

**DUGWAY PERMIT**

**MODULE VII**

**ATTACHMENT 49**

**HAZARDOUS WASTE MANAGEMENT UNIT  
(HWMU) 9  
POST-CLOSURE PLAN**

**TABLE OF CONTENTS**

	<b>Page No.</b>
LIST OF TABLES .....	ii
LIST OF FIGURES .....	ii
LIST OF APPENDICES .....	ii
LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS .....	iii
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
<b>2.0 FACILITY DESCRIPTION .....</b>	<b>4</b>
2.1 DPG-9 LOCATION AND HISTORY .....	4
2.2 PAST OPERATIONS .....	4
2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION .....	5
2.4 CLOSURE ACTIVITIES .....	5
2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT .....	5
2.6 SURFACE WATER AND GROUNDWATER .....	5
2.7 CLOSURE NOTIFICATIONS .....	6
<b>3.0 SECURITY REQUIREMENTS .....</b>	<b>6</b>
<b>4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS .....</b>	<b>6</b>
4.1 INTRODUCTION .....	6
4.2 ROUTINE SITE INSPECTIONS .....	6
4.3 INSPECTION FOLLOW-UP .....	7
<b>5.0 SUBMITTALS/REPORTING .....</b>	<b>7</b>
5.1 NON-COMPLIANCE REPORTING .....	7
5.2 BIENNIAL POST-CLOSURE REPORT .....	8
5.3 REQUIRED SUBMITTALS .....	8
<b>6.0 POST-CLOSURE CERTIFICATION .....</b>	<b>9</b>
<b>7.0 REFERENCES .....</b>	<b>9</b>

**LIST OF TABLES**

		<b>Page No.</b>
Table 1	Summary of DPG-9 Post-Closure Information Requirements Under 40 CFR §270.14 and UAC R315-3-2.5 .....	2
Table 2	DSHW Library Documents Detailing DPG-9 Investigations .....	5
Table 3	DPG-9 Post-Closure Inspection Schedule .....	8
Table 4	Summary Table of Required Submittals .....	9

**LIST OF FIGURES**

Figure 1	DPG-9 Site Location Map
Figure 2	DPG-9 Regional Topography

**LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS**

bgs	below ground surface
BWA	Biological Warfare Agent
CFR	Code of Federal Regulations
COPC	Constituent of Potential Concern
DPG	Dugway Proving Ground
DSHW	Divisions of Solid and Hazardous Waste
ft	feet
GPI	Granite Peak Installation
HWMU	Hazardous Waste Management Unit
mg/L	milligrams per liter
NFA	No Further Action
PAH	Polycyclic Aromatic Hydrocarbon
PCP	Post Closure Plan
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
TDS	Total Dissolved Solid
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality

## 1.0 INTRODUCTION

The objectives of this Post-Closure Plan (PCP) are to 1) ensure that Dugway Proving Ground (DPG or Dugway) complies with the Post-Closure Permit issued by the State of Utah in accordance with Title 40 Code of Federal Regulations (CFR) §264.117, with respect to post-closure inspection requirements and 2) to document tracking and inspections to ensure industrial site use. To meet these objectives, this PCP provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Hazardous Waste Management Unit (HWMU) 9 (herein referred to as DPG-9). Post-closure requirements will continue for a minimum of 30 years after closure of DPG-9. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR §264.117(a)(2)).

Based on the approved Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI), there are no uncontrolled sources of contamination (Utah Administrative Code (UAC) R315-101-2 and 3) present at DPG-9. The nature and extent of potential contamination has been characterized in soil in accordance with UAC R315-101-4 and the site risks have been assessed in accordance with UAC R315-101-5. Soil does not qualify for no further action (NFA) based upon a hypothetical residential land use, but soil does meet industrial use risk levels. Soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are not expected at DPG-9.

In accordance with 40 CFR §270.28 and UAC R315-3-2.19, the Post-Closure Plan is required to include specific information for a closed facility. As applicable to DPG-9, the information requirements include:

- General description of the facility,
- Description of security procedures,
- General inspection schedule,
- Preparedness and Prevention Plan,
- Facility location information (including seismic and flood plain considerations),
- Closure Plan or Closure Proposal,
- Certificate of Closure,
- Topographic map, with specific scale,
- Summary of groundwater monitoring data, and
- Identification of uppermost aquifer and interconnected aquifers.

Table 1 provides the regulatory citations for the general information requirements and the locations in this Post-Closure Plan where the specific information is presented.

**Table 1: Summary of DPG-9 Post-Closure Information Requirements  
 Under 40 CFR §270.14, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
40 CFR §270.14(b)(1) UAC R315-3-2.5(b)(1)	General Description of the Facility	Section 2.0.
40 CFR §270.14(b)(4) UAC R315-3-2.5(b)(4)	Description of Security Procedures	Section 3.0.
40 CFR §270.14(b)(5) UAC R315-3-2.5(b)(5)	General Inspection Schedule	Section 4.0 and Form A of Module VII

**Table 1: Summary of DPG-9 Post-Closure Information Requirements  
Under 40 CFR §270.14, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
40 CFR §270.14(b)(6) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 3.0.
40 CFR §270.14(b)(11)(i-ii, v) UAC R315-3-2.5(b)(11) (i-ii, v)	Facility Location Information Applicable seismic standard	There are no active faults in the vicinity of DPG-9.
40 CFR §270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	DPG-9 is not located within a verified 100-year floodplain area.
40CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Plan	The Revised Final Closure Plan for HWMUs 9 and 9A was issued on April 27, 2011 and approved by UDEQ on May 9, 2011. No public comments were received.
40 CFR §270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Certification and Notification	Section 2.7 and Appendix A.
40 CFR §270.14(b)(16) UAC R315-3-2.5(b)(16)	Post-Closure Cost Estimate	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(18) UAC R315-3-2.5(b)(18)	Proof of Financial Coverage	Federal Facilities are exempt from this requirement.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (i)	Topographic Map Map Scale and Date	Figure 2 (1 inch = 1000 feet (ft)).
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ii)	Topographic Map 100-year floodplain area	DPG-9 is not located within a verified 100-year floodplain area.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	DPG-9 is within a military base. There are no nearby operations in the vicinity of DPG-9.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (v)	Topographic Map A wind rose (i.e., prevailing windspeed and direction)	There are no residential populations abutting DPG-9. The closest residential area is English Village. A wind rose is not deemed necessary for DPG-9.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (viii)	Topographic Map Access control, fence, gates	Figure 2. The site is not surrounded by a fence.
40 CFR §270.14(b)(19)	Topographic Map	Figure 2.

**Table 1: Summary of DPG-9 Post-Closure Information Requirements  
Under 40 CFR §270.14, and UAC R315-3-2.5**

<b>Regulation Citation</b>	<b>Requirement Description</b>	<b>Location Requirement is Addressed</b>
UAC R315-3-2.5(b)(19) (ix)	Injection and withdrawal wells	
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	Figure 2. There are no barriers to drainage or flood control in the vicinity of DPG-9.
40 CFR §270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Section 2.6.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Section 2.6.
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Post-closure groundwater monitoring at DPG-9 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Section 2.6.
40 CFR §270.14(c) UAC R315-3-2.5(c)(5)	Groundwater Monitoring Information Detailed Plans/Engineering Report for Proposed Groundwater Program	Post-closure groundwater monitoring at DPG-9 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Post-closure groundwater monitoring at DPG-9 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(ii)	Groundwater Monitoring Information Proposed Groundwater Monitoring System	Post-closure groundwater monitoring at DPG-9 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at DPG-9 is not required.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iv)	Groundwater Monitoring Information A description of the Proposed Sampling	Post-closure groundwater monitoring at DPG-9 is not required.

## **2.0 FACILITY DESCRIPTION**

The following provides a general description of DPG-9, as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

### **2.1 DPG-9 LOCATION AND HISTORY**

DPG-9 is a 2.5-acre site, located in the west-central portion of DPG at the western flank of Granite Peak (Figure 1, “Site Location Map”, and Figure 2, “Regional Topography”). This site was primarily used for the above ground storage of range debris from range clearance activities from the West Granite Holding Area (DPG-192). A small staging area associated with DPG-9, known as DPG-9A, is located approximately 400 ft northwest of DPG-9.

DPG-9A consisted of two small turnaround areas on the north fork of the road that leads to the top of Granite Peak. These turn around areas were used to stage material such as immersion tanks removed from the West Granite Peak Holding Area (DPG-192) and large vacuum pumps removed from the North Wig Grid and Horizontal Grid. This material was later moved inside the fence at DPG-9 (Foster Wheeler Environmental Corporation [FWEC], 1998). Several areas of dioxin impacted soil, as well as the scattered debris remaining at the site was removed in accordance with the Revised Final Closure Plan for HWMUs 9 and 9A (Shaw, 2011).

### **2.2 PAST OPERATIONS**

Previous investigation activities at DPG-9 included a geophysical survey and collection of surface and subsurface soil samples (FWEC, 1998). Previous geophysical survey results had indicated the presence of scattered magnetic anomalies mainly attributed to metallic debris on the surface. Test pits excavated across most of the identified anomalies indicated that the geophysical detections were caused by small pieces of charred munitions debris including parts of M55 rockets, melted fuses, and a magnetic boulder. Previous site investigation activities indicated that debris and burned soil were limited to the top 0.5 foot of the ground surface at DPG-9.

Prior to site closure, soil samples were collected from 15 soil borings, 1 background soil boring, 18 surface soil locations, and 8 test pits. Two additional soil borings were drilled at DPG-9A located north of the previously fenced area. The subsurface materials consist primarily of silty sand to sand. The maximum sample depth was 3 ft bgs. Test pits were excavated down to depths ranging from 2.5 to 9 ft bgs. Debris encountered in some of the test pits ranged from the surface to 0.5 ft bgs. Debris in the test pits consisted of burned metal fragments up to 6 inches across. Some of the fragments were identified as parts of M55 rockets, fuses, and bomb casings.

Beryllium, zinc, silver, and lead results exceeded background values in one or more samples. Organic detections included volatile organic compounds, semi-volatile organic compounds, agent breakdown products (ABPs), explosives, and constituents of total petroleum hydrocarbons.

Samples collected from the two soil borings drilled at DPG-9A (SB16 and SB17) resulted in metals and ABP concentrations less than their corresponding residential PRGs. For additional details on the geophysical survey and analytical soil sampling results, refer to the Foster Wheeler Closure Plan (FWEC, 1998) which is included as Appendix C of the Revised Final Closure Plan for HWMUs 9 and 9A (Shaw, 2011).

### 2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous soil and groundwater sampling and closure information including the risk assessment are available for DPG-9 in the Division of Solid and Hazardous Waste (DSHW) public documents listed below in Table 2 (UAC R315-3-2.5(b)(13)).

**Table 2: DSHW Library Documents Detailing DPG-9 Investigations**

<b>Document Title</b>	<b>Received Date</b>	<b>DSHW Library No.</b>
Foster Wheeler Environmental Corporation (FWEC), 1998. <i>Dugway Proving Ground Closure Plan Module 3, HWMU 9/9a, Dugway Proving Ground, Dugway, Utah</i> , May.	05/98	XXXXXX
Shaw, 2007. <i>Final Voluntary Interim Measures Plan and Emergency Permit Application, Firm-Fixed Price Remediation at DPG-009, Dugway Proving Ground, Dugway, Utah</i> , December.	12/07	XXXXXX
Shaw, 2011. <i>Revised Final Closure Plan for HWMUs 9 and 9A, Dugway Proving Ground, Dugway, Utah</i> , Revised Final, Revision 1, April.	04/11	XXXXXX
Shaw, 2012. <i>Draft Closure Certification Report for HWMUs 9 and 9A, Dugway Proving Ground, Utah</i> , March.	03/12	XXXXXX

### 2.4 CLOSURE ACTIVITIES

Documentation in the approved CMIR indicates that conditions at DPG-9 meet the closure performance standards under UAC R315-7-14 (by reference 40 CFR Part 265, Subpart G, §265.111). Exposure to risks and hazards associated with potential exposure to soil qualifies for industrial use. Land use controls are required to prevent residential use of the site and to ensure the Dugway Dig Permit process is followed.

### 2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Human health and ecological risk assessments were conducted for DPG-9. The results of the human health risk assessment indicated that HWMU-9 site soils do not qualify for NFA under UAC R315-101 (DSHW, 2001) since the estimated cumulative residential risk estimate was above the NFA target level; however, levels were within industrial risk and hazard levels. Soil-to-groundwater analysis indicates that future impacts to groundwater from constituents of potential concern (COPCs) in soil also are not expected. There were no COPCs identified as potential hazards for populations of ecological receptors.

### 2.6 SURFACE WATER AND GROUNDWATER

The area around DPG-9 slopes at approximately 5.5 percent on the western flank of Granite Peak. An intermittent stream is located approximately 300 ft northwest of the site. A second intermittent stream is located southeast of the site. The general direction of surface water drainage in the area surrounding DPG-9 is southwest (Figure 2). Regional groundwater data from DPG-192, approximately one mile west of DPG-9, suggests that the shallow non-potable water-bearing zone is present approximately 16 ft below ground surface (bgs); (Parsons, 2007). Regionally, groundwater in the shallow water-bearing zone flows

to the west-northwest. Data from nearby monitoring wells at DPG-192 suggest the shallow non-potable groundwater at DPG-9 is likely Class IV non-potable (saline), per Utah Administrative Code (UAC) R317-6-3 (Utah Division of Water Quality, 2002). Groundwater in the shallow water-bearing zone is highly saline and is therefore not used for drinking water, irrigation, or other purposes.

The closest well, WW10, is located 3 miles to the northeast at the northern end of Granite Peak. This well has a depth of 155 ft bgs and has non-potable water in the interval between 85 and 125 ft bgs. The depth to bedrock beneath DPG-9 is expected to be 142 feet bgs based on the log for WW 10.

## **2.7 CLOSURE NOTIFICATIONS**

Federal facilities are exempt from submitting notifications to the local zoning authority as required by 40 CFR §264.116 and §264.119, which are incorporated by reference in UAC R315-8-7.

## **3.0 SECURITY REQUIREMENTS**

The following security conditions are applicable to DPG-9:

DPG-9 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.

The Dugway Emergency Response and Contingency Plan (Part B Permit), where applicable to this site, shall be used to announce and respond to emergency conditions. At a minimum, the site inspector should have a radio or phone and a First Aid kit available during inspections.

## **4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS**

### **4.1 INTRODUCTION**

DPG-9 has been closed under a continued industrial use scenario, which prohibits residential use in the area formerly occupied by the site. The site has been closed under the DPG RCRA part B Permit requirements. To ensure that the area is not reused or developed, annual site inspections and a biennial post-closure report shall be required.

### **4.2 ROUTINE SITE INSPECTIONS**

During its Post-Closure period, general inspections of the former DPG-9 site shall be conducted annually by November 1st to ensure that the former site remains under industrial use and to ensure the Dugway Dig Permit Process (Module VII.I) has been followed. The frequency of inspections can be modified in accordance with amendments submitted in the form of proposed permit modifications.

Site inspections will consist of visual inspection of the site. A general site inspection checklist is included in Module VII (Form A). Completed inspection forms shall be filed with the Dugway Environmental Office.

At a minimum the site shall be visually inspected to ensure the following conditions are maintained at the site:

1. There is no evidence of land use other than for industrial purposes within the former site boundary;  
and
2. There is no evidence of soil disturbance.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-9, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

**Table 3: DPG-9 Post-Closure Inspection Schedule**

<b>Inspection/ Monitoring Item</b>	<b>Method of Documentation</b>	<b>Frequency of Inspection</b>
Land Use	Industrial Use Inspection Checklist (Form A of Module VII)	Annually, by November 1st
Soil Disturbance	Industrial Use Inspection Checklist (Form A of Module VII)	Annually, by November 1 <sup>st</sup>

### **4.3 INSPECTION FOLLOW-UP**

Copies of completed site inspection checklists (Module VII, Form A) shall be forwarded to the Dugway Environmental Office. The Point-of-Contact for the Dugway Environmental Office is as follows:

Environmental Programs Compliance Representative  
Dugway Proving Ground Environmental Program Office  
Dugway Proving Ground, UT 84022  
Telephone: 435.831.3560

The Dugway Environmental Office shall notify the appropriate personnel to implement corrective action as needed.

Corrective action shall be initiated as soon as practical after identifying the problem, or as directed by Dugway. If the corrective action requires substantial effort, a technical plan shall be prepared to summarize the problem, the potential impacts, the proposed plan for action, and the time-frame in which corrective action will be implemented as required under this Permit. This plan shall be approved by the Executive Secretary prior to implementing corrective action.

### **5.0 SUBMITTALS/REPORTING**

Based on the evaluation presented in the CMIR for DPG-9 (Shaw, 2012), post-closure inspection is required. Groundwater monitoring for DPG-9 is not needed.

#### **5.1 NON-COMPLIANCE REPORTING**

The conditions at DPG-9 are such that the impact to human health and the environment is very unlikely. Hazardous wastes are no longer managed at the site. Nonetheless, if there is any type of non-compliance with any condition of this Permit, notifications shall be submitted per permit condition VII.C.5.

## 5.2 BIENNIAL POST-CLOSURE REPORT

In accordance with UAC R315-3-3.1(l)(9), a Biennial Post-Closure Report shall be prepared for all Dugway closed Hazardous Waste Management Units (HWMUs) and SWMUs undergoing post-closure care by March 1, of the reporting year. The first Post-Closure report for DPG-9 shall be due no later than March 1, 2012. Specifically for DPG-9, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions; and
- Inspection records.

## 5.3 REQUIRED SUBMITTALS

Table 4 summarizes the requirements for the Biennial Post-Closure Report for DPG-9 and reporting for any non-compliance.

**Table 4: Summary Table of Required Submittals**

Required Submittals	Frequency and Submittal Date
<u>Biennial Post-Closure Report</u>	Post-Closure Reports shall be submitted to the Division of Solid and Hazardous Waste no later than March, of the year the report is due. Reporting years are even numbered years beginning with March 2012, for the duration of the Post-Closure Monitoring Period.
<u>Non-Compliance Reporting</u>  Anticipated Non-Compliance  24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment.  Five-day written notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment including evidence of groundwater contamination, significant data quality issues, or a request for reduced monitoring frequency. The Executive Secretary may waive the 5-day notice, in favor of a 15-day notice.  Written notification for information concerning the non-compliance, which does not endanger human health or the environment.	30 days advance notice of any change which may result in noncompliance  Orally within 24 hours of discovery  Within 5 days of discovery  Submitted when the Biennial Post Closure Reports are submitted.

## **6.0 POST-CLOSURE CERTIFICATION**

No later than 60 days after post-closure activities are completed and approved by the Executive Secretary, Dugway representatives shall submit a certification to the Board, signed by Dugway and an independent professional engineer registered in the State of Utah, stating why post-closure care is no longer needed.

## **7.0 REFERENCES**

DSHW (Division of Solid and Hazardous Waste), 2001. *Administrative Rules for Cleanup Action and Risk-Based Closure Standards*. Utah Department of Environmental Quality. R315-101, Utah Administrative Code.

Division of Water Quality (DWQ), 2002. *Division of Water Quality Administrative Rules for Groundwater Quality Protection R317-6 Utah Administrative Code*.

Foster Wheeler Environmental Corporation (FWEC), 1998. Dugway Proving Ground Closure Plan Module 3, HWMU 9/9a, Dugway Proving Ground, Dugway, Utah, May.

Parsons, 2007. Final Phase I RCRA Facility Investigation Report, Dugway Proving Ground, Dugway, Utah, Revision 1, September.

Shaw, 2011. *Revised Final Closure Plan for HWMUs 9 and 9A, Dugway Proving Ground, Dugway, Utah*, Revised Final, Revision 1, April.

Shaw, 2012. *Draft Closure Certification Report for HWMUs 9 and 9A, Dugway Proving Ground, Utah*, March.

