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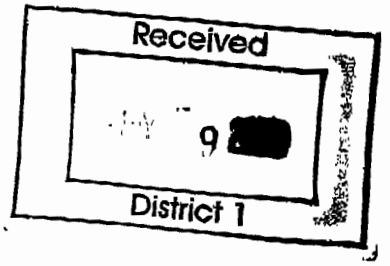
May 6, 2005



Mr. Cornelius Amindyas
Haz Waste Bureau
New Mexico Environment Department
5500 San Antonio NE
Albuquerque, New Mexico 87109

Subject: *FT-31 Voluntary Corrective Measures Completion Report*
Holloman AFB, New Mexico
USACE – Omaha District
Bhate Project No. 9030232

Dear Mr. Amindyas:

Please find enclosed a copy of the *FT-31 Voluntary Corrective Measures Completion Report – Holloman AFB, New Mexico,* for your review. The two volumes include the text, tables, figures and Appendices A and C. Appendix B, waste manifests, was foregone due to the extremely large size.

Bhate Environmental Associates, Inc., appreciates the opportunity to provide services to the U.S. Army Corps of Engineers, Holloman Air Force Base and the State of New Mexico. If you have any questions or need additional assistance, please feel free to contact me at (970) 216-7819 or our Birmingham office at (205) 918-4000.

Cordially,
BHATE ENVIRONMENTAL ASSOCIATES, Inc.

Frank Gardner, P.G.
Program Manager

FT-31 VOLUNTARY CORRECTIVE MEASURES COMPLETION REPORT HOLLOMAN AIR FORCE BASE, OTERO COUNTY, ALAMOGORDO, NEW MEXICO

CONTRACT NO. DACA45-03-D-0018
Delivery Order No. 1
Bhate Project Number: 9030232

Prepared For:
US Army Corps of Engineers
Omaha District
Omaha, Nebraska

Prepared By:
Bhate Environmental Associates, Inc.
1608 13th Avenue South
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February 2005

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FT-31 VOLUNTARY CORRECTIVE MEASURES COMPLETION REPORT

HOLLOMAN AIR FORCE BASE, OTERO COUNTY, ALAMOGORDO, NEW MEXICO

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LIST OF ACRONYMS AND ABBREVIATIONS

Bhate	Bhate Environmental Associates, Inc.
COC	Contaminant of concern
DO	Delivery Order
DRO	Diesel-range organics
EBASCO	Ebasco Environmental Corporation
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FWENC	Foster Wheeler Environmental Corporation
FT-31	Fire Training Area 31
GRO	Gasoline-range organics
HAFB	Holloman Air Force Base
JP-4	Jet fuel
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
µg/L	Micrograms per liter
µg/kg	Micrograms per kilogram
NAPL	Non aqueous-phase liquid
NFA	No Further Action
NMED	New Mexico Environment Department
ORO	Oil-range organics
OWS	Oil/Water Separator
PCS	Petroleum-contaminated soil
PID	Photoionization detector
POL	Petroleum, oils, and lubricants
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Rhino	Rhino Environmental Services, Inc.
RI	Remedial Investigation
SSHP	Site Safety and Health Plan
SSL	Soil Screening Level
SVOC	Semivolatile organic compound
SWMU	Solid Waste Management Unit
TCLP	Toxicity characteristic leaching procedure
T&D	Transportation and disposal
TDS	Total dissolved solids
TRPH	Total recoverable petroleum hydrocarbons
TPH	Total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers

LIST OF ACRONYMS AND ABBREVIATIONS – (CONTINUED)

UST	Underground storage tank
VCM	Voluntary Corrective Measures
VOC	Volatile organic compound
WQCC	Water Quality Control Commission

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Omaha District, has retained Bhate Environmental Associates, Inc., (Bhate) to prepare this *Voluntary Corrective Measures Completion Report* for the soil excavation activities at the Fire Training Area 31 (FT-31) on Holloman Air Force Base (HAFB), New Mexico. Bhate prepared this document for HAFB under the Service Contract with the USACE (Contract No. DACA45-03-D-0018, Delivery Order (DO) No. 1).

This report documents the Voluntary Corrective Measures (VCMs) performed to remove petroleum-contaminated soil (PCS) from the Environmental Restoration Program (ERP) Site FT-31, the Former Fire Protection Training Area. FT-31 is comprised of the following four Solid Waste Management Units (SWMUs):

- SWMU 39- Oil/Water Separator (OWS)
- SWMU 127- Waste Oil Tank
- SWMU 135- OWS Drainage Pit
- SWMU 170- Fire Training Area 1

Collectively, these four SWMUs are known as FT-31 and were integral to the operation of the former fire training area at HAFB. In 2001, SWMU 171- Fire Training Area 2, was removed from the list of SWMUs requiring corrective action. This list (Appendix 4-A), can be found in the HAFB **Resource Conservation and Recovery Act** (RCRA) *Hazardous Waste Facility Permit No. NM6572124422* issued by the New Mexico Environment Department (NMED) on February 24, 2004.

Initial VCMs at these SWMUs were performed by USACE and Foster Wheeler Environmental Corporation (FWENC). The original approach consisted of an air injection bioventing soil remediation system which was operated at the site from 1995 to 2001. The purpose of the bioventing system was to supply air to indigenous bacteria. The injection of air then accelerated the bioremediation of PCS in-situ. However, the system did not adequately remove PCS to the NMED Site Screening Levels (SSLs) for PCS and related hazardous constituents.

In 2002, the VCM approach for these SWMUs changed to an excavation, transportation, and disposal (T&D) operation where remaining PCS was excavated and soil samples were collected from the side walls of the excavations to document removal of PCS exceeding the NMED SSLs. The work was begun by FWENC and completed by Bhate. Excavated soil was transported offsite to a permitted landfarm operated by Rhino Environmental Services, Inc. (Rhino). Clean soil was imported and used to backfill the VCM excavations.

This document describes the activities of the VCM at SWMUs 39, 127, 135, and 170, collectively known as Site FT-31. Also, the report summarizes the previously known subsurface conditions, the extent of PCS, and impacts to groundwater. The conclusion of the document requests that NMED issue a No Further Action (NFA) for these SWMUs based upon Criterion #5 which states (NMED 1995):

"The site was characterized or remediated in accordance with applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use."

This criterion was accomplished by removing the PCS present at the site which had exceeded the NMED SSLs.

1.1 Technical Approach

Activities were conducted in accordance with the *Phase I Project Plans for Remediation of POL-Contaminated Sites and Oil/Water Separator (OWS) Removals* (Ebasco Environmental Corporation [EBASCO] 1995), the *Revised Final Letter Work Plan for Petroleum Contaminated Soil Excavation at SS-17, FT-31 and West POL Yard* (FWENC, 2003) which included the work plan, quality assurance project plan, field sampling and analysis plan, and contractor quality control plan; and the *Basewide Site Safety and Health Plan (SSHP)* (FWENC, 2000a).

1.2 Report Organization

The remainder of this report is organized as follows:

- Section 2 provides a summary of previous investigations and describes the extent of soil and groundwater contamination before any VCM was performed.
- Section 3 summarizes the VCM PCS excavation and soil sampling activities.
- Section 4 provides conclusions and recommendations for the Request for NFA based upon NMED Criterion #5.

2 SITE BACKGROUND

Site FT-31, which contains SWMUs 39, 127, 135, and 170, is located north of the Main Base Area and west of the former Main Base Landfill (Figure 1). Collectively, these SWMUs were used to simulate aircraft and fuel fires for training the HAFB Fire Department. The site consists of a circular gravel bermed area (SWMU 170) which contained a mock-up of a large aircraft, a waste oil tank (SWMU 127), an OWS (SWMU 39), and a drainage pit (SWMU 135) which accepted the effluent from the OWS. The site also contained an underground storage tank (UST) which supplied jet fuel (JP-4) to propagate training fires and was not listed as a SWMU.

2.1 Summary of Previous Investigations

Until 1979, waste oils, solvent, and fuel were delivered to FT-31 from all major industrial shops. The flammable liquids were sprayed on the mock aircraft and ignited for the training exercises. Beginning in 1979 only new fuel was used in fire department training exercises. Training exercises included pre-soaking the area with water prior to fuel application and ignition. Fuels used for igniting fires were stored in an underground steel tank near the site. Most of the ignition materials were consumed in the fires; however, some percolation of these materials into the subsurface occurred. HAFB abandoned FT-31 in 1990 as a training facility and moved training exercises to a new propane fueled facility approximately 0.5 miles north.

The *Installation Restoration Program Records Search* (CH2M Hill, 1983) concluded that percolation of waste fuel and solvents into the soil and groundwater was inevitable; therefore, further investigation was recommended. The Phase II Stage I investigation (Dames & Moore 1984) of this site consisted of the installation of one monitoring well and the sampling of two soil borings. This study concluded that FT-31 had low levels of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) contamination and recommended further study.

The *Final Remedial Investigation Report for Installation Restoration Program Sites* (RI) conducted by Walk, Haydel, and Associates in 1989, consisted of a soil gas survey, installation of seven monitoring wells, drilling and sampling of two borings, and collection of four sediment samples. The RI report concluded that extensive soil and water contaminated with total petroleum hydrocarbons (TPH), VOCs, and some SVOCs was found in the OWS area and recommended that the OWS be removed.

The NMED requested further investigation at the site and a *Phase I RCRA Facility Investigation* (RFI) (Radian Corp., 1993) was conducted at SWMUs 39, 127, and 135 in the northern part of the site (see Figure 2). An additional investigation was conducted in the southern portion of the site at SWMUs 170 and 171, as part of the Table 1 Phase II RFI *Report* (FWENC, 1995). These investigations delineated the impacts to soil and groundwater. In 1996, a bioventing remediation system was installed. The bioventing system was designed to remediate subsurface hydrocarbon impacts to soil and groundwater. Additionally, removal of the OWS (SWMU 39), the waste oil tank (SWMU 127), the OWS drainage pit (SWMU 135), the circular gravel area (including the plane), the JP-4 UST, and the excavation of the surrounding PCS were performed between 1996 and 1999.

2.2 Extent of Soil and Groundwater Contamination Prior to the VCM

Several investigations have been conducted at Site FT-31. The most comprehensive representation of the nature and extent of PCS and other constituents is presented in the Table 1 Phase II RFI *Report* (FWENC, 1995). The Table 1 Phase II RFI report integrated the soil and groundwater analytical results from two prior investigations (the 1989 RI performed by Walk, Haydel, and Associates and the 1993 Phase I RFI performed by Radian Corp.) with an additional 45 soil and 12 groundwater sample analytical results. Therefore, the data presented in Table 1 Phase II RFI is representative of site conditions prior to remedial efforts carried out by the VCM.

2.2.1 Extent of PCS in Soil

The analytical results for soil data compiled in the Table 1 Phase II RFI are graphically represented in Figures 3 and 4. Figure 3 presents the lateral extent of PCS where concentrations of total recoverable petroleum hydrocarbons (TRPH) by Method 418.1 exceed 1,000 milligrams per kilogram (mg/kg). In turn, Figure 4 provides a series of idealized cross sections illustrating the vertical extent of PCS using maximum TRPH concentrations reported. TRPH concentrations in soil beneath SWMUs 39, 127, and 135 ranged from 1,130 mg/kg to 31,800 mg/kg. TRPH in soil beneath SWMU 170 ranged from 1,060 mg/kg to 11,500 mg/kg. Additional PCS in excess of 1,000 mg/kg was detected near the dispensing area of the JP-4 tank where concentrations ranged between 1,170 mg/kg and 3,760 mg/kg. The maximum concentrations of VOCs detected in soil beneath these SWMUs were: benzene (2,200 micrograms per kilogram (µg/kg) at 31-B15 18 to 20 feet), ethylbenzene (19,000 µg/kg at 31-B15, 18 to 20 feet), toluene (13,000 µg/kg at 31-B11, 18 to 30 feet), xylenes (97,000 µg/kg at 31-B17, 6 to 8 feet) and 1,1,1-trichloroethane (2,000 µg/kg at 31-B15, 18 to 20 feet). The maximum concentrations of SVOCs detected in soil beneath these SWMUs were 2-methylnaphthalene (8.6 µg/kg at 31-B17, 6 to 8 feet), and naphthalene (5.0 µg/kg at 31-B17, 6 to 8 feet).

2.2.2 Estimated Volume of Contaminated Soil

An estimate of the volume of PCS present at FT-31 was calculated based upon the delineation provided in the Table 1 Phase II RFI. The conservative estimate was calculated by determining the area of contamination from the map provided in Figure 3 and multiplying it by the depth to groundwater (21 feet). Using this method, the following volumes of PCS would have been present at each area of contamination prior to the VCM:

SWMU	DESCRIPTION	PCS (cubic yards)
39, 127, & 135	OWS, Waste Oil Tank & OWS Drainage Pit	5,200
170	Training Area No. 1	10,000
	JP-4 Tank (above ground)	2,600
Total Volume of PCS at FT-31		**17,800**

The weight of this volume of PCS (using a conversion factor of 1.13 tons per cubic yard) is 15,752 tons.

2.2.3 Extent of Groundwater Contamination

Figure 5 is a map of FT-31 illustrating the extent of groundwater containing any detectable concentrations of VOCs and SVOCs. The extent of contamination appears to be limited to the immediate area of each SWMU. Chlorinated VOCs such as 1,1-dichloroethene (8.7 micrograms per liter (µg/L) at 31-MW13) and trichloroethene (4.7 µg/L at 31-MW03) were limited to a small plume beneath the JP-4 UST. The maximum concentrations of petroleum related VOCs such as benzene (4,500 µg/L), toluene (360 µg/L), ethylbenzene (1,600 µg/L), and xylenes (560 µg/L) were all identified in groundwater at well 31-W1 which is located immediately adjacent to SWMUs 39 (OWS), 127 (waste oil tank), and 135 (the OWS drainage pit). The only SVOC positively identified was bis-2-ethylhexylphthalate (0.017 µg/L) at well 31-MW-13. No non-aqueous phase liquid (NAPL) was identified at the FT-31 site.

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3 VCM EXCAVATION AND SAMPLING ANALYTICAL RESULTS

Three distinct areas of excavation, the north area, the south area, and the east area, were necessary to remove the PCS from the four SWMUs at Site FT-31. The extent of these excavations and associated SWMUs are illustrated in Figure 6. Initial excavation and sampling were performed by FWENC between November 2002 and January 2003. The remaining efforts were tasked to Bhate and were performed between March and July 2003. Laboratory analytical results are attached as Appendix A.

3.1 Excavation Activities

Excavation of PCS required removal of a considerably larger volume of "clean" soil to provide access to the PCS. Safe and effective extraction of PCS could not be accomplished without "over excavation" of "clean" soil. Much of the soil excavated at each distinct area was clean soil as documented both by the Table 1 Phase II RFI data and through field screening. Soils excavated during the VCM were field screened with a photoionization detector (PID) to confirm that the soils were not contaminated. Clean soil removed to expose known PCS that either exhibited a PID response, hydrocarbon odors, and/or was visibly stained was classified as "suspect soil" and was segregated and placed on plastic liners for additional sampling and laboratory analysis. Every 100 cubic yards of suspect soil was sampled for laboratory analysis (sample prefix FT31-SP) of PCS contaminants. A summary of the excavations are presented in Sections 3.1.1., 3.1.2, and 3.1.3 below. Section 3.2 describes the soil sampling and analytical procedures for each area and stockpiled "suspect soil". Section 3.3 describes the site restoration activities and Section 3.4 describes the transportation and disposal of impacted soil. Post VCM groundwater quality is presented in Section 3.5.

3.1.1 East Excavation (SWMU 170 and JP-4 Tank)

The east excavation, which encompassed SWMU 170 and the former location of the above ground tank that contained JP-4, was the first excavation at FT-31. FWENC began initial excavation and removal activities in November 2002, and completed soil sampling and laboratory analysis of the sidewalls in January 2003.

The approximate area of the final excavation was 13,000 square feet with a maximum depth of 21 feet. The calculated volume removed from the excavation was 10,110 cubic yards. Of this volume, approximately 5,880 cubic yards of soil were determined by visual inspection and PID screening to be clean and thus stockpiled for return to the pit. Another 2,200 cubic yards of soil were determined to be "suspect" for PCS contamination and were placed on liner material. Samples were collected at approximately 100 cubic yard intervals for laboratory analysis. Approximately 2,030 cubic yards (2,298 tons) of PCS were excavated and transported offsite for disposal as New Mexico Special Waste by Rhino Environmental Services, Inc. (Rhino). "Suspect" soil was sampled and determined to be less than the NMED SSLs for PCS and was returned to the excavation as backfill. Laboratory analytical results for suspect soils are discussed in Section 3.2.4. Approximately 2,000 cubic yards of clean imported gravel fill material was placed in the excavation at the completion of the sidewall confirmation sampling

and analysis. The clean soil that was removed or benched to reveal the PCS was graded back into the excavation. Appendix B provides copies of the waste manifests for the soil requiring offsite disposal. Appendix C presents photographs taken during the excavation field activities.

3.1.2 South Excavation (SWMU 170)

The south excavation encompasses the area of SWMU 170 (Fire Training Area 1). Bhate began excavation and removal activities at the south excavation in March 2003, and completed excavation, soil sampling, and laboratory analysis of the sidewalls in June 2003. The approximate area of the final excavation was 23,800 square feet with a maximum depth of 21 feet. The calculated volume removed from the excavation was 18,510 cubic yards.

Of this volume, approximately 1,000 cubic yards of soil were determined by visual inspection and PID screening to be clean and thus stockpiled for return to the pit. Another 4,250 cubic yards of soil were determined to be "suspect" for petroleum hydrocarbon contamination and were placed on liner material. A soil sample was collected at approximately 100 cubic yard intervals for laboratory analysis. Approximately 13,275 cubic yards (15,000 tons) of PCS were excavated and transported offsite for disposal as New Mexico Special Waste by Rhino. "Suspect" soil was sampled and determined to be less than the NMED SSLs for PCS. The soil was returned to the excavation as backfill. Approximately 15,000 cubic yards of clean imported gravel fill material was placed in the excavation at the completion of the sidewall confirmation sampling and analysis. The clean soil that was removed or benched to reveal the PCS was graded back into the excavation. Appendix B provides copies of the waste manifests for the soil requiring offsite disposal. Appendix C presents photographs taken during the excavation field activities.

3.1.3 North Excavation (SWMUs 39 and 127)

The north excavation encompasses the area of SWMUs 39 and 127. Bhate began excavation and removal activities at the north excavation in June 2003, and completed excavation, soil sampling, and laboratory analysis of the sidewalls in July 2003. The approximate area of the final excavation was 9,600 square feet with a maximum depth of 21 feet. The calculated volume removed from excavation was 7,470 cubic yards.

Approximately 1,970 cubic yards of this volume were determined by visual inspection and PID screening to be clean and thus stockpiled for return to the pit. Approximately 2,750 cubic yards of soil were determined to be "suspect" for petroleum hydrocarbon contamination and were placed on liner material. A soil sample was collected at approximately 100 cubic yard intervals for laboratory analysis. A total of approximately 2,750 cubic yards (3,100 tons) of PCS were excavated and transported offsite for disposal as New Mexico Special Waste by Rhino. "Suspect" soil that was determined to be less than the NMED SSLs for PCS was returned to the excavation as backfill. Approximately 2,800 cubic yards of clean imported gravel fill material was placed in the excavation at the completion of the sidewall confirmation sampling and analysis. The clean soil that was peeled back to reveal the PCS was graded back into the excavation. Appendix B provides copies of the waste manifests for the soil requiring offsite disposal. Appendix C presents photographs taken during the excavation field activities.

3.2 Soil Sampling and Analytical Procedures

To determine the effectiveness of the VCM, confirmation soil samples were collected from the sidewalls of the excavations (labeled with the prefix FT31-EX-) at a frequency of one sample per 20 linear feet of sidewall. Soil samples were collected from the stockpiled "suspect" soil (approximately 1 per 100 cubic yards) to determine the appropriate classification of the soil. These soil samples were submitted for laboratory analysis. Copies of laboratory reports and data validation findings are provided in Appendix A.

Confirmation soil samples were collected from the sidewalls of each of the excavations. Sampling of the side-wall was performed laterally at 20-foot intervals and vertically at 3-foot depth intervals at each location. For example, soil sample FT31EX06-17 was collected from the sidewall of the excavation at station EX06 from 17 feet above the water table (approximately 4 feet below the ground surface). Soil samples were collected from three levels, approximately 0 to 4 feet, 10 to 12 feet, and 15 to 21 feet above the water table at each sample station along the perimeter of the wall. No samples were collected from the bottom of the excavations because the excavations extended to the water table. Excavation confirmation samples were analyzed by the offsite laboratory for the following:

- TPH as diesel-range organics (DRO), gasoline-range organics (GRO), and oil-range organics (ORO) by EPA Method 8015 Modified
- VOCs by EPA Method 8260B
- SVOCs by EPA Method 8270C

The results of the laboratory analyses were reviewed and compared to the SSLs. The SSLs for TPH were derived from averaged TPH values for diesel #2, fuel oil #3, fuel oil #6, crankcase oil, kerosene, and jet fuel from the *New Mexico Environment Department TPH Screening Guidelines* (June 2003). The SSLs for other contaminants of concern (COCs) were calculated values using the data and equations provided in the *New Mexico Environment Department Technical Background Document for Development of Soil Screening Levels* (revised February 2004).

3.2.1 East Excavation Sidewall Soil Analytical Results

Confirmation samples were collected by FWENC at a total of 53 locations at varying depths from the sidewalls along the perimeter of the east excavation (Figure 7). Samples were collected according to the protocol presented in Section 3.1 of the work plan (FWENC, 2003a). Concentrations in these samples did not exceed the associated SSLs. The results of the FWENC sampling for the east excavation confirmation samples are presented in Table 3-1.

3.2.2 South Excavation Sidewall Soil Analytical Results

Confirmation samples were collected by Bhate at a total of 36 locations at varying depths from the sidewalls along the perimeter of the south excavation (Figure 8). Samples were collected in accordance with the protocol presented in Section 3.1 of the work plan (FWENC, 2003a). Concentrations in these samples did not exceed the associated SSLs. The results of the Bhate sampling for the south excavation confirmation samples are presented in Table 3-2.

3.2.3 North Excavation Sidewall Soil Analytical Results

Confirmation samples were collected by Bhate at a total of 29 locations at varying depths from the sidewalls along the perimeter of the north excavation (Figure 9). Samples were collected in accordance with the protocol presented in Section 3.1 of the work plan (FWENC, 2003a). Concentrations in these samples did not exceed the associated SSLs. The results of the Bhate sampling for the north excavation confirmation samples are presented in Table 3-3.

3.2.4 Stockpile Analytical Results

A total of 78 soil samples were collected by FWENC and Bhate from stockpiled "suspect" soil at a frequency of approximately one sample every 100 cubic yards. The approximation of the sample frequency to soil volume is due to several factors such as different soil compositions, varied moisture content (particularly the difference between soils excavated above and below the water table), and the field measurement of approximately 100 cubic yards in each soil stockpile. Stockpile samples were analyzed by the offsite laboratory for the following:

- TPH as DRO, GRO, and ORO by EPA Method 8015 Modified
- VOCs by EPA Method 8260B
- SVOCs by EPA Method 8270C

The offsite laboratory also analyzed the FWENC samples for toxicity characteristic leaching procedure (TCLP) RCRA metals, RCRA VOCs, RCRA SVOCs, reactivity, and ignitability when TPH results were greater than 940 mg/kg. As presented in Tables 3-4 and 3-5, evaluation of the analytical results indicated that 20,398 tons (18,050 cubic yards) of soil removed from the three excavations required offsite disposal. Approximately 4,500 cubic yards of the stockpiled soil removed from the three excavations was determined to be clean and was used as backfill during the site restoration activities.

3.3 Site Restoration

Site restoration activities for the project included backfilling the excavation with clean soil stockpiled during the excavation and additional base reuse material as needed. The backfill was compacted with a sheep's foot vibrating compactor. Soil with TPH concentrations less than 940 mg/kg was also used for backfill.

Borrow soil from the HAFB reuse area was used by FWENC to backfill the east excavation to within 12 to 15 feet from surface grade. The site was secured with a perimeter storm water safety berm. Following these east excavation site restoration activities, the USACE project engineer performed a completion inspection in January 2003. In March 2003, Bhate completed the backfilling of the east excavation that was begun by FWENC. The excavation was graded to existing surface topography and slightly arched to provide drainage for storm water run-off.

Clean borrow soil from the FT-31 excavations was used by Bhate to backfill the north and south excavations, supplemented by soil from the HAFB reuse area. The north and south excavation site restoration activities were completed in June 2003.

3.4 PCS Transportation and Disposal

Rhino transported approximately 2,300 tons (approximately 2,035 cubic yards) of PCS in excess of 940 mg/kg to their landfarm facility in Newman, New Mexico, during the FWENC excavation activities in 2002 and 2003. Rhino transported an additional 18,098 tons (approximately 16,020 cubic yards) of PCS to their landfarm during the Bhate excavation activities in 2003. The waste manifests for contaminated soil from the excavations are presented in Appendix B.

3.5 Post VCM Groundwater Quality

During the VCM, groundwater was exposed and subjected to aeration and sunlight for several weeks. This exposure, along with the removal of PCS, may have promoted volatilization and photodegradation of the contaminants previously identified in groundwater samples from the site.

After the VCM, only two of the monitoring wells remained at the FT-31 site. However, four new monitoring wells were installed in the immediate proximity of the former SWMUs. These wells, labeled LM-01 through LM-04, were installed in August 2003. Figure 10 is a site map illustrating the locations of remaining groundwater monitoring wells at FT-31. These wells were installed to monitor groundwater quality at the PCS landfarm, subsequently constructed on the site of FT-31 in August 2003. Groundwater samples were collected and analyzed for VOCs, SVOCs, and total dissolved solids (TDS). Data from the first two rounds of quarterly groundwater sampling collected from wells (August 26 and November 8, 2003) is tabulated and presented in Table 3-6 and the laboratory results are attached in Appendix B. VOCs or SVOCs, were not above detection limits in the samples collected from these monitoring wells.

TDS in groundwater beneath FT-31 has ranged from 18,300 milligrams per liter (mg/L) to 23,300 mg/L. Also, continual quarterly monitoring of these wells has not detected VOCs or SVOCs above detection limits. Groundwater flow direction data collected during the landfarm monitoring is consistent with the Table 1 Phase II RFI direction of south-southeast.

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4 CONCLUSIONS AND RECOMMENDATIONS

PCS identified in the Table 1 Phase II RFI for FT-31 (SWMUs 39, 127, 135, and 170) and the JP-4 fuel tank were excavated and transported offsite for treatment and disposal. Soil samples collected from the sidewalls of each excavation (confirmation samples) provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs. Analytical results from groundwater samples collected at the site do not contain VOCs or SVOCs above detection limits. TDS in groundwater at the site is in the 20,000 mg/L range which exceeds the *New Mexico Water Quality Control Commission Regulations* (20.6.2 NMAC) (WQCC) standard for potable groundwater.

PCS excavated from the area of the SWMUs was transported offsite for treatment and disposal. Soil that was analyzed during the excavation process and determined to be acceptable for backfilling along with imported clean material was used to backfill the excavations.

Based upon the sampling, laboratory analytical results, and documentation of excavation and disposal provided, NFA is recommended for the following SWMUs at site FT-31:

- SWMU 39 OWS
- SWMU 127 Waste Oil Tank
- SWMU 139 OWS Drainage Pit
- SWMU 170 Fire Department Training Area 1

NFA for these SWMUs is based upon NMED Closure Criterion #5 which states:

> *"The site was characterized or remediated in accordance with applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use."*

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FIGURES