

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
<u>EXECUTIVE SUMMARY</u>	xxiv
1.0 <u>INTRODUCTION</u>	1-1
1.1 BACKGROUND	1-1
2.0 <u>INSTALLATION DESCRIPTION</u>	2-1
2.1 LOCATION	2-1
2.2 DEMOGRAPHICS OF THE SURROUNDING COMMUNITIES	2-1
2.3 POTENTIAL WATER USE IN AND NEAR TEAD-S	2-1
2.4 SITE LAYOUT	2-6
2.5 HISTORY	2-6
2.6 CLIMATE	2-9
2.7 PHYSIOGRAPHY	2-9
2.8 SOILS AND GEOLOGY	2-10
2.8.1 <u>Soils</u>	2-10
2.8.2 <u>Geology</u>	2-10
2.9 SURFACE WATER	2-13
2.10 GROUNDWATER	2-14
2.11 VEGETATION AND WILDLIFE	2-18
3.0 <u>PREVIOUS AND RFI-PHASE I INVESTIGATIONS</u>	3-1
3.1 INSTALLATION ASSESSMENT - 1979	3-1
3.2 AERIAL PHOTOGRAPHY INTERPRETATION - 1982	3-1
3.3 INSTALLATION ENVIRONMENTAL ASSESSMENT - 1982	3-2
3.4 EXPLORATORY SURVEY - 1982	3-2
3.5 AERIAL PHOTOGRAPHY INTERPRETATION ADDENDUM - 1986	3-3
3.6 SWMU EVALUATION - 1986	3-3
3.7 FINAL INTERIM RCRA FACILITY ASSESSMENT - 1987	3-4
3.8 PRELIMINARY ASSESSMENT/SITE INVESTIGATION - 1988	3-4
3.9 REMEDIAL INVESTIGATION - 1989	3-5
3.10 RFI-PHASE I FIELD INVESTIGATION - 1990	3-5
3.10.1 <u>Scope</u>	3-5
3.10.2 <u>Geophysical Survey</u>	3-6
3.10.3 <u>SWMU 26 Landfill Exploratory Excavation</u>	3-9
3.10.4 <u>Product Sampling</u>	3-9
3.10.5 <u>Soil Gas Sampling and On-Site Analysis</u>	3-12
3.10.6 <u>Soil Sampling</u>	3-12
3.10.7 <u>Well Installation and Sampling</u>	3-12
3.10.8 <u>Well and Other Surveying</u>	3-15

TABLE OF CONTENTS
(continued)

<u>Section</u>	<u>Page</u>
3.10.9 <u>Additional Sampling Program</u>	3-15
3.10.10 <u>Other Field Operations</u>	3-15
3.10.11 <u>Chemical Analytical Program</u>	3-17
3.10.12 <u>Field Quality Assurance/Quality Control</u>	3-20
3.10.12.1 <u>Trip Blanks</u>	3-20
3.10.12.2 <u>Rinse Blanks</u>	3-20
3.10.12.3 <u>Field Sample Duplicates</u>	3-27
3.10.13 <u>Laboratory Quality Assurance/Quality Control</u>	3-27
4.0 <u>BACKGROUND CONCENTRATIONS OF INORGANIC ANALYTES</u>	4-1
4.1 <u>BACKGROUND CONCENTRATIONS OF METALS IN SOIL</u>	4-1
4.2 <u>BACKGROUND CONCENTRATIONS OF INORGANIC ANALYTES IN GROUNDWATER</u>	4-3
4.2.1 <u>Delineation of Water Quality Zones</u>	4-3
4.2.2 <u>Metals in Groundwater</u>	4-6
4.2.3 <u>Anions in Groundwater</u>	4-9
4.2.4 <u>Radiological Parameters in Groundwater</u>	4-11
5.0 <u>SWMU CHARACTERIZATION</u>	5-1
5.1 <u>SWMU 1: EAST DEMILITARIZATION AREA/DISPOSAL PITS</u>	5-4
5.1.1 <u>Site Description and Waste Generation</u>	5-4
5.1.2 <u>Site Hydrogeology</u>	5-7
5.1.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-8
5.1.4 <u>Contamination Assessment</u>	5-8
5.1.5 <u>Recommendations</u>	5-17
5.2 <u>SWMU 2: GRAVEL PIT (AREA 10)</u>	5-21
5.2.1 <u>Site Description and Waste Generation</u>	5-21
5.2.2 <u>Site Hydrogeology</u>	5-21
5.2.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-23
5.2.4 <u>Contamination Assessment</u>	5-23
5.2.5 <u>Recommendations</u>	5-32
5.3 <u>SWMU 3: DISPOSAL PIT (SOUTHEAST OF AREA 2)</u>	5-33
5.3.1 <u>Site Description and Waste Generation</u>	5-33
5.3.2 <u>Site Hydrogeology</u>	5-33
5.3.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-35
5.3.4 <u>Contamination Assessment</u>	5-35
5.3.5 <u>Recommendations</u>	5-41

TABLE OF CONTENTS
(continued)

<u>Section</u>		<u>Page</u>
5.4	SWMU 4: MORTAR PITS (SOUTHEAST OF AREA 2)	5-43
5.4.1	<u>Site Description and Waste Generation</u>	5-43
5.5	SWMU 5: BUILDING 600 FOUNDATION, DRAINAGE POND AND DITCH	5-44
5.5.1	<u>Site Description and Waste Generation</u>	5-44
5.5.2	<u>Site Hydrogeology</u>	5-46
5.5.3	<u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-47
5.5.4	<u>Contamination Assessment</u>	5-47
5.5.5	<u>Recommendations</u>	5-56
5.6	SWMU 8: SURVEILLANCE TEST SITE	5-60
5.6.1	<u>Site Description and Waste Generation</u>	5-60
5.6.2	<u>Site Hydrogeology</u>	5-60
5.6.3	<u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-62
5.6.4	<u>Contamination Assessment</u>	5-62
5.6.5	<u>Recommendations</u>	5-62
5.7	SWMU 9: OLD AREA 2 (INCLUDING MUSTARD HOLDING AND PIT AREAS)	5-67
5.7.1	<u>Site Description and Waste Generation</u>	5-67
5.7.2	<u>Site Hydrogeology</u>	5-67
5.7.3	<u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-69
5.7.4	<u>Contamination Assessment</u>	5-69
5.7.5	<u>Recommendations</u>	5-82
5.8	SWMU 11: CHEMICAL MUNITIONS STORAGE AREA (AREA 10)	5-84
5.8.1	<u>Site Description and Waste Generation</u>	5-84
5.8.2	<u>Site Hydrogeology</u>	5-84
5.8.3	<u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-84
5.8.4	<u>Contamination Assessment</u>	5-86
5.8.5	<u>Recommendations</u>	5-96
5.9	SWMU 14: BUILDING 5108 (FORMER MOTOR POOL)	5-97
5.9.1	<u>Site Description and Waste Generation</u>	5-97
5.9.2	<u>Site Hydrogeology</u>	5-97
5.9.3	<u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-97
5.9.4	<u>Contamination Assessment</u>	5-104
5.9.5	<u>Recommendations</u>	5-104

TABLE OF CONTENTS
(continued)

<u>Section</u>	<u>Page</u>
5.10 SWMU 15: OLD DEMOLITION PIT (UNDER BUILDING C-4002) ..	5-105
5.10.1 <u>Site Description and Waste Generation</u>	5-105
5.10.2 <u>Site Hydrogeology</u>	5-105
5.10.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-105
5.10.4 <u>Contamination Assessment</u>	5-107
5.10.5 <u>Recommendations</u>	5-107
5.11 SWMU 19: BUILDING 533 FOUNDATION (EMPTY DRUM STORAGE)	5-113
5.11.1 <u>Site Description and Waste Generation</u>	5-113
5.11.2 <u>Site Hydrogeology</u>	5-113
5.11.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-113
5.11.4 <u>Contamination Assessment</u>	5-115
5.11.5 <u>Recommendations</u>	5-121
5.12 SWMU 20: BUILDING 521 (CRATING FACILITY)	5-123
5.12.1 <u>Site Description and Waste Generation</u>	5-123
5.12.2 <u>Site Hydrogeology</u>	5-123
5.12.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-123
5.12.4 <u>Contamination Assessment</u>	5-123
5.12.5 <u>Recommendations</u>	5-128
5.13 SWMU 21: INCENDIARY WASHOUT OPERATIONS (BUILDING S-554) AND SWMU 22: INCENDIARY WASHOUT BASINS	5-130
5.13.1 <u>Site Description and Waste Generation</u>	5-130
5.13.2 <u>Site Hydrogeology</u>	5-130
5.13.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-132
5.13.4 <u>Contamination Assessment</u>	5-142
5.13.5 <u>Recommendations</u>	5-142
5.14 SWMU 23: DEMILITARIZATION HOLDING AREA (NORTH OF SWMU 1)	5-143
5.14.1 <u>Site Description and Waste Generation</u>	5-143
5.14.2 <u>Site Hydrogeology</u>	5-143
5.14.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-143
5.14.4 <u>Contamination Assessment</u>	5-145
5.14.5 <u>Recommendations</u>	5-145
5.15 SWMU 25: WEST DEMILITARIZATION AREA/DISPOSAL PITS ..	5-146
5.15.1 <u>Site Description and Waste Generation</u>	5-146
5.15.2 <u>Site Hydrogeology</u>	5-148
5.15.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-149

TABLE OF CONTENTS
(continued)

<u>Section</u>		<u>Page</u>
	5.15.4 <u>Contamination Assessment</u>	5-149
	5.15.5 <u>Recommendations</u>	5-164
5.16	SWMU 26: SANITARY LANDFILL (ACTIVE AND INACTIVE) ...	5-167
	5.16.1 <u>Site Description and Waste Generation</u>	5-167
	5.16.2 <u>Site Hydrogeology</u>	5-167
	5.16.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-169
	5.16.4 <u>Contamination Assessment</u>	5-174
	5.16.5 <u>Recommendations</u>	5-181
5.17	SWMU 27: SEWAGE TREATMENT PLANT	5-182
	5.17.1 <u>Site Description and Waste Generation</u>	5-182
	5.17.2 <u>Site Hydrogeology</u>	5-182
	5.17.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-184
	5.17.4 <u>Contamination Assessment</u>	5-184
	5.17.5 <u>Recommendations</u>	5-184
5.18	SWMU 28: INACTIVE LANDFILL (NORTHEAST CORNER)	5-190
	5.18.1 <u>Site Description and Waste Generation</u>	5-190
	5.18.2 <u>Site Hydrogeology</u>	5-190
	5.18.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-190
	5.18.4 <u>Contamination Assessment</u>	5-192
	5.18.5 <u>Recommendations</u>	5-192
5.19	SWMU 29: METAL SCRAP LANDFILL	5-199
	5.19.1 <u>Site Description and Waste Generation</u>	5-199
	5.19.2 <u>Site Hydrogeology</u>	5-199
	5.19.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-199
	5.19.4 <u>Contamination Assessment</u>	5-205
	5.19.5 <u>Recommendations</u>	5-205
5.20	SWMU 30: CAMDS LANDFILL	5-206
	5.20.1 <u>Site Description and Waste Generation</u>	5-206
	5.20.2 <u>Site Hydrogeology</u>	5-206
	5.20.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-208
	5.20.4 <u>Contamination Assessment</u>	5-209
	5.20.5 <u>Recommendations</u>	5-227
5.21	SWMU 31: DEMILITARIZATION AREA (NORTHEAST OF SWMU 1)	5-229
	5.21.1 <u>Site Description and Waste Generation</u>	5-229
	5.21.2 <u>Site Hydrogeology</u>	5-229
	5.21.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-229

TABLE OF CONTENTS
(continued)

<u>Section</u>		<u>Page</u>
	5.21.4 <u>Contamination Assessment</u>	5-229
	5.21.5 <u>Recommendations</u>	5-231
5.22	SWMU 32: RAILROAD SCRAP YARD	5-232
	5.22.1 <u>Site Description and Waste Generation</u>	5-232
	5.22.2 <u>Site Hydrogeology</u>	5-232
	5.22.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-232
	5.22.4 <u>Contamination Assessment</u>	5-234
	5.22.5 <u>Recommendations</u>	5-234
5.23	SWMU 33: BUILDING 536 (CAMDS SALT STORAGE)	5-236
	5.23.1 <u>Site Description and Waste Generation</u>	5-236
	5.23.2 <u>Site Hydrogeology</u>	5-236
	5.23.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-238
	5.23.4 <u>Contamination Assessment</u>	5-238
	5.23.5 <u>Recommendations</u>	5-238
5.24	SWMU 34: BUILDING 4105 (CARBON STORAGE)	5-243
	5.24.1 <u>Site Description and Waste Generation</u>	5-243
	5.24.2 <u>Site Hydrogeology</u>	5-243
	5.24.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-243
	5.24.4 <u>Contamination Assessment</u>	5-243
	5.24.5 <u>Recommendations</u>	5-245
5.25	SWMU 36: BUILDING 3200 AND SURROUNDING AREA	5-246
	5.25.1 <u>Site Description and Waste Generation</u>	5-246
	5.25.2 <u>Site Hydrogeology</u>	5-246
	5.25.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-248
	5.25.4 <u>Contamination Assessment</u>	5-248
	5.25.5 <u>Recommendations</u>	5-248
5.26	SWMU 37: SLAG PILES AND BOMB FRAGMENTS	5-252
	5.26.1 <u>Site Description and Waste Generation</u>	5-252
	5.26.2 <u>Site Hydrogeology</u>	5-252
	5.26.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-252
	5.26.4 <u>Recommendations</u>	5-252
5.27	METEOROLOGICAL STATIONS	5-254
	5.27.1 <u>Site Description and Waste Generation</u>	5-254
	5.27.2 <u>Site Hydrogeology</u>	5-254
	5.27.3 <u>Previous Sampling and RFI-Phase I Sampling Results</u>	5-254
	5.27.4 <u>Contamination Assessment</u>	5-254
	5.27.5 <u>Recommendations</u>	5-265
5.28	OTHER AREAS	5-266

TABLE OF CONTENTS
(continued)

<u>Section</u>	<u>Page</u>
6.0 <u>SUMMARY OF RECOMMENDATIONS FOR FURTHER INVESTIGATION</u>	6-1
6.1 RECOMMENDATIONS	6-1
6.2 PROPOSED SOIL INVESTIGATIONS	6-6
6.3 PROPOSED GROUNDWATER INVESTIGATIONS	6-8
6.3.1 <u>Contaminant Concentrations and Distributions</u>	6-8
6.3.2 <u>Migration Pathways</u>	6-10
6.4 OTHER PROPOSED INVESTIGATIONS	6-10
6.5 SCHEDULE	6-12
7.0 <u>REFERENCES</u>	7-1
7.1 PUBLICATIONS	7-1
7.2 INTERVIEWS	7-6
APPENDIX A FIELD BORING LOGS	A-1
APPENDIX B WELL COMPLETION DIAGRAMS AND GROUNDWATER ELEVATION DATA	B-1
APPENDIX C WELL DEVELOPMENT AND PRESAMPLING RECORDS	C-1
APPENDIX D FIELD SURVEY DATA AND METHODS	D-1
APPENDIX E CHARACTERISTICS OF DETECTED ANALYTES	E-1
APPENDIX F RFI-PHASE I CHEMICAL ANALYTICAL DATA	F-1
APPENDIX G ADDITIONAL ANALYTICAL RESULTS FOR SWMU 15	G-1
APPENDIX H GEOTECHNICAL TEST RESULTS FOR TOOELE ARMY DEPOT SITE	H-1

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1.1-1 Suspected Release Solid Waste Management Units (SWMUs) at Tooele Army Depot South Area	1-4
1.1-2 SWMU History Summary	1-5
2.3-1 Water Rights Within Three-Miles of Tooele Army Depot-South Area	2-3
2.5-1 Chemical Agents at Tooele Army Depot	2-8
3.10-1 SWMU 26 Trench Descriptions	3-11
3.10-2 Soil Sampling	3-13
3.10-3 Summary of USATHAMA Certified Methods and EPA Equivalents	3-16
3.10-4 RFI Phase I Additional Soil and Surface Water Sampling	3-18
3.10-5 RFI Phase I Additional Groundwater Sampling	3-19
3.10-6 Summary of Analytical Results for Field Quality Assurance/Quality Control Samples: Trip Blanks	3-21
3.10-7 Summary of RFI-Phase I Analyses for Water Supply Well 2-S	3-22
3.10-8 Summary of Analytical Results for Field Quality Assurance/Quality Control Samples: Rinse Blanks	3-24
3.10-9 Analytical Data Quality Control Deficiencies by Lot Designation for Water	3-29
3.10-10 Analytical Data Quality Control Deficiencies by Lot Designation for Soil	3-30
4.1-1 Background Metal Concentrations in Soil	4-2
4.2-1 Monitoring Wells Assigned to Water Quality Zones	4-7
4.2-2 Summary Statistics for Inorganics in Groundwater	4-8
4.2-3 Tolerance Levels Compiled for Inorganics in Groundwater	4-10

LIST OF TABLES
(continued)

<u>Table</u>	<u>Page</u>
5.0-1 Unified Soil Classification System	5-2
5.1-1 SWMU 1 - East Demilitarization Area/Disposal Pits Documented Pit/ Trench Contents	5-6
5.1-2 Summary of Previous Analytical Investigations for SWMU 1: East Demilitarization Area/Disposal Pits	5-9
5.1-3 Summary of RFI-Phase I Investigations for SWMU 1: East Demilitarization Area/Disposal Pits	5-12
5.2-1 Summary of Previous Analytical Investigations for SWMU 2: Gravel Pit (Area 10)	5-24
5.2-2 Summary of RFI-Phase I Investigations for SWMU 2: Gravel Pit (Area 10)	5-26
5.3-1 Summary of RFI-Phase I Investigation for SWMU 3: Disposal Pit (Southeast of Area 2)	5-36
5.5-1 Summary of Previous Analytical Investigations for SWMU 5: Building 600 Foundation, Drainage Pond, and Ditch	5-48
5.5-2 Summary of RFI-Phase I Investigations for SWMU 5: Building 600 Foundation, Drainage Pond and Ditch	5-50
5.6-1 Summary of RFI-Phase I Investigations for SWMU 8: Surveillance Test Site	5-63
5.7-1 Summary of Previous Analytical Investigations for SWMU 9: Old Area 2 (Including Mustard Holding and Pit Areas)	5-70
5.7-2 Summary of RFI-Phase I Investigations for SWMU 9: Old Area 2 (Including Mustard Holding and Pit Areas)	5-76
5.8-1 Summary of Previous Analytical Investigations for SWMU 11: Chemical Munitions Storage Area (Area 10)	5-87

LIST OF TABLES
(continued)

<u>Table</u>	<u>Page</u>
5.8-2 Summary of RFI-Phase I Investigations for SWMU 11: Chemical Munitions Storage Area (Area 10)	5-90
5.9-1 Summary of RFI-Phase I Investigations for SWMU 14: Building S-108 (Former Motor Pool)	S-99
5.10-1 Summary of RFI-Phase I Investigations for SWMU 15: Old Demolition Pit (Under Building C-4002)	5-108
5.11-1 Summary of RFI-Phase I Investigations for SWMU 19: Building 533 Foundation (Empty Drum Storage)	5-116
5.12-1 Summary of RFI-Phase I Investigations for SWMU 20: Building 521 (Crating Facility)	5-125
5.13-1 Summary of Previous Analytical Investigations for SWMU 21 and SWMU 22: Incendiary Washout Operations (Building 554) and Basins	5-133
5.13-2 Summary of RFI-Phase I Investigations for SWMU 21 and SWMU 22: Incendiary Washout Operations (Building 554) and Basins	5-136
5.15-1 Summary of Previous Analytical Investigations for SWMU 25: West Demilitarization Area/Disposal Pits	5-150
5.15-2 TEAD-AED Analytical Results for SWMU 25: Windrows and Ash Piles . .	5-156
5.15-3 Summary of RFI-Phase I Investigations for SWMU 25: West Demilitarization Area/Disposal Pits	5-157
5.16-1 Summary of RFI-Phase I Investigations for SWMU 26: Sanitary Landfill (Active and Inactive)	5-170
5.17-1 Summary of RFI-Phase I Investigations for SWMU 27: Sewage Treatment Plant	5-185

LIST OF TABLES
(continued)

<u>Table</u>	<u>Page</u>
5.18-1 Summary of RFI-Phase I Investigations for SWMU 28 and SWMU 32: Inactive Landfill (Northeast Corner) and Railroad Scrap Yard	5-193
5.19-1 Summary of RFI-Phase I Investigations for SWMU 29: Metal Scrap Landfill	5-201
5.20-1 Summary of Previous Analytical Investigations for SWMU 30: CAMDS Landfill	5-210
5.20-2 Summary of RFI-Phase I Investigations for SWMU 30: CAMDS Landfill . .	5-219
5.22-1 Summary of RFI-Phase I Investigations for SWMU 32: Railroad Scrap Yard	5-235
5.23-1 Summary of RFI-Phase I Investigations for SWMU 33: Building 536 (CAMDS Salt Storage)	5-241
5.25-1 Summary of Previous Analytical Investigations for SWMU 36: Building 3200 and Surrounding Area	5-249
5.25-2 Summary of RFI-Phase I Investigations for SWMU 36: Building 3200 and Surrounding Area	5-250
5.27-1 Summary of RFI-Phase I Investigations for Meteorological Stations MS-1 through MS-8	5-256
5.28-1 Summary of RFI-Phase I Investigations for Other Areas Northwest	5-267
5.28-2 Summary of RFI-Phase I Investigations for Other Areas Southeast	5-271
6.1-1 Summary of Recommendations for Suspected Releases SWMUs	6-2
6.2-1 Proposed Soil and Surface Water Investigations	6-7
6.3-1 Proposed Groundwater Investigations	6-9
6.4-1 Other Proposed Investigations	6-11

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1.1-1 Location Map of Tooele Army Depot	1-2
1.1-2 Location of Solid Waste Management Units (SWMUs)	1-3
2.2-1 Surrounding Land Use	2-2
2.3-1 Water Use	2-5
2.8-1 Geology of Tooele and Rush Valleys, Utah	2-11
2.8-2 Surficial Geology of TEAD-S	2-12
2.9-1 Surface Water	2-15
2.10-1 General Groundwater Flow Directions, July 1990	2-17
3.10-1 SWMU 26 - Sanitary Landfill (Active and Inactive)	3-7
3.10-2 SWMU 26 - Sanitary Landfill Trenches Magnetic Anomalies	3-10
4.2-1 Water Quality Zones Based on Sodium Chloride Concentrations	4-5
5.0-1 Potentiometric Surface, July 1990	5-3
5.1-1 Site Map SWMU 1 - East Demilitarization Area/Disposal Pits	5-5
5.1-2 SWMU 1 - East Demilitarization Area/Disposal Pits Organics and Explosives	5-13
5.1-3 SWMU 1 - East Demilitarization Area/Disposal Pits Anions	5-14
5.1-4 SWMU 1 - East Demilitarization Area/Disposal Pits Metals	5-15
5.1-5 SWMU 1 - East Demilitarization Area/Disposal Pits Radionuclides	5-16
5.1-6 SWMU 1 - East Demilitarization Area/Disposal Pits Proposed Sampling Locations	5-19
5.2-1 Site Map SWMU 2 - Gravel Pit (Area 10)	5-22

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.2-2 SWMU 2 - Gravel Pit (Area 10) Organics	5-27
5.2-3 SWMU 2 - Gravel Pit (Area 10) Explosives, Agent Breakdown Products, Total Petroleum Hydrocarbons	5-28
5.2-4 SWMU 2 - Gravel Pit (Area 10) Metals and Cyanide	5-29
5.2-5 SWMU 2 - Gravel Pit (Area 10) Anions	5-30
5.2-6 SWMU 2 - Gravel Pit (Area 10) Radionuclides	5-31
5.3-1 Site Map SWMU 3 - Disposal Pit (Southeast of Area 2)	5-34
5.3-2 SWMU 3 - Disposal Pit (Southeast of Area 2) Volatile Organics	5-37
5.3-3 SWMU 3 - Disposal Pit (Southeast of Area 2) Metals	5-38
5.3-4 SWMU 3 - Disposal Pit (Southeast of Area 2) Anions	5-39
5.3-5 SWMU 3 - Disposal Pit (Southeast of Area 2) Radionuclides	5-40
5.3-6 SWMU 3 - Disposal Pit (Southeast of Area 2) Proposed Sampling Locations	5-42
5.5-1 Site Map SWMU 5 -Building 600 Foundation, Drainage Pond, and Ditch	5-45
5.5-2 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Organics	5-52
5.5-3 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Radionuclides	5-53
5.5-4 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Metals	5-54
5.5-5 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Anions	5-55

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.5-6 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Proposed Sampling Locations	5-57
5.5-7 SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch Additional Proposed Sampling Locations	5-58
5.6-1 Site Map SWMU 8 - Surveillance Test Site	5-61
5.6-2 SWMU 8 - Surveillance Test Site, Soil Sample Locations Metals	5-64
5.6-3 SWMU 8 - Surveillance Test Site Proposed Sampling Locations	5-65
5.7-1 Site map SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage)	5-68
5.7-2 SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage) Organics and Agent Breakdown Products	5-78
5.7-3 SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage) Metals	5-79
5.7-4 SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage) Anions	5-80
5.7-5 SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage) Radionuclides	5-81
5.7-6 SWMU 9 - Old Area 2 (including Mustard Holding and Pit Areas) and SWMU 34 - Building 4105 (Carbon Storage) Proposed Sampling Locations .	5-83
5.8-1 Site Map SWMU 11 - Chemical Munitions Storage Area (Area 10)	5-85
5.8-2 SWMU 11 - Chemical Munitions Storage Area (Area 10) Organics	5-91
5.8-3 SWMU 11 - Chemical Munitions Storage Area (Area 10) Explosives, Agent Breakdown Products, Total Petroleum Hydrocarbons	5-92

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.8-4 SWMU 11 - Chemical Munitions Storage Area (Area 10) Metals and Cyanide	5-93
5.8-5 SWMU 11 - Chemical munitions Storage Area (Area 10) Anions	5-94
5.8-6 SWMU 11 - Chemical Munitions Storage Area (Area 10) Radionuclides . . .	5-95
5.9-1 Site Map SWMU 14 - Building S-108 (Former Motor Pool) as Remodeled, 1988	5-98
5.9-2 SWMU 14 - Building S-108 (Former Motor Pool) as Remodeled, 1988, Organics	5-101
5.9-3 SWMU 14 - Building S-108 (Former Motor Pool) as Remodeled, 1988, Metals	5-102
5.9-4 SWMU 14 - Building S-108 (Former Motor Pool) as Remodeled, 1988, Soil Gas Detections	5-103
5.10-1 Site Map SWMU 15 - Old Demolition Pit (under Building C-4002)	5-106
5.10-2 SWMU 15 - Old Demolition Pit (under Building C-4002) Organics	5-109
5.10-3 SWMU 15 - Old Demolition Pit (under Building C-4002) Metals	5-110
5.10-4 SWMU 15 - Old Demolition Pit (under Building C-4002) Anions	5-111
5.10-5 SWMU 15 - Old Demolition Pit (under Building C-4002) Radionuclides . . .	5-112
5.11-1 Site Map SWMU 19 - Building S-533 Foundation (Empty Drum Storage) . .	5-114
5.11-2 SWMU 19 - Building S-533 Foundation (Empty Drum Storage) Volatile Organics	5-118
5.11-3 SWMU 19 - Building S-533 Foundation (Empty Drum Storage) Soil Gas Detections	5-119

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.11-4 SWMU 19 - Building S-533 Foundation (Southern Portion) Volatile Organics and PCBs	5-120
5.11-5 SWMU 19 - Building S-533 Foundation (Empty Drum Storage) Proposed Soil Sampling Locations	5-122
5.12-1 SWMU 20 - Building S-521 (Crating Facility)	5-124
5.12-2 SWMU 20 - Building S-521 (Crating Facility) Organics	5-126
5.12-3 SWMU 20 - Building S-521 (Crating Facility) Metals	5-127
5.12-4 SWMU 20 - Building S-521 (Crating Facility) Proposed Sampling Locations	5-129
5.13-1 Site Map SWMU 21 - Incendiary Washout Operations (Building S-554) and SWMU 22 - Incendiary Washout Basins	5-131
5.13-2 SWMU 21 - Incendiary Washout Operations (Building S-554) and SWMU 22 - Incendiary Washout Basins Agent Breakdown Products and Organics	5-138
5.13-3 SWMU 21 - Incendiary Washout Operations (Building S-554) and SWMU 22 - Incendiary Washout Basins Metals	5-139
5.13-4 SWMU 21 - Incendiary Washout Operations (Building S-554) and SWMU 22 - Incendiary Washout Basins Anions	5-140
5.13-5 SWMU 21 - Incendiary Washout Operations (Building S-554) and SWMU 22 - Incendiary Washout Basins Radionuclides	5-141
5.14-1 Site Map SWMU 23 - Demilitarization Holding Area (North of SWMU 1)	5-144
5.15-1 Site Map SWMU 25 - West Demilitarization Area/Disposal Pits	5-147
5.15-2 SWMU 25 - West Demilitarization Area/Disposal Pits Organics and Explosives	5-158

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.15-3 SWMU 25 - West Demilitarization Area/Disposal Pits Inorganics - Previous	5-159
5.15-4 SWMU 25 - West Demilitarization Area/Disposal Pits Metals	5-160
5.15-5 SWMU 25 - West Demilitarization Area/Disposal Pits Anions	5-161
5.15-6 SWMU 25 - West Demilitarization Area/Disposal Pits Radionuclides	5-162
5.15-7 SWMU 25 - West Demilitarization Area/Disposal Pits Proposed Sampling Locations	5-165
5.16-1 Site Map SWMU 26 - Sanitary Landfill (Active and Inactive)	5-168
5.16-2 SWMU 26 - Sanitary Landfill Trenches and Magnetic Anamolies	5-173
5.16-3 SWMU 26 - Sanitary Landfill Organics	5-175
5.16-4 SWMU 26 - Sanitary Landfill Trenches Organics	5-176
5.16-5 SWMU 26 - Sanitary Landfill Metals	5-177
5.16-6 SWMU 26 - Sanitary Landfill Trenches Metals	5-178
5.16-7 SWMU 26 - Sanitary Landfill Anions	5-179
5.16-8 SWMU 26 - Sanitary Landfill Radionuclides	5-180
5.17-1 Site Map - SWMU 27 - Sewage Treatment Plant	5-183
5.17-2 SWMU 27 - Sewage Treatment Plant Volatile Organics	5-187
5.17-3 SWMU 27 - Sewage Treatment Plant Soil Gas Detections	5-188
5.17-4 SWMU 27 - SWMU 27 - Sewage Treatment Plant Metals	5-189
5.18-1 Site Map - SWMU 28 - Inactive Landfill (Northeast Corner)	5-191

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.18-2 SWMU 28 - Inactive Landfill (Northeast Corner) and SWMU 32 - Railroad Scrap Yard Semivolatile Organics	5-194
5.18-3 SWMU 28 - Inactive Landfill (Northeast Corner) and SWMU 32 - Railroad Scrap Yard Explosives	5-195
5.18-4 SWMU 28 - Inactive Landfill (Northeast Corner) and SWMU 32 - Railroad Scrap Yard Metals	5-196
5.18-5 SWMU 28 - Inactive Landfill (Northeast Corner) and SWMU 32 - Railroad Scrap Yard Anions	5-197
5.18-6 SWMU 28 - Inactive Landfill (Northeast Corner) and SWMU 32 - Railroad Scrap Yard Radionuclides	5-198
5.19-1 Site Map - SWMU 29 - Metal Scrap Landfill	5-200
5.19-2 SWMU 29 - Metal Scrap Landfill Semivolatile Organics	5-203
5.19-3 SWMU 29 - Metal Scrap Landfill Metals	5-204
5.20-1 Site Map - SWMU 13 - CAMDS (Known Releases SWMU) and SWMU 30 - CAMDS Landfill	5-207
5.20-2 SWMU 30 - CAMDS Landfill Organics	5-221
5.20-3 SWMU 30 - CAMDS Landfill Explosives and Agent Breakdown Products	5-222
5.20-4 SWMU 30 - CAMDS Landfill Total Petroleum Hydrocarbons	5-223
5.20-5 SWMU 30 - CAMDS Landfill Metals and Cyanide	5-224
5.20-6 SWMU 30 - CAMDS Landfill Anions	5-225
5.20-7 SWMU 30 - CAMDS Landfill Radionuclides	5-226
5.20-8 SWMU 30 - CAMDS Landfill Proposed Sampling Locations	5-228

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.21-1 SWMU 31 - Demilitarization Area (Northeast of SWMU 1) Proposed Sampling Locations	5-230
5.22-1 Site Map - SWMU 32 - Railroad Scrap Yard	5-233
5.23-1 Site Map - SWMU 33 - Building 536 (CAMDS Salt Storage)	5-237
5.23-2 SWMU 33 - Building S-536 (CAMDS Salt Storage) Agent Breakdown Products	5-239
5.23-3 SWMU 33 - Building S-536 (CAMDS Salt Storage) Metals	5-240
5.23-4 SWMU 33 - Building S-536 (CAMDS Salt Storage) Proposed Sampling Locations	5-242
5.24-1 Site Map - SWMU 34 - Building 4105 (Carbon Storage)	5-244
5.25-1 Site Map - SWMU 36 - Building 3200 and Surrounding Area	5-247
5.25-2 SWMU 36 - Building 3200 and Surrounding Area Volatile Organics	5-251
5.26-1 Site Map - SWMU 37 - Slag Piles and Bomb Fragments	5-253
5.27-1 Meteorological Stations	5-255
5.27-2 Meteorological Station 1 - Mercury	5-257
5.27-3 Meteorological Station 2 - Mercury	5-258
5.27-4 Meteorological Station 3 - Mercury	5-259
5.27-5 Meteorological Station 4 - Mercury	5-260
5.27-6 Meteorological Station 5 - Mercury	5-261
5.27-7 Meteorological Station 6 - Mercury	5-262

LIST OF FIGURES
(continued)

<u>Figure</u>	<u>Page</u>
5.27-8 Meteorological Station 7 - Mercury	5-263
5.27-9 Meteorological Station 8 - Mercury	5-264
5.28-1 Location of Wells Outside of Suspected Releases SWMUs	5-267
5.28-2 Location of Wells Outside of Suspected Releases Area 30	5-268

LIST OF PLATES

Plate

- 1 Tooele South SWMU and RFI-Phase I Sampling Location Map
- 2 Potentiometric Surface, April 1990
- 3 Potentiometric Surface, July 1990
- 4 Potentiometric Surface, October 1990
- 5 Potentiometric Surface, February 1991

LIST OF ACRONYMS AND ABBREVIATIONS

AC	hydrogen cyanide blood agent
ASCS	Agricultural Stabilization and Conservation Service
BBZP	butyl benzyl phthalate
CAMDS	Chemical Agent Munitions Disposal System
CG	phosgene choking agent
CK	blood agent
CMS	corrective measures study
CRL	certified reporting limits
CS	riot control agent
DANC	decontaminating agent, noncorrosive
DIPC	Diisopropyl carbodiimide, nerve agent stabilizer
DPG	Dugway Proving Ground
EBASCO	Ebasco Services Incorporated
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Photographic Interpretation Center
EPTOX	extraction procedure toxicity
ERTEC	Earth Technology Corporation
FS	smoke agent
GA	tabun nerve agent
GB	sarin nerve agent
GC/MS	gas chromatograph/mass spectrophotometer
GFAA	graphic furnace atomic absorption
gpm	gallons per minute
H	mustard blister agent
HC	smoke agent
HD	distilled mustard blister agent
HE	high explosive
HT	mustard, T mixture blister agent
ICP	inductively coupled plasma
IMPA	isopropylmethyl phosphonic acid
km	kilometer
L	lewisite
mg/l	milligram per liter
mi	miles
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
NEPA	National Environmental Policy Act
PCB	polychlorinated biphenyl
pCi/l	picocuries per liter
ppb	parts per billion
ppm	parts per million

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QC	quality control
RAM	random access memory
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,4-triazine (explosive)
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	remedial investigation
RPD	relative percent difference
SWMU	Solid Waste Management Unit
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TEAD	Tooele Army Depot
TEAD-AED	Tooele Army Depot Ammunition Equipment Directorate
TEAD-N	Tooele Army Depot North Area
TEAD-S	Tooele Army Depot South Area
TNT	trinitro toluene
TOD	Tooele Ordnance Depot
TPH	total petroleum hydrocarbons
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USGS	U.S. Geological Survey
UST	underground storage tank
UXO	unexploded ordnance
V	nerve agent
VX	nerve agent
WP	white phosphorous smoke agent
°F	degrees Fahrenheit
µg/g	microgram per gram
µg/l	microgram per liter