# DUGWAY PERMIT

# MODULE VII

# ATTACHMENT 27

# HWMU 14
# POST-CLOSURE PLAN

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## LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

| | |
|---|---|
| CCR | Closure Certification Report |
| CFR | Code of Federal Regulations |
| CMI | Corrective Measures Implementation |
| CN | chloroacetophenone |
| CS | 2-chlorobenzalmalononitrile |
| DPG | Dugway Proving Ground |
| DSHW | Division of Solid and Hazardous Waste |
| EOD | Explosive Ordnance Disposal |
| EPA | Environmental Protection Agency |
| ft | feet |
| FWEC | Foster Wheeler Environmental Corporation |
| GCL | Geosynthetic Clay Liner |
| GMA | Groundwater Management Area |
| HWMU | Hazardous Waste Management Unit |
| lbs | pounds |
| mg/L | milligrams per liter |
| mm | millimeter |
| msl | mean sea level |
| PRGs | Preliminary Remediation Goals |
| Shaw | Shaw Environmental, Inc. |
| SWMU | Solid Waste Management Unit |
| 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) 14, herein referred to as DPG-014. Post-closure requirements will continue for a minimum of 30 years after closure of DPG-014. 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-014, 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-014 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| 40 CFR §270.14(b)(1)<br>UAC R315-3-2.5(b)(1) | General Description of the Facility | Section 2.0 |
| 40 CFR §270.14(b)(4)<br>UAC R315-3-2.5(b)(4) | Description of Security Procedures | Section 3.0 |
| 40 CFR §270.14(b)(5)<br>UAC R315-3-2.5(b)(5) | General Inspection Schedule | Section 4.0 and Form B of Module VII |
| 40 CFR §270.14(b)(6)<br>UAC R315-3-2.5(b)(6) | Preparedness and Prevention | Section 4.0 |

**Table 1 (Continued): Summary of DPG-014 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| 40 CFR §270.14(b)(11)(i-ii, v)<br>UAC R315-3-2.5(b)(11) (i-ii, v) | Facility Location Information<br>Applicable Seismic Standard | Section 4.3.1 |
| 40 CFR §270.14(b)(11) (iii-v)<br>UAC R315-3-2.5(b)(11) (iii-v) | Facility Location Information<br>100-year Floodplain | Section 4.3.2 |
| 40 CFR §270.14(b)(13)<br>UAC R315-3-2.5(b)(13) | Copy of the Closure Plan | Closure Plan was open for public comment ending on July 31, 2006 with no comments received. |
| 40 CFR §270.14(b)(14)<br>UAC R315-3-2.5(b)(14) | Closure Certification and Notification | Section 2.7 and Appendix A. |
| 40 CFR §270.14(b)(16)<br>UAC R315-3-2.5(b)(16) | Post-Closure Cost Estimate | Federal Facilities are exempt from this requirement. |
| 40 CFR §270.14(b)(18)<br>UAC R315-3-2.5(b)(18) | Proof of Financial Coverage | Federal Facilities are exempt from this requirement. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (i) | Topographic Map<br>Map Scale and Date | Figure 2 (1 inch = 1000 feet [ft]). |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (ii) | Topographic Map<br>100-year floodplain area | Section 4.3.2; DPG-014 is not located within a verified 100-year floodplain area. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (iii) | Topographic Map<br>Surface Waters Including Intermittent Streams | Figure 2. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (iv) | Topographic Map<br>Surrounding Land Uses | DPG-014 is within a military base. There are no nearby operations in the vicinity of DPG-014. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (v) | Topographic Map<br>A Wind Rose (i.e., prevailing windspeed and direction) | There are no residential populations abutting DPG-014. The closest residential area is English Village (approximately 26.5 miles away). A wind rose is not deemed necessary for DPG-014. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (vi) | Topographic Map Orientation of Map, North Arrow | Figure 2. |
| 40 CFR §270.14(b)(19)<br>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)<br>UAC R315-3-2.5(b)(19) (viii) | Topographic Map<br>Access Control, Fence, Gates | Figure 3. The site is not surrounded by a fence. |
| 40 CFR §270.14(b)(19)<br>UAC R315-3-2.5(b)(19) (ix) | Topographic Map<br>Injection and Withdrawal Wells | Figure 3. |
| 40 CFR §270.14(b)(19) | Topographic Map | Figure 3. DPG-014 is graded to |

**Table 1 (Continued): Summary of DPG-014 Post-Closure Information Requirements Under 40 CFR §270.14, UAC R315-3-2.19, and UAC R315-3-2.5**

| Regulation Citation | Requirement Description | Location Requirement is Addressed |
|---|---|---|
| UAC R315-3-2.5(b)(19) (xi) | Barriers for Drainage or Flood Control | drain surface water away from the engineered covers. There are no barriers to drainage or flood control. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(1) | Groundwater Monitoring Information<br>Summary of Groundwater Data | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(2) | Groundwater Monitoring Information<br>Identification of Uppermost Aquifer | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(3) | Groundwater Monitoring Information<br>Delineation of The Waste Management Area | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(4) | Groundwater Monitoring Information<br>Extent of Plume | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(5) | Groundwater Monitoring Information<br>Detailed Plans/Engineering Report for Proposed Groundwater Program | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(6)(i) | Groundwater Monitoring Information<br>Proposed List of Parameters | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(6)(ii) | Groundwater Monitoring Information<br>Proposed Groundwater Monitoring System | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(6)(iii) | Groundwater Monitoring Information<br>Background Values | Post-closure groundwater monitoring at DPG-014 is not required. |
| 40 CFR §270.14(c)<br>UAC R315-3-2.5(c)(6)(iv) | Groundwater Monitoring Information<br>A Description of the Proposed Sampling | Post-closure groundwater monitoring at DPG-014 is not required. |

## 2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-014Junction as required by UAC R315-3-2.5(b)(1) (Figures 1 and 2).

## 2.1 DPG-014 LOCATION AND HISTORY

DPG-014, known as the Landfill at the Junction of Downwind West and Juliet Roads, is located at the southern end of the Downwind Grid in the central portion of DPG, southeast of Granite Peak (Figure 1-1). The topography surrounding DPG-014 (Figure 1-2) has little relief, with the exception of Granite Peak to the northwest and the Dugway Range to the southwest, which rise approximately 2,800 ft and 1,300 ft, respectively, over the surrounding, relatively flat terrain. The ground surface elevation in the area of DPG-014 is approximately 4,305 ft above mean sea level (msl). A waste pit and detonation crater were present at the site prior to implementation of corrective action.

This site is a former disposal area reportedly used during the 1960s and 1970s for disposal of miscellaneous items, primarily munitions and munition scrap. During a site inspection in October 1991, a wide range of waste materials, including range-related debris such as tear gas and fog oil canisters, empty decontamination fluid containers, smoke pots, 155-millimeter (mm) ordnance fragments, tear gas (2-chlorobenzalmalononitrile [CS]) bomblets, and wooden ammunition cases were observed (Foster Wheeler, 1998).

## 2.2 PAST OPERATIONS

During a site inspection in October 1991, a wide range of waste materials, including range-related debris such as tear gas and fog oil canisters, empty decontamination fluid containers, smoke pots, 155 mm ordnance fragments, tear gas (CS) bomblets, and wooden ammunition cases were observed (Foster Wheeler, 1998).

Several removal actions have occurred at this site in the past, including the 1994 detonation of 2,500 pounds (lbs) of plastic explosives used by the Army Explosive Ordnance Disposal (EOD) unit to destroy CS canisters, smoke bomblets, and CS submunitions. The blast, which created the detonation crater currently located northwest of the original disposal trench, reportedly unearthed other munitions buried at the site, including a 155-mm round, a chemical (CS or Chloroacetophenone [CN]) canister round, additional CS canisters, and munitions fragments. Additional site history is unknown, including the amount of waste disposed.

## 2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION

The detailed results of previous soil and groundwater sampling and closure information are available for DPG-014 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-014 Investigations**

| Document Title | Received Date | DSHW Library No. |
|---|---|---|
| Foster Wheeler, 1998 Dugway proving Ground Closure Plan, Module 3, SWMU 14. August 1998 | 08/98 | DPG00029 |
| Shaw Environmental, Inc, 2006a. *Final Corrective Measures Implementation (CMI) Plan, Firm Fixed-Price Remediation, Landfill Sites, Dugway Proving Ground, Dugway, Utah.* November 2006 | 11/06 | DPG00521 |
| Shaw, 2006b. *Corrective Measures Study (CMS) Report, Firm Fixed-Price Remediation at Landfill Sites, Dugway Proving Ground, Dugway, Utah.* July 2006 | 07/06 | DPG00528 |
| Shaw Environmental, Inc., 2007. *Final Closure Certification Report for HWMU 14, Dugway Proving Ground, Utah*. June 2007 | 06/07 | DPG00575 |

## 2.4 CLOSURE ACTIVITIES

In compliance with UAC R315-7-21 and the Corrective Measures Implementation (CMI) Plan (Shaw, 2006a), closure at DPG-014 has been completed with the construction of an engineered cover system consisting of a geomembrane-supported geosynthetic clay liner (GCL) placed over the identified waste cell. Approval for the DPG-014 Final Closure Certification Report (CCR) (Shaw, 2007. Appendix A includes a copy of the DPG-014 Closure Certification that will be signed and stamped by a Utah-licensed Professional Engineer following submission of the final CCR.

The final cover system as designed and constructed satisfies the requirements of UAC R315-7-14 and R315-7-21 (by reference 40 CFR §265, Subpart N, §265.310) for the closure and post-closure of DPG-014, namely:

- Providing long-term minimization of liquid migration through the closed landfill;
- Functioning with minimum maintenance;
- Promoting drainage and minimize erosion or abrasion of the cover;
- Accommodating settling and subsidence so that the integrity of the cover is maintained; and
- Achieving a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

In meeting the above performance standards, the major closure activities completed at DPG-014 included:

- Installation of the final engineered cover system; and
- Final grading of the site, including hydroseeding and enhancement of drainage features, to help control erosion and minimize long-term maintenance requirements.

These measures will minimize human contact with the waste and will provide protection of groundwater. An inspection checklist for landfill sites designed to insure that these objectives are maintained is presented in Module VII as Form B.

The investigative and closure activities performed at DPG-014 are described in detail in the Closure Certification Report (Shaw, 2007).

## 2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

Human health and ecological risk assessments for DPG-14 were not required because on the characterization completed during the investigation as summarized below:

- No contamination was identified in the soil outside of the buried waste;
- Surface debris was removed;
- Groundwater analysis indicated that organic constituents were below Environmental Protection Agency (EPA) Preliminary Remediation Goals (PRGs) and inorganic constituents were within natural geochemical variations;
- The absence of groundwater contamination indicates that there has not been a release of leachate from the buried waste; and
- The potential for ecological risk at this site is considered to be minimal.

Elimination of exposure pathways to buried waste and removal of the potentially contaminated surface debris are sufficient to meet the interim status closure requirements. Future use is restricted to continued industrial use outside the burial areas. No intrusive activities will be permitted within the waste cell.

## 2.6 SURFACE WATER AND GROUNDWATER

There are no defined surface water features within or near DPG-014. The general direction of surface water drainage in the area surrounding this unit is to the northwest, toward the main portion of the Great Salt Lake Desert.

Water-level measurements indicate the groundwater in the shallow aquifer beneath DGP-014 is under a low hydraulic gradient, so the flow direction is indeterminate. In the vicinity of DPG-014; however, the regional groundwater flow direction is to the northwest, toward the Great Salt Lake Desert. The shallow groundwater found in DPG-014 is non-potable and brackish.

Although waste was left in place, groundwater and soil sample results do not indicate the need for post-closure groundwater monitoring at DPG-014. Future monitoring of regional groundwater will be implemented through the Downrange 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-014:

1. DPG-014 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population.

2. At DPG-014, 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-014.

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 R3l5-8-2.6(c).

## 4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS

### 4.1 INTRODUCTION

DPG-014 has been closed under the interim status landfill closure requirements. Disturbance of the waste will not be allowed. To ensure that the area is not reused or developed, annual site inspections and a biennial post-closure report shall be required. DPG-014 is no longer receiving waste and there are no structures or other equipment at the site. Although waste was left in place, groundwater and soil sample results do not indicate the need for post-closure groundwater monitoring at DPG-014. 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 Downrange GMA Plan. Removal and reuse of soil from this site will not be allowed.

### 4.2 ROUTINE SITE INSPECTIONS

During its post-closure period, general inspections of the former DPG-014 site shall be conducted annually by November 1st to ensure that the integrity of the engineered caps is maintained and to verify the Dugway Dig Permit process 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. A general site inspection checklist for landfill sites is included in Module VII as Form B. 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:

- No noticeable sliding (slope failure);
- No noticeable damage to the soil covering from burrowing animals;
- No noticeable depressions or ponding water are present;
- No excessive soil erosion is evident on the cap surface or at the cap edges;

- No weeds or trees (with deep taproots) are present that may penetrate the cap;
- 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.

**Protective Soil Layer Inspections**

Maintenance of the protective soil layer is an essential step in ensuring that the integrity of the final cover system is preserved. During each site visit, observations will be made to ensure that the protective soil layer is functioning as designed (i.e., protecting the underlying GCL). Repairs to the protective soil layer may include removal of vegetation species having tap roots greater than 12 inches, regrading through the placement of fill in areas where a potential for ponding water on the cover exists due to settlement, or repair and stabilization of areas that have been eroded.

If signs of soil erosion are excessive (for example, cracks or rills greater than 2 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 system 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. Soil samples will be collected in accordance with Field Work Variance 119350-02-006 (August 6, 2007) and analyzed for salinity as a contingency in case erosion control is necessary in the future.

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.

**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, settlement marker 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 baseline northings, eastings, and elevations of the DPG-014 settlement markers are summarized in Table 3. In addition, the survey coordinates for locations around the perimeter of the cover system shown on Figure 4 are presented for future reference.

**Table 3: Survey Monument Coordinates**

| Description/ Point Location | Northing (ft) | Easting (ft) | Elevation [a] (ft above msl) |
|---|---|---|---|
| SM-014 | 7,199,182 | 1,178,904 | 4317.5 |
| 7000 | 7,199,244 | 1,178,888 | 4316.5 |
| 7001 | 7,199,191 | 1,178,869 | 4316.4 |
| 7002 | 7,199,117 | 1,178,88 | 4316.2 |
| 7003 | 7,199,113 | 1,178,894 | 4316.4 |
| 7004 | 7,199,146 | 1,178,940 | 4316.5 |
| 7005 | 7,199,191 | 1,178,977 | 4316.4 |
| 7006 | 7,199,213 | 1,178,957 | 4316.6 |

[a] *The elevation of the settlement markers are based on the design. The final elevations were recorded with the initial baseline survey and are provided 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-014. Module VII contains an inspection checklist for landfill sites (Form B).

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-014 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-014.

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 6.5 magnitude or higher earthquake centered within 50 miles of the site, qualified personnel will visually inspect the landfill cap for signs of damage as soon as it is safe and practical to do so. Any damage to the landfill cap will be repaired to ensure the integrity of the cap. If the landfill 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 landfill and landfill cap will also be inspected for lateral shifting of debris. Settlement markers will be resurveyed to determine any horizontal or vertical movement of the cap.

### 4.3.2 Floods or Major Storms

DPG-014 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-014, the site was graded so that surface water from precipitation flows away from the capped areas and to the northwest in the direction of the natural drainage flow. Most of the surface water evaporates rather than percolating 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 landfill cap to ensure its integrity within 72 business hours of the event. A checklist is included in Module VII (Form B). 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 landfill 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 landfill cap, the Dugway Fire Department will be notified and the DPG integrated contingency plan will be implemented. In the event of a landfill fire, if the cap is observed to have been breached, other firefighting methods (such as using foam or smothering with dirt) will be considered and used as appropriate. Following the incident, DPG will perform a thorough inspection of the landfill cap using the checklist included in Module VII (Form B) to ensure that the integrity of the soil cover has not been compromised and waste is not exposed. If there is fire damage, DPG will implement corrective actions to ensure that contaminants are contained and human health is protected.

Table 4 summarizes the Post-Closure Inspection Schedule for DPG-014, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate DPG representatives.

**Table 4: DPG-014 Post-Closure Inspection Schedule**

| Inspection/Monitoring Item | Method of Documentation | Frequency of Inspection |
|---|---|---|
| Landfill Caps | General Site Inspection Checklist (Form B of Module VII) | Annual |
| Settlement Markers | General Site Inspection Checklist (Form B of Module VII) | Annual / 5 year intervals |
| Protective vegetation | General Site Inspection Checklist (Form B of Module VII) | Annual |
| Signs | General Site Inspection Checklist (Form B of Module VII) | Annual |

| Inspection/Monitoring Item | Method of Documentation | Frequency of Inspection |
|---|---|---|
| Drainage | General Site Inspection Checklist (Form B of Module VII) | Annual |
| Monitoring Wells | General Site Inspection Checklist (Form B of Module VII) | Annual |

## 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 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 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-014, post closure inspection is required for DPG-014. Groundwater monitoring is not required.

## 5.1 NON-COMPLIANCE REPORTING

The conditions at DPG-014 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(l)(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. Reporting years will be odd-numbered years with the first Post-Closure report for DPG-014 due by March 2007. All subsequent reporting years shall be even-numbered years beginning in 2008. Specifically for DPG-014, 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-014 and reporting for any non-compliance.

**Table 5: Summary Table of Required Submittals**

| Required Submittals | Frequency and Submittal Date |
|---|---|
| Biennial Post-Closure Report | 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. |
| Non-Compliance Reporting | |
| Anticipated Non-Compliance | 30 days advance notice of any change which may result in noncompliance |
| 24-hour Notification for information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment | Orally within 24 hours of discovery |
| 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 | Within 5 days of discovery |
| Written notification for information concerning the non-compliance, which does not endanger human health or the environment. | 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

Barnhard, T.P. and R.L. Dodge, 1988. *Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1º x 2º Quadrangle, Northwestern Utah*, United States Geological Survey.

Hunt, Roy E, 1984. *Geotechnical Engineering Investigation Manual*. New York: McGraw-Hill.

Foster Wheeler Environmental Corporation (FWEC), 1998. *Dugway proving Ground Closure Plan, Module 3, SWMU 14*. August.

Shaw Environmental, Inc. (Shaw), 2007. *Closure Certification Report for HWMU 14, Dugway Proving Ground, Utah*. June.

Shaw, 2006a. *Final Corrective Measures Implementation (CMI) Plan, Firm Fixed-Price Remediation, Landfill Sites, Dugway Proving Ground, Dugway, Utah.* November.

Shaw, 2006b. *Corrective Measures Study (CMS) Report, Firm Fixed-Price Remediation at Landfill Sites, Dugway Proving Ground, Dugway, Utah.* July.

**APPENDIX A**

**COPY OF**
**CERTIFICATION OF CLOSURE**

## CERTIFICATION OF CLOSURE

The Closure Certification Report for Hazardous Waste Management Unit (HWMU) 14 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, except for re-vegetation.

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,

_____
Scott Reed
Directorate of Environmental Programs
Dugway Proving Ground

_____
Sunil Kishnani, P.E.
Utah Registered Civil Engineer No. 6027103
Shaw Environmental, Inc.