DUGWAY PERMIT

MODULE VII

ATTACHMENT 6

HWMU 128
POST-CLOSURE PLAN

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

bgs	Below Ground Surface
CFR	Code of Federal Regulations
cm	Centimeters
DAF	Dilution Attenuation Factor
Dugway	Dugway Proving Ground
DSHW	Division of Solid and Hazardous Waste
ft	Feet
FWEC	Foster Wheeler Environmental Corporation
HWMU	Hazardous Waste Management Unit
IDW	Investigation-Derived Waste
MCL	Maximum Contaminant Level
µhos/cm	Micromhos per centimeter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
msl	Mean Sea Level
PAH	Polynuclear Aromatic Hydrocarbon
PCP	Post-Closure Plan
PES	Parsons Engineering Science
POL	Petroleum, Oil, and Lubricants
Shaw	Shaw Environmental, Inc.
SWMU	Solid Waste Management Unit
TDS	Total Dissolved Solids
TERC	Total Environmental Restoration Contract
TSDF	Treatment, Storage, and Disposal Facility
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality
UDSHW	Utah Division of Solid and Hazardous Waste
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

1.0. INTRODUCTION

The objectives of this Post-Closure Plan (PCP) are to ensure that Dugway Proving Ground (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 tracking and inspections to ensure industrial site use. To meet these objectives, this PCP provides detailed information regarding the location, regulatory criteria, and post-closure inspections at Hazardous Waste Management Unit (HWMU) 128. Post-closure requirements will continue for a minimum of 30 years after closure of HWMU 128. 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 permit is required to include specific information for a closed facility. As applicable to HWMU 128, the information requirements include:

1. General description of the facility,
2. Description of security procedures,
3. Copy of general inspection schedule,
4. Preparedness and Prevention Plan,
5. Facility location information (including seismic and flood plain considerations),
6. Closure Plan or Closure Proposal,
7. Certificate of Closure, and
8. Topographic map, with specific scale.

Table 1-1 provides the regulatory citations for the general information requirements and the specific locations in the Attachments or in the PCP where the specific information is presented.

Table 1-1: Summary of HWMU 128 Post-Closure Information Requirements Under 40 CFR §270.14 and UAC R315-3-2.19 and R315-3.2.5 (Page 1 of 2):

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	Post-Closure Permit, Attachment 1
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 7.0, Module VII Table VII-3, and Module VII Form A
40 CFR §270.14(b)(6) UAC R315-3-2.5(b)(6)	Preparedness and Prevention	Section 4.0
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 5.0
40 CFR §§270.14(b)(11) (iii-v) UAC R315-3-2.5(b)(11) (iii-v)	Facility Location Information 100-year floodplain	Section 6.0
40 CFR §270.14(b)(14) UAC R315-3-2.5(b)(14)	Closure Certification and Notification	Appendix B
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 (1 inch = 1000 feet) and Figure 2-3; (1 inch = 60 feet)
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ii)	Topographic Map 100-year floodplain area	HWMU 128 is not located within a verified 100-year floodplain area Figure 2-2.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iii)	Topographic Map Surface waters including intermittent streams	There are no surface waters or intermittent streams within the HWMU 128 area Figure 2-2 Figure 2-3
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (iv)	Topographic Map Surrounding land uses	HWMU 128 is within a military base. There are no nearby residents in the vicinity of HWMU 128. Figure 2-3
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)	The closest residential area is English Village (approximately 1,600 feet away). A wind rose is not deemed necessary for HWMU 128.
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (vi)	Topographic Map Orientation of Map, North Arrow	Figure 2-2 and 2-3.

Table 1-1 (Continued-Page 2 of 2): Summary of HWMU 128 Post-Closure Information Requirements Under 40 CFR 270.14 and UAC R315-3-2.19 and R315-3.2.5.

Regulation Citation	Requirement Description	Location Requirement is Addressed
40 CFR §270.14(b)(19) UAC R315-3-5(b)(19) (vii)	Topographic Map Legal boundaries of the hazardous waste management facility.	The site is shown in Figure 2-2
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (viii)	Topographic Map Access control, fence, gates	The fenced area and access gates are shown in, Figure 2-3
40 CFR §270.14(b)(19) UAC R315-3-2.5(b)(19) (ix)	Topographic Map Injection and withdrawal wells	The nearest groundwater supply well (WW18) is approximately 2,600 feet northeast of HWMU 128. There are no injection wells in the vicinity of HWMU 128.
40 CFR §270.14(b)(19) UAC R315-3--2.5(b)(19) (xi)	Topographic Map Barriers for drainage or flood control	Figure 2-2.
40 CFR §270.14(c) UAC R315-3-2.5(c)(1)	Groundwater Monitoring Information Summary of Groundwater Data	Groundwater monitoring has been conducted once, in 1995. Results from 1995 are as follows: 1. All inorganic analytes are below regulatory standards. 2. Only one organic analyte (chloromethane) was detected in one well (128MW02) at a concentration of 5.2 µg/L. There are no regulatory standards for this analyte. Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
40 CFR §270.14(c) UAC R315-3-2.5(c)(2)	Groundwater Monitoring Information Identification of uppermost aquifer	Post-Closure Permit 2.0 HWMU 128 Final Closure Report. Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
40 CFR §270.14(c) UAC R315-3-2.5(c)(3)	Groundwater Monitoring Information Delineation of the Waste Management Area	Figures 2-2 and 2-5. Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
40 CFR §270.14(c) UAC R315-3-2.5(c)(4)	Groundwater Monitoring Information Extent of Plume	There is no groundwater plume in the vicinity of HWMU 128. Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
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 HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).

40 CFR §270.14(c) UAC R316-3-2.5(c)(6)(i)	Groundwater Monitoring Information Proposed List of Parameters	Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
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 HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
40 CFR §270.14(c) UAC R315-3-2.5(c)(6)(iii)	Groundwater Monitoring Information Background Values	Post-closure groundwater monitoring at HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).
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 HWMU 128 will be in compliance with the English Village Groundwater Management Plan (PES, 2007).

2.0. HWMU 128 DESCRIPTION

The following provides a general description of HWMU 128, also known as the Pesticide Storage Building, Septic Tank and Drainfield at Dugway. A general description of the Dugway installation can be found in Attachment 7-1.

2.1. Location and History

HWMU 128 consists of a 1,000-gallon septic tank and drainfield associated with the pesticide storage and preparation area at Building 5658. It is located on the southwestern margin of English Village, south of Stark Road, and west of Manookin Road. Figure 2-1 shows the location of HWMU 128 within Dugway and Figure 2-2 is a topographic map showing the location of HWMU 128 adjacent to English Village. The septic system will remain active following closure of HWMU 128. HWMU 128 is located between the Sewage Treatment Plant (SWMUs 44 and 68) and the aboveground Petroleum, Oil, and Lubricants (POL) Tanks (SWMU 69). Photographs of the site are presented in the Final Closure Report (Shaw, 2004).

Building 5658 is used for storage and preparation of insecticides, herbicides, and rodenticides. A 6-foot (ft) high fence encloses the pesticide storage area at Building 5658. Warning signs are posted on the perimeter. The area enclosed by the fence is approximately 90 ft by 120 ft and is paved with asphalt. The asphalt pad is sloped to drain away from the building in all directions. A 500-gallon underground storage tank (UST) used to store fuel/heating oil is located on the north side of the building. Attached to the west side of the building there are a small shed and a small cabinet. The shed is labeled "flammable" and the storage cabinet is labeled "acid." On the south side of the building is the equipment filling and wash area, which consists of a wash pad with a 4.5-inch high berm. There is a drain in the center of the pad that is connected to the HWMU 128 septic tank. The drain is reportedly sealed when vehicles and equipment are sprayed down. This operating procedure was instituted to prevent hazardous materials from entering the drains and migrating to the septic tank and drain field.

The field measurements taken during Mobilization 3 indicated that the bottom of the septic tank is nine ft below ground surface (bgs). The septic tank is located west of Building 5658, seven ft beyond the asphalt pad and fence. The top of the septic tank is below grade and is accessible through an 18-inch diameter pipe covered at the surface with a removable concrete plug. According to engineering drawings (Dugway, 1987), the drain in the pad and all plumbing inside Building 5658 are connected to the septic

tank. As-built drawings of the septic system show that the septic tank is connected to the drain field by an 18-foot long, 4-inch diameter polyvinylchloride (PVC) pipe. The outside dimensions of the septic tank are shown to be 5 ft by 5 ft. The drain field contains a rectangular loop of perforated 4-inch PVC drainpipe that is 27 ft long and 10.5 ft wide. The perforated pipe is buried 4.3 ft bgs in a ditch that is three ft wide, giving the drain field a total width of 13.5 ft and length of 30 ft.

2.2. Past Operation

HWMU 128 is associated with Dugway's principal pesticide storage and preparation area at Building 5658 and has been in use since the late 1980's. According to Dugway public works personnel, the original plan of operation for HWMU 128 was to discharge sanitary wastewater from Building 5658 to the English Village sanitary sewer system ditch east of Manookin Road. However, according to J. Anderson (Dugway Public Works) it was later decided to discharge the wastewater to the septic tank and drainfield on the west side of the building (FWEC, 1999). Figure 2-3 is a detailed plot plan showing the septic tank, drainfield, and nearby features.

Insecticides previously used at Dugway included chlordane, diazinon, malathion, baygon, and pyrethrum. Herbicides included 2,4-D, Atratol 8P (atrazine, sodium chlorate, sodium melaborate), Hyvar-X (bromacil), and Tordon 212 (picloram). Additional materials handled at the site may have also included insecticide-neutralizing agents and decontamination solutions.

Spent chlordane and chlordane-contaminated materials are classified as hazardous wastes by the State of Utah (UAC R315-2 [UAC, 2001b]). Because HWMU 128 is in direct connection with the pesticide facility, it is possible that all of these wastes may have been present at one time or another.

HWMU 128 was one of the 27 sites listed at Dugway under the Utah Department of Environmental Quality – Division of Solid and Hazardous Waste (UDEQ-DSHW) Stipulation and Consent Order No. 8909884 (dated September 19, 1990). This Consent Order directed Dugway to determine whether hazardous waste management occurred at these sites. This Stipulation and Consent Order was amended in December 22, 1993 and identified HWMU 128 among the sites to be closed. With the investigative and closure actions performed at this site, all stipulations of the Consent Order have been satisfied for HWMU 128.

2.3. Previous Investigations Documentation

The detailed results of previous material, soil, and groundwater sampling, and closure information including the risk assessment are available, for HWMU 128, in the Utah DSHW (UDSHW) public documents listed in Table 2-1.

Table 2-1: Pertinent UDSHW Library Documents Detailing HWMU 128 Investigations.

Document Title	Received Date	UDSHW Library No.
United States Army Corps of Engineers, 1996. Dugway Proving Ground Closure Plan, Module 3, Volume 2,SWMU 51,55,58,59,63-1,63-2,90,99,124128,,130,158 and 162,163,165,167,168,169 and 190.	9/27/1996	DPG 00029

Final Interim Response Action Plan for HWMUs 51, 58, 63-1, and 128, Waste Characterization and Removal Activities, Dugway Proving Ground, Dugway, Utah. (IT, 2000a);	5/12/2000	DPG 00173
Final Work Plan & Sampling and Analysis Plan for HWMU 128 Pesticide Storage Building, Septic Tank, and Drainfield Investigation, Dugway Proving Ground, Dugway, Utah, Revision 0 (IT, 2000b)	12/20/2000	DPG 00197
Final Closure Report HWMU 128 Pesticide Storage Building, Septic Tank and Drainfield Investigation (Closure Report), Dugway Proving Ground, Dugway, Utah (Shaw, 2004);	9/3/2004	DPG 00369

2.4. Closure Activities

The detailed results of previous material, soil, and groundwater sampling at HWMU 128 are included in the Final Closure Report. The reader is referred to these documents for detailed information.

Utah has specific regulations governing the closure and post-closure requirements for interim status/non-notifier hazardous waste treatment, storage and disposal facilities (TSDFs) (UAC R315-7-14; 40 CFR §265.111 by reference). Based on the work performed at HWMU 128 and the risk evaluations presented in the Final Closure Report, the requirements specified under 40 CFR §265, subpart G and a Consent Order have been achieved.

The Certification of Closure (Appendix A) certifies that HWMU 128 meets the closure performance standards under UAC R315-7-14 and 40 CFR §265.111 (subpart G) adopted by reference, as follows: (1) minimizes the need for further maintenance, (2) controls, minimizes or eliminates, to extent necessary to protect human health and environment, post closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere, and (3) complies with closure requirements of this subpart and other applicable requirements.

HWMU 128 has been closed in a manner that will no longer require any post-closure maintenance, including removal of waste. The septic tank contents have been removed and the septic tank has been decontaminated. The site was closed based on continued industrial use. The human and ecological risk assessments are also presented in the Final Remedial Action Closure Report.

The closure of HWMU 128 has been completed. Approval for the HWMU 128 Final Closure Report (Shaw, 2004) was received in a letter dated June 16, 2004, from the Utah Solid and Hazardous Waste Control Board. Appendix A includes a copy of the HWMU 128 Closure Certification signed and stamped by a Utah-licensed Professional Engineer. The original signed Closure Certification is on file at UDEQ-DSHW. With the investigative and closure actions performed at this site, all stipulations of the Consent Order No. 8909884 have been satisfied for HWMU 128.

2.5. Human Health and Ecological Risk Assessment

A human health risk assessment and ecological risk assessment have been conducted indicating the remaining residual contamination does not pose an unacceptable risk as defined in UAC R315-101.

Based on the results of the human health risk assessment, HYMU 128 was closed based on continued industrial use.

HWMU 128 did not qualify for risk-based residential closure due to the presence of arsenic, polynuclear aromatic hydrocarbons (PAHs) and chlorinated pesticides in site soils in the vicinity of the septic tank and drainline.

Human health and ecological risk screening evaluations results indicate that there is no unacceptable risk posed at the site. The cancer risk is less than 1E-04 and the Hazard Index is less than one. Since the waste has been removed, there is no potential for escape of hazardous waste, leachate, or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere.

The human and ecological risk assessments are presented in the. *Final Closure Report HWMU 128 Pesticide Storage Building, Septic Tank and Drainfield Investigation, Shaw Environmental, Inc., 2004.*

2.6. Surface Water and Groundwater

The only surface water feature present in the vicinity of HWMU 128 is an abandoned sewage effluent ditch northeast of the site (Figure 2-2). A portion of the Camels Back Ridge North East Quadrangle (U.S. Geological Survey [USGS], 1993a) topographic map and a portion of the Davis Knolls Quadrangle (USGS, 1993b) topographic map have been combined to produce Figure 2-2. The nearest natural surface water body is the northern branch of Government Creek, an ephemeral stream which drains from the Simpson and Sheeprock mountains (southeast of Dugway) towards the Great Salt Lake Desert to the northwest.

Three groundwater-monitoring wells were installed at HWMU 128 in 1995 (Figure 2-3). Groundwater is addressed under the English Village GMA.

2.7. Closure Notifications

Federal facilities are exempt from submitting notifications to the local zoning authority as required by 40 CFR §§264.116 and 264.119, which are incorporated by reference in UAC R315-8-7. Dugway's Post-Closure Management Plan (PCMP) shall be used to monitor land use as required under this Permit in Module 1, Condition I.M.4.

3.0. SECURITY REQUIREMENTS

The Permittee shall comply with the following security conditions as applicable to HWMU 128:

1. HWMU 128 is located within a federal, military installation (Dugway). As such, the installation is restricted for the common population.

2. Specifically, at HWMU 128, a fence is present around Building 5658 but not around the septic system.

3. Signs shall be posted on the fence, warning against unauthorized entry,

4. And a warning sign shall be posted near the HWMU 128 drainfield.

5. Verify security facilities are maintained and shall be inspected throughout the post-closure care period. The security facilities (i.e., posted signs) to be inspected and the frequency of inspection are listed on the inspection Table 7-1**.** Dugway shall report to the DSHW any decrease of Dugway's Base Security, which could affect the security conditions as applicable to HWMU 128.

6. 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 UAC R315-8-2.6(c).

4.0. PREPAREDNESS AND PREVENTION MEASURES

All wastes have been removed from HWMU 128. The Dugway Emergency Response and Contingency Plan (Part B Permit), where applicable to this site, shall be used to announce and respond to emergency conditions.

At a minimum, the site inspector should have a radio or phone and a First Aid kit available during inspections.

5.0. SEISMIC STANDARD

HWMU 128 is not located within 200 feet of active faults, which have displacement in Holocene time. Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east along the Wasatch Range Foothills. The U.S. Geological Survey has conducted a study ([U.S. Geological Survey (USGS), 1988]. Map of Fault Scarps Formed on Unconsolidated Sediments, Tooele 1°x2° Quadrangle, Northwestern Utah. Compiled by T.P. Bamhard and R. L. Dodge) to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps in the Tooele 1°x2° Quadrangle in northwestern Utah. The conclusions of the study state that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the later Pleistocene era with no clear evidence of Holocene surface faulting. Several faults inferred on geophysical evidence are located at Dugway; however, there is no evidence of displacement during Holocene time. No hazardous wastes remain at HWMU 128; therefore, even if an earthquake were to occur, no hazardous wastes would be released.

6.0. FLOODPLAIN STANDARD

HWMU 128 is not located within a 100-year verified floodplain. A National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, has not been prepared for Dugway. These are no permanent streams or other surface water bodies on Dugway. Surface water from precipitation flows through well-established drainage channels into the flat plain and evaporates. Like other arid regions, Dugway 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 Ditto Technical Center. No hazardous wastes remain at HWMU 128; therefore, even if a flood were to occur, no hazardous wastes would be released.

7.0. POST-CLOSURE INSPECTIONS

7.1. Introduction

HWMU 128 has been closed under a continued industrial use scenario, which prohibits residential use in the areas formerly occupied by the site. To ensure that the area is not reused or developed for residential purposes, annual site inspections and a biannual report shall be required.

7.2. Annual Inspections

General site inspections of the former HWMU 128 site shall be conducted annually before November 1st, to ensure that the former Pesticide Storage Building, Septic Tank and Drainfield area remains under industrial use and to verify the Dugway Dig Permit process as described in Module VII.I has been followed. The frequency of inspections can be modified in accordance with UAC R315-3-4.3. The general post-closure site inspection checklist for industrial use sites should be used and is included in Module VII as Form A. Completed inspection forms shall be filed with the Dugway Environmental Office. 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. That Security Controls are still in place and active at HWMU 128.

Table 7-1, summarizes the Post-Closure Inspection Schedule for HWMU 128, and lists the items to be inspected and potential problems. Inspection personnel shall note any problems found and shall inform appropriate Dugway representatives.

Table 7-1: HWMU 128 Post-Closure Inspection and Monitoring Schedule.

Inspection/Monitoring Item	Method of Documentation	Frequency of Inspection
1) Land use for industrial purposes only. 2) That signs security controls are still in place and active.	General Post-Closure Site Inspection Checklist for Industrial Sites (Form A, Module VII)	Annual inspections shall be conducted no later than November 1st, of each year.

7.3. Inspection Follow-up

Copies of completed site inspection checklists (Form A of Module VII) 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 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.

8.0. SUBMITTALS/REPORTING

8.1. Post-Closure Groundwater Monitoring

Based on the evaluation presented in the Final Closure Report, one round of groundwater monitoring is required for HWMU 128 to verify the results of the 1995 monitoring. The groundwater monitoring will be conducted under the guidance of the English Village Groundwater Management Plan (PES, 2007).

8.2. Non-Compliance Reporting

The conditions at HWMU 128 are such that the impact to human health and the environment is very unlikely. All wastes have been removed from the site. Hazardous wastes are no longer managed or maintained 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.

8.3. Biennial Post-Closure Report

In accordance with UAC R315-3-3.1(l)((9), a Biennial Post-Closure Report shall be prepared for all of Dugway's HWMUs and SWMUs undergoing post-closure care. Post Closure Reports shall be submitted to DSHW no later then March 1st, of the following year, that the report is due. The first Post-Closure reporting year is 2006 for HWMU 128 (Table 8-1). The report shall be submitted no later than March 1st of 2007. After this initial period, reporting years shall change to odd numbered years, with subsequent biennial reports due by March 1st of even numbered years, beginning in 2008. Specifically for HWMU 128, the Biennial Post-Closure Report shall include, at a minimum, the following:

1. General site description and conditions, and
2. Inspection records.

Table 8-1: 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 1st, of the following year that the report is due. Reporting years are even numbered years beginning with 2006 and odd numbered years beginning 2007 for the duration of the Post-Closure Monitoring Period.
Anticipated Non-Compliance (VII.C.5.).	30 days advance notice of any change, which may result in non-compliance.
24-hour Notification on information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment ((VII.C.5.).	Orally within 24 hours of discovery noncompliance
Five-day written notification on information concerning the non-compliance, which may endanger public drinking water supplies or human health or the environment. The Executive Secretary may waive the 5-day notice, in favor of a 15-day (VII.C.5.).	Within 5 days of discovery
Written notification on information concerning the non-compliance, which does not endanger human health or the environment (VII.C.5.).	Submitted with the Biannual Post Closure Report are submitted.

9.0. POST-CLOSURE CERTIFICATION

No later than 60 days after post-closure activities are completed and approved by the Executive Secretary, Dugway 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.

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
Carbamate Pesticides by EPA Method 8318				
Propoxur	X	10		
Carbamate Pesticides by EPA Method 8321A				
Bromacil	X	10		
Chlorinated Herbicides by EPA Method 8151A				
2,4,5-T		0.5		
2,4,5-TP (Silvex)	X	0.5	50	1000
2,4-D	X	0.5	70	10000
2,4-DB		1		
Dalapon		0.5	200	
Dicamba		0.5		
Dichloroprop		1		
Dinoseb	X	0.7	7	
MCPA		500		
MCPP		500		
Pentachlorophenol	X	0.5	1	100000
Picloram		1	500	
Mercury by CVAA by EPA Method 7470A				
Mercury	X	0.2	2	200
Metals by ICP by EPA Method 6010B/6020				
Aluminum		200		
Antimony	X	6	6	
Arsenic	X	10	10	5000
Barium	X	5	2000	100000
Beryllium		4	4	
Cadmium		5	5	1000
Calcium		200		
(1) Chromium		10	100	5000
Cobalt		4		
Copper		10	1300	
Iron		100		
(2) Lead	X	10	15	5000
Magnesium		200		
Manganese		5		
Molybdenum		10		
Nickel	X	20		
Potassium		2000		
Selenium	X	10	50	1000
Silver	X	5		5000
Sodium		2000		
Thallium	X	5	2	
Vanadium	X	5		
Zinc	X	10		

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

	Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
Organochlorine Pesticides by EPA Method 8081A					
	4,4'-DDD		0.1		
	4,4'-DDE		0.1		
	4,4'-DDT	X	0.1		
	Aldrin		0.05		
	alpha-BHC		0.05		
(3)	alpha-Chlordane		0.05	2	
	beta-BHC	X	0.05		
	delta-BHC		0.05		
	Dieldrin		0.1		
	Endosulfan I		0.05		
	Endosulfan II		0.1		
	Endosulfan sulfate		0.1		
	Endrin	X	0.1	2	20
(4)	Endrin aldehyde		0.1	2	
(5)	Endrin ketone		0.1	2	
	gamma-BHC (Lindane)		0.05	0.2	400
(6)	gamma-Chlordane		0.05	2	
	Heptachlor	X	0.05	0.4	8
	Heptachlor epoxide		0.05	0.2	8
	Hexachlorobenzene		0.05	1	100
	Methoxychlor	X	0.5	40	10000
	Toxaphene	X	3	3	500
Organophosphorus Pesticides by EPA Method 8141A					
	Bolstar		1		
	Chlorpyrifos		3		
	Coumaphos		15		
	Demeton-O		2		
	Demeton-S		2		
	Diazinon	X	6		
	Dichlorvos	X	10		
	Disulfoton		2		
	Ethoprop		2		
	Ethylparathion	X	1		
	Famphur	X	1		
	Fensulfothion		15		
	Fenthion		1		
	Malathion	X	1		
	Merphos		2		
	Methylazinphos		15		
	Methylparathion	X	1		
	Mevinphos		3		
	Naled		1		

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
Organophosphorus Pesticides by EPA Method 8141A				
Phorate		1		
Ronnel		3		
Stirophos		50		
Tokuthion		5		
Trichloronate		1		
Semivolatile Organic Compounds by EPA Method 8270C				
1,2,4,5-Tetrachlorobenzene		10		
1,2,4-Trichlorobenzene		10	70	
1,2-Dichlorobenzene		10	600	
1,3-Dichlorobenzene		10		
1,4-Dichlorobenzene	X	10	75	7500
2,3,4,6-Tetrachlorophenol		10		
2,4,5-Trichlorophenol		10		400000
2,4,6-Trichlorophenol		10		2000
2,4-Dichlorophenol		10		
2,4-Dimethylphenol		10		
2,4-Dinitrophenol		50		
2,4-Dinitrotoluene		10		100
2,6-Dimethylphenol		10		
2,6-Dinitrotoluene		10		
2-Chloronaphthalene		10		
2-Chlorophenol	X	10		
2-Methylnaphthalene		10		
2-Methylphenol	X	10		200000
2-Nitroaniline		50		
2-Nitrophenol		10		
3,3'-Dichlorobenzidine		20		
3,4-Dimethylphenol		10		
3-Methylphenol		10		
3-Nitroaniline		50		
4,6-Dinitro-2-methylphenol		50		
4-Bromophenyl phenyl ether		10		
4-Chloro-3-methylphenol	X	10		
4-Chloroaniline		20		
4-Chlorophenyl phenyl ether		10		
4-Methylphenol		10		200000
4-Nitroaniline		50		
4-Nitrophenol		50		
Acenaphthene		10		
Acenaphthylene		10		
Anthracene		10		
Benzo[a]anthracene		10		

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
Semivolatile Organic Compounds by EPA Method 8270C				
Benzo[a]pyrene		10	0.2	
Benzo[b]fluoranthene	X	10		
Benzo[g,h,i]perylene		10		
Benzo[k]fluoranthene	X	10		
Benzoic acid		50		
Benzyl alcohol		50		
Butylbenzylphthalate		10		
Bis(2-chloroethoxy)methane		10		
Bis(2-chloroethyl)ether		10		
Bis(2-chloroisopropyl)ether		10		
Bis(2-ethylhexyl)phthalate		10	6	
Carbazole		10		
Chrysene		10		
Di-n-butylphthalate		10		
Di-n-octyl phthalate		10		
Dibenzo(a,h)anthracene	X	10		
Dibenzofuran		10		
Diethylphthalate		10		
Dimethyl phthalate		10		
Fluoroanthene		10		
Fluorene		10		
Hexachlorobenzene		10	1	100
Hexachlorobutadiene		10		500
Hexachlorocyclopentadiene	X	50	50	
Hexachloroethane		10		3000
Indeno(1,2,3-cd)pyrene	X	10		
Isophorone		10		
N-Nitroso-di-n-butylamine		10		
N-Nitroso-di-n-propylamine	X	10		
N-Nitrosodiethanolamine		10		
N-Nitrosodiethylamine		10		
N-Nitrosodimethylamine		10		
N-Nitrosodiphenylamine		50		
N-Nitrosomethylethylamine		10		
N-Nitrosopyrrolidine		10		
Naphthalene		10		
Nitrobenzene		10		2000
Pentachlorobenzene		50		
Pentachloronitrobenzene		50		
Phenanthrene		10		
Phenol		10		
Pyrene	X	10		

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

	Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
	Semivolatile Organic Compounds by EPA Method 8270C				
	Pyridine		20		5000
	Volatile Organic Compounds by EPA Method 8260B				
	1,1,1,2-Tetrachloroethane		1		
	1,1,1-Trichloroethane		0.5	200	
	1,1,2,2-Tetrachloroethane		0.5		
	1,1,2-Trichloro-1,2,2-trifluoroethane		1		
	1,1,2-Trichloroethane		0.5	5	
	1,1-Dichloroethane		0.5		
	1,1-Dichloroethene	X	0.5	7	700
	1,1-Dichloropropene		1		
	1,2,3-Trichlorobenzene		1		
	1,2,3-Trichloropropane		1		
	1,2,4-Trichlorobenzene		1	70	
	1,2,4-Trimethylbenzene		1		
	1,2-Dibromo-3-chloropropane		1	0.2	
	1,2-Dibromoethane		1	0.05	
	1,2-Dichlorobenzene		1	600	
	1,2-Dichloroethane		0.5	5	500
	1,2-Dichloropropane		0.5	5	
	1,3,5-Trimethylbenzene		1		
	1,3-Dichlorobenzene		1		
	1,3-Dichloropropane		1		
	1,4-Dichlorobenzene	X	1	75	7500
	2,2-Dichloropropane		1		
	2-Chloroethyl vinyl ether		20		
	2-Chlorotoluene		1		
	2-Hexanone		5		
	4-Chlorotoluene		1		
(7)	Acetone		10		
(8)	Benzene	X	0.5	5	500
	Bromobenzene		1		
	Bromochloromethane		1		
	Bromodichloromethane		0.5	100	
	Bromoform		0.5	100	
	Bromomethane		0.5		
	Carbon disulfide		1		
	Carbon tetrachloride		0.5	5	500
	Chlorobenzene	X	0.5	100	100000
	Chloroethane		0.5		
(9)	Chloroform	X	0.5	100	6000

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

	Parameter	*Control Analyte*	*PQL (ug/L)*	*Utah MCL (ug/L)*	*RCRA limits (ug/L)*
Volatile Organic Compounds by EPA Method 8260B					
	Chloromethane		1		
	cis-1,2-Dichloroethene		0.5	70	
	cis-1,3-Dichloropropene		0.5		
	Dibromochloromethane		0.5	100	
	Dibromomethane		1		
	Dichlorodifluoromethane		1		
(10)	Ethylbenzene		0.5	700	
	Hexachlorobutadiene		1		500
	Isopropylbenzene		1		
(11)	m,p-Xylene		0.5	10000	
	2-Butanone		20		200000
	4-Methyl-2-pentanone		20		
	Methyl tert-butyl ether		1		
	Methylene chloride		5	5	
	n-Butylbenzene		1		
	n-Propylbenzene		1		
(12)	o-Xylene		0.5	10000	
	p-Isopropyltoluene		1		
	sec-Butylbenzene		1		
	Styrene		0.5	100	
	tert-Butylbenzene		1		
	Tetrachloroethene		1	5	700
	Toluene	X	0.5	1000	
	trans-1,2-Dichloroethene		0.5	100	
	trans-1,3-Dichloropropene		0.5		
	Trichloroethene	X	0.5	5	500
	Trichlorofluoromethane (Freon 11)		1		
	Vinyl acetate		5		
	Vinyl chloride		0.5	2	200

Table 8-2: Aqueous Target Analytes, Practical Quantitation Limits, and Regulatory Limits
HWMU 128 Post-Closure Sampling; Dugway Proving Ground, Dugway, Utah

Circled PQLs are greater than the Utah MCL.

---	not available
PQL	Practical Quantitation Limit
ug/L	micrograms per Liter

(1) The tap water PRG for Chromium VI is used.

(2) Tap Water PRG is not available for lead. The State of Utah drinking water action level is used.

(3) MCL for Chlordane is used as a surrogate for alpha-Chlordane.

(4) MCL for Endrin is used as a surrogate for Endrin aldehyde.

(5) MCL for Endrin is used as a surrogate for Endrin ketone.

(6) MCL for Chlordane is used as a surrogate for gamma-Chlordane.

(7) Acetone PRG recalculated to reflect more recent toxicity values presented on the Chemical Specific Physical Constants and Toxicity Values Table, than those used in the USEPA (2002) table.

(8) Benzene PRG recalculated to reflect more recent toxicity values presented on the Chemical Specific Physical Constants and Toxicity Values Table, than those used in the USEPA (2002) table.

(9) Chloroform PRG recalculated because USEPA (2002) incorrectly used the subchronic inhalation RfD rather than the chronic RfD. The chronic RfD results in a more conservative screening.

(10) Ethylbenzene PRG recalculated due to the inhalation SF being withdrawn from IRIS. PRG now based on RfDs from IRIS (USEPA 2003) and USEPA (2002) PRGs equations and default values.

(11) PRG for Total Xylenes is used as a surrogate for m,p-xylenes.

(12) PRG for Total Xylenes is used as a surrogate for o-xylene.

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DUGWAY PERMIT

MODULE VII

ATTACHMENT 6

APPENDIX A

HWMU 128

CERTIFICATION OF CLOSURE

CERTIFICATION OF CLOSURE

The Closure Report for Hazardous Waste Management Unit (HWMU) 128 at Dugway Proving Ground, Utah has been prepared by Shaw Environmental in accordance with the closure requirements specified under the Utah Administrative Code (UAC) 315-7-14 and 40 Code of Federal Regulations 265, Subparts G. The requirements of UAC 315-101 form the basis for the risk-based criteria in the closure of HWMU 128.

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

Respectfully submitted,

Scott Reed
Directorate of Environmental Programs
Dugway Proving Ground

PROFESSIONAL ENGINEER
No. 4858945
ADAM S. NG
Exp. 12/31/04
STATE OF UTAH

Adam S. Ng, Ph.D., P.E.
Shaw Environmental, Inc.
Utah Registered Civil Engineer No. 4858945-2202

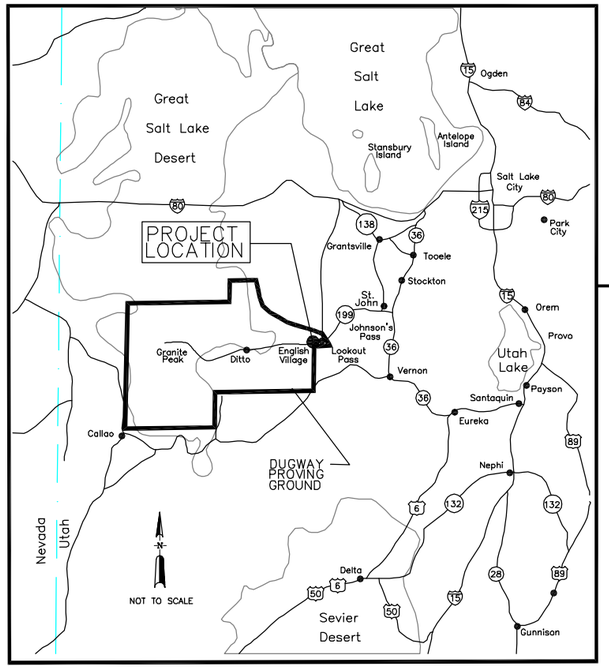
DUGWAY PERMIT

MODULE VII

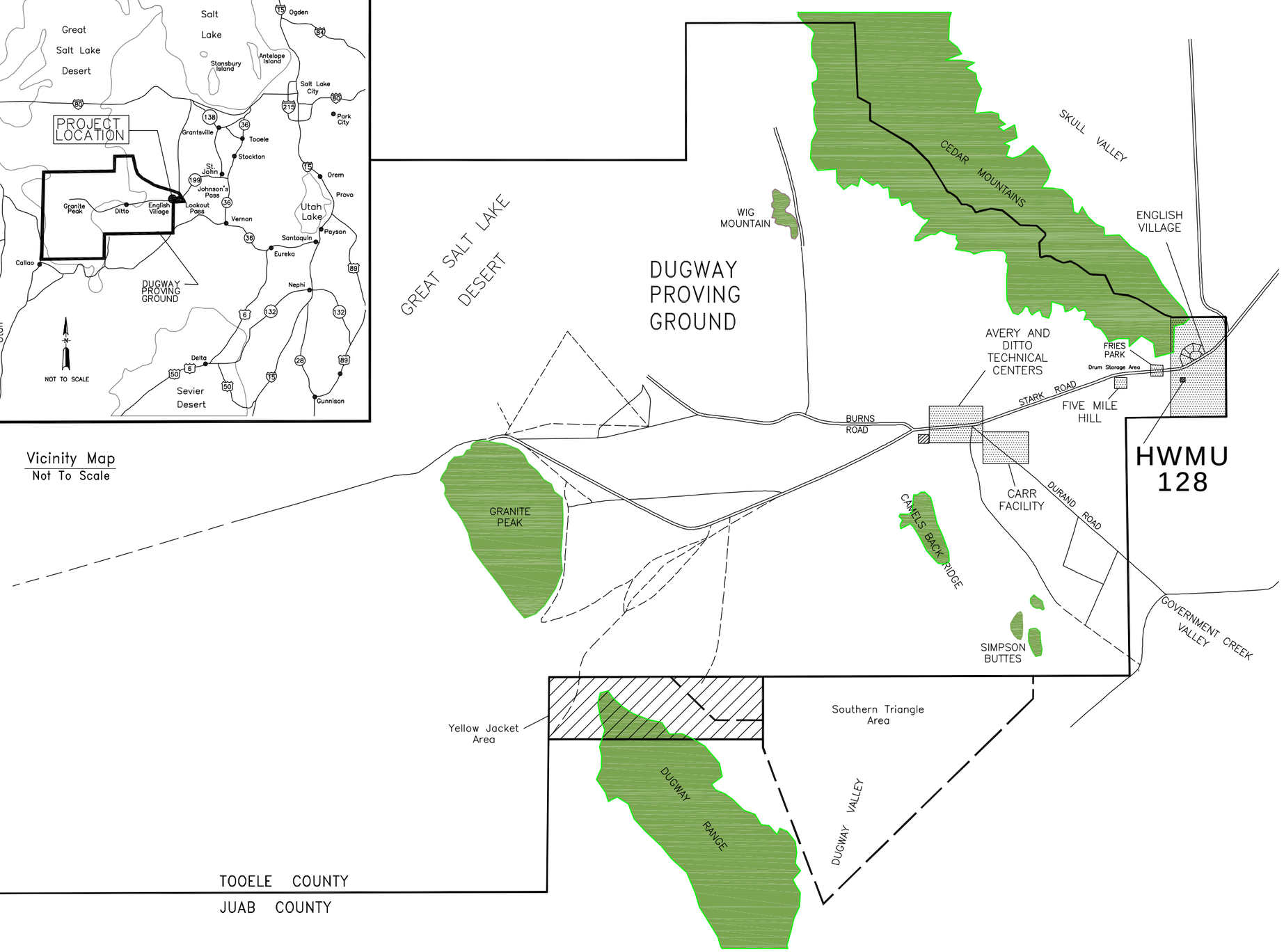
ATTACHMENT 6

HWMU 128

FIGURES



Vicinity Map
Not To Scale



LEGEND

- Trail or unpaved road
- Secondary road
- Primary road
- Installation boundary

N

SCALE IN MILES
4 0 4

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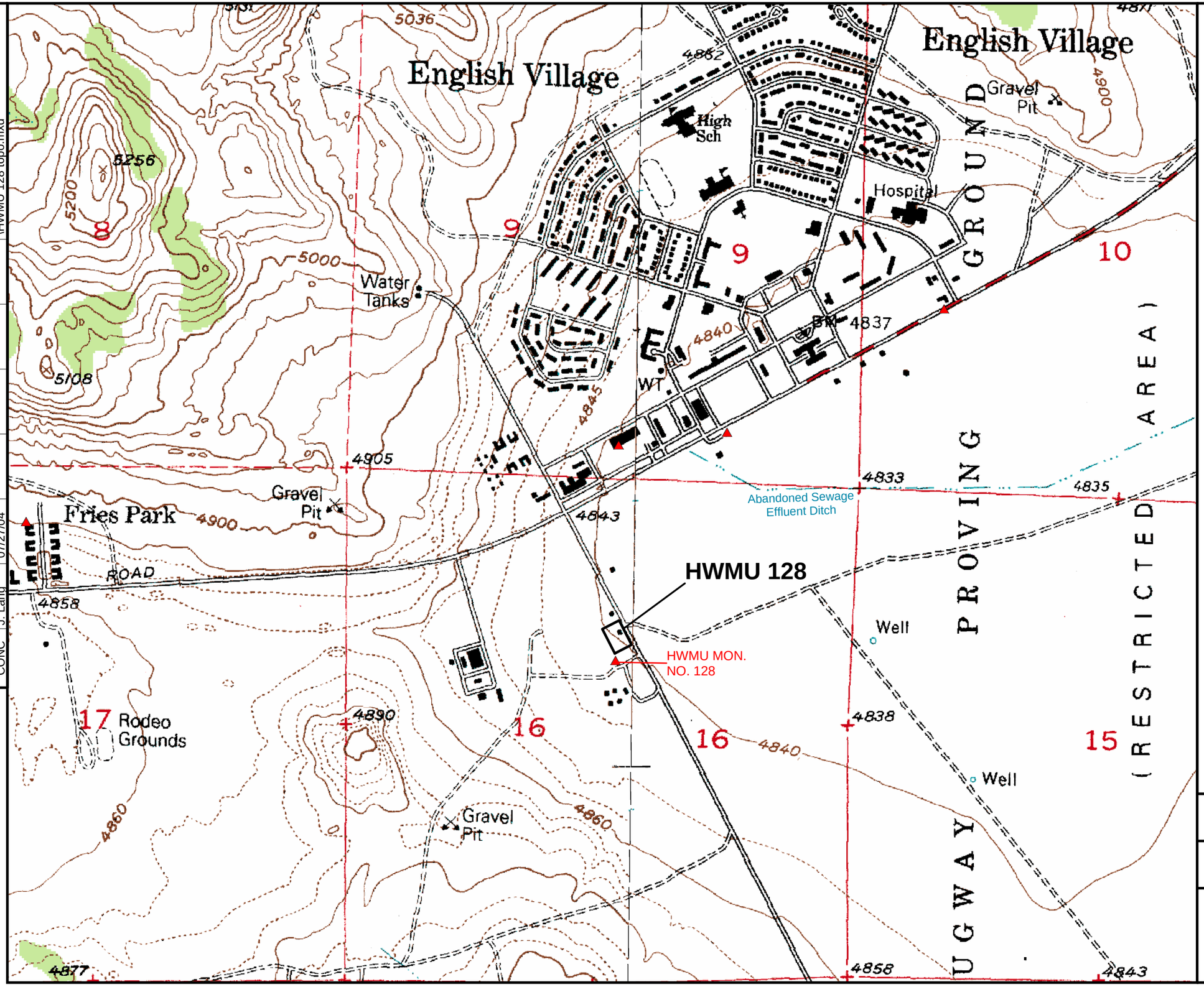
U.S. Army
Corps of Engineers
Sacramento District

FIGURE 2–1

DUGWAY PROVING GROUND
VICINITY MAP AND
HWMU 128 LOCATION MAP
DUGWAY PROVING GROUND
DUGWAY, UTAH

IMAGE	X–REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	R. LANGSTON 3/24/2003	J. SCIACCA 5/27/2003	MULLENMEISTER 5/27/2003	870502–B582



Legend

▲ HWMU Monument

N
W E
S

0 500 1,000 1,500 2,000 Feet

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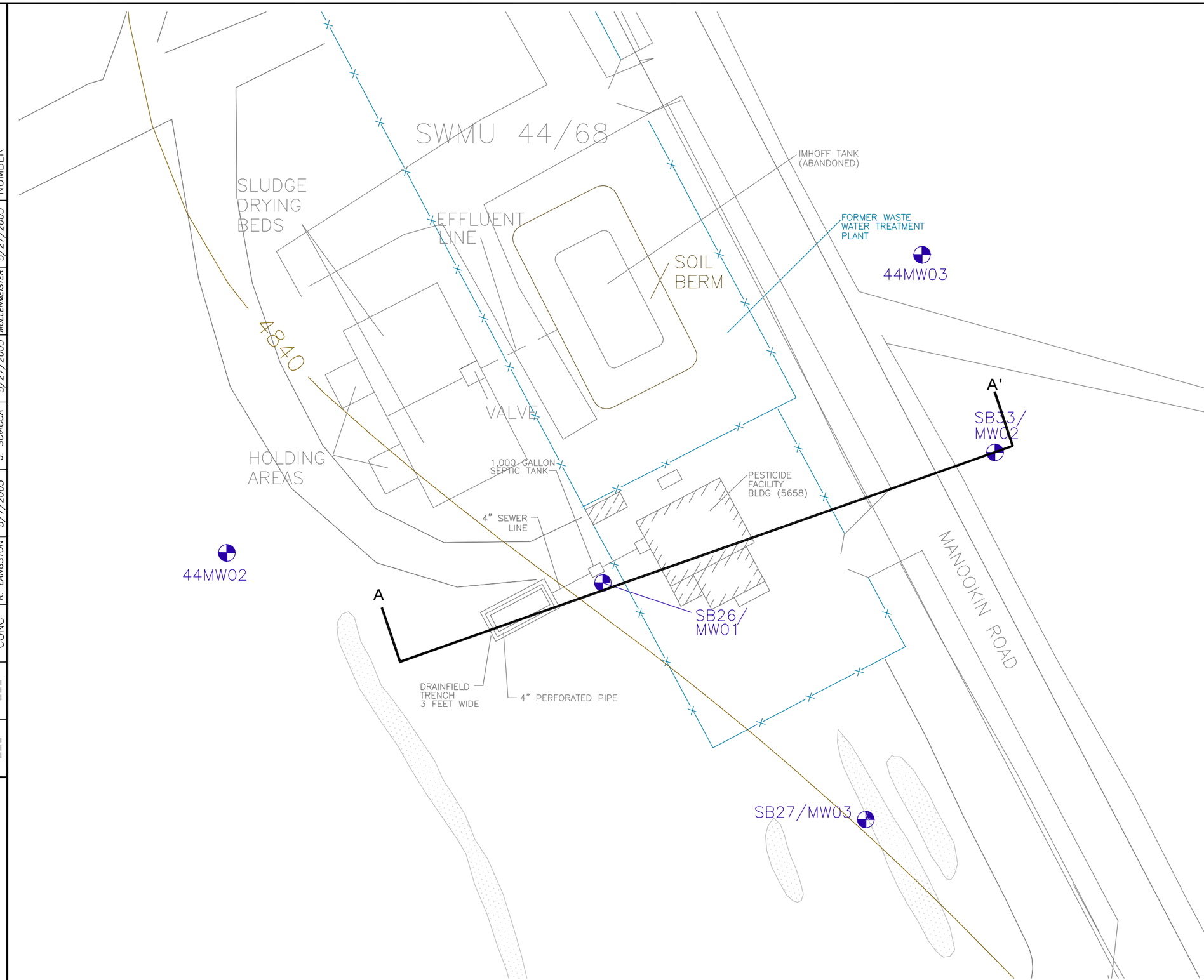
Corps of Engineers
Sacramento District

Figure 2-2
Topographic Map of English Village
In the Vicinity of HWMU 128

Dugway Proving Ground
Dugway, Utah

Office:	Drawn By:	Checked By:	Approved By:	File: U:\Dugway\HWMU 128 \HWMU 128 topo.mxd
CONC	J. Lang 07/27/04			



LEGEND

MW01 MONITORING WELL

SOIL PILE OR ELEVATED AREA

A A' GENERALIZED GEOLOGIC CROSS SECTION LINE (See Figure 1–6)

4840 ELEVATION CONTOUR LINE (feet)

FENCE

N

SCALE IN FEET

40 0 40

Modified from FWEC, 1999

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U.S. Army
Corps of Engineers
Sacramento District

FIGURE 2–3
HWMU 128
PESTICIDE STORAGE AND PREPARATION AREA DETAIL
DUGWAY PROVING GROUND
DUGWAY, UTAH

IMAGE	X–REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	R. LANGSTON 5/7/2003	J. SCIACCA 5/27/2003	MULLENMEISTER 5/27/2003	870502–B587

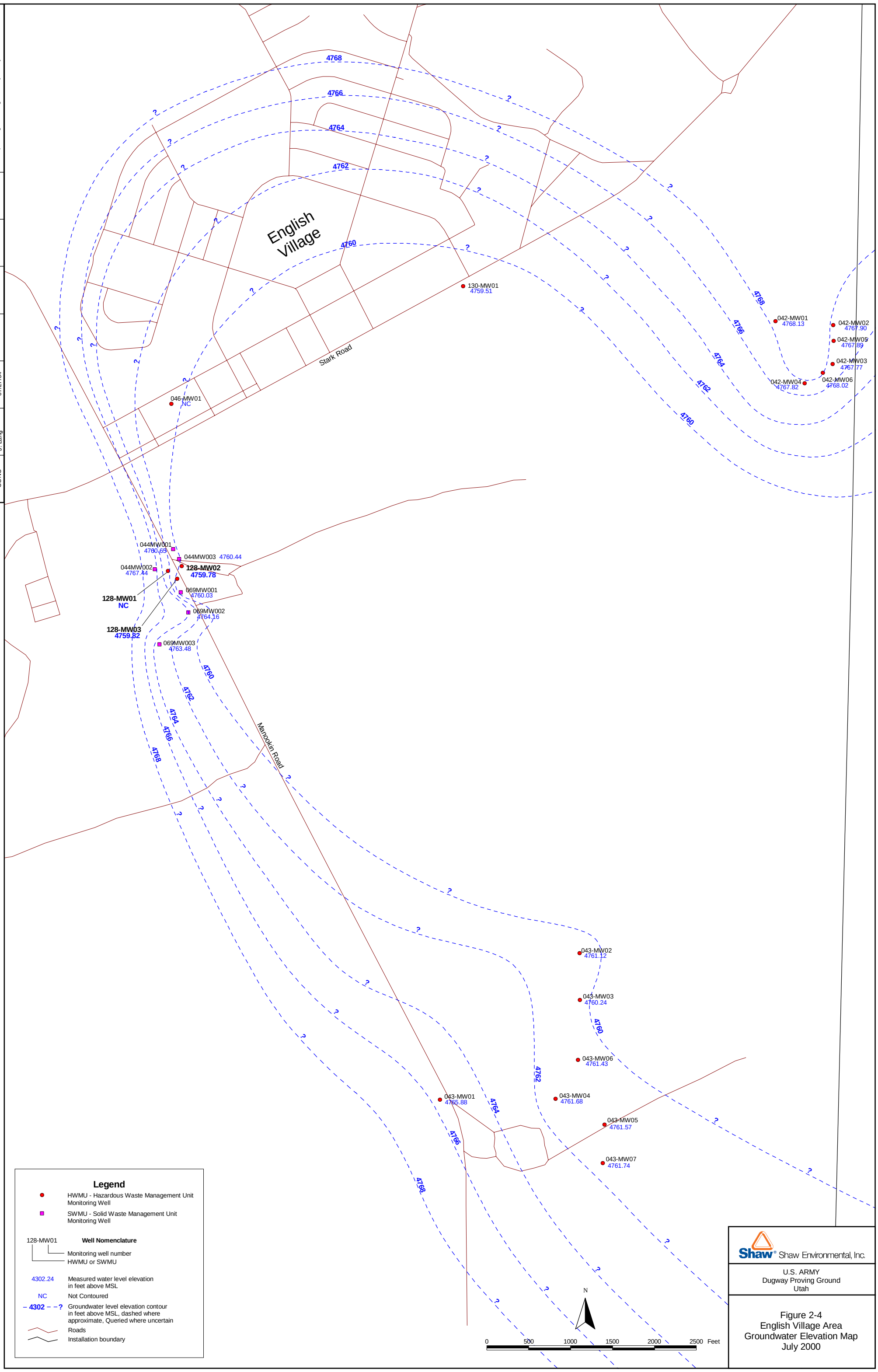
File: W:\Dugway\Projects\HWMU 128 Post-Closure Plan.apr - English Village 2000Qtr3 Layout

Approved By:

Checked By:

Drawn By: J. Lang 07/27/04

Office: CONC



Legend

- HWMU - Hazardous Waste Management Unit Monitoring Well
- SWMU - Solid Waste Management Unit Monitoring Well

128-MW01 — **Well Nomenclature**
- Monitoring well number
- HWMU or SWMU

4302.24 — Measured water level elevation in feet above MSL

NC — Not Contoured

– 4302 – – ? — Groundwater level elevation contour in feet above MSL, dashed where approximate, Queried where uncertain

Roads

Installation boundary

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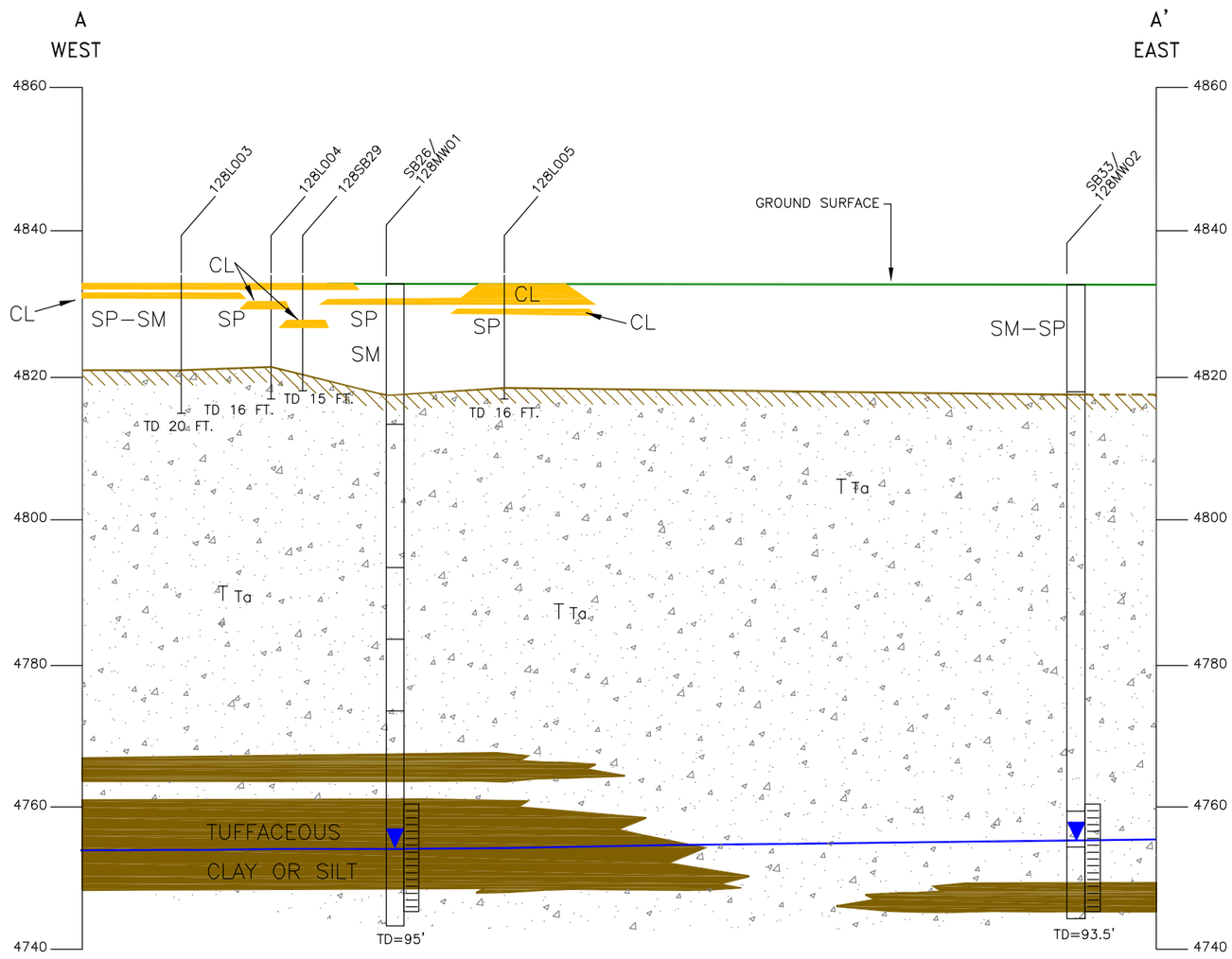
U.S. ARMY
Dugway Proving Ground
Utah

Figure 2-4
English Village Area
Groundwater Elevation Map
July 2000



Geology adapted from cross section in HWMU 128 Closure Plan Module 3, FWEC Final, January 1999.

Volcanic bedrock is interpreted as Tertiary–age tuffs and agglomerates (T_{Ta}), which correlate with two units mapped by Maurer, (1970): the Middle Tuff unit, and Lower Basaltic Andesite Flows and Agglomerates unit.

HORIZONTAL SCALE

0 40 80 FEET

VERTICAL SCALE

0 20 40 FEET

VERTICAL EXAGGERATION = 2X

LEGEND

GEOLOGIC LEGEND INCLUDING USCS SOIL CLASSIFICATION

CL– INORGANIC SANDY OR SILTY LEAN CLAYS

SP– POORLY GRADED SANDS, LITTLE OR NO FINES

SM– SILTY SANDS, POORLY GRADED SAND–SILT MIXTURES

TOP OF WEATHERED VOLCANIC BEDROCK (APPROXIMATE)

TTa
TERTIARY TUFF, TUFFACEOUS SEDIMENTS AND AGGLOMERATES

WATER TABLE ELEVATION (JULY 2000)

SCREENED INTERVAL OF MONITORING WELL

USCS – UNIFIED SOIL CLASSIFICATION SYSTEM

CROSS SECTION A–A' LOCATION SHOWN ON FIGURE 2–3

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FIGURE 2–5

GENERALIZED GEOLOGIC CROSS SECTION OF HWMU 128
DUGWAY PROVING GROUND
DUGWAY, UTAH

IMAGE	X–REF	OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
---	---	CONC	RB 5/7/2003	J. SCIACCA 5/27/2003	MULLENMEISTER 5/27/2003	870502–B589