

**DUGWAY PERMIT**

**MODULE VII**

**ATTACHMENT 25**

**HWMU 58  
POST-CLOSURE PLAN**

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## LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
CCR	Closure Certification Report
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
COPEC	chemicals of potential ecological concern
DPG	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
EPA	Environmental Protection Agency
EPO	Environmental Program Office
ft	feet
FWEC	Foster Wheeler Environmental Corporation
GCL	Geosynthetic Clay Liner
GMA	Groundwater Management Area
HDPE	High Density Polyethylene
HHRA	Human Health Risk Assessment
HWMU	Hazardous Waste Management Unit
ILCR	Incremental Lifetime Cancer Risk
lbs	pounds
mg/L	milligrams per liter
mm	millimeter
msl	mean sea level
PES	Parsons Engineering Science
PRGs	Preliminary Remediation Goals
PVC	polyvinyl chloride
RME	reasonable maximum exposure
Shaw	Shaw Environmental, Inc.
SSL	soil screening level for leaching to groundwater
SWMU	Solid Waste Management Unit
TDS	total dissolved solid
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
USGS	U.S. Geological Survey

## 1.0 INTRODUCTION

The two objectives of this Post-Closure Plan are: 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; 2) outline the requirements needed to prevent exposure or contact with waste left in place at this landfill site. To meet these objectives, this Post-Closure Plan provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Hazardous Waste Management Unit (HWMU) 58, herein referred to as DPG-058. Post-closure requirements will continue for a minimum of 30 years after closure of DPG-058. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR 265.117(a)(2)).

In accordance with 40 CFR §270.28 and Utah Administrative Code (UAC) R315-3-2.19, the Post-Closure Plan is required to include specific information for a closed facility. As applicable to DPG-058, 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 specific locations in this Post-Closure Plan where the specific information is presented.

**Table 1: Summary of DPG-058 Post-Closure Information Requirements  
Under 40 CFR §§270.14, UAC R315-3-2.19, 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 4.2 and Inspection Form B of Module VII
40 CFR §270.14(b)(6) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 3.0

**Table 1 (Continued): Summary of DPG-058 Post-Closure Information Requirements  
Under 40 CFR §270.14, UAC R315-3-2.19, 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)(11)(i-ii, v) UAC R315-3-2.5(b)(11) (i-ii, v)	Facility Location Information Applicable Seismic Standard	Section 4.3.1
40 CFR §270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year Floodplain	Section 4.3.2
40 CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Plan	The Corrective Measures Implementation Plan Firm Fixed-Price Remediation at DPG-058 was approved on 8/1/07. 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	Section 4.3.2; DPG-058 is not located within a verified 100-year floodplain area.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iii)	Topographic Map Surface Waters Including Intermittent Streams	Figure 2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding Land Uses	DPG-058 is within a military base. There are no nearby operations in the vicinity of DPG-058.
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-058. The closest residential area is English Village (approximately 10 miles away). A wind rose is not deemed necessary for DPG-058.
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 4. The site is not surrounded by a fence.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and Withdrawal Wells	Figure 4.

**Table 1 (Continued): Summary of DPG-058 Post-Closure Information Requirements  
Under 40 CFR §270.14, UAC R315-3-2.19, 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)(19) UAC R315-3-2.5(b)(19) (xi)	Topographic Map Barriers for Drainage or Flood Control	Figure 4. DPG-058 is graded to drain surface water away from the compacted soil cover. There are no barriers to drainage or flood control.
40 CFR §270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Post-closure groundwater monitoring at DPG-058 will be in accordance with the Carr Groundwater Management Area (GMA) Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of Uppermost Aquifer	Post-closure groundwater monitoring at DPG-058 will be in accordance with the Carr GMA Plan.
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-058 will be in accordance with the Carr GMA Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Post-closure groundwater monitoring at DPG-058 will be in accordance with the Carr GMA Plan.
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-058 will be in accordance with the Carr GMA Plan.
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-058 will be in accordance with the Carr GMA Plan.
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-058 will be in accordance with the Carr GMA Plan.
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at DPG-058 will be in accordance with the Carr GMA Plan.
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-058 will be in accordance with the Carr GMA Plan.

## **2.0 FACILITY DESCRIPTION**

The following provides a general description of DPG-058 as required by UAC R315-3-2.5(b)(1).

### **2.1 DPG-058 LOCATION AND HISTORY**

DPG-058, previously known as the Evaporation Pond at building 3445, is located at the southern end of Pond Road, to the east of the Carr Facility (Figure 1). The Pond was located approximately 1,350 ft east of Building 3445 (formerly Building 3008), the Toxic Agent Transfer Building which is located in the eastern corner of the Carr Facility. The topography in this area slopes gently towards the west, with about 10-15 ft of relief per mile (IT Corporation [IT], 2001). The ground surface elevation at DPG-058 is approximately 4,366 ft above msl.

DPG-058 was an inactive surface impoundment previously used for disposal (by evaporation) of decontaminated toxic waste solutions generated at various facilities, including the Toxic Agent Transfer Building in the Carr Facility, the Ditto Chemical Laboratory, and the Biological Laboratory in the Baker Area. Waste from these facilities were decontaminated, drummed, and shipped to the Carr Facility, where the contents were stored at Building 3445 until they were released to the evaporation pond through a buried industrial sewer.

### **2.2 PAST OPERATIONS**

DPG-058 was originally constructed in 1972; however, interviews with former DPG employees suggest that use of the pond dated back to 1965 (Ebasco Services, Inc. [Ebasco] and Ageiss Environmental, Inc. [Ageiss], 1993). As constructed, the original pond was a simple impoundment lined with 6 inches of compacted clay, located in the bottom of a large excavation; 300 ft long on each side and 15 ft deep. The original pond, which was approximately 160 ft long at the top and 120 ft long at the bottom of each side, occupied the bottom 6 ft of the pit. Effluent intended for disposal would travel from Building 3445 to the pond through a buried vitrified-clay industrial sewer line. This line discharged at the center of the western side of the evaporation pond (R&M Consultants, 1989).

Between 1986 and 1988, the sewer line was replaced and the pond was retrofitted with liners, a leachate detection system, and soil berms. According to design drawings (Kearney, 1989), the new pond was constructed within the area of the original unlined lagoon. This area was over-excavated and then covered with a 6-inch layer of soil compacted to 95 percent (%) of the maximum dry density. A soil barrier was then constructed using 3 to 4 ft of low-permeability soil compacted at a minimum to 95% of the maximum dry density. Immediately above the soil barrier, a dual plastic liner was installed. The liners were 60 mil high-density polyethylene (HDPE) flexible membrane liners. HDPE drainage nets were installed above both liners (Kearney, 1989). A protective cover consisting of a 1-ft-thick layer of soil was placed over the upper drainage net. The retrofitted pond was approximately 80 ft long on each side and 10 ft deep. The bottom of this pond lies 20 ft below grade.

For leachate detection, a liner sump was constructed at the center of the pond. The sump measured 5 ft by 5 ft and was 3.5 ft deep. Although the engineering drawings of the sump were not definitive, it was apparently constructed to collect any leachate occurring between the liners. According to these plans, the upper liner and the two layers of drainage net continue over the sump were supported by cobbles wrapped in filter fabric. A sloping polyvinyl chloride (PVC) pipe was installed to carry any leachate from the liner

sump to a deeper observation sump on the east side of the pond, outside the berm. This observation sump was 18 ft deep and measures 5 ft by 5 ft (Kearney, 1989).

As part of the reconstruction of the system, the old vitrified clay sewer pipe was replaced with PVC piping, which was extended to discharge near the center of the reconstructed pond. In addition, an inner berm was constructed. The top of this berm was 11 ft below the lip of the original pit and is about 10 ft wide. A 2-ft-deep drainage ditch lay outside this berm on the north, west, and south sides of the pond. A security fence with warning signs (now removed) was installed around the inside edge of the outer berm (Kearney, 1989; R&M Consultants, 1989).

At some time after the pond was retrofitted in 1988, the Army decided to suspend operations at the pond. However, according to U.S. Army Test and Evaluation Command personnel, the pond contained liquid as recently as 1991 (Foster Wheeler Environmental Corporation [FWEC], 1996).

### 2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous soil and groundwater sampling and closure information are available for DPG-058 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-058 Investigations**

Document Title	Received Date	DSHW Library No.
Foster Wheeler, 1996. Dugway Proving Ground, Closure Plan Module 3, Draft Closure Plan for Solid Waste Management Unit (SWMU) 58 – Evaporation Pond at Building 3445. Carr Facility. September 1996.	09/96	DPG00029
Shaw., 2006. <i>Final Field Activity and Risk Evaluation Report (FAR), HWMU 58, Evaporation Pond at Building 3445, Carr Facility, Dugway Proving Ground, Dugway, Utah.</i> April 2006	04/06	DPG00505
Shaw, 2007a. <i>Corrective Measures Study (CMS) Report for Solid Waste Management Units (SWMUs) 180, 197, 199 and RCRA Closure Plans for Hazardous Waste Management Units (HWMUs) 55 and 58, Dugway Proving Ground, Dugway, Utah.</i> April 2007	04/07	DPG00549
Shaw, 2007b. <i>Final Corrective Measures Implementation (CMI) Plan, Firm Fixed-Price Remediation, at DPG-058, Dugway Proving Ground, Dugway, Utah.</i> May 2007	05/07	DPG00558
Shaw, 2008. <i>Final Closure Certification Report for HWMU 58, Dugway Proving Ground, Utah.</i> April 2008	04/08	DPG00587

### 2.4 CLOSURE ACTIVITIES

In compliance with UAC R315-7-21 and the Corrective Measures Implementation (CMI) Plan (Shaw, 2007a), closure at DPG-058 has been completed by backfilling the surface impoundment with a compacted soil cover. Approval for the DPG-058 Final Closure Certification Report (CCR) (Shaw, 2008). Appendix A includes a copy of the DPG-058 Closure Certification that will be signed and stamped by a Utah-licensed Professional Engineer following submission of the final CCR.

The Certification of Closure certifies that DPG-058 meets the closure performance in accordance with UAC R315-7-14 and R315-7-21 (by reference 40 CFR 265, Subpart N, 265.310), namely:

- Provide long-term minimization of migration of liquids through the closed impoundment;
- Function with minimum maintenance;
- Promote drainage and minimize erosion or abrasion of the cover;
- Accommodate settling and subsidence so that the compacted soil cover's integrity is maintained; and
- Achieve a permeability less than or equal to the permeability of any bottom liner system in natural subsoil present.

In meeting the above performance standards, the major closure activities completed at DPG-058 included:

- Backfilling of the pond with compacted clean fill, graded to drain;
- Installation of a survey monument for post-closure monitoring of settlement;
- Restoration of the final compacted soil cover surface and affected areas, and
- Completion of an as-built site survey.

These measures will minimize human contact with the waste residual contamination and will provide protection of groundwater. The general site inspection checklist for landfill sites, provided as Form B in Module VII, is designed to insure that these objectives are maintained.

The investigative and closure activities performed at DPG-058 are described in detail in the Closure Certification Report (Shaw, 2008).

## **2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT**

A human health risk screen was conducted to evaluate potential human health risks and hazards associated with exposure to chemicals detected in soil and groundwater at DPG-058 for residential receptors. The screen was conducted in accordance with UAC R315-101, Cleanup Action and Risk-Based Closure Standards, as in effect on April 1, 2002 (UAC, 2002b) and the guidance contained in the Risk Assumptions Document (PES, 2002). The results of the Preliminary Remediation Goal (PRG) screen indicated that the site does not meet the criteria for risk-based closure for residential receptors because the incremental lifetime cancer risk (ILCR) exceeded  $1E-06$  and the noncancer hazard index exceeded 1.0 for the hypothetical on-site resident (USEPA, 2004).

Therefore, in accordance with the risk assessment guidance presented in the Risk Assumptions Document (PES, 2002), a quantitative HHRA was conducted for receptors related to actual and future industrial use to determine if the site met requirements for industrial risk-based closure in UAC R315-101 (UAC, 2002a). The selection of receptors was based on the current and proposed future industrial use for HWMU 58. Under current site conditions and assuming reasonable maximum exposure (RME) assumptions for current and future workers, the estimated receptor-specific cancer risks are less than  $1E-04$  for potential carcinogens and the estimated noncancer hazards are less than 1.0. Therefore based on the above discussion, HWMU 58 qualifies for industrial use, and also represents a source of groundwater degradation that will be addressed as part of the Carr GMA.

An ecological risk assessment was prepared based on the methodology described in the Risk Assumptions Document, Revision 2 (PES, 2002) and the June 2004 toxicity reference value list provided in Attachment 4 of that document. Tier 1 and Tier 2 ecological risk assessments performed on soil data from HWMU 58 at DPG indicated that none of the chemicals of potential ecological concern (COPECs)

were at concentrations that indicated a level of concern for ecological receptors at this site based on the hazard quotients calculated in the Tier 2 assessment. The evaluation of uncertainties associated with these COPECs indicates that these hazard quotients are probably conservative due to assumptions of contaminant distribution across the site. The potential for ecological risk at this site is therefore expected to be minimal. Additional information is provided in the HWMU 58 Field Activity & Risk Evaluation Report (Shaw, 2006).

## **2.6 SURFACE WATER AND GROUNDWATER**

Most of the precipitation at DPG either infiltrates only the upper few inches of soil or ponds briefly before it is lost to evaporation. Only a fraction of the precipitation becomes runoff. Photographs taken of DPG-058 during a pre-consent order site visit indicated that the lip of the pit was slightly raised, preventing runoff from the surrounding area reaching the evaporation pond (Shaw, 2006b). Erosive features on the walls of the pit indicated that precipitation flowed into the area of the evaporation pond. Since a soil berm surrounded the lined evaporation pond, any surface water was routed into the bermed area where it evaporated or percolated into the soil. Prior to the retrofitting of DPG-058 and the installation of the berm, runoff flowed directly into the unlined evaporation pond (Kearney, 1989; R&M Consultants, 1989). Based upon the topography of the area, the natural drainage of surface water is to the west (U.S. Geological Survey, 1993).

Two groundwater units, a deep potable aquifer, and a shallow water-bearing zone are present beneath DPG-058. Groundwater in the shallow water-bearing zone at DPG-058 is classified as Class III – Limited Use to Class IV – Saline, based on the State of Utah groundwater classification system (Utah Administrative Code [UAC] R317-6-3, UAC, 2002). Non-degradation of groundwater in accordance with UAC R315-101-3 is the goal for site closure at DPG-058. Future monitoring of the groundwater to confirm that the selected remedy is protective of groundwater will be implemented through the Carr Groundwater Management Area (GMA) Plan.

## **2.7 CLOSURE NOTIFICATIONS**

The Certification of Closure (Appendix A) was received and verified by the Executive Secretary of the Utah Solid and Hazardous Waste Control Board on September 2008.

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 Permittee shall comply with the following security conditions as applicable to DPG-058:

1. DPG-058 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.
2. At DPG-058, signs are present warning against unauthorized entry.
3. Security facilities are to be maintained and inspected throughout the post-closure care period. The security facilities (i.e., posted signs) to be inspected and the frequency of inspection are listed in

Table 4. DPG shall report to the Division of Solid and Hazardous Waste any decrease of Dugway's Base Security, which could affect the security conditions as applicable to DPG-058.

4. Damaged security facilities shall be noted in the inspection checklist. Repairs shall be completed as soon as practicable after the problem is discovered, in compliance with R315-8-2.6(c).

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

### **4.1 INTRODUCTION**

DPG-058 has been closed under the interim status landfill closure requirements. To ensure that the area is not reused or developed, periodic site inspections and a biennial post-closure report shall be required. DPG-058 is no longer receiving waste and there are no structures or other equipment at the site. Future monitoring of the groundwater to confirm that the selected remedy is protective of groundwater and meets the requirements of UAC R315-101-3 (non-degradation) will be implemented through the Carr Groundwater Management Area (GMA) Plan. Removal and reuse of soil from this site will not be allowed unless under an excavation permit approved by the Dugway Proving Ground Environmental Program Office (EPO). Soil excavation at this site must be coordinated through the DPG EPO.

### **4.2 ROUTINE SITE INSPECTIONS**

During its post-closure period, general inspections of the former DPG-058 site shall be conducted annually by November 1<sup>st</sup> to ensure that the integrity of the compacted soil cover is maintained and to verify the Dugway Dig Permit process as described in Module VII.I has been followed. Any modifications to the frequency of inspections will be in accordance with amendments submitted in the form of proposed permit modifications.

Site inspections will consist of a complete walkthrough and visual inspection of the covered areas as well as surface water drainage features. Completed inspection forms shall be filed with the Dugway EPO.

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

- No noticeable sliding (slope failure);
- No noticeable depressions or ponding water are present;
- No excessive soil erosion is evident on the cap surface or at the cap edges;
- Signs are in good condition;
- Drainage patterns and roads are functioning as planned with no significant erosion or ponding;
- The survey monument is undamaged and there is no significant subsidence of the landfill cap; and
- The monitoring wells are undamaged and locked.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-058, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate DPG representatives.

**Table 3: DPG-058 Post-Closure Inspection Schedule**

<b>Inspection/Monitoring Item</b>	<b>Method of Documentation</b>	<b>Frequency of Inspection</b>
Cap	Module VII, Form B	Annual
Survey Monument	Module VII, Form B	Annual / 5 year intervals
Signs	Module VII, Form B	Annual
Drainage	Module VII, Form B	Annual
Monitoring Wells	Module VII, Form B	Annual

**4.2.1 Cover Soil**

If signs of soil erosion are excessive (for example, cracks or rills greater than two-inches wide) or continual (recurring in the same area), corrective action may be necessary. Significant cracks or rills that have the potential to impact the functionality of the cover will be documented on the inspection forms. Corrective action may include filling in the eroded or cracked area, regrading slopes, establishing vegetation (if soil salinity is favorable), or adding mulch to the soil surface.

For most routine repairs, corrective action should be initiated as soon as possible after identifying the problem or as directed by DPG. If the corrective action requires substantial effort and/or a technical plan, a brief plan will be prepared to summarize the problem, the potential impacts, and the time-frame in which corrective action will be implemented and the planning involved.

**4.2.2 Survey Monument Inspections**

During each visit, the survey monument installed during closure (Figure 4) will be inspected to determine if any damage has made its use questionable as a reference point. If missing or badly damaged, it will be replaced as soon as possible after discovery of the problem.

As part of the routine inspection, survey monument locations and elevations should be surveyed at least once per year for the first two years after construction. Once a settlement of 0.1 ft or less has been measured for two consecutive years, surveys can be scaled back to once every five years. The northing, easting, and elevation of the DPG-058 survey monument are listed in Table 4.

**Table 4: Survey Monument Coordinates**

<b>Description/ Point Location</b>	<b>Northing (ft)</b>	<b>Easting (ft)</b>	<b>Elevation <sup>a</sup> (ft above msl)</b>
SM58	7,233,381.4	1,254,499.6	4,372.8

<sup>a</sup> The coordinates for the survey monument (SM58) were surveyed in February, 2008 and are summarized in the 2008 biennial report.

**4.3 CONTINGENCY INSPECTIONS**

This section provides information about emergency response inspection procedures to be implemented in the event of any natural disaster in the DPG area that may affect the soil cover at DPG-058.

The DPG 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.

#### **4.3.1 Earthquakes**

DPG is located in Seismic Zone 2 with a peak ground acceleration of 0.2 gravity force (Hunt, 1984). DPG-058 is not located within 200 ft of any active faults. Although Utah is tectonically active, most of the earthquake activity occurs about 65 miles to the east along the Wasatch Range Foothills.

A geologic map, completed in a 1988 study by the U.S. Geological Survey (USGS) (Barnhard and Dodge, 1988), was used to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps in the area of DPG-058.

The USGS study (Barnhard and Dodge, 1988) concluded that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the later Pleistocene era and there is not any clear evidence of Holocene surface rupture. Several faults inferred on geophysical evidence are located at DPG; however, there is no evidence of displacement during Holocene time.

In the event of a magnitude 6.5 or higher earthquake centered within 50 miles of the site, qualified personnel will visually inspect the cap for signs of damage as soon as it is safe and practical to do so. Any damage to the cap will be repaired to ensure the integrity of the cap. If the cap has sustained extensive damage, DPG will implement corrective actions to ensure that contaminants are contained and human health is protected. Post-earthquake site inspection records will be submitted to the Dugway Environmental Department.

Following an earthquake, the cap will also be inspected for lateral shifting of soil. The survey monument will be resurveyed to determine any horizontal or vertical movement of the cap.

#### **4.3.2 Floods or Major Storms**

DPG-058 is not located within a 100-year verified floodplain. The National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, does not include DPG. There are no permanent streams or other surface water bodies on DPG.

During the capping of DPG-058, the site was graded so that surface water from precipitation flows away from the capped area and to the northwest in the direction of the natural drainage flow. Most of the surface water evaporates and does not infiltrate into the ground. Like other arid regions, DPG is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at the Ditto Technical Center.

In the event of a flood or major storm, DPG will inspect the cap to ensure its integrity within 72 business hours of the event. A major storm is defined in this plan as a storm with one inch of

precipitation or more over a 24-hour period. Any damage to the cap will be repaired as soon as possible to ensure the integrity of the cap.

#### **4.3.3 Fire**

In the event of a surface fire near the cap, the Dugway Fire Department will be notified and the DPG integrated contingency plan will be implemented. Following the incident, DPG will perform a thorough inspection of the cap using Form B (provided in Module VII) to ensure that the integrity of the soil cover has not been compromised. If there is fire damage, DPG will implement corrective actions to ensure that human health is protected.

#### **4.4 INSPECTION FOLLOW-UP**

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

Environmental Programs Compliance Representative  
Dugway Proving Ground Environmental Program Office  
Dugway Proving Ground, UT 84022  
Telephone: (435) 831-3560

The Dugway EPO 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 DPG. 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 shall be implemented as required under this Permit. This plan shall be approved by the Executive Secretary and shall be submitted within 30 days of Dugway's decision to implement corrective action.

#### **5.0 SUBMITTALS/REPORTING**

Based on the evaluation presented in the Final Closure Certification Report for DPG-058, post closure inspection is required for DPG-058. Groundwater monitoring will be implemented through the Carr GMA Plan.

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

The conditions at DPG-058 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 Conditions VII.C.5.

#### **5.2 BIENNIAL POST-CLOSURE REPORT**

In accordance with UAC R315-3-3.1(1)(9), a Biennial Post-Closure Report shall be prepared for all DPG closed HWMUs and Solid Waste Management Units (SWMUs) undergoing post-closure care by March 1, of the reporting year. The first Post-Closure report that included inspection results for DPG-058 was submitted on February 26, 2008. Specifically for DPG-058, the Biennial Post-Closure Report shall include, at a minimum, the following:

- General site description and conditions;
- Areas of cap repair or re-vegetation; and
- Inspection records.

### 5.3 REQUIRED SUBMITTALS

Table 5 summarizes the requirements for the Biennial Post-Closure Report for DPG-058 and reporting for any non-compliance.

**Table 5: 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 2008 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	30 days advance notice of any change which may result in noncompliance  Orally within 24 hours of discovery
<u>Non-Compliance Reporting (Continued)</u>  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.	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, DPG representatives shall submit a certification to the Board, signed by DPG and an independent professional engineer registered in the State of Utah, stating why post-closure care is no longer needed.

## 7.0 REFERENCES

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- Ebasco and Ageiss, 1993. *Closure Plans for Solid Waste Management Units at Dugway Proving Grounds, Dugway, Utah, Nature and Extent Investigation Plan No. 10, SWMUs 51, 58, and 167.* Arlington, VA. June.
- Department of Solid and Hazardous Waste, 2001. *Administrative Rules for Cleanup Action and Risk-Based Closure Standards. R315-101, Utah Department of Environmental Quality, Utah Administrative Code.* April.
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- Shaw, 2008. *Closure Certification Report for HWMU 58, Dugway Proving Ground, Utah.* April.

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United States Geological Service (USGS), 1993. *Topographic Map, Camels Back ridge, NW Quadrangle, 7.5 Minute Series. Dugway, Utah*.

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**APPENDIX A**  
**COPY OF**  
**CERTIFICATION OF CLOSURE**

## **CERTIFICATION OF CLOSURE**

The Closure Certification Report for Hazardous Waste Management Unit (HWMU) 58 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the Utah Administrative Code (UAC) R315-7-14 and 40 Code of Federal Regulations 265, Subpart G. The site has been managed in accordance with the specifications in the approved CMI Plan.

In accordance with 40 CFR 265.115, the signature and seal certify that a licensed professional has reviewed the Closure Certification Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,

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Scott Reed  
Directorate of Environmental Programs  
Dugway Proving Ground

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Sunil Kishnani, P.E.  
Utah Registered Civil Engineer No. 6027103