

DUGWAY PERMIT

MODULE VII

ATTACHMENT 1

GENERAL FACILITY DESCRIPTION

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

ATEC Army Test and Evaluation Command
DTC Army Developmental Test Command
Dugway Dugway Proving Ground
HWMU Hazardous Waste Management Unit
SWMU Solid Waste Management Unit

1.0 INTRODUCTION

Dugway Proving Ground (Dugway) is a research, test and training ground. The facility was established in 1942 by the Army Chemical Warfare Service for the development and testing of mortars, incendiary, flame-throwing weapons, and chemical and biological warfare agents. At present, it is an active unit of the Army Developmental Test Command (DTC), a subcommand of Army Test and Evaluation Command (ATEC).

1.1 Facility Description

Dugway, which covers 1,315 square miles, is located in the Great Salt Lake Desert approximately 75 miles southwest of Salt Lake City, Utah, as shown in Figure 1-1. The installation can be divided into three main activity areas: 1) English Village and Fries Park, which includes the administration, housing and maintenance activities; 2) Avery, Carr and Ditto areas, which include chemical warfare agent laboratories and testing facilities; and 3) Baker Laboratory, which is the biological warfare agent test facility. Large bombing ranges located mostly west and south of the Ditto and Carr area and north of Baker are used for testing and training. Figure 1-2 shows the locations of each main activity area.

The research, test and training operations and facility functions at Dugway generated various waste streams. Operations involving chemical warfare agent (agent) testing included decontamination of materials and substances that were exposed to agents such as the nerve agents Sarin (GB), and VX and blister agents Mustard (H) and Lewisite (L). Discarded agent, decontamination solution and decontaminated solids were disposed at many of the hazardous waste management units (HWMUs) and solid waste management units (SWMUs). Currently, testing of chemical and biological warfare agents is limited to laboratory study.

Other hazardous waste streams, past and present, include battery operations, building maintenance wastes, photo processing, open burning and detonation of waste explosives and vehicle and equipment maintenance waste. A variety of household, office building and industrial type solid waste also is generated. Before about 1990, much of the solid and hazardous waste that was generated was disposed in the landfills, surface impoundments, tanks and waste piles. Also, pesticides and herbicides may be present from historic crop warfare testing activities.

1.2 Geology

Dugway is located in the Basin and Range region of the western United States. This region is generally characterized by north-south trending mountain ranges separated by sediment filled basins or valleys. The prominent inselbergs and

nearby mountain ranges are composed of Precambrian intrusive and metamorphic rocks, Paleozoic limestone, sandstone, orthoquartzite and Tertiary extrusives.

Large alluvial fans comprised of coarse-grained materials are common where streams exit the mountain fronts. Dry lakebeds and shallow, sandy stream channels are common in the valleys. The basins are filled with Plio-Pleistocene alluvial, aeolian, and lacustrine sediments.

1.3. General Hydrologic Setting

Groundwater flows in two main valleys or basins bounded by bedrock, Dugway Valley and Government Creek Valley. Groundwater in both the Government Creek and Dugway Valley areas flow toward the Great Salt Lake Basin. A groundwater divide separates these areas and English Village is part of the Skull Valley aquifer system.

Surface water at Dugway drains predominately to the northwest toward the Great Salt Lake desert. No perennial streams are located at Dugway; however, ephemeral and intermittent streams are present which drains onto the basin floor and infiltrate or quickly evaporate. Government Creek, which is intermittent, originates near Simpson Mountain, and is the main drainage at Dugway.

1.4. Post Closure Summary Reference Table

Table A1-1 of this Post-Closure Permit Attachment provides a summary sites (SWMUs and HWMUs) of under post closure or other sites with special restrictions tracked through this post closure module. The table is provided as a reference only.

Table 1-1 Post Closure Summary for Landfill Cover Systems, GMA, Industrial Use Areas, and Special Provisions

Site No.	Site Description	Site Location STPL X Coordinates	Site Location STPL Y Coordinates	Outcome (RIP)	Decision Document Final Approval	Type Closure	Special Provisions
2	Landfill, North Granite Mtn.	1135989.84155	7237800.23314	Landfill cover & Groundwater monitoring	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed December 27, 2004 DEQ Letter	Landfill	Prohibited from Installation of Drinking Water Wells
3	Landfill, Waste Pile and Vehicle Decontamination Pad, V-Grid, North Granite	1142829.92853	7240593.18148	Landfill cover and removal – PC maintenance and GW monitoring are needed	<i>RFI Approved 9/30/05, Certified Closed February 18, 2010</i>	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
6	Petroleum Surface Storage Area, V-Grid	1161513.58340	7268104.09548	Industrial closure - site use tracking and GW monitoring needed	DEQ RFI Approval Letter September 22, 2004, Certified Closed for Soil with GW Restrictions, NFA, GW monitoring required	Groundwater Restrictions	GMA - Prohibited from Installation of Drinking Water Wells
7	Decontamination Tanks, Granite Mountain	1128360.25672	7216752.54149	Removal action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed December 27, 2004 DEQ Letter	Industrial	N/A
9	3X Storage, West Granite Mountain	1131964.11058	7222388.45614	Removal action, Industrial	Certified Closed August 8, 2012 DEQ Letter, Certified Closed August 8, 2012	Industrial	N/A
11	Radiological Landfill, East	1154992.50640	7223781.42490	Soil Cover and no groundwater	RFI Approval March 3, 2011 CMIR Approval	Landfill	Contact Health Hazard

	Granite Mountain			monitoring	September 13, 2011 DEQ Letter, Certified Closed September 13, 2011		Beryllium Trenches
14	Landfill, Downrange	1178811.55644	7199162.17996	Landfill cover and maintenance	Certified Closed August 1, 2007	Landfill	N/A
15	Landfill, Rising Sun Grid	1219746.77689	7185125.09799	MMRP	Approved April 26, 2010	Special Restrictions	Prohibited from Installation of Drinking Water Wells
17	Agent Disposal, South Tower Grid	1225357.09848	7200079.74587	Landfill cover and removal - PC maintenance and limited GW monitoring are needed	<i>RFI Approved 9/30/05, Certified Closed August 28, 2008</i>	Landfill	N/A
21	Diposal Site North of Camel Back	1230464.26642	7230360.76766	Landfill cover and PC site maintenance	<i>RFI Approved October 14, 2005, Certified Closed August 1, 2007</i>	Landfill	N/A
32	Dump Site, SW of Baker	1203912.53838	7239432.36201	Administrative Closure - Waste in Place - PC tracking	DEQ RFI Approval Letter August 26, 2009	Special Restrictions	Prohibited from Installation of Drinking Water Wells
33	Baker area sewage lagoon	1209115.14867	7241875.05843	Removal action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed July 15, 2003	Industrial	N/A
36	Sewer Tank, Ditto	1238997.37047	7237997.06207	Removal action, Industrial closure, Groundwater Monitoring	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed December 27, 2004	Industrial	GMA - Prohibited from Installation of Drinking Water Wells

37	Landfill, Ditto	1239719.89249	7236812.07443	Landfill cover variance and maintenance	DEQ Letter Certifying Closure May 31, 2006, Certified Closed May 31, 2006	Landfill	N/A
38	Decontamination/ Test Area, Ditto	1240760.55093	7236147.58008	Industrial Closure with Groundwater Monitoring	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed May 11, 2004	Industrial	GMA - Prohibited from Installation of Drinking Water Wells
39	Landfill, Avery	1246372.87300	7242727.99589	Landfill cover and maintenance	Certified Closed May 5, 2008	Landfill	N/A
41	Evaporation Pond and USTs, Avery	1245242.83102	7240004.52814	Areas A and B, residential and industrial risk based closure with PC tracking	RFI Report Approved August 25, 2009 DEQ Letter	Industrial	N/A
43	Landfill, English	1294390.24682	7242683.43865	Landfill cover & Groundwater monitoring	Certified Closed September 30, 2005	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
47	Sewage Lagoon, Fries Park	1281777.45177	7244858.34255	Removal action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed November 5, 2004	Industrial	N/A
48	48 - F999 Waste & PCB Storage, Fries Park	1283904.50312	7249698.88157	Removal action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed February 3, 2005	Industrial	N/A
51	DTC Lagoon, West	1245432.43798	7217684.84678	Removal action,	RFI Report and Permit	Groundwater	Prohibited from

	of CARR			Residential Closure, NFA soil, groundwater use tracking	Mod Approved October 24, 2006 DEQ Letter, Certified Closed February 26, 2007	Restrictions	Installation of Drinking Water Wells
52	Waste Burial Area, CARR	1254239.84327	7231274.68106	Landfill cover and PC site maintenance, GW Monitoring	RFI Approved 3/9/2006, Certified Closed August 28, 2008	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
54	Landfill, CARR	1254379.10031	7232151.95944	Landfill cover and PC maintenance	RFI Report and Permit Mod Approved October 22, 2003 DEQ Letter, Certified Closed August 1, 2007	Landfill	N/A
55	Landfill, South of CARR	1258619.51016	7230967.09970	Landfill cover & Groundwater monitoring	Certified Closed 4 April, 2008	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
56	Storage, East CARR	1261693.85298	7231496.85961	Landfill cover and PC maintenance, GW monitoring	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed August 1, 2007	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
56 B	Storage, East CARR	1260595.71399	7230825.24894	Landfill cover and PC maintenance, GW monitoring	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed August 1, 2007	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
57	57, 79, 80, 106 - Combined Landfills, East CARR DEQ Letter August 12, 2004	1265023.72850	7234631.04932	Landfill cover and PC maintenance, GW monitoring	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed October 8, 2008	GMA	GMA - Prohibited from Installation of Drinking Water Wells
58	Lagoon, East of	1254505.46469	7233389.58105	Soil cover &	Certified Closed 28	Landfill	GMA -

	CARR			Groundwater monitoring	August, 2008		Prohibited from Installation of Drinking Water Wells
60	Chemical Storage, CARR	1253196.20888	7233249.58723	Long term Groundwater Monitoring, address Bldg. 3445 upon closure	RFI Report Approved August 25, 2009 DEQ Letter	Industrial	GMA - Special Restrictions - Prohibited from Installation of Drinking Water Wells
61	Contaminated Soil, CARR	1252092.92150	7232777.59460	Interim Removal and PC GW monitoring	Approved 4/26/2010	Industrial	GMA - Prohibited from Installation of Drinking Water Wells
63-1 & 2	Sewer System Sump, CARR	(1) 1252880.94946 (2) 1250635.37331	(1) 7233890.08101 (2) 7232892.09643	(63-1)Removal action, Residential Closure, NFA (632) Removal action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed March 18, 2005	Industrial	N/A
75	75 - Old Sewage Lagoon, Fries Park	1283497.36142	7247647.40001	NFA, Industrial Closure	RFI Report Approved October 14, 2005 DEQ Letter	Industrial	N/A
79	57, 79, 80, 106 - Combined Landfills, East CARR DEQ Letter August 12, 2004	1264651.34078	7234397.55237	Landfill cover and PC maintenance, GW monitoring	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed October 8, 2008	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
80	57, 79, 80, 106 - Combined Landfills, East CARR DEQ Letter August 12, 2004	1264428.45849	7234463.55214	Landfill cover and PC maintenance, GW monitoring	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed October 8, 2008	GMA	GMA - Prohibited from Installation of Drinking Water Wells
90	Landfill, East of	1256374.06243	7232072.09303	Landfill cover and	RFI Report and Permit	Landfill	N/A

	CARR			maintenance	Mod Approved October 24, 2006 DEQ Letter, Certified Closed August 6, 2006		
97	Drainfield and Decontamination pad, SW Avery	1243746.53119	7239887.53199	NFA for soil and GW monitoring PC	RFI Approved September 27, 2007 DEQ Letter	Groundwater Restrictions	GMA - Prohibited from Installation of Drinking Water Wells
106	57, 79, 80, 106 - Combined Landfills, East CARR DEQ Letter August 12, 2004	1264021.81984	7234361.05396	NFA	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed October 8, 2008	GMA	GMA - Prohibited from Installation of Drinking Water Wells
114	114 & 202 - GPI-3 Bio Test, NW V-Grid	1157677.25535	7262904.10494	Industrial closure - site use tracking	RFI Approved 3/3/2011	Industrial	N/A
118	Test Vat, East V-Grid	1150142.49213	7249939.33836	Removal and Industrial Use - post-closure	CMIR Approval February 24, 2008 DEQ Letter, Certified Closed February 24, 2009	Industrial	N/A
124	Incinerator, Baker/CARR	1252262.36493	7232184.68881	Removal Action, Residential Closure, NFA	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed December 27, 2004 DEQ Letter	Industrial	N/A
128	Pesticide Building, English	1290768.22854	7248496.88566	Removal Action, Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed December 27, 2004 DEQ Letter	Industrial	N/A

133	Ditto Aircraft Hanger Disposal	1241419.07724	7238846.04789	NFA for soil - PC groundwater monitoring needed	RFI Approved September 27, 2007 DEQ Letter	Groundwater Restrictions	GMA - Prohibited from Installation of Drinking Water Wells
158	Ditto Lagoon	1233079.09601	7248028.21555	Industrial closure - land use tracking	Certified Closed 30 September, 2005	Industrial	N/A
163	Fire Training Area, Ditto	1242408.10990	7238748.54725	Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, January 25, 2006, Certified Closed January 25, 2006 DEQ Letter	Industrial	N/A
169	Decontamination Pad, Baker	1209011.14374	7240539.07597	Industrial Closure	DEQ Letter Certifying Closure of Site in Accordance with Consent Order 8909884, March 7, 2005, Certified Closed November 5, 2004	Industrial	N/A
172	Old Battery Shop, Avery	1245114.32714	7240237.02575	Removal and Industrial	RFI Report and Permit Mod Approved October 22, 2003 DEQ Letter	Industrial	N/A
177	Old Dry Clean Shop, Ditto	1242250.72721	7237255.56455	NFA soil and Groundwater monitoring in PC	RFI approved August 25, 2009	Industrial	GMA - Prohibited from Installation of Drinking Water Wells
180	Old Bio Lab, West CARR	1250846.50608	7231542.80762	Interim Removal and NFA for soil, PC Groundwater monitoring	Approved April 26, 2010	Industrial	N/A
192	M55 GB Landfill, 63 pits, West Granite	1126450.05018	7223818.49638	Landfill Cover and Surface Removal - post-closure	DEQ PCP Permit Mod Letter and RFI Approval February 3,	Landfill	N/A

				including groundwater monitoring	2012		
194 A	Landfills at CARR	1255990.77078	7233066.13769	Landfill cover and PC maintenance	RFI Approved September 30, 2004, Certified Closed August 1, 2007	Landfill	N/A
194 B	Landfills at CARR	1259909.84169	7233730.07178	Landfill cover and PC maintenance	RFI Approved 9/30/04, Certified Closed August 1, 2007	Landfill	N/A
194 C	Landfills at CARR	1260910.12559	7233890.04839	Landfill cover and PC maintenance	RFI Approved 9/30/04, Certified Closed August 1, 2007	Landfill	N/A
197	Landfill, Target Site, Downwind Grid	1174083.23930	7206611.20899	Landfill cover and PC GW monitoring and maintenance	RFI Report and Permit Mod Approved October 24, 2006 DEQ Letter, Certified Closed April 1, 2008	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
199	Old OB/OD Site, South Tower Grid	1228920.09717	7200897.03686	Removal and industrial PC	CMIR Approval August 12, 2009 DEQ Letter, Certified Closed August 12, 2009	Landfill	Industrial
200	Landfill, SE of CARR	1255877.81134	7229461.81891	Landfill cover and PC maintenance	RFI Report and Permit Mod Approved October 22, 2003 DEQ Letter, Certified Closed August 1, 2007	Landfill	N/A
201	Cave, Camels Back Mtn	1225768.32943	7219582.77863	Fencing and PC maintenance	RFI Approved September 27, 2007 DEQ Letter	Industrial	N/A
204	Lewisite Area, Simpsons Butte	1255786.34613	7186597.96666	Landfill cover and PC maintenance	Final Interim measures plan and RFI approved August 21, 2012, DEQ PCP Permit Mod Letter and RFI Approval February 3, 2012	Landfill	N/A

207	Disposal Trenches, CARR	1253666.59984	7233464.58396	Landfill cover and PC GW monitoring and maintenance	RFI Approved 9/30/05, Certified Closed August 1, 2007	Landfill	GMA - Prohibited from Installation of Drinking Water Wells
213	Burial Trench, Target S	1169631.44266	7206541.43860	Landfill cover and PC maintenance	RFI Final Report Approved September 20, 2004 DEQ Letter, Certified Closed August 1, 2007	Landfill	N/A
215	Pigeon Loft Trenches, Downwind Grid	1176072.34532	7212929.30259	Landfill cover and PC maintenance	RFI Final Report Approved September 20, 2004 DEQ Letter, Certified Closed August 1, 2007	Landfill	N/A
<p>CMIR – Corrective Measures Implementation Report DEQ – Department of Environmental Quality DTC – DITTO Technical Center GMA – Groundwater Management Area GW - Groundwater MMRP – Military Munitions Response Program N/A – Not Applicable NFA – No Further Action OB/OD – Open Burn / Open Detonation PC – Post Closure PCB – Polychlorinated Biphenyl RCRA – Resource Conservation and Recovery Act RFI – RCRA Facility Investigation RIP – Remedy In Place UST – Underground Storage Tank</p>							

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MODULE VII

ATTACHMENT 1

General Facility Description

FIGURES