



FINAL

REMEDIAL ACTION PLAN

FOR YPG-028

U.S. ARMY GARRISON

YUMA PROVING GROUND

Submitted To:

U.S. ARMY ENVIRONMENTAL COMMAND



Prepared By:



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ACRONYMS AND ABBREVIATIONS

ADEQ	Arizona Department of Environmental Quality
AHA	Activity Hazards Analysis
AHWMA	Arizona Hazardous Waste Management Act
BTV	Background Threshold Value
CFR	Code of Federal Regulations
ft	Foot/Feet
QAPP	Quality Assurance Project Plan
GPL	Groundwater Protection Level
IDW	Investigation Derived Waste
nrSRL	Nonresidential Soil Remediation Level
PID	Photoionization Detector
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
rSRL	Residential Soil Remediation Level
SHARP	Safety, Health, and Risk Program
SOP	Site Operating Procedure
SSHPP	Site-Specific Safety and Health Plan
U.S.	United States
USAGYPG	United States Army Garrison Yuma Proving Ground
VOCs	Volatile Organic Compounds
yd ³	Cubic Yards



1.0 INTRODUCTION

This report was prepared by Parsons, Inc. (Parsons) for the U.S. Army Garrison Yuma Proving Ground (USAGYPG) located near Yuma, Arizona. The purpose of this document is to present a Remedial Action Plan (RAP) for the voluntary removal of buried waste at YPG-028. YPG-028 is an inactive landfill located approximately 3 miles south-southeast of the Main Administrative Area, south of Laguna Dam Road. This RAP is being submitted pursuant to A.A.C.R18-8-270.A (40 CFR 270.41) in accordance with the Arizona Hazardous Waste Management Act (AHWMA) Permit, Part VI Section L (AHWMA, 2007). This work is performed pursuant to Federal Contract number W91ZLK-05-D-0016, Task Order 0002.

As specified in Part VI.L(3) of the permit, a notice briefly describing the RAP and listing USAGYPG and Arizona Department of Environmental Quality (ADEQ) contacts has been sent to persons on a mailing list provided by ADEQ. The notice informs stakeholder of a 30-day comment period on the draft RAP prior to ADEQ approval. A copy of the notice has been included in Appendix C. Upon completion of the remedy presented in this RAP, the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report for YPG-028 will be submitted according to provisions specified in Part VI.L(2)(r) of the permit.

2.0 REMEDIAL ACTION OBJECTIVES

Data from the RFI and other previous investigations will be used to support the proposed remedial action at YPG-028. In November 2009, a surface removal of one cubic yard (yd³) of metal debris was completed, followed by a post-removal geophysical survey. The removed surface metal debris consisted of a piece of a vehicle fender, a metal drill bit, and other smaller pieces of rusted metallic debris which were identified and removed (Parsons, 2010).

Field work was conducted as part of the RFI in 2010 and consisted of excavating five test pits (028EP001 through 028EP005). Only one (028EP002) of the five contained buried waste. The debris found in this test pit included broken glass, oxidized aluminum, and pieces of concrete. Samples of the waste were collected from the test pit, and

analytical results show the waste to be nonhazardous (Table 1). Laboratory test results found no contamination exceeding residential soil remediation levels, (rSRL), nonresidential soil remediation levels (nrSRL), or groundwater protection levels (GPLs).

The initial estimated horizontal and vertical extent of solid waste and debris at YPG-028 was delineated based on geophysical survey results and the limited amount of solid waste found during test pitting. To ultimately establish the horizontal and vertical extent of solid waste disposal, two additional test pits crossing the footprint of the buried waste will be excavated (Figure 1). If a test pit contains buried waste, it will be extended until clean soil is excavated. Thus the footprint of the disposal area will be determined. Although no volatile organic compounds (VOCs) were detected at the site, a photoionization detector (PID) will be used to monitor air quality during excavation.

Following the delineation of the horizontal and vertical extent of soil waste disposal, the solid waste at YPG-028 will be removed from the site, and disposed of at the USAGYPG solid waste landfill. Since this waste has been previously sampled and shown to be nonhazardous, no samples of the waste are needed during this proposed removal action, and the waste will be treated as nonhazardous during removal and disposal operations.

The primary remedial action objective of this RAP is to remove the remaining limited amount of buried debris in order to expedite the permit modification process and close the site under a no-further-action scenario. No future monitoring will be required and there will be no land-use restrictions. The remedial action proposed and discussed in this RAP meets the standards for remedies established under Permit Condition VI.H.1 of the AHWMA Permit. This remedial alternative is a long-term solution and eliminates the presence of solid waste permanently from the site. The selected remedy will implement a cost-effective approach with a low level of difficulty to perform.

Proposed objectives of this remedial action include: 1) excavate the solid buried waste and debris associated with the YPG-028 site; 2) haul the waste to the USAGYPG solid waste landfill; and 3) remediate the site by backfilling the excavation with clean soil taken from soil piles of a nearby shallow excavation that was present prior to the 2009 surface debris removal action. Location of the backfilled soil is presented on Figure 1.

TABLE 1
DETECTED CONCENTRATIONS OF ANALYTES
FROM THE SAMPLED WASTE LAYER AT YPG-028
U.S. ARMY GARRISON YUMA PROVING GROUND, ARIZONA

Location	028EP002				
Depth	2.5-3				
Date	13-Jul-10				
Type	N	FD			
Analyte	Results		rSRL	GPL	BTV
Aluminum	10,700	10,900	76,000	NA	12,000
Arsenic	5.86	6.12	10	290	6.6
Barium	153 J	125 J	15,000	12,000	290
Beryllium	0.41 J	0.44 J	23	150	0.92
Cadmium	0.34 J	0.69	39	29	0.65
Calcium	28,300 J	28,100 J	NA	NA	37,000
Chromium (Total)	11.8 J	11.8 J	17,000	590	14
Cobalt	4.16 J	4.5 J	1,400	NA	7.9
Copper	135	136	3,100	NA	15
Iron	13,800 J	14,800 J	NA	NA	15,000
Lead	17.1 J	18.8 J	400	290	14
Magnesium	4,710 J	5,060 J	NA	NA	6,100
Manganese	248 J	271 J	3300	NA	920
Mercury	0.019	0.0051 J	23	12	0.016
Molybdenum	0.27 J	0.27 J	390	NA	0.49
Nickel	10 J	11.4 J	1,600	590	14
Potassium	2,180 J	2,320 J	NA	NA	2,500
Sodium	455 J	449 J	NA	NA	8400
Vanadium	19.3 J	20.1 J	78	NA	26
Zinc	246	345	23,000	NA	44
bis(2-Ethylhexyl) Phthalate	0.0339 J	0.0233 J	390	NA	NA
Toluene	0.0018 J	0.00192 J	650	400	NA

Notes: results are reported in units of milligrams per kilogram (mg/kg). Sample depths are in feet below ground surface (ft bgs). rSRL = ADEQ residential soil remediation level. GPL = ADEQ minimum groundwater protection level. 'NA' means not available. Bolded values are above the background threshold value. Highlighted rows are samples collected within the debris zone. '--' means non-detect. 'J' flag means estimated value.

Coordinates are 32° 52' 10.396" N, 114° 26' 48.568" W. Upon completion, the site will be graded to match the existing topography.

3.0 OVERVIEW OF IMPLEMENTATION APPROACH

The approach for remediation involves excavation of solid waste and debris from the YPG-028 site, followed by disposal at the USAGYPG solid waste landfill. Debris will be excavated by use of backhoe operation and then transported to the USAGYPG solid waste landfill by a single load dump truck. Soil and debris removed from the site will include all debris encountered throughout the disposal zone. Soil overburden from above the debris will be segregated for reuse as backfill. The excavation will continue until undisturbed native soil is exposed along the sides and the bottom of the disposal area. The amount of debris estimated for removal at the YPG-028 site is approximately 30 yd³. Previous test pit locations excavated during the RFI along with the proposed debris areas to be excavated and removed from the site are shown on Figure 1.

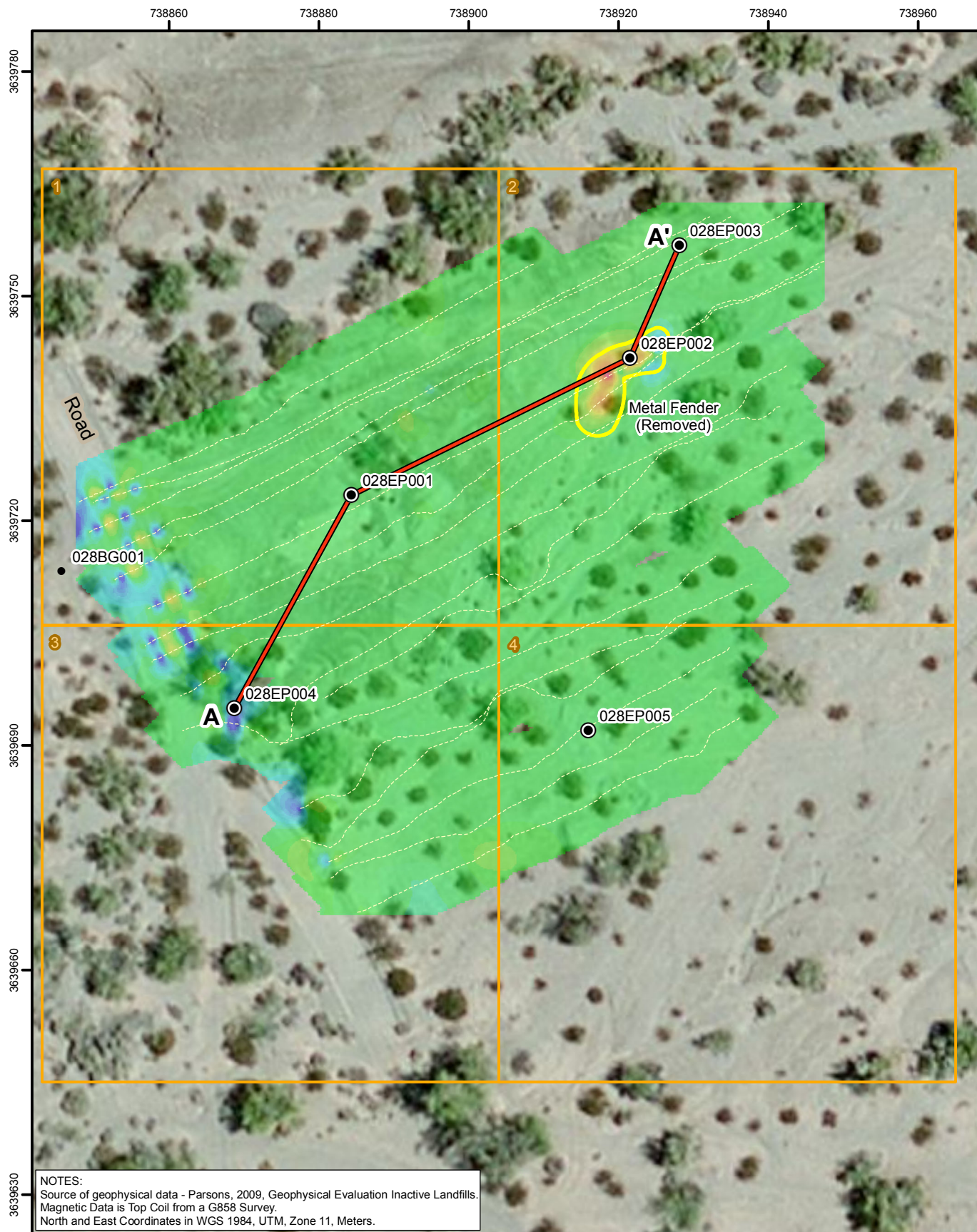
Two contingencies and the resulting mitigation strategy may result from the removal action as listed below.

- If unexpected uncharacterized wastes such as drums or munitions are identified during the excavation process, operations will cease and the site reevaluated prior to any further excavation.
- If there is a large amount of soil intermixed with only a limited amount of solid waste, a mechanical screener will be used to separate the solid waste from the soil. The solid waste will be disposed at the USAGYPG landfill and the clean soil used on-site for backfill.

3.1 YPG-028 Landfill Excavation and Waste Disposal

The field work sequence of events will be the following:

- Excavate soil and debris;
- Transport the mixed soil and debris to the UAGYPG solid waste landfill for disposal;
- Backfill the excavation using clean fill material from adjacent soil piles; and
- Grade site to match existing topography



LEGEND

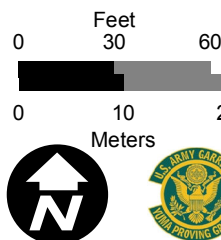
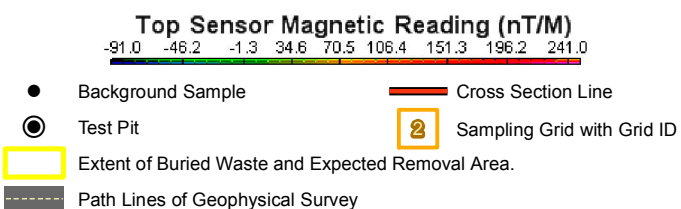


FIGURE 1

YPG-028
 2009
 MAGNETIC DATA
 U.S. Army Garrison
 Yuma Proving Ground

3.2 Schedule

It is estimated that one ten-hour day would be sufficient to complete the construction activities required to meet the remediation objectives. This assumes all heavy equipment and operation personnel are on-site and in good working condition.

3.3 Permitting

An excavation permit will be required, following the USAGYPG dig permit process, for the excavation of soil and debris at YPG-028 and for any site preparatory earth work where the existing ground surface is disturbed.

4.0 WASTE MANAGEMENT

Debris removed from the YPG-028 site will be loaded by backhoe into a single load dump truck and transported to the USAGYPG solid waste landfill for permanent disposal. At projects end, on-site equipment will be cleaned thoroughly without the use of water, leaving equipment free from on-site soils at YPG-028. Since the debris will be removed from the site, and equipment will be wiped down without rinsing, no Investigation Derived Waste (IDW) is expected during this remedial action.

5.0 SITE RESTORATION AND DEMOBILIZATION

Following the excavation and removal of debris from YPG-028, backhoe operators will use clean on-site soil as backfill. Two small soil mounds are present at the site (Coordinates 32° 52' 10.396" N, 114° 26' 48.568" W) and will be used to backfill the areas where debris was removed. The on-site soil piles were previously surveyed with a hand-held geophysical magnetometer and visually inspected for evidence of debris and found clean of debris. Backfilled soil will be graded to meet the existing topography and compacted using the backhoe. No compaction testing will be required for backfilled areas. Revegetation of the site will not be required because the land fill consists of a small area (2,500 square feet [sq ft]) and vegetation surrounding the site is sparse. Once restoration activities are completed, the site will be inspected by the USAGYPG environmental office and all heavy equipment and on-site personnel will demobilize from the site.

6.0 SITE SAFETY

Parsons has implemented a Corporate Safety, Health, and Risk Program (SHARP) which requires Project Managers to implement effective programs during remedial field operations. Parsons goal is zero accidents and zero injuries with work tasks designed to minimize or eliminate hazards to personnel, equipment and the general public.

An electronic copy of the SHARP compliant Site-Specific Safety and Health Plan (SSHP) (Parsons, 2010) is located in Appendix A of this report. A paper copy of the plan will accompany the field team during field work, and will be followed and incorporated into this RAP.

6.1 Site Operating Procedures

A list of Site Operating Procedures (SOPs) can be found in electronic form in Appendix B of this report and Attachment 3 of the Quality Assurance Project Plan (QAPP) (Appendix A of the RFI Work Plan [Parsons, 2010]). A paper copy of the SOPs will accompany the field team during field work. Specific SOPs that will be followed during the remedial action at YPG-028 include:

- SOP 1.0 – Three Phase QC Inspection and Corrective Action
- SOP 5.0 – Field Equipment Decontamination
- SOP 6.0 – Global Positioning System Surveys
- SOP 8.0 – Surface Debris Removal at Landfill Sites
- SOP 9.0 – Test Pit/Trench Construction and Sampling

6.2 Activity Hazard Analysis

In addition to the SOPs described above, Parsons and its subcontractors are required to conduct an activity hazards analysis (AHA) for aspects of the work. The activity hazards analysis consists of the following three steps:

1. Identify the task and break it down into steps.
2. Identify the hazards associated with each step.
3. Identify the specific hazard control measure used for each step in accordance with the order-of-precedence method of control.

The AHAs for this project are contained in the Appendix A of the SSHP (Appendix A of this report).

7.0 REFERENCES

- Arizona Department of Environmental Quality (ADEQ). 2007a. Arizona Hazardous Waste Management Act Permit, Part VI Section I: Permit Modification for Remedy. June, 2007.
- Jason (Jason Associates Corporation). 2007. Final Geophysical Evaluation Inactive Landfills Solid Waste Management Units (SWMUs):37 (CCYPG-027), 36 (CCYPG-028), 41 (CCYPG-029), 39 (CCYPG-141), 40 (CCYPG-143) and CCYPG-178. U.S. Army, Yuma Proving Ground. February, 2007.
- Parsons. 2010. Final RCRA Facility Investigation Work Plan for Inactive Landfills and Muggins Mountain OB/OD Sites for U.S. Army Garrison Yuma Proving Ground. May, 2010.
- USAGYPG (U.S. Army Garrison Yuma Proving Ground). 2009. The History of USAGYPG and Base Population Available at <http://www.yuma.army.mil>.