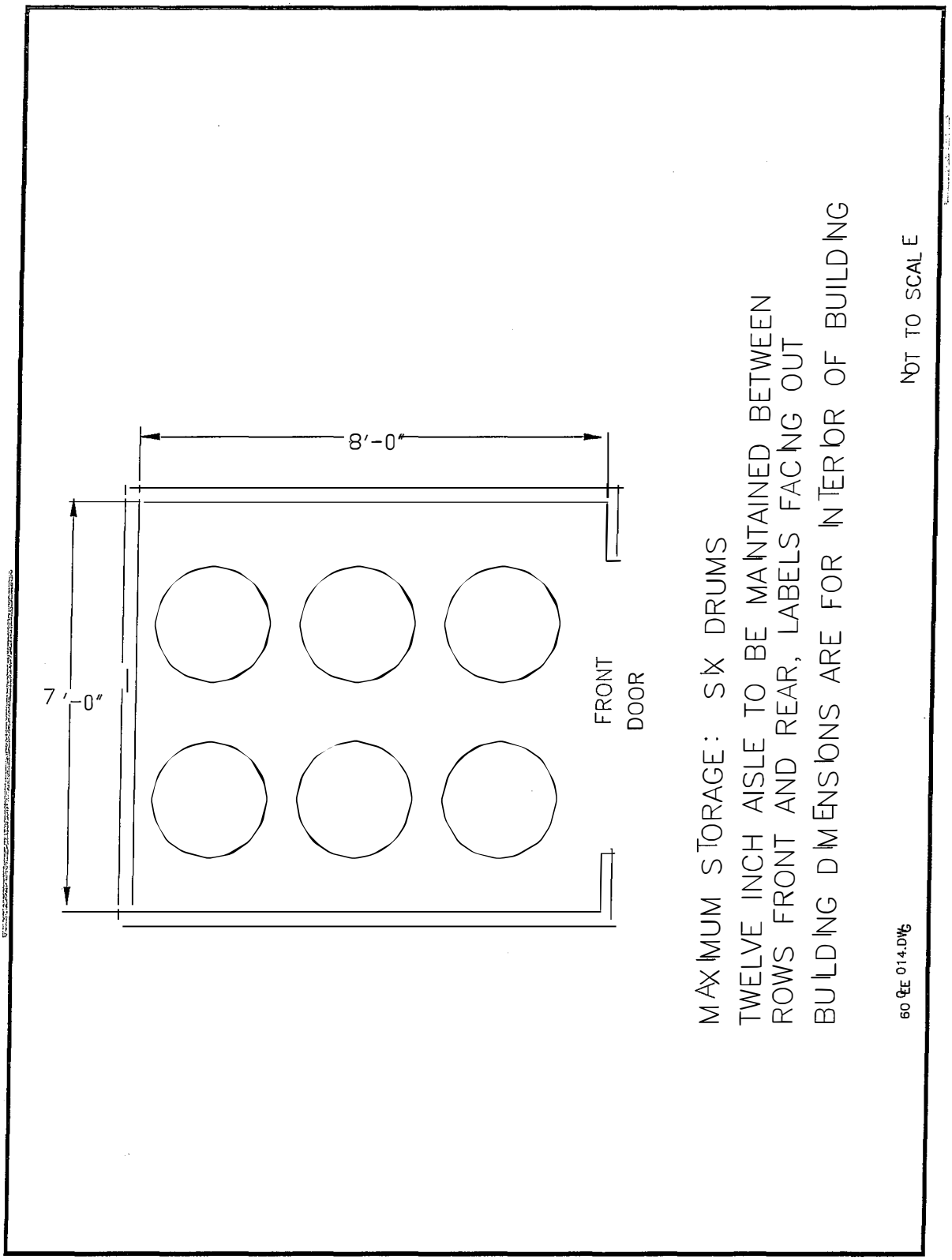


Figure 2-5 Containment Area in Building S22906(D)



ATTACHMENT 3
WASTE ANALYSIS PLAN

3.0 WASTE ANALYSIS PLAN

3.1 Introduction

The Hazardous Waste Storage Facility or HWSF located on WSMR is used to store waste prior to shipment for off-site disposal. A detailed description of the HWSF and a discussion of the facility design and operation are provided in Permit Attachment 2.

The requirements for a Waste Analysis Plan (WAP) are established in the New Mexico Hazardous Waste Management Regulations at NMAC 20.4.1.500, incorporating 40 CFR 264.13, pursuant to NMAC 20.4.1.900, incorporating 40 CFR 270.14 (b) (2-3). These regulations require waste characterization through acceptable (process) knowledge, analysis, or historical data to provide all the information neededto store, and ultimately dispose of the waste, as required by 20.4.1.300 NMAC, incorporating 40 CFR 264.13 and 40 CFR 268.7.

This WAP will be periodically reviewed to ensure the plan is compliant with current regulations and WSMR waste streams. The most recent revision of this (WAP) will be maintained at WSMR as part ofthe required Operating Record. Should the requirement for revision be identified, the NMED will be notified and a permit modification to incorporate the revised WAP will be initiated.

3.2 Waste Characterization Objectives

The WAP describes the procedures used to obtain sufficient waste information to operate the HWSF andthe hazardous waste sampling and analytical procedures routinely conducted.

It addresses the following specific items: 1) waste characteristics; 2) current waste sources; 3) sampling procedures; 4) chemical and physical analysis; 5) incompatible wastes; 6) quality assurance/quality control (QA/QC) procedures and 7) recordkeeping.

NMED has established data quality objectives (DQOs) for WAPs, to ensure that regulatory requirementsof the Resource Conservation and Recovery Act (RCRA) are met. These DQOs include:

1. To determine information needed to treat, store and dispose of the wastes in accordance with New Mexico's Hazardous Waste Regulations 20.4.1.500 NMAC, incorporating 40 CFR 264.13 (a)(l);
2. To determine if the waste is hazardous as required by 20.4.1.300 NMAC, incorporating 40 CFR 262. 10 (b) and 262.11;
3. To determine the hazardous constituents in a waste stream to identify all applicable hazardous waste codes and all underlying hazardous constituents as required by 20.4.1.300 NMAC, incorporating 40 CFR 262.11, 20.4.1.800 NMAC, incorporating 268.7 (a)(1) and (2), and 268.9 (a);
4. To determine whether the waste must be treated before it can be land disposed as required by 20.4.1.800 NMAC, incorporating 40 CFR 268.7 and 268.9;
5. To determine whether a routine waste generating process has changed sufficiently to create a new waste stream and alternative regulatory requirements as required by 20.4.1.800 NMAC, incorporating 40 CFR 264.13 (a)(3)(i), 268.7 (a)(3)(iii), and 268.7 (b)(3)(ii));
6. To facilitate appropriate waste packaging for transportation as required by 20.4.1.300 NMAC, incorporating 40 CFR 262.10 (h);
7. To determine the presence and concentration of wastes constituents that might cause unlawful air emissions as required by 40 CFR 270.25 (a), 264.179, 264.200, 264.13 (b)(6), and 264.1082;

8. To ensure that wastes are not inappropriately diluted to avoid treatment requirements as required by 20.4.1.800 NMAC, incorporating 40 CFR 268.3;
9. To determine the presence of prohibited waste as required by 40 CFR 268.50;
10. To determine the presence of free liquids in wastes as required by 40 CFR 270.15 (b)(1), 264.13 (b)(6);
11. To determine waste/waste and waste/container compatibility characteristics as required by 40 CFR 270.15, 270.16, 264.172, 264.177, and 264.199; and
12. To determine waste ignitability and reactivity characteristics as required by 40 CFR 270.16 (j), 264.17, and 264.198.

3.3 Waste Analysis Approach

3.3.1 Acceptable (Process) Knowledge

The HWSF receives waste that is generated from numerous buildings and shops on WSMR. For many of these waste streams, acceptable (process) knowledge can be used to make a waste characterization using data developed under 40 CFR Part 261, or existing published or documented data on the waste or on waste generated by a similar process, as specified in 40 CFR 264.13(a)(2). For example, the generator of a waste stream may know and be able to document that none of the constituents in a given waste are hazardous. For other waste streams, analytical samples have been historically collected and used to make waste characterizations.

The characterization for a waste stream, whether it is based on acceptable (process) knowledge or historical data must be reevaluated any time the process generating the waste is changed or the knowledge of process or safety data sheet has changed. Waste streams that have been combined must be analyzed and the proportion of each waste reported.

Some wastes turned in to the HWSF cannot be characterized by one of the above methods. Samples of these wastes are collected and analyzed to draw conclusions about the waste characteristics and disposal requirements. Many of these waste streams are generated in the course of fulfilling the mission of WSMR. Subsequent wastes from the same process are then characterized by the results of the initial sample. In accordance with 40 CFR 264.13 (a)(3) and 40 CFR 264.13(b)(4), additional samples from the same waste stream are collected when:

- There is reasonable doubt about the identity of the waste;
- The process generating the waste has changed such that the characteristics of the waste may change; or
- Confirmation is needed that the analysis is current.

3.3.2 Identification/EPA Classification of the Hazardous Waste Managed

Many of the activities conducted at WSMR, in support of its diverse missions, generate waste streamswith the potential to be hazardous. The potentially hazardous waste streams can be assigned to one ormore waste generating activity groups identified at WSMR.

Activities within a group generate similar types of wastes by virtue of having similar functions. Through the analysis and characterization of numerous waste streams, the constituents likely to be found in each ofthe major activity groups can be identified. The knowledge of the processes and the associated waste streams is used to select the appropriate analytical parameters for sampling and avoid unnecessary sampling.

To ensure that all waste characterization information is accurate, the following determinations will bemade:

1. Whether the waste was characterized at the point of generation, in compliance with 20.4.1.800 NMAC, incorporating 40 CFR 268.7(a)(3) and 268.9(c);
2. Whether routinely generated wastes are re-evaluated annually to ensure that the characterization is accurate and current and in compliance with 40 CFR 264.13(a)(3);

3. Whether generators have appropriately identified when the processes or activities that routinely generate the waste have changed; in compliance with 20.4.1.500 NMAC, incorporating 40 CFR 264.13(a)(3)(i).

The major waste categories, the specific waste type, their respective parameters of concern for analysis, and Environmental Protection Agency (EPA) waste codes are outlined in Table 3.1 in accordance with 40CFR 264.13(b)(1) and (2). This table may not be a comprehensive list of all specific wastes but provides the framework for making decisions on chemical analyses for common WSMR waste streams. Many of the waste streams listed in the table can be characterized by acceptable (process) knowledge, on the basis of historical sampling and analytical data or other appropriate documentation such as Safety Data Sheets (SDSs), eliminating the need for additional analyses.

Table 3.1. Major Waste Categories and Parameters of Concern.

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes[1]	LDR (WW or NWW)[2]
Research, Development, Testing and Evaluation (RDT&E)	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Solder waste (C)	SDS	Corrosivity (D002), silver (D011), lead (D008)	NWW
	Spent Laser dye solution (I)	KOP[3], SDS	Ignitability (D001), solvents (VOCs and SVOCs)	NWW
	Used shop floor sweeping compound (T)	KOP[3], SDS	RCRA metals	NWW
Installation Remediation Activity	Contaminated purge water (Listed)	KOP[3]	RCRA metals, solvents (VOCs and VOCs) (F002), (F003), (F005)	WW
	Contaminated fuel/solvents (I, listed)	KOP[3]	Ignitability(D001), solvents (VOCs and SVOCs)	NWW
	Contaminated soil (Listed)	KOP[3]	RCRA metals, solvents (VOCs and SVOCs) (F002), (F003), (F005)	NWW
	Rags and debris contaminated with	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes[1]	LDR (WW or NWW)[2]
	solvents and oil (I,T, listed)			
	Used shop floor sweeping compound (T)	KOP[3],	RCRA metals	NWW
Vehicle Maintenance	Rags contaminated with solvents, oil and grease (I,T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Used fuel filters (I,T)	KOP[3], Historical Test Data	Ignitability (D001), benzene (D018)	NWW
	Used Antifreeze (T)	KOP[3], SDS, Historical Test Data	RCRA metals	NWW
	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Off-Spec. Fuels	KOP[3], SDS, Historical Test Data	Ignitability (D001), VOCs and SVOCs	NWW
	Used shop floor sweeping compound (T)	KOP[3], SDS	RCRA metals	NWW
Equipment Maintenance	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents, oil and grease (I,T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Used fuel filters (I, T)	KOP[3] & Historical Test Data	Ignitability (D001), benzene (D018)	NWW
	Used Antifreeze (T)	KOP[3], SDS, Historical Test Data	RCRA metals	NWW
	Off-Spec. Fuels	KOP[3], SDS, Historical Test Data	Ignitability (D001), VOCs and SVOCs	NWW
	Used shop floor sweeping compound (T)	KOP[3], SDS	RCRA metals	NWW
Shop Operations	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP[3], SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes[1,4]	LDR (WW or NWW)[2]
	Solder waste (C)	SDS	Corrosivity (D002), RCRA metals	NWW
	Used shop floor sweeping compound (T)	KOP[3], SDS	RCRA metals	NWW
Laboratory Activities	Spent solvent wastes (I,T,listed)	SDS	Ignitability (D001), solvents (VOCs and SVOCs)	NWW
	Corrosives (C,T)	SDS	Corrosivity (D002), RCRA metals	NWW
	Rags contaminated with solvents (I,T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Lab packs of expired chemicals (I, C, T, listed)	KOP[3], SDS,	Ignitability (D001), corrosivity (D002), RCRA metals, solvents (VOCs and SVOCs)	NWW
Photographic Operations	Flammable liquids (I,T)	KOP[3], SDS, Historical Test Data	Ignitability (D001), silver (D011), solvents (VOCs and SVOCs)	NWW
	Flammable corrosives (C,T)	KOP3, SDS, Historical Test Data	Ignitability (D001), silver (D011), solvents (VOCs and SVOCs)	NWW
Facility Maintenance	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
Paint and Solvent Recovery from Aerosol Can Recycling	Paint waste and solvent waste (I, T, listed)	KOP[3], SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags and debris contaminated with paint and solvent wastes (I,T, listed)	KOP[3], Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

[1] RCRA hazardous constituents and/or properties. Analysis may include full TCLP metals, if appropriate.
[2] Refer to 40 CFR 268.2 (d) and (f) for the definitions of wastewater (WW) and non-wastewater (NWW).
[3] KOP is defined as knowledge of process or acceptable knowledge.
C = corrosive I = ignitable T = toxic R = reactive Listed = EPAF-and U- or P-listed wastes
[4] Appropriate EPA test methods test methods (i.e., Sw-846) are required to achieve the required or estimated detection limits as specified in the appropriate EPA methods. If equivalent methods are used, these will be justified and approved by NMED in advance.

3.4 Selecting Waste Analysis Parameters

When acceptable (process) knowledge or historical analytical data are not available, testing of waste streams is conducted to obtain a detailed chemical and physical analysis in accordance with 40 CFR 264.13. The objectives of sampling are to:

- Confirm characterizations of wastes for which prior analysis or acceptable (process) knowledge is not available;
- Determine compliance with applicable regulatory requirements, including Land Disposal Restrictions;
- Provide information to aid in the safe management of wastes, such as using biodegradable sorbents, if appropriate;
- Provide relevant data for use in making disposal decisions and,
- Resolve differences associated with inspections and generator descriptions.

The following subsections outline the procedures that will be followed to ensure that the objectives aremet and that WSMR complies with all regulatory requirements for waste analysis.

3.4.1 Criteria and Rationale for Parameter Selection

Chemical analysis is conducted as needed to identify specific waste characteristics. Chemical analyses may vary, based on the knowledge of the processes generating the waste and the parameters of concern. Waste analysis parameters are selected to fulfill three criteria: waste identification, identification of incompatible or inappropriate wastes, and process and design considerations for container compatibility. The subsections below outline the rationale for the selection of these parameters in accordance with 40 CFR 264.13(b)(1).

3.4.1.1 Paint-related materials group

In general, uncharacterized waste associated with painting activities is analyzed to determine the presenceof metals above toxicity characteristic levels. Metals such as cadmium and chromium are found in some types of paints used in specific shops. Paint-related waste may also be tested for ignitability. Waste associated with the chemical stripping of paint and the use of paint thinners may be tested for the presenceof solvents or other semivolatile or volatile organic compounds (SVOC or VOC). Paint thinners, strippers, and rinse water associated with stripping may require testing for corrosivity, based on knowledge of the materials used in the process.

3.4.1.2 Vehicle and equipment maintenance waste

Vehicle and equipment maintenance activities generate a variety of waste streams with different characteristics. However, similar constituents are found in these waste streams. Because some waste or used fuels contain lead, cadmium, or other metals, a metals analysis is conducted for all uncharacterized waste streams involving vehicle or equipment maintenance. VOCs and SVOCs are also typical components of fuels and lubricants and should be tested for in uncharacterized waste streams associated with fuel or lubricant use. Wastes associated with parts cleaning and/or may have come into contact with solvents should also be tested for TPH and also VOCs and SVOCs, as halogenated and non-halogenated solvents can be identified by these analyses. Finally, because many of these waste streams are associated with fuels or ignitable substances, ignitability testing may be appropriate.

3.4.1.3 Shop Floor Sweeping Compound Waste

Shop floors, for some activities, are sprinkled with sweeping compound. This material helps to pick up dust and dirt from the floors. In soldering, welding and cutting processes, particulates can be generated and swept up with the sweeping compound. In other instances sweeping compound is used to absorb oils or other liquids from the floor. This waste group may be tested for RCRA metals, which could be present at levels that make the waste characteristic for toxicity, PFAS, and VOCs, or SVOCs as appropriate depending on the activity and products mixed with the sweeping compound.

3.4.1.4 Installation Remediation Activities

Wastes generated from Installation Remediation activities include environmental media (e.g. soil, groundwater) and contact-waste (e.g. personal protective equipment (PPE), decontamination solutions, debris, etc.). These wastes can vary widely and are addressed on a case-by-case basis. Work Plans are

prepared for each investigation or remediation project. Management of any wastes expected to be generated is discussed in the Work Plan.

3.4.1.5 Photographic Operations

Metals are the primary concern in wastes from photographic operations. Mercury is found in photo imaging paper and should be tested for in uncharacterized waste streams associated with this paper. Othermetals such as cadmium, selenium, and silver are found in wastes such as photo-fixing solution and silverrecovery cartridges. These metals are often present at levels that make these wastes characteristically toxic. In addition, VOCs and the corrosivity of uncharacterized waste streams may also be tested.

3.4.1.6 Aerosol Can Puncturing Activities

RCRA-empty aerosol cans are collected for scrap metal recycling. They are then punctured by a device commonly called a "can popper." Any residual liquid contents in the aerosol cans are captured by draining into a drum. The collection drum is kept closed, except when actively puncturing cans. The recovered liquids are accumulated until the drum is near full. Analysis is performed for VOCs, SVOCs, ignitability and RCRA metals, based on knowledge of the various products contained in aerosol cans around WSMR activities and RCRA characteristics, as applicable. Aerosol cans that cannot be punctured such as foams, pesticides, and adhesives are managed under waste characterization procedures for disposal.

3.4.1.7 Miscellaneous

Spill cleanups and lab packs are other waste streams that can occur. These wastes are not generated on a regular basis, and the waste characteristics change depending on the material spilled. These wastes will be addressed on a case-by-case basis, and knowledge of the material spilled could form the basis for selecting analyses to run. Labs packs result from the decision to discard expired shelf-life products and materials that can no longer be used. SDS sheets can provide the basis for performing a hazardous waste determination or for determining the analyses required.

3.4.1.8 Other Analyses to Support Treatment Alternatives

In addition to the specific analyses identified in Table 3.1, other analyses such as thermal content British Thermal Units (BTUs) may be conducted to provide information regarding treatment alternatives. Current analytical methods are provided, but these are suggested methods and are not meant to be restrictive of the analyses that can be performed. In many cases, additional analytical methods for constituents may be appropriate. The methods are intended to serve as a guide and could be substituted for other, more relevant or more current methods as they are developed. The analytical laboratory may be consulted prior to sampling events to ensure that the most up-to-date methods are used for analysis.

3.4.2 Special Parameter Selection and Procedural Requirements

Additional waste analysis and procedural requirements for wastes may be necessary in special cases; specifically for ignitable, reactive, and incompatible wastes, and to comply with LDR requirements.

3.4.2.1 Ignitable, Reactive and Incompatible Wastes

Parameters are chosen to ensure the proper storage and disposal of these wastes in accordance with 40CFR 264.17(b), by preventing reactions which:

- Generate extreme heat or pressure, fire or explosions, or violent reactions;
- Produce uncontrolled toxic or flammable fumes or gases;
- Damage the structural integrity of the containers or the HWSF; and
- Threaten human health or the environment.

The same waste analysis approach is employed for determining the characteristics of ignitable, reactive,and incompatible waste is outlined in Part 2.4.2.1 of this permit, in accordance with 40 CFR264.17(c). All sampling and analytical procedures used for waste characterization, with the exception of hydrazine wastes, shall be performed in accordance with the most recent version of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, (U.S. EPA Publication SW-846) or an equivalent method with prior NMED approval.

The procedures for properly handling ignitable, reactive, and incompatible wastes at the HWSF are outlined in detail in Part 3.11 (Special Provisions for Ignitable or Reactive Waste) of the permit and as specified by 40 CFR 264.17(a).

3.4.2.2 Land Disposal Restrictions

The hazardous wastes stored at the HWSF are prohibited from land disposal if contaminant concentrations exceed levels listed in 40 CFR 268, Subpart D. Containers of such wastes are stored solely for the purpose of accumulation of quantities necessary to facilitate proper recovery. In accordance with NMAC 20.4.1.800, incorporating 40 CFR 268.50, these wastes will be stored for less than one year. Each container is clearly marked to identify its contents, quantity, and the accumulation start date. When generated waste is determined restricted from land disposal, all supporting data used to make the determination are kept on file per 40 CFR 268.7(a)(6)(ii).

Before shipping hazardous wastes off site, a determination will be made as to whether the waste needs treatment before it can be land disposed. In accordance with the LDR regulations outlined in 40 CFR 268.7, hazardous wastes must meet the applicable LDR treatment standards contained in 40 CFR Part 268, Subpart D. This determination will be made by either acceptable (process) knowledge or testing. If it is known that the wastes do not meet applicable LDR treatment standards based on acceptable (process) knowledge or historical analytical results, no testing is necessary. Additional testing, if necessary, will be conducted only to certify that the waste meets LDR treatment standards. Each waste for which a treatmentstandard has been set will be evaluated for the applicable parameters in 40 CFR Part 268, Subpart D. In addition, for any wastes that exhibit the hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity, the underlying hazardous constituents shall be determined in accordance with 40 CFR 268.9. All analytical results generated in support of LDR requirements shall be retained within the Operating Record.

Wastes resulting from WSMR operations that exceed the applicable LDR treatment standards will be sentoff site to a permitted treatment facility. LDR notifications, and any additional data as required by 40 CFR 268.7(a)(2), will be supplied with the shipment of each waste. Wastes that are determined through analysis to meet treatment standards as specified in 40 CFR Part 268, Subpart D, can be land-disposed in a permitted facility without further treatment. An LDR certification, including data to support the certification as required by 40 CFR 268.7(a)(3), will be prepared and accompany the shipment of waste tothe receiving facility.

3.5 Sampling and Analysis Plan

This section presents the Sampling and Analysis Plan (Plan) for wastes managed at the HWSF.

3.5.1 Objectives

The Plan provides procedures for testing the waste streams requiring analytical characterization that are stored in the HWSF. It explains how samples will be collected and the analyses that will be performed. The plan's design is based on knowledge of the materials used at WSMR and knowledge of the characteristics of categories of waste. Specific topics covered in this plan include:

- Sampling procedures and methodology;
- Sampling QA/QC Procedures;
- Sample Container Preservation Requirements; and
- Laboratory procedures.

Samples collected shall be prepared according to the most current appropriate EPA sample protocol. If EPA methods are not available, ASTM methods are used.

Proper waste identification will be ensured by the following measures:

- A waste profile form will be prepared for each new waste stream to identify the process and characterize the waste;

- An annual review of waste stream will be conducted to determine waste inconsistency with the waste profile and whether additional sampling is warranted;
- Waste generators identify when new material is introduced into process for determination of the need for re-evaluation of the waste stream.

3.5.2 Sampling Methodology

In many cases, samples from containers containing waste will be collected for characterization. This section outlines the procedures and methods to be followed for sampling containers containing liquid and non-liquid organic and inorganic wastes. Sample handling, sample documentation, and sampling quality assurance and quality control are outlined in subsequent sections.

The physical, chemical, and waste-specific parameters of each waste are considered to determine the most appropriate type of sampling equipment and sampling strategy. Sampling personnel will be knowledgeable of, and have experience with, the sampling techniques outlined below.

As part of the inventory, a visual inspection of the container and its contents is conducted. Once a visual inspection inventory has been completed, the container to be sampled is opened. Only sampling equipment constructed of materials that are compatible with wastes and not susceptible to reactions thatmight alter or bias the physical or chemical characteristics of organic and inorganic wastes is used.

To ensure proper characterization of the waste in situations where acceptable knowledge is not sufficient to make a complete hazardous waste determination, a representative sample is collected. Because the physical state of the hazardous waste stored at the HWSF may vary from free liquid to solids, the representative sample must be tailored to these physical states. Generic sampling procedures are describedbelow.

For liquid wastes, the representative sample is a grab sample per container taken by an appropriate sampling device such as a composite liquid waste sampler (Coliwasa), per the most recent EPA *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods* or other NMED approved methods. The sampling device and decontaminated sample containers are made of glass or fluorinated ethylene propylene (FEP) plastic to guard against loss or cross contamination of volatile organics. If a container has only one bung opening, the sample is taken from that opening such that the entire depth of the container is sampled and then analyzed. If the container potentially demonstrates liquid stratification or sediment settling, sampling methods detailed in ASTM procedures will be used. These include Method D5743-97 (Standard Practice for Sampling Single or Multilayered Liquids, With or Without Solids, in Drums or Similar Containers) or Method D5956-96 (Standard Guide for Sampling Strategies for Heterogeneous Wastes, as they may be updated.

For containers containing sludges or solid wastes, a representative sample is taken using the appropriate sampling protocol as listed in 40 CFR 261, Appendix I. This includes: 1) ASTM Method D140-70 for extremely viscous liquid; 2) ASTM D346-75 for crushed or powdered material; 3) ASTM D420-69 for soil or rock-like material; 4) ASTM 1452-65 for soil-like material; 5) and ASTM D2234-76 for fly ash-like material. These methods specify the sampling device and appropriate procedure for collecting the sample.

For wet materials, it is necessary to identify whether the waste will or could generate free liquids, as defined at 40 CFR 260. The presence of free liquids can be identified by visual inspection of the containeror by conducting the paint filter test (EPA Method 9095).

These tests will be conducted to determine whether the waste contains or could generate free liquids.

Contact-waste, such as gloves, rags, or other non-liquid wastes, may be sampled or they may be characterized based on knowledge of the contaminating process. In the event of a release/spill to the ground, contaminated soil may be sampled or may be characterized based on knowledge of the spilledmaterial.

3.5.3 QA/QC Procedures

The quality assurance (QA) process ensures that all decisions made about waste characterization and the

data used are technically based, and that proper documentation is maintained. Quality control (QC) tools are used to measure whether the QA objectives are met.

Sampling for waste characterization will be conducted in accordance with the guidance provided in the EPA document SW-846 and EPA's waste analysis plan guidance manual (*Waste Analysis at Facilities that Generate, Treat, Store and Dispose of Hazardous Waste).* Quality assurance for sampling will apply to all samples for waste characterization. The QA program for sampling includes requirements for the following:

- Training requirements for sampling personnel, including QA/QC procedures and proper sampling techniques
- Chain-of-custody protocols for tracking samples
- Review of procedures by sampling personnel to ensure proper use of equipment
- Procedures for equipment maintenance
- Procedures for field sampling QC
- Documentation of sampling locations.

All sampling conducted for the purpose of characterizing wastes will use appropriate QA/QC procedures. Additionally, WSMR will ensure that waste characterization information is accurate by making the following determinations:

- Whether the waste was characterized at the point of generation, in compliance with 40 CFR 268.7(a)(3) and 268.9(c);
- Whether routinely generated wastes are re-evaluated (or re-profiled), at least annually, to ensure the waste's characterization is accurate and up to date, in compliance with 40 CFR 264.13(a)(3);
- Whether SAP operators have appropriately identified when the process or operation generating routinely generated wastes has changed, in compliance with 40 CFR 264.13(a)(3)(i); and
- Whether persons preparing hazardous waste determinations are trained in the applicable waste characterization requirements as required by 40 CFR 264.16.

3.5.4 Sampling Procedures

3.5.4.1 Documentation of Activities

Sample containers will be uniquely identified with the following information:

- Collector's initials;
- Sample identification;
- Analytical methods requested;
- Generating facility;
- Sample date; and
- Sample time.

3.5.4.2 Contamination Control

Only compatible sampling tools and containers will be used for sample collection and storage. Sampling tools and equipment will be protected from contamination sources prior to sampling and will be decontaminated before and between samples, if reused. Sample containers will also be protected from contamination sources. Sampling personnel will wear clean chemical-resistant gloves when handling sampling equipment and samples. Gloves will be decontaminated or disposed of between samples.

3.5.4.3 Chain of Custody

Chain-of-custody (COC) forms will be used and procedures will be followed to track possession of the samples from the time they are collected until the analytical data from the samples are received and recorded. For all samples, procedures will begin once sampling is complete. The following information will be

recorded when samples of waste are collected:

- The type of waste collected, and a brief description;
- Requested test methods;
- The names and signatures of the samplers;
- The sample number and the date and time of sample collection;
- The names of any persons involved in transferring samples; and
- The shipping number (e.g., air bill number) for samples shipped to off-site laboratories.

A sample will be considered under custody if it is: in the possession of the sampling team; in view of the sampling team; or transferred to a secure area.

3.5.4.4 Container and Preservation

Samples will be collected in new, pre-cleaned sampling containers and will be kept cold during storageand transportation as necessary. Containers, preservatives, and holding time requirements will be determined based on EPA method requirements or direction from the analytical laboratory.

At the end of each sampling event, samples will be carefully packaged to prevent damage during transport or shipping. Each shipping container will be shipped to an analytical laboratory by an overnight delivery service, transported directly by a contracted laboratory, or transported directly to the laboratory.

3.5.5 Laboratory Analysis

Each laboratory used to conduct analyses will maintain an internal quality assurance program, as documented in its laboratory quality assurance manual. The laboratories will use a combination of blanks, surrogates, duplicates, MS/MSD (matrix spike, matrix spike duplicate) and laboratory control samples to demonstrate analytical Quality Assurance/Quality Control (QA/QC). Control limits will be established for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The procedures to be completed and the laboratory control limits will be included in the QA manual for each laboratory used. QA/QC procedures will follow those in the most recent appropriate EPA methods. The following is a summary of the laboratory specifications. The laboratory report will contain the following:

- Unique laboratory identification;
- Sample identification;
- Sampling date;
- Preparation date;
- Analysis date;
- Preparation batch;
- Preparation method;
- Analysis batch;
- Analysis method;
- Analyte;
- Results;
- Footnotes/data qualifiers;
- Units;
- Sample matrix;
- Method detection limit;
- Dilution factor;
- Case narrative (if necessary); and
- Laboratory control sample results.

Appropriate EPA methods address most of the procedures proposed in this Plan. The laboratory will be required to achieve the required or estimated detection limits specified in the appropriate EPA methods. Ifequivalent methods are used, these will be justified and approved in advance. NMED-approval is required for any equivalent methods employed by the laboratory. Analytical method detection limits shall

not be higher than the LDR treatment standards listed in40 CFR 268.40.

ATTACHMENT 4

CONTINGENCY PLAN

4. Contingency Plan

This plan consists of descriptions and emergency procedures specific to hazardous waste storage locations and is consistent with the Installation Protection Program Strategic Plan 15-004, Annex G Hazardous Materials & Oil Spill Response Plan.

4.1. Purpose

This Contingency Plan defines responsibilities, provides guidance for coordination of activities, and minimizes hazards to human health or the environment from fires, explosions, or any sudden or non-sudden release of hazardous waste to the air, soil, or surface water. The provisions of this plan will be carried out immediately if there is a fire, explosion, spill, or release of hazardous waste constituents that could threaten human health or the environment.

This plan identifies policies, responsibilities, procedures, and resources for response to actual and potential spills at area storing hazardous waste. This plan has been reviewed by, and agreed upon by the WSMR Fire Department, Security Office, Medical Clinic, and White Sands Missile Range Safety Division.).

4.2. Distribution

Copies of this RCRA Contingency Plan will be on file at the following locations in compliance with 40 CFR 264 subpart D.

- WSMR Emergency Operations Center
- WMSR McAfee Clinic;
- WSMR Fire and Emergency Services Division;
- Administrative offices of the Hazardous Waste Management Center

4.3. Types of Waste

Wastes covered under this plan include corrosive, reactive, flammable, and toxic materials and include RCRA listed wastes.

4.4. Schedule, Emergency Response Procedures, and Notification

The following information is supplied in accordance with 40 CFR 264.50 through 264.56. Emergency response procedures for all areas storing hazardous are written in accordance with the Installation Protection Program Strategic Plan 15-004, Annex G, Hazardous Materials & Oil Spill Response Plan under which WSMR will operate in the event of a hazardous material spill. It defines the roles, responsibilities, and organizational relationships of WSMR Directorates, tenant and other organizations in responding to, and recovering from, an oil spill or incident involving the transport, use, storage, or processing of hazardous waste.

At any time any person becomes aware of a fire, spill, potential release, or any other emergency, a call must immediately be placed to the WSMR Emergency Operations Center (911). This organization will notify the appropriate organizations for response to the situation (medical, security, fire, etc.). The Installation Incident Commander (IC) is the senior Fire Department person on site until relieved by a higher authority such as the WSMR Fire Chief. At the time of the emergency, the WSMR Garrison Commander (GC) is notified and provided with all information regarding the emergency. The IC will evaluate the emergency and determine the onsite actions. The IC has the authority to commit resources to address an emergency, as specified in 40 CFR 264.55.

The management of emergencies may change depending on time of day, availability of personnel and type of incident. All emergencies on WSMR are handled through the WSMR Emergency Operations Center (911). This agency has the resources to respond effectively and to activate currently trained and knowledgeable personnel. Specific personnel from the areas storing hazardous will be contacted in the event of an emergency. Notification to individuals with specific expertise and the WSMR Fire and Emergency Services Division is managed from the centrally located WSMR Emergency Operations Center, which is staffed on a 24- hour basis. The WSMR Emergency Operations Center maintains an updated roster of specialty personnel required for an emergency response.

The primary and alternate emergency coordinators for Post operations are:

- Primary EC: Director of Emergency Services (DES)
- Mr. Donald R. Morrison, 1400 Tierra Del Sol, Las Cruces, NM 88007 Office: 575-678-2503 Cell: 575-993-0651 Home: 575-523-5680
- lst Alternate EC: Fire Chief
- Mr. Carlos Soto, 155 Aberdeen Ave, WSMR, NM 88002 Office: 575-678-0314 Cell: 575-993-0155
- 2nd Alternate EC: Deploy Chief
- Mr. Marc Davis, 155 Aberdeen Ave, WSMR, NM 88002 Office: 575-678-2600 Cell: 575-993-7529

4.5. Installation Response

Upon notification of an emergency incident, the WSMR Emergency Operations Center will record all pertinent information from the first responder and first response emergency organizations. The IC, as described above, will form a team using personnel from all WSMR activities to form an IRT. This person will notify the WSMR Emergency Operations Center to ensure appropriate people and organizations are activated for emergency response.

If an incident can be easily managed by on-hand equipment, supplies, and labor, it is considered a minor incident. A minor incident is defined as an incident where no possible hazards exist to human health or the environment. The IC will define the nature of the assistance requested, will make a determination whether the incident is minor and provide instruction to those organizations requested.

In no instance shall of fire be considered a minor incident.

4.6. Installation Response Team (IRT)

If the IC determines that the members of the IRT must be activated, the organizations listed below will be called. Representatives from each organization will respond. The IRT telephone roster is provided in the table below. The top three organizations will be activated by dialing 911. At this time, the WSMR Emergency Operations Center will activate all emergency services organizations.

4.7. Installation Response Team (IRT) Roster

Organization	Daytime Telephone
Fire and Emergency Services Division	678-4187 or 678-1234
McAfee U.S. Army Health Clinic	674-3500 or 678-1234

Law Enforcement and Security	678-1234 or 911
Environmental Compliance	678-2225
Public Works Directorate	678-7810 or 678-8966
Safety Division	678-2305 or 678-5746
Weather Station	678-2488 or 678-2462
WSMR helicopter support	679-1315

4.8. HAZMAT Incident Site Operations and Field Teams

The following information is provided in accordance with (40 CFR 264.56 and 262.265).

During normal working hours at all areas storing hazardous, the first person to become aware of an incident shall contact the WSMR Emergency Operations Center (911). He/she will provide, if possible, the following information: substance involved, nature of the incident, quantity, location, and/or injuries involved. All personnel will immediately leave the vicinity of the area storing hazardous. If the Emergency Operations Center determines that a HAZMAT incident/emergency situation exists (e.g., large spill, fire, or explosion), or that human health or the environment is threatened, the center will immediately activate the Contingency Plan.

There are many steps required in the handling of a HAZMAT Incident. After a HAZMAT incident is reported, the response is initiated and operations started. Each operation is addressed step by step in priority:

- **Assess the Situation**: Assessment will be made by observing the scene, interviewing personnel, and/or reviewing records; then identifying the potential hazard and the parameters that determine the degree of the hazard. The IC will gather information relevant to the response, such as the type of event, quantity, and type of released material, and actual or potential hazards to human health or the environment. Direct and indirect effects will be used to determine potential effects to human health and the environment as specified in 40 CFR 264.56(c).
- **Protect Personnel:** The IC will take all reasonable measures to ensure the safety of personnel, such as activating the fire alarm, accounting for facility personnel, attending to injuries, or coordinating the evacuation of personnel, if necessary. If evacuation is indicated for other personnel, the IC must be informed.
- **Contain or Mitigate the Hazards:** The IC will take reasonable measures to ensure that fires, explosions, or releases do not occur, recur, or spread. The IC will apply methods to reduce or control the risk associated with the hazardous waste/material, such as effective engineering to reduce or eliminate the exposure time, use minimum personnel limiting the amount of time personnel spend in the hazard area, and selection of personnel protective clothing and equipment.

4.9. Field Teams and Operational Levels

The field team size is determined by the size of the incident and the operational level for the risk posed by the hazardous waste/material. The "buddy system" will be used at all times when working in hazardous areas. There are four operational levels, as defined by 40 CFR 1910.120.

Level A is the maximum protection required. It includes a pressure-demand, full face- piece respirator Self Contained Breathing Apparatus (SCBA) and totally encapsulating chemical protective suits, which may require pressurization, dependent on the hazard.

Level B requires a pressure-demand, full face-piece respirator and encapsulating or hooded one or two-piece chemical splash suit (may be disposable), dependent on the hazard.

Level C requires half or a full face-piece air purifying respirator and hooded chemical resistant clothing (may be disposable).

Level D requires no respiratory protection, but usually requires a work uniform including steel-toed boots, hard hat, eye protection and gloves.

In incidents where level D is required, the Hazardous Material (HAZMAT) Response Unit will be dispatched with the following crew: on-scene commander, driver, 2 rescue men, and 2 firefighters as a work party. Other supporting agencies will be notified as required. In addition to the 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course, the incident commander, where feasible, will have received the 8- Hour supervisory training. It is specifically acknowledged that firefighters receive training as specified by NFPA 472 and 473, which is equivalent to 29 CFR 1910.120.

In incidents where Level A-C is required, the HAZMAT Unit will be dispatched with the following crew: on-scene commander, driver, 2 rescue men, and 2 firefighters as a work party. One fire company with at least a 3-man crew will be dispatched to be used as needed.

Security, safety, and medical support will be called to the scene. All other on duty fire department personnel will be on alert status for dispatch.

A field investigation will be initiated to determine the potential hazard and appropriate response. The investigation is intended to rapidly identify the hazardous waste by review of SDS, turn-in documents, and manifests; interview of personnel involved or witness to the incident; observing containers for markings; using testing equipment; taking samples for lab identification if required. An evaluation will be made to the need for evacuation of personnel at risk, to include down wind, as required.

4.10. Control of Incident Scene

Control of the incident scene will be established by using marking tape or other barriers to exclude unnecessary personnel from the area. Work zones will be established within the site using the 3-Zone method.

Zone 1 - Exclusion Zone: The exclusion zone is the innermost of the three zones where the hazardous waste is located. Personnel entering this zone must wear the prescribed level of protective gear and be visually monitored by the site safety and decontamination officers. The boundary of Zone l is the hot line, and once determined, will be physically marked and secured. Factors such as fire or explosion, blown contaminants, etc. must be considered when establishing the limits of the exclusion zone and its dimensions may change as work proceeds.

Zone 2 - Contamination Reduction Zone: This zone is used for decontamination of personnel, equipment, and waste containers leaving the exclusion zone. Entry points to the outer boundary of Zone 2 will be determined and will be the only access used. Exit points from Zone 1 will be determined and pass-through decontamination stations will be set up in Zone 2. Access (entry and exit) control points will be

visually monitored by the site safety and decontamination officers. Personal protective equipment is typically required in Zone 2, but at a lesser level than that required in Zone l.

Zone 3 - Support Zone: The support zone is considered to be a clean area. Support equipment, command post, etc. are located in this zone. Traffic is restricted to authorized personnel only. Level D protection is typically required in Zone 3.

The following criteria should be considered in establishing work zone dimensions and boundary distance:

- Physical and topographical features at the area storing hazardous;
- Weather conditions;
- Field/laboratory measurements of air contaminants and environmental samples;
- Air dispersion calculations;
- Potential for explosion and flying debris;
- Physical, chemical, toxicological & other characteristics of the RCRA waste present;
- Cleanup activities required;
- Potential for fire;
- Area needed to conduct operations;
- Decontamination procedures;
- Dimensions of contaminated area;
- Potential for exposure to contaminant;

Handling, decontamination, and disposal of hazardous wastes will be in accordance with Federal/State laws and regulations, 40 CFR 264.56(g) and 262.265(g).

4.11. Emergency Response Implementation of the Contingency Plan

4.12. Fire

Any fire in the vicinity of an area storing hazardous shall be considered an emergency. This includes any fire involving hazardous waste or hazardous material, or any buildings, vegetation, or non-hazardous waste fire that threatens to ignite hazardous waste. Prior to any firefighting, the following criteria will be implemented.

- WSMR Fire Department will be notified.
- Facility personnel shall evacuate to an upwind location at least 100 yards (90 m) from the fire.
- The IC will be notified immediately by the WSMR Emergency Operations Center. The IC will determine the appropriate response.
- Fire-fighting personnel must wear appropriate personal protective equipment.
- immediately transport any injured personnel to the medical facility.
- The IC will remain near the site, but at a safe distance, so he can advise the personnel responding to the fire of the known hazards involved.
- In the event of an explosion/fire, the IC retains responsibility to select the fire-fighting methods and tactics. IC determines when the emergency action has been completed.
- The IC will be in overall control of WSMR-emergency response efforts. Wastes/Materials involved in a fire can be identified in the following ways:
- The location of the drum may indicate the contents of the drum (e.g., drums in the flammable storage building contain flammables).

- If the location of the drum does not indicate its contents, the label number can be used to identify the material. Records of the contents of each drum are kept in the HWMC. If the label has been burned, the number painted on the drum can be used to identify the material.
- If the label and number are destroyed by fire, the inventory in the HWMC office, should be used to identify drum contents. Unknown chemicals will be sampled and analyzed according to methods in WSMR Waste Analysis Plan and U.S. EPA "Test Methods for Evaluating Solid Waste Physical Chemical Methods," SW-846, (most recent edition).

An appropriate spill absorbent will be poured over all chemical residues resulting from a hazardous waste fire. Once the liquid is absorbed, the waste will be swept or shoveled back in the appropriate containers using spark-less tools, and the surface will be cleaned using cleaners appropriate to the chemicals and in compliance with environmental requirements.

4.13. Explosion

The following procedures will be implemented in the event of a hazardous waste explosion or when a danger exists for a probable explosion.

- Immediately evacuate the area.
- The first responder will contact the WSMR Emergency Operations Center. The IC will be notified immediately by the WSMR Emergency Operations Center. The IC will determine the appropriate response.
- Immediately transport any injured personnel to medical facility.
- The IC will remain near the site, but at a safe distance, so he can advise personnel responding to the explosion of the known hazards involved and the degree and location of the explosion.
- In the event of an explosion, the IC retains responsibility to select the fire-fighting methods and tactics. IC determines when the emergency action has been completed.
- The IC will be in overall control of WSMR-emergency response efforts.
- An appropriate spill absorbent will be poured over all chemical residues resulting from a hazardous waste release. Once the liquid is absorbed, the waste will be swept or shoveled back in appropriate containers using spark-less tools, and the surface will be cleaned using cleaners appropriate to the chemicals and in compliance with RCRA requirements for waste management.

4.14. Spill or Material Release

WSMR will implement the following procedures in the event a hazardous waste or hazardous material spill where the spill causes an immediate health hazard, the spill cannot be contained with secondary containment or application of absorbents, or a threat exists for spilled material to move out of hazardous waste storage area boundaries.

- First response is to protect human health and safety; the second response is to protect the environment
- Evacuate the immediate area.
- Determine the identity and chemical nature of released material.
- Don appropriate personal protective equipment for exposure to the material.
- If possible, secure the source of the release.
- Build a dike to contain runoff, if appropriate.
- Contain the waste utilizing absorbent materials, if appropriate.

- If material/waste has contaminated the soil, the visibly contaminated soil will be drummed and treated as hazardous waste; the remaining soils are to be sampled in accordance with SW-846 and analyzed for the contaminates listed in Table 3.1 in Permit Attachment 3 .
- Waste is to be transferred to a salvage drum using spark-less tools and marked as hazardous waste. The waste is then transferred to appropriate conforming storage.
- During regular working hours. WSMR will immediately notify the NMED Hazardous Waste Bureau if human health or the environment is threatened or after hours will contact NMED Spill Response. WSMR will notify the National Response Center (1-800-424-8802) if human health or the environment outside WSMR are threatened, or if the quantity of Hazardous waste spilled is greater than the reportable quantity (RQ) specified in 40 CFR 302.
- Incompatible waste shall be managed in accordance with Permit Part 2.14 (Ignitable, Reactive, or Incompatible Waste)

4.15. Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The following information is provided in accordance with 40 CFR 264.56 and 262.265. Actions to prevent the recurrence or spread of fires, explosions, or releases include stopping operations, collecting and containing released waste, and recovering or isolating containers. During an emergency, the IC will monitor other equipment not directly involved in the emergency for leaks, pressure build up, gas generation or ruptures that could encourage the spread of fire and/or explosions. An incident review will be conducted to identify root causes and any corrective measures identified will be implemented.

4.16. Storage and Treatment of Released Material

The following information is provided in accordance with 40 CFR 264.56(i) and 262.265 (g).

If the hazardous waste storage area, or a portion of the facility, stops operations in response to either a minor or emergency event, IC will monitor, inspect, and make a safety determination before operations commence again. Hazardous waste containers and equipment will be inspected for leaks, breaks, rupture, corrosion, bulges, or dents. Such containers will be placed in over-pack drums or the contents will be transferred to new containers, as conditions dictate.

Immediately after an emergency, WSMR will make arrangements for the proper handling and treatment of all recovered waste, contaminated soil, or other contaminated materials. Liquids that have accumulated in the containment system will be pumped into containers and stored in the container storage area. All other liquids and contaminated materials not within the containment system will also be collected in containers and stored in the container storage area. These items will be analyzed to determine proper disposition.

4.17. Incompatible Waste

Every effort is made to prevent the commingling of incompatible waste at the facility. No blending of waste shall be performed without prior NMED approval.

4.18. Post Emergency Equipment Maintenance

The following information is provided in accordance with 40 CFR 264.56(h) and (i) and 262.265 (h)(2).

Following an emergency, all equipment shall be inspected to determine if it is clean, uncontaminated, and in working order. Those items not fit for use will be cleaned or replaced. All rinsate retrieved from cleaning of equipment after an emergency event will be collected in an area provided with a containment system. The residue shall be adsorbed or collected and containerized, then stored as a hazardous waste in the proper area. When the inspection shows that adequate safety and emergency equipment are available,

and before operations are resumed, NMED shall be notified that post-emergency equipment is ready for use. Operations will then resume.

4.19. Container Spills and Leakage

Spills and leaks will be managed in accordance with 40 CFR 264.56(e) through(g) and 262.265 (g).

4.20. Evacuation Plan

This information is provided in accordance with 40 CFR 264.52(f) and 262.261 (f).

In the event of any major emergency, it will be necessary to follow an established set of procedures. Evacuation from the hazardous waste storage area may be accomplished by means of exits in the building and the fenced compound. A person in an emergency would exit out the closest door and meet at the designated area, at least 100 yards (90 m) upwind, outside the facility boundary. The fire alarms, or hand/voice signals shall be used to initiate evacuation. An evacuation plan is provided in the following figures: Hazardous Waste Storage Facility (Figure 4-1), DPW 90 Day Yard (Figure 4-2) and the 10-K 90 Day Yard (Figure 4-3).

4.21. Required Reports

The following information is provided in accordance with 40 CFR 264.56(i) and 262.265(i).

Any emergency event that requires implementation of the Contingency Plan will be reported to NMED verbally within 24 hours and in writing within 5 days to NMED in accordance with Permit Sections 1.12.9.11. The information to be included in this report includes:

- Name, address, and telephone number of the owner or operator;
- Name, address, and telephone number of the facility;
- Date, time, and type of incident;
- Name and quantity of materials involved;
- Extent of injuries, if any;
- Assessment of actual or potential hazards to human health or the environment, where applicable;
- Estimated quantity and disposition of recovered material that resulted from the accident;
- specifically other information requested by NMED, which is necessary and relevant to the purpose of an operating record.

The Permittee shall report any noncompliance that may endanger health or the environment orally within 24 hours from the time the Permittee becomes aware of the circumstances in accordance with the requirements of Permit Section 1.12.9.11 and 40 CFR 270.30 (k) (6), including:

- Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies; and
- Information concerning a release or discharge of hazardous waste or of a fire or explosion from the hazardous waste storage area which could threaten the environment or human health outside the facility.

The description of the occurrence and its cause will include:

- Name, address, and telephone number of the facility at WSMR;
- Date, time, and type of incident;
- Name and quantity of materials involved;

- Extent of injuries, if any;
- Assessment of actual or potential hazards to the environment and human health outside the facility, where applicable;
- Estimated quantity and disposition of recovered material that resulted from the incident;

In addition to these reporting requirements for state authorities, WSMR has internal reporting requirements. WSMR will perform required reporting within 24 hours as deemed necessary by quantity and area of influence to include:

- Office of The GC Command Group;
- National Response Center;
- NMED HWB;
- Region VI EPA, Dallas.

A written submission will be provided within 5 days of the time WSMR becomes aware of the circumstances. The written submission will contain:

- Description of noncompliance and its cause;
- Period of non-compliance including exact dates and times;
- If not corrected, anticipated time of incident correction; and
- Steps taken or planned to be taken to reduce, eliminate and prevent recurrences.

4.22. Amendments of the Contingency Plan

The following information is provided in accordance with 40 CFR 264.54. Modifications to the Contingency Plan shall follow the procedures described in 40 CFR 270.42. The Contingency Plan shall be reviewed and amended, as necessary, whenever:

- Facility permit is revised;
- Plan fails in an emergency;
- Facility changes in its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste, or hazardous waste constituents, or changes in the response necessary in any emergency;
- List of emergency equipment changes;
- Training exercise identifies a deficiency in the plan, or
- When there is a change in emergency contact personnel.

A copy of the Contingency Plan shall be maintained at the facility and at the WSMR HWMC.

4.23. Emergency Equipment

The following list of dedicated emergency equipment located at the facility is provided in accordance with 40 CFR 264.52(e) and 262.261 (e).

The following equipment is located at building 22895:

- Four (4), 95-gal (0.361 cu m), emergency spill response kits containing sock absorbents, pads, and pulp; capable of absorbing multiple types of non-aggressive liquids.
- One (1) spill kit for aggressive spills containing sock absorbents, pads, and pulp; capable of absorbing acids and bases.

- Twelve (12) sacks of absorbent; capable of absorbing multiple types of non-aggressive liquids.
- Six (6) recovery/over-pack drums; capable of containing a damaged 55 gallon drum.
- Non-sparking shovels, picks, etc. capable of handling flammable liquids without creating sparks.

The following equipment is located at the DPW 90-Day Yard:

- One (1), 95-gal (0.361 cu m), emergency spill response kit containing sock absorbents, pads, and pulp; capable of absorbing multiple types of non-aggressive liquids.
- One (1) spill kit for aggressive spills containing sock absorbents, pads, and pulp located; capable of absorbing acids and bases.
- Six (6) sacks of absorbent located in building 1870; capable of absorbing multiple types of non-aggressive liquids.
- Two (2) recovery/over-pack drums; capable of containing a damaged 55 gallon drum.
- Non-sparking shovels, picks, etc. capable of handling flammable liquids without creating sparks.

The following equipment is located at the 10-K 90-Day Yard:

- One (1), emergency spill response kit containing sock absorbents, pads, and pulp; cpable of absorbing multiple types of non-aggressive liquids.
- One (1) spill kit for aggressive spills containing sock absorbents, pads, and pulp located; capable of absorbing acids and bases.
- Six (6) sacks of absorbent located; capable of absorbing multiple types of non-aggressive liquids.
- One (1) recovery/over-pack drum; capable of containing a damaged 55 gallon drum.
- Non-sparking shovels, picks, etc. capable of handling flammable liquids without creating sparks.

The following equipment is located at the WSMR Fire Station:

- Ten (10) SCBA units; used against particulates, gases, and vapors that are at atmospheric concentrations less than immediately dangerous to life and health.
- Five (5) Level A suits; used against particulates, gases, and vapors that are at atmospheric concentrations less than immediately dangerous to life and health.
- Two (2) Fire Engines; capable of pumping 1250 gallon per minute with a 750 gallon tank.
- One (1) Rescue Pumper Engine; capable of pumping 500 gallon per minute with a 350 gallon tank.

4.24. Arrangements with Local Authorities

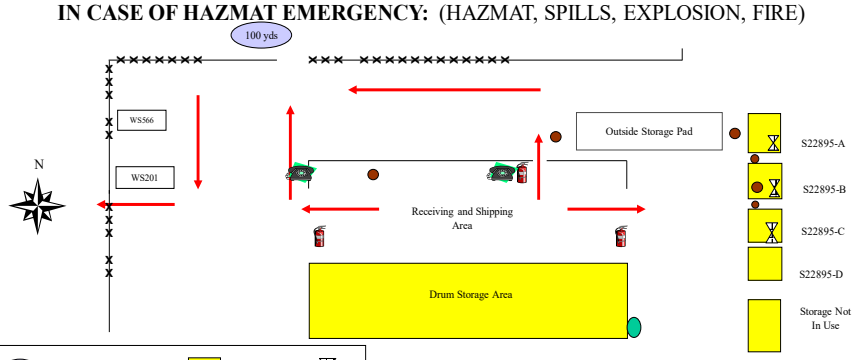
20.4.1.500 NMAC, incorporating 40 CFR 262.265 (Arrangements with Local Authorities), specifies that a hazardous waste storage facility will make arrangements to familiarize local authorities, such as police, fire departments and emergency response teams, with the facility and possible scenarios. WSMR is a self-contained military base; therefore, arrangements with local authorities, such as hospitals, fire or police, are not included in this contingency plan.

Figure 4-1

WSMR - Building 22895

SPILL, EVACUATION & EMERGENCY PLAN

IN CASE OF HAZMAT EMERGENCY: (HAZMAT, SPILLS, EXPLOSION, FIRE)



Meeting Place | Hazardous Waste | Sprinkler System
Exit | Eye Wash/Shower
Fire Extinguisher | Spill kit
Emergency Telephone | Chain-link Fence

CONTACT:
EMERGENCY (FIRE/MEDICAL/POLICE): 678-1234
ACTIVITY ENVIRONMENTAL OFFICER (ECO)
James Lopez 575-678-4841 (office) 575-993-0933 (cell)
WSMR EMERGENCY COORDINATOR
Primary Mr. Donald R. Morrison 575-678-2503 (office) 575-993-0651 (cell)
1st Alt Mr. Carlos Soto 575-678-0314 (office) 575-993-0155 (cell)
2nd Alt. Mr. Marc Davis 575-678-2600 (office) 575-993-7529 (cell)
FACILITY POINT OF CONTACT (POC)
Raymond Duran 575-678-4641 (office) 575-202-6752 (cell)
ALTERNATE FACILITY POC
Jon Harrison 575-678-4641 (office) 915-630-4957 (cell)

DATE PREPARED: 30 March 2020

SPILL PLAN AND IMMEDIATE ACTION PROCEDURES

WARNING : Spill will always be approached from upwind where possible. Avoid physical contact with spilled chemicals/petroleum products

1. PROTECT YOURSELF AND OTHER FROM HARM.
Evacuate the premises if necessary. Use appropriate clothing. Remove other sources of potential ignition.

2. STOP THE FLOW IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)
Close the valve. Turn a ruptured or punctured container so the point of exit is up.
Place the leaking container in another container (over-pack drum)

3. CALL 911 TO NOTIFY THE FIRE DEPARTMENT, AND THEN THE ACTIVITY CHAIN OF COMMAND.
Report spills, any amount of HAZMAT (other than POL) including chemicals and pesticides (FAX to 678-4028)
Any amount of any other material in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or may unreasonably interfere with public welfare or the use of property. This includes chemical, biohazardous, petroleum-product, and sewage spills and incidents. In addition to recent spills, the discovery of evidence of previous unauthorized discharges, such as contaminated soil of ground water, also must be reported

4. CONFINE THE SPILL IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)
Protect floor or storm Drains. (cover drains with a mat; surround with absorbent material)
Shovel sand, sawdust, sweeping compound, or place sandbags in path of flow.
Place sweeping compound, absorbent pillows, pad, or mats to confine the spill.

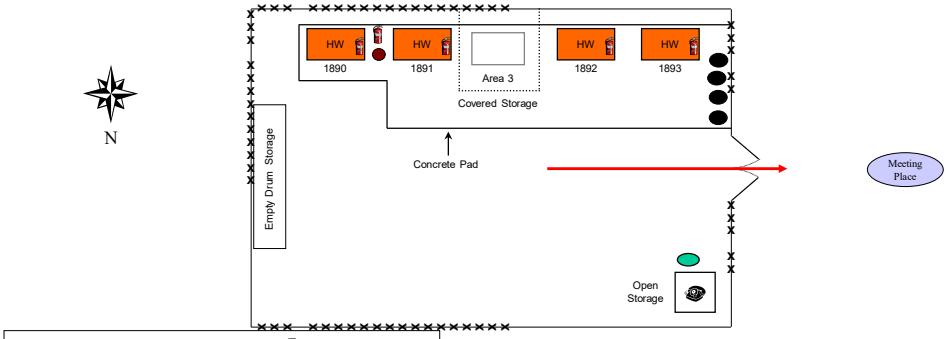
5. ALL SPILL RESPONSE ACTIONS ARE CONDUCTED BY THE LOCAL WSMR FIRE AND EMERGENCY SERVICES DIVISION, WSMR SECURITY DIRECTORATE AND THE LOCAL HEALTH CLINIC.

Figure 4-2

WSMR – DPW 90-Day Yard

SPILL, EVACUATION & EMERGENCY PLAN

IN CASE OF HAZMAT EMERGENCY: (HAZMAT, SPILLS, EXPLOSION, FIRE)



Eye Wash | Fire Extinguisher | Used Oil Tanks
Meeting Place | Spill Kit
Hazardous Waste HW | Exit
Emergency Phone | Chain-link Fence

CONTACT:

EMERGENCY (FIRE/MEDICAL/POLICE): 678-1234
ACTIVITY ENVIRONMENTAL OFFICER (ECO)
James Lopez 575-678-4841 (office) 575-993-0933 (cell)
WSMR EMERGENCY COORDINATOR
Primary Mr. Donald R. Morrison 575-678-2503 (office) 575-993-0651 (cell)
1st Alt Mr. Carlos Soto 575-678-0314 (office) 575-993-0155 (cell)
2nd Alt. Mr. Marc Davis 575-678-2600 (office) 575-993-7529 (cell)
FACILITY POINT OF CONTACT (POC)
Raymond Duran 575-678-4641 (office) 575-202-6752 (cell)
ALTERNATE FACILITY POC
Jon Harrison 575-678-4641 (office) 915-630-4957 (cell)

DATE PREPARED: 30 March 2020

SPILL PLAN AND IMMEDIATE ACTION PROCEDURES

WARNING : Spill will always be approached from upwind where possible. Avoid physical contact with spilled chemicals/petroleum products.

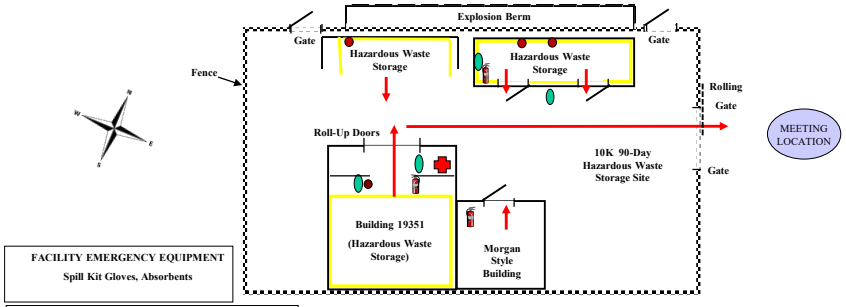
1. PROTECT YOURSELF AND OTHER FROM HARM
• Evacuate the premises if necessary. • Use appropriate clothing. • Remove other sources of potential ignition.
2. STOP THE FLOW IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)
• Close the valve. • Turn a ruptured or punctured container so the point of exit is up. • Place the leaking container in another container (over-pack drum).
3. CALL 911 TO NOTIFY THE FIRE DEPARTMENT, AND THEN THE ACTIVITY CHAIN OF COMMAND
• Report spills, any amount of HAZMAT (other than POL) including chemicals and pesticides (FAX to 678-1199)
• Any amount of any other material in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or may unreasonably interfere with public welfare or the use of property. This includes chemical, biohazardous, petroleum-product, and sewage spills and incidents. In addition to recent spills, the discovery of evidence of previous unauthorized discharges, such as contaminated soil of ground water, also must be reported.
4. CONFINE THE SPILL IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)
• Protect floor or storm drains (cover drains with a mat; surround with absorbent material).
• Shovel sand, sawdust, sweeping compound, or place sandbags in path of flow.
• Place sweeping compound, absorbent pillows, pad, or mats to confine the spill.
5. ALL SPILL RESPONSE ACTIONS ARE CONDUCTED BY THE LOCAL WSMR FIRE AND EMERGENCY SERVICES DIVISION, WSMR SECURITY DIRECTORATE AND THE LOCAL HEALTH CLINIC.

Figure 4-3

WSMR 10K / BUILDING 19351

SPILL, EVACUATION & EMERGENCY PLAN

IN CASE OF HAZMAT EMERGENCY: (HAZMAT, SPILLS, EXPLOSION, FIRE)



FACILITY EMERGENCY EQUIPMENT

Spill Kit Gloves, Absorbents

Eye Wash — Spill Kit

Meeting Location — Fire Extinguisher

First Aid Station — Exit

Hazardous Waste Storage Areas

CONTACT:

EMERGENCY (FIRE/MEDICAL/POLICE): 678-1234

ACTIVITY ENVIRONMENTAL COMPLIANCE OFFICER (ECO)

Cathy Giblin 575-678-3541

WSMR EMERGENCY COORDINATOR

Primary Mr. Donald R. Morrison 575-678-2503 (office) 575-993-0651 (cell)

1st Alt Mr. Carlos Soto 575-678-0314 (office) 575-993-0155 (cell)

2nd Alt. Mr. Marc Davis 575-678-2600 (office) 575-993-7529 (cell)

FACILITY POINT OF CONTACT (POC)

Randall Reddick 575-678-3781 (office) 575- 680-8502 (cell)

ALTERNATE FACILITY POC

Rick Whiteley 575-678-3198 (office) 520-471-6697 (cell)

DATE PREPARED: April 20,2015

IMMEDIATE ACTION PROCEDURES

WARNING : Spill should always be approached from upwind where possible. Avoid physical contact with spilled chemicals/petroleum products

1. PROTECT YOURSELF AND OTHER FROM HARM

• Evacuate the premises if necessary. • Use appropriate clothing. • Remove other sources of potential ignition.

2. STOP THE FLOW IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)

• Close the valve. • Turn a ruptured or punctured container so the point of exit is up. • Place the leaking container in another container (over-pack drum)

3. CALL 678-1234 TO NOTIFY THE FIRE DEPARTMENT

• Contact the Fire Department, which has trained responders that can be immediately dispatched to the scene.

• Report spills, any amount of HAZMAT (other than POL) including chemicals and pesticides (FAX to 678-1199)

- •For POL, Any Amount:
  - ✓Spilled in Water
  - ✓Could Flow or Wash into Storm Water Drains, or
  - ✓Spilled onto Land (not pavement)
- •POL Spills greater than 20 gallons

4. CONFINE THE SPILL IF POSSIBLE (ONLY IF IT CAN BE DONE SAFELY)

• Protect floor or storm drains (cover drains with a mat; surround with absorbent material).

• Shovel sand, sawdust, sweeping compound, or place sandbags in path of flow.

• Place sweeping compound, absorbent pillows, pad, or mats to confine the spill.

5. ALL SPILL RESPONSE ACTIONS ARE CONDUCTED BY THE WSMR FIRE AND EMERGENCY SERVICES DIVISION, WSMR SECURITY DIRECTORATE AND THE LOCAL HEALTH CLINIC.

ATTACHMENT 5

TRAINING PLAN

5. Training Plan

5.1. Introduction

White Sands Missile Range (WSMR) personnel shall successfully complete a program of classroom instruction and/or on-the-job training to ensure compliance with state and federal hazardous waste management regulations and to operate and maintain the Hazardous Waste Storage Facility or HWSF in a safe manner and to ensure compliance with New Mexico Hazardous Waste Regulations. Training shall comply with 20.4.1.500 NMAC, incorporating 40 CFR 264.16(a)(3) and shall fulfill the requirements of 29 CFR 1910.120.

5.2. Job Titles and Job Descriptions

5.2.1. Job Title: Hazardous Waste Program Manager

Job Description: Ensure hazardous wastes are stored in compliance with Permit requirements and ultimately disposed of in accordance with state, federal, and DOD regulations and Army guidelines. This person also oversees operation of satellite and less than 90-day accumulation areas. The Hazardous Waste Program Manager is responsible for implementing the hazardous waste management training program and shall be trained in hazardous waste management procedures as specified in 40 CFR 264.16(a)(2).

5.2.2. Job Title: Hazardous Waste Operator

Job Description: Provide technical and operations support at the HWSF and/or less than 90-day accumulation areas to ensure hazardous wastes are managed in accordance with requirements of this Permit, federal and State regulations, and Army Guidelines.

5.2.3. Job Title: Waste Generator

Job Description: Army regulation 200-1 requires that all persons handling or managing hazardous waste receive appropriate training. Waste generators create and/or handle hazardous waste or are responsible for operations that generate or handle hazardous waste. Waste Generators may operate satellite accumulation points and may transport waste containers from satellite accumulation points to less than 90-day accumulation areas, following non-public, WSMR routes.

5.3. Description of Training

5.3.1. Hazardous Waste Storage Facility Manager Training

The HWSF Manager shall be knowledgeable of Federal and State RCRA regulations and Permit conditions. This knowledge may be met through a combination of on-the-job training, classroom training, and experience and education.

5.3.2. Hazardous Waste Operator Training

Personnel assigned as Hazardous Waste Operators shall complete training to ensure their job functions are completed in compliance with Permit requirements. This training may be completed as on-the-job training (OJT), classroom training, or a combination of OJT and classroom training. Training will address the following topics:

- Physical layout of the buildings, particularly the location and use of emergency equipment and systems (i.e., how to operate alarm systems);

- Hazardous waste identification, treatment, and disposal procedures (turn-in requirements, analysis, packaging, and record keeping);
- Procedures in handling, storing, and manifesting hazardous waste;
- Inspection and corrective action techniques for potential inadequacies;
- Emergency response procedures for spills, fires, explosions, operations shutdown, evacuation; and
- Procedures for how to use and inspect facility emergency and communication equipment.

5.3.3. RCRA Waste Generator Training

This training shall include the following topics:

- Overview of Federal and State waste management regulations
- Army requirements and policies for waste management
- Procedures for handling and accumulating hazardous waste including the applicable sections of 40 CFR 262
- Inspection of accumulation areas and containers
- Transport of waste containers from Satellite Accumulation Areas to Less Than 90 Day Accumulation Areas
- Management of Universal Waste and Recyclables

5.4. Training Frequency

Training shall be completed within six months of job assignment and refresher training shall be completed annually thereafter. Facility personnel must take part in an annual review of the initial training as required by 40 CFR 264.16(c).

5.5. Personnel Assignments

No employee shall work unsupervised until he/she has completed applicable training requirements.

5.6. Training Records

Training records will include the job title and job description as listed above, the name of the employee, a description of completed training, and the completion date for training. Training records on current personnel shall be kept until closure of the facility. Training records of former personnel shall be maintained in the operating record a minimum of 3 years.

5.7. Less than 90-day Hazardous Waste Storage Inspection Procedures

All personnel assigned to less-than-90-day hazardous waste storage facilities shall be trained in the inspection procedures outlined in the White Sands Missile Range Inspection Sheet -<90 Day Storage Facility, HWSF below.

White Sands Missile Range Inspection Sheet

<90 Day Storage Facility, HWSF

The following inspection checklist is to be completed on a weekly basis and retained onsite for all Sites.

HWSF:	Date:	Inspector: (signature)
90-Day Site:	Time:	Inspector: (print)

No.	Item	Yes	No	Comments/Corrective Action
1.	Signs are posted for HW as required?			
2.	Is site security maintained properly (gates, doors, locks, etc ...)?			
3.	Is a means of communications or alarm readily available and operational? (Emergency numbers posted).			
4.	Are containers marked properly (lAW WSMR Reg. 200-1)?			
5.	Are all containers in good condition? (Free of leaks, spills, and structural defects)			
6.	Are containers kept securely closed?			
7.	Is waste compatible with container it is in?			
8.	Is secondary containment present? (For liquids only)			
9.	Are there any signs of spills?			
10.	Is spill equipment available on site? (Over pack, absorbent, PPE).			
11.	Is a log book maintained for each container recording date, type of waste, total amount of waste in the container, and the person's signature?			
12.	Are all weekly inspection records available and up to date?			
13.	Is the fire extinguisher inspection conducted monthly?			
14.	Are the ventilation systems on portable buildings operational? (Pertains to HWSF only)			
15.	Is a water source and hose available? (pertains to HWSF only)			
16.	Is there an eyewash and emergency shower available on site and is it operational?			
17.	Is the air conditioning system operating?			
18.	Were odor or fumes detected or observed prior to or upon entry?			
19.	Is the wind sock operational? (Pertains to HWSF only)			
20.	Are all containers properly located (aisle space, compatibility, grounding)?			
21.	Is the containment area in good condition (deterioration of curbs, seals)?			
22.	Is all material handling equipment operational (load test/inspection date current)?			
23.	Is a current waste stream profile available?			

Comments:

Acknowledgement of Manager:_____ Date and Time:_____

ATTACHMENT 6
INSPECTION PLAN

6.1. Inspection Plan

Inspections of the HWSF will be conducted weekly to identify malfunctions, deterioration, operator errors and discharges which may cause a release of hazardous waste or hazardous waste constituents or may pose a threat to human health in accordance with Permit Section 2.12 and 40 CFR 264.15. Inspections shall be made by the HWSF manager or their properly trained representative. Inspections shall be recorded on an inspection sheet, such as the one shown below. The inspection sheet will include the date, time of inspection, name of the inspector, a notation of the observations made. Upon entry into the facility the inspector will observe and assess safety and emergency equipment, security devices, operating and structural equipment, communication equipment and container storage areas. The inspection logs shall be kept on file at the administrative offices of the HWSF. These records shall be maintained for at least three years from the date of the inspection.

If an inspection reveals that non-emergency repair or maintenance is needed, the remedial action will be accomplished on a schedule that ensures that the problem does not lead to an environmental or human health hazard. If the deficiency constitutes an emergency involving hazard to human health or the environment, the remedial action will be initiated immediately

White Sands Missile Range Inspection Sheet

Hazardous Waste Storage Facility and <90 Day Storage Facility

The following inspection checklist is to be completed on a weekly basis and retained onsite for all Sites.

HWSF:	Date:	Inspector: (signature)
90-Day Site:	Time:	Inspector: (print)

No.	Item	Yes	No	Comments/Corrective Action
1.	Signs are posted for HW as required?			
2.	Is site security maintained properly (gates, doors, locks, etc ...)?			
3.	Is a means of communications or alarm readily available and operational? (Emergency numbers posted).			
4.	Are containers marked properly (lAW WSMR Reg. 200-1)?			
5.	Are all containers in good condition? (Free of leaks, spills, and structural defects)			
6.	Are containers kept securely closed?			
7.	Is waste compatible with container it is in?			
8.	Is secondary containment present? (For liquids only)			
9.	Are there any signs of spills?			
10.	Is spill equipment available on site? (Over pack, absorbent, PPE).			
11.	Is a log book maintained for each container recording date, type of waste, total amount of waste in the container, and the person's signature?			
12.	Are all weekly inspection records available and up to date?			
13.	Is the fire extinguisher inspection conducted monthly?			
14.	Are the ventilation systems on portable buildings operational? (Pertains to HWSF only)			
15.	Is a water source and hose available? (pertains to HWSF only)			
16.	Is there an eyewash and emergency shower available on site and is it operational?			
17.	Is the air conditioning system operating?			
18.	Were odor or fumes detected or observed prior to or upon entry?			
19.	Is the wind sock operational? (Pertains to HWSF only)			
20.	Are all containers properly located (aisle space, compatibility, grounding)?			
21.	Is the containment area in good condition (deterioration of curbs, seals)?			
22.	Is all material handling equipment operational (load test/inspection date current)?			
23.	Is a current waste stream profile available?			

Comments:

Acknowledgement of Manager:_____ Date and Time:_____

ATTACHMENT 7

CLOSURE PLAN FOR THE HAZARDOUS WASTE STORAGE FACILITY

7. Closure Plan

The Closure Plan for the HWSF is provided in accordance with 270.14 (b) (13) incorporating 264.112, that meets the requirements of 40 CFR 264 subpart G and 40 CFR 264.178. The Closure Plan identifies the steps necessary to completely close the HWSF at the end of its intended operations.

7.1. Amendments

The Closure Plan will be amended whenever a change in operating plans or facility design occurs that may affect HWSF closure. Amendments to the closure plan must comply with the requirements of 40 CFR 270.42. Amendments to the Closure Plan may be made at any time during the active life of the facility. In addition, an amendment will be submitted no later than 60 days after an unexpected event has occurred affecting the Closure Plan or, if an unexpected event occurs during the final closure period, no later than 30 days after the unexpected event. No later than 60 days prior to the final receipt of waste at the HWSF, the Permittee shall submit an amended closure plan that provides updated proposed sampling and other activities associated with closure and including proposed soil sampling locations outside of the buildings in loading/unloading areas as well as any areas discussed in Attachment 7 Section 7.3 below.

7.2. Records

A copy of the Closure Plan, and its revisions, shall be kept at the Facility until the closure of the facility is complete, certified, and approved by NMED. At the start of closure, the Permittee shall conduct a records review to identify all incidents where spills or releases have occurred during the history of operations of the HWSF. The records review shall include identification of all waste stored at the HWSF including nonhazardous wastes and all hazardous constituents or other chemicals historically stored within the facility boundary.

7.3. Disposal of Containers, Decontamination of Equipment and Confirmation Sampling

At the time of closure, all containers of hazardous waste remaining in storage shall be removed and transported off-site to a permitted treatment or disposal facility.

After all containers are removed, the facility shall be inspected to identify stains, structural damage or any other indications of releases or potential migration pathways to the environment. The interior of the hazardous waste storage buildings, the containment area in Building 22895, and all operating equipment shall be steam-cleaned. Any concrete stains that indicate the presence of surface contamination in the containment area in Building 22895 shall be removed, using technology deemed appropriate at the time of closure. This may include scraping, chipping, washing, and/or bioremediation. Sampling of building materials, loading and unloading areas, and beneath the buildings, if necessary, shall be conducted where evidence of cracks or other structural damage indicate that contaminants may have migrated from the building. The sampling methods shall be appropriate for the type of materials being sampled and analytical suite for any samples obtained from the structures or underlying soils shall be based on the chemicals identified in the records review. All sampling methods (e.g., chip sampling, swipe sampling, soil sampling) and analytical methods must be approved by NMED prior to implementation.

The storage buildings may be disposed of or reused. If they are reused, they shall be verified to be free of contamination by rinsing interior surfaces including the walls, ceiling, floor and floor grating with high pressure water or steam and subsequent collection of swipe samples from the building floors and walls. The swipe samples shall be analyzed based on the chemicals identified in the records review. The results shall be compared to screening levels identified in NMED guidance.

If staining or damage indicates movement of hazardous waste components into the concrete, chip samples will be obtained for chemical analysis. The floor at the location of the staining or damage will be cored to evaluate the extent of the infiltration. Should this portion also show transport of hazardous waste constituents into the subfloor, samples of the soil beneath the main building will be obtained beneath the

locations where infiltration or migration beneath the flooring is observed. Identification of contamination in the concrete subfloor of the containment area may require the removal and appropriate disposal of the contaminated concrete as hazardous waste and removal of underlying soils.

In the event that contamination is identified in the soil beneath the containment area of Building 22895, the NMED will be notified. The Permittee will submit an amendment to the closure plan to propose investigation of the nature and extent of the contamination in accordance with 40 CFR 264.112 and 40 CFR 270.42. The amended Closure Plan shall specify the number, locations and types of samples to be collected, the analyses to be performed and the schedule for implementing the plan and subsequent reporting.

Surface soil sampling (0-1 foot below ground surface or first encounter with native soil below constructed surface) shall be conducted in all loading/unloading areas and any location of a release outside of the buildings identified in the records review. The soil sampling locations shall be proposed in the updated closure plan required by Section 7.5 below.

All miscellaneous equipment used in cleanup and decontamination of the storage facility (e.g., brushes, mops, buckets, protective clothing, pump hose, investigation derived waste) will be managed as hazardous waste.

7.4. Closure Performance Standard

The Closure Plan will comply with the performance standards set forth in Permit Section 2.19, 40 CFR 264.111 and in accordance with the most updated NMED risk assessment guidance. All closure investigation and remediation activities shall be conducted in accordance with the methods and procedures described in Permit Section 7.

7.5. Schedule for Closure

Closure will be accomplished according to the schedule contained in 40 CFR 264.113. Guidelines for the closure schedule activity durations (in days) are as follows:

1.	Notify the NMED of intent to close facility.	90 days prior to anticipated final receipt of waste
2.	Initiate records review	90 days prior to anticipated final receipt of waste
3.	Submit updated closure plan	60 days prior to anticipated final receipt of waste
4.	Receive final volume of hazardous waste from WSMR.	0 days
5.	Removal of all hazardous waste from storage facility complete.	90 days
6.	Completion of decontamination	120 days
7.	Completion of confirmation sampling	150 days
8.	Closure report and certification submitted to the NMED.	210 days

If closure activities cannot be completed within the proposed timeframes, the Permittee shall request an extension in accordance with 20 NMAC, 40 CFR 264.113 and 40 CFR 270.42.

7.6. Closure Certification and Closure Report

Certification that the facility was closed in accordance with the approved plan and 40 CFR 264.115 shall be submitted to NMED no later than 60 days after completion of closure as specified by 40 CFR 264.115. A closure report shall be submitted concurrently with the certification for NMED review and approval. The closure report shall be prepared in accordance with the requirements of Permit Section 9.3

7.7. Post Closure

Should the Permittee be unable to clean close the HWSF, the Permittee shall submit a post-closure plan as a permit modification in accordance with 40 CFR 270.42(c) that proposes all activities necessary to restrict access, prevent exposure or the release of hazardous waste or hazardous constituents and monitor, as necessary, the HWSF to protect human health and the environment.

ATTACHMENT 8

CORRECTIVE ACTION PLAN

8.1 Corrective Action Unit Identification

TABLE 8-1
SOLID WASTE MANAGEMENT UNITS (SWMUs) & AREAS OF CONCERN (AOCs)
REQUIRING CORRECTIVE ACTION

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 1	Floor Drain System for Building 1621	Also identified as CCWS-81
SWMU 2	Bleach and Fixer Collection Containers at Building 1621	Also identified as CCWS-81
SWMU 3	Bleach and Fixer Collection Containers at Building 1621	Also identified as CCWS-81
SWMU 4	Bleach and Fixer Collection Containers at Building 1621	Also identified as CCWS-81
SWMU 5	Bleach and Fixer Collection Containers at Building 1621	Also identified as CCWS-81
SWMU 6	Bleach and Fixer Collection Containers at Building 1621	Also identified as CCWS-81
SWMU 7	Silver Recovery Unit Tailing Tank at Building 1621	Also identified as CCWS-81
SWMU 8	Former Waste Oil Tank & Sump East of Building 1794	SWMUs 8 & 9 were combined into SWMU 8, Also identified as WSMR-36
SWMU 10	Vehicle Wash Ramp, Drains, Sump, & Oil/Water Separator West of Building 1778	SWMUs 10 & 11 were combined into SWMU 10, Also identified as WSMR-74 (Pad #1780)
SWMU 12	Wash Ramp, Drains, Sump, & Oil/Waste Separator @ Building 1778	SWMUs 12 & 13 were combined into SWMU 12, Also identified as WSMR-60 (Pad #1777)
SWMU 14	Used Battery Accumulation Area at Main Post Building 1776 & 1742	SWMUs 14 & 15 were combined into SWMU 14, Also identified as WSMR-33
SWMU 16	Heavy Equipment Wash Pad & Drain at Building 1736	Also identified as WSMR-79 (Pad #1747) Active, Deferred
SWMU 17	Waste Underground Injection Pipe Southwest of Building 1753	Also identified as WSMR-73

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 19	Steam Wash Pad & Oil/water Separator North of Building 1753	SWMUs 19 & 20 were combined into SWMU 19, Also identified as WSMR-80 Active, Deferred
SWMU 22	Main Post Former Fire Fighting Training Area Waste Pile	Also identified as WSMR-32
SWMU 23	Hazardous Waste Tank at HELSTF	Also identified as WSMR-78
SWMU 24	Hazardous Waste Tank at HELSTF	Also identified as WSMR-78
SWMU 25	Waste Accumulation Area at HELSTF	Also identified as WSMR-78
SWMU 26	Vapor Recovery Unit at HELSTF Building 26131	Also identified as WSMR-78
SWMU 27	Former Sanitary Treatment Impoundment at HELSTF	SWMUs 27, 28, 29, & 30 were combined into SWMU 27, Also identified as CCWS-79
SWMU 31	Chemical Waste Tank at HELSTF	Also identified as WSMR-43
SWMU 32	Chemical Waste Tank at HELSTF	Also identified as WSMR-43
SWMU 33	Fluorspar Tank at HELSTF	Also identified as WSMR-49
SWMU 34	Fluorspar Tank at HELSTF	Also identified as WSMR-49
SWMU 35	Ethylene Glycol Tank at HELSTF	Also identified as WSMR-50
SWMU 36	Ethylene Glycol Tank at HELSTF	Also identified as WSMR-50
SWMU 37	Waste Oil Accumulation Area at Building 26121 at HELSTF	
SWMU 40	Waste Oil Accumulation Drum at Oscura Range Center near Building 9000	
SWMU 47	Former North Oscura Peak Landfill	Also identified as WSMR-71
SWMU 48	Former North Oscura Peak Landfills	SWMUs 48 & 49 were combined into SWMU 48, Also identified as WSMR-71
SWMU 62	Former STP Imhoff Tank	Also identified as WSMR-59
SWMU 63	Former Main Post Landfill 1A	Also identified as WSMR-39
SWMU 64	Former Main Post Landfill 2A	Also identified as WSMR-40
SWMU 66	Main Post Sewage Treatment Plant Subsurface Influent Line	Also identified as WSMR-17 Active, Deferred
SWMU 67	Main Post Sewage Treatment Plant (STP) Bar Screen and Grinder	Also identified as WSMR-17 Active, Deferred
SWMU 68	North Primary Clarifiers at the STP	SWMUs 68 through 78 were combined into SWMU 68, Also identified as WSMR-17 Active, Deferred

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 79	Former Sludge Beds at the STP	Also identified as WSMR-29
SWMU 80	STP Sludge Waste Pile Main Post	Also identified as WSMR-30
SWMU 81	Boiler at the STP	Active, Deferred
SWMU 84	Effluent Pipeline at the STP	Active, Deferred
SWMU 85	STP Discharge at Playa Lake	Also identified as Davies Tank, WSMR-42. Active, Deferred
SWMU 86	Former Sanitary Landfill at the Main Post	Also identified as WSMR-81
SWMU 87	Former Construction Landfill	Also identified as WSMR-82
SWMU 102	Burn Pan South of Building 21547	
SWMU 103	Scrap Metal Yard at Building 21280	Active, Deferred
SWMU 108	Vapor Extraction Well at TTF	Also identified as WSMR-41
SWMU 109	Drum Storage Area (Splash Pan) at TTF	Also identified as CCWS-82 Active, Deferred
SWMU 110	Methylene Chloride Catchment System at TTF	Also identified as CCWS-82 Active, Deferred
SWMU 111	Methylene Chloride Separation System at TTF	Also identified as CCWS-82 Active, Deferred
SWMU 112	Methylene Chloride Separation System at TTF	Also identified as CCWS-82 Active, Deferred
SWMU 113	Salt Water Evaporation Tanks at TTF	Also identified as CCWS-82
SWMU 119	Former Stallion Range Landfill	Also identified as WSMR-70
SWMU 120	Former Stallion Center Landfill	Also identified as WSMR-70
SWMU 121	Stallion Asphalt Tank	Also identified as WSMR-67
SWMU 122	Stallion Asphalt Tank	Also identified as WSMR-67
SWMU 123	Stallion Asphalt Tank	Also identified as WSMR-67
SWMU 124	Waste Oil Storage Tank @ Stallion North of Building 34250	Also identified as CCWS-83
SWMU 127	Autoclave at McAffee Clinic Building 530	

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 128	Silver Recovery System Tailing Tank at Building 1512	Also identified as CCWS-84
SWMU 129	Cyanide Treatment Unit at Building 1512	Also identified as CCWS-85
SWMU 130	Former Spent Developer Storage Tank at Building 1512	Also identified as CCWS-86
SWMU 131	Acetic Acid Spill Containment Tank at Building 1524	Also identified as CCWS-86
SWMU 132	Orogrande Waste Stabilization Pond	Ft. Bliss operated SWMU, Also identified as WSMR-76
SWMU 133	NOMTS Machine Shop Accumulation Area at Building 1436	Also identified as CCWS-87 Active, Deferred
SWMU 134	NOMTS Outdoor Accumulation Area at Building 1436	Also identified as CCWS-87 Active, Deferred
SWMU 135	Paint Shop Accumulation Area at Building 1742	Also identified as CCWS-88
SWMU 136	Paint Shop Spray Booth at Building 1742	Also identified as CCWS-88
SWMU 137	Paint Shop Sump at Building 1742	Also identified as WSMR-56,
SWMU 138	Waste Accumulation Area @ RATSCAT	Also identified as CCWS-89
SWMU 141	HELSTF Equipment Storage Area	Also identified as WSMR-83
SWMU 143	HELSTF Storage Yard Chromium Spill Site	Also identified as WSMR-54
SWMU 144	HELSTF Laser System Test Center Wastewater Discharge Pond	Also identified as WSMR-47
SWMU 145	HELSTF Test Cell Lagoons	Also identified as WSMR-53
SWMU 146	HELSTF STP Dry Pond	Also identified as WSMR-45
SWMU 147	HELSTF Decontamination Pad & Underground Holding Tank	Also identified as WSMR-78
SWMU 148	HELSTF Former MAR Waste Stabilization Pond	Also identified as WSMR-83
SWMU 149	HELSTF Maintenance Building Septic System	Also identified as WSMR-46
SWMU 150	HELSTF MAR Dump Site	
SWMU 151	HELSTF Trailer Area Septic System	Also identified as WSMR-46
SWMU 152	HELSTF Property and Supply Building Septic System	Also identified as WSMR-46
SWMU 153	Vandal Burial Site	Also identified as WSMR-58
SWMU 154	HELSTF Systemic Diesel Spill Site	Also identified as WSMR-55

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 157	Former Oscura Range Center Landfill-A	Also identified as WSMR-05
SWMU 159	Former Oscura Range Center Landfill-C	Also identified as WSMR-05
SWMU 164	AMRAD Facility UST near Building 25900	
SWMU 165	LC-34 Contaminated Soils @ Buildings 23104 & 23106	Also identified as CCWS-90
SWMU 166	Denver AST Site	Also identified as CCWS-18
SWMU 167	Malpais AST Site	Also identified as CCWS-20
SWMU 168	Lance Missile Impact @ White Sands National Monument	Also identified as WSMR-86
SWMU 197	HELSTF Technical Support Area Gasoline Spill	Also identified as CCWS-16
SWMU 198	LC-38 Diesel Fuel Oil Release	Also identified as CCWS-09
SWMU 199	Hardin Ranch First AST Site	Also identified as CCWS-27
SWMU 200	Hardin Ranch Second AST Site	Also identified as CCWS-27
SWMU 201	RAM (Facility 6002) AST Site	Also identified as CCWS-42
SWMU 202	Dead Horse Instrumentation AST Site	Also identified as CCWS-43
SWMU 203	Oscura (Facility 31795) Communication AST Site	Also identified as CCWS-29
SWMU 204	Harriet (Facility 34600) Instrumentation AST Site	Also identified as CCWS-30
SWMU 205	SE-70 (Facility S-31427) Instrumentation AST Site	Also identified as CCWS-31
SWMU 206	Atom (Facility S-33151) First AST Site	Also identified as CCWS-32
SWMU 207	Atom (Facility S-33151) Second AST Site	Also identified as CCWS-32
SWMU 208	SE-50 (Facility 29055) Instrumentation AST Site	Also identified as CCWS-34
SWMU 209	EC-50 (Facility29085) Instrumentation AST Site	Also identified as CCWS-35
SWMU 210	Minnow (Facility S-31132) Instrumentation AST Site	Also identified as CCWS-36
SWMU 211	Cowan Instrumentation AST Site	Also identified as CCWS-37
SWMU 212	NW-70 (Facility S-31620) Instrumentation AST Site	Also identified as CCWS-53

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 213	Gran Jean (Facility S-34050) Instrumentation AST Site	Also identified as CCWS-38
SWMU 214	NE-50 (Facility 29090) Instrumentation AST Site	Also identified as CCWS-39
SWMU 215	Missile Graveyard	Also identified as CCWS-23
SWMU 216	UST at Timing Station, Building 20710, LC-32 (Uncle Site)	Also identified as CCWS-91
SWMU 217	AAFES Gas Station at Building 270	Also identified as CCWS-78 Active.
SWMU 218	LC-38 UST at Building 23626	1,764-gallon steel UST
SWMU 219	Main Post POL AST Release Site	Also identified as CCWS-83
AOC A	Sink & Drain System @ Building 1621	Also identified as CCWS-93
AOC B	Battery Accumulation Area @ North Oscura	Also identified as CCWS-94
AOC D	Drum Storage Area @ STP	Also identified as CCWS-95
AOC E	Pesticide Storage Area at Building 1708	Also identified as CCWS-96 Active, Deferred
AOC G	Brine (MeCl) Storage Tank at TTF	Also identified as CCWS-97 Active, Deferred
AOC H, I, J, K, & L	Methylene Chloride Tanks (five tanks) at TTF	Also identified as CCWS-82 Active, Deferred
AOC P	Chemistry Laboratory Drains at Building 1530	
AOC S	Septic Tanks with Leach Fields	Also identified as WSMR-69 Active, Deferred
AOC V	HELSTF Pressure Recovery System	
AOC W	Rhodes Canyon Impoundment	
AOC X	Stallion Range Desalinization/Sewage Lagoons	Active, Deferred
AOC Y	Stormwater Drainage Ditches	Run-off from various operations related to SWMUs 10, 12, 14, 15, 16 and 19.
AOC Z	Abandoned Underground Storage Tank	Also identified as CCWS-98
AOC AA	Alamogordo Bombing Range	Also identified as Stallion Range Center Cantonment Area, WSMR-003-R-01;
AOC AB	Sewage Lagoon	Also identified as Main Post Wastewater Treatment Plant WSMR-004-R-01
AOC AC	Condron Field	Also identified as WSMR-005-R-01. Active, Deferred

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
AOC AD	Main Cantonment Area	Also identified as WSMR-006-R-01
AOC AE	Red Rio Bombing Range	Active Range, Deferred
AOC AF	Oscura Bombing Range	Active Range, Deferred
AOC AG	Main Post Skeet Range	Active Range, Deferred
AOC AH	Heavy Equipment Shop Building 21095	Active, Deferred
AOC AI	North Range Region (NRR) Live Fire Ranges (3)	Active, Deferred
AOC AJ	NRR Harriet RDT&E Impact Area	Active, Deferred
AOC AK	NRR Harriet RDT&E Specialized Facility	Active, Deferred
AOC AL	NRR Oscura Gap RDT&E Specialized Facility with possible waste pile	Active, Deferred
AOC AM	NRR Trinity Site RDT&E Specialized Facility	Active, Deferred
AOC AN	NRR Trinity Site Surface Impoundment	Active, Deferred
AOC AO	NRR Capitol Peak RDT&E Specialized Facility	Active, Deferred
AOC AP	NRR Fairview Mountain RDT&E Specialized Facility	Active, Deferred
AOC AQ	NRR North Extension Area RDT&E Launch Complex	Active, Deferred
AOC AR	North Extension Area RDT&E Impact Areas (2)	
AOC AS	Central Range Region (CRR) Bitter Creek UXO Area	Active, Deferred
AOC AT	CRR RDT&E Specialized Facility	Active, Deferred
AOC AU	CRR RDT&E Ranges	Active, Deferred
AOC AV	CRR Landing strip with surface impoundments near Rhodes Canyon	Active, Deferred
AOC AW	South Range Region (SRR) RDT&E Launch Complex	Active, Deferred
AOC AX	SRR Drop Zone	Active, Deferred
AOC AY	SRR UXO Area	Active, Deferred

TABLE 8-2
SWMUs & AOCs
CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 116	Rhodes Canyon Subgrade Asphalt Tanks	SWMUs 116, 117, & 118 were combined into SWMU 116, Also identified as WSMR-75
SWMU 125	Veterinary Clinic Incinerator	Also identified as WSMR-77
SWMU 126	McAffee Clinic Incinerator	
SWMU 137	Paint Shop Sump	Also identified as WSMR-56
SWMU 162	Stallion Range Center Former Firefighter Training Area	Also identified as WSMR-66
SWMU 219	Hawk Facility, Building 204548 at LC-38	3,000-gallon UST
SWMU 220	Rhodes Canyon Range Center POL Station, Building 30725-1 & 2)	
SWMU 139		No corresponding SWMU unit assigned to this number
AOC C	Areas Where heavy pesticides and/or herbicides were used	
AOC F	Methane Vent (Flare) at STP	
AOC M	Exploded / Unexploded Low Level Radioactive Ordnance	
AOC N	Process Spills at HELSTF	
AOC O	Miscellaneous Areas ID'd by Aerial Photos	
AOC Q	HELSTF Lab Drains	
AOC T	Collection Lines to the STP	
AOC U	Miscellaneous Spills	
SWMU 21	Main Post Former Fire Fighting Training Area & Pit	
SWMU 140	LC-37 Paint Dump	Also identified as WSMR-84
SWMU 107	Storage Tank at Temperature Test Facility (TTF)	Also identified as WSMR-35
SWMU 156	Former Golf Course Pesticide Storage Shed @ Building T-1348	Also identified as WSMR-57

SWMU 163	Abandoned Disposal Trench @ New Commissary	Also identified as WSMR-72

TABLE 8-3
HAZARDOUS WASTE MANAGEMENT UNITS

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 38	HELSTF Landfill	Also identified as WSMR-52, Closure required
SWMU 39	HELSTF Landfill	Also identified as WSMR-52, Closure required
SWMU 41	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 42	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 43	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 44	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 45	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 46	Oscura Munitions Landfill	Also identified as WSMR-03, Closure required
SWMU 50	Red Rio North Landfill	Also identified as WSMR-02, SWMUs 50-54 were combined into SWMU 50, Closure required
SWMU 55	Open Burn Pit at the OB/OD	Post Closure Care Plan Required
SWMU 56	Open Detonation Pit at the OB/OD	Post Closure Care Plan Required
SWMU 56A	Open Detonation Pit at the OB/OD	Post Closure Care Plan Required
SWMU 57	Tula Peak Burial Sites	Also identified as WSMR-23, SWMUs 57-60 were combined into SWMU 57, Post-Closure Care Plan Submitted
SWMU 61	Tula Peak Incinerator	Also identified as WSMR-24, Closure required
SWMU 65	Former Main Post Landfill #3 at Scrap Yard	Also identified as WSMR-61, Closure required
SWMU 82	Former STP Ditches	SWMUs 82 and 83 were combined into SWMU 82, Also identified as WSMR-62, Post-Closure Care Plan Submitted
SWMU 88	Container Storage Area at Building 22895	Operating

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 89	Former Acid Neutralization Unit at the Hazardous Waste Storage Facility Building 22895	Also identified as WSMR-27, Closure required
SWMU 90	Evaporation Tank at Building 22895	Also identified as WSMR-37, Clean closure complete
SWMU 91	Hazardous Waste Landfill near Building 2295	Clean closure complete
SWMU 92A	Liquid Propellant Evaporation Neutralization Pits at Building 21546	Closure complete, Also identified as WSMR-11
SWMU 92B	Liquid Propellant Evaporation – Neutralization Pit 2 at Building 21512	Closure complete, Also identified as WSMR-11
SWMU 93	Liquid Propellant Evaporation at Neutralization Pits at Building 21532	Closure complete, Also identified as WSMR-11
SWMU 94	Liquid Propellant Evaporation – Neutralization Pit 4 at Building 21502	Closure complete, Also identified as WSMR-11
SWMU 95	Liquid Propellant Evaporation Neutralization Pits at Building 21510	Closure complete, Also identified as WSMR-11
SWMU 96	Liquid Propellant Evaporation Neutralization Pits at Building 21506	Closure complete, Also identified as WSMR-11
SWMU 97	Liquid Propellant Evaporation Neutralization Pits at Building 21501	Closure complete, Also identified as WSMR-11
SWMU 98	Liquid Propellant Evaporation Neutralization Pits at Building 21511	Closure complete, Also identified as WSMR-11
SWMU 99	Liquid Propellant Evaporation Neutralization Pits at Building 21507	Closure complete, Also identified as WSMR-11
SWMU 100	Liquid Propellant Evaporation Neutralization Pits at Building 21500	Closure complete, Also identified as WSMR-11
SWMU 101	Acid Neutralization Pit South of Building 21547	Closure required
SWMU 104	Temperature Test Facility Former Evaporation Pond	Also identified as WSMR-34, Clean closure complete
SWMU 105	New Evaporation Tank at TTF	Closure complete

UNIT ID NUMBER	UNIT DESCRIPTION	COMMENTS
SWMU 106	Discharge Pipe at TTF	Closure required
SWMU 114	Rhodes Canyon Landfill	Also identified as WSMR-14, Closure complete Post-Closure Care Plan Submitted
SWMU 115	Rhodes Canyon Landfill	Also identified as WSMR-14, Closure complete Post-Closure Care Plan Submitted
SWMU 142	HELSTF Cleaning Facility Sump	Also identified as WSMR-48, Closure required
SWMU 155	Red Rio South Landfill	Closure required
SWMU 158	Former Oscura Range Landfill	Also identified as WSMR-05, Clean closure complete
SWMU 160	Nuclear Effects Reactor Facility Pond #1	Also identified as WSMR-09, Clean closure complete
SWMU 161	Nuclear Effects Reactor Facility Pond #2	Also identified as WSMR-09, Clean closure complete

8.1. Solid Waste Management Unit Summaries

SWMU 1 – Floor Drain System for Building 1621

This unit is listed as a Solid Waste Management Unit. The floor drain system, covered by a one foot square metal grate in the concrete floor of Building 1621 was used to dispose of photochemical waste. The system lines flowed into piping underneath the first floor. These lines then drained into the sewer main located west of the building. From the sewer main, the waste flowed to the STP via sewage lines made of vitrified clay and concrete. Specific dimensions of the unit are not known. Photo processing operations at Building 1621 were active from approximately 1958 to 1990. The floor drains were grouted and abandoned in place. The types of chemicals and waste managed, stored, and treated included prehardener, neutralizers, developer, bleach, fixer, and stabilizer residues that contained concentrations of chromium, silver, cyanide, SVOCs, and nitrate. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMUs 2-6 – Bleach and Fixer Collection Containers at Building 1621

These solid waste management units at Building 1621 were active from approximately the mid-1970's to 1990. The bleach and fixer collection containers were used to store liquid waste bleach and fixer from photo processing equipment. The structures for SWMUs 2–6 were located on the first floor of building 1621 and were removed during remodeling activities. The containers had a ten gallon capacity. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 7 – Silver Recovery Unit Tailing Tank at Building 1621

The SWMU 2-6 containers were emptied into the silver recovery unit tailing tank (SWMU 7) which operated from March 1988 to 1990. This solid waste management unit was used to recover silver from the photo processing operations. The structure for SWMU 7 was located on the first floor of building 1621 near SWMUs 2-6 and was removed during remodeling activities. The dimensions of this unit are no known. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 8 – Waste Oil Tank & Sump East of Building 1794

SWMU 8 was located at the Maintenance Area on the Main Post. The waste oil tank was an underground steel tank with a 5,000 gallon capacity. Waste oil entered the tank via the waste oil sump. The waste oil tank and sump started operation in the 1950's and was removed in 1990. The tank and the sumps received waste oil that was routinely drained from vehicles on post. There is no indication of any significant release of hazardous waste or hazardous constituents from this solid waste management unit.

SWMU 10 – Wash Pad, Drains, & Sump West of Building 1778

The Vehicle Wash Pad, Drains and Sump are located immediately west of Building 1778 in the Main Post area. The dimensions of the concrete wash pad are 30 feet by 30 feet and it is surrounded by a 2-foot wide drain. The drain is 2-feet deep, constructed of concrete and covered with metal grates. The drain empties to a concrete, 500-gallon sump and oil/water separator at the northwest corner of the Vehicle Wash Pad. The Vehicle Wash Pad and Oil/Water Separator were built in the mid 1950's and used till an unknown date. The concrete pad collected wastewater from the spray washing of vehicles. The wastewater formerly discharged through a subgrade pipe to the drainage ditch located east of the wash pad. After the Main Post sewage treatment plant was built, the oil/water separator outlet was plumbed to the sanitary sewer system for treatment and disposal of the wastewater. There is no indication of any significant release of hazardous waste or hazardous constituents from this solid waste management unit.

SWMU 12 – Wash Ramp, Drains, Sump, & Oil/Waste Separator @ Building 1778

SWMU 12 was built in the 1950s and used for spray washing of vehicles till 1997 when the steel ramp was dismantled. The dimensions of the concrete wash pad are 40 feet by 15 feet and it slopes to a central, longitudinal drain that discharges to the 200-gallon sump with oil/water separator at the north end of the drain. The separator/sump is constructed of concrete and covered by a metal grate. When the facility was operational, waste oil and debris from the separator/sump were periodically transferred to a waste oil tank for recycling and disposal, while the effluent flowed to the STP through the sanitary sewer. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 14 – Used Battery Accumulation Area at Main Post Building 1776

The former Used Battery Accumulation Areas are located immediately south and approximately 50 feet northeast of the Building 1776 Battery Shop. Lead-acid batteries were stored on wood pallets placed on asphalt pavement at this solid waste management unit. A sump located on the east side of Building 1776 collected solids prior to wastewater entering the sanitary sewer system. The sanitary sewer system ultimately discharges the wastewater flowing through this sump into the Sewage Treatment Plant. The date of initial operation of the unit is unknown but is expected to be from the

1950's. Battery storage reportedly ceased at the site in 1990 when the covered battery storage area was built. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 16 – Heavy Equipment Wash Pad & Drain at Building 1736

The Heavy Equipment Wash Pad is located in the southern section of the WSMR Main Post, west of Building 1736. The wash pad is constructed of concrete and measures 50 feet by 40 feet. The pad slopes toward the center where a grate covers the drain. The drain flows to a drainage ditch located south of the wash pad. The Heavy Equipment Wash Pad came into use during the 1960's and has been used primarily for spray washing trucks and heavy equipment maintenance. This solid waste management unit is still in operation. Contaminants of concern are those associated with petroleum, oil, and lubricants. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 17 – Waste Underground Injection Pipe Southwest of Building 1753

The Waste Underground Injection Pipe (SWMU 17) was reportedly located at the southwest corner of Building 1753, the Heavy Equipment Maintenance Shop, at the WSMR Main Post. The dimensions, composition and depth of the pipe are unknown. SWMU 17 was reportedly used to dispose of waste oils from the Heavy Equipment Maintenance Shop, Building 1753. According to site personnel, the pipe was installed vertically in the ground and wastes were poured into the open end. The dates of operation are unknown. There are no physical indications of a significant release of hazardous waste or hazardous constituents from this unit other than anecdotal evidence.

SWMU 19 – Steam Wash Pad & Oil/water Separator North of Building 1753

SWMU 19 consists of a wash pad, drain, and an oil/water separator sump. This site is located immediately north of Building 1753, in the southern part of Main Post. The washpad and sump have been active since approximately 1968 and 1984, respectively. The washpad is still in operation. The wash pad is a 50 feet by 15 feet concrete pad with an interconnected network of three drains. The drains are spaced 15 feet apart along the center of the pad. Fluids and debris flow via underground pipes to a 500 gallon oil/water separator. The above-grade separator is constructed of reinforced concrete and is covered by a metal plate. The waste oil and debris from the separator are periodically transferred to an aboveground waste oil tank, while effluent flows to the sewage treatment plant via the sanitary sewer. Contaminants of concern are those associated with petroleum, oil, and lubricants. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 22 – Main Post Former Fire Fighting Training Area Waste Pile

The purpose of the SWMU 22 waste pile has not been identified based on previous studies and, therefore, its operational history is unknown. The site is located approximately 350 feet south of Martin Luther King Boulevard and immediately west of Headquarters Avenue. The solid waste management unit was identified as SWMU 22 based on its proximity to the Fire Fighter Training Area (FFTA) (SWMU 21) and due to its petroleum-stained soil. The dimensions of the SWMU pile were 25 by 50 feet. It was speculated that the pile was excavated from the FFTA (SWMU 21). The potential for minor amounts of metals and constituents related to fuels have been released to soils exists at the site.

SWMUs 23-24 – Hazardous Waste Tanks at HELSTF

Between approximately 1981 and 1984, the tanks identified as SWMUs 23 and 24 were used to accumulate waste from the cleaning facility (Building 26131) at the High Energy Laser Systems Test Facility. SWMU 23 was a 5,000-gallon AST and SWMU 24 was a 2,500-gallon AST. The footprints for each SWMU were approximately 4 feet by 10 feet. The tanks were constructed of metal and lined with fiberglass and stood on concrete pads in an asphalt-covered area. The tanks received wastes containing phosphoric acid, sodium hydroxide, sodium carbonate, nitric acid, hydrofluoric acid, methyl ethyl ketone, isopropyl alcohol, and deionized water. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 25 – Waste Accumulation Area

SWMU 25 is an asphalt-paved fenced area that was used for the storage of spent degreasing solvents (e.g., 1,1,1-trichloroethane) in 55-gallon drums. Drums were stored on pallets and were reportedly stored for less than 90 days. Use of the site for this type of storage began in 1984 and continued through at least the early 1990s. In 2001 and 2002 the area was used as a sorting yard for wastes awaiting analysis and a storage area for non-hazardous wastes. The solid waste management unit area is approximately 75 feet by 60 feet. A leak from a drum containing chromate additive (thought to contain hexavalent chromium and zinc) was reported in the 1990 Ground-Water Quality Survey. The report stated that soil adjacent to the west side of SWMU 25 had been contaminated by the chromate release between 1984 and 1986.

SWMU 26 – Vapor Recovery Unit at HELSTF Building 26131

SWMU 26 is a vapor recovery unit that removed vapors from the solvent cleaning baths located in the gross cleaning room inside the cleaning facility. The original vapor recovery system operated from approximately 1984 to 1998, when it was replaced with a similar unit that was in operation until April 2009. The vapor recovery unit is constructed of plate metal, fiberglass, and Plexiglas. The VOC vapors from the vapor recovery unit were vented to the atmosphere. After the chemical waste tanks were taken out of service, the scrubbing solution was drummed and transferred to a permitted waste management facility. The footprint of SWMU 26 is approximately 8 by 10 feet and abuts the cleaning facility (Building 26131), to which the unit is connected. The ground under and around the vapor recovery unit is covered with concrete and asphalt. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 27 – Former Sanitary Treatment Impoundment at HELSTF

In 1981 a lined, two-cell, total evaporation lagoon was constructed at HELSTF for sanitary wastewater. The two cells associated with the 1981 lagoon are connected by a narrow inlet. The two cells had a total operating volume of approximately 1.3 million gallons, and dimensions of 120 feet by 120 feet by 6 feet deep. Another two-cell lagoon became operational in 1984 and are connected by a narrow inlet and have a total operating volume of approximately 2.3 million gallons. Dimensions for these cells are 123 feet by 214 feet by 6 feet deep. The lining material for the lagoons consisted of a reinforced Hypalon® sheet made by encapsulating reinforced fabric between two sheets of 15-millimeter or heavier gauge Hypalon® sheeting. SWMU 27 was taken out of service at the end of 2007. Historical releases of chromated water to this SWMU have been reported.

SWMUs 31-32 – Chemical Waste Tanks at HELSTF

The chemical waste tanks were constructed for containment and evaporative treatment of chromated de-ionized water and hazardous waste generated at the cleaning facility. The hazardous waste

treatment system included a double-walled drain line (1,000 feet long) to carry wastewater from the cleaning facility sump to the chemical waste tanks. The drain line consisted of a 3-in.- diameter reinforced thermosetting resin service pipe encased by a 6-in.-diameter reinforced thermosetting resin secondary containment pipe. The chemical waste tanks (SWMUs 31-32) were identical above-grade, open-top tanks constructed of reinforced concrete. Each tank had an industrial grade 45-millimeter Hypalon® liner with a leak detection system and was contained a 6- in. layer of ballast sand. The interior dimensions of the tanks were 37 feet by 74.7 feet by 7 feet deep sloping to 7.5 feet deep in the center. The west tank (SWMU 31) was first used for storage of hazardous wastes in late 1985 and was in operation until 1989. In addition to the cleaning facility sump wastewater, the west tank also received wastes that were dumped directly into it including chromate wastes, scrubbing water from the low-power chemical laser, chemistry lab wastes, and potassium hydroxide waste. According to facility records and reports, the east tank (SWMU 32) was never used. Shortly after tank operations began in 1985, the leak detection ports for both tanks were observed to contain a measurable amount of liquid. However, the water in the ports was attributed to either concrete hydration or groundwater intrusion because the chromium concentrations in the ports were significantly lower than the chromium concentrations in the liquid contained in the west tank.

SWMUs 33-34 – Fluorspar Tanks at HELSTF

The fluorspar tanks (constructed in approximately 1984) consist of two 30-feet by 60-feet concrete tanks that extend 2 feet□4 feet below ground surface with no secondary containment. The tanks served as drying beds for fluorspar sludge that was generated by an emissions control scrubbing tower at the laser systems pressure recovery system (AOC V). The scrubbing tower on the system used a solution of sodium hydroxide to react with the hydrogen fluoride and deuterium fluoride to form sodium fluoride, which was then treated with lime to form fluorspar (calcium fluoride, CaF2). The fluorspar sludge is assumed to have had a very high pH. Fluorspar sludge was pumped to the tanks/drying beds through a 4-inch-diameter PVC pipe. Each tank has a sloped entrance from the south for use by a front-end loader to remove the dry fluorspar solids. The tanks were historically used once per week but were later used only once every 3 months until use of the pressure recovery system and the SWMU 33 and 34 fluorspar tanks was discontinued in 2009. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMUs 35-36 – Ethylene Glycol Tanks at HELSTF

The two former ethylene glycol tanks were portable, 500-gallon steel aboveground tanks. Each tank was approximately 5 feet long, 4 feet wide, and 4 feet tall. The tanks were filled with ethylene glycol in 1988 when the compressor system at HELSTF developed a problem and the ethylene glycol had to be removed. This reportedly only happened once. Following reuse or disposal of the ethylene glycol, the tanks were decommissioned and removed from the site in 1989. There are no indications of a release of hazardous waste or hazardous constituents from this unit. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 37 – Waste Oil Accumulation Area at Building 26121 at HELSTF

This Solid Waste Management Unit consisted of 55-gallon drums of waste oil which were stored on a concrete pad under a roof at Building 26121 beginning in 1982. Information obtained during interviews with WSMR personnel in 2009 indicated that drums of waste oil were at that time stored inside the building within a secondary containment structure. In addition, there were no floor drains to septic systems or wastewater treatment lagoons in the waste oil accumulation area. At the time of the

interviews, Building 26121 was in use as the Heavy Equipment Maintenance Building, and there was no reported storage of waste oil outside of the building. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 40 – Waste Oil Accumulation Drum at Oscura Range Center near Building 9000

This solid waste management unit consisted of a single drum (closed-top 55-gallon metal container) under a roof near building 9000 at Oscura Range Center on WSMR. When the drum was full it was taken to the Holloman Air Force Base for final disposal. The waste oil came from range vehicle maintenance. The dates of operation of this SWMU is not known but was active in 1988 during the WSMR RCRA Facility Assessment. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMUs 47-48 – Former North Oscura Peak Landfills

SWMU 47 consisted of an open trench landfill with the approximate dimensions of 40 feet by 50 feet and five feet deep, and was rimmed by a barbed-wire fence. Debris visible in the trench included glass and plastic bottles, rubber tubing, aluminum cans, wood and waste paper. The second open trench (SWMU 48) was located in an area which is above the surrounding grade with little vegetation and disturbed soil. The trench is oriented north-south and its dimensions are approximately 120 feet long, five feet wide, and six feet deep. Material visible in the trench included glass and plastic bottles, rubber tubing, aluminum cans, wood and waste paper. The startup date of the landfill is unknown but both landfill cells were removed by 2002. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 62 – Former STP Imhoff Tank

The sanitary sewage from the WSMR Main Post was treated by the former STP Imhoff tank at SWMU 62 during the 1940s and 1950s, prior to construction of the current STP in 1958. This tank consisted of a single, large, metallic and concrete, multi-chambered, subsurface structure that was used to treat sewage sludge through the processes of sedimentation and anaerobic digestion. Based on information from previous investigations, the former STP Imhoff tank is believed to have been abandoned in place during the abandonment of the historical sewage lines and construction of the current STP. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 63 – Former Main Post Landfill 1A

SWMU 63 was thought to be Landfill 1 located in the southeast area of the present site of Building 1678 near the Main Post of WSMR. Investigations indicated that the landfill was not under building 1678 and therefore it was recommended to direct further investigations to the east of the golf course and south of Martin Luther King Avenue which was referred to as Landfill 1A. The area subsequently investigated covers approximately 18 acres. An exact start-up date of the previously identified area could not be determined, but possibly coincides with the beginning activities on White Sands in the early 1940s. It is believed that the area was in operation prior to implementation of RCRA and prior to the operation of the Hazardous Waste Landfill (SWMU 91). Investigations have determined that no landfill exists. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 64 – Former Main Post Landfill 2A

The Phase I and Phase II RFI investigated what was thought to be Landfill 2 located in the southeast area of the present site of Building 1747. Historical aerial photographs, aerial searches and personnel interviews indicated that the landfill was not under building 1747 and directed further investigations to the south of Martin Luther King Avenue near the motor pool storage area which is referred to as Landfill 2A. The area subsequently investigated covers approximately 68.8 acres. An exact start-up date could not be determined, but possibly coincides with the beginning activities on White Sands in the early 1940s. Investigations have determined that no landfill exists, either at the site of the original investigation (Building 1747) or south of Martin Luther King Drive near the motor pool storage area. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 66 – Main Post Sewage Treatment Plant Subsurface Influent Line

This unit is the underground sewer line which extends several miles from the Post Area to the sewage treatment plant. Facility representatives reported that the line is constructed of concrete or vitrified clay. The line is reported to be the original line installed in 1958 to convey sanitary sewage when the sewage treatment plant was constructed and is still active. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 67 – Main Post Sewage Treatment Plant (STP) Bar Screen and Grinder

This unit is the first unit to receive wastes at the STP, and is located in the eastern end of the STP. It is a partially below-grade tank constructed of six-inch concrete. The estimated dimensions are six feet by ten feet, and three to five feet deep. The unit is equipped with a bar screen and grinder for the separation and grinding of large pieces of debris present in the influent. The waste stream is received from the Sewage Influent Pipe (SWMU 66). This unit was active from 1958 to present. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 68 – North Primary Clarifiers at the STP

These units are two circular, open-topped, concrete tanks located in the eastern portion of the STP. They are 35 feet in diameter, and approximately seven feet deep, with slightly below-grade construction. The reported operating capacity of the units is one million gallons/day. The purpose of the unit is for the gravity settlement of solids. Facility representatives reported no chemicals are added to facilitate settlement. Film is skimmed from the surface and pumped along with the bottom solids to the Primary Digester. The effluent overflows a weir and is conveyed to Splitter Box 2 by an 18 inch vitrous clay pipe. This unit was active from 1958 to present. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 79 – Former Sludge Beds at the STP

This unit was a series of 11 parallel beds used for the drying of the STP sludge. The beds were separated by two-foot high concrete walls, and have sand bottoms. The unit is bounded on the north by a concrete distribution trough, (approximately two feet wide and two feet high) for the entire length of the beds. Each bed was approximately 15 to 20 feet wide and 50 feet long. The sludge beds were built as part of the STP in 1958. The original structures were constructed with concrete retention walls. One documented release occurred in 1978 when a flash flood damaged retention structures causing sludge to be spread across an area approximately 200 feet to the south and 500 feet to the east and west of the sludge beds (SWMU 80). The sludge beds at the STP were reconstructed within the same general footprint and consisted of 11 basins having dimensions of 20 feet by 50 feet with 2-foot-deep concrete retention walls and bottoms and operated till the late 1990's.

SWMU 80 - STP Sludge Waste Pile Main Post

This solid waste management unit consists of a former sludge waste pile. A flash flood in 1978 damaged the Main Post Sewage Treatment Plant sludge drying beds (SWMU 79). Debris from the flood damage cleanup, including reinforced concrete, excavated soil, and sludge, was stockpiled approximately 200 feet to the south and 500 feet to the east and west of the sludge beds creating the SWMU 80 unit in 1978. SWMU 80 was approximately 50 feet by 75 feet by 10 feet high. The site was subsequently used for the stockpiling of dried sludge following construction of the new sludge drying beds at SWMU 79. Following the removal of the sludge pile at SWMU 80 in 1996, no waste disposal activity at the site has occurred. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 81 – Boiler at the STP

This unit is an Envirox Boiler located inside the boiler house within the central portion of the STP. Sludge from the Primary Digester is circulated through four-inch pipes through the boiler for heating. The sludge remains in the enclosed pipe with no entry into the heating chamber. The heated sludge is returned to the Primary Digester. The boiler is fueled by a natural gas supplemented with methane from the Primary Digester. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 84 – Effluent Pipeline at the STP

This unit is an underground PVC pipeline which carries treated effluent from the STP to the Playa Lake (SWMU 85) starting in 1986. The pipeline extends a distance of approximately three miles. The unit is still in place but is no longer in use when a new effluent pipeline was constructed near to SWMU 84 in the late 2010's. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 85 – STP Discharge at Playa Lake

The unit is a dry lake bed which is located approximately three miles east of the STP. Effluent from the STP is discharged to the Playa via the Effluent Pipeline (SWMU 84). The estimated dimensions of the Playa are 1000 feet by 1000 feet. At the time of the WSMR RCRA Facility Assessment in 1988 the water level appeared to be very shallow (six to eight inches deep) and the area heavily vegetated with reeds and grasses. The unit has been active from 1986 to present. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 86 – Former Sanitary Landfill at the Main Post

The Main Post Landfill has been in operation since 1983 and covers an area of approximately 82.9 acres, although only 38.6 acres have actually been utilized. The MPL ceased receiving municipal solid waste (SWMU 86) in 1996 and no longer accepts C&D waste (SWMU 87). The sanitary landfill unit covers an area of approximately 60 acres and is surrounded by an eight-foot chain link fence. The active disposal cell was excavated to an approximate depth of 20 feet. Waste collected from the Post area was transported to the landfill and placed in the active cell. The cell was backfilled with soil as the cell was filled with waste on a reported daily basis. The MPL (SWMU86) was closed in 2011 in accordance with NMED Solid Waste Bureau requirements. Current cover thickness per the cap design is at least 30 inches of native soil and 6 inches of erosion control layer capable of supporting vegetation. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 87 – Former Construction Landfill

The Main Post Landfill has been in operation since 1983 and covers an area of approximately 82.9 acres, although only 38.6 acres have actually been utilized. The MPL ceased receiving municipal solid waste (SWMU 86) in 1996 and no longer accepts C&D waste (SWMU 87). SWMU 87 received construction debris from various locations in the Post area. The landfill cell was approximately 300 feet long and 20 to 30 feet in depth. The Construction Landfill (SWMU 87) was closed in 2011 in accordance with NMED Solid Waste Bureau requirements. Current cover thickness per the cap design is at least 30 inches of native soil and 6 inches of erosion control layer capable of supporting vegetation. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 102 – Burn Pan South of Building 21547

The Burn Pan site is located approximately 3.5 miles east of WSMR Headquarters, south of Route 2 and west of Route 19. The Burn Pan was a steel pan, 7 feet long by 3 feet wide by 1 foot deep that was used for open burning of spent rocket fuel. The startup date of the burn pan is not known but operations ceases in 1984. WSMR chose to discontinue using the site for thermal treatment and decontaminated and removed from the site in 1989. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 103 – Scrap Metal Yard at Building 21280

This is a fenced yard used for the storage of scrap metal which is eventually sold as scrap. The fenced area is approximately 100 yards by 100 yards, and is unpaved. The ground surface is partially covered with gravel. The unit is located about four miles southeast of the Post. The unit operated from 1958 to present. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 108 – Vapor Extraction Well at TTF

SWMU 108 was a soil vapor extraction system installed in 1995 to remediate methylene chloride and other constituents in soils associated with a release at the Temperature Test Facility. The constituents in the soil were the result of releases of approximately 8,000 gallons of coolant from a lined wastewater pond (SWMU 104), approximately 5,000 gallons from faulty valves associated with an underground tank located between SWMU 104 and the TTF building, and approximately 4,500 gallons spilled during building construction. SWMU 108, consisting of 19 Soil Vapor Extraction (SVE) wells, was installed in 1998. Operation of the SVE system continued until October 2002. Dismantling of the SVE system was completed in August 2004. Vapor and groundwater wells were plugged and abandoned in December 2007. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 109 – Drum Storage Area (Splash Pan) at TTF

SWMU 109 is primarily a concrete equipment pad which was occasionally used for temporary storage of drummed wastes generated at TTF. Drummed waste could possibly have contained methylene chloride and freons. Methylene Chloride and freons are no longer used at the facility. A concrete dike surrounds the pad which slopes to a drain/sump which ties into the drain line and discharges to the Evaporation Tank (SWMU 105). Dates of operation of the SWMU are unknown but was active at the time of the WSMR RCRA Facility Assessment in 1988. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 110 – Methylene Chloride Catchment System at TTF

This unit consists of a series of 2.5-gallon safety cans which collect drips from pump seals. A piece of copper tubing runs from below the pump seals into each can. Methylene chloride collected in the cans is recycled into the refrigerant system. Each pump has its own collection can. The cans sit on a concrete floor inside the TTF building. Methylene Chloride is no longer used at the facility. The catchment system was installed in 1985 and is still in use. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMUs 111-112 – Methylene Chloride Separation System at TTF

This unit was installed as an interim measure after the former Evaporation Pond (SWMU 104) was removed and prior to installation of the New Evaporation Tank (SWMU 105). The units operated during 1985. This unit consists of two tanks which were formerly used to prevent possible methylene chloride spills from reaching the wastewater Storage Tank (SWMU 107). The first tank in the separation system is an in-ground 1000- gallon rectangular steel tank equipped with a baffle. Water containing methylene chloride was conveyed to the second tank, a horizontally mounted cylindrical 500-gallon in-ground steel tank. Both units have been removed from the site and Methylene Chloride is no longer used. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 113 – Salt Water Evaporation Tanks at TTF

Salt fog condensate from the TTF test chambers drains to two galvanized steel open-topped tanks each approximately ten feet in diameter and two feet deep. The tanks sit directly on the ground.

Water evaporates from the tanks leaving crystallized sodium chloride in the tank. The tanks receive only salt water from the test chambers. No hazardous waste or hazardous constituents are managed in these tanks. These units operated from 1984 to present. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 116 – Rhodes Subgrade Asphalt Tanks

SWMU 116 consisted of three steel tanks which were found to be partially exposed above the ground surface. Each steel tank had an estimated 2,500-gallon capacity and was likely used for fuel or oil storage. The dates of operation and information detailing the historical tank contents are unknown. The tanks and an unknown amount of soil were removed in 1994. A release of hydrocarbons to the soil occurred at the site which was removed in 2016.

SWMU 119 – Former Stallion Range Landfill

This unit is located at Stallion Range Center approximately 100 miles north of the Main Post in The northeast portion of WSMR. The landfill is about 300 feet by 380 feet in size, and is surrounded by an eight-foot chain link fence. The cells were excavated to a size of approximately 60 feet wide by 100 feet long and sloped to depth of about 15 feet. Waste was collected in dumpsters and emptied into active cells, where it was reportedly covered with soil daily. The landfill operated from 1984 to approximately 2001. The landfill is reported to have received only nonhazardous paper, office, kitchen, and yard/grounds waste from the Stallion Range Center. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 120 – Former Stallion Center Landfill

The unit was a sanitary landfill used for sanitary waste generated at Stallion Range Center from 1970 until 1984. The landfill is about 300 feet by 380 feet in size. The cells were excavated to a size of approximately 60 feet wide by 100 feet long and sloped to depth of about 15 feet. Waste was collected in dumpsters and emptied into active cells, where it was reportedly covered with soil daily. The unit is located adjacent to SWMU 119), and is not fenced. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMUs 121-123 – Stallion Asphalt Tanks

Three sub-grade storage tanks were used in the 1960s during the paving of the Stallion Range Center roads. The storage tanks were labeled Tank 1 (SWMU 121), Tank 2 (SWMU 122), and Tank 3 (SWMU 123). Tanks 1 and 2 were constructed of plate steel. Tank 3 was constructed of aluminum. Each storage tank had a capacity of approximately 15,000 gallons and dimensions of 26 feet in length by 9 feet in diameter. All three tanks appeared to be empty and abandoned during the WSMR RCRA Facility Investigation in 1988. The ground on the north side of the tanks appeared to be stained with a tar-like substance that looked dry, dark, and cracked, and appeared to have been there a long time. Facility personnel were unable to provide a list of materials that may have been managed within the tanks, the age of the tanks, and the dates of operation of the units although it is expected to have been tar. Although there is evidence of a release of a tar-like substance to the ground surface, there are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 124 – Waste Oil Storage Tank at Stallion North of Building 34250

This unit was a portable 500-gallon closed steel tank sitting on concrete pavement. The tank was used for storage of waste oil generated at Stallion Range Center. The tank was reportedly transported to the WSMR Main Post for emptying and disposal as needed. The tank was in use at the time of the 1988 WSMR RCRA Facility Assessment and it was noted that the concrete around the tank was stained with oil. The tank was located north of Building 34250 at Stallion Range Center. The operational dates of the tank are unknown, however as of this date, the tank is no longer in use. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 125 – Incinerator at Veterinary Clinic Building 1834

SWMU 125, the Veterinary Clinic Incinerator, is located approximately 50 feet south of Building 1834 in the southeast portion of the WSMR Main Post. The incinerator was a Stamco gas-fired unit that measured 3 feet by 5 feet by 2 feet high. It was mounted outside on a concrete slab next to the Veterinary Clinic. The incinerator was formerly used to dispose of “red bag” waste and “sharps” generated at the veterinary clinic. Currently, only the 6 inch thick concrete slab is present at the site. The startup date of the incinerator is unknown and was used until approximately 1986. No hazardous wastes were managed within this unit, and no history of a release at this site is documented. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 126 – Incinerator at McAffee Clinic Building 530

SWMU 126, the McAfee Clinic Incinerator, was located in the northwest portion of the WSMR Main Post. The incinerator was a double-hearth unit inside Building 530, the McAfee Clinic, on the Main Post. It was formerly used to dispose of clinical wastes that had been sterilized in a nearby autoclave prior to incineration. Residue and ash from incineration was placed into bags and disposed of in the Sanitary Landfill on the Main Post. The unit was decommissioned in 1988 and is no longer located on site. The startup date is not known. No hazardous wastes were managed within this unit, and no

history of a release is documented at this site. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 127 – Autoclave at McAffee Clinic Building 530

The autoclave at McAffee Clinic was a laboratory-sized unit which used high pressure steam at 121°C to sterilize clinical waste prior to disposal. After treatment, the solid waste was disposed in the WSMR Sanitary Landfill. Condensate from the unit drained via sewer liner to the sewage treatment plant. The autoclave was in use as of the mid to late 1970's. This unit did not manage hazardous waste. The McAfee Clinic building 530 is no longer present at WSMR. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 128 – Silver Recovery System Tailing Tank at Building 1512

The silver recovery system tailing tanks (SWMU 128) were located in the basement of Building 1512 and were used to store recovered silver from the photo fixer solution. The solid waste management unit was constructed of fiberglass and operated from the 1970s to the 1990s. The silver recovery system discharged effluent to the sewer system. The tank had an approximately 40 gallon capacity with its specific dimensions unknown. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 129 – Cyanide Treatment Unit at Building 1512

The cyanide treatment unit (SWMU 129) was used to oxidize spent photographic bleacher solutions containing ferrous cyanide. The solid waste management unit was constructed of stainless steel and operated from the 1970s to the 1990s. After 1985, sodium persulfate replaced ferrous cyanide in the bleaching process. The cyanide treatment unit discharged effluent to the sewer system. The dimensions of this unit are no known. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 130 – Former Spent Developer Storage Tank at Building 1512

SWMU 130 consists of one cylindrical plastic tank (1,000-gallon capacity) that was used at both Building 1512 and Building 1524. Before 1985, the tank was located outside Building 1512 (SWMU 130) where it was used to store spent developer (ferrous cyanide solution) from photo processing operations. The starting date of tank usage is not known. The dimensions of the tank are approximately 64 inches in diameter and 80 inches high. The tank was removed from building 1512 in 1985. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 131 – Acetic Acid Spill Containment Tank

SWMU 131 consists of one cylindrical plastic tank (1,000-gallon capacity) that was used at both Building 1512 and Building 1524. Before 1985, the tank was located outside Building 1512 where it was used to store spent developer (ferrous cyanide solution) from photo processing operations. The dimensions of the tank are approximately 64 inches in diameter and 80 inches high. After 1985, the tank was relocated outside of Building 1524 (SWMU 131) where it was used as a secondary containment tank for the acetic acid storage area until an unknown date. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 132 - Orogrande Waste Stabilization Pond Stabilization Pond

The Orogrande Waste Stabilization Pond (OWSP) is roughly trapezoidal in shape and is surrounded by a berm approximately 6 feet high and 18 feet wide at the base. When measured on the highest point of the berm, the pond measures approximately 560 feet along the western boundary, 570 feet along the eastern boundary, 300 feet along the southern boundary and 500 feet along the northern boundary. A barbed-wire topped fence surrounds the OWSP, but the fence has fallen. The OWSP was originally constructed in 1972 as a disposal facility for sanitary waste and liquid wastes generated by Army personnel, maintenance operations, and other related activities at the Fort Bliss Orogrande Range Training Camp. The OWSP is a one-cell pond, with a 10-mil plastic liner, covering approximately 4.74 acres of land. The pond was constructed with a plastic liner placed over compacted soil that was then covered with an approximately 12-inch thick soil layer. The liner extends up the side slopes of the pond, which were designed with a side slope ratio of about 1:4. The OWSP is managed by Fort Bliss and is currently in operation. There are no indications of a release of hazardous waste or hazardous constituents from this unit

SWMU 133 NOMTS Machine Shop Accumulation Area at Building 1436

SWMU 133 is located in the southern portion of the Machine Shop (Building 1436). The area is in use as waste drum storage. The drums rest directly on the concrete floor of the building. According to NOMTS personnel, the drums were being stored in the building until the content of the drums was characterized for proper disposal. The accumulation area has been active since late 1987.

There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 134 - NOMTS Outdoor Accumulation Area at Building 1436

The NOMTS Outdoor Accumulation Area is located on the east side of Building N197 (Building 1436), the Machine Shop Oil Shed, on the Main Post. At the time of the WSMR RCRA Facility Assessment, three 55-gallon drums in overpack containers were stored here. The accumulation area is above-ground, open-topped concrete box that has the approximate dimensions of 3.5 feet tall, ten feet wide, and five feet wide. The unit has been active since late 1987. The accumulation area manages drummed waste. The composition of the waste in the drums was unknown at the time of the WSMR RCRA Facility Assessment but is expected to be waste oil. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 135 – Paint Shop Accumulation Area at Building 1742

SWMU 135 is located at Building 1742 (former paint shop) in the southeast portion of the WSMR Main Post. SWMU 135, located outside of Building 1742, was a fenced, gravel-covered accumulation area where drums containing paint waste and solvent were stored on wooden pallets that were used in operation of the paint spray booth (SWMU 136). As of 1988, the spray booth had been in use for approximately 5 years. Building 1742 is no longer a paint shop and is currently used for office space and storage related to janitorial services at the WSMR Main Post. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 136 – Paint Shop Spray Booth at Building 1742

SWMU 136, located inside of Building 1742, was a water cascade-type spray booth used for airless and conventional spray painting. The dimensions of the spray booth were approximately 15 feet by 10 feet by 8 feet. While the spray booth was in operation, a curtain of water captured overspray.

Wastewater from the spray booth contains particulates from paint overspray. Volatiles from paint solvents are vented through an exhaust duct to the atmosphere. Building 1742 had a floor drain system installed in the concrete floor that connected to the paint shop sump (SWMU 137), which drained to the sewer system. Water containing paint overspray was discharged from the spray booth to the SWMU 137 paint shop Sump. As of 1988, the spray booth had been in use for approximately 5 years. Building 1742 is no longer a paint shop and is currently used for office space and storage related to janitorial services at the WSMR Main Post. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 137 - Paint Shop Sump at Building 1742

SWMU 137 is located at the northeast end of Building 1742 on the Main Post. Operation of the paint shop began in 1968; however, it is no longer used as a paint shop. Wastewater generated from the paint spray booth located inside Building 1742 was discharged by gravity flow into a concrete sump. Sludge (mixture of water and solids), paint, and other debris (trash, leaves, and minor sediment) were separated by gravity and transferred by gravity flow to the Sewage Treatment Plant. The sludge was removed periodically and disposed of as hazardous waste. The paint shop sump was square (3 feet by 3 feet) and 3 feet deep with 3 inch concrete walls. The head of the 6-inch steel drain pipe was exposed in the northern face of the sump and extended for 6 feet north and then transitioned to a 6 inch vitreous clay pipe. In 2013, the sump and drain lines were abandoned. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 138 - Waste Accumulation Area at RATSCAT

The former waste accumulation area is located at the RATSCAT site on WSMR. This site is located approximately 35 miles north of the main Post area and 23 miles west of Alamogordo, NM. The accumulation area consisted of metal drums containing waste hydraulic fluid, waste oil and paint waste. The area was in the open and was underlain by a curbed, concrete pad. This unit was in operation since the mid 1980's. The waste managed at this unit included waste hydraulic fluid, oil and paint from vehicle maintenance. Less than 350 gallons of petroleum waste and five gallons of paint waste were generated per year. The unit is no longer in operation (unknown date). There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 141 – HELSTF Equipment Storage Area

Prior to establishment of the equipment storage area, the area where SWMU 141 is located was the multifunction array radar waste stabilization pond (SWMU 148). Historical photographs indicate that the pond was filled and graded by 1982 but was not yet used for equipment storage. By 1986 the area had been fenced and was being used for storage. The area is a flat, fenced yard approximately 1.2 acres in size. Spare hardware, materials employed in HELSTF operations, and, for short periods of time, drums of chemicals, scrubber liquors, and waste oils have been stored at SWMU 141. Currently, the site is used for storage of site materials and parts on pallets. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 143 – HELSTF Storage Yard Chromium Spill Site

SWMU 143 consists of a release of approximately 55 gallons of Entec 300, a corrosion inhibitor containing hexavalent chromium and zinc, which resulted from the mishandling of the drum. The release was discovered in December 1989 while the area (equipment storage area) was being prepared for paving. The spill site was initially covered by a shingled, wooden roof to inhibit leaching and

runoff. The cover was removed in 1998 when a gaseous reduction test using injection and extraction wells was conducted. A plastic sheet barrier was installed in the subsurface to inhibit leaching and runoff of chromate associated with the spill. Hexavalent chromium has been released to the soil and perched groundwater at the site.

SWMU 144 - HELSTF Laser System Test Center Wastewater Discharge Pond

SWMU 144 is a rock-filled irregularly shaped pit surrounded by thick brush. The pit is approximately 10 feet in diameter and 8 feet deep. The discharge pond received wastewater from the laser systems test center from the 1960's through 2008. A sump and discharge pump in the basement of Building 26129 collected and ejected chiller coil condensate, water drained periodically from the building fire sprinkler system, and blowdown from the cooling tower water treatment system. The collected liquid was pumped to a French drain located outside the HELSTF fence. Because of area soil characteristics, the discharged water dissolved the gypsiferous soil and caused subsidence of the original drain. This resulted in fracturing of the drainpipe just upstream of the French drain and leaking of wastewater from the fractured pipe. The pit was filled with rocks in 1991. Discharge to the pit no longer occurs. A potential release of chromium and solvents to groundwater has likely occurred.

SWMU 145 - HELSTF Test Cell Lagoons

The Test Cell Lagoon was constructed in 1988 with a single 6-millimeter Hypalon® liner with no secondary containment. The lagoon was 105 feet by 60 feet by 6 feet deep. The Test Cell Lagoon was used once in 1989 to treat 30,000 gallons of sodium fluoride wastewater. The wastewater level in the lagoon dropped 2 feet in the 2□3 days after it was filled, indicating that the integrity of the liner was compromised. The lagoon was not used again. The liner and impacted soil were removed in 1996 and then the area was backfilled and paved. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 146 - HELSTF STP Dry Pond

The sewage treatment plant dry pond is a 120 feet by 120 feet by 7 feet deep unlined surface impoundment that formerly received non-sewage wastewater from the Test Cell 2 Mechanical Building (26115) at a reported rate of 30□50 gallons per minute. In addition, the dry pond received overflow of wastewater from the sanitary treatment impoundments (SWMU 27) on an as-needed basis. Discharges from SWMU 27 included a 1983 discharge of 15,000 gallons of domestic sewage and discharge of cooling tower water, pressure recovery system pump cooling water, and pressure recovery system boiler water in 1984 and 1985. Discharges to the dry pond likely began before the early 1980's and continued till 2008. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 147 – HELSTF Decontamination Pad & Underground Holding Tank

The decontamination pad was constructed in 1982 and had a sump measuring 3 feet by 5 feet by 6.5 feet (deep), with an open top, grate and steel cover. The pad emptied into the adjacent sump (which may have been referred to as a tank in the RFA) and that it was connected to an above ground tank. The pad was used for cleaning large pieces of equipment that could not be cleaned in the HELSTF Cleaning Facility (SWMU 142). Accumulated wastewater was periodically removed from the tank and disposed. Sediment/sludge and water collected from within the sump were found to be contaminated with VOCs, SVOCs, and TPH. Contents of the sump were removed and properly

disposed. The sump was filled with concrete in April 1996 to prevent its continued use. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 148 – HELSTF Former MAR Waste Stabilization Pond

The former multifunction array radar waste stabilization pond was an unlined pond with an earthen berm that was used to treat sewage effluent and possibly industrial wastewater generated by the former multifunction array radar facilities. The pond, built in 1962, was 110 feet by 130 feet and 7 feet deep. The pond was backfilled and graded during construction of HELSTF in 1981, and a replacement sanitary treatment system was constructed, which is now referred to as SWMU 27. The area was paved with asphalt in 1990 and now lies below the northeast corner of SWMU 141. SWMU 141 is still an active equipment and materials storage area. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 149 – HELSTF Maintenance Building Septic System

The maintenance building septic system (SWMU 149) has been in use since the 1960s and consists of a 200-gallon septic tank and a drainage field measuring approximately 30 feet by 70 feet. There are two subsurface 4-inch drainage lines measuring 30 feet in length. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 150 – HELSTF MAR Dump Site

When discovered, the multifunction array radar dump site (SWMU 150) was inactive and consisted of an open trench that was partially filled with what was thought to be building debris and old paint materials. The trench measured approximately 225 feet by 35 feet by 8 feet deep. An approximately 50 feet diameter spoil pile of soil was located approximately 40 feet northwest of the trench and was believed to be the soils excavated during trench construction. In 1996 the contents of the trench were removed and transported to the WSMR Main Post Construction landfill. The entire area was then graded to blend with the existing terrain. It is presumed that the trench used as a landfill in the 1960s and early 1970s during the operation of the MAR facility. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 151 – HELSTF Trailer Area Septic System

SWMUs 151 and 152 shared a drain field that measured approximately 40 feet by 110 feet The office trailers that discharged to SWMU 151, previously located just to the north north-east of SWMU 151, had been removed by the early 1990s. Only the property and supply building (Building 26145) used the SWMU 151 and 152 drain field once the trailers were removed. Between 2009 and 2019 use of the septic systems was discontinued. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 152 – HELSTF Property and Supply Building Septic System

SWMUs 151 and 152 shared a drain field that measured approximately 40 feet by 110 feet The office trailers that discharged to SWMU 151, previously located just to the north north-east of SWMU 151, had been removed by the early 1990s. Only the property and supply building (Building 26145) used the SWMU 151 and 152 drain field once the trailers were removed. Between 2009 and 2019 use of the septic systems was discontinued. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 153 – Vandal Burial Site

The Former Vandal Burial Site, SWMU 153, is an area approximately 270 feet by 140 feet that is located in the Hazardous Test Area of WSMR adjacent (25 feet south) to the OB/OD Area (SWMUs 55, 56, and 56A). The site is approximately 7 miles north of the Main Post. During the mid-1950s, missile and rocket parts were buried in three distinct cells and covered with approximately 2 to 3 feet of soil. All buried material was removed in 1994 and the site was backfilled with soil. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

SWMU 154 – HELSTF Systematic Diesel Spill Site

A 30,000-gallon underground storage tank (UST) was installed east/northeast of SWMU 141 in late 1979 or early 1980 at the HELSTF facility. Two-inch fuel oil supply steel piping connected the UST to the Test Cell No. 2 area (approximately 120 feet to the south) and to the cleaning facility (approximately 360 feet east-northeast of the UST). These lines were installed during renovation of the multifunction array radar site for use at HELSTF about 1981. The UST supplied No. 2 fuel oil to a turbine generator at Test Cell No. 2 and boilers at the cleaning facility. The UST was removed in April 1988 as part of a facility-wide tank replacement program when aboveground storage of fuel became the preferred material handling practice.

A release of diesel fuel from the supply line for the cleaning facility boilers was discovered on the south side of the cleaning facility in early 1990 during an investigation of the cleaning facility sump. Diesel fuel contamination was discovered starting at 11 feet below ground surface and free product diesel was discovered at 20 feet below ground surface. Approximately 100,000 gallons of diesel fuel was released to soil and groundwater at the site.

SWMU 157 – Former Oscura Range Center Landfill-A

The operation dates of SWMU 157 are unknown, however, the site was identified by WSMR environmental personnel in 1997. The units consisted of an approximately 30 feet by 30 feet area in which waste material was dumped. A description of debris at the site included communications wire, wood pallets, refrigerator, and a propane tank. Landfill A was located 100 yards south of the ORC Commo building 31775. Dumped waste material was removed and properly disposed in 1998. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 159 – Former Oscura Range Center Landfill-C

SWMU 159 consisted of a bladed area approximately 3 acres in size that was used in 1987 as the site for a landfill trench. An area having scattered surface debris was located south of the landfill trench and is where dump trucks likely backed into the site to unload debris into the landfill trench. The landfill trench was approximately 200 feet in length by 20-30 feet in width by 10-20 feet in depth. The landfill trench was excavated in 2006. Waste material from the trench including concrete, scrap metal, and scrap wood was properly disposed off-site. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 162 – Stallion Range Center Former Fire Fighting Training Area

SWMU 162 was the Fire Fighting Training Area (FFTA) at Stallion Range Center. The exact dates of use of the area are unknown but activities took place before the late 1980s. The FFTA consisted of an area approximately 200 feet by 50 feet adjacent to a dirt road where firefighter training occurred. Typically, a flammable liquid was used to start the training fires and may have included diesel and/or

gasoline. No structures were present at the FFTA and no further details regarding the training activities were available. Though no records of the cleanup have been discovered, in the late 1980's an area of soil approximately 50 feet by 100 feet by 4 feet deep was excavated, aerated in the sun, and used as clean fill for the Stallion Range Center Landfill. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 164 – AMRAD Facility UST near Building 25900

SWMU 164 is a 3,000-gallon steel Underground Storage Tank discovered near Building 25900, at the Anti-Missile Radar Facility (AMRAD) in 1997. The tank contained oil from the operation of the large radar dish at the site. A release of motor oil range hydrocarbons has occurred at the unit. WSMR implemented a Voluntary Corrective Action (VCA) in 2004 which consisted of filling the tank in place with a mixture of sand, concrete, fly ash and water. The tank was closed in place to avoid costly relocation of or potential damage to the structural integrity of the radio frequency fence and anchor system under the tank.

SWMU 165 – LC-34 Contaminated Soils @ Buildings 23104 & 23106

Diesel fuel tanks were installed near Buildings 23104 and 23106 at an undetermined date to provide heating oil. The buildings are located within LC-34 in the southern portion of WSMR and approximately 5 miles northeast of the WSMR Main Post. The UST at Building 23104 was a 500-gallon steel tank, and the UST at Building 23106 was a 1,000-gallon steel tank. A minor release of fuel from the tanks has occurred. The two tanks were removed from WSMR in 1998. Approximately 90 cubic yards of soil were removed from Building 23104 and 35 cubic yards from Building 23106.

SWMU 166 – Denver AST Site

The Denver AST Site consists of two spatially distinct contamination zones. Diesel-contamination resulted due to releases from a former Above Ground Storage Tanks (AST) and associated piping and equipment which occurred prior to 1999. Dates of operation of the AST and generators on site is not known. The ASTs provided diesel fuel for portable generators on site. By 1999, the AST and generators had been removed. Since a diesel fuel release to soil had occurred at the site, WSMR completed soil removal of approximately 660 cubic yards of contaminated soil.

SWMU 167 – Malpais AST Site

SWMU 167 consisted of a 2,000-gallon AST located approximately 40 miles northwest of Alamogordo, New Mexico on the northeastern portion of the range. The AST and associated product line was used to provide fuel for a field generator. Operations reportedly ceased in 1989. Dates of operation of the AST and generators on site is not known. The site was discovered during a 1999 WSMR Range-wide AST survey, where the leaking diesel AST was identified at the Malpais site. The tank contents were removed, and the tank and concrete pedestals were removed in 1999. As of 2004, 3,500 cubic yards of diesel contaminated soil were removed from the site.

SWMU 168 – Lance Missile Impact Site

SWMU 168 is located within the White Sands National Monument (WSNM) near Lake Lucero on property managed by the National Park Service (NPS). On Dec. 14, 1999, a Lance Missile Launched from WSMR impacted within WSNM. Propellant used in the Lance Missile included Unsymmetrical Dimethyl Hydrazine (UDMH) and Inhibited Red Fuming Nitric Acid (IRFNA).

The missile penetrated the ground surface and exposed the water table at approximately three feet below ground surface. The impact created a crater approximately 18 feet in diameter and 5 feet deep. All surface debris has been removed from the site and the crater filled in with native soil from the site. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 197 – HELSTF Technical Support Area Gasoline Spill

SWMU 197 consists of a fueling station with a 3000 gallon AST that released approximately 1490 gallons of unleaded gasoline. The pump island at the TSA included one dispenser supplied by the AST which is located approximately 35 feet west of the dispenser island. The single AST serving the facility is mounted within a concrete secondary containment structure and stored unleaded gasoline for motor vehicle fueling. The release was discovered on March 16, 2000. The magnitude of the loss was estimated on the basis of an inventory review. The fueling station at the site was shut down in March 2000. It is unknown when fueling operations at the site began. Investigation results indicate that both soil and groundwater at the site has been affected by constituents related to unleaded gasoline.

SWMU 198 – LC-38 Diesel Fuel Oil Release

SWMU 198 is the Launch Complex (LC)-38 Diesel Fuel Spill Site, which consisted of a steel 150,000-gallon AST and surrounding contaminated area. Corroded piping, connected to the AST, resulted in the loss of approximately 31,000 gallons of diesel fuel to soil beneath the site. The tank and associated piping were removed in 2005. Fuel is no longer stored at the site. Investigation results indicate that both soil and groundwater at the site has been affected by constituents related to diesel fuel. Chromium has been detected at concentrations above regulatory criteria in groundwater at the LC-38; however, the chromium is not attributed to the diesel fuel release.

SWMU 199 – Hardin Ranch First AST Site

SWMU 199 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 20 feet by 16 feet by 14 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 200 – Hardin Ranch Second AST Site

SWMU 200 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 16 feet by 10 feet by 12 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 201 – RAM (Facility 6002) AST Site

The Range-Wide AST survey (1997-1999) identified a surface stain beneath the location of an active AST at the Ram site. It is not known when the AST was first used at the unit. The AST had been removed at the time of the preliminary investigation conducted in May 2003, but a small stain was

located near a concrete pad sloping toward the building at the site. Investigation results indicate that a release at this unit has not occurred.

SWMU 202 – Dead Horse Instrumentation AST Site

The Range-Wide AST survey (1997-1999) identified the location of an AST at the Dead Horse Instrumentation site. It is not known when the AST was first used at the unit. The AST had been removed at the time of the AST survey in 1998. Investigation results indicate that a release at this unit has not occurred.

SWMU 203 – Oscura (Facility 31795) Communication AST Site

SWMU 203 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 15 feet by 15 feet by 10 feet deep. Contaminated soil was removed from this unit in 2006.

SWMU 204 – Harriet (Facility 34600) Instrumentation AST Site

SWMU 204 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 15 feet by 8 feet by 14.5 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 205 – SE-70 (Facility S-31427) Instrumentation AST Site

SWMU 205 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 45 feet by 22 feet by 5 feet deep. Contaminated soil was removed from this unit in 2005.

SWMU 206 – Atom (Facility S-33151) First AST Site

SWMU 206 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. Results of the investigation indicate that a release has not occurred at this site.

SWMU 207 – Atom (Facility S-33151) Second AST Site

SWMU 207 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown

amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 50 feet by 40 feet by 9 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 208 – SE-50 (Facility 29055) Instrumentation AST Site

SWMU 208 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 20 feet by 15 feet by 15 feet deep. Contaminated soil was removed from this unit in 2005.

SWMU 209 – EC-50 (Facility29085) Instrumentation AST Site

SWMU 209 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 40 feet by 20 feet by 32 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 210 – Minnow (Facility S-31132) Instrumentation AST Site

The Range-Wide AST survey (1997-1999) identified a surface stain beneath the location of an inactive AST at the Minnow site. It is not known when the AST was first used at the unit. The AST had been removed at the time of the preliminary investigation conducted in May 2003, but a small stain was located near a concrete pad sloping toward the building at the site. Investigation results indicate that a release at this unit has not occurred.

SWMU 211 – Cowan Instrumentation AST Site

SWMU 211 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 12 feet by 10 feet by 14 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 212 – NW-70 (Facility S-31620) Instrumentation AST Site

The Range-Wide AST survey (1997-1999) identified a surface stain beneath the location of a former AST at the NW-70 site. It is not known when the AST was first used at the unit. The AST had been removed at the time of the preliminary investigation conducted in May 2003, but a small stain was located near a concrete pad sloping toward the building at the site. Investigation results indicate that a release at this unit has not occurred.

SWMU 213 – Gran Jean (Facility S-34050) Instrumentation AST Site

SWMU 213 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 30 feet by 30 feet by 20 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 214 – NE-50 (Facility 29090) Instrumentation AST Site

SWMU 214 was discovered in May 2003 as a result of preliminary investigation of the AST originally identified during a Range-Wide AST survey (1997-1999). This SWMU consisted of a former AST which was used for fueling generators supporting testing operations on the Range. An unknown amount of diesel fuel was released at this site over an extended period of time ending in 2003. Start of operations of the AST and generator at the site is not known. The AST and generator have been removed. The diesel fuel release resulted in an area of soil contamination approximately 12 feet by 12 feet by 11 feet deep. Contaminated soil was removed from this unit in 2007.

SWMU 215 – Missile Graveyard

SWMU 215 is located off of Range Road 202 on WSMR. Waste is concentrated on either side of an abandoned, dirt power-line road and covered with loose, native soil. The area of obvious ground disturbance and visible surface debris covers 4.4 acres. Waste materials are scattered and typically protrude from the soil cover that forms the longitudinal mounds. The site's appearance gives the impression that shallow trenches may have been filled with waste and then covered with the excavated soil. Wastes exposed in the soil cover include scrap metal, glass, tires, wood, wire, batteries, cans, electric motors, hydraulic pump components and baseball-sized submunitions. The visible waste is scattered randomly and intermittently across the site. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

SWMU 216 – UST at Timing Station, Building 20710, LC-32 (Uncle Site)

SWMU 216 is a former 600-gallon UST at the LC-32 Building 20710 Timing Station. 600-gallon underground storage tank (UST) containing diesel fuel was installed north of Building 20710-A at an undetermined date. WSMR was unable to locate the tank dimensions from the installation records. The UST provided fuel for a generator that supplied electricity to Building 20710. The UST was removed in 1995. Diesel fuel has been released to soil at the unit.

SWMU 217 – AAFES Gas Station at Building 270

In May 2000 an unleaded gasoline spill occurred at the Army Air Force Exchange Service (AAFES) Desert Oasis Gas Station on White Sands Missile Range (WSMR) Main Post. The spill occurred from a capped fuel line at the gas station. Following discovery, the cap on the fuel line was tightened which prevented fuel from further leaking into the subsurface. The leak occurred at the access delivery lines for pumps #3 and #4. The leak had occurred at the site of the first dispenser on the concrete island. The dispenser housing had already been removed for replacement when the gasoline had leaked out the top of one of the capped stand pipes on the dispenser island. Investigation results indicate that a significant release of unleaded gasoline to the subsurface has not occurred.

SWMU 218 – LC-38 UST at Building 23626

SWMU 218 is located near to Building 23626 which is included within the LC-38 complex and was used for maintenance as well as administrative offices for WSMR personnel. SWMU 218 consists of a UST, which stored gasoline fuel for vehicles, was installed east of LC-38, Building 23626, at an undetermined date. The facilities near SWMU 218 are associated with LC-38 operations that began in the 1950s. The gasoline UST was installed at an unknown date after operations began. The reported use of the UST was for unleaded gasoline storage to fuel vehicles. The UST was a single-walled, 1,764-gallon steel tank not equipped with a leak detection system. Releases were not documented during the period that the UST was actively in use. The UST and all associated conveyance piping were removed in 1993 and a release of unleaded gasoline to the surrounding soil was documented during the removal activities.

SWMU 219 – Main Post POL AST Release Site

SWMU 219 is located at the WSMR Main Post, within the Main Post POL Storage Area. The POL Storage Area provided storage and a fueling point for official government vehicles. The POL Storage Area began service in the 1960s. There were three 6,000 gallon diesel ASTs located to the northwest of the fueling island and three 6,000 gallon gasoline ASTs located to the west of the fueling island. The ASTs are located within containment areas which are constructed of concrete walls with a concrete floor. A release of approximately 1,370 gallons of gasoline occurred while transferring gasoline between ASTs identified as structure number 1772. The concrete walls of the containment prevented the release of the gasoline to the surrounding ground surface. However, a crack in the southeastern corner of the floor of the concrete containment allowed fuel to escape and be released to the subsurface.

AOC A – Sink and Drain System at Building 1621

Area of Concern A consisted of three sinks and a polyvinyl chloride (PVC) drain system associated with photochemical operations at building 1621 (SWMUs 1-7). Photochemical waste drained into the sewer main located west of building 1621. The types of chemicals and waste managed, stored, and treated included prehardener, neutralizers, developer, bleach, fixer, and stabilizer residues that contained concentrations of chromium, silver, cyanide, SVOCs, and nitrate. The dimensions of this unit are no known. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC B – Battery Accumulation Area at North Oscura

AOC B was an accumulation area where approximately 10 vehicle lead/acid batteries were accumulated next to a tracking station at the North Oscura Range. As of 1988 the batteries had been there for 1 year. The batteries were placed in the open on soil, exposed to the weather. No evidence of leakage or spills was observed as of 1988. Batteries were removed from the site at an unknown date following the WSMR RCRA Facility Assessment in 1988. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC D – Drum Storage Area at STP

AOC D was located at the northeast corner of the Main Post sewage treatment plant, approximately 2 miles southeast of the WSMR Main Post. The site consisted of a concrete pad where lube oil and solvent were stored in drums. In 2015, it was noted that the concrete pad was still present; however, drums were no longer being stored at the site. Potentially hazardous materials are no longer stored at

AOC D. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC E – Pesticide Storage Area at Building 1708

Building 1708 is used to store and mix pesticides. Storage is in commercially approved containers including one- and five-gallon cans, 30- and 55-gallon drums for liquids and three- to 50-pound plastic lined bags for dry materials. The storage and mixing area is a concrete slab which was modified in 1981 to provide a 4-inch deep concrete retaining basin to contain possible spills. The storage facility is within a controlled fenced area and securely locked. The site is still used at this time. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC G – Brine (MeCl) Storage Tank at TTF

The methylene chloride storage tanks at TTF are pressurized, underground, stainless steel tanks insulated with urethane foam. The two tanks have a combined capacity of 46,000 gallons. The methylene chloride (called Brine at TTF) is stored cold and under pressure to minimize losses from volatilization. The tanks are reportedly inspected on a routine basis. The tanks are still in use. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC H, I, J, K, & L – Methylene Chloride Tanks (five tanks) at TTF

The five expansion tanks are mounted about 20 feet above ground level outside the TTF building. The expansion tanks are part of the TTF refrigerant system. Methylene chloride is used as a secondary refrigerant to control temperature in the test chambers. The expansion tanks are mounted above the Drum Storage Area/Splash Pad (SWMU. 109). During start-up activities at TTF in 1984, leaky gaskets in the expansion tanks and other equipment resulted in a release of methylene chloride. As a result, soil beneath the expansion tanks was contaminated with methylene chloride. The tanks are still in use. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC P – Chemistry Laboratory Drains at Building 1530

The Chemistry lab, Building 1530 is located in the Main Post near the Post Headquarters. The drains are connected to the Sewage Treatment Plant (STP). Prior to the mid 1980's, waste lab chemicals and samples reportedly may have been disposed in the lab sinks. Lab practices changed to segregate the waste chemicals and samples for waste management. The chemistry lab was closed in the 2010's and is no longer in use. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC S – Septic Tanks with Leach Fields

Numerous septic tanks on the WSMR are drained to leach fields. As many as 60 septic tanks have been reported to be on the WSMR. Reportedly the sludge is periodically removed and discharged into the sewage treatment plant. It is uncertain if any of the septic tanks have ever been contaminated with hazardous constituents. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC V – HELSTF Pressure Recovery System

The PRS was an engineered closed loop system on the Mid-Infrared Advanced Chemical Laser (MIRACL). The PRS was used to produce the vacuum required to operate the laser and to treat the

effluent. No pumps were used in this system, as a result no fluorine-contaminated pump oils were produced by the MIRACL. The PRS contained a scrubber to remove fluoride compounds from the deuterium fluoride chemical laser by reacting with 1% sodium hydroxide solution to neutralize the hydrogen fluoride. The PRS is approximately 400 feet long and 70 feet wide. It is comprised of two main exhaust trains, each with its own scrubber unit. Ancillary piping delivered sodium hydroxide to neutralize the hydrogen fluoride and calcium hydroxide (lime) to form fluorspar. AOC V was in operation from 1985 to 2009. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC W – Rhodes Canyon Impoundment

A disturbed area was observed on the south side of Range Road 6 south of the Rhodes Canyon Landfill (SWMU 114), and west of the Subgrade Tanks (SWMUs 116-118). The disturbed area had been identified as a possible former surface impoundment from observations made during the inspection of the adjacent landfills during the WSMR RCRA Facility Assessment in 1988. Facility personnel were unable to identify the possible function of the unit. At the time of the RFA, the disturbed area was not distinguishable as a surface impoundment. An old road bed or a possible berm was observed near the perimeter of the disturbed area. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC X – Stallion Range Desalinization/Sewage Lagoons

The SRC septic system sewage lagoons have been updated and it consists of two lined, bermed pits located approximately 700 feet southeast of Building 34265. Each pit is approximately 20 feet wide by 40 feet long. The current septic lagoons replaced, in the same approximate location, 4 sewage lagoons that were 20 feet by 40 feet. Sewage effluent is first processed in two parallel septic tanks located approximately 375 feet southeast of building 34265 along an unimproved access road to the sewage lagoons. The sewage lagoons have been operated since 1961 and are currently operational. The SRC desalinization pond consists of a large 300 feet by 60 feet unlined, bermed pit. Four pits were originally constructed to receive effluent; however, the northern-most pit is the only one that has been used since construction. In the past effluent discharged to the pond contains elevated concentrations of dissolved solids due to the desalinization process, but these consistent are much lower due to reverse osmosis unit now being used. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC Y – Stormwater Drainage Ditches

The stormwater drainage ditches at the Main Post area have been reported to receive or potentially receive waste by run-off from various operations and spills. (SWMU 10, 12, 14, 15, 16, 18, 19, 21, and 22). The drainage ditch generally flows toward the Playa Lake area (SWMU 85). The stormwater drainage ditches on WSMR Main Post likely date back to the 1950's and are still in use. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC Z – Abandoned Underground Storage Tank

The former UST was located in the southern portion of the WSMR Main Post and was installed approximately 200 feet south of the intersection of Raritan Avenue (now Martin Luther King Jr. Boulevard) and Headquarters Avenue at an undetermined date. The dates of operation and contents are unknown. The UST was removed; however, the date of removal is not known. The former UST was approximately 10 feet long by 4 feet wide and constructed of steel. No records of the tank condition or

removal were identified. There are no indications of a significant release of hazardous waste or hazardous constituents from this unit.

AOC AA – Alamogordo Bombing Range

AOC AA is a Munitions Response Site (MRS) located within the Stallion Range Center Cantonment Area (SRC) site and is comprised of 461 acres coinciding with an auxiliary cantonment area in the northern portion of WSMR. It is located approximately 115 miles north of the installation main post area within the northwest corner of the historical Alamogordo Bombing and Gunnery Range used to train bomber aircrews during the early to mid-1940s. The area is no longer used for this purpose. Based on available documentation, the nearest bombing target area was 5 miles east of this MRS. The MRS lies directly within the flight path for the aerial gunnery range used to train aircraft gun crews to shoot aerial targets. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC AB – Sewage Lagoons

AOC AB is a Munitions Response Site (MRS) located in the area of the Main Post sewage treatment plant. It encompasses 11 acres and lies within the northern boundary of an historical 3- inch Anti-Aircraft Artillery (AAA) range that was located to the south at former Camp Beasley and used from approximately 1940 to 1942. The area is no longer used for this purpose. Available records did not identify any response actions associated with munitions from the Camp Beasley AAA range activities. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC AC – Condron Field

This is a closed range comprising 480 acres in the extreme southern portion of the installation where Condron Field (airfield) now exists. This area was used as an artillery impact area for 3-inch rockets from Fort Bliss' Camp Beasley between approximately 1942 and 1944, and as a mobile combat range utilizing small arms in 1944. The area is now used as an airfield for drones that serve as missile targets. There have been no known Unexploded Ordnance (UXO) responses in this area. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC AD – Main Cantonment Area

AOC AD is the Main Cantonment Area (MCA) site which encompasses 1,687 acres and lies within the boundary of the 3-inch anti-aircraft artillery (AAA) range that was located to the south at Camp Beasley and used from approximately 1940 to 1942. The MCA is located in the far northwestern area of the historical AAA range boundary. Available records did not identify any response actions associated with munitions from the Camp Beasley AAA range activities. There are no indications of a release of hazardous waste or hazardous constituents from this unit.

AOC AE – Red Rio Bombing Range

AOC AE is an active bombing range which is located in the north-western portion of WSMR. The red rio bombing range is approximately 9 miles long and 6 miles wide. The bombing range began operation in the early 1960’s and is still in use. Both the Oscura and Red Rio sites are used by the U.S. Armed Services as tactical fighter aircraft air-to-ground gunnery strafing practice and bombing ranges. The sites are used on a daily basis. Located on site are numerous practice targets consisting of decommissioned cars, trucks, planes, and helicopters.

AOC AF – Oscura Bombing Range

AOC AF is an active bombing range which is located in the north-western portion of WSMR. The Oscura bombing range is approximately 10 miles long and 4 miles wide. The bombing range began operation in the early 1960's and is still in use. Both the Oscura and Red Rio sites are used by the U.S. Armed Services as tactical fighter aircraft air-to- ground gunnery strafing practice and bombing ranges. The sites are used on a daily basis. Located on site are numerous practice targets consisting of decommissioned cars, trucks, planes, and helicopters.

AOC AG – Main Post Skeet Range

AOC AG has been in use since 1975 and is currently active. The range is a recreational target practice area used for shot gun shooting and competitions. Its use over the decades has fluctuated from very light to moderate. The site is presumed to contain lead contamination from the various shot gun ammunitions. The WSMR Skeet Range is located approximately 2 miles south of the Main Post. The range consists of a firing range (facility 1801) and supporting infrastructure (concrete firing pads, observation towers; facility 1800). Including the Surface Danger Zone (SDZ) the site is approximately 35 acres.

8.1.1. Hazardous Waste Management Unit Summaries

HELSTF Landfills (SWMUs 38 and 39)

SWMUs 38 and 39 consist of two construction landfills located east of the High Energy Laser Systems Test Facility (HELSTF). Both landfills were in operation from the early 1960s to 1989 and described as two unlined trenches approximately 300 feet x50 feet x8 feet. They reportedly received non-hazardous construction waste including wood, piping material, paper, and insulation. The landfills may have also received drummed soil from the SWMU 143 hexavalent chromium spill. The units are listed as LDU-6 and 9. Completion of the RFI for the site is required. Following investigation completion, closure and post- closure care will be conducted.

It is likely that the corrective measures objective will be to design and construct a 25-year life soil cover over SWMUs 38 and 39, primarily intended to promote positive drainage away from the landfill. Post-Closure Care may include semi-annual inspections of the soil landfill cap, fences, and groundwater monitoring wells; As-needed maintenance of the corrective measures; and annual groundwater monitoring. A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis.

Oscura Munitions Landfill (SWMUs 41 through 46)

Oscura Bombing Range is located at the northeast corner of WSMR, west of Range Road 9 and north of Range Road 12. The bombing range is situated on the eastern flanks of the Oscura Mountains, west of the Malpais Lava Flow, and encompasses approximately 26,400 acres which are used as a target area for inert munitions drops from aircraft. The munitions burial area is about 4 miles west of Range Road 9 and 4 miles north of Range Road 12. Approximately 10 acres are included within the boundaries of the munitions burial site. The total area of the pits is approximately 1,000 feet by 1,000 feet. The pits are trench-like with approximate dimensions of 50 feet by 15 feet and reportedly 12 feet deep. Individual pits vary in size from 20 feet by 50 feet by ten feet to 30 feet by 75 feet by ten feet. Bounding the munitions burial area on the north and west sides are low berms that prevent the occurrence of sheet wash across the landfill cap from surface run-off water. This burial site was used

for the disposal of practice bombs after all spotting charges had been detonated. The exact nature of materials disposed and the dates of landfill operations are unknown. Reportedly, explosives were placed in a pit, then detonated and burned. After burning, the debris was covered with four inches of fill. The disposal operation was conducted in a progressive manner of layering until the pit was filled, at which time a new pit was started.

The bombing range is active and restoration activities are deferred for the landfill until after completion of training activities. It is likely that the corrective measures objective will be to design and construct a soil cover over the landfill, primarily intended to promote positive drainage away from the landfill. Post-Closure Care may include Semi-annual inspections of the soil landfill cap, fences, and groundwater monitoring wells; as-needed maintenance of the corrective measures; and annual groundwater monitoring. A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis.

Red Rio Munitions Landfills (SWMU 50 and 155)

Red Rio Bombing Range encompasses approximately 29,500 acres near the northeast boundary of WSMR, approximately 140 miles northeast of the Main Post. The bombing range is currently used as a target area for munitions drops from aircraft. Two separate areas were reportedly used for munitions burial from 1963 until 1987. These sites are located along the unimproved access road connecting the Hunter's Lodge gate to the Red Rio mock runway. The northern munitions burial site is approximately 0.75 miles south of the gate, along the east side of the road. The southern munitions burial site is located along the west side of the Red Rio mock runway, approximately 2.25 miles south of the northern burial site. The dimensions of the Red Rio Range Landfills area are 1,000 feet by 1,000 feet. Individual burial pits reportedly may vary in size from 20 feet by 50 feet by ten feet to 30 feet by 75 feet by ten feet including layers of earth between the waste materials. Reportedly, munitions were collected and brought to the unit. A pile of the projectiles would be placed in an open pit, detonated and burned. Following this, the residue was buried with four inches of fill material.

The bombing range is active and restoration activities are deferred for the landfill until after completion of training activities. It is likely that the corrective measures objective will be to design and construct a soil cover over the landfill, primarily intended to promote positive drainage away from the landfill. Post-Closure Care may include Semi-annual inspections of the soil landfill cap, fences, and groundwater monitoring wells; as-needed maintenance of the corrective measures; and annual groundwater monitoring. A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis.

Open Burn/Open Detonation at the Hazardous Test Area (SWMUs 55, 56, and 56A)

SWMUs 55, 56, and 56A were the OB/OD site within the Hazardous Test Area (HTA) and are located in the southwest portion of WSMR, approximately 5 miles north of U.S. Highway 70, and 10 miles north of the WSMR Main Post area. The HTA covers approximately 18 square miles and is surrounded by the San Augustin Mountains to the west, Mineral and Antelope Hills to the south, Bear Peak and Black Mountain to the north, and the Tularosa Basin to the east. The OB/OD site is located in the northwestern corner of the HTA. The OB/OD site consisted of two open detonation pits (SWMUs 56 and 56A) and a burn pan (SWMU 55). The detonation pits were constructed in 1953 and used primarily for controlled destruction of primary and secondary explosives, low explosives, propellants, explosive ingredients of propellants, propellant compositions, powders, and smokes. The two areas measured approximately 100 feet by 180 feet (west pit) and 170 feet by 180 feet (east pit).

The east pit operated as the primary treatment pit; the west pit, which operated as the secondary pit, was used less frequently. The burn pan was constructed in the mid-1980s and was used for burning non-explosives such as solid and liquid propellants. The pan measured approximately 5 feet wide by 10 feet long by 1 foot deep and was constructed of .25-inch-thick steel and lined with firebrick. Groundwater analytical data indicate three contaminant plumes are commingled over the downgradient area. The COCs consist of explosives (specifically RDX), perchlorate, and nitrate plus nitrite.

The two adjacent prepared pits were treated as a single thermal treatment unit under permit number NM275021123OB/OD. The New Mexico Environment Department (NMED), in a 12 January 2000 letter, instructed WSMR to cease using the unit by 31 Dec 2000. The last detonation at the OD pits occurred on 30 Nov 2000. The partial closure of OB/OD was completed, according to the provision of the closure plan, under the operating permit. Closure activities were performed in 2001. WSMR submitted a closure certification to NMED on 4 November 2002. Completion of site remediation consisting of groundwater remediation is required for the site. WSMR is looking at effectiveness of in situ enhanced bioremediation (ISEB) to reduce concentrations of the primary constituents of concern (COCs)−perchlorate, RDX, and nitrate−present in groundwater at the site. Post Closure Care may consist of the operation and maintenance of the system to keep it operating under peak conditions, and treatment performance monitoring.

Tula Peak Burial Sites and Incinerator (SWMUs 57 and 61)

Tula Peak Ordnance Disposal Site consisted of bomblet burial areas (pits) and an incinerator. The SWMUs are located near the eastern boundary of WSMR, approximately 10 miles west of the town of Tularosa, New Mexico, and 2 miles north of Tula Peak. The site is an approximately 12-acre area that contained an incinerator (a modified shell of an old boiler) and several former disposal pits. The incinerator was used to thermally treat ordnance prior to disposal. SWMU 57 was originally divided into SWMUs 57-60 but were administratively combined. These SWMU pits are designated as RCRA Subpart X units. SWMU 61 was an ordnance incinerator located on site to the east of the Unexploded Ordnance (UXO) burial areas. The start date of the unit is unknown. Operations at the site ended in 1988. Cluster bomb units and other small ordnance were placed in the incinerator as part of an ordnance disposal procedure. Additionally, miscellaneous aircraft and missile parts were present in the pits prior to removal.

Closure activities were completed at the site in 2018 with approval of the closure report achieved in December 2018. Post-closure care activities may consist of performing annual site inspections with UXO surveys, maintenance of site access controls and semiannual groundwater monitoring at four existing site monitoring wells. Groundwater monitoring will be performed semiannually for 2 years. If perchlorate concentrations remain stable and below the applicable groundwater screening levels, groundwater monitoring will be terminated. A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis. SWMU 61 (former ordnance incinerator) was approved for clean closure in March 2018.

Former Main Post Landfill #3 at Scrapyard (SWMU 65)

SWMU 65, Former Main Post Landfill Number # 3, is an approximately 49-acre site located in the southeast portion of WSMR Main Post. In the north-south direction, the landfill measures approximately 1,700 feet long and 1,000 feet wide in the east-west direction. Trench sizes were reportedly 600 to 800 feet long, 10 to 12 feet deep, and 30 to 40 feet wide. The landfill was reportedly

used to dispose of sanitary waste materials generated at WSMR. The northern portion of the site was also used as a scrap metal accumulation area, referred to as the Former Scrap Yard. Based on a review of the available records and historical aerial photographs, the landfill was in operation possibly as early as 1961. The landfill stopped receiving sanitary wastes in 1982. Historical information about landfill design, construction, or operating procedures is not available. Scrap metal continued to be accumulated at the site for sorting and resale from the 1970s until the late 1990s. All scrap from the yard has since been removed.

Completion of the RFI for the site is required. Following investigation completion, closure and post-closure care will be conducted. The corrective measures objective is to design and construct a 25-year life soil cover over SWMU 65, primarily intended to promote positive drainage away from the landfill. Post-Closure Care may include semi-annual inspections of the soil landfill cap, fences, and groundwater monitoring wells; As- needed maintenance of the corrective measures; and annual groundwater monitoring. A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis.

Former STP Ditches (SWMU 82)

The SWMU 82 site is located approximately 3 miles east of the WSMR Main Post in the southwestern corner of the installation. WSMR headquarters and most installation support activities are located at the WSMR Main Post area. The area encompasses the former WSMR Sewage Treatment Plant (STP) effluent drainage ditches and impoundment areas, the Main Post landfill (MPL), and undeveloped desert land surrounding these sites. Land near the SWMU 82 site has been minimally developed, with land use consisting of industrial and military use from the 1950s to the present. The area is unpaved with site features that include the percolation ditches, unpaved roads, and impoundment berms. The Former STP Percolation Ditches are two subparallel earthen ditches that begin at the former STP effluent head gates and end at the former unlined earthen impoundment area. The impoundment area is a natural topographic low with a road and berms providing barriers to surface drainage flow. The ditches remain intact and are approximately 1,500 and 1,700 feet long, respectively.

The SWMU 82 site was used to support STP operations beginning in the 1950s following construction of the current STP. The area served as a discharge point for treated sewage effluent from 1957 to 1986. During the initial period of operation from 1957 to 1967, effluent was discharged to the ground surface and allowed to drain naturally. In 1967, the Former STP Percolation Ditches were constructed to channel effluent to an impoundment area located to the east. Treated effluent from the STP was discharged into the percolation ditches and drained to the impoundment area. Discharge from the STP to the Former STP Percolation Ditches ceased in 1986 after a pipeline was constructed to convey effluent to the Davies Tank area.

Contaminant releases occurred at the site when photochemical wastes were discharged in the STP effluent. Site groundwater was contaminated with cyanide and nitrate due to the infiltration of sewage effluent as part of historical site operations.

Closure activities at SWMU 82 have been completed and approved in accordance with the closure plan dated September 2016. Proposed Post Closure Care activities may include the installation of additional monitoring wells to include interface wells and nested wells at the interface, mid-level, and deep-level. The groundwater monitoring wells will be installed in accordance with the approved Closure Plan. Collection of groundwater samples from newly installed wells are additionally proposed post well installation, and a groundwater monitoring program will be implemented for post-closure

care. Post-closure care will consist of continued groundwater monitoring to evaluate changes in the cyanide and nitrate plumes for the remedy of natural attenuation (no action with monitoring). A Frequent Monitoring Report addressing post closure care activities will be submitted on an annual basis.

Former Acid Neutralization Unit at Waste Storage Facility (SWMU 89)

The tank formerly consisted of an aboveground, open-topped, 21 foot long by 21 foot wide by 18 inch high, epoxy-coated double-walled concrete tank that was used to evaporate liquid chemical wastes generated at photographic laboratories. The unit was also occasionally used as a storage pad for damaged transformers containing polychlorinated biphenyls (PCBs). In 1981, the unit was converted to a loading dock by extending its walls to 4 feet high, filling it with clean fill dirt, and installing a reinforced concrete cap/seal over the structure. The exact date of construction of Evaporation Tank No. S-22896 was unknown, but the tank was reportedly operated for 10 to 15 years from the late 1960s until 1981, when it was converted to the loading dock. The tank was used to evaporate liquid chemical wastes generated at WSMR photographic laboratories. The wastes included potassium ferricyanide, potassium ferrocyanide, waste bleach solution, and soil contaminated with methylene chloride. Remediation activities were conducted in 2012 which included demolition of the loading dock and evaporation tank, and contaminated soil removal.

Closure activities consist of an investigation to evaluate the extent of potential cyanide contaminated soil at SWMU 89 through the collection and analysis of additional surface and subsurface soil samples, and, if needed, excavation of cyanide contaminated soil that exceeds the NMED risk-based soil screening level (RSSL). The soil samples will be analyzed for cyanide, which is the remaining contaminant of potential concern. Excavations will be backfilled with clean soil. Additional depth to groundwater measurements will be made in nearby monitoring wells to resolve uncertainties regarding groundwater flow direction and additional groundwater sampling will be conducted. WSMR's objective is to clean close the site.

Liquid Propellant Evaporation Neutralization Pits (SWMUs 92A/B through 100)

The 63-acre Liquid Propellant Storage Area (LPSA) is located approximately three miles east of the Main Post area, south of Route 2. Ten Evaporation/Neutralization Pits, SWMUs 92A/B through 100, were constructed in the mid- to late1950s at the LPSA and present on site until 1995. Each SWMU was an unlined earthen pit, which was approximately 20 feet in diameter and 10 feet deep, that provided secondary containment for a specific product storage area (i.e., a storage pad or building). In the event of a spill in a storage area, the associated pit would collect the spilled material via a drain and pipe leading from the storage area. The pits were associated with storage areas that contained Inhibited Red Fuming Nitric Acid (IRFNA); liquid propellants such as monomethyl hydrazine (MMH), unsymmetrical dimethyl hydrazine (UDMH), and ammonia; and petroleum, oil, and lubricants (POLs). The pit associated with the IRFNA tanks was covered with a layer of lime. In the event of a spill, the acid would be flushed to the pit with water and neutralized as it percolated through the lime layer.

In 1995, the pits underwent a removal action and materials associated with the drain lines were characterized and disposed. The activities included plugging storage area drains, removing piping, collection of confirmatory soil samples from pipe trenches, backfilling pipe trenches and pits with soil and disposal of pipe materials and impacted soils encountered.

Closure activities consisted of completion of soil background study, soil sampling for contaminants of concern at each pit and survey of the location and ground surface elevation of each soil boring. Based on the closure field activities, WSMR is recommends the site status be changed to clean closure complete.

Acid Neutralization Pit (SWMU 101)

SWMU 101 is approximately 3.5 miles east of the WSMR Main Post in the southwestern corner of the installation. The study area encompasses the former acid neutralization pit and undeveloped desert land surrounding the site. The area is unpaved, without structures, and surrounded by a barbed wire fence. From 1958 to approximately 1984, SWMU 101 was used for the disposal of up to 200 gallons of spent red fuming nitric acid once per year. The spent red fuming nitric acid was discharged into the pit that was lined with either lime or soda ash and allowed to infiltrate; the spent red fuming nitric acid was neutralized during infiltration. The Acid Neutralization Pit was an approximately 100 feet long, 50 feet wide, and 6 to 8 feet deep. A constructed liner was not present in the pit.

A Phase I closure plan for site investigation was approved by NMED and work completed in 2018. The Phase I closure report was approved in April 2019. A closure plan is required to complete site closeout. WSMR's objective is to clean close the site.

Discharge Pipe at the TTF (SWMU 106)

This is a six-inch cast iron pipe which drains wastewater and condensate from TTF to the Evaporation Tank (SWMU 105). The pipeline is approximately 300 feet long and does not connect directly to the tank. The level of the tank is slightly below the lower end of the pipeline which extends over the side wall of the tank. Liquid flowing from the pipe would freefall about four feet into the tank. Wastewater/condensate collected in the drains and sumps inside the TTF process area and from the test chambers discharges to the Evaporation Tank via this pipe. The pipe was installed in 1987 and is still in use.

This site is currently active and is deferred. Following completion of use, closure and post-closure care (if warranted) will be required.

HELSTF Cleaning Facility Sump (SWMU 142)

The sump is located in the Pre-Clean Room of the High Energy Laser Systems Test Facility Cleaning Facility that was used for general cleaning of parts and materials including degreasing, rust-stripping, and intermediate cleanings with caustics and acids. Solvents that were previously used included MEK, acetone, Freon 113, TCE, and TCA. Rinsate solutions and by-products (used solvents) from cleaning activities accumulated in the sump via a floor trench in the Pre-Clean Room. Operation of the sump began in 1982 and concluded in 1989 when a leak from the sump was discovered. The leak has led to a solvent contaminant plume that is currently comingled with diesel fuel from the SWMU 154 diesel spill. The cleaning facility is still in use at this time however it no longer uses the solvents that attributed to the subsurface contamination. Construction details of the sump are unknown.

Completion of the RFI for the site is required. Following investigation completion, closure and potentially post-closure care will be conducted.

8.2. Closure Plan Submittal Schedule

Table 8-5
Closure Plan Submittal Schedule

Unit ID Number and Description	Due Date
Closure Plan for the Former Oscura Range Landfill (SWMU 158)	Clean Closure Complete
Closure Plan for the Tula Peak Burial Sites and Incinerator (SWMUs 57 and 61)	Submitted February 2008
Post Closure care plan of the OB/OD at the HTA (SWMUs 55, 56, and 56A)	Submitted January 2011
Closure Plan for the Former STP Ditches (SWMU 82)	Submitted July 2011
Closure Plan for the Former Main Post Landfill #3 at Scrap Yard (SWMU 65)	Submitted December 2010
Closure Plan for the Discharge Pipe at TTF (SWMU 106)	Deferred, Active
Closure Plan for the HELSTF Landfills (SWMUs 38 and 39)	Submitted June 2011
Closure Plan for the HELSTF Cleaning Facility Sump (SWMU 142)	December 2025.
Closure Plan for the Acid Neutralization Pit (SWMU 101)	December 2022
Closure Plan for the Liquid Propellant Evaporation/Neutralization Pits (SWMUs 92A, 92B, and 93 - 100)	Submitted July 2013
Closure Plan for the Former Acid Neutralization Unit at the HWSF (SWM 89)	Submitted June 2014
Closure Plan for the Red Rio Munitions Landfills (SWMUs 50 and 155)	Deferred. Active
Closure Plan for Oscura Munitions Landfills (SWMUs 41 - 46)	Deferred. Active

White Sands Missile Range

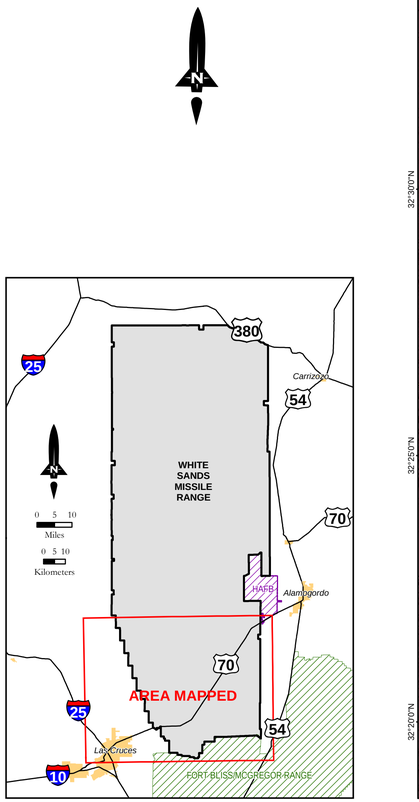
SWMU/HWMU Locations
South Range

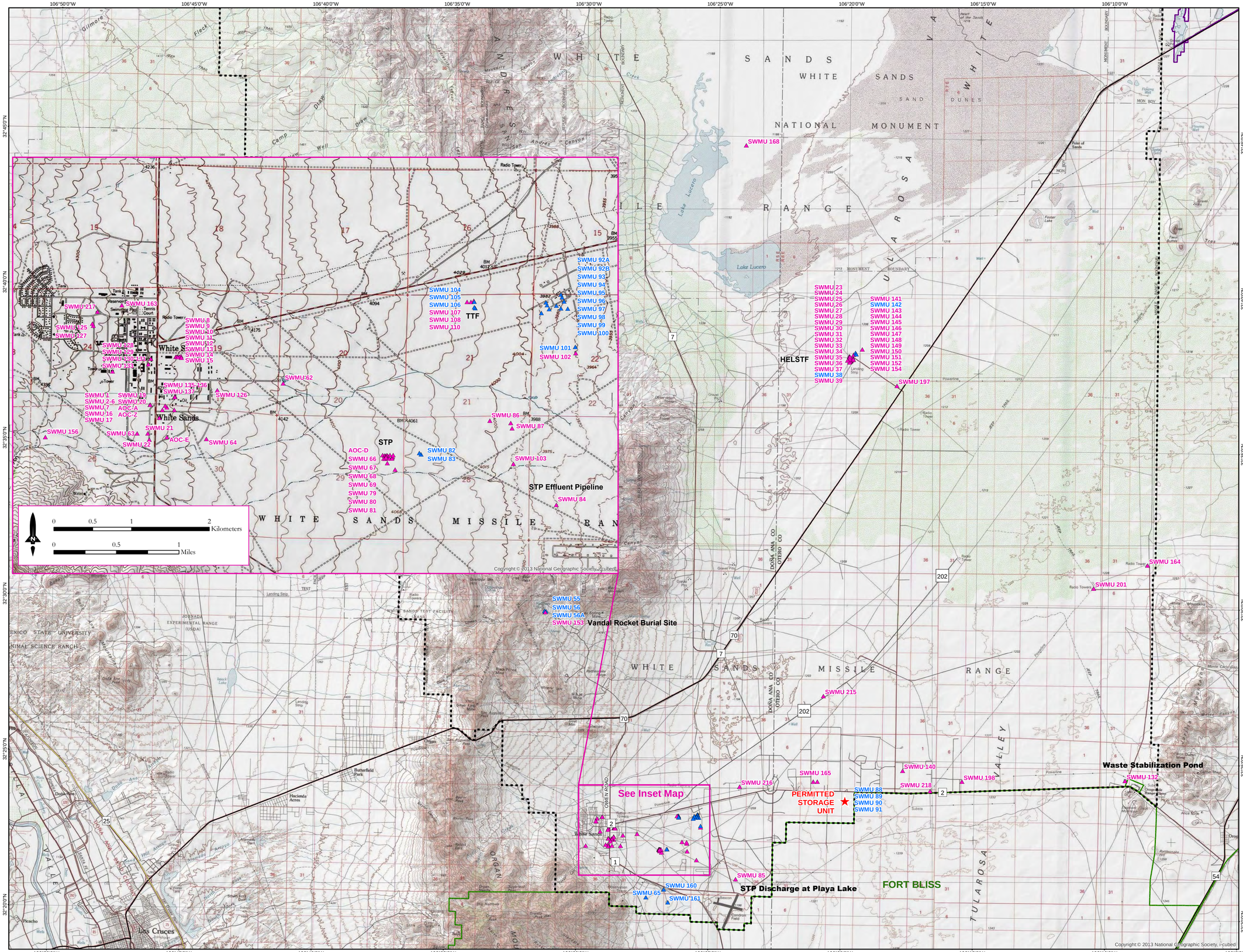
7/30/2020

- SWMU Location
- HWMU Location
- WSMR Boundary
- Holloman AFB
- Fort Bliss

0 5
Kilometers

0 5
Miles





White Sands Missile Range

SWMU/HWMU Locations
North Range

7/30/2020

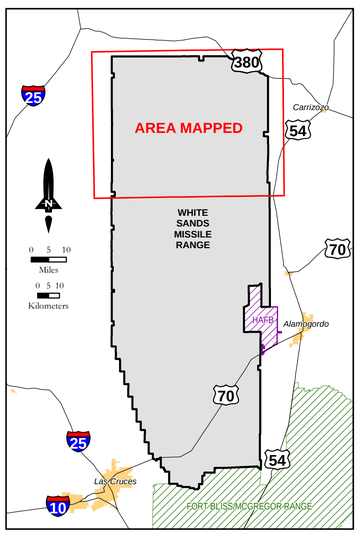
▲ SWMU Location

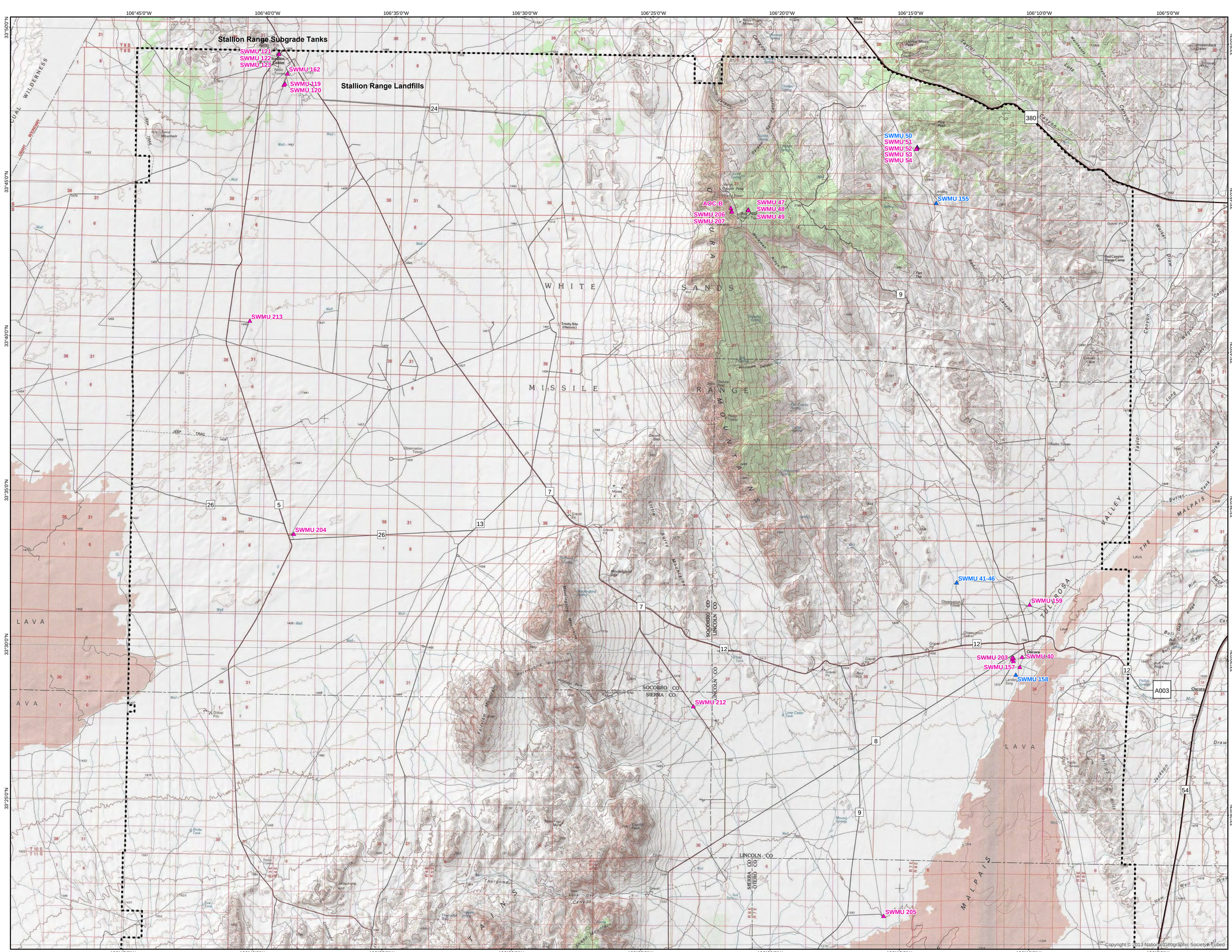
▲ HWMU Location

▭ WSMR Boundary

0 5
Kilometers

0 5
Miles





White Sands Missile Range

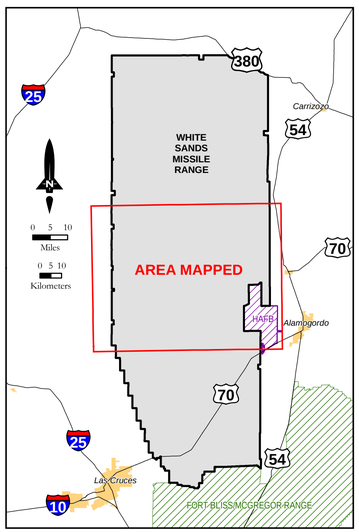
SWMU/HWMU Locations
Mid Range

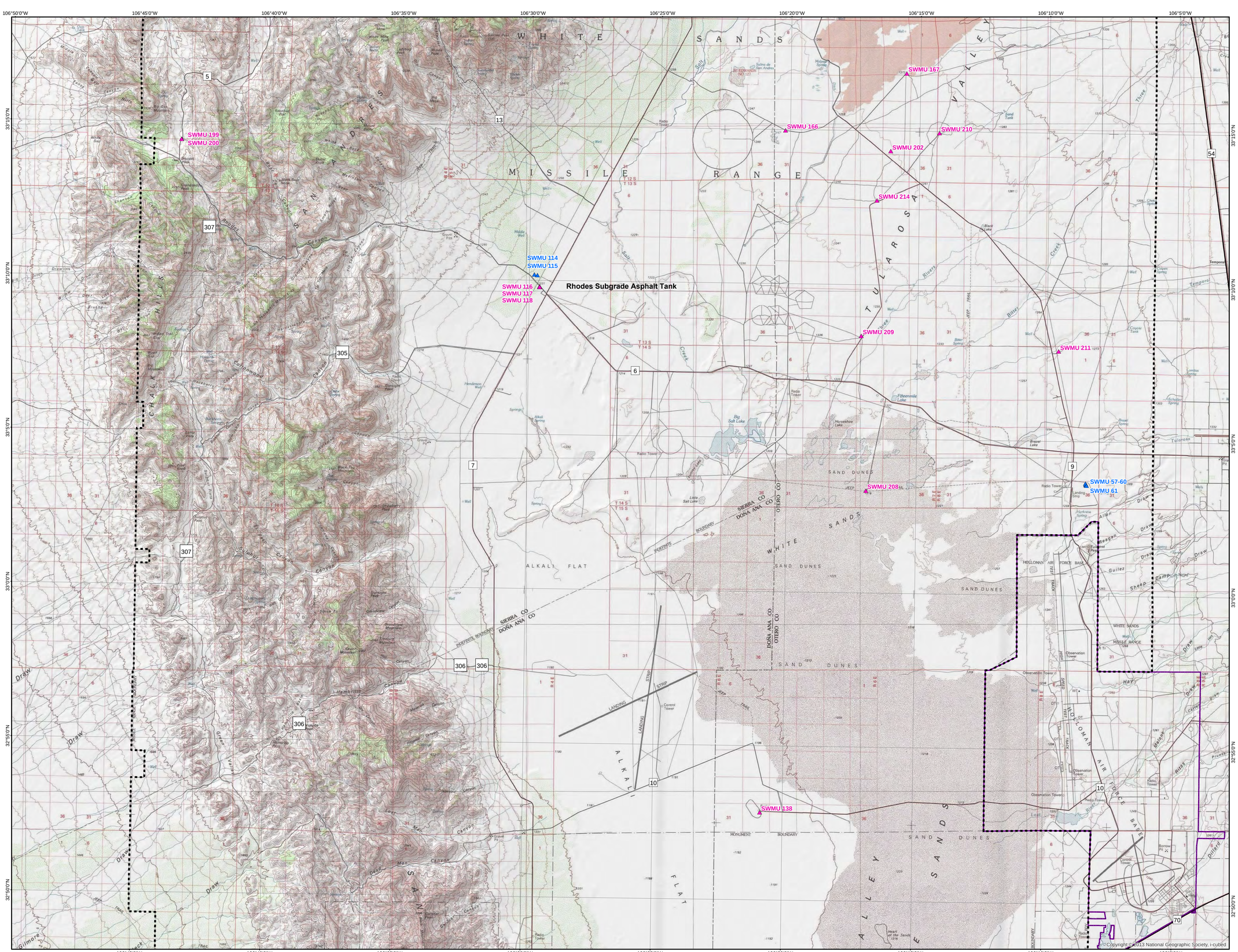
7/30/2020

- SWMU Location
- HWMU Location
- WSMR Boundary
- Holloman AFB

0 5
Kilometers

0 5
Miles





Post-Closure Care Plan

Rhodes Canyon Landfill

Solid Waste Management Units 114 and 115

Introduction

This Post-Closure Care Plan (PCCP) presents the post-closure care activities for Solid Waste Management Units (SWMU) 114 and 115, Rhodes Canyon Landfill, at White Sands Missile Range (WSM R), New Mexico (Figure 1). Post-closure care activities for SWMUs 114 and 115 include annual groundwater monitoring and semi-annual inspections of the landfill soil cover.

Location

Rhodes Canyon Landfill is located just west of the Rhodes Canyon Range Center, at the junction of Range Road 6 and Range Road 7 in the central region of White Sands Missile Range (WSMR). The site consists of Solid Waste Management Unit (SWMUs) 114 and 115, with a combined area of 13 acres. (Figure 1).

Background

The start of operations for SWMU 115 is not known. The site received sanitary waste from Rhodes Canyon Range Center and missile debris from up-range impact areas. SWMU 115 was closed in 1976. The adjacent landfill, SMWU 114, was opened in 1976 and operated until September 1987. SWMU 114 received office refuse and construction debris from the Rhodes Canyon Range Center and potentially other wastes. Both landfills were trench-type cut and cover landfills.

A natural soil cover was constructed between April and July 2004. The cover was placed over top both SWMUs. The soil cover consisted of approximately 30 inches of native sand and a 6 inch vegetative layer. A swale constructed of 40-mil high density polyethylene and medium stone was placed down the center of the cover to channel rainwater off the final grade of cover. The entire area was hydroseeded to promote re-vegetation for erosion control. The final contours were designed to promote storm water runoff into the swale and away from the landfill. The cover is intended to prevent direct contact with the buried waste and minimize infiltration of storm water. The perimeter of the site is fenced and locked with signs posted at the entrance and along the perimeter prohibiting unauthorized entry.

The WSMR Permit lists SWMUs 114 and 115 as Hazardous Waste Management Units that have achieved closure and are currently under post closure care. In 2006, the New Mexico Environment Department (NMED) required that WSMR continue monitoring as described in the Rhodes Canyon Revised CMI Work Plan. Monitoring requirements are established in the Sampling and Analysis Plan provided in Appendix G of the Rhodes Canyon Revised CMI Work Plan. Groundwater is sampled once a year per the Addendum to the CMI Work Plan.

Regulatory Requirements

This PCCP complies with the federal requirements for post-closure care of hazardous waste management units as specified in 40 CFR parts 264.117, 264.118, 264.119, 264.120, and 270.1(c)(6)(iii). This PCCP shall be retained at WSMR during the post-closure monitoring period for the site and shall be reviewed annually.

Amendment of Plan

Any modifications or revisions to this PCCP that are necessary to meet changes in USEPA methods and/or state regulatory provisions shall be made in accordance with WSMR RCRA Permit Part 5.4 (Amendment of the Post-Closure Care Plan) and 40 CFR 264.118(d). The Permittee must request a permit modification to authorize a change to the PCCP. This request must be in accordance with applicable requirements of 40 CFR Part 270.42 and 20.4.1.900 and 901 NMAC and must include a copy of the proposed amended PCCP for review by NMED. The

The Permittee must submit a written request for a permit modification to the NMED at least sixty (60) days prior to the proposed change in design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure care requirements in accordance with 40 CFR 264.118(d)(3).

Post-Closure Care Activities

Site Inspections and Maintenance

The Permittee shall implement long-term maintenance and monitoring of the soil cover. The perimeter fence and soil cover will be inspected semi-annually and following a major storm event by trained personnel. The personnel will examine the cover to ensure that there are no signs of human or animal disturbance, that no solid waste has been uncovered, and that water is not ponding over the landfill cells. The inspection will be documented noting the personnel onsite and any observations. Site inspections will include but are not limited to:

1. Verify that the gate is in good condition and closed and locked.
2. Walk the fence and check for breaches or deterioration in construction
3. Ensure that signage remains intact and legible.
4. Confirm that the monitoring wells are locked and well covers are tight.
5. Inspect the landfill cap for traffic, water ponding, vegetation, erosion, animal activity, settlement, and waste protrusion.

Restoration of the soil cover will be performed if inspections reveal that land fill material is exposed or water is ponding over the cells. Repairs to damaged structures (e.g., fencing, wells) shall be completed no less than 30 days after discovery.

Groundwater Monitoring

Groundwater shall be sampled annually under this PCCP. Groundwater samples shall be collected from one up gradient well (RMW-01) and three down gradient wells (RMW-03, RMW-05, and RMW- 06). The samples shall be analyzed for volatile organic compounds (VOCs) by EPA Method 8260D, semi-volatile organic compounds (SVOCs) by EPA Method 8270E or 8310, Gasoline Range Organics (GRO) by EPA Method 8015 modified, total lead by EPA Method 6020, sulfate using EPA 9000 series, and total dissolved solids (TDS), and alkalinity using field test kits. Water level measurements shall be collected twice per year at wells (RMW-01, -02, -03, -04, -05, and -06).

The Permittee shall submit a frequent monitoring plan for NMED review and approval no later than 120 days after the effective date of this Permit prepared in accordance with Permit Part 9. At a minimum, monitoring and sampling shall be conducted in accordance with the methods described in Permit Part 7. All methods and procedures proposed to be used during post-closure groundwater monitoring shall be included in the frequent monitoring plan.

Reporting

Site activities shall be documented in an annual Frequent Monitoring Report (FMR) submitted annually no later than April 1 of the year subsequent to the year that sampling was conducted. The FMR shall document the annual groundwater monitoring activities and analytical results, semi-annual inspections, and any corrective actions and/or maintenance performed during the reporting period. The FMR must comply with the requirements of WSMR Permit Part 9.

If groundwater monitoring is discontinued, the Permittee shall submit an annual inspection report summarizing all debris and munitions constituents observed at the site and the disposition of such materials after discovery and also any repairs and maintenance activities performed at the site during the inspection year no later than April 1 of the year subsequent to each annual inspection event.

FIGURE 1 Monitoring Well Locations

Rhodes Canyon Landfill (SWMU 114,115)

Monitoring Well, Gauge Only

Monitoring Well, Sample/Gauge

SWMU Boundary

0 150 300 450

Feet

1:3,000

March 2020

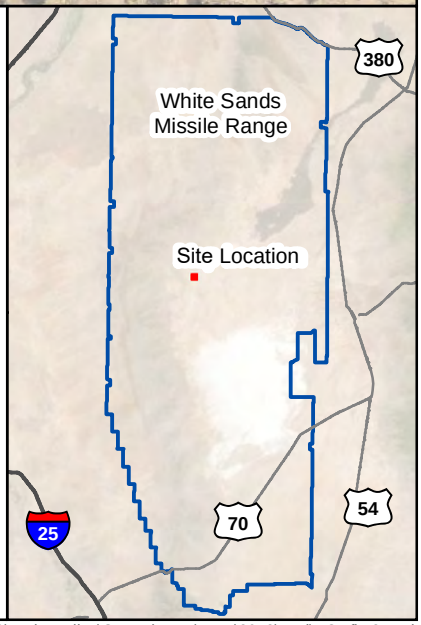


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Table 1. Monitoring Well Information
SWMUs 114, 115, Rhodes Canyon Landfill

Well ID	Northing (WGS84 UTM13N, meters)	Easting (WGS84 UTM13N, meters)	Top of Casing Elevation (NAVD88, feet amsl)	Depth of Well (feet btoc)	Screen Top (feet btoc)	Screen Bottom (feet btoc)
RMW-01	3671370.22	360398.73	3968.88	94.54	76.30	96.30
RMW-02	3671176.20	360669.74	3960.00	88.92	70.40	90.40
RMW-03	3671006.32	360612.84	3958.12	89.49	71.40	91.40
RMW-04	3671085.19	360358.96	3965.96	92.86	73.30	93.30
RMW-05	3670907.44	360544.12	3956.85	91.73	66.40	86.40
RMW-06	3670981.29	360454.09	3960.14	92.58	67.50	87.50

Notes:

Surveyed by Moy Surveying 11/2015

amsl-above mean sea level

btoc-below top of casing

Post-Closure Care Plan

SWMU 82, Former Sewage Treatment Plant (STP) Percolation Ditches

Introduction

This Post-closure Care Plan (PCCP) presents the proposed post-closure care activities for Solid Waste Management Unit (SWMU) 82, Former Sewage Treatment Plant (STP) Percolation Ditches at White Sands Missile Range (WSMR), New Mexico. The post-closure care activities will be performed in accordance with the New Mexico Environment Department (NMED)-approved 2015 Revision 2 Closure Plan, Former Sewage Treatment Plant (STP) Ditches Solid Waste Management Unit (SWMU) 82 (Closure Plan).

Location

The Former STP Percolation Ditches are located approximately three miles east of the WSMR Main Post and consist of two subparallel earthen ditches that begin at the former STP effluent head gates (splitter box) and end at the former unlined earthen impoundment area (Figure 1). The impoundment area is a natural topographic low with a road and berms providing barriers to surface drainage flow. The ditches remain intact and are approximately 1,500 and 1,700 feet long, respectively.

Background

Land near the SWMU 82 site has been minimally developed, with land use consisting of industrial and military use from the 1950s to the present. The area is unpaved with site features that include the percolation ditches, unpaved roads, and impoundment berms.

The SWMU 82 site was used to support STP operations beginning in the 1950s following construction of the current STP. The area served as a discharge point for treated sewage effluent from 1957 to 1986. During the initial period of operation from 1957 to 1967, effluent was discharged to the ground surface and allowed to drain naturally. In 1967, the Former STP Percolation Ditches were constructed to channel effluent to an impoundment area located to the east of the STP. Treated effluent from the STP was discharged into the percolation ditches and drained to the impoundment area. Discharge from the STP to the Former STP Percolation Ditches ceased in 1986 after a pipeline was constructed to convey effluent to the Davies Tank area.

The source of soil and groundwater contamination at SWMU 82 is the STP drainage ditches. The discharge of treated sewage effluent to the STP drainage ditches contaminated the soil with metals, cyanide, and nitrate. Photographic processing waste discharged to the sewer system from 1980 to 1985 is a likely source of cyanide in groundwater. Infiltration measurements collected in 1969 indicated that nearly 224 million gallons per year of effluent percolated down to the groundwater from the drainage ditches and impoundment area. A U.S. Geological Survey (USGS) study conducted in 1988 concluded that if 30 percent of the total volume of water pumped from the post headquarters well field was returned to the ground by seepage from wastewater effluent, an average of 664 acre-feet (216 million gallons) of effluent per year may have recharged the aquifer.

Topography around SWMU 82 is relatively flat with ground elevations ranging from 4,080 feet in the west to 3,990 feet in the east (downgradient) of the site. Drainage is to the east along

shallow arroyos. Surface soils are dry and sandy, and soil cover is sparse mesquite and creosote brush. Near-surface geology near the effluent drainage ditches and MPL consists of unconsolidated alluvial silt, sand, and gravel up to a depth of about 15 feet bgs. Below 15 feet, older Quaternary and Tertiary alluvial material consists of unconsolidated discontinuous deposits of gravelly sand, sandy silt and silty sand, clay, and occasional caliche seams.

The aquifer in the SWMU 82 monitoring area is largely unconfined with the water table present in sediments ranging from coarse sand to lean clay. Semi-confining conditions are indicated in some locations, where the water table is present in impermeable clay units. Groundwater elevations at well clusters indicate the presence of a mild downward gradient in some portions of the monitoring area in the upper 200 feet of the saturated zone. Depth to groundwater in the vicinity of the Former STP Percolation Ditches ranges from 130 feet bgs in the farthest downgradient well (T40) to 250 feet bgs in directly upgradient well SMW04. Local groundwater flow is to the southeast, with flat gradients and moderate hydraulic conductivities. The calculated mean groundwater transport velocity ranges from 0.039 foot per day (approximately 14 feet per year) west of the STP to 0.0014 foot per day (approximately 0.51 foot per year) downgradient of the site. The average groundwater gradient at the site is 0.008 foot per foot.

Cyanide-contaminated groundwater that exceeds the EPA maximum contaminant level (MCL) and the New Mexico Water Quality Control Commission (WQCC) standard of 0.2 mg/L is present at and downgradient from the unit. Groundwater monitoring indicates that the cyanide plume is located beneath the former impoundment area and the WSMR MPL.

Regulatory Requirements

This PCCP complies with the federal requirements for post-closure care of hazardous waste management units as specified in 40 CFR parts 264.117, 264.118, 264.119, 264.120, and 270.1(c)(6)(iii). This PCCP shall be retained at WSMR during the post-closure monitoring period.

Amendment of Plan

Any modifications or revisions to this PCCP that are necessary to meet changes in USEPA methods and/or state regulatory provisions shall be made in accordance with WSMR RCRA Permit Part 5.4 (Amendment of the Post-Closure Care Plan) and 40 CFR 264.118(d). The Permittee must request a permit modification to authorize a change to the PCCP. This request must be in accordance with applicable requirements of 40 CFR Part 270.42 and 20.4.1.900 and 901 NMAC and must include a copy of the proposed amended PCCP for review by NMED.

The Permittee must submit a written request for a permit modification to the NMED at least sixty (60) days prior to the proposed change in design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure care requirements in accordance with 40 CFR 264.118(d)(3).

Post-Closure Care Activities

Monitoring Well Drilling, Design, and Construction

The Permittee shall add 11 groundwater monitoring wells to the existing well network. The wells shall be located upgradient, cross-gradient, and down-gradient of the 2017 total cyanide plume in order to further define the boundary of groundwater contamination above the New Mexico WQCC standard. The well locations (Figure 1) were selected based on the most recent groundwater monitoring data and NMED requirements. The Permittee must request a permit modification to authorize a change made to the monitoring well locations, drilling methods, well design, well construction, sample collection, analytical methods, or monitoring frequency described below. The Permittee must also request a Permit modification to install additional wells if the addition of the 11 wells described in this PCCP does not adequately define the extent of the contaminant plume.

The Permittee shall file an exploratory well application permit for each well with the New Mexico Office of the State Engineer (NMOSE) in accordance with NMAC Title 19, Chapter 27, Part 4 Well Driller Licensing; Construction, Repair and Plugging of Wells. A utility clearance of the area where the wells will be installed must be performed using WSMR excavation permitting protocol, a utility information request, and New Mexico One Call services.

Groundwater monitoring well construction shall be performed in accordance with the requirements of the WSMR RCRA Permit, Part 8 (Monitoring Well Construction Requirements) and NMOSE requirements (NMAC Title 19, Chapter 27, Part 4). The proposed well designs were selected based on the lithologic and well construction information from adjacent monitoring wells.

Wells will be installed in boreholes advanced by the air-rotary casing hammer (ARCH) drilling method. The borehole depths and screened intervals will be determined in the field based on site conditions and the presence of groundwater.

Interface Well Construction

Boreholes for interface wells (MPL-33 through MPL-37) will be advanced to depth with the ARCH drilling method using an 8½-inch tri-cone bit and 9⅝-inch-diameter drive casing. During the ARCH drilling activities, field staff will monitor for the presence of groundwater by visually inspecting drill cuttings for moisture. After drill cuttings become wet, drilling will be suspended for at least 1 hour. A water level probe will then be lowered into the borehole to determine the depth to groundwater. The borehole will then advance approximately 25 feet into the water-bearing unit to allow for construction of a well with a screened interval that intersects the water table interface and extends approximately 15 feet below the water table. A 5-foot sump will be placed beneath the screened interval to allow for accumulation of fine-grained sediment over time without compromising the screen length.

Nested Well Construction

Nested wells (MPL-38 through MPL-43) will be installed as noted above but will be installed within close proximity to one another. They will be installed in separate boreholes. Total depths will vary from approximately 450 to 550 ft bgs for deep-level wells (with well screen installed near total depth of well) to approximately 285 to 325 ft bgs for mid-level wells (with well screen

installed near total depth of well); and at approximately 220 to 280 ft bgs for interface wells. The total depths for installed wells will be based upon site conditions.

Soil cuttings shall be collected at five-feet intervals by a trained field geologist to the total depth of the well. The soil cuttings shall be classified in accordance with the requirements specified in Permit Section .

The final monitoring well designs will be based on the lithology and groundwater elevations encountered at each well location. Final well designs shall be submitted to NMED for approval via email prior to the start of construction.

All wells will be constructed of 4-inch, inside-diameter, Schedule 80 polyvinyl chloride (PVC) casing with a 5-foot well sump, 20 feet of 0.010-inch slot size well screen, and approximately 2 to 3 feet of stickup at the surface as shown in Figure 2. The well annular space will be backfilled with 10/20 Colorado Silica Sand filter pack material placed around the well sump and well screen. A well seal will be placed in the annular space above the filter pack by backfilling with approximately 10 feet of hydrated bentonite chips, followed by placement of a high-solids bentonite slurry and approximately 50 feet of cement grout to the ground surface. The surface completion will consist of a 5-foot long, 9-inch diameter steel standpipe with locking cap cemented into a 3-foot-square concrete well pad.

Well Development

Newly installed groundwater monitoring wells will be developed prior to sampling. Well development will be performed in accordance with the requirements of the WSMR RCRA Permit, Part 8 (Monitoring Well Construction Requirements). Well development will be performed subsequent to completion of well construction. Groundwater samples shall initially be obtained from newly constructed monitoring wells no later than five days after the completion of well development in accordance with the requirements of the WSMR RCRA Permit, Part 7.3.2 (Groundwater Sampling).

Groundwater Monitoring

The existing monitoring well network at SWMU 82 consists of 35 wells (Table 1). Of the existing monitoring wells, 28 wells are currently sampled semiannually. Seven of these existing wells (MPL-08, MPL-11, MPL-12, MPL-14, MPL-27, SMW-02, and SMW-03) are only gaged annually. This sampling schedule for the existing wells will continue for a minimum duration of five (5) years, after which the Permittee may request a Permit modification to make changes to the sampling schedule. Groundwater samples will be analyzed for total, amenable, and free cyanide; chloride, fluoride, sulfate, orthophosphate, ammonia, nitrate/nitrite, total dissolved solids, total alkalinity, total suspended solids, total organic carbon, and total metals (Table 2).

The Permittee shall submit a frequent monitoring plan for NMED review and approval no later than 120 days after the effective date of this Permit. At a minimum, monitoring and sampling shall be conducted in accordance with the methods described in Permit Part 7. All methods and procedures proposed to be used during post-closure groundwater monitoring shall be included in the frequent monitoring plan.

The 11 newly installed groundwater monitoring wells shall be sampled quarterly for a minimum duration of eight quarters for the analytes listed above. After the eight quarters of groundwater monitoring of these newly installed wells, the sampling schedule may convert to semiannual upon NMED approval included in the approval of the associated frequent monitoring report described in the section below. The Permittee may request a Permit modification to make additional changes to the sampling schedule for the 11 new wells.

Reporting

A RCRA Investigation Report (IR) detailing drilling, construction, development, and sampling results of newly installed groundwater monitoring wells shall be submitted to NMED no later than 180 days following the initial round of groundwater sampling. The IR shall be prepared in accordance with the requirements of WSMR RCRA Permit Part 9.3 (Reporting Requirements for Investigation Reports) (NMED 2022). Upon Approval or Approval with Modifications of the IR, NMED will provide direction to WSMR for groundwater monitoring activities and frequencies in compliance with 40 CFR Part 264 and this Permit.

An annual frequent monitoring report (FMR) shall be submitted annually no later than April 1 of the year subsequent to the year that sampling was conducted. The FMR shall be prepared in accordance with the requirements of Permit Part 9. The FMR shall include at a minimum the following information:

- A facility map showing all monitor and recovery wells and identifying zones in which wells are screened;
- A well construction table showing well number, well depth, screen interval, zone monitored, well diameter, and screen and casing material for all wells;
- A summary of analytical data for all monitor and recovery wells for the reporting period;
- Discussion of any significant changes in the analytical data when compared to the previous reporting period;
- Water level measurements and potentiometric surface maps for each monitored zone for the reporting period;
- Discussion of the effectiveness and progress of the post-closure monitoring activities; and
- Supporting documentation such as water sampling logs, field parameter forms, data validation checklists, laboratory data reports, and other documentation as deemed necessary.
- Groundwater plume evaluation.

A comprehensive 5-year Periodic Review will be conducted based on the results of the performance monitoring during the previous five years. The well network and sampling will be evaluated during the periodic review periods for effectiveness of cyanide plume evaluation, with potential recommendations for the addition of monitoring wells.

F:\Federal\DOD\Army\Project\6268612 - White Sands Missle Range\SMWU 82\Figure 2_Site Map.mxd jpetersen 8/18/2020 11:57:54 AM

MPL41
MPL43
MPL42
MPL38
MPL40
MPL39
MPL13
MPL14
MPL22
MPL21
MPL11
MPL12
MPL10
MPL09
MPL01
MPL05
MPL24
MPL23
MPL27
MPL18
MPL15
MPL04
MPL06
MPL02
T-11
SMW03
SMW01
SMW04
MPL03
MPL19
MPL20
MPL37
MPL28
MPL26
SMW02
Former Percolation Ditch Head Gates
Sewage Treatment Plant
MPL36
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MPL25
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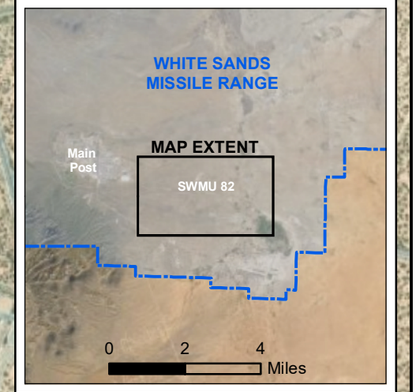
MPL34
MPL17
MPL30
MPL16
MPL33
T40
MPL31
MPL35

MAP INDEX



Legend

Proposed Groundwater Monitoring Well by Aquifer Depth
- Interface
- Mid-level
- Deep-level

Existing Groundwater Monitoring Well by Aquifer Depth
- Interface
- Mid-level
- Deep-level
- Former Sewage Treatment Plant Percolation Ditch
- Main Post Landfill
- Impoundment Area
- Cyanide Plume Extent Greater than 0.2 mg/L Fall 2019

Source(s):
Aerial imagery from 5/27/2016 : Google Earth Pro, 2019
USA Base Map : ESRI, 2019
Site features are based on available information from the WSMR geodatabase.

Acronym(s) and Abbreviation(s) :
MPL = Main Post Landfill
SWMU = Solid Waste Management Unit
WSMR = White Sands Missile Range

Notes:
1. Cyanide plume is defined by concentrations in excess of 0.2 mg/L.
2. Cyanide data are based on available information form the WSMR ERPIMS database.

N

1 in = 1,200 feet

0 600 1,200 Feet

FIGURE 1

SITE MAP AND PROPOSED GROUNDWATER MONITORING WELLS

POST CLOSURE CARE PLAN, SWMU 82, FORMER SEWAGE TREATMENT PLANT PERCOLATION DITCHES
WHITE SANDS MISSILE RANGE, NEW MEXICO

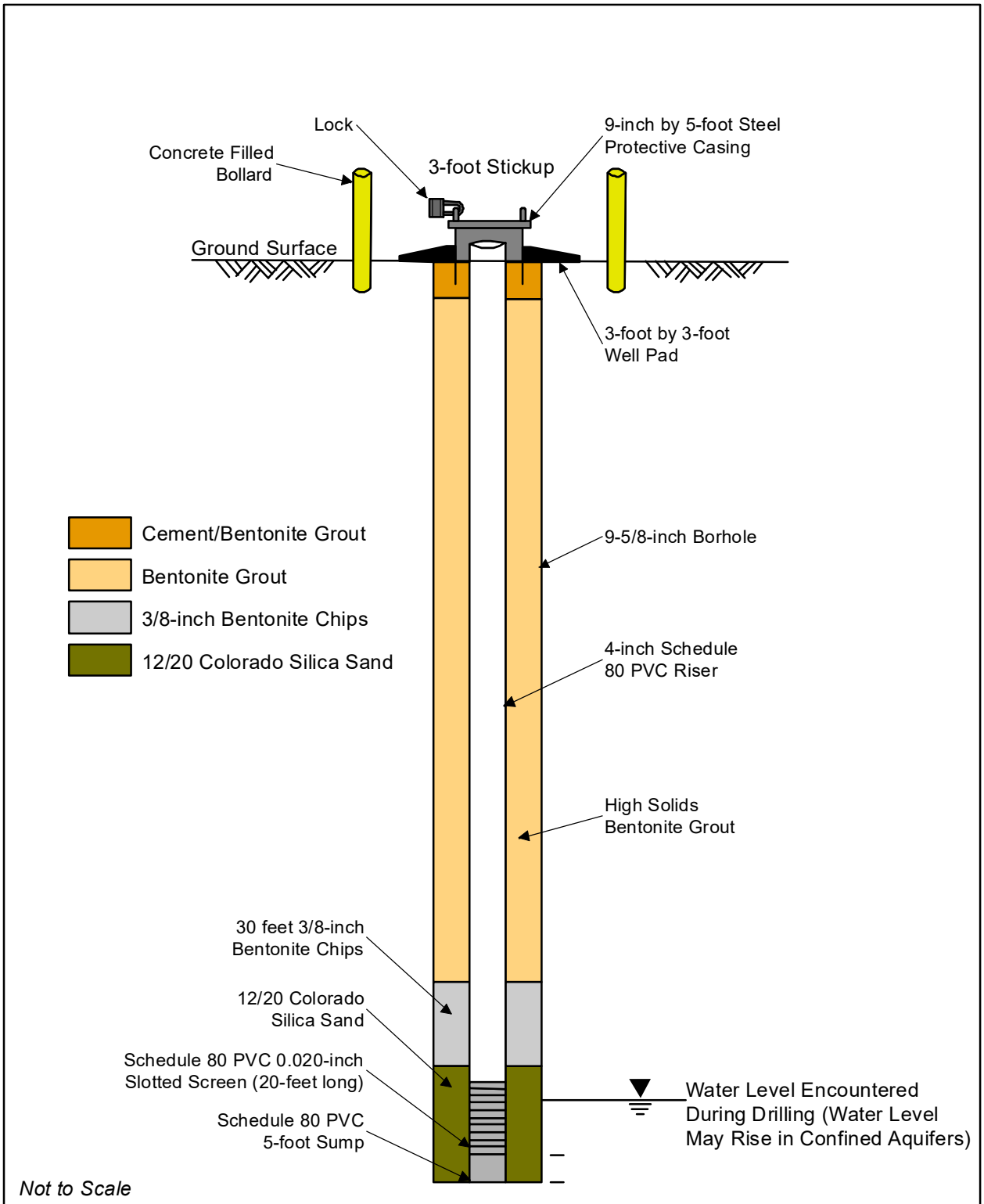


FIGURE 2
PROPOSED MONITORING WELL DESIGN
POST CLOSURE CARE PLAN, SWMU 82, FORMER SEWAGE TREATMENT PLANT PERCOLATION DITCHES
WHITE SANDS MISSILE RANGE, NEW MEXICO

Table 1. Well Construction, Survey Information, and Proposed Wells

Post Closure Care Plan, SWMU 82, Former STP Percolation Ditches

White Sands Missile Range, New Mexico

Well ID	Northing (m) [a]	Easting (m) [a]	TOC Elevation (NAVD 88) [b]	Total Depth (ft bgs)	Interval (ft bgs)	Casing Diameter	Screen Type	Formation at Screened Interval	Depth Interval	Well Location	Sampling Frequency
Existing Wells											
MPL01	3582677.858	364990.683	4,014.18	220	197-217	4-inch	0.010-inch slot PVC	Sand, minor clay	Interface	Plume	Semiannual
MPL02	3582267.132	365097.912	4,004.13	220	195-215	4-inch	0.010-inch slot PVC	SW	Interface	Plume	Semiannual
MPL03	3582244.306	365302.051	3,999.35	228.5	205-225	4-inch	0.010-inch slot PVC	SW, SC	Interface	Plume	Semiannual
MPL04	3582316.603	365414.903	3,995.42	225	203-223	4-inch	0.010-inch slot PVC	SW	Interface	Plume	Semiannual
MPL05	3582750.442	365636.41	3,993.53	205	182-202	4-inch	0.010-inch slot PVC	SM	Interface	Plume	Semiannual
MPL06	3582280.704	365886.645	3,977.67	190	167-187	4-inch	0.010-inch slot PVC	SW	Interface	Boundary	Semiannual
MPL07	3581722.23	365582.281	3,985.09	215	182-212	4-inch	0.010-inch slot PVC	SP	Interface	Plume	Semiannual
MLP08	3581519.87	364201.58	4,060.14	275	240-270	4-inch	0.010-inch slot PVC	ML	Interface	Downgradient	None
MPL10	3582676.74	364242.493	4,051.66	275	242-272	4-inch	0.010-inch slot PVC	ML, SM	Interface	Plume	Semiannual
MPL11	3582787.38	362748.32	4,122.01	325	290-320	4-inch	0.010-inch slot PVC	SM	Mid-level	Upgradient	Semiannual
MLP12	3582787.48	363635.68	4,081.82	265	230-260	4-inch	0.010-inch slot PVC	CL	Interface	Upgradient	Semiannual
MPL13	3582902.754	364786.973	4,028.42	235	203-233	4-inch	0.010-inch slot PVC	CL	Interface	Plume	Semiannual
MPL14	3582827.98	365071.80	4,014.21	230	195-225	4-inch	0.010-inch slot PVC	CL	Interface	Downgradient	Semiannual
MPL16	3581211.937	364401.961	4,046.67	255	222-252	5-inch	0.030-inch slot PVC	ML	Interface	Boundary	Semiannual
MPL17	3581265.755	365776.284	3,981.28	225	192-222	5-inch	0.030-inch slot PVC	CL	Interface	Boundary	Semiannual
MPL18	3582525.745	365998.116	3,977.68	230	197-227	5-inch	0.030-inch slot PVC	CL	Interface	Boundary	Semiannual
MPL19	3582227.738	365323.021	3,996.62	475	452-472	5-inch	0.030-inch slot PVC	SM	Deep-level, nested at MPL03	Plume	Semiannual
MPL20	3582230.244	365312.347	3,997.87	325	302-322	5-inch	0.030-inch slot PVC	CL, SW	Mid-level, nested at MPL03	Plume	Semiannual
MPL21	3582766.235	365647.056	3,993.13	445	422-442	5-inch	0.030-inch slot PVC	SM, SC	Deep-level, nested at MPL05	Plume	Semiannual
MPL22	3582775.179	365625.567	3,994.42	310	287-307	5-inch	0.030-inch slot PVC	SW	Mid-level, nested at MPL05	Plume	Semiannual
MPL23	3582657.485	364297.732	4,047.36	540	518-538	5-inch	0.030-inch slot PVC	SM	Deep-level, nested at MPL10	Plume	Semiannual
MPL24	3582665.692	364276.871	4,048.91	315	292-312	5-inch	0.030-inch slot PVC	SP, ML	Mid-level, nested at MPL10	Plume	Semiannual
MPL25	3581589.805	363830.65	4,079.21	275	242-272	4-inch	0.030-inch slot PVC	ML	Interface	Boundary	Semiannual
MPL26	3581964.56	363388.189	4,099.23	255	222-252	4-inch	0.030-inch slot PVC	SM	Interface	Upgradient	Semiannual
MLP27	3582529.21	363980.96	4,067.13	285	250-280	5-inch	0.030-inch slot PVC	ML	Interface	Upgradient	Semiannual
MPL28	3582006.137	365493.725	3,990.95	200	175-195	4-inch	0.010-inch slot PVC	CL	Interface	Plume	Semiannual
MPL29	3581624.106	364893.281	4,023.58	225	200-220	4-inch	0.010-inch slot PVC	CL	Interface	Boundary	Semiannual
MPL30	3581247.582	365192.953	4,005.05	220	195-215	4-inch	0.010-inch slot PVC	SW	Interface	Boundary	Semiannual
MPL31	3580889.718	365335.009	4,001.24	213	188-208	4-inch	0.010-inch slot PVC	CL, SW	Interface	Boundary	Semiannual
MPL32	3581550.598	366075.79	3,965.04	189.5	164.5-184.5	4-inch	0.010-inch slot PVC	ML	Interface	Boundary	Semiannual
SMW01	3582159.896	363685.437	4,085.39	286	263-293	5-inch	0.010-inch slot SS	CL	Mid-level	Upgradient	Semiannual
SMW02	3582001.97	363829.17	4,075.89	282.35	250-280	5-inch	0.010-inch slot SS	CL	Interface	Downgradient	Semiannual
SMW03	3582213.21	363867.98	4,075.85	277.95	247-277	5-inch	0.010-inch slot SS	CL	Interface	Downgradient	Semiannual
SMW04	3582108.183	363928.387	4,070.97	278.5	254-284	5-inch	0.010-inch slot SS	CL	Interface	Boundary	Semiannual
T40	3581070.099	367975.236	3,929.20	140	115-135	4-inch	0.010-inch slot PVC	SP	Interface	Downgradient	Semiannual

Table 1. Well Construction, Survey Information, and Proposed Wells
Post Closure Care Plan, SWMU 82, Former STP Percolation Ditches
White Sands Missile Range, New Mexico

Proposed Wells											
MPL33	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Downgradient	Quarterly
MPL34	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Downgradient	Quarterly
MPL35	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Downgradient	Quarterly
MPL36	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Crossgradient	Quarterly
MPL37	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Crossgradient	Quarterly
MPL38	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Upgradient	Quarterly
MPL39	--	--	--	--	285-325	4-inch	0.010-inch slot PVC	--	Mid-level	Upgradient	Quarterly
MPL40	--	--	--	--	450-550	4-inch	0.010-inch slot PVC	--	Deep-level	Upgradient	Quarterly
MPL41	--	--	--	--	220-280	4-inch	0.010-inch slot PVC	--	Interface	Upgradient	Quarterly
MPL42	--	--	--	--	285-325	4-inch	0.010-inch slot PVC	--	Mid-level	Upgradient	Quarterly
MPL43	--	--	--	--	450-550	4-inch	0.010-inch slot PVC	--	Deep-level	Upgradient	Quarterly

Notes:
[a]Survey data in universal transverse Mercator, North American Datum 1983, Zone 13N, Meters.
[b]Vertical data in North American Vertical Datum 1988 feet.
CL = lean clay
ft bgs = feet below ground surface
ID = identification
m = meter(s)
ML = silt
NAVD 88 = North American Vertical Datum of 1988
NP = not provided
PVC = polyvinyl chloride
SC = clayey sand
SM = silty sand
SP = poorly graded sand
SS = stainless steel
STP = Sewage Treatment Plant
SW = well-graded sand
SWMU = Solid Waste Management Unit
TOC = top of casing

Table 2. Groundwater Monitoring Analytical Program
Post Closure Care Plan, SWMU 82, Former STP Percolation Ditches
White Sands Missile Range, New Mexico

Parameter	Laboratory Method[a]	EPA MCL[b]	NM WQCC[c]
Cyanide by Laboratory Analysis			
Total and amenable cyanide	EPA 9012B	0.2 mg/L	0.2 mg/L
Free cyanide	OIA-1677-09	0.2 mg/L	0.2 mg/L
Ions by Laboratory Analysis			
Chloride	EPA 300.0	250 mg/L	250 mg/L
Fluoride	EPA 300.0	4.0 mg/L	1.6 mg/L
Sulfate	EPA 300.0	250 mg/L	600 mg/L
Orthophosphate	EPA 365.3	Not established	
Ammonia (NH_3+NH_4)	SM 4500-NH3B/C	Not established	
Nitrate/nitrite (NO_3+NO_2)	EPA 353.2	10 mg/L	10 mg/L
Water Quality by Laboratory Analysis			
Total dissolved solids	SM 2540C	500 mg/L	1,000 mg/L
Total alkalinity	SM 2320B	Not applicable	
Total suspended solids	SM 2540D	Not applicable	
Total organic carbon	SM 5310B	Not applicable	
Total Metals by Laboratory Analysis			
Antimony	EPA 6010C/6020A	0.006 mg/L	Not established
Arsenic	EPA 6010C/6020A	0.01 mg/L	0.1 mg/L
Barium	EPA 6010C/6020A	2.0 mg/L	1.0 mg/L
Beryllium	EPA 6010C/6020A	0.004 mg/L	Not established
Cadmium	EPA 6010C/6020A	0.005 mg/L	0.01 mg/L
Calcium	EPA 6010C/6020A	Not established	
Chromium	EPA 6010C/6020A	0.1 mg/L	0.05 mg/L
Cobalt	EPA 6010C/6020A	NE	0.05 mg/L
Copper	EPA 6010C/6020A	1.3 mg/L	1.0 mg/L
Iron	EPA 6010C/6020A	0.3 mg/L	1.0 mg/L
Lead	EPA 6010C/6020A	0.015 mg/L	0.05 mg/L
Magnesium	EPA 6010C/6020A	Not established	
Manganese	EPA 6010C/6020A	0.05 mg/L	0.2 mg/L
Nickel	EPA 6010C/6020A	NE	0.2 mg/L
Potassium	EPA 6010C/6020A	Not established	
Selenium	EPA 6010C/6020A	0.05 mg/L	0.05 mg/L
Silver	EPA 6010C/6020A	0.1 mg/L	0.05 mg/L
Sodium	EPA 6010C/6020A	Not established	
Thallium	EPA 6010C/6020A	0.002 mg/L	Not established
Tin	EPA 6010C/6020A	Not established	
Vanadium	EPA 6010C/6020A	Not established	
Zinc	EPA 6010C/6020A	5.0 mg/L	10 mg/L
Mercury (total)	EPA 7470A	0.002 mg/L	0.002 mg/L

Notes:
[a] Analytical methods selected to meet data quality requirements and comparable with historical analysis.
[b] U.S. Environmental Protection Agency Maximum Contaminant Levels for drinking water 40 D. 141 to 143 CFR.
[c] New Mexico Water Quality Control Commission Standard for Groundwater, 20.6.2.3103 NMAC.
The analyte list for the monitoring program is described in the RCRA Monitoring Plan (WTS, 2008).
CFR = Code of Federal Regulations
EPA = U.S. Environmental Protection Agency
EPA analytical methods from Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846, November 1986.
H_2SO_4 = sulfuric acid
HNO_3 = nitric acid
MCL = maximum contaminant level
mg/L = milligrams(s) per liter
NaOH = sodium hydroxide
NH_3 = ammonia
NH_4 = ammonium
NMAC = New Mexico Administrative Code
NMED = New Mexico Environment Department
NO_2 = nitrite
NO_3 = nitrate
RCRA = Resource Conservation and Recovery Act
STP = Sewage Treatment Plant
SWMU = Solid Waste Management Unit
WQCC = Water Quality Control Commission

Post-Closure Care Plan

SWMU 57, Tula Peak Burial Sites

Introduction

This Post-Closure Care Plan (PCCP) presents the post-closure care activities for Solid Waste Management Unit (SWMU) 57, Tula Peak Burial Sites, at White Sands Missile Range (WSMR), New Mexico (Figure 1). Post-closure activities will be performed in accordance with the New Mexico Environment Department (NMED) approvals of the Groundwater Monitoring Report SWMU 57, Tula Peak Burial Sites (2019) and Revision 2 Closure Report SWMU 57, Tula Peak Burial Sites, and SWMU 61, Tula Peak Incinerator (2018). Post-closure care activities for SWMU 57 include annual site inspections for materials potentially presenting an explosive hazard (MPPEH) and semiannual groundwater monitoring.

Location

SWMU 57 is located near the eastern boundary of WSMR, approximately 10 miles west of the town of Tularosa, New Mexico, and 2 miles north of Tula Peak. The site is an approximately 12-acre area that contained an incinerator, SWMU 61, (a modified shell of an old boiler) and multiple former disposal pits (Figure 1).

Background

The Tula Peak Ordnance Disposal Site consisted of a formerly used unexploded ordnance (UXO) incinerator (SWMU 61) and 12 burial trenches (SWMU 57). SWMU 61 was a converted boiler shell that acted as an expedient thermal treatment unit. Bomblets and other UXO were reportedly introduced manually to the cylindrical incinerator and heated past their auto-ignition temperature, after which debris was buried in the disposal trenches. Miscellaneous aircraft and missile parts were also disposed of in the trenches. While the initial startup date is unknown, UXO disposal operations ended in 1988 according to WSMR personnel.

Closure activities began at SWMU 57 and SWMU 61 in 1988 when WSMR ceased UXO operations at the site. Seven of the twelve pits identified by a 2008 geophysical survey were found during exploratory excavation to contain debris. During closure activities, MPPEH was removed, inspected, and certified to be material documented as safe. Non-munitions-related debris was also removed. The site is currently fenced with a locked gate and inactive. NMED approved SWMU 61 for clean closure in 2018.

Groundwater was monitored at four site monitoring wells (Figure 1 and Table 1) for explosives, dissolved metals, New Mexico Water Quality Control Commission (NMWQCC) cations and anions from 1997 to 2001. Depth to groundwater ranged from 22.4 feet to 25.79 feet during the January 2019 sampling event. Potentiometric surface elevations indicate that groundwater flow is from the east to the southwest.

The primary remaining concern at SWMU 57 is the potential presence of buried MPPEH left in place that may become exposed due to wind or water erosion and the presence of perchlorate in the groundwater.

In January 2019, perchlorate was detected in four site groundwater monitoring wells. The highest perchlorate concentration was detected in the sample from monitoring well TP-2, which is

downgradient of the site. Perchlorate was not analyzed for during the 1997 to 2001 groundwater sampling events thus historical concentrations are not known.

Closure activities at SWMU 57 and SWMU 61 were completed between 2008 and 2010 and in 2017. NMED required additional groundwater monitoring at site wells as part of post-closure care. SWMU 61 was approved for clean closure in 2018. Clean closure was not achieved for SWMU 57; therefore, SWMU 57 is subject to post-closure care requirements.

Regulatory Requirements

This PCCP complies with the federal requirements for post-closure care of hazardous waste management units as specified in 40 CFR parts 264.117, 264.118, 264.119, 264.120, and 270.1(c)(6)(iii). This PCCP shall be retained at WSMR during the post-closure monitoring period for the site and shall be reviewed annually.

Amendment of Plan

Any modifications or revisions to this PCCP that are necessary to meet changes in USEPA methods and/or state regulatory provisions shall be made in accordance with WSMR RCRA Permit Part 5.4 (Amendment of the Post-Closure Care Plan) and 40 CFR 264.118(d). The Permittee must request a permit modification to authorize a change to the PCCP. This request must be in accordance with applicable requirements of 40 CFR Part 270.42 and 20.4.1.900 and 901 NMAC and must include a copy of the proposed amended PCCP for review by NMED. The

The Permittee must submit a written request for a permit modification to the NMED at least sixty (60) days prior to the proposed change in design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure care requirements in accordance with 40 CFR 264.118(d)(3).

Post-Closure Care Activities

Site Inspections

The Permittee shall conduct periodic inspections of SWMU 57 to monitor the site for MPPEH. Corrective action must be conducted if MPPEH is observed to be migrating outside of the post-closure care area. Corrective action will be contingent on the results of the periodic inspections. Site inspections will include, but are not limited to:

1. Flagging MPPEH items;
2. Notifying WSMR Explosive Ordnance Disposal of MPPEH items flagged at SWMU 57 and identified for removal. WSMR Explosive Ordnance Disposal will be responsible for removal and disposal of all identified MPPEH items;
3. Verify that the gate is in good condition and closed and locked.
4. Walk the perimeter fence and check for breaches or deterioration in construction.
5. Ensure that signage remains intact and legible.
6. Confirm that the monitoring wells are locked and well covers are tight.

Preventative and corrective maintenance and repairs will be performed as necessary. Site inspections shall be conducted annually and following a major storm event.

Inspectors will be accompanied by a qualified UXO Technician II or III who will flag MPPEH items and provide munitions and explosives of concern avoidance procedures for personnel. The inspection shall be documented on the site-specific form included in Appendix A or equivalent form approved by NMED.

Groundwater Monitoring

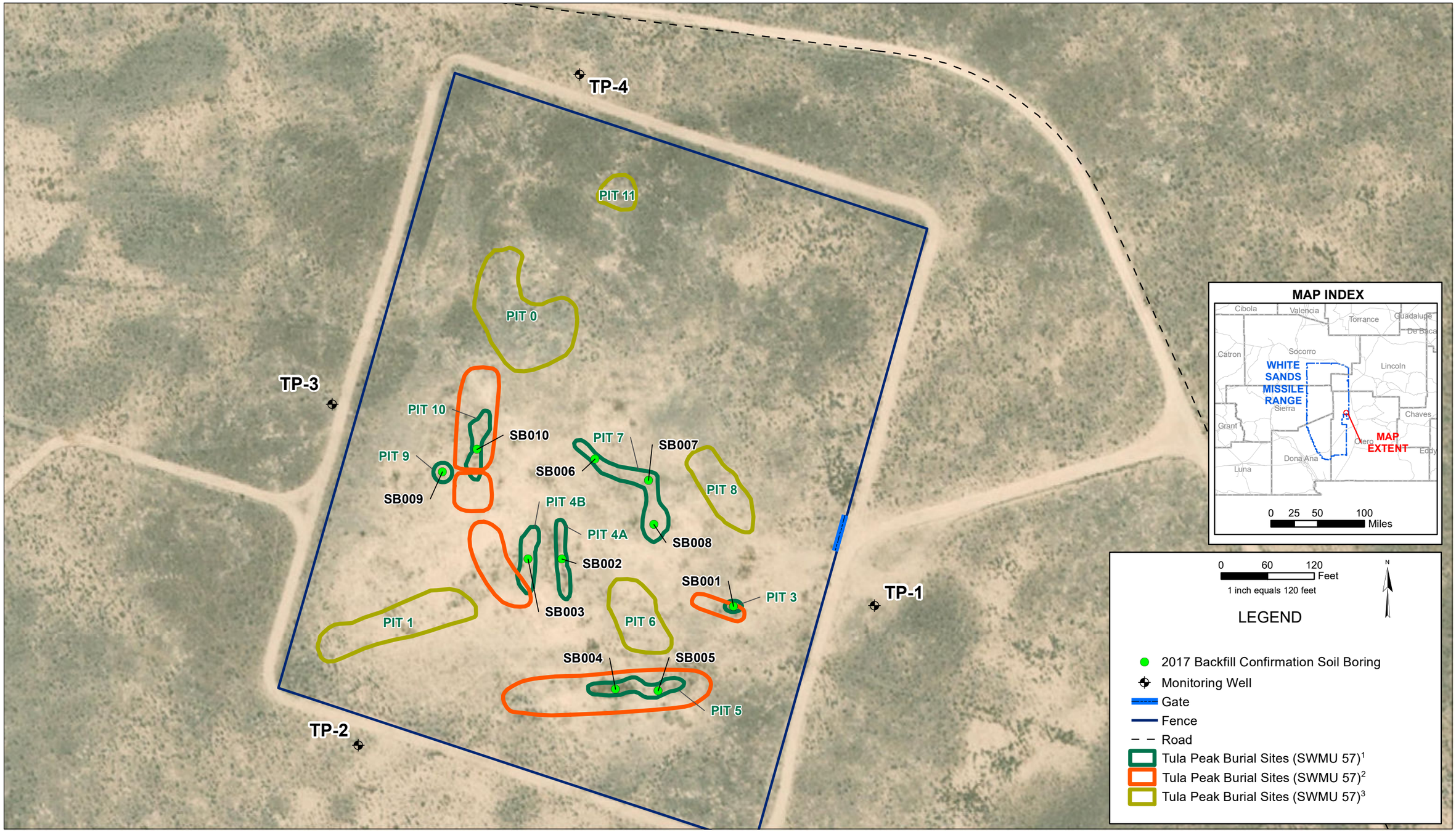
Groundwater monitoring shall be performed on a semiannual basis for a minimum period of two years after the initiation of post-closure care that begins on the effective date of this Permit. At the completion of groundwater monitoring activities, site inspections will continue annually under post-closure care. If concentrations of perchlorate or any other detected contaminant remain below the applicable groundwater screening levels, the Permittee may request a permit modification to authorize the cessation of groundwater monitoring activities. If contaminant concentration levels are shown to be increasing, NMED will require additional monitoring that also may include submittal of a work plan for the installation and sampling of additional monitoring wells to evaluate the extent of contamination.

The Permittee shall submit a frequent monitoring plan for NMED review and approval no later than 120 days after the effective date of this Permit prepared in accordance with Permit Part 9. At a minimum, monitoring and sampling shall be conducted in accordance with the methods described in Permit Part 7. All methods and procedures proposed to be used during post-closure groundwater monitoring shall be included in the frequent monitoring plan.

Reporting

Site activities shall be documented in an annual Frequent Monitoring Report (FMR) submitted annually no later than April 1 of the year subsequent to the year that sampling was conducted. The FMR shall document the semiannual groundwater monitoring activities and analytical results, MPPEH inspections, and any corrective actions and/or maintenance of facilities performed during the annual reporting period. The FMR must comply with the requirements of WSMR Permit Part 9.

If groundwater monitoring is discontinued, the Permittee shall submit an annual inspection report summarizing all debris and munitions constituents observed at the site and the disposition of such materials after discovery and also any repairs and maintenance activities performed at the site during the inspection year no later than April 1 of the year subsequent to each annual inspection event.



Acronym(s) and Abbreviation(s):
SWMU = Solid Waste Management Unit
TP = Tula Peak

Note(s):
ESRI World Imagery online mapping service
1. Pits identified during 2008 site geophysical surveys; debris identified, excavation completed.
2. Pits identified during 1992 geophysical surveys.
3. Pits identified during 2008 geophysical survey; debris not found during exploratory excavation. Additional soil samples were not collected.

FIGURE 4
2017 SOIL BACKFILL CONFIRMATION SAMPLE LOCATIONS
POST-CLOSURE CARE PLAN
SWMU 57, TULA PEAK BURIAL SITES
WHITE SANDS MISSILE RANGE, NEW MEXICO

Table 1. Monitoring Well Completion Details

Post-Closure Care Plan, SWMU 57, Tula Peak Burial Sites

White Sands Missile Range, New Mexico

Well	Northing UTM Zone 13N (meters)	Easting UTM Zone 13N (meters)	Latitude WGS 1984 (decimal degrees)	Longitude WGS 1984 (decimal degrees)	Brass Marker Elevation NAVD 88 (ft)	Screen Depth (ft bgs)	TOC Elevation NAVD 88 (ft)	Depth to Groundwater 1/10/19 (ft bgs)	Groundwater Elevation NAVD 88 (ft)
TP-1	3658494.93	393578.62	33.05981	-106.13996	4170.73	22-42	4173.02	25.79	4147.23
TP-2	3658440.13	393375.74	33.05930	-106.14212	4164.50	18-38	4166.71	22.54	4144.17
TP-3	3658574.22	393365.42	33.06051	-106.14225	4167.21	20-40	4169.03	23.8	4145.23
TP-4	3658703.62	393462.77	33.06168	-106.14122	4166.75	18-38	4168.86	22.78	4146.08

Notes:
bgs = below ground surface
ft = foot/feet
NAVD 88 = North American Vertical Datum of 1988
SWMU = solid waste management unit
TOC = top of casing
UTM = Universal Transverse Mercator
WGS = World Geodetic System

Appendix A
Tula Peak Inspection Form

Example Inspection Log

Post-closure Plan for Tula Peak Burial Sites, White Sands Missile Range, New Mexico

Name of Inspector:	**Dates of Inspection:**				
Post-closure Permit Area Boundary	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Has the perimeter been inspected?				Yes No	
Has erosion been observed?				Yes No	
Have MEC been observed outside the boundary?				Yes No	
Has evidence of trespassing been observed?				Yes No	
Note: Document locations of erosion or MEC or evidence of trespassing on a map.					
Areas Prone to Erosion or Frost Heave	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have areas prone to erosion or frost heave been inspected?				Yes No	
Has erosion been observed?				Yes No	
Has frost heave been observed?				Yes No	
Note: Document locations of erosion or frost heave on a map.					
Groundwater Monitoring Wells	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have the monitoring well caps and locks been inspected?				Yes No	
Were repairs necessary, and if so, have they been completed?				Yes No	
Were the inspection and maintenance documented?				Yes No	
Note: Document locations of monitoring well cap or lock damage and repairs on a map.					
Fences, Signs, Gates, and Barriers	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have the installation boundary fence and signs been inspected?				Yes No	
Were repairs necessary, and if so, have they been completed?				Yes No	
Have the boundary signs and road barriers been inspected?				Yes No	
Were repairs necessary, and if so, have they been completed?				Yes No	
Were the fence, sign, and barrier inspections and repairs documented?				Yes No	
Note: Document locations of fence, sign, or barrier damage and repairs on a map.					
Trespassing and Other Incidents	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Has trespassing into the Post-closure Plan Area occurred?				Yes No	
Have MEC or MPPEH been discovered in or near the Post-closure Plan Area?				Yes No	
Have fire or medical incidents occurred in or near the Post-closure Plan Area?				Yes No	
Note: Document locations of trespassing, MEC discovery, fire or medical incidents on a map.					
Name of Inspector:	**Dates of Inspection:**				
MEC Awareness Training	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have WSMR employees received training regarding accessing the area?				Yes No	
Have military units received training?				Yes No	
Have contractors received training?				Yes No	
Are training materials up to date?				Yes No	
Note: Revise training materials if site conditions, land uses, or LUCs have changed.					

Example Inspection Log

Post-closure Plan for Tula Peak Burial Sites, White Sands Missile Range, New Mexico

Land Use	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have military training records been reviewed?				Yes No	
Have the types or durations of military training changed?				Yes No	
Has land use adjacent to the installation changed?				Yes No	
Note: Document if changes in military training and land uses have occurred.					

Permit Reference documents	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have documents referenced in the permit been reviewed?				Yes No	
Have the reference documents been revised?				Yes No	
Do the revisions remain consistent with permit requirements?				Yes No	
Note: Append new or revised documents to the annual report.					

Real Property Development	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Has the Real Property Development Plan been reviewed?				Yes No	
Have the Post-closure Permit Area LUCs been notated and shown on a map?				Yes No	
Do the Post-closure Plan LUCs support current and planned future land uses near the Post-closure Plan Area?				Yes No	
Note: Revise the notations if the land uses or LUCs have changed.					

Munitions Responses	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have munitions responses occurred in or near the Post-closure Plan Area?				Yes No	
Have the associated munitions response after action reports been reviewed?				Yes No	
Were the munitions response adequate?				Yes No	
Note: Document any munitions responses that have occurred.					

Maintenance and Repairs	**Yes**	**No**	**N/A**	**Response Required?**	**See Note No.**
Have maintenance or repairs been conducted since the previous inspection?				Yes No	
Were maintenance or repairs conducted during this inspection?				Yes No	
Have maintenance or repairs been scheduled for future completion?				Yes No	
Note: Provide descriptions, dates, locations, and schedules in the notes below.					

Note No.	**Notes**

Example Inspection Log

Post-closure Plan for Tula Peak Burial Sites, White Sands Missile Range, New Mexico
