

DUGWAY PERMIT

MODULE VII

ATTACHMENT 33

SWMU 118

POST-CLOSURE PLAN

TABLE OF CONTENTS

	Page No.
LIST OF TABLES	ii
LIST OF FIGURES	ii
LIST OF APPENDICES	ii
LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS	iii
1.0 INTRODUCTION	1
2.0 FACILITY DESCRIPTION	3
2.1 DPG-118 LOCATION AND HISTORY	4
2.2 PAST OPERATIONS	4
2.3 PREVIOUS INVESTIGATIONS DOCUMENTATION	4
2.4 CLOSURE ACTIVITIES	4
2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT	5
2.6 SURFACE WATER AND GROUNDWATER	5
2.7 CLOSURE NOTIFICATIONS	5
3.0 SECURITY REQUIREMENTS	6
4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS	6
4.1 INTRODUCTION	6
4.2 SITE INSPECTIONS	6
4.3 INSPECTION FOLLOW-UP	7
5.0 SUBMITTALS/REPORTING	7
5.1 NON-COMPLIANCE REPORTING	7
5.2 BIENNIAL POST-CLOSURE REPORT	7
5.3 REQUIRED SUBMITTALS	8
6.0 POST-CLOSURE CERTIFICATION	8
7.0 REFERENCES	9

LIST OF TABLES

		Page No.
Table 1	Summary of DPG-118 Post-Closure Information Requirements Under 40 CFR §270.14 and UAC R315-3-2.5	1
Table 2	DSHW Library Documents Detailing DPG-118 Investigations	4
Table 3	DPG-118 Post-Closure Inspection Schedule	7
Table 4	Summary Table of Required Submittals	9

LIST OF FIGURES

Figure 1	DPG-118 Site Location
Figure 2	DPG-118 Regional Topography
Figure 3	DPG-118 Post-Removal Topography

APPENDICES

Appendix A	Certification of Closure
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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	below ground surface
CFR	Code of Federal Regulations
DPG	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
DWQ	Division of Water Quality
ft	feet
ft/ft	feet per feet
ft/yr	feet per year
HWMU	Hazardous Waste Management Unit
mg/L	milligrams per liter
NFA	No Further Action
Parsons	Parsons Engineering Science, Inc.
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Shaw	Shaw Environmental, Inc.
SWMU	Solid Waste Management Unit
TDS	Total Dissolved Solids
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
USGS	United States Geological Survey

1.0 INTRODUCTION

The objectives of this Post-Closure Plan (PCP) are to 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) §265.117, with respect to post-closure inspection requirements and 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 Solid Waste Management Unit (SWMU) 118. Post-closure requirements will continue for a minimum of 30 years after closure of SWMU 118. The post-closure care period may be extended or shortened, as deemed necessary (40 CFR §265.117(a)(2)).

Based on the approved Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) there are no uncontrolled sources of contamination (R315-101-2 and 3) present at DPG-118. The nature and extent of potential contamination has been characterized in soil, soil vapor, and groundwater in accordance with R315-101-4 and the site risks have been assessed in accordance with R315-101-5. Surface and subsurface soil qualify for an industrial land-use scenario. Groundwater qualifies for No Further Action (NFA) based on hypothetical residential use. Soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are not expected at DPG-118. Corrective measures for soil and groundwater are not required, and groundwater monitoring is not required at DPG-118. Future site management is based on the characterization in the approved RFI.

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-118, 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-118 Post-Closure Information Requirements
 Under 40 CFR §270.14 and UAC R315-3-2.5**

Regulation Citation	Requirement Description	Location Requirement is Addressed
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)	General Inspection Schedule	Section 4.2 and Module VII

**Table 1: Summary of DPG-118 Post-Closure Information Requirements
Under 40 CFR §270.14 and UAC R315-3-2.5**

Regulation Citation	Requirement Description	Location Requirement is Addressed
UAC R315-3-2.5(b)(5)		(Form A).
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	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
40CFR §270.14(b)(13) UAC R315-3-2.5(b)(13)	Copy of the Closure Proposal	The Draft Final Phase II RFI was issued in June 2004, and approved on September 29, 2005. No public comments were received.
40 CFR §270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Notification	Section 2.7
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 4.0; DPG-118 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-118 is within a military base. There are no nearby operations in the vicinity of DPG-118.
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-118. The closest residential area is English Village (approximately 30 miles away). A wind rose is not deemed necessary for DPG-118.
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 3. DPG-118 is not surrounded by a fence.

**Table 1: Summary of DPG-118 Post-Closure Information Requirements
Under 40 CFR §270.14 and UAC R315-3-2.5**

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and withdrawal wells	Figure 3. There are no monitoring wells present at the site.
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-118.
40 CFR §270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Final Phase II RFI Report, Section 2.2.4. There are no monitoring wells present at the site.
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Final Phase II RFI Report, Section 2.2.1. There are no monitoring wells present at the site.
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Figure 3. There are no monitoring wells present at the site.
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	Final Phase II RFI Report, Section 2.2.4. A mappable plume is not present at DPG-118.
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-118 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-118 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-118 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-118 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-118 is not required.

2.0 FACILITY DESCRIPTION

The following provides a general description of DPG-118, as required by UAC R315-3-2.5(b)(1).

2.1 DPG-118 LOCATION AND HISTORY

DPG-118 occupied 0.4 acres near V-Grid, north of Granite Peak (Figure 1). The site consisted of an above-ground concrete vat measuring 32' x 14' x 14' deep. The vat walls were one foot thick with a sloped soil berm around the entire structure. A wooden stairway on the east berm led from natural grade up to the top of the open vat. A drain line originating in the floor of the vat extended eastward and terminated east of the base of the berm. The site is relatively flat with an average elevation of 4,285 feet (ft) mean sea level (Figure 2).

2.2 PAST OPERATIONS

The site was used during the 1940s and 1950s to test flares, munitions, and possibly chemical agents. Testing continued into the 1960s when the vat was used for hazard classification of chemical munitions.

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-118 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-118 Investigations

Document Title	Received Date	DSHW Library No.
Parsons, 1999. <i>Final Phase I RCRA Facility Investigation (RFI), Investigation Report, Revision 1</i> . September.	09/99	
Parsons, 2004. <i>Draft Final Phase II RCRA Facility Investigation (RFI) Report, SWMU-118 Addendum</i> . June.	06/04	
Shaw, 2007a. <i>Corrective Measures Study (CMS) Reports for Solid Waste Management Units (SWMUs) 19, 23, 25, 115, 118, and 188, Updated CMS Reports for SWMUs 18 and 212, and Closure Plans for Hazardous Waste Management Units (HWMUs) 9 and 9A</i> . Dugway Proving Ground. January.	01/07	
Shaw Environmental, Inc. (Shaw), 2007b. <i>Corrective Measures Implementation Plan, Firm Fixed-Price Remediation at Removal Sites</i> , Dugway Proving Ground, Utah. May.	05/07	
Shaw Environmental, Inc., 2008. <i>Corrective Measures Implementation Report For DPG-118</i> . Dugway Proving Ground. March.	03/08	

2.4 CLOSURE ACTIVITIES

Documentation in the approved RFI Report indicates that conditions at DPG-118 meet the closure performance standards under UAC R315-7-14 (by reference 40 CFR Part 265, Subpart G, §265.111). Groundwater qualifies for NFA. Risks and hazards associated with potential exposure to soil, while not qualifying for NFA, are less than industrial screening levels. Land use controls are required to prevent residential use of the site.

The major closure activities completed at DPG-118 included:

- Removal of the concrete vat and drainline;
- Collection of post removal confirmation samples from surface soil;
- Evaluation of risks to human health based on confirmation sample concentrations and previous soil results; and
- Demonstrating that further degradation of groundwater was unlikely based on the soil-to-groundwater screening analysis.

These measures indicate that no waste is present, only residual concentrations in subsurface soil above the residential preliminary remediation goals. Groundwater monitoring will not be required based on the site characterization in the Corrective Measures Implementation Report.

2.5 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

The results of the Health Risk Assessment performed per UAC R315-101 (DSHW, 2001) indicate that groundwater qualifies for NFA under UAC R315-101 (DSHW, 2001) based on hypothetical residential land use. Subsurface soil does not qualify for NFA; however, cancer risk and noncancer hazard estimated under an industrial land-use scenario indicated that risks and hazards associated with potential exposures are below UAC R315-101 (DSHW, 2001) industrial levels. Soil-to-groundwater analysis indicates that potential future impacts to groundwater from soil are not expected at DPG-118.

The results of the Ecological Risk Assessment conducted in two sequential assessment tiers (Tier 1 and Tier 2) indicated that concentrations of inorganic Chemicals of Potential Concern were not expected to pose unacceptable hazards to small mammal or bird populations that may utilize DPG-118 during some of their foraging activities. Additional remedial strategies, therefore, do not need to be considered to ensure protection of ecological resources.

2.6 SURFACE WATER AND GROUNDWATER

The area around DPG-118 is relatively flat with no defined surface water features within or near the site (Figure 2). The general direction of surface water drainage in the area surrounding this unit is to the northwest, toward the Great Salt Lake Desert.

Four monitoring wells were installed during the investigation. The average water quality from the shallow wells is Class IV (saline) per Utah Administrative Code (UAC) R317-6-3 (Division of Water Quality, 2002) with total dissolved solids values in the 30,100 to 36,100 milligrams per liter (mg/L). Water levels from these monitoring wells indicate local groundwater flow is toward the northwest. The four wells were abandoned during the removal action in 2007 (Shaw, 2008). The Downrange GMA does not require groundwater sampling or water level measurement at this site (Parsons, 2007).

2.7 CLOSURE NOTIFICATIONS

The certificate of closure (Appendix A) was verified by the Executive Secretary of the Utah Solid and Hazardous Waste Board on February 24, 2009.

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-118:

1. DPG-118 is located within a federal, military installation (DPG). As such, the installation is restricted for the common population; and
2. Dugway's excavation permit process shall prevent unintended human health exposures to subsurface contamination.

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 cell phone and a First Aid kit available during inspections.

4.0 POST-CLOSURE OPERATIONS AND INSPECTIONS

4.1 INTRODUCTION

DPG-118 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. Removal and reuse of soil from this site will not be allowed unless under an excavation permit approved by the Dugway Environmental Program Office (EPO). Soil excavation at this site must be coordinated through the Dugway EPO and follow the Dugway Dig Permit Process (Module VII.I).

4.2 SITE INSPECTIONS

During its Post-Closure period, general inspections of the former DPG-118 site shall be conducted annually by November 1st to ensure that the former site remains under industrial use and that 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 a complete walkthrough and visual inspection of the site. Inspection forms for industrial use sites are provided in Module VII (Form A). 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:

1. There is no evidence of land use other than for industrial purposes within the former site boundary;
2. There is no evidence of soil disturbance; and
3. Drainage patterns and roads are functioning as planned with no significant erosion or ponding.

Table 3 summarizes the Post-Closure Inspection Schedule for DPG-118, 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-118 Post-Closure Inspection Schedule

Inspection/ Monitoring Item	Method of Documentation	Frequency of Inspection
Land Use	Industrial Use Site Inspection Form (Module VII, Form A)	Annual inspections shall be conducted before <u>November 1st</u> , of each year.
Soil Disturbance	Industrial Use Site Inspection Form (Module VII, Form A)	Annual inspections shall be conducted before <u>November 1st</u> , of each year.
Drainage/Roads	Industrial Use Site Inspection Form (Module VII, Form A)	Annual inspections shall be conducted before <u>November 1st</u> , of each year.

4.3 INSPECTION FOLLOW-UP

Copies of completed site inspection checklists 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 Corrective Measures Implementation Report for DPG-118 (Shaw, 2008), post-closure inspection is required. Groundwater monitoring for DPG-118 is not required.

5.1 NON-COMPLIANCE REPORTING

The conditions at DPG-118 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-118 shall be due no later

than March 1, 2010. Specifically for DPG-118, 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-118 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 2010, 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

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

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

Parsons Engineering Science, Inc. (Parsons), 1999. *Final Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation, Investigation Report, Revision 1.* September.

Parsons, 2004. *Draft Final Phase II RCRA Facility Investigation (RFI) Report, SWMU-118 Addendum.* June.

Parsons, 2007 – *Final Hydrogeological Assessment and Regional Groundwater Management Plan, Volume III Downrange Groundwater Management Area, Salt Lake City, Utah.* June.

Shaw Environmental, Inc. (Shaw), 2007a. *Corrective Measures Study (CMS) Reports for Solid Waste Management Units (SWMUs) 19, 23, 25, 115, 118, and 188, Updated CMS Reports for SWMUs 18 and 212, and Closure Plans for Hazardous Waste Management Units (HWMUs) 9 and 9A.* Dugway Proving Ground, Utah. January.

Shaw, 2007b. *Corrective Measures Implementation Plan, Firm Fixed-Price Remediation at Removal Sites,* Dugway Proving Ground, Utah. May.

Shaw, 2008. *Corrective Measures Implementation Report for DPG-118.* Dugway Proving Ground, Utah. March.

APPENDIX A
COPY OF
CERTIFICATION OF CLOSURE

CERTIFICATION OF CLOSURE

The Closure Certification Report for DPG-118 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the DPG Part B RCRA Permit and the CMI Plan for Removals. The requirements of UAC R315-101 form the basis for the risk-based criteria in the closure of DPG-118. The site has been managed in accordance with the specifications in the approved CMI Plan.

In accordance with the DPG Part B RCRA Permit, the signature and seal certify that a licensed professional has reviewed the Corrective Measures Implementation Report in accordance with the above referenced regulatory requirements.

Respectfully submitted,

Scott Reed
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Dugway Proving Ground

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