



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
FORT BLISS, TEXAS 79916-0058



15 July 1997

REPLY TO
ATTENTION OF

Directorate of Environment

Mr. Jerry Bober
Hazardous and Radioactive Materials Bureau
RCRA Technical Compliance Program
New Mexico Environment Department
2044 Galisteo
Santa Fe, NM 87505

Dear Mr. Bober:

Please find enclosed three copies of the Final RFI Report for five SWMU's listed on our RCRA permit (four landfills and one open demolition area) for your review. The Fort Bliss Directorate of Environment (DOE) has previously submitted the Final RFI for the four evaporation ponds listed on the permit. Fort Bliss DOE is aware that you and your staff probably face an enormous work load. I respectfully request, however, an expedited review of these two reports if at all possible. DOE faces the potential loss of existing funding for follow on work at these SWMU's if the work cannot be identified and funds obligated before mid September 1997. Any consideration you can make to this schedule without creating unfairness for your other clients would be greatly appreciated and speed the closure of these sites.

If you have any questions or concerns please do not hesitate to call Mr. Kelly Blough, the Fort Bliss DOE technical point of contact. Mr. Blough can be reached at (915) 568-7979.

Sincerely,

Mr. Jim Stefanov
Chief, Multimedia Compliance Div., DOE
Fort Bliss, Texas

cc. Steve Pullen, NMED
Dr. James Hartman, Ft. Bliss

enc. (3)

ASWA FB 97



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Engineering
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July 3, 1997

Mr. Jim Stefanov
Directorate of Environment
Building 515B
Fort Bliss, Texas 79916-6816

Re: RFI Final Report, Fort Bliss, Texas
Contract No. DACA63-94-D-0009
Delivery Order No. 0036

Dear Mr. Stefanov:

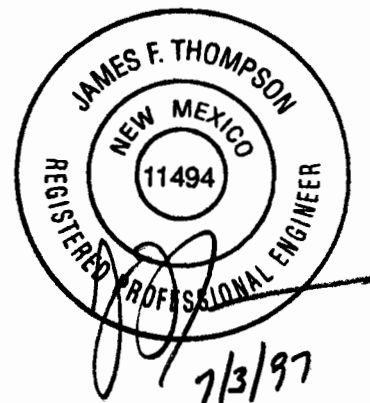
We respectfully submit this RFI Final Report for five Solid Waste Management Units (SWMUs) at Fort Bliss identified within the above referenced delivery order. The Final Report is contained in three volumes: Volume 1 includes the narrative report; Volume 2 contains Appendices 1 through 10; and, Volume 3 consists of Appendix 11, Analytical Laboratory Reports. The comments of Fort Bliss and those of the Fort Worth District, U.S. Army Corps of Engineers, on the Draft Final Report have been addressed in the Final Report documents.

Thank you very much for your assistance in producing this RFI Final Report. Please contact John Laser or me at (713) 956-4100 if you have any questions regarding these documents.

Very truly yours,

JAMES F. THOMPSON, P.E.
President

JAL:eb
pc: F867-02.06
JFT File



U.S. ARMY CORPS OF ENGINEERS
FORT WORTH DISTRICT

VOLUME 1 OF 3

FINAL REPORT

HRNB

**RCRA FACILITY INVESTIGATION
FOR FIVE SOLID WASTE
MANAGEMENT UNITS
FORT BLISS, TEXAS AND
NEW MEXICO**

CONTRACT NO. DACA63-94-D-0009
DELIVERY ORDER NO. 0036

THOMPSON PROFESSIONAL GROUP, INC.
HOUSTON, TEXAS

JULY 1997

RCRA FACILITY INVESTIGATION

FOR

FIVE SOLID WASTE MANAGEMENT UNITS

**FORT BLISS, TEXAS
AND NEW MEXICO**

FINAL REPORT

July 1997

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LIST OF ACRONYMS

AAS	Atomic Absorption Spectroscopy
ANSI	American National Standard Institute
ASTM	American Society for Testing and Materials
BLM	Bureau of Land Management
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CQAR	Chemical Quality Assurance Report
DCQAP	Data Collection and Quality Assurance Plan
DO	Dissolved Oxygen
DOT	Department of Transportation
EB	Equipment Blank
EM	Electromagnetics
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ESE	Environmental Science & Engineering, Inc.
FTBL	Fort Bliss
GC/MS	Gas Chromatograph/Mass Spectrometer
GIS	Geographic Information System
GPM	Gallons per Minute
GPR	Ground Penetrating Radar
GPS	Global Positioning System
H ₂ S	Hydrogen Sulfide
HCL	Hydrochloric Acid
HPLC	High Performance Liquid Chromatography
HTRW	Hazardous Toxic and Radioactive Waste
ICP	Inductively Coupled Plasma Atomic Emission Spectrometry
LCS/LCSD	Laboratory Control Standard/Laboratory Control Standard Duplicate
LEL-LFL	Lower Explosive Limit - Lower Flammable Limit
MDL	Method Detection Limit
µg/Kg	Micrograms per Kilogram
mg/Kg	Milligrams per Kilogram
MRD	Missouri River Division
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MUC	Maximum Use Concentration
NMED	New Mexico Environmental Department
NMSWMR	New Mexico Solid Waste Management Regulations
NO ₃	Nitrate
O ₂	Oxygen
OEW	Ordnance and Explosive Waste
PARCC	Precision, Accuracy, Representatives, Completeness, and Comparability

PCB	Polychlorinated Biphenyls
PID	Photo-Ionization Detector
PPM	Parts per Million
PQL	Practical Quantitation Limit
PRG	Preliminary Remediation Goal
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QCO	Quality Control Officer
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RPD	Relative Percent Difference
SCS	Soil Conservation Service
SLOP	Standard Laboratory Operating Procedure
SSHO	Site Safety and Health Officer
SSHP	Site-Specific Safety and Health Plan
STB	Supertropical Bleach
SVOC	Semi-Volatile Organic Compounds
SWDL	U.S. Army Corps of Engineers Southwestern Division Laboratory
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TD	Total Depth
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
WSMR	White Sands Missile Range

1. INTRODUCTION

1.1. Purpose and Objectives of the RFI

Thompson Professional Group, Inc. of Houston, Texas, (Thompson) was retained by the United States Army Corps of Engineers (USACE), Fort Worth District, under Contract No. DACA63-94-D-0009, Delivery Order No. 0036, to conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation of five Solid Waste Management Units (SWMUs) at the Fort Bliss Military Reservation in New Mexico. The purpose of the investigation, as described in the contract Statement of Work, Task 2, and expressed in the RCRA Facility Investigation (RFI) Workplan, is to reasonably determine whether hazardous waste and/or hazardous constituents have been released to the environment at any of the sites, and if so, to evaluate the nature and extent of that contamination, and to assess the potential risk posed by such contamination to the public health and to the environment.^{1,2}

In order to accomplish the goal of the RFI, a logical progression of investigative objectives would need to be satisfied. First, the areal extents and depths of the waste trenches at the four rubble pit/landfill SWMUs, and the locations and extents of the detonation pits at the inactive open detonation area, would need to be determined and mapped. Second, employing the information generated from the first objective, soil gases extracted from the entrenched waste masses at the four rubble pit/landfill sites would be analyzed as an indicator of the presence and relative concentrations of any volatile or semi-volatile organic contaminants. Third, using the data resulting from the soil gas sampling program to identify potential "hot spots" (i.e., in areas of specific VOC and SVOC concentrations) in the waste trenches, an observation trench would be excavated into a waste mass at each of the four rubble pits/landfills to characterize the types of wastes buried in the trenches and to confirm previously generated data on trench

¹ U.S. Army Corps of Engineers, Fort Worth District, Statement of Work, RFI Workplan and Investigations, Fort Bliss, Contract No. DACA63-94-0009, Delivery Order No. 0026, Fort Worth, Texas, September, 1995.

² Thompson Professional Group, Inc., RCRA Facility Investigation Workplan for Nine Solid Waste Management Units, Fort Bliss, Texas, Houston, Texas, July, 1996.

depth and cover thickness. Fourth, depending on the nature of the site, surface and subsurface soil samples would be collected and submitted for laboratory analysis of potential contaminants. The probability of detecting contaminant releases would be optimized by applying the results of the first three investigative activities in selecting the locations for soil sampling. Therefore, sampling would be directed at locations most likely to produce positive results, rather than in a random distribution across a site.

Geotechnical soil samples would also be recovered from the soil borings in order to delineate the lithology and determine the properties of the soils at the five sites. Geotechnical soil samples of the waste trench covers at the four rubble pit/landfill sites would be collected and submitted for analysis to determine the properties of these soil covers. Information generated from the geotechnical analysis of the trench covers and surface soils would be used in conjunction with other relevant data to evaluate the potential for erosion at the four rubble pit/landfill sites.

Additionally, Thompson was tasked with constructing permanent bench mark monuments at the five sites included in this Report and at four additional sites that were incorporated into the RFI Workplan but were not included in Thompson's investigative scope for Task 2. Following construction, the monuments were to be surveyed and identified with the New Mexico State Plane Coordinate System for future reference.

To establish and maintain a safe work environment for conducting the RFI, Unexploded Ordnance (UXO) specialists would survey the five sites prior to the commencement of the investigative activities, and would remain on-site until the conclusion of all intrusive procedures. In addition, the health and safety guidelines presented in Section 7 of the RFI Workplan would be adhered to during the course of all field operations.

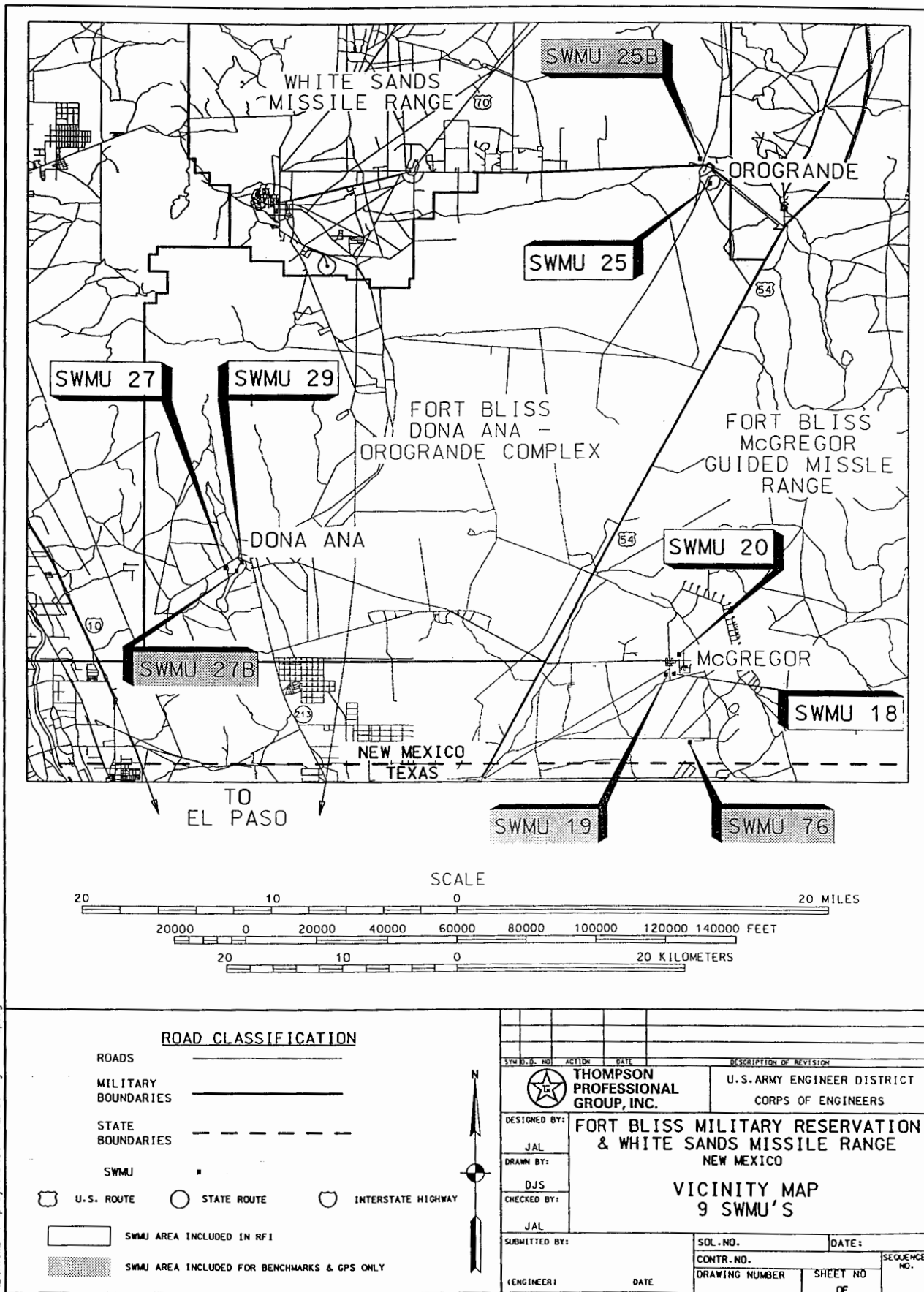
Finally, all tasks and activities associated with Task 2 of the RFI would be conducted in a manner consistent with the following U.S. Environmental Protection Agency (EPA) guidance documents: RCRA Facility Investigation Guidance Document; RCRA Groundwater Monitoring Technical Enforcement Guidance Document; and Test Methods for Evaluating

Solid Waste. Furthermore, the investigation would be performed to comply with the New Mexico Environmental Department (NMED), the EPA RCRA permit (EPA ID No. NM42113720101) as defined in Module V for this facility, and section 3004(u) of the RCRA as amended by the Hazardous and Solid Waste Amendments of 1984.

1.2. Facility Description

The five SWMUs to be investigated under Task 2 are located on three separate range camps within the Fort Bliss Military Reservation in the State of New Mexico. The SWMUs are basically oriented in three clusters: SWMUs 18 and 20 are located in the McGregor Range Camp area; SWMUs 27 and 29 are located in the Doña Ana Range Camp vicinity; and SWMU 25 is located in the Orogrande Range Camp area. Four of the SWMUs are rubble pits/landfills, while SWMU 20 is an inactive open detonation area. A Vicinity Map (Figure 1-1) indicating the general geographic location of these five SWMUs is included on the following page. Also depicted on this map are the locations of the four SWMUs where bench mark monuments were constructed and incorporated into the state plane coordinate survey.

The Fort Bliss Military Reservation is owned and operated by the United States Government and is considered federal land. McGregor Range is Bureau of Land Management (BLM) property that has been withdrawn from the public domain for military use until the year 2000. Land use and ownership maps (Figures 1-2, 1-3 and 1-4) are included at the end of this section. Maps indicating more detailed topographic features are included in Section 4 with the discussions of the individual SWMU investigations along with the aerial photographs and the investigative activity maps.



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Figure 1-1
 Section 1 - Page 4

The SWMUs involved in this investigation are managed and operated by the U.S. Army at Fort Bliss, and are identified throughout this RFI Report as follows (note that the SWMUs identified with an asterisk [*] are included solely for the purpose of bench mark construction and coordinate survey):

<u>SWMU</u>	<u>DESCRIPTION</u>
18	McGregor Range Rubble Pit/Landfill - Inactive
19*	McGregor Range Oxidation Pond - Active
20	McGregor Range Open Detonation Area - Inactive
25	Orogrande Range Rubble Pit/Landfill - Inactive
25B*	Orogrande Range Oxidation Pond - Active
27	Doña Ana Rubble Pit/Landfill - Inactive
27B*	Doña Ana Range Oxidation Pond - Partially Active
29	Doña Ana Range Sanitary Landfill - Inactive
76*	Meyer Range Oxidation Pond - Partially Active. ³

Eight of the nine SWMUs are located on the Fort Bliss Military Reservation while SWMU 25B is located on White Sands Missile Range.

1.3. Background

The Fort Bliss Military Reservation operates these SWMUs for the United States Government and the U.S. Army. The Army utilizes the range camp areas for personnel training and other defense purposes. As a result of the daily operation and personnel occupancy, the SWMUs were constructed as disposal facilities for solid waste, sanitary waste, rubble, and other waste generated by the Army personnel, maintenance, and other operations. Some of the rubble pits/landfills were constructed and used since World War II; however, the rubble pits/landfills and the detonation area are currently inactive.

³ RFI Workplan - Statement of Work dated September 1995.

1.4. Summary of Previous Investigations

Fort Bliss obtained their RCRA permit on July 8, 1995. There have been some previous site investigations performed for some of the SWMUs in the area. Details of the previous site investigations are discussed under each individual SWMU as it pertains to that site. The following is a list of studies that were completed and submitted to the NMED and EPA:⁴

1. United States Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, Final Report, Evaluation of Solid Waste Management Units, Fort Bliss, Texas, 3-7 August 1987 and 26-29 September 1989.
2. A.T. Kearney, Inc., RCRA Facility Assessment PR/VSI Report, (PR/VSI stands for Preliminary Review/Visual Site Inspection) March 1989.
3. Earth Science Corporation, Environmental Compliance Assessment Report, April 1993.

Hazardous wastes are reported as having been generated from approximately twenty different organizations through the 1.2 million acres that comprise Fort Bliss.⁵ The largest quantities of such wastes include solvents, battery acid and STB (Supertropical Bleach, a substance used to decontaminate equipment). Other hazardous wastes reported as having been generated in smaller quantities include methanol, formaldehyde, xylene, paints and thinners, and chromic acid rinse water. It is not known for certain which, if any, of the five SWMUs involved in this investigation contain any one or more of these substances or any other hazardous substances. No interim measures or corrective actions have been implemented at any of the SWMUs.

⁴ Statement of Work

⁵ U.S. Environmental Protection Agency, Region VI, Houston Branch, RCRA Compliance Inspection Report of Fort Bliss, Texas, Houston, Texas, March 29, 1988.

1.5. RFI Report Format

The remainder of this RFI Report is divided into five major sections. Section 2, Environmental Setting, provides general information on the geology, hydrogeology, physiography, and other pertinent natural characteristics of the Fort Bliss Military Reservation and White Sands Missile Range area. An explanation of the field methods and procedures used to conduct the RFI are discussed in generic terms in Section 3, Field Data Collection Methods. The characterization of the individual SWMU sites, including the site-specific presentation of the results of the field investigation, is detailed in Section 4, Characterization of SWMUs. Also included in Section 4 is a discussion of the data evaluation methods. Section 5, Summary and Conclusions, presents a summary of the findings of the investigation and an assessment of the impact of these findings. Recommendations for further investigative activities relative to individual SWMU sites are detailed in Section 6, Recommendations. Supporting documentation from the investigation is presented in the Appendices.