DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

ENTERED

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DEC 2011
NMED Hazardous Waste Bureau

A. David Budak
Deputy Base Civil Engineer
550 Tabosa Avenue
Holloman AFB NM 88330-5840

New Mexico Environment Department
Attn: Mr. John Kieling
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87105-6303

Dear New Mexico Environment Department

Holloman Air Force Base is pleased to submit the response to comments to your October 31 Notice of Disapproval Class 3 Permit Modification Request for Ten Solid Waste Management Units (SWMUs). Attached you will find our responses to comments and the corrected Statement of Basis.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. David Scruggs of our Asset Management Flight at (575) 572-5395.

Sincerely

2011 12 14

A. DAVID BUDAK, GS-14, DAFC

2 Attachments:
1. Response to Comments
2. Statement of Basis for Ten SWMUs

cc:

(w/ Atch)	(w/o Atch)	(w/o Atch)
Mr. David Strasser	Mr. Will Moats	Ms. Laurie King
Hazardous Waste Bureau	Hazardous Waste Bureau	USEPA, Region 6 (6PD-F)
5500 San Antonio Dr. NE	5500 San Antonio Dr. NE	1445 Ross Ave., Ste 1200
Albuquerque NM 87109	Albuquerque NM 87109	Dallas TX 75202

7011 0470 0000 2285 9488

RESPONSE TO COMMENTS

STATEMENT OF BASIS
FOR APPROVAL OF
NO FURTHER ACTION FOR TEN SOLID WASTE MANAGEMENT UNITS

March 2007

RCRA CORRECTIVE ACTION PROGRAM

HOLLOMAN AFB, NEW MEXICO

The following table contains the comments provided by the New Mexico Environment Department (NMED) in the October 31, 2011 Notice of Deficiency and the response by Holloman Air Force Base to each comment.

	NMED Comment:	Comment Response:
1.	**General Comment:** The Permittee shall submit revised Tables A and B of Appendix 4-A of Permit Part 4 showing the redline-strikeout and clean versions of the proposed changes to the Tables. The revised Table A must show the addition of AOC-838 (SS-72) and AOC-1088 (SS-73) as new sites.	Tables A and B have been provided in both the clean and redline strikeout versions.
2.	**Page 5, Section C, 1st Paragraph, 3rd Sentence:** The Permittee shall revise this sentence to indicate that the Permit was renewed on February 24, 2004	The Figure has been revised to reflect the change requested in the comment.
3.	**Figure 2.** The Permittee shall revise this Figure to show the correct location of AOC-S at the corner of 1st Street and Arnold Ave.	The Figure has been revised to reflect the change requested in the comment.
4.	**Page 9, Sections G and H, Public Participation and Further Steps.** The Permittee shall revise these Sections to provide a discussion about the Public Meeting that the Permittee held on June 6, 2008 and to provide its results (i.e. that no public comments or public hearing request were received	The Figure has been revised to reflect the change requested in the comment.
5.	**Page 23, Section J3, ERP Site FT-31.** The Permittee shall provide the status of the Discharge Permit(s) issued by the NMED, Ground Water Quality Bureau for the Hydrocarbon Land Farm, including the permit number(s), termination date, and reasons for termination	The Figure has been revised to reflect the change requested in the comment. Information regarding the status and permit number have been included.

APPENDIX 4-A

SUMMARY OF SOILID WASTE MANAGEMENT UNITS

TABLE A

The following is the Prioritized list of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Corrective Action

SERIAL NO.	SWMU	ERP SITE ID	UNIT NAME
1	4	SD-08	Building 131 Oil/Water Separator
2	8	N/A	Building 231 Oil/Water Separator
3	19	SS-59	Building 638 Oil/Water Separator
4	20	SS-59	Building 639 Oil/Water Separator
6	82	N/A	Building 131 Washrack
7	101	LF-10	Building 121 Landfill
8	104	LF-29	Former Army Landfill
9	105	LF-19	Golf Course Landfill
11	108	LF-23	MOBSS Landfill Disposal Trench
12	109	LF-10	Old Main Base Landfill
13	111	RW-42	Radioactive Waste Disposal Area
14	113A	OT-20	Sludge Disposal Trench near Lagoons
15	113B	DP-30/SD-33	Sludge Disposal Trenches Fire Training Area
16	114	OT-03	TEL Disposal Site
17	115	LF-22	Waste Area Landfill #1 PCB Disposal Area
18	116	LF-21	West Area Landfill #2
19	118	OT-16	Building 21 Pesticides Holding Tank
20	122	N/A	Building 702 Waste Oil Tank
21	123	N/A	Building 704 Waste Oil Tank
23	130	SS-46	Taxiway 4 Tank 28 JP-4 Underground Waste Tank
24	132	OT-16	Building 21 Entomology Leachfield
26	136	N/A	Building 1119 Washrack Drainage Area
27	137	OT-38	Building 1166 Test Track Drain Field
28	139	OT-37	Lake Holloman
29	140	N/A	Lake Stinky
30	141	SD-27	Pad 9 Drainage Pit
31	165	SS-39	Building 1176 Pond
32	166	SD-25	MOBSS Drainage Lagoon
34	177	SS-39	Building 1176 Sumps
35	179	SS-39	Discharge Box
36	181	SS-39	Building 1176 Drainage Trough
37	183	N/A	Air Base Sewer System
38	197	OT-14	Former Entomology Shop

SERIAL NO.	SWMU/AOC	ERP SITE ID	UNIT NAME
39	229	SS-59	Test Cell Fuel Spill Site
40	AOC-1	DP-64	Chemical Agent Site
42	AOC-3	DP-63	Ammunition Yard Disposal Pit
43	AOC-4	N/A	West POL Fuel Spill Site
44	AOC-1001	SS-61	Building 1001 Fuel Spill Site
45	AOC-FST837	N/A	Building 837 Fuel Spill Site
46	AOC-A	OT-16	Building 21 Pesticide Rinsewater Spill Area
47	AOC-B	SS-65	Building 807 Test Cell Surface Spill Area
48	AOC-C	SS-66	Building 835 Spills
49	AOC-E	SS-67	Buildings 903-909 Sand Blast Residues
51	AOC-H	SS-18	Chromic Acid Spill Area
52	AOC-I	SS-69	Fighter Wing Flight Line Spill
53	AOC-J	SS-13	Herbicide Sodium Arsenite Spill Area
54	AOC-K	SS-12	Northeast Fuel Line Spill #1
55	AOC-L	OT-37	Early Missile Test Site
56	AOC-M	RW-70	Building 18
57	AOC-N	SS-48	Building 137 Military Gas Tank Leak
58	AOC-O	OT-45	Building 296 Old AGE Refueling Station
59	AOC-P	OT-44	Building 301 Fuel Tank Leak
60	AOC-Q	SS-17	BX Gas Station Fuel Line Leaks
62	AOC-RD	DP-62	Rita's Draw Disposal Pit
64	AOC-T	SS-05	POL Storage Tank Spill Sites 1 & 2
65	AOC-U	N/A	Lost River Basin
69	PRI-A	OT-35	Primate Research Lab Sewer Line
70	AOC-838	SS-72	TCE in Groundwater up-gradient of LF-21
71	AOC 1088	SS-73	TEC in Groundwater up-gradient of SS61

TOTAL OF CORRECTIVE ACTION SITES = 59 [i.e., 35 SWMUs + 24 AOCs].

STATEMENT OF BASIS FOR APPROVAL OF NO FURTHER ACTION FOR TEN SOLID WASTE MANAGEMENT UNITS

RCRA CORRECTIVE ACTION PROGRAM

HOLLOMAN AFB, NEW MEXICO

Prepared By:

49 CES/CEV
Environmental Flight
550 Tabosa Avenue
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New Mexico

December 2007

STATEMENT OF BASIS FOR APPROVAL OF NO FURTHER ACTION FOR TEN SOLID WASTE MANAGEMENT UNITS

RCRA CORRECTIVE ACTION PROGRAM

HOLLOMAN AFB, NEW MEXICO

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ACRONYMS AND ABBREVIATIONS

AAF	Army Air Field
AFB	Air Force Base
amsl	Above mean sea level
AOC	Area of Concern
AS	Air Sparging
AST	Aboveground storage tank
ASTM	American Society foresting Materials
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
BTEX	Benzene, toluene, ethyl benzene, xylenes
BHUST	Base Hospital Underground Storage Tank
CA	Corrective Action
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES/CEV	Civil Engineering Squadron/Combat Engineer Vehicle
COPC	Chemicals of potential concern
CSM	Conceptual site model
cy	Cubic yards
DPT	Direct Push Technology
DRO	Diesel-Range Organics
EM	Exposure Model
ERP	Environmental Restoration Program
ESA	Ecological Screening Assessment
°F	Degrees Fahrenheit
ft	Feet or foot
FWENC	Foster-Wheeler Environmental Corporation
GRO	Gasoline-Range Organics
HAFB	Holloman Air Force Base
HHRA	Human Health Risk Assessment
HSWA	Hazardous and Solid Waste Amendments
HVAC	Heating, ventilation, and air conditioning
IRP	Installation Restoration Program
J&E	Johnson and Ettinger
JP-4	Jet Fuel (formula 4)
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
mg/L	Milligram per liter
$\mu g/m^3$	Micrograms per cubic meter
µg/g	Micrograms per gram
µg/kg	Micrograms per kilogram
ND	Not detected

NFA	No Further Action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	Oil-Range Organics
OWS	Oil/Water Separator
pCi/g	PicoCuries per gram
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
PCS	Petroleum-Contaminated Soils
PID	Photoionization Detector
POL	Petroleum, Oil and Lubricants
PRG	Preliminary Remediation Goals
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SI	Site Investigation
SOB	Statement of Basis
SSL	Soil Screening Level
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
T&D	Transportation and disposal
TAL	Target Analyte List
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper tolerance limit
VCM	Voluntary Corrective Measures
VOC	Volatile Organic Compounds
TPHCWG	Total Petroleum Hydrocarbon Criteria Working Group
ROEs	Routes of exposure
SSTLs	Site-Specific Target Levels

A. INTRODUCTION

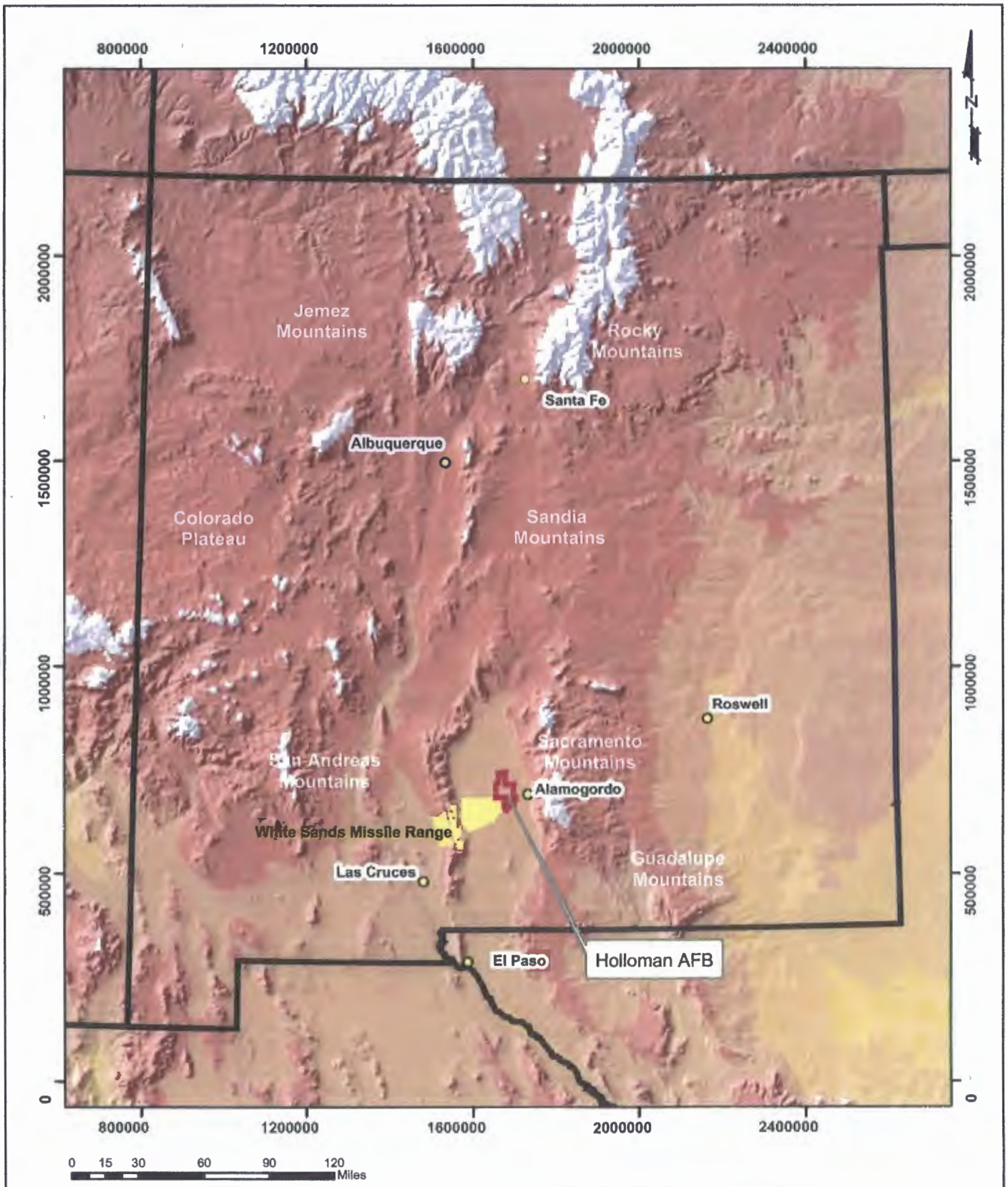
The New Mexico Environment Department (NMED) has made a final determination to approve the Holloman Air Force Base (HAFB) request to remove 10 Solid Waste Management Units (SWMUs) from the Hazardous and Solid Waste Amendments (HSWA) Corrective Action module Resource Conservation and Recovery Act (RCRA) permit No. NM 657214422-1.

B. FACILITY DESCRIPTION

HAFB is situated in south central New Mexico, in the northwest central part of Otero County, approximately 75 miles north-north-east of El Paso, Texas (**Figure 1**). HAFB has a population of 6,000 and occupies about 50,000 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the Base. Private and public owned lands border the remainder of HAFB. The major highway servicing HAFB is Highway 70, which runs southwest from the town of Alamogordo and separates HAFB from publicly owned lands to the south. Alamogordo which has a population of approximately 35,000 is located approximately 7 miles east of the base.

HAFB was first established in 1942 as Alamogordo Army Air Field (AAF). From 1942 through 1945, Alamogordo AAF served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of un-manned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed Holloman Air Force Base, in honor of the late Col. George V. Holloman; a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at HAFB and has remained since. Today, HAFB also serves as the training center for the German Air Force's Tactical Training Center.

Holloman AFB is located within the Sacramento Mountains Physiographic Province on the western edge of the Sacramento Mountains. HAFB is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet above mean sea level (amsl). The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward and of west-facing escarpments with the wide bracketed basin forming the basin and range complex. The Base is located in the Tularosa Sub-basin which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 feet amsl. The San Andres Mountains bound the basin to the west (about 30 miles) with the Sacramento Mountains approximately 10 miles to the east. At its widest, the basin is about 60 miles east to west and stretches approximately 150 miles north to south.



bhate associates
ENGINEERING, SCIENCE AND CONSTRUCTION

Holloman AFB Location Map

PROJECT NO.	SCALE	DATE	DRAWN BY:
	Shown	2/20/07	cm
			DRAWING NO: Figure 1

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 1

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to the Base comes from the Lost River, located in the north-central region of the Base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. HAFB is dissected by several southwest trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Rita's Draw, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the Base. Approximately 10,000 years ago, indications are of a much wetter climate. The present day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water bearing deposits over the older bedrock basement material. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin with more saline water towards the center. Two of the principal sources of potable water are a long narrow area on the upslope sides of Tularosa and Alamogordo with the other in the far southwestern part of the basin. A portion of Alamogordo's water, as well as the Base's, is supplied from Lake Bonito (which is in the Pecos River Basin).

The sedimentary rocks which make up the adjacent mountain ranges are between 500 and 250 million years old. During the period when the area was submerged under the shallow intra-continental sea, the layers of limestone, shale, gypsum, and sandstone were deposited. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago the center began to subside resulting in a vertical drop of thousands of feet leaving the edges still standing (the present day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e. Tularosa Basin). Water carrying eroded gypsum, limestone, dolomite, gravel, and other alluvial matter continues to flow into the basin with no route of exit.

The Tularosa Sub-basin is geologically described as a bolson, which is an extensive flat alluvium-floored depression, into which drainage from the surrounding mountains flows toward a central playa. The overlying alluvium generally consists of unconsolidated gravels (limestone, dolomite, and gypsum), sands, and clays. A fining sequence from the San Andreas and Sacramento Ranges towards the basin's center characterizes the area with the near surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of silty clay containing gypsum and are contiguous with the alluvial fan and eolian deposits.

The predominance of the groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream run-off along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges, and flows downgradient through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area only leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath HAFB, groundwater ranges from 5 to 50 feet. Flow for the Base is generally towards the southwest with localized influences from the variations in the topography of the Base. Near the arroyos, groundwater flows directly toward the surface drainage feature.

Groundwater quality in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas (Radian, 1993). The majority (over 70 %) of the Environmental Restoration Program (ERP) Sites / SWMUs / Areas of Concern (AOCs) located across HAFB, have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). This TDS data supports the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the New Mexico Water Quality Control Commission (NMWQCC) limit as potable water and thus, the groundwater beneath HAFB has been designated as unfit for human consumption. Likewise, U.S. Environmental Protection Agency (USEPA) guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L.

In addition, there are no potable water wells on HAFB. Potable water for the base and the city of Alamogordo is derived from the nearby Sacramento Mountains. The only production water well, used for livestock irrigation, is located approximately 12 miles southwest of Spill Site SS-61.

As a whole, New Mexico has a mild, arid to semi-arid continental climate characterized by light precipitation totals; abundant sunshine, relatively low humidity and relatively large annual and diurnal temperature range. The climate of the Central Closed Basins varies with elevation. The Base is found in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit (°F) in the summer months and middle 50s in the winter. A preponderance of clear skies and relatively low humidity permits rapid night time cooling resulting in average diurnal temperature ranges of 25 to 35°F. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 10 inches. The very low rainfall amounts resulting in the arid conditions, which with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized "dust devils". Much of the precipitation falls during the mid-summer monsoonal period

(July and August) as brief, yet frequent, intense thunderstorms culminating to 30 – 40% of the annual total rainfall.

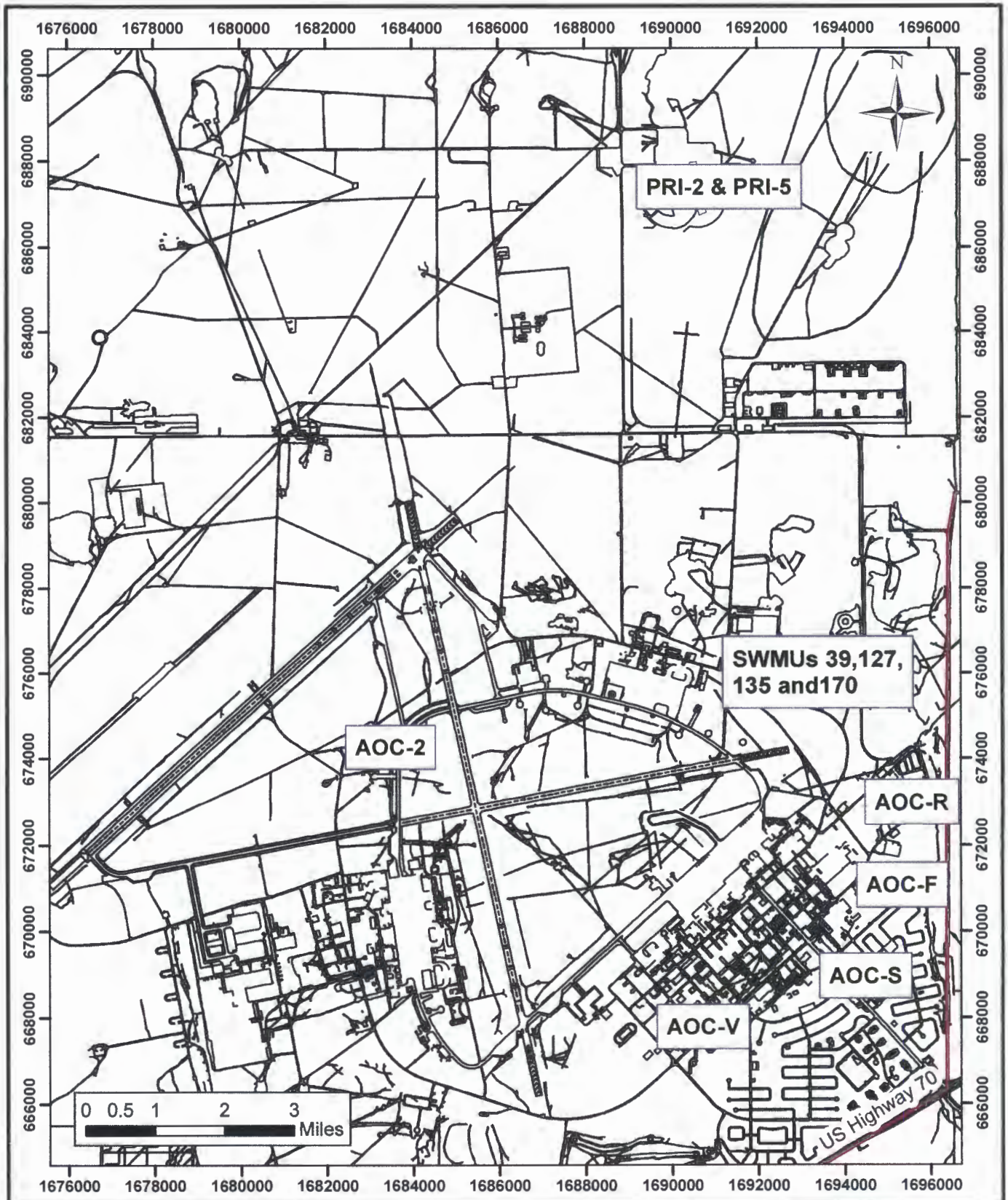
C. HISTORY OF INVESTIGATION

At HAFB, investigation and remediation of SWMUs is conducted under both the Air Force's ERP and the RCRA Corrective Action Program. The ERP program [formerly the Installation Restoration Program (IRP)] was initiated in 1983 and the RCRA Facility Assessment (RFA) was conducted in 1987. A RCRA Permit and the HSWA module was issued to HAFB in 1991 and became effective on September 25, 1991 and was revised February 24, 2004. Since the permit became effective, investigations and remediation of SWMUs and AOCs at the Base have been conducted under the RCRA Facility Investigation (RFI) and Corrective Action (CA) guidelines. Table A of Appendix 4-A of the Base RCRA Facility Permit identifies SWMUs and AOCs at the Base requiring CA. Table B of Appendix 4-A of the Base RCRA Facility Permit contains SWMUs and AOCs not currently requiring CA. Initially, approximately 236 potential SWMUs and 29 AOCs were listed on Table A. Currently, 62 sites remain on Table A. The remaining sites have been transferred through this process to Table B.

This document has been prepared to provide NMED with the basis for removing an additional 10 SWMUs and AOCs from the Base permit. **Figure 2** is a general map of the Base illustrating the locations of the ERP sites and SWMUs listed in this Statement of Basis.

D. INVESTIGATION RESULTS

The 2005 Statement of Basis resulted in the removal of seven sites from Table A of the RCRA permit. Since, the previous Statement of Basis, additional sites have undergone remediation or corrective action as directed by NMED. At present, 10 sites have been identified for No Further Action (NFA). Section J of this document contains a brief description of each of each site, the actions performed, the basis for removal from the permit, and relevant references concerning the site.



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ENERGY

Solid Waste Mangement Units for No Further Action Status

PROJECT NO	SCALE	DATE	DRAWN BY: WB
	Shown	11/28/2011	DRAWING NO. 2

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 2

E. PERMIT MODIFICATION

The administrative record for this proposed action consists of a legal notice, fact sheet, the NMED Statement of Basis for removal, the request for Permit Modification, related correspondence, documents, and the modified permit. The administrative record may be reviewed during normal business hours at:

New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Mr. John Kieling

(505) 428-2535

The legal notice, fact sheet, the NMED Statement of Basis, and modified permit may also be reviewed at:

Public Library of Alamogordo
920 Oregon Street
Alamogordo, New Mexico 883310

F. SELECTED REMEDY

The NMED determination that NFA is required at these SWMUs is based on sampling and analytical data, field surveys, documentation of remediation, historical records, aerial photographs, and employee interviews regarding operations at these sites. The determination for permit removal is based one or more of the following criteria:

NFA Criterion 1: The SWMU/AOC cannot be located, does not exist or is a duplicate SWMU/AOC.

NFA Criterion 2: The SWMU/AOC has never been used for the management (i.e. generation, treatment, storage and/or disposal) of RCRA solid waste or hazardous waste and/or constituents, or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.

NFA Criterion 3: No release to the environment has occurred or is likely to occur in the future from the SWMU/AOC

NFA Criterion 4: A release from the SWMU/AOC to the environment has occurred, but the SWMU/AOC was characterized and/or remediated under another authority (such as the NMED Petroleum Storage Tank, Solid Waste, or Groundwater Quality Bureaus).

NFA Criterion 5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Each site eligible for NFA is summarized in **Table 1**.

Table 1. List of SWMUs Proposed for NFA by Criteria

SWMU No.	SWMU Title	ERP Site No.	NFA Criteria No.
AOC-F	Asphalt Tank Spill Area	SS-68	1
PRI-2 & PRI-5	Spent Solvent Disposal Area	OT-35	5
SWMU 39 SWMU 127 SWMU 135 SWMU 170	Former Fire Training Area	FT-31	5
AOC-2	Sewage Disposal Area Taxiway G	AOC-2	5
AOC-R	JP-4 Fuel Line Spill Site	SS-06	5
AOC-V	Officer's Club	SS-57	5
AOC-S	Hospital Underground Storage Tank (UST)	HUST	5

G. PUBLIC PARTICIPATION

Requirements for public notification by the New Mexico Hazardous Waste Regulations include public notice in a local newspaper and sending notices to all persons on the facility mailing list maintained by the NMED. The notice announces the 60-day comment period for the request for permit modification. The notice indicates the date, time, and place for a public meeting. Also, the notice will provide a contact person and address for submitting written comments on the permit modification. Upon review of the request for permit modification, a list of SWMUs that NMED deems appropriate for NFA must be published in a local newspaper and public notices must be sent to all persons on the facility mailing list. As part of this process, the public may make comments to and/or request additional information from NMED. A public meeting was held at the City of Alamogordo Civic Center on June 16, 2008. No members of the public attended or provided comment.

H. FURTHER STEPS

The public meeting will be scheduled and notices will be posted/published as indicated in Section G. The NMED will notify all persons on the mailing list concerning the location, time, and date of the public meeting and the contact person for public written comment. When the comment period has passed and the public meeting has been conducted, the NMED will notify HAFB and each person on the public comment mailing list of the final decision. The final decision will become effective 30 days after service of the decision, unless a later date is specified or Public Hearing is requested in accordance with New Mexico Hazardous Waste Management Regulations, 20 New Mexico Administrative Code (NMAC) 4.1, Section 901. F. *Hearings*. A public meeting was held at the City of Alamogordo Civic Center on June 16, 2008. No members of the public attended or provided comment.

I. CONTACT PERSON FOR ADDITIONAL INFORMATION

Mr. John Kieling, Manager
Permits Management Program
New Mexico Environment Department, Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 428-2535 telephone
(505) 428 2567 Fax

OR

Mr. Cornelius Amindyas
New Mexico Environment Department
550 San Antonio Drive NE
Albuquerque, New Mexico 87109
(505) 222-9543 telephone
(505) 222-9510 Fax

J. DESCRIPTIONS OF SWMUs PROPOSED FOR NO FURTHER ACTION

J.1 SWMU (AOC-F), Asphalt Tank Spill Area (ERP Site SS-68)

Location

SWMU AOC-F is identified in the ERP as site SS-68, Asphalt Tank Spill Area. The 1988 RFA states that aboveground and belowground tanks were previously removed and were located to the northwest of Building 121. The December 2005 *HAFB Environmental Restoration Program Site Status Summaries Report* places the location as 200 feet northeast of Creosote Avenue. This location coincides with the current piles of asphalt that are gathered from road work across the Base and recycled. While the exact location is unknown, the most likely location of these tanks (if they ever existed) would have been at the location used to stockpile and recycle asphalt pavement. A detailed layout of this site and its surroundings is provided as **Figures 3 and 4.**

Evaluation of Relevant Information

The records searched to obtain information on AOC-F include:

- Aerial photographs taken in 1984, 1996, and 2004
- The 1988 RFA prepared by A.T. Kearney, Inc. dated September 1988
- Site visit on July 10, 2006
- HAFB Environmental Restoration Program Site Status Summaries Report (December 2005)
- Interview with Mr. Darvin St. John of the HAFB 49th CES/CEV Environmental Flight

Weathered asphalt removed from road improvement projects at HAFB has been crushed and reused since the 1980s. Typically, after it has been removed, the asphalt has been staged in an undeveloped area east of Creosote Avenue and north of the base enlisted personnel housing. Normally the asphalt is staged in piles until it is reused. This has been standard practice since the early 1980s. A tank has not been observed in the aerial photographs of the area taken in 1984, 1996, and 2004. Further, asphalt tanks are typically heated to keep the material warm and flowable for use and that would make underground tanks unlikely for this kind of operation at HAFB.

0 125 250 500 Feet

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SWMU AOC-F (SS-68) and Area Layout -1996 Aerial Photograph

PROJECT NO	SCALE	DATE	DRAWN BY
9050360	AS SHOWN	11/20/06	MRM/CM
			DRAWING NO Figure 3

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Figure 3

0 125 250 500 Feet

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SWMU AOC-F (SS-68) and Area Layout -2004 Aerial Photograph

PROJECT NO	SCALE	DATE	DRAWN BY:
	AS SHOWN	08/10/06	MRM/CM
			DRAWING NO: Figure 4

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Holloman AFB, NM

Figure 4

An interview with Mr. Darvin St. John of the 49th CES/CEV, who in the 1990s was responsible for documenting the removal of many USTs at HAFB, did not recall the presence of either a UST or aboveground storage tank (AST) in this area. No ASTs or USTs are identified within this area in Base records. Currently, 6 piles of asphalt are located approximately 700 feet south of Building 121. Aerial photographs from years 1996 and 2004 confirm the storage of asphalt in this area but do not confirm the presence of any tanks. No releases of hazardous constituents have been documented related to this site.

Basis for Determination

NFA is requested for AOC-F SS-68, Asphalt Tank Spill Area, based upon Criterion 1: The SWMU/AOC cannot be located, does not exist or is a duplicate SWMU/AOC.

A source of contamination cannot be tied to this location. After contacting personnel familiar with the presence and removal of USTs at HAFB, and searching the records at the HAFB Office of Real Property, there remains no evidence of USTs or ASTs at this site and there is no documentation of releases to the environment. Storage of asphalt for reuse is not considered a hazardous waste practice. If a tank was present at the site during the 1988 RFA, it could have been a portable tank for fueling equipment or some other type of portable unit for processing the asphalt.

References

A.T. Kearny, 1988 *RCRA Facility Assessment Report*, HAFB, New Mexico.

Bhate Environmental Associates, Inc. (Bhate), 2007, *Confirmatory Sampling Work Plan Multiple Sites*, HAFB, New Mexico.

J.2 SWMUs AOC-PRI-2 & PRI-5, Spent Solvent Disposal Area (ERP Site OT-35)

Location

AOC-PRI-2 & PRI-5 (ERP Site OT-35) are the Building 1264 Solvent Burn Area (AOC-PRI-2) and the Building 1264 Solvent Disposal Area (AOC PRI-5). The two sites are co-located and have been investigated as one unit. The Spent Solvent Disposal Area (OT-35) is located immediately south and within the confines of the new Primate Research Laboratory (Buildings 1264 and 1265) approximately 2 miles north of the Main Base Area (**Figure 5**). The Site topography is relatively flat, and the area is sparsely vegetated.

History

Spent solvents had reportedly been disposed of intermittently on the ground and ignited in an area south of Building 1264 during the 1950s and 1960s. The spent solvents were generated as part of the on-site laboratory operations and consisted of xylenes, methanol, toluene, and acetone. Spent solvents may also have contained small quantities of radioactive tracers (carbon-14, iodine-125, and tritium). Based on interviews and site visits with longtime Primate Research Laboratory employees, three potential solvent disposal areas were identified. The disposal sites include:

- An area of stressed vegetation immediately north of Building 1264 (site AOC-PRI-2) where scintillation cocktails were reportedly disposed of on the ground,
- A slightly vegetated area north of Building 1269 where stained soils were observed,
- An area several hundred yards south of Building 1269 that was identified as the former solvent evaporation area (site AOC-PRI-5) where solvents were set out in evaporation pans for disposal (Radian, 1993).

Evaluation of Relevant Information

A records search for Site OT-35 (AOC-PRI-2 &5) was conducted by CH_2M Hill in 1982 (CH_2M Hill. August 1983). The records search concluded that the site did not present any significant concern for adverse effects on health or the environment. The site was investigated in December 1992 and February 1993 during a Site Investigation (SI) conducted by Radian Corporation. The field investigations were conducted before construction was completed at the primate research facility.

The following Investigation activities have been performed at the OT-35 site (Radian, 1993):

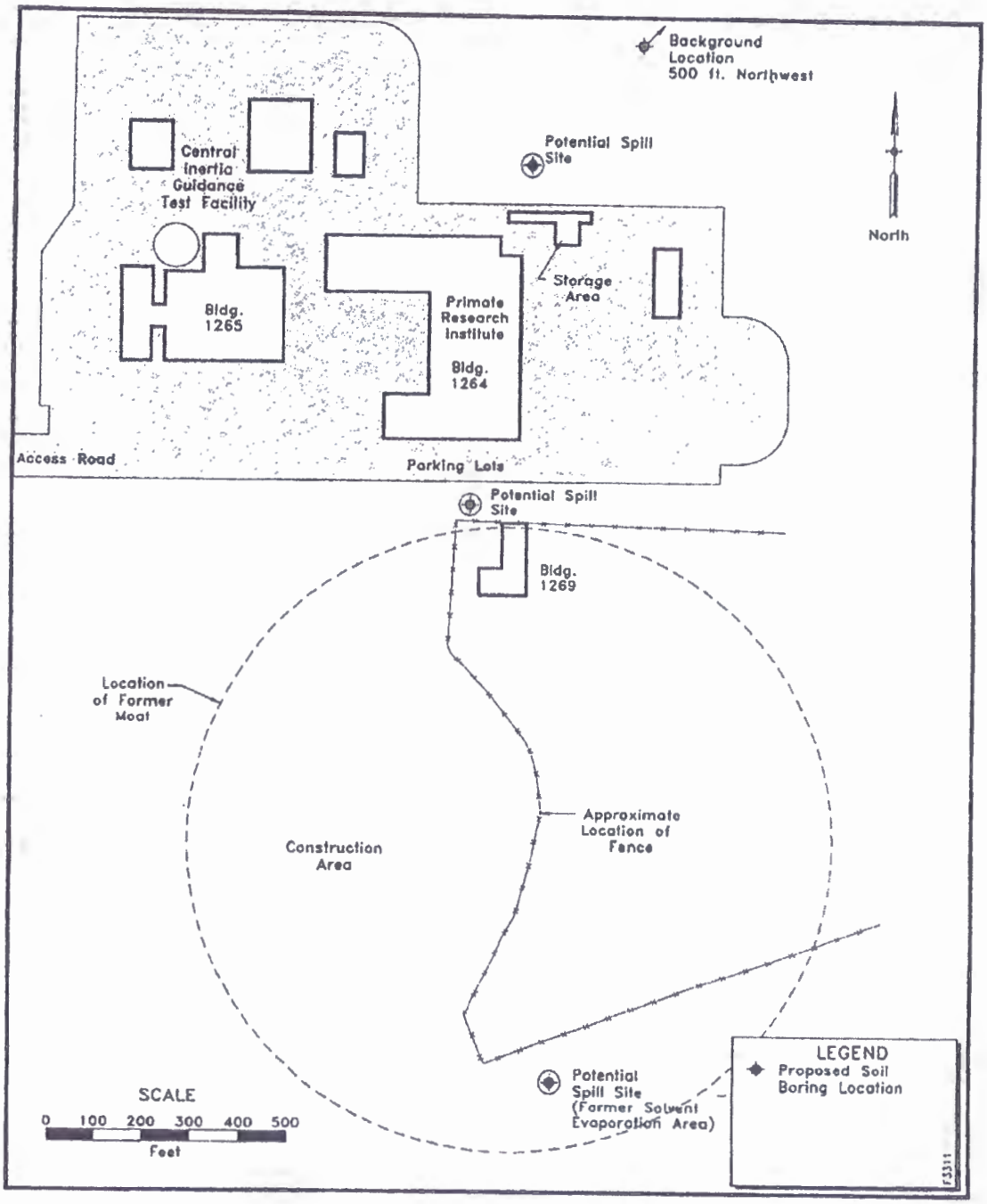
- A passive soil-gas survey using the PETREX sampling technique was conducted at the site using 15 samplers. Five samplers were installed at each of the three potential disposal sites (Radian, 1993).
- One soil boring was drilled into each of the three potential disposal sites (BH-35-01 through BH-35-03). Two subsurface soil samples were collected from each borehole and submitted for chemical analysis: the surface sample (0 to 4.5 ft feet below ground surface [ft bgs]) and a subsurface sample with the most visible

contamination or the highest photoionization detector (PID) reading. These soil samples were analyzed for volatile organic compounds (VOCs), gross alpha and beta radioactivity, and gamma radioactivity (Radian 1993).

- One background soil sample (BH-35-04) was collected from 0 to 2 ft bgs approximately 500 ft northeast of the site and was analyzed for alpha, beta, and gamma radioactivity (Radian 1993).

The soil-gas survey identified the presence of chloroform vapors in soil-gas samplers installed in the three disposal areas. It is reported that chloroform was used in the scintillation cocktails. It is also a common laboratory artifact. The soil-gas survey technique used is a qualitative tool (ion counts) that does not report the quantity of vapor in the vadose zone, rather the relative presence of gasses. The soil-gas survey results are presented on **Figures 6, 7, and 8**. The results of the soil-gas survey were used to locate soil borings and sampling locations as illustrated on **Figure 9**.

Table 2 summarizes the analytical results for soil samples collected from the three borings. No VOCs were detected in the soil samples. Review of gross alpha, gross beta, and gamma radiation results for the six soil samples collected during the OT-35 SI indicates that detected radioactivity levels were comparable to background levels found at HAFB. Concentrations of gross alpha and gross beta ranged from not detected (ND) to 21.21 picoCuries per gram (pCi/g) and ND to 19.51 pCi/g, respectively. Using one half of the detection limit for the not detected data, the average concentrations of gross alpha and gross beta for these soil samples is 10.1 pCi/g and 11.3 pCi/g, respectively. These average concentrations are within and below the background ranges for gross alpha (4.6 to 15.4 pCi/g) and gross beta (18.0 to 21.1 pCi/g) detected in the background samples collected during the Preliminary Assessment (PA) conducted at Site RW-42 (Radian, 1993. In addition, the single detection of gamma radiation (0.33 pCi/g) is estimated and is well below the reporting limit (100 pCi/g). Additionally, Iodine-125 and Tritium-3 radioactive tracers historically used at OT-35 have relatively short half-lives. The half-lives of Iodine-125 and Tritium-3 are 60 days and 12.3 years, respectively. As the OT-35 disposal sites have been inactive for over 30 years there has been approximately an eighty percent (80%) degradation (decay) of Tritium-3 and 99% decay of Iodine-125. Although Carbon-14 has a half life of 5,730 years, Carbon-14 has never been considered a carcinogen. Furthermore, these radioactive tracers are not alpha emitters. Iodine-125 emits gamma particles while Carbon-14 and Tritium-3 emit beta particles, therefore the gross alpha levels found at OT-35 are naturally occurring (International Commission on Radiological Protection, 2002).



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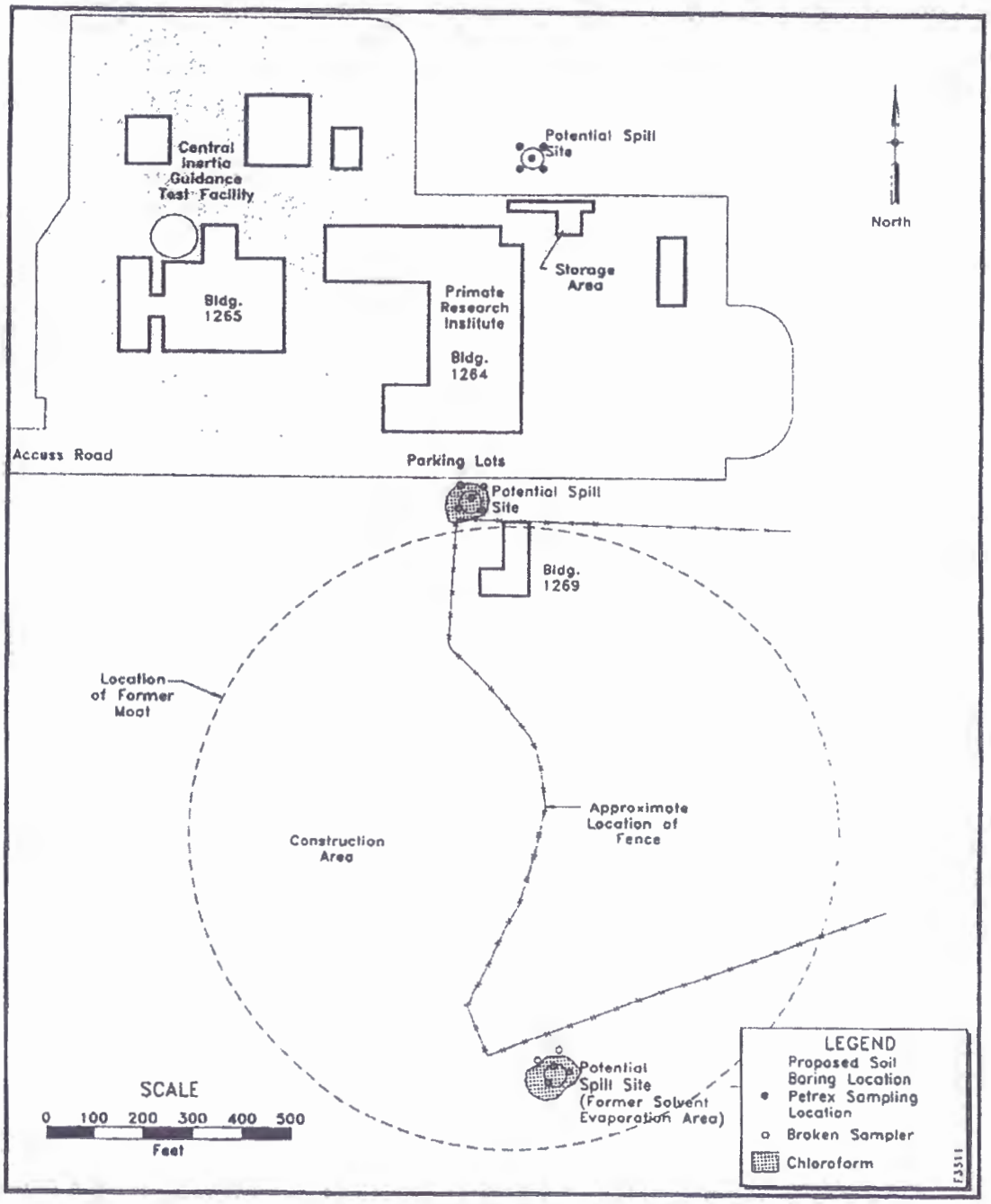
OT-35 Features and Proposed Soil Boring Locations
Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/5/07	DRAWING NO: Figure 5

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 5



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OT-35 Passive Soil-Gas Results

Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 6

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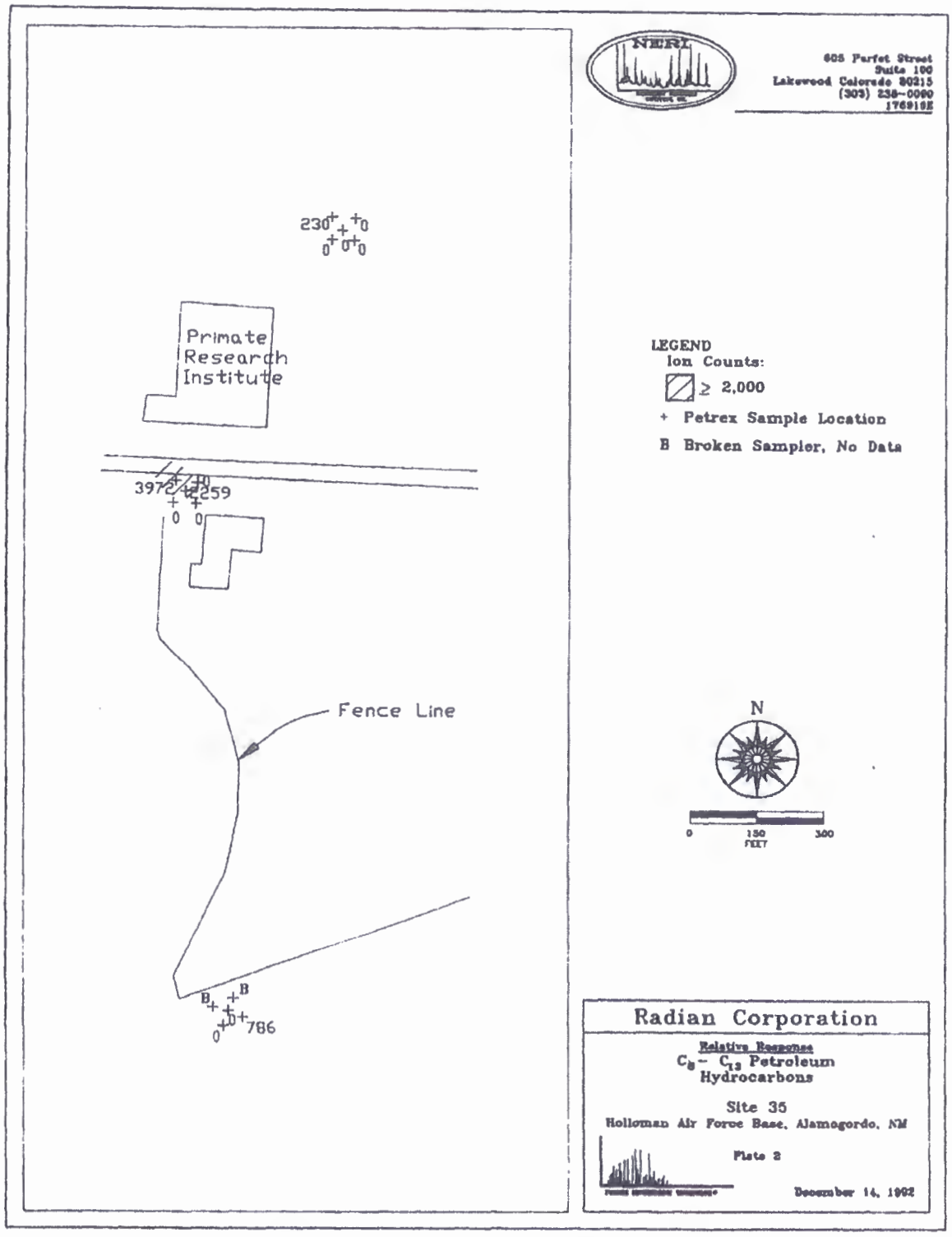
Holloman AFB, NM

Figure 6



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OT-35
Relative Responses - Hydrocarbons
Source: Radian 1993

PROJECT NO.	SCALE	DATE	DRAWN BY
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			DRAWING NO. Figure 7

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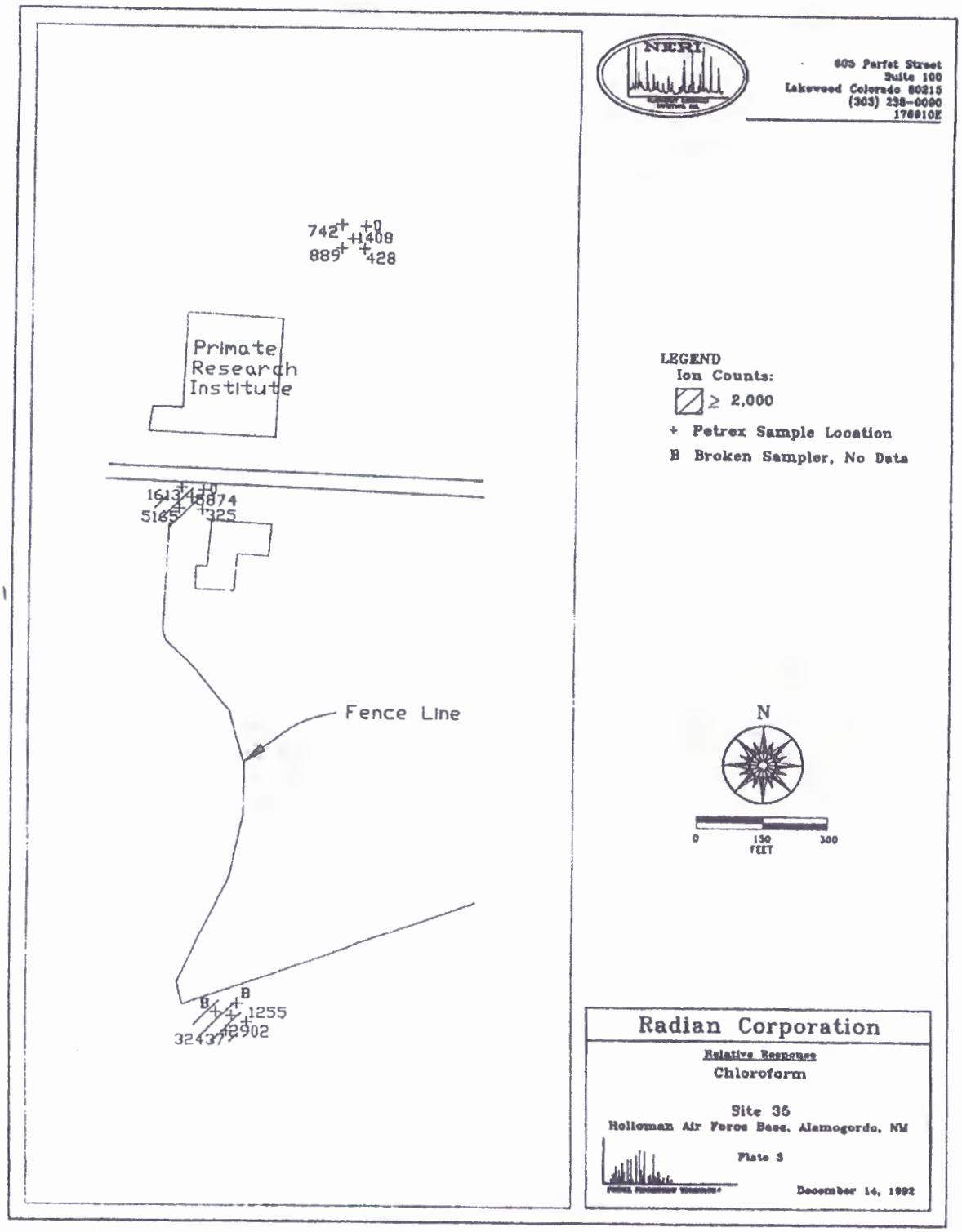
Holloman AFB, NM

Figure 7



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OT-35
Relative Responses - Chloroform
Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 8

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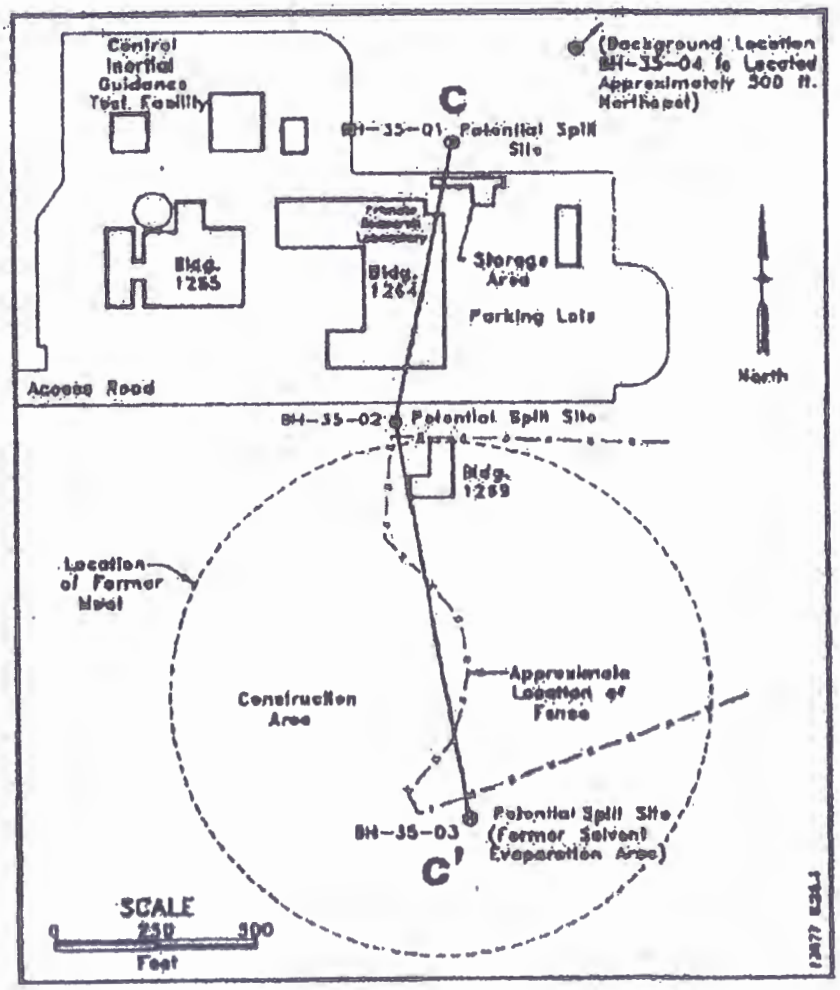
Holloman AFB, NM

Figure 8



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Site OT-35 Soil Boring Locations

Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 9

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Figure 9

Table 2. Summary of Soil Analytical Results for ERP Site OT-35 (SWMUs PRI-2 & 5)

Location	Depth (ft)	Gross Alpha (pCi/g)	RL (pCi/g)	Gross Beta (pCi/g)	RL (pCi/g)	Total Gamma (pCi/g)	RL (pCi/g)	VOCs (µg/kg)
BH-35-01	0-2	21.21	3.97	19.08	5.18	0.33	100	ND
	25-27	15.08	3.83	19.51	5.15	ND	100	ND
BH-35-02	2.5- 4.5	4.01	3.52	5.83	5.43	ND	100	ND
	10 – 12	12.06	3.51	17.94	5.47	ND	100	ND
BH-35-03	0-2	6.61	3.16	ND	5.05	ND	100	ND
	5-7	ND	3.0	ND	5.5	ND	100	ND
BH-35-04	0-2	7.87	2.93	5.95	5.61	ND	100	ND

Note: RL = Reporting Limit, µg/kg = micrograms per kilogram
Source: Radian, 1993

The subsurface conditions at Site OT-35 were defined by direct sampling and observation of the drill cuttings for the three soil borings conducted by Radian during the Site Investigation (Radian, 1993). The OT-35 site stratigraphy consists primarily of two broadly defined lithologic units. The upper-most unit consists of 10 ft of silt and silty sand that is underlain by 25 ft of clay. Interbedded lenses of sand and silt, ranging in thickness from 1 to 6 ft, occur within the clay layer. Based on the HAFB base-wide potentiometric surface, groundwater is estimated to be approximately 35 to 40 ft bgs in the vicinity of OT-35. The *Draft Final Preliminary Assessment and Site Investigation Report, Investigation of Four Waste Sites* (Radian 1993) determined that there are no risks to human health or the environment and recommended NFA for OT-35.

Basis for Determination

NFA is requested for AOC-PRI-2 and AOC-PRI-5 (OT-35) based upon the following Criterions:

- 1 - The SWMU/AOC cannot be located, does not exist or is a duplicate SWMU/AOC
- 5 - The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use

Presently, the sites investigated in 1993 have been graded and incorporated into the new primate research facility. This facility has rendered the site inaccessible because of the structures present and the requirements of primate management. Many of these animals are old and under protective care. The site has limited access (a fenced boundary) in order to provide these animals with minimal disturbance.

References

Bhate, 2006, *Accelerated Corrective Measures Work Plan*, Holloman Air Force Base, New Mexico.

References

Bhate, 2006, *Accelerated Corrective Measures Work Plan*, Holloman Air Force Base, New Mexico.

CH_2M Hill. August 1983. *Installation Restoration Program, Records Search for Holloman Air Force Base, New Mexico*

International Commission on Radiological Protection. 2002. CD1: Database of Dose Coefficients: Workers and Members of the Public. (http://www.cea.fr/gb/publications/Clefs48/pdfgb/109a11.pdf).

Radian Corporation. November 1993. *Draft Final Preliminary Assessment and Site Investigation Report, Investigation of Four Waste Sites*, Holloman Air Force Base, NM.

Radian Corporation. June 1992. *Draft Final Remedial Investigation (RI) Report, Investigation, Study and Recommendation for 29 Waste Sites*, Holloman Air Force Base, NM.

J.3 SWMUs 39, 127, 135, and 170, Former Fire Training Area (ERP Site FT-31)

Location

The Former Fire Training Area, ERP Site FT-31, is comprised of the following four 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, located at the Fire Training Area, was removed from Appendix 4-A of the HAFB RCRA Permit.

Site FT-31, is located north of the Main Base Area and west of the former Main Base Landfill (**Figure 10**). 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 UST by definition, which supplied jet fuel (JP-4) to propagate training fires and was not listed as a SWMU. The tank resided in a concrete vault that was below ground surface; however, the tank was visible on all sides.

History

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. The start date of these activities at the site is unknown. 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. 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 of the site.

Current Use

The FT-31 site is the current location of the FT31 Land Farm. On June 14, 2004 Holloman Air Force Base (New Mexico) was granted discharge permit DP 1446 to operate a landfarm for petroleum contaminated soil (PCS) at the closed Fire Training Area Site (FT-31) by the New Mexico Environment Department (NMED). On November 6, 2009, NMED renewed the operating permit (DP 1446) for the landfarm and its expansion. The new configuration allows for 16 cells containing 720 cubic yards each (11,520yards/lift). The operating permit requires that monitoring of subsurface

conditions at the site (both soil and groundwater) be conducted in accordance with the approved discharge application and permit approval conditions listed in the November 9, 2009 authorization.

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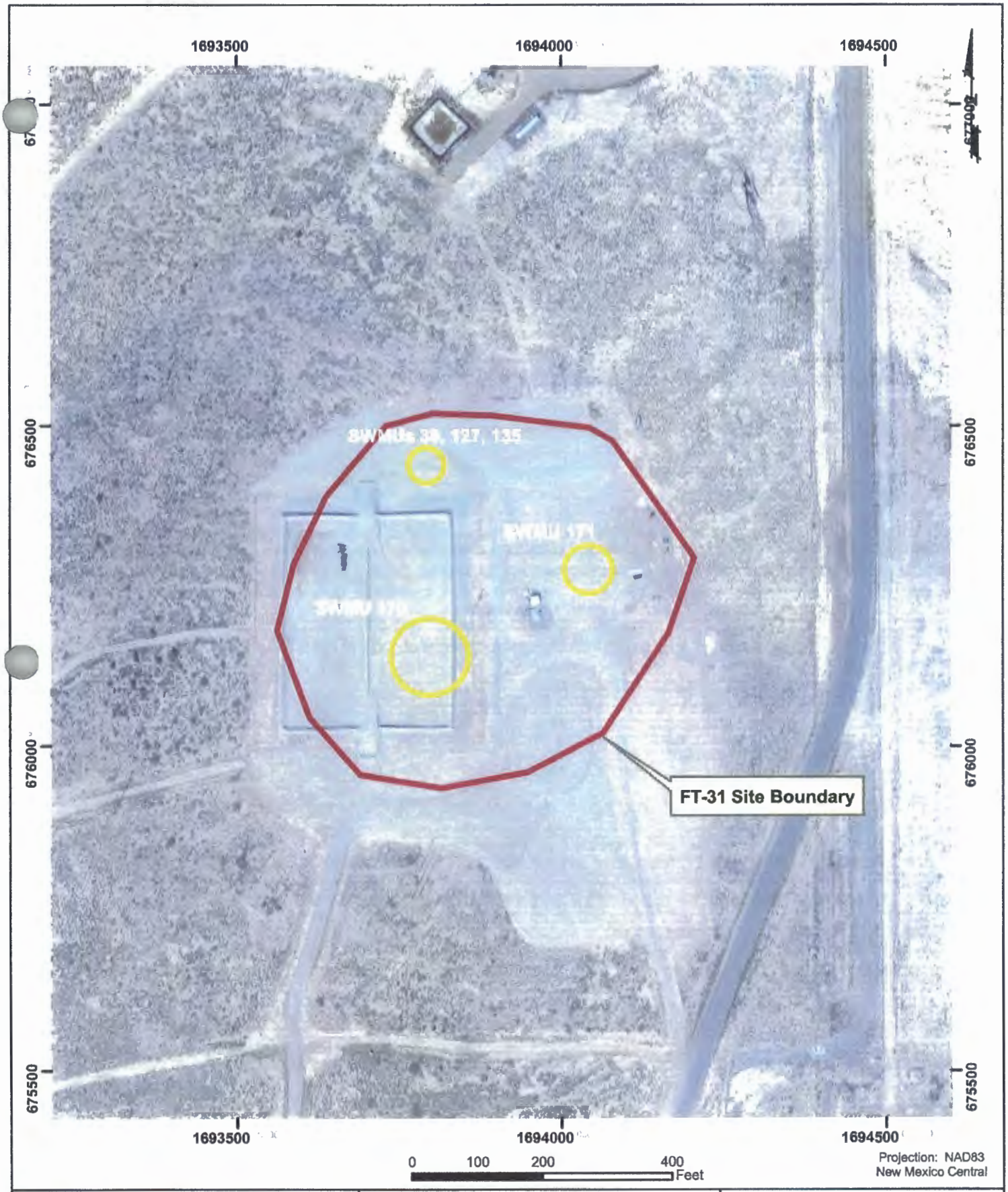

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FT-31 Site Layout Map

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 10

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10 SWMUs
Holloman AFB, NM

Figure 10

The *Installation Restoration Program Records Search* (CH_2M 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 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 VOCs and semi-volatile organic compounds (SVOCs) contamination and recommended further study. Investigations for the *Final Remedial Investigation Report for Installation Restoration Program Sites* (Walk, Haydel & Associates, 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 Remedial Investigation (RI) report concluded that extensive soil and groundwater 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* (Radian, 1993) was conducted at SWMUs 39, 127, and 135 in the northern part of the site. 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* (Foster Wheeler Environmental Corporation [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 petroleum-contaminated soils (PCS) were performed between 1996 and 1999. 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 Soil Screening Levels (SSLs) for PCS and related hazardous constituents. Limited excavation of PCS began in 1999 while the bioventing system was still operational. Excavation activities to remove recalcitrant PCS accelerated in January 2003 and were completed in July 2003. In 2005, additional investigations to address groundwater conditions were at the southeastern perimeter of the site. The completed VCM report was submitted to NMED in April 2006. The report was approved and the site was made eligible for NFA by NMED in October 2006. Excavated soil was transported offsite to a permitted landfarm facility. Clean soil was imported and used to backfill the VCM excavations.

Evaluation of Relevant Information

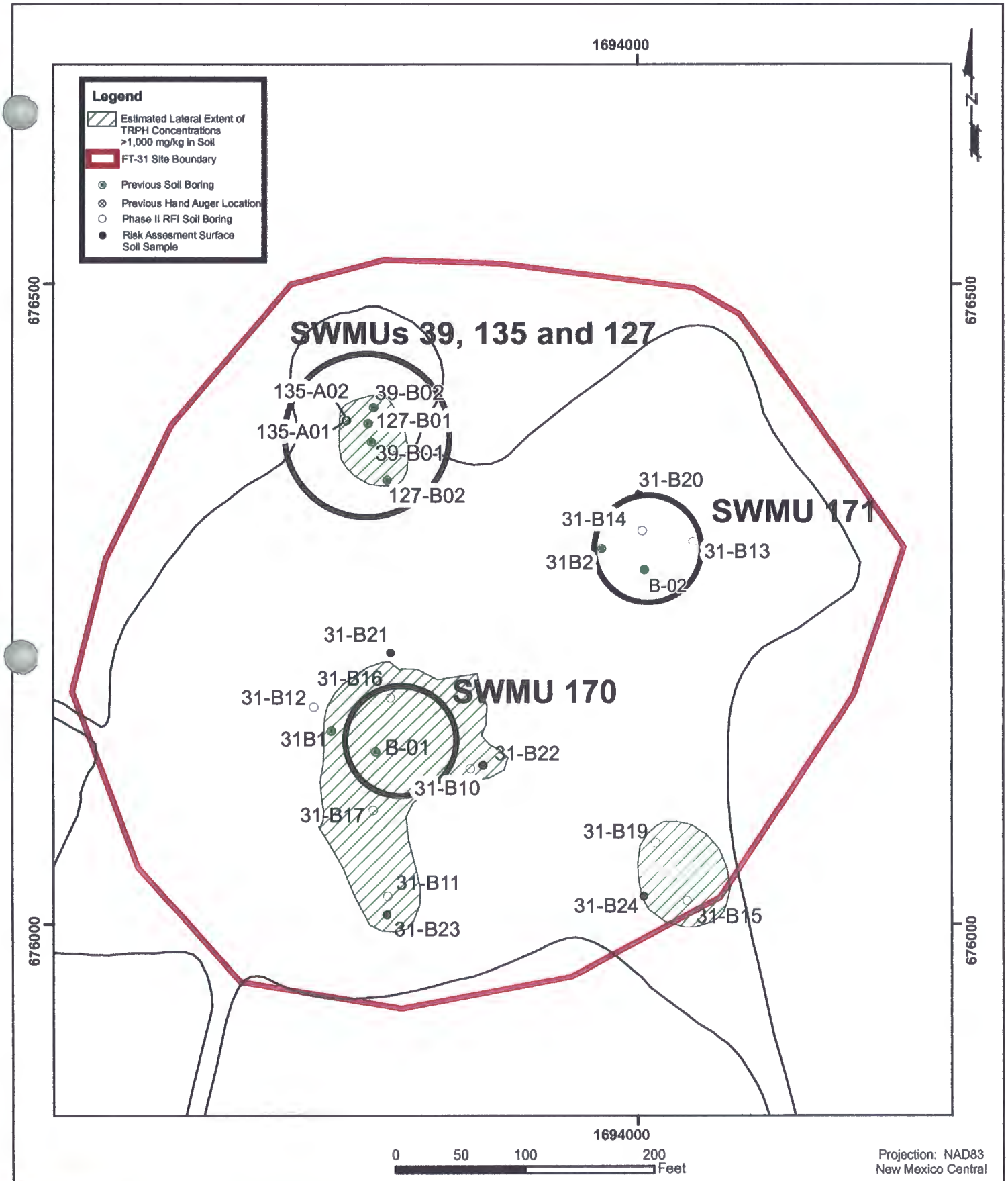
Several investigations were conducted at Site FT-31. Prior to the VCM, the most comprehensive representation of the nature and extent of PCS and other constituents was presented in the *Table 1 Phase II RFI Report* (FWENC, 1995). The data presented in *Table 1 Phase II RFI* was representative of site conditions prior to remedial efforts carried out by the VCM. The analytical results for soil data compiled in the *Table 1 Phase II RFI* are graphically represented on **Figures 11** and **12. Figure 11** 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 12** provides a series of idealized cross sections illustrating the vertical extent of PCS using the maximum TPH concentrations reported. TPH concentrations in soil beneath SWMUs 39, 127, and 135 ranged from 1,130 mg/kg to 31,800 mg/kg. TPH 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 UST 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 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). An estimate of the volume of PCS present at FT-31 was calculated based upon the delineation provided in **Figure 11** and **Figure 12**. The conservative estimate was calculated by determining the area of contamination from the map provided in **Figure 11** and multiplying it by the depth to groundwater (21 feet). The conservative estimate of the total volume of PCS that was present at all the SWMUs plus the JP-4 UST was approximately 17,800 cubic yards.

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 on **Figure 13**.

Soil excavated during the VCM were field screened with a 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.

To determine the effectiveness of the VCM, confirmation soil samples were collected from the sidewalls of the excavations. Excavation confirmation samples were analyzed by the offsite laboratory for TPH Diesel-Range Organics (DRO), TPH Gasoline-Range Organics (GRO) and TPH Oil-Range Organics (ORO) by Method 8015, VOCs by Method 8260B, and SVOCs by Method 8270C. The results of the laboratory analyses were reviewed and compared to the SSLs to determine completeness of PCS removal or the disposition of PCS soil.



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FT-31 Extent of PCS
[Phase II RFI (FWENC, 1995)]

PROJECT NO.	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
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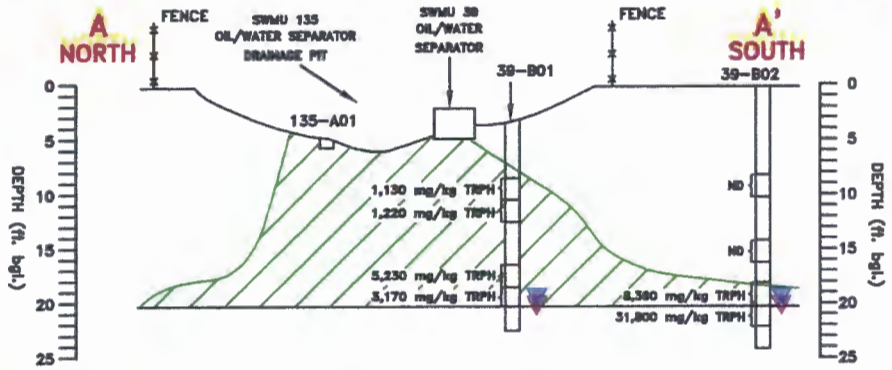
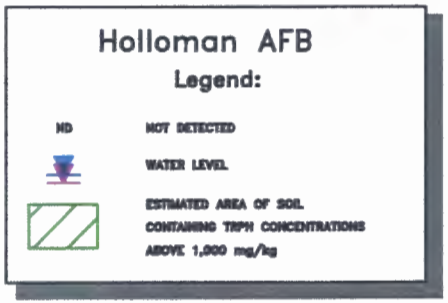
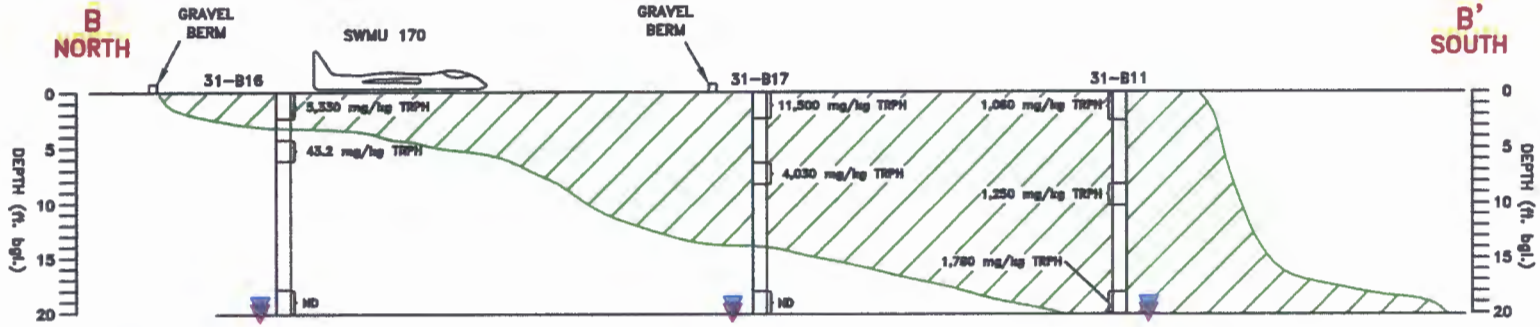
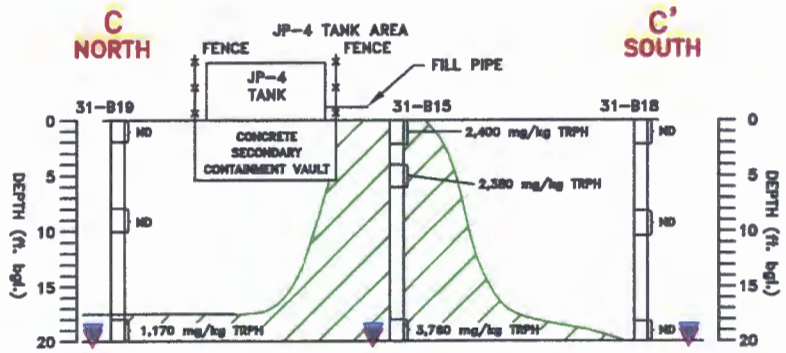
Holloman AFB, NM

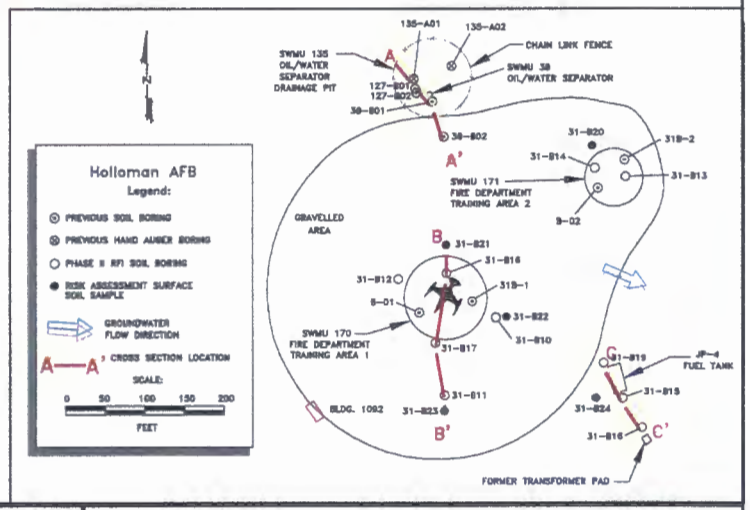
Figure 11











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FT-31 CROSS SECTIONS
DELINEATION OF PCS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	AS SHOWN	3/5/07	DRAWING NO: FIGURE 12

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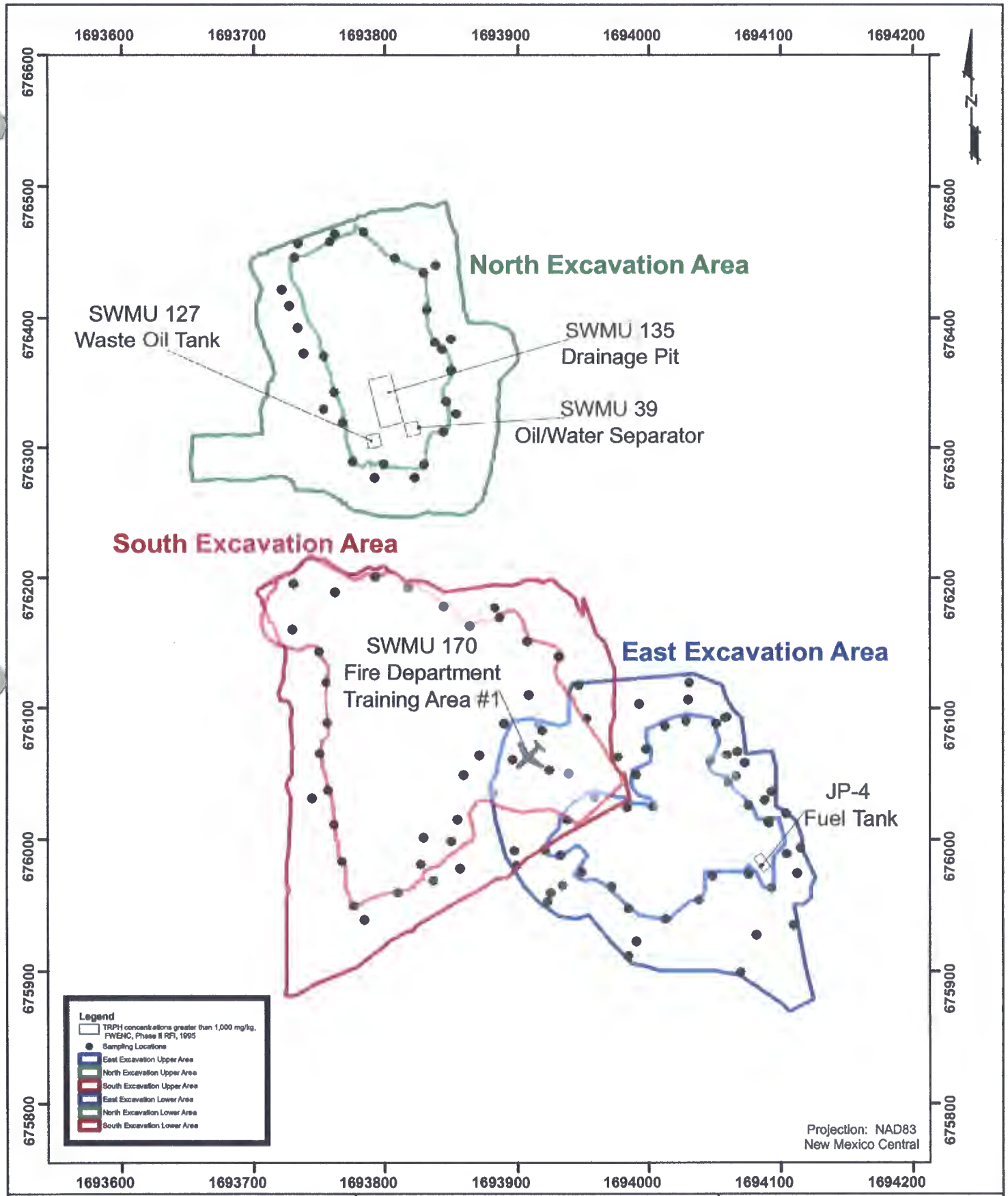
Figure 12



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FT-31 Excavation Areas With Confirmation Sample Locations

PROJECT NO.	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/5/07	DRAWING NO. Figure 13

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Figure 13

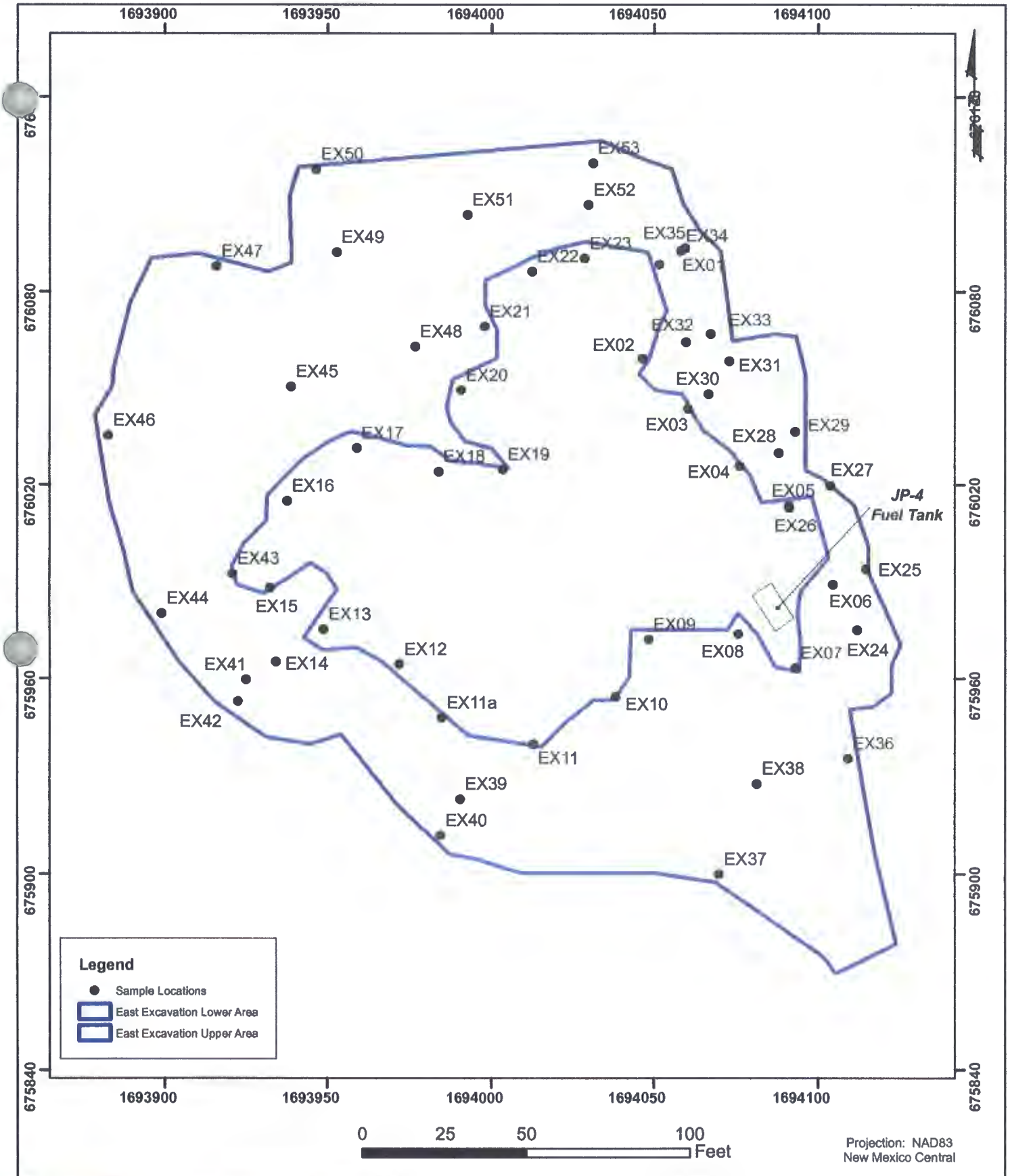
Hundreds of soil samples and several groundwater samples were collected to implement the VCM. These samples were used to document the completeness of the VCM excavations, the conditions of the PCS excavated and the quality of groundwater at the site. They document the successful removal of all PCS in excess of NMED SSLs. The tabulated results of these analyses required 58 pages in the original VCM Report. Therefore, these summary tables have been attached as Appendix A.

The east excavation, which encompassed SWMU 170 and the former location of the UST that contained JP-4, was the first excavation at FT-31. Approximately 2,030 cubic yards (2,298 tons) of PCS were excavated and transported offsite for disposal. "Suspect" soil was sampled and determined to be less than the NMED SSLs for PCS and was returned to the excavation as backfill. Confirmation samples were collected at 53 locations at varying depths from the sidewalls along the perimeter of the east excavation (**Figure 14**). Concentrations in these samples did not exceed the associated SSLs. The results of the confirmation sampling for the east excavation are presented in **Table 3-1** located in **Appendix A**.

Excavation and removal activities began at the south excavation in March 2003, and were completed 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 and 13,275 cubic yards (15,000 tons) of PCS were excavated and transported offsite for disposal. Confirmation samples were collected at 36 locations at varying depths from the sidewalls along the perimeter of the south excavation (**Figure 15**). Concentrations in these samples did not exceed the associated SSLs. The results of the confirmation sampling for the south excavation confirmation samples are presented in **Table 3-2** of **Appendix A**.

The north excavation encompasses the area of SWMUs 39 and 127. Excavation and removal activities began in June 2003 and were completed 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 the excavation was 7,470 cubic yards and approximately 2,750 cubic yards (3,100 tons) of PCS were excavated and transported offsite for disposal. Confirmation samples were collected at a total of 29 locations at varying depths from the sidewalls along the perimeter of the north excavation (**Figure 16**). Concentrations in these samples did not exceed the associated SSLs. The results of the north excavation confirmation samples are presented in **Table 3-3** located in **Appendix A**.

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. The excavation was graded to existing surface topography and slightly arched to provide drainage for storm water run-off.



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FT-31 East Excavation Area

PROJECT NO.	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/5/07	DRAWING NO: Figure 14

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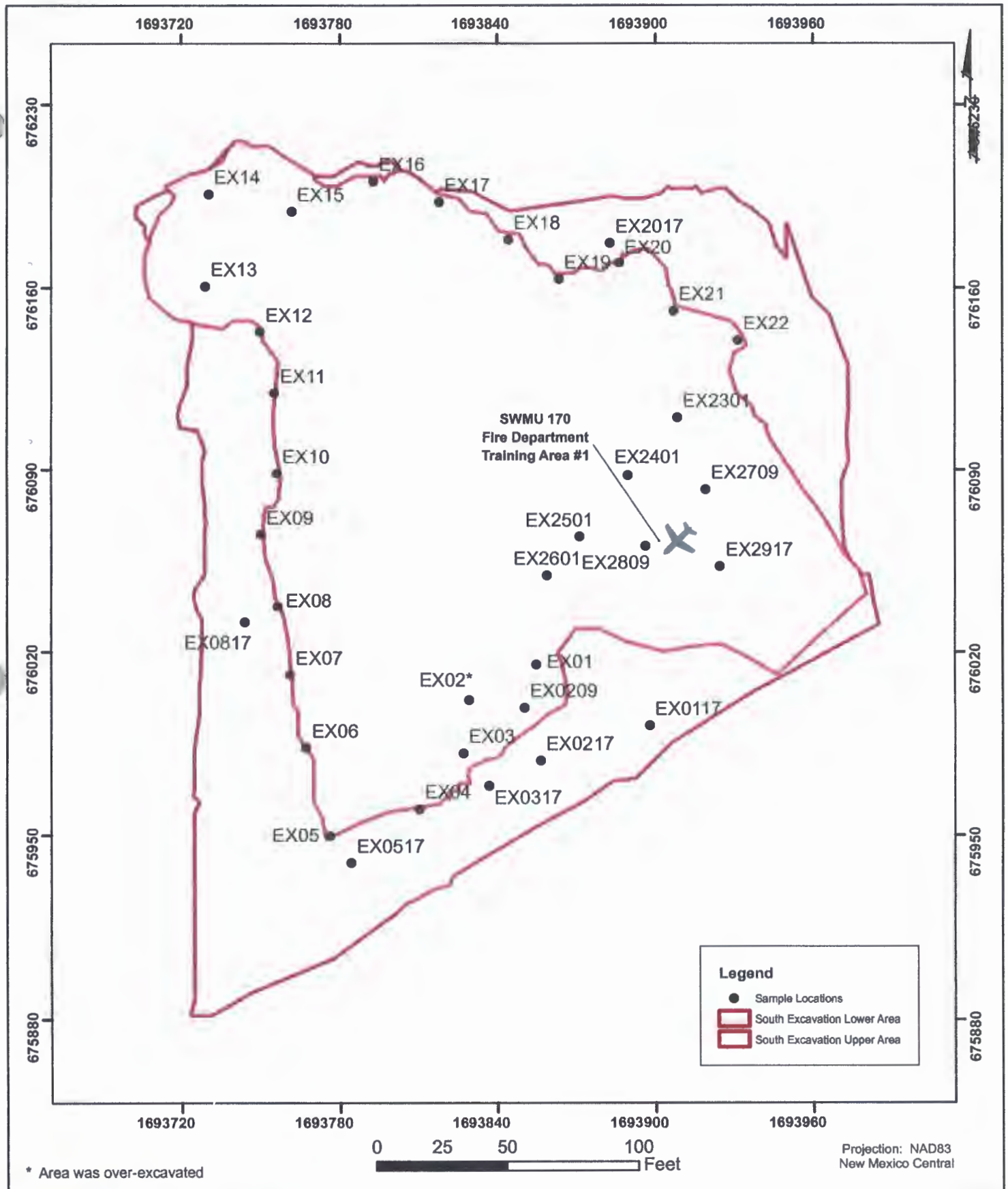
Figure 14



* Area was over-excavated

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FT-31 South Excavation Area

PROJECT NO.	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/7/07	DRAWING NO: Figure 15

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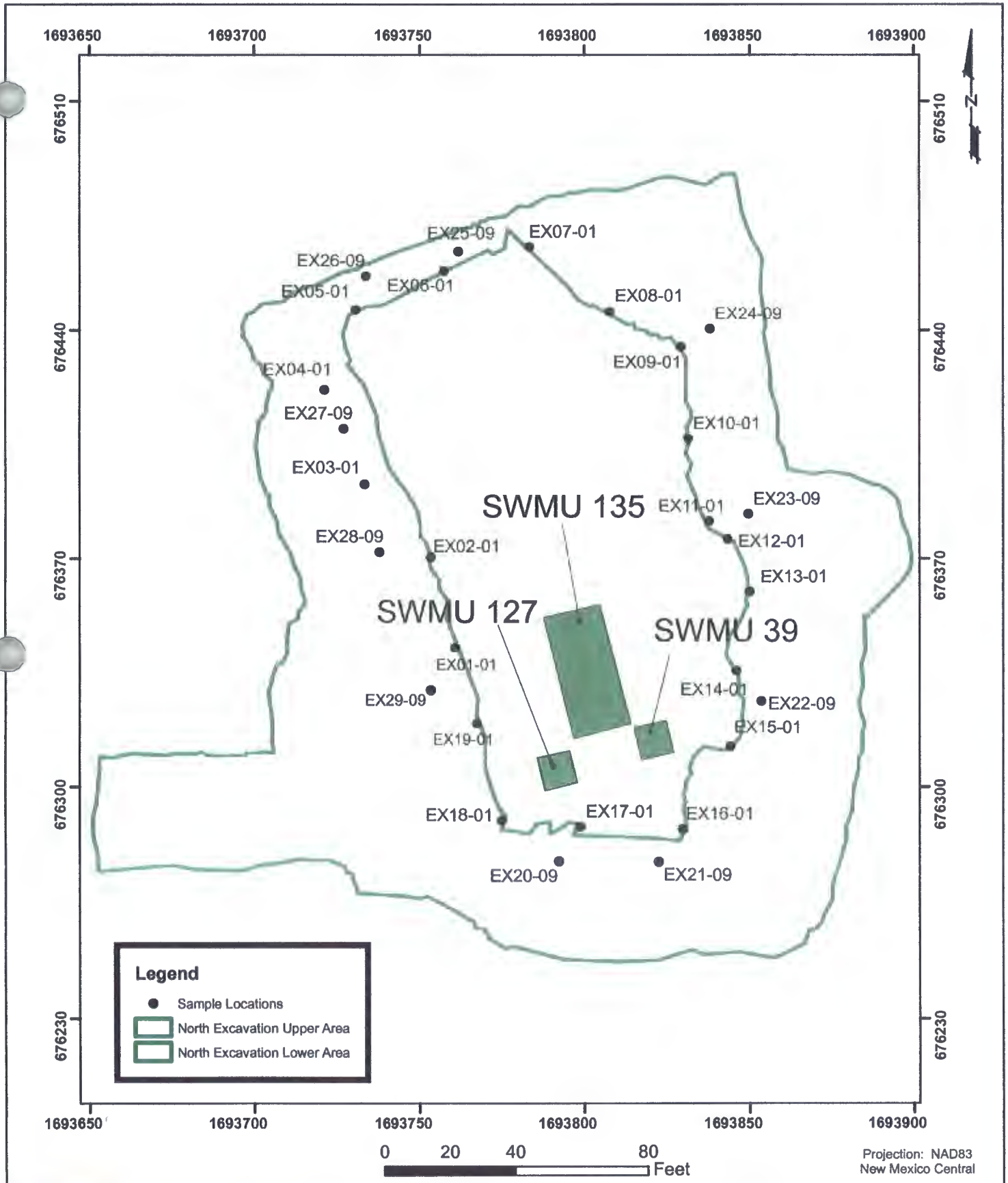
Figure 15



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FT-31 North Excavation Area

PROJECT NO.	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/5/07	DRAWING NO: Figure 16

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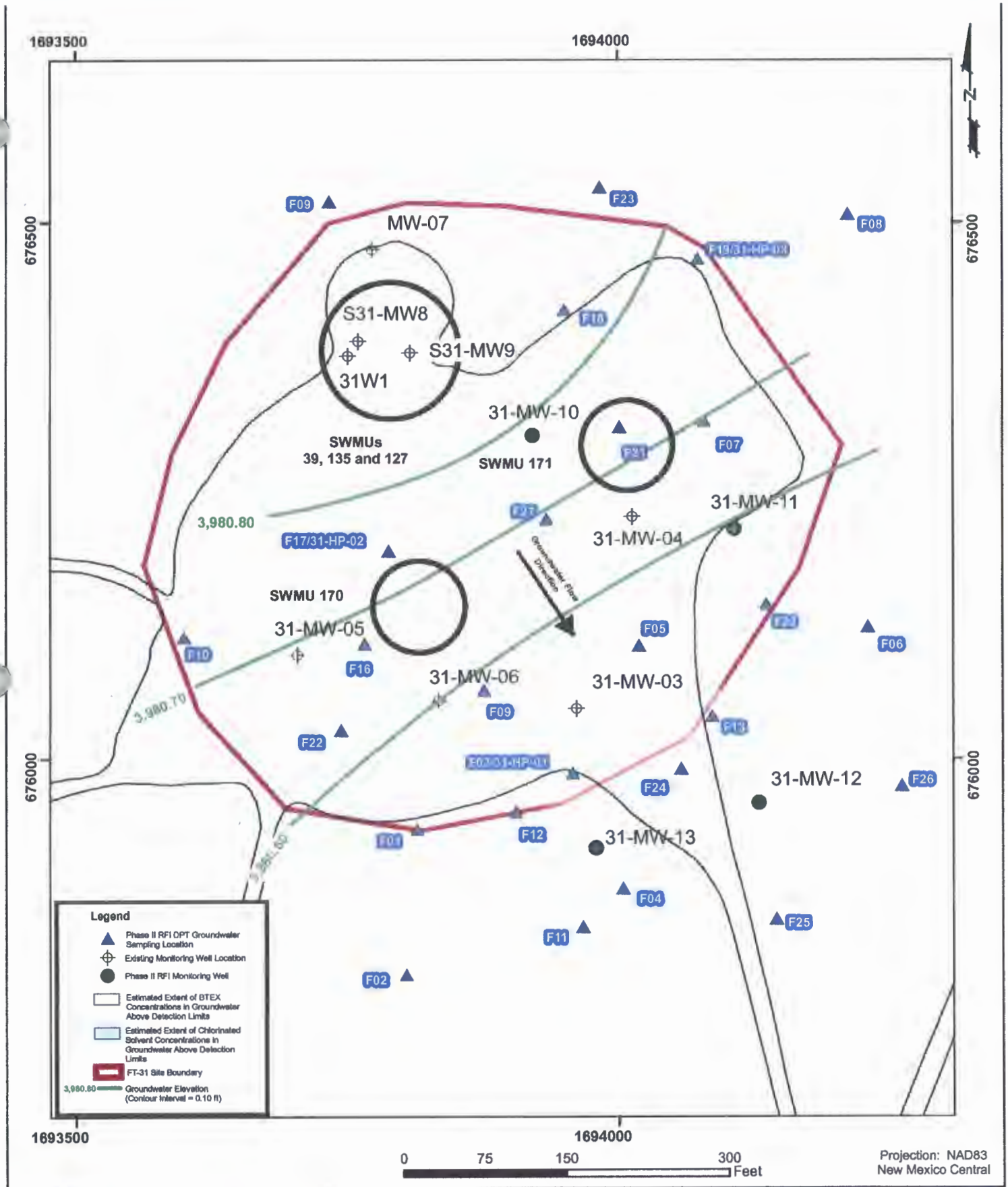
Figure 16

Groundwater samples were collected from several wells at the Site during the Table 1 Phase II RFI. Several wells identified VOCs and SVOCs. These results are summarized in **Table 3-6** located in **Appendix A** and **Figure 17.**

In 2005, groundwater samples were collected from wells MW-10 and MW-13 to determine the current concentrations of petroleum related constituents and TDS. Further, at the direction of NMED, three additional groundwater monitoring wells (MW-14, MW-15, and MW-16) were installed south of MW-13 to delineate the presence of VOCs identified in MW-13. Additional data concerning the presence of VOCs and the presence of TDS at the Site were derived from the Landfarm groundwater monitoring wells (LM-01, LM-02, LM-03, and LM-04) located on the Site. Well locations and a potentiometric surface map (January 2006) is included as **Figure 18**. Groundwater flow in the area of FT-31 is to the southeast.

TDS in groundwater at the site exceeds the NMWQCC (20.6.2 NMAC) standard for potable groundwater in all wells (average concentration of 20,000 mg/L) except well MW-16 which contained TDS at 8,990 mg/L. Well MW-13 contained the maximum concentrations of VOCs. At MW-13, benzene was detected at a concentration of 86.5 µg/L, sec-butylbenzene at 0.87 µg/L, 1,1-dichloroethane at 11.0 µg/L, 1,1-dichloroethene at 10.1 µg/L, isopropylbenzene at 2.8 µg/L, naphthalene at 7.2 µg/L, and trichloroethene at a concentration of 1.1 µg/L. Diethylphthalate, 2-methylnaphthalene, and naphthalene were the SVOCs detected at concentrations of 3.0 µg/L, 2.3 µg/L, and 6.4 µg/L, respectively. Wells LM-01 through LM-04 and MW-14 through MW-16 contained no VOCs or SVOCs. Well MW-15 contained one VOC, toluene at 0.53 µg/L which is significantly below all applicable standards.

Concentrations of metals in samples from the monitoring wells (MW-14, MW-15, and MW-16) were compared to NMWQCC standards for potable groundwater, even though the concentration of TDS is above the 10,000 mg/L standard. Concentrations of four metals were detected above the NMWQCC standards. Lead was detected above the standard of 100 µg/L, at a concentration of 114 µg/L in the sample collected from MW-15; however, lead was not above the standard in the duplicate sample from this well. The standard for iron of 1,000 µg/L was exceeded in each sample collected from the new wells MW-14, MW-15, and MW-16. Concentrations ranged from 20,200 µg/L to 137,000 µg/L. Manganese was also exceeded in each of the samples collected. It was detected at concentrations ranging from 565 µg/L in the sample from MW-14 to 3,130 µg/L in the sample from MW-15. The standard for manganese is 200 µg/L. Selenium was also above the standard of 50 µg/L in each of the samples collected. Selenium concentrations ranged from 76.3 µg/L to 170 µg/L.



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FT-31 Groundwater Analytical Results
[Phase II RFI (FWENC, 1995)]

PROJECT NO.	SCALE	DATE	DRAWN BY: cm
	AS SHOWN	3/5/07	DRAWING NO: Figure 17

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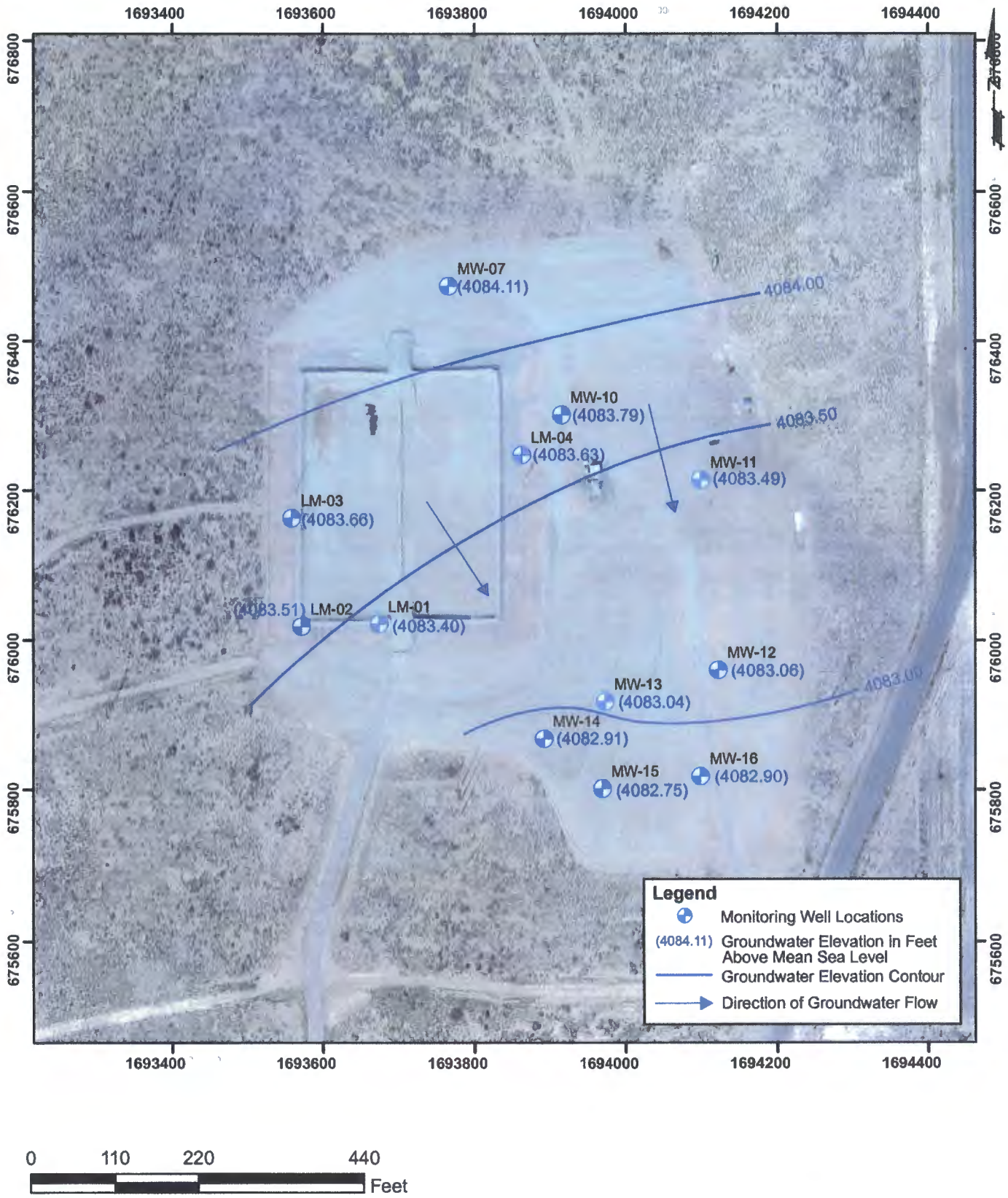
Figure 17



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FT-31 POTENTIOMETRIC SURFACE MAP (JANUARY 2006)

PROJECT NO.	SCALE	DATE	DRAWN BY: MRM
	AS SHOWN	3/5/07	DRAWING NO: Figure 18

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Holloman AFB, NM

Figure 18

Basis for Determination

PCS identified in the Table 1 Phase II RFI for FT-31 (SWMUs 39, 127, 135, and 170) and the JP-4 fuel UST 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 consistently exceeds the NMWQCC standard for potable groundwater.

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

The SWMUS at site FT-31 meet the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use. **Figure 19** is a copy of the September 27, 2006, NMED letter to HAFB indicating the site is eligible for NFA.

References

Bhate Environmental, April 2006, *FT-31 Voluntary Corrective Measures Completion Report, Holloman AFB, New Mexico.*

CH_2M Hill, August 1983, *Installation Restoration Program Records Search, Holloman AFB, New Mexico.*

FWENC, June 1995, *Table 1 Phase II RFI Report, Holloman AFB, New Mexico.*

FWENC, June 2003, *Closure Report for the Excavations at FT-31 – South Area and the West POL Yard, Holloman Air Force Base, New Mexico.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone (505) 428-2500
Fax (505) 428-2567
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 27, 2006

Ms. Debbie Hartell, Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

RE: APPROVAL OF THE RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION FT-31 VOLUNTRARY CORRECTIVE MEASURES COMPLETION REPORT (SWMUs 39, 127, 135, AND 170), APRIL 2006 HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422 HWB-HAFB-05-002

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the **Permittee's**) May 5, 2006 response to NMED's July 27, 2005 Request For Supplemental Information for the FT-31 Voluntary Corrective Measures (VCM) Completion Report, dated February 2005, for the removal of petroleum-contaminated soils. The FT-31 site is shown on Table A of the Facility Permit for Container Storage Unit as Solid Waste Management Units 39, 127, 135 and 170. The subject document is hereby approved by the NMED.

It should be noted that post-VCM groundwater at this site contains contaminants (volatile organic compounds and metals) at concentrations in excess of the NM Water Quality Control Commission's human health standards for groundwater. However, pursuant to 20.6.2.3103 NMAC, these standards only apply to groundwater with total dissolved solids (TDS) concentrations of less than 10,000 mg/L. The TDS concentrations at this site range from 23,700 mg/L to 35,400 mg/L. In addition, due to the remote location of this site, there are no current or potential exposure pathways (e.g. dermal contact, vapor inhalation or construction worker exposure) that would require the evaluation of potential exposure risk. Additionally, this site is the current location of a permitted petroleum-contaminated soil treatment landfarm regulated by

the NMED Groundwater Quality Bureau through a Groundwater Discharge Permit, which requires regular groundwater monitoring.

If you have any questions regarding this matter, please contact David Strasser of my staff at (505) 222-9526 or at the above address.

Sincerely,

John E. Kieling
Manager
Permits Management Program

JEK:dcs

cc: J. Bearzi, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region 6 (6PD-F)
D. Griffin, HAFB
File: HAFB 2006 and Reading
HWB-HAFB-05-002

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FT-31 September 27, 2006 NMED NFA Letter

PROJECT NO.	SCALE	DATE	DRAWN BY:	CREATED BY:
	AS SHOWN	3/5/07	cm	
			DRAWING NO: Figure 19	

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Holloman AFB, NM

Figure 19

References (continued):

FWENC, January 2003, *Revised Final Letter Work Plan for Petroleum-Contaminated Soil Excavation at SS-17, FT-31, and The West POL Yard, Holloman Air Force Base, New Mexico.*

NMED, February 2004, *Technical Background Document for the Development of Soil Screening Levels, Revision 2.* Hazardous Waste Bureau, Ground Water Quality Bureau, and the Voluntary Remediation Program.

NMED, June 24, 2003, *New Mexico Environment Department TPH Screening Guidelines.*

Radian Corporation, 1993, *Phase I RCRA Facility Investigation*, Holloman AFB, New Mexico.

Walk, Haydel and Associates, December 1989, *Final Remedial Investigation Report for Installation Restoration Program Sites.*

J.4 SWMU AOC-2, Sewage Disposal Area Taxiway G

Location

AOC-2 is located on the western part of the main base, across Taxiway G. AOC-2 is approximately 110 feet in diameter with primarily salt cedars comprising the vegetation and is slightly depressed topographically as compared to the surrounding area. The site boundary is defined by a wire fence with signage indicating the area to be a former sewage disposal area. The site is approximately 900 feet northeast of the existing air traffic control tower, Building 864. A site location photomap with the surface features visible is provided as **Figure 20**.

Prior to the 2004 and 2005 RFI efforts, no previous information relating to the environmental status of the site existed. It is inferred that disposal activities were terminated prior to 1984 although no documentation of disposal records are presently available to corroborate this assertion. Additionally, no regulatory permits, violations, or documents pertaining to AOC-2 were found that disclosed information on the purpose or past uses of the site. If the former air traffic tower was a source of disposal to the site, it has since been removed.

Relevant Information

Interviews of Base personnel were conducted in 2004 as part of the document review process. Personnel from the 49th Civil Engineering Squadron (CES) were interviewed concerning potential dumping, burial, or storage of wastes at the site. To the recollection of the personnel interviewed, there was no dumping, burial, or storage of hazardous wastes at the site. Each individual questioned had been stationed at HAFB for at least 30 years.

Aerial photographs from 1945, 1982, and 1997 were shown to CES personnel during the interviews. The photos show the former air traffic control tower that was located immediately west of AOC-2. There has been no indications from the documentation reviewed that disposal of any substance from the former tower to the area, septic or otherwise, has occurred in the past. No historical documents were found pertaining to the purpose or past uses of the site. No potential receptors have been identified for the soil, surface, and air media. It is inferred that only the groundwater media would have the potential to impact potential receptors; however, due to the large distances, even this is unlikely. In summary, based on the interviews, site reconnaissance, and the presence of the sewage disposal sign, the site may have been plumbed to the former control tower for sanitary purposes; however, no direct evidence is available to confirm this assertion.

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AOC-2 Surface Features

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 20

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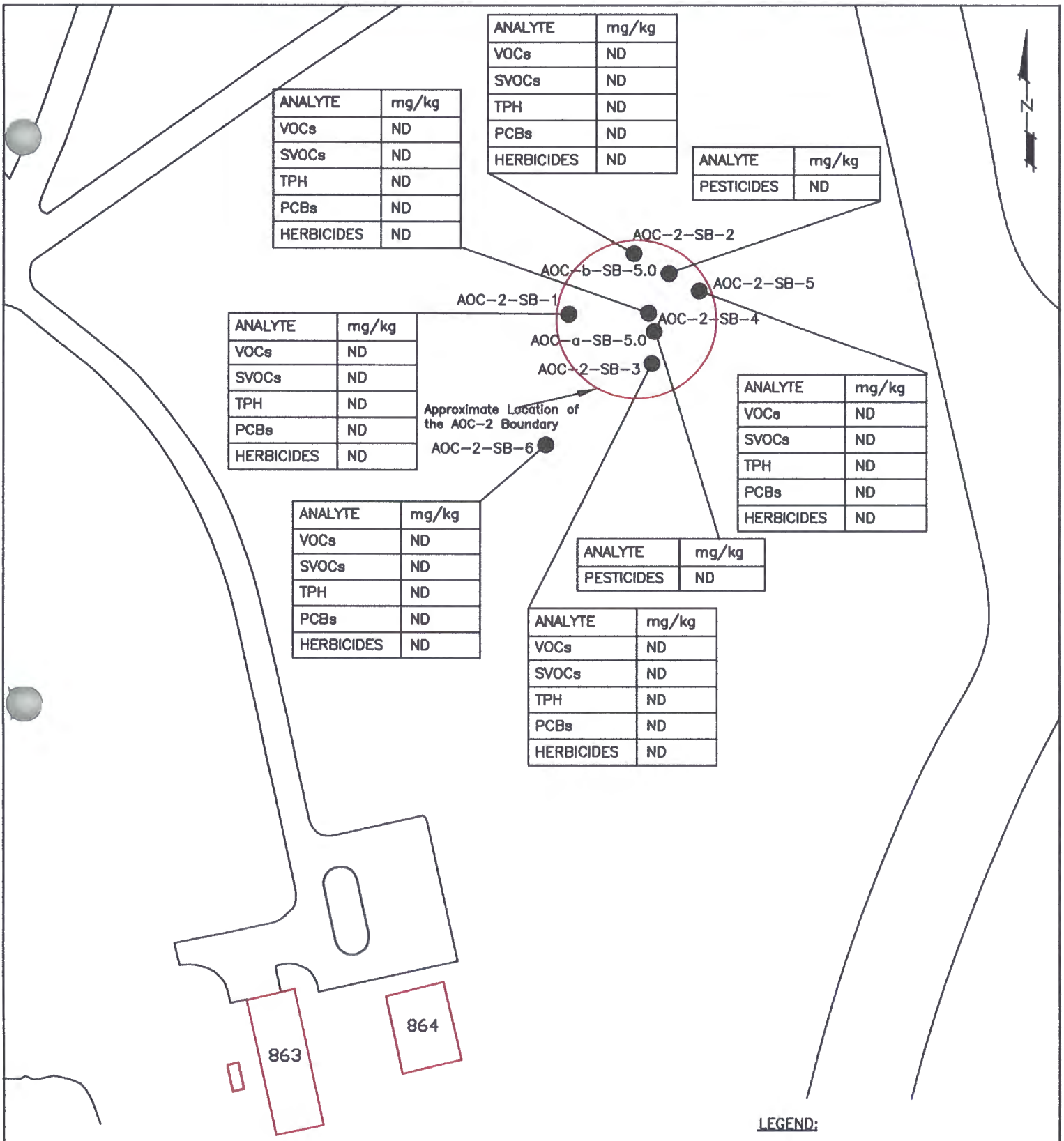
Holloman AFB, NM

Figure 20

RFI field activities were conducted in 2004. To facilitate the production and review of this document, figures summarizing the results and tables comparing the relevant results to regulatory standards have been included in the text. During the RFI, soil borings were advanced, and soil and groundwater samples were collected from selected locations at the site to determine the nature and extent of possible contamination. In May 2004, six soil borings (SB-1 through SB-6) were advanced around AOC-2 (**Figure 21**). These soil borings were sampled continuously to a depth of approximately 20 feet bgs. Two shallow boreholes (A and B) were advanced within the AOC-2 boundary using a hand auger. Temporary monitoring wells were installed in each of the six deep soil borings for the purpose of collecting groundwater samples. Groundwater samples were collected from each of the monitoring wells. The soil and groundwater samples were analyzed for VOCs; SVOCs; TPH-GRO, TPH-DRO, and TPHORO; RCRA-8 metals; polychlorinated biphenyls (PCBs); herbicides; and pesticides. Additionally, groundwater samples were also analyzed for TDS and nitrate and nitrite.

Analytical results for samples collected from AOC-2 indicate that no VOCs, SVOCs, PCBs, herbicides, TPH, or pesticides were detected above the method detection limits. However, several RCRA-8 metals were detected. Summaries of these soil results are illustrated on **Figures 21** and **22**. Each metal concentration was compared to the Base-wide upper tolerance limits (UTLs) (Radian, 1993) and then to the Residential SSLs (NMED, February 2004). As summarized in **Table 3**, arsenic, barium, cadmium, chromium, lead, and silver were all detected at low concentrations in the soil samples. Of these detections, two occurrences of arsenic (4.12 milligrams per kilogram [mg/kg] in SB03-3 and 4.91 mg/kg in SB-04-3) are below the base-wide UTL (6.88 mg/kg), but exceed the SSL (3.90 mg/kg). Two occurrences of silver (1.6 mg/kg in SB-04-9 and 0.86 mg/kg in SB-04-3) exceeded the base-wide UTL of 0.73 mg/kg though each is well below the SSL of 391 mg/kg. Because selenium and mercury were not detected in any soil samples they were not included in the table.

Analytical results for groundwater samples collected from AOC-2 indicate that with the exception of low levels of several RCRA-8 metals, no VOCs, SVOCs, TPH, pesticides, or herbicides were detected. Each metal concentration has been compared to the base-wide UTLs for total metals in groundwater (Radian, 1993), the NMWQCC Groundwater Standards (NMAC 20.6.2), EPA Maximum Contaminant Levels (MCLs), and EPA Region 6 Preliminary Remediation Goals (PRGs). Cadmium, lead, mercury, and silver were not detected in groundwater at the site. Analytical results for groundwater are summarized on **Figures 23** and **24**. Comparisons of groundwater results with the applicable regulatory standards and background values is presented in **Table 4**.



ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
PESTICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
PESTICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- ● SOIL BORING LOCATIONS
- BUILDINGS
- ND NOT DETECTED
- mg/kg MILLIGRAMS PER KILOGRAM

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AOC-2 SOIL ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 21

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Figure 21

SAMPLE	SB-01-4	SB-01-10
METALS	mg/kg	mg/kg
ARSENIC	3.52	3.22
BARIUM	13.6	30.1
CADMIUM	ND	ND
CHROMIUM	1.44	4.13
LEAD	ND	0.64
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

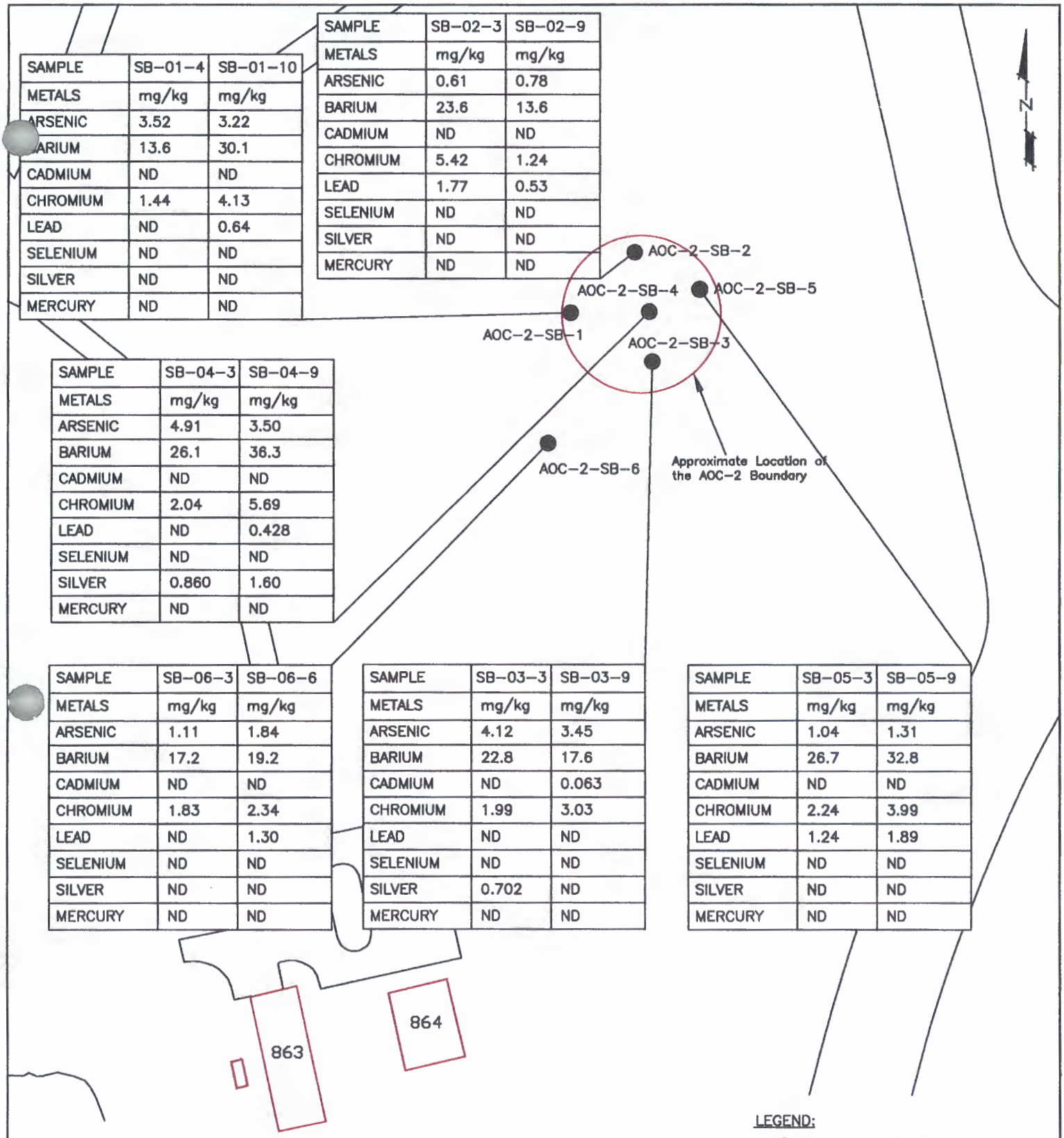
SAMPLE	SB-02-3	SB-02-9
METALS	mg/kg	mg/kg
ARSENIC	0.61	0.78
BARIUM	23.6	13.6
CADMIUM	ND	ND
CHROMIUM	5.42	1.24
LEAD	1.77	0.53
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

SAMPLE	SB-04-3	SB-04-9
METALS	mg/kg	mg/kg
ARSENIC	4.91	3.50
BARIUM	26.1	36.3
CADMIUM	ND	ND
CHROMIUM	2.04	5.69
LEAD	ND	0.428
SELENIUM	ND	ND
SILVER	0.860	1.60
MERCURY	ND	ND

SAMPLE	SB-06-3	SB-06-6
METALS	mg/kg	mg/kg
ARSENIC	1.11	1.84
BARIUM	17.2	19.2
CADMIUM	ND	ND
CHROMIUM	1.83	2.34
LEAD	ND	1.30
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

SAMPLE	SB-03-3	SB-03-9
METALS	mg/kg	mg/kg
ARSENIC	4.12	3.45
BARIUM	22.8	17.6
CADMIUM	ND	0.063
CHROMIUM	1.99	3.03
LEAD	ND	ND
SELENIUM	ND	ND
SILVER	0.702	ND
MERCURY	ND	ND

SAMPLE	SB-05-3	SB-05-9
METALS	mg/kg	mg/kg
ARSENIC	1.04	1.31
BARIUM	26.7	32.8
CADMIUM	ND	ND
CHROMIUM	2.24	3.99
LEAD	1.24	1.89
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND



NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- ● SOIL BORING LOCATIONS
- ▭ BUILDINGS
- ND NOT DETECTED
- mg/kg MILLIGRAMS PER KILOGRAM

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AOC-2 RCRA-8 METALS
SOIL ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 22

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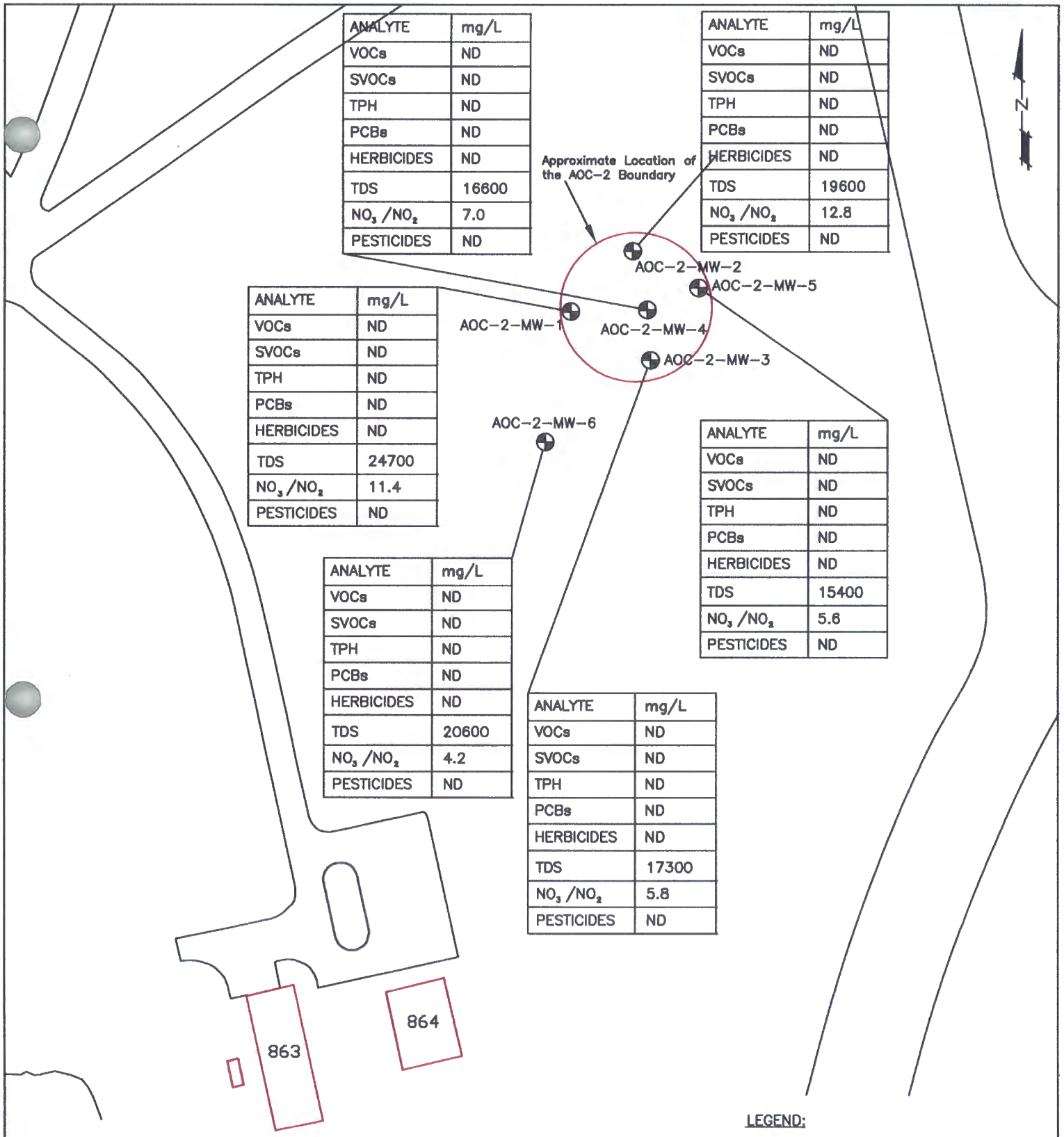
Figure 22

Table 3. Comparison of AOC-2 Soil Analytical Results to Base-wide Background Levels and NMED SSLs

Analyte	Arsenic	Barium	Cadmium	Chromium	Lead	Silver
Number of samples with detections	14 (including duplicates)	14 (including duplicates)	1	14 (including duplicates)	9 (including duplicates)	3
Range	0.61 to 4.91 mg/kg	13.6 to 36.3 mg/kg	0.063 mg/kg	1.24 to 5.69 mg/kg	0.428 to 1.89 mg/kg	0.702 to 1.6 mg/kg
High	SB-04-3	SB-04-9	SB-03-9	SB-04-9	SB-05-9	SB-04-9
Base-wide UTL	6.88 mg/kg	84.36 mg/kg	1.04 mg/kg	6.6 mg/kg	*	0.73 mg/kg
NMED SSL	3.9 mg/kg	5,450 mg/kg	74.1 mg/kg	234 mg/kg	400 mg/kg	391 mg/kg
Exceed UTL	No	No	No	No	N/A	Yes
Exceed SSL	Yes	No	No	No	No	No

Notes: * calculated UTL was a non-positive value, which is not a usable value for screening.
N/A = Not Applicable



ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	16600
NO_3/NO_2	7.0
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	19600
NO_3/NO_2	12.8
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	24700
NO_3/NO_2	11.4
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	15400
NO_3/NO_2	5.6
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	20600
NO_3/NO_2	4.2
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	17300
NO_3/NO_2	5.8
PESTICIDES	ND

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- MONITORING WELL LOCATIONS
- BUILDINGS
- ND — NOT DETECTED
- mg/L — MILLIGRAMS PER LITER

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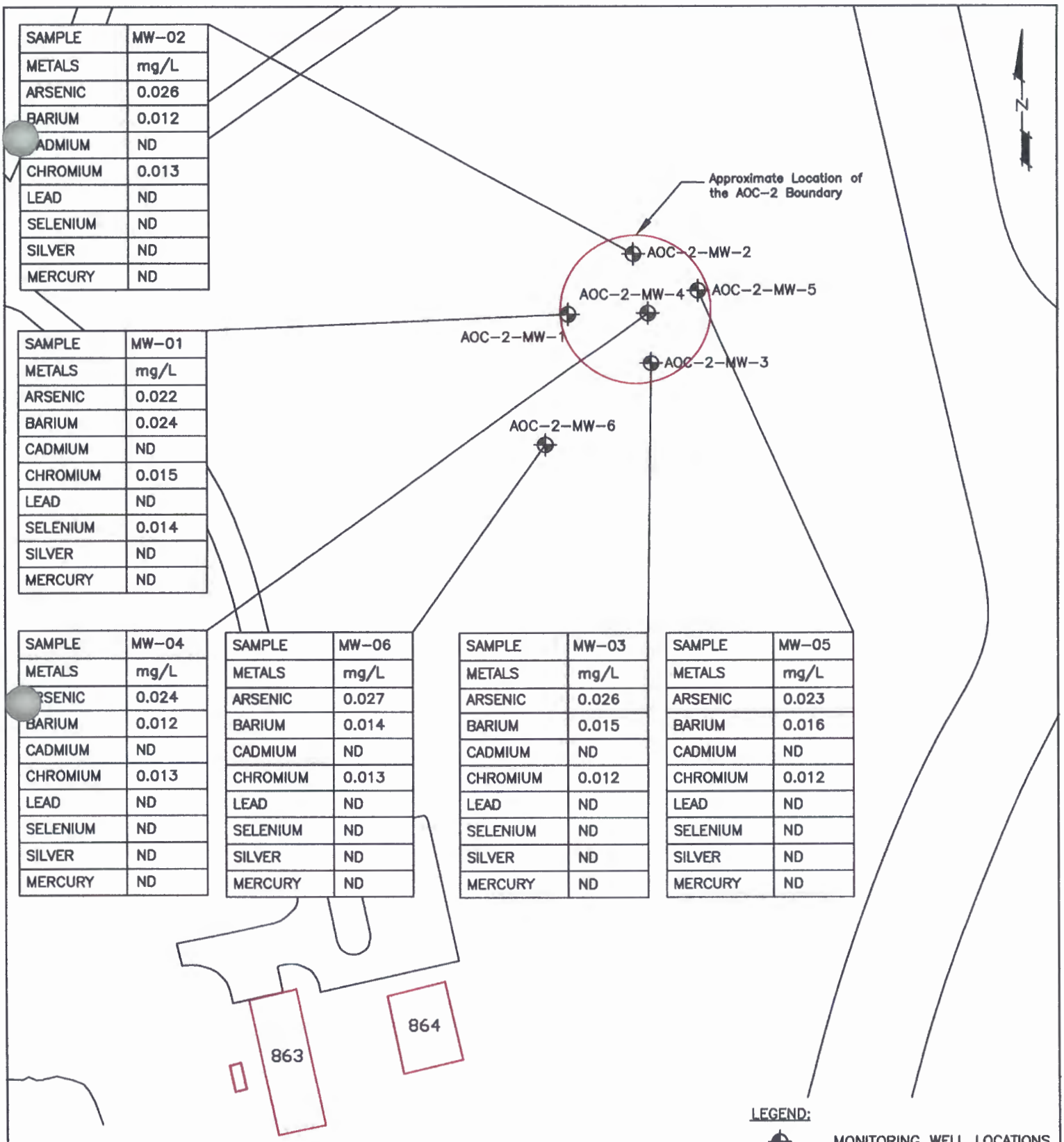
AOC-2 GROUNDWATER ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 23

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 23



SAMPLE	MW-02
METALS	mg/L
ARSENIC	0.026
BARIUM	0.012
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-01
METALS	mg/L
ARSENIC	0.022
BARIUM	0.024
CADMIUM	ND
CHROMIUM	0.015
LEAD	ND
SELENIUM	0.014
SILVER	ND
MERCURY	ND

SAMPLE	MW-04
METALS	mg/L
ARSENIC	0.024
BARIUM	0.012
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-06
METALS	mg/L
ARSENIC	0.027
BARIUM	0.014
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-03
METALS	mg/L
ARSENIC	0.026
BARIUM	0.015
CADMIUM	ND
CHROMIUM	0.012
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-05
METALS	mg/L
ARSENIC	0.023
BARIUM	0.016
CADMIUM	ND
CHROMIUM	0.012
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

LEGEND:

MONITORING WELL LOCATIONS

BUILDINGS

ND NOT DETECTED

mg/L MILLIGRAMS PER LITER

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

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AOC-2 RCRA-8 METALS
GROUNDWATER ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 24

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Figure 24

or groundwater pathways. Analytical results for soil samples collected do not exceed the NMED SSLs. Groundwater analytical results do not exceed NMWQCC standards except for nitrate with a maximum concentration of 12.8 mg/L. The RFI Report concluded that the presence of nitrate above the NMWQCC standard of 10 mg/L is not considered a risk due to the naturally high TDS concentrations and the lack of an ongoing discharge at the site. TDS concentrations in each of the monitoring wells exceed the NMWQCC standard of 10,000 mg/L which indicates the shallow groundwater at AOC-2 cannot be used for human consumption.

Based upon the RFI investigation conducted at SWMU AOC-2, this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use. **Figure 25** is a copy of the letter from NMED indicating the site is eligible for NFA status.

References

Bhate, 2005, Revised Final Facility Investigation Site AOC-2 Holloman AFB, New Mexico

Radian Corporation. December 1993. *Base-wide Background Study – Sewage Lagoons and Lakes Investigation*, Holloman Air Force Base, NM.

Tetra Tech FW. January 2004. Letter Report *Long Term Groundwater Monitoring Program for ERA Sites: Groundwater Quality Evaluation, Holloman Air Force Base, New Mexico.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone (505) 428-2500
Fax (505) 428-2567
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

January 25, 2006

Ms. Debbie Hartell
Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

SUBJECT: APPROVAL OF RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION, RFI REPORT ON AOC-2 HOLLOMAN AIR FORCE BASE EPA ID# NM6572124422 HWB-HAFB-05-001

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has completed review of Holloman Air Force Bases's (the Permittee's) November 18, 2005 Revised Final RCRA Facility Investigation (RFI) Report for Area of Concern (AOC) 2. The Permittee submitted this revised RFI Report in response to NMED's Request for Supplemental Information (RSI), dated July 25, 2005. This RSI was issued after review of the initial RFI Report dated February 2005.

Based on NMED's review of this response, it has been determined that AOC-2 appears to be suitable for a No Further Action (NFA) petition. Therefore, the Permittee may propose this site for NFA based on NMED's NFA Criterion 5, which states, "*The AOC has been characterized and/or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.*"

If you have any questions regarding this matter, please contact David Strasser at (505) 222-9526.

Sincerely,

Cornelius Amindyas
HAFB Project Leader
Permits Management Program

CA/dcs

cc: J. Bearzi, Chief, NMED, HWB
J. Kieling, NMED, HWB
W. Moats, NMED, HWB
D. Strasser, NMED, HWB
D. Tellez, EPA, Region 6 (6PD-F)
D. Holmquist, HAFB

File: HAFB 2006 and Reading

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AOC-2 January 25, 2006 NMED NFA Letter					Statement of Basis 2007 10 SWMUs Holloman AFB, NM
PROJECT NO.	SCALE AS SHOWN	DATE 3/5/07	DRAWN BY: cm	CREATED BY:	Figure 25
			DRAWING NO: Figure 25		

J.5 SWMU AOC-R JP-4 Fuel Line Spill Site (ERP Site SS-06)

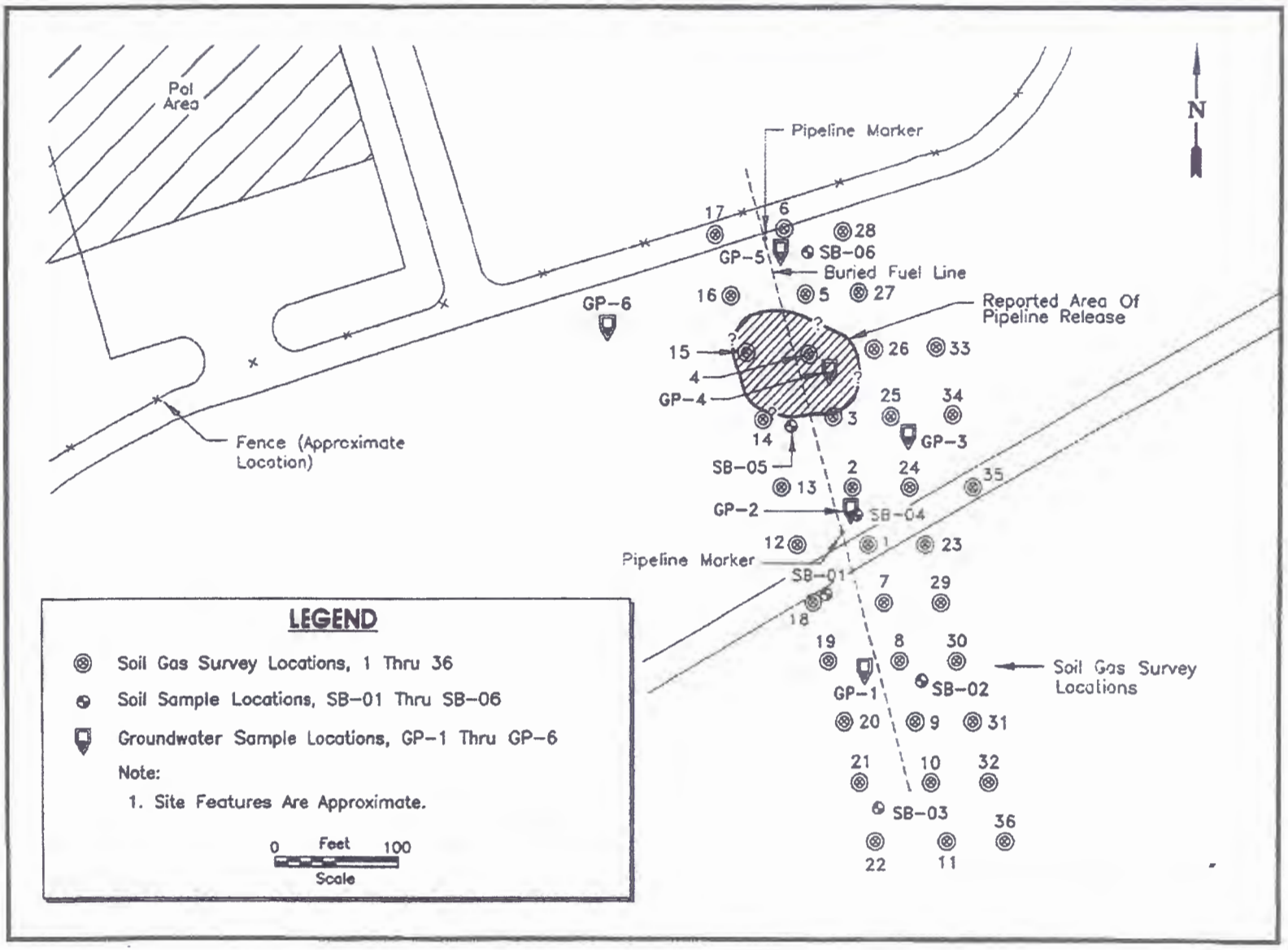
Location
SWMU AOC-R, JP-4 Fuel Spill Site (ERP Site SS-06) is located along the eastern boundary of the Base, in the Main Base Area near Building 1254 (**Figure 26**). The site is situated approximately 200 feet south of the Petroleum, Oil, and Lubricants (POL) storage area.

History
In 1979, a road grader accidentally hit and ruptured the JP-4 fuel line leading to the POL storage areas. Approximately 8,000 gallons of JP-4 spilled onto the ground before the release could be stopped. Cleanup operations were immediately performed and the majority of the jet fuel was reportedly recovered.

A records search for Site SS-06 was conducted by CH_2M Hill in 1982. The site was not considered to present a significant risk and further investigation of the site was not recommended at that time. A SI was conducted at SS-06 in March 1995 by Ebasco Services, Inc. The objective of the SI was to determine the presence or absence of contaminants in the soil and groundwater related to the 1979 JP-4 release from the pipeline.

The scope of work for the SS-06 SI included the following field activities:

- Thirty-six (36) soil-vapor points (SS-06-SG-1 through SS-06-SG-36) were installed in a rectangular pattern around the spill area. Soil-vapor samples were analyzed by an on-site mobile laboratory for benzene, toluene, ethylbenzene, and xylene (BTEX) constituents and TPH as JP-4.
- Six soil boring locations (SS-06-SB-01 through SS-06-SB-06) were drilled in a pattern that straddled the pipeline. Two samples, one from the groundwater interface and the other from the highest headspace VOC reading were selected for analysis. Soil samples were analyzed for TPH, VOCs, and Target Analyte List (TAL) metals. One sample for each boring was also selected for geotechnical analysis.
- Six temporary monitoring well points (GP-01 through GP-06) were installed during the SI. Groundwater samples were collected from wells GP-01, GP-02, and GP-03. Wells GP-04, GP-05, and GP-06 did not contain water and were not sampled. The three groundwater samples were analyzed for VOCs, dissolved TAL metals, and field parameters (pH, temperature, and specific conductance).



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SS-06 Site Map and Sample Locations

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 26

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Holloman AFB, NM

Figure 26

Evaluation of the Relevant Data

Results from the soil-vapor survey did not identify areas of potential soil and/or groundwater contamination. TPH was detected in only one sample (SG-36) with a concentration of 22 µg/L (micrograms per liter of air). Benzene and toluene concentrations ranged from not detected (<0.05 µg/L) to 0.14 µg/L and 1.20 µg/L, respectively at soil-vapor point SG-1. Total BTEX concentrations ranged from 0.24 µg/L (SG-31) to 2.05 µg/L (SG-1). However, total BTEX concentrations in the field blanks ranged from 0.45 µg/L to 1.13 µg/L. **Figure 27** is a site map summarizing the soil-vapor survey results.

No VOCs or TPH constituents were detected above the reporting limits in each of the 12 soil samples collected at SS-06, and all of the TAL metal concentrations were below their respective SSLs. No VOCs except acetone (17 µg/L) were detected in the three groundwater samples and duplicate samples analyzed. Zinc and lead were the only TAL metals detected above the Base-wide UTLs with concentrations of 3.4 mg/L and 0.063 mg/L, respectively. **Figures 28** and **29** summarize the results from soil and groundwater analyses respectively.

The subsurface conditions at SS-06 were defined by direct sampling and observation of the six soil borings. The lithology at SS-06 consists of fine grained materials, mostly inorganic silts and clayey sands with abundant gypsum crystals. The unconsolidated material varies from a light brown sand or clayey sand near the surface to a red silt with depth. Groundwater was encountered from 9 to 13 feet during borehole and direct push techonology (DPT) sampling but some wells at this depth did not produce enough water for sampling. A hard caliche layer is located above the groundwater table

Basis for Determination

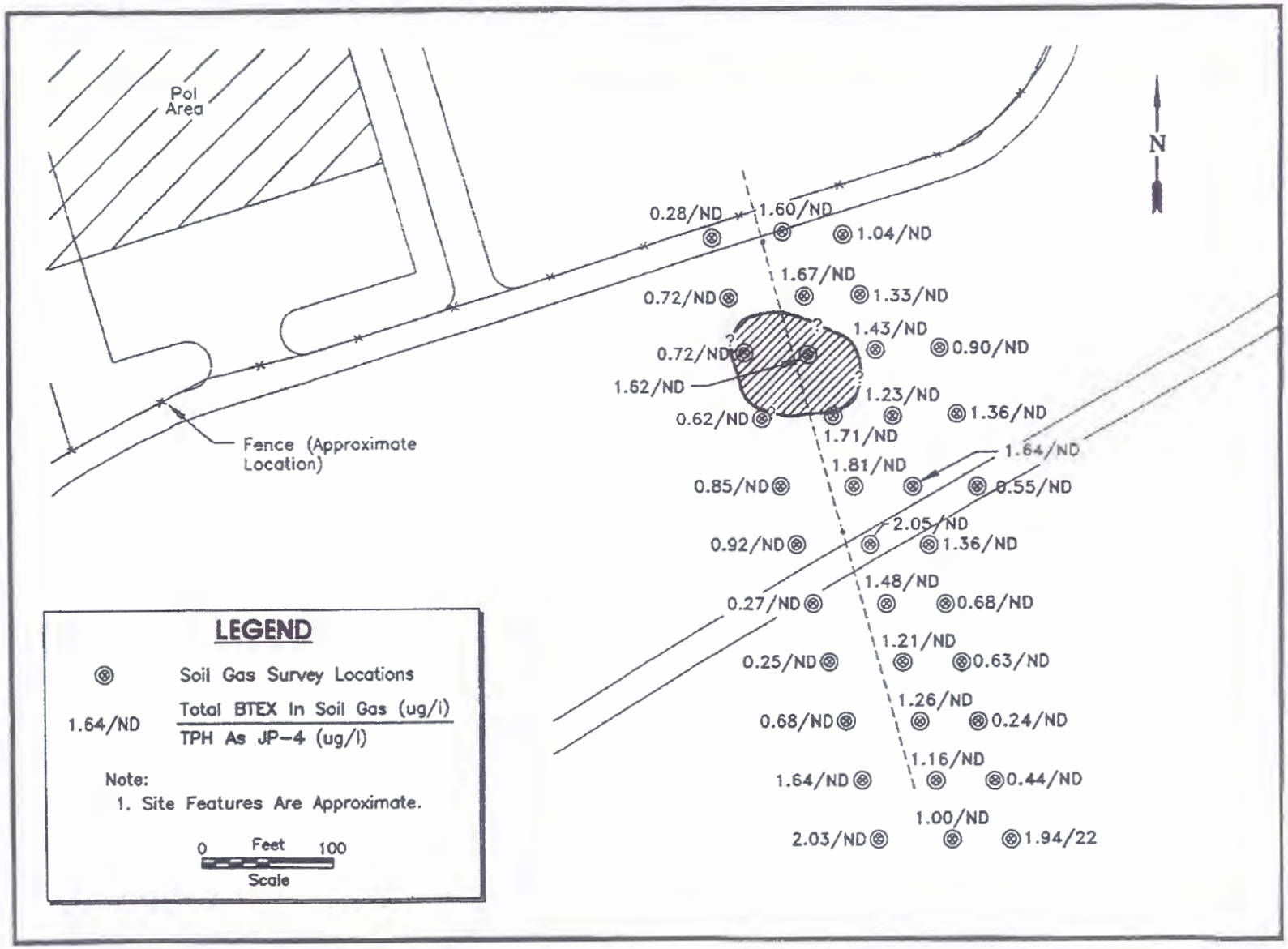
No petroleum related constituents were detected in the soil or groundwater samples collected during the investigation. The data indicates that the 1979 release did not impact the subsurface.

Based upon the investigation conducted at SWMU AOC-R (ERP Site SS-06), this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

References

CH_2M Hill. August 1983. *Installation Restoration Program Records Search for Holloman Air Force Base, New Mexico.*

Ebasco Services, Inc. (Foster Wheeler Environmental Corp), 1995. *Draft Final Site Investigation Report, Sites SS-06, SD-15, AOC-RR, and AOC-BBMS*. Holloman AFB, New Mexico.



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SS-06 Soil-Vapor Survey Results, March 1995

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 27

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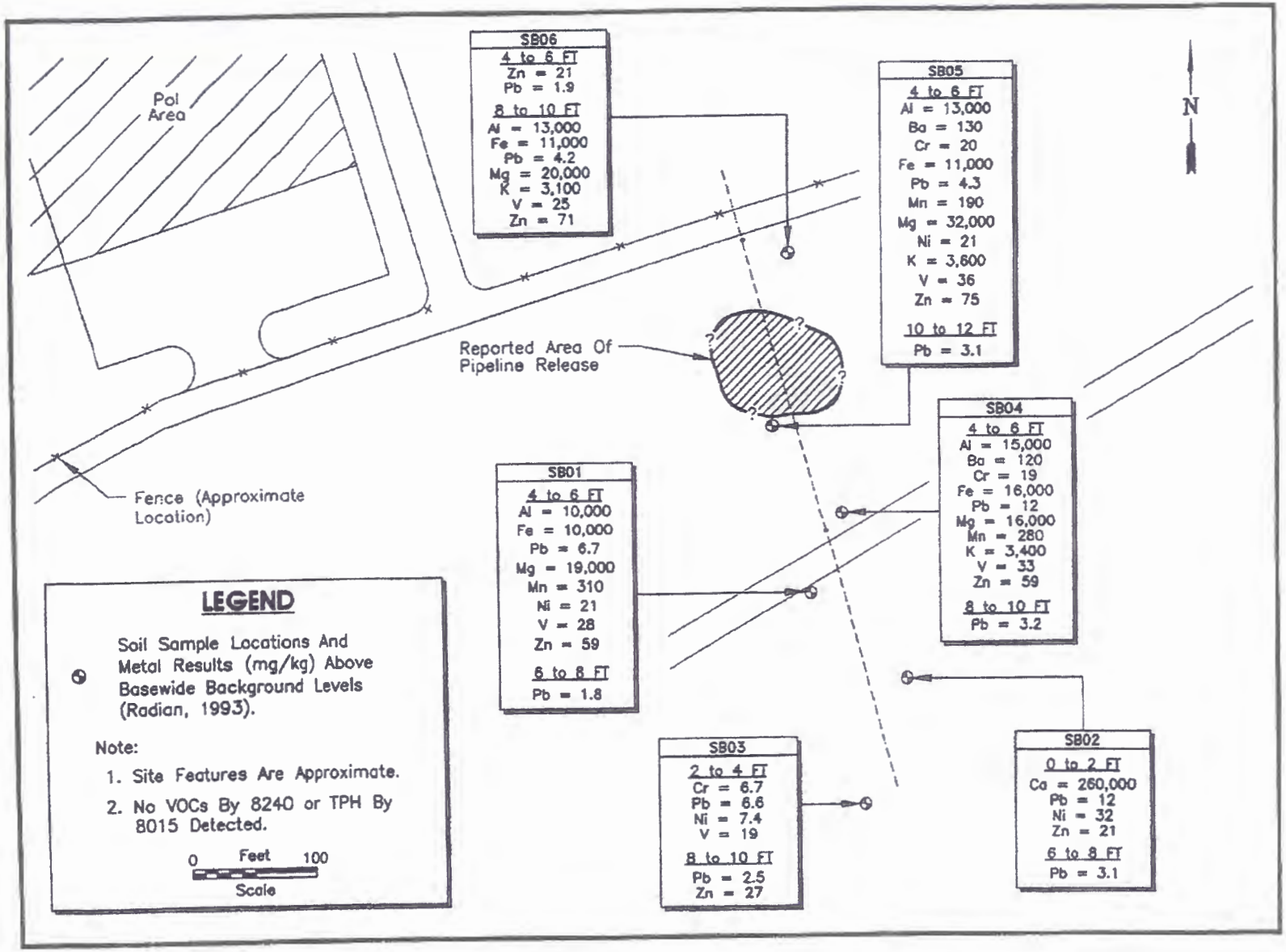
Figure 27



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SS-06 Soil Analytical Results, March 1995

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 28

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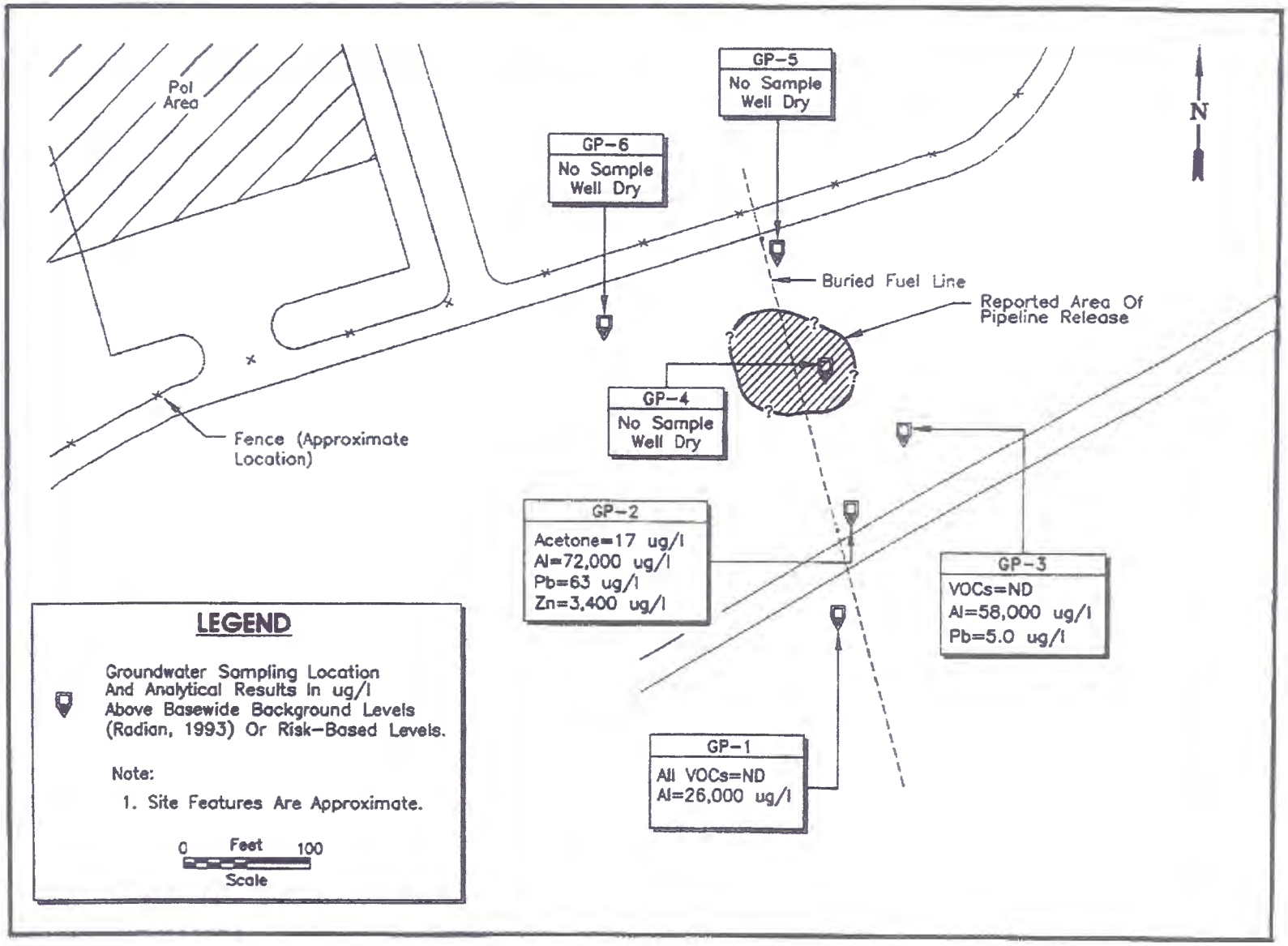
Figure 28



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SS-06 Groundwater Analytical Results, April 1995

Source: FWENC, 1995

PROJECT NO	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 29

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Figure 29

J.6 SWMU AOC-V, Officer's Club (ERP Site SS-57)

Location

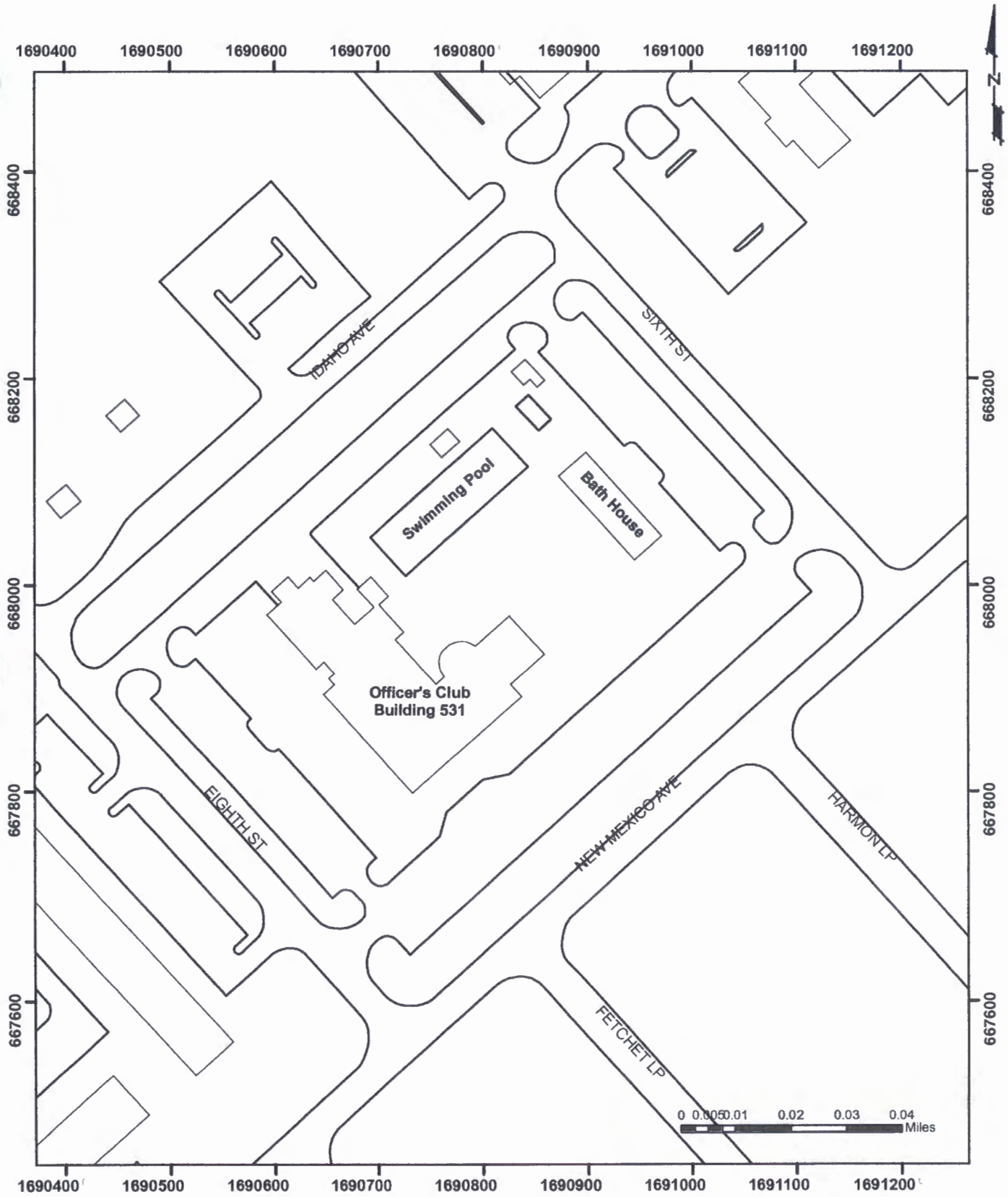
The Officer's Club (Building No. 531 ERP Site SS-57) is located at the corner of West 8th Street and West New Mexico Avenue, HAFB (**Figure 30**). The grounds around the Officer's Club are landscaped along the southwestern and western sides of the building while the northern and eastern portions of the site are paved with asphalt and concrete. The Officer's Club was designed in early 1957 and constructed as an addition to an existing dining hall. Remodeling and additions in 1985 and 1991 detected leaks from the swimming pool along with hydrogen sulfide odors. Site SS-57 was identified in the fall of 1991 when hydrogen sulfide odors were assumed to result from the natural anaerobic organic degradation of diesel fuel hydrocarbons which leaked from an UST prior to 1991. This UST was located near the southwestern corner of the Officer's Club and was removed prior to 1991.

History

From 1991 to 2004, the Officer's Club (Site SS-57) was the subject of a series of environmental investigations related to evaluating the soil and groundwater conditions to determine the cause of the hydrogen sulfide odors present in the Officer's Club. The first investigation was geotechnical and conducted in 1991. Two investigations were conducted in 1992 to determine the lateral and vertical extent of hydrocarbon contamination and the hydrogen sulfide gas. In 1996, an Air Sparging/Soil Vapor Extraction (AS/SVE) pilot test to determine the feasibility of using AS in conjunction with SVE to minimize the hydrogen sulfide generation (FWENC and Groundwater Technology, Inc., 1996). A system was installed in late 1996 and operated at the site until 2002. In 2002, a risk assessment and follow on investigation were conducted to better characterize the remaining hydrocarbons at the site. Additional characterization to document current subsurface conditions and support a risk assessment were performed in 2004. The results from the 2004 risk assessment and investigation demonstrated that conditions at the site were remediated below risk based standards. Soil boring and monitoring well locations for all the investigations are shown on **Figure 31.**

Evaluation of Relevant Information

A geotechnical investigation was performed in October 1991 to evaluate soil and groundwater conditions to determine the source of hydrogen sulfide odors emanating from the subsurface below the Officer's Club. Nine soil borings (B-1 to B-9) were advanced to depths ranging from approximately 1 to 29 feet below existing grade. Three monitoring wells (MW-5, MW-7, and MW-9) were installed at three of the nine borings. These borings and monitoring wells identified the presence of hydrocarbons (diesel fuel) in soil and groundwater samples collected from these wells.



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SS-57 Location Map

PROJECT NO.	SCALE	DATE	DRAWN BY.
	Shown	2/20/07	cm
			DRAWING NO: Figure 30

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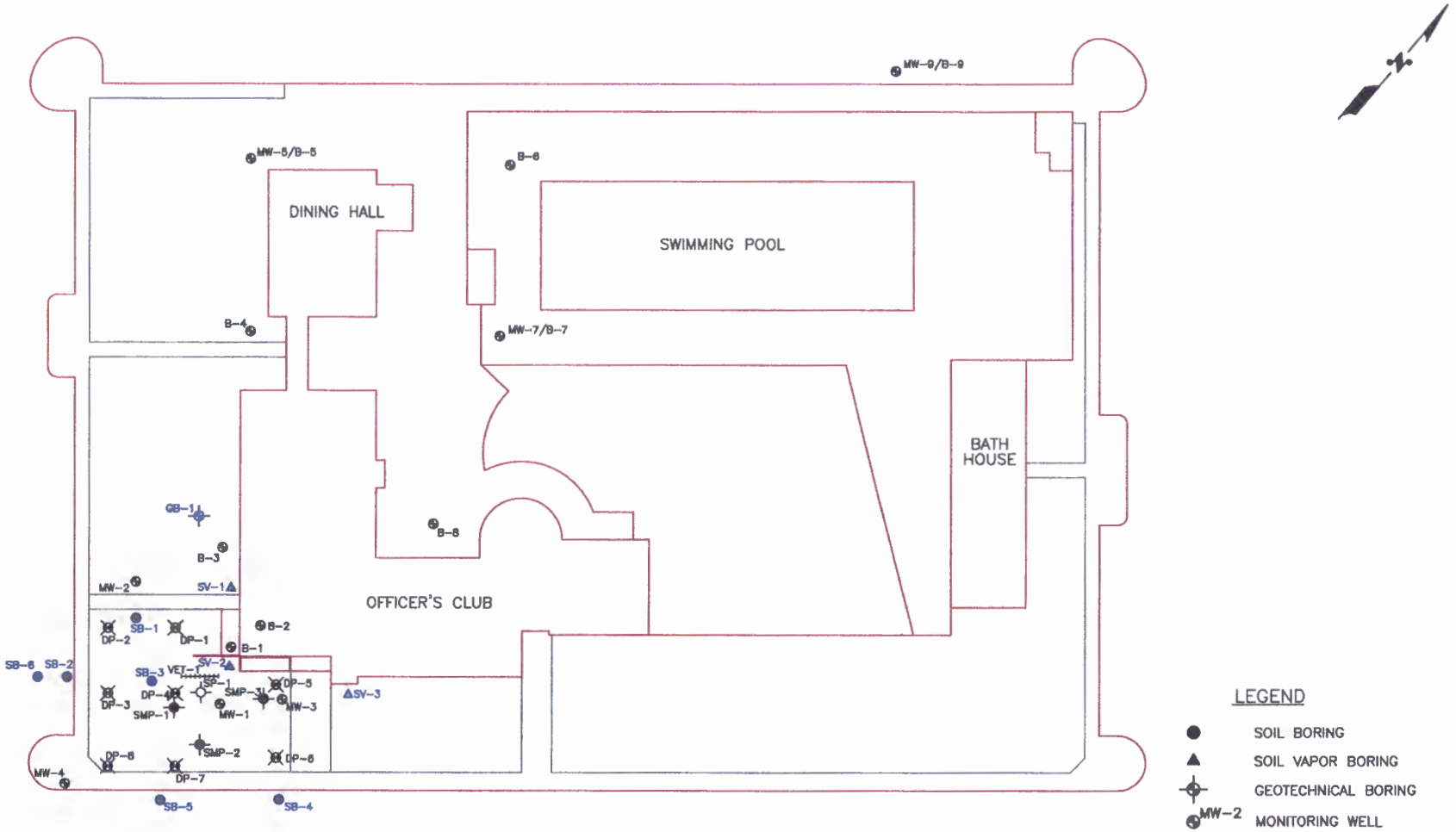
Holloman AFB, NM

Figure 30



LEGEND

- SOIL BORING
- SOIL VAPOR BORING
- GEOTECHNICAL BORING
- MW-2 MONITORING WELL
- B-2 BORING
- SPARGE POINT
- SPARGE MONITORING POINT
- DIRECT PUSH WELL
- VAPOR EXTRACTION TRENCH

0' 20' 40' 80'

SCALE:

NOTES:

Blue symbols indicate 2004 RFI

Drawing source: RAM GROUP INC.

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HOLLOMAN AFB, NM

Figure 31

SS-57 SAMPLE LOCATION MAP

PROJECT NO.	SCALE	DATE	DRAWN BY:	DRAWING NO:
	1"=40'	3/5/07	CM	Figure 31

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The subsurface investigation conducted in 1992 consisted of drilling four vertical borings (VB-01 to VB-04) and two angle borings (AB-01 and AB-02) near the southern corner of the Officer's Club. Soil samples were collected from the surface to 31 feet below ground surface. The objectives of this investigation were to better define the horizontal and vertical extent of the hydrocarbon contamination, determine the source of the offensive odor and to gather data necessary to enable the selection of a remedial action for the site. Twenty-five soil samples were collected and analyzed for TPH as diesel using Modified American Society for Testing and Materials (ASTM) Method D3328 and thirteen soil samples were analyzed for a bacteria enumeration study and a biological screening. The investigation concluded that the maximum TPH as diesel concentration was encountered at 18 feet bgs in boring AB-02 with a concentration of 12,000 micrograms per gram (µg/g). It appears from the 1992 investigation that most of the contamination exists primarily in the saturated zone. Diesel concentrations greater than 1,000 µg/g were detected in 14 of the 25 subsurface soil samples collected and analyzed. The report determined that the remedial alternative with the highest potential to reduce soil, water, and air contamination at the Officers Club was biosparging and SVE.

A pilot study was conducted at the site in 1996. Four existing wells, three new monitoring wells, and a triple nested sparge well were sampled for the study. The groundwater samples were analyzed for TPH as diesel by Modified ASTM Method D3328, dissolved iron by EPA Method 6010A, and sulfate by Modified EPA Method 375.4. An AS/SVE pilot test was conducted to determine the feasibility of using air sparging in conjunction with SVE to minimize the hydrogen sulfide generation.

TPH as diesel concentrations ranged from less than 10 mg/kg (MW-04) to 4,800 mg/kg (SMP-03) and were generally greatest at the 14 to 19-foot bgs sampling interval. Based on these results, it appeared that the TPH impact to the soil was limited to the southwest lawn of the Officer's Club and extended to a depth of 20 feet bgs. Groundwater samples were collected from seven monitoring wells (MW-1 through MW-4, and MW-5, MW-7, and MW-9) and the sparge well (SP-01) at all three screened intervals. TPH as diesel concentrations ranged from <100 to 9,700 µg/L with the highest concentration in MW-3. Based on the analytical results for the AS/SVE pilot test air samples, air emission rates of approximately 0.14 pound per hour TPH (as gasoline) was expected from the AS/SVE remediation system. The maximum hydrogen sulfide removal rate during the pilot tests was 0.0043 pounds per day (FWENC and GTI, 1996).

The AS/SVE system was installed in 1996 and operated until 1999. The AS/SVE system performance/long term monitoring was conducted from 1997 to 1999 at SS-57. System performance monitoring consisted of collecting subsurface soil samples at various locations for determining the effectiveness of the AS/SVE system.

In July 2002, 16 soil samples were collected from 8 soil borings (DP-1 to DP-8) at SS-57 to adequately characterize the nature and extent of contamination in the source area in order to conduct a human health risk assessment (HHRA) and ecological screening assessment (ESA). The assessments were performed to evaluate the magnitude and

probability of threats to public health and the environment posed by site-related chemicals in untreated soil and groundwater (Foster Wheeler, 2003). Groundwater samples were not collected during the 2002 event. A complete discussion of the HHRA and the ESA was presented in the *Phase I Human Health Risk Assessment and Ecological Screening-Level Assessment for SS-57- Officers Club, Holloman Air Force Base, New Mexico* (Foster Wheeler, 2003). This assessment, however, was determined to not be representative of subsurface conditions. Additional data collection was deemed necessary to completely evaluate the site for suitability for risk-based closure.

In 2004, RFI activities were conducted at SS-57. The purpose of this RFI was to collect soil, groundwater, and soil-vapor data to characterize the current site conditions for a comprehensive site-specific risk assessment. Data from this investigation was used to determine whether the residual soil and groundwater concentrations of petroleum hydrocarbons result in an unacceptable risk. Data collected before June 2002 was not considered representative of current site conditions due to the natural biodegradation of petroleum hydrocarbons. Additionally, data collected during the operation of the AS/SVE system would be biased to the low end and would not be representative of static or current conditions. Although the pre June 2002 data was not used quantitatively, it was used qualitatively to develop the data acquisition plan for the risk assessment.

In February 2004, five shallow soil borings (SB-01 to SB-05) were advanced in the vicinity of the source area at SS-57 (**Figure 32**). The soil borings were advanced using a DPT rig. Two soil samples were collected from each borehole at various intervals from 2 to 10 feet bgs. In addition, two soil samples were collected from each of the three dual completion soil-vapor borings (SV-1 to SV-3). In August 2004, one additional borehole (SB-6) was drilled 10 feet west of SB-2 to a depth of six feet bgs. Groundwater samples were collected from each of the five soil borings (SB-1 to SB-5) and monitoring wells MW-1 to MW-5 and MW-7. Six soil-vapor samples were collected from three dual completion soil-vapor borings (SV-1 to SV-3) that were advanced adjacent to the basement area at the Officer's Club. Soil-vapor samples were collected in order to assess the potential for exposure to VOCs via indoor air.

The soil samples collected during this RFI were analyzed for VOCs, SVOCs, TPH, and carbon fractions to identify chemicals of potential concern (COPCs). Based on the review of soil data collected in July 2002, February 2004, and August 2004 the following was observed:

- Twenty-seven subsurface soil samples were collected from borings DP-1 to DP-7, SB-1 to SB-6, and SV-1 to SV-3.
- Acetone, carbon disulfide, chrysene, ethylbenzene, diethylphthalate, fluoranthene, 2-methylnaphthalene, phenanthrene, TPH, hexane, indeno(1,2,3-c,d)pyrene, isopropylbenzene, xylenes, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, and pyrene were detected in the subsurface soil.

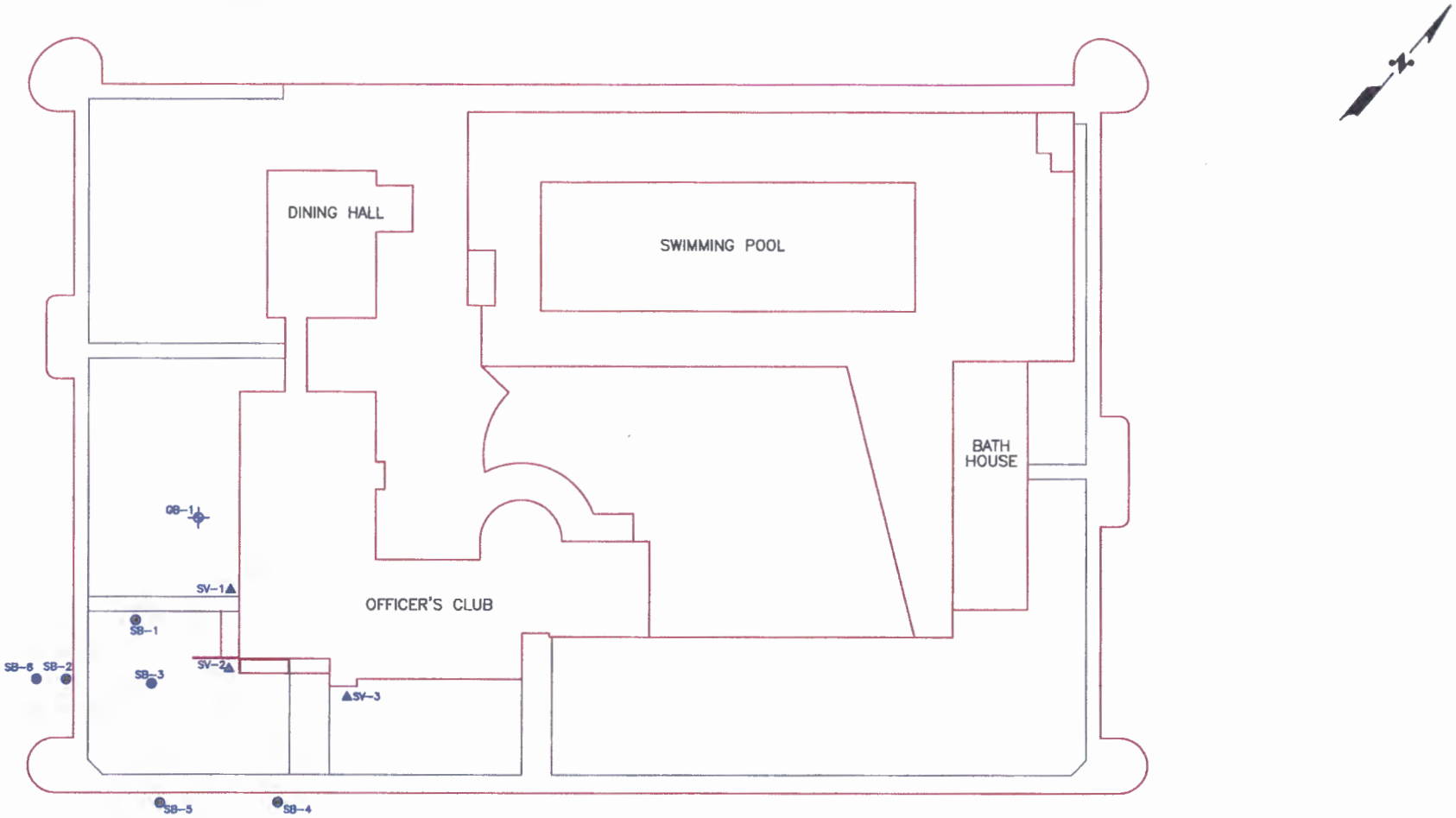
- The maximum depth of soil analysis was at 12 feet bgs for boring DP-4. TPH-DRO and TPH-ORO were detected.
- The maximum TPH-DRO concentration observed was 9,350,000 µg/kg at 6-8 feet bgs in SB-2.
- Except for TPH-DRO, none of the maximum soil concentrations exceeded the NMED SSLs.

The groundwater samples collected during this investigation were analyzed for TPH, VOCs, and TDS. Based on the review of groundwater data collected in February and August 2004 and February 2006, the following was observed:

- The 11 groundwater samples collected from borings SB-1 to SB-5, and monitoring wells MW-1 through MW-5, and MW-7 were analyzed for VOCs and TPH.
- TPH-DRO, acetone, benzene, 2-butanone, carbon disulfide, chloroform, cyclohexane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichlorodifluoromethane, ethylbenzene, isopropylbenzene, methylcyclohexane, trichloroethene, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylenes were detected in the groundwater samples referenced above.
- The maximum TPH-DRO concentration of 3,600 µg/L was observed in the sample from SB-3.
- Except for TPH-DRO, none of the maximum groundwater concentrations exceeded the groundwater standards.
- The four groundwater samples collected from monitoring wells MW-1 to MW-4 in February 2006 were analyzed for TDS. TDS concentrations ranged from 2,040 mg/L (MW-1) to 4,590 mg/L (MW-4).
- Groundwater flow direction is southward at the site (**Figure 33**).

Soil-Vapor analytical results are summarized as follows:

- Six soil-vapor samples were collected from the soil-vapor borings (two each from locations SV-1 to SV-3).
- TPH-GRO, 2-propanol, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, acetone, chloroform, toluene, m/p-xylene, o-xylene, and naphthalene were detected in the soil-vapor samples.
- The maximum TPH-GRO concentration of 530 micrograms per cubic meter ($\mu g/m^3$) was observed in the sample from SV-2.
- A toluene concentration of 5.2 $\mu g/m^3$ was detected at 3 feet bgs at soil-vapor boring location SV-3.



0' 20' 40' 80'

SCALE:

Drawing source: RAM GROUP INC.

LEGEND

- SOIL BORING
- SOIL VAPOR BORING
- GEOTECHNICAL BORING

NOTES:

Blue symbols indicate 2004 RFI

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 32

SS-57 RFI SOIL AND SOIL-VAPOR

PROJECT NO.	SCALE	DATE	DRAWN BY:	DRAWING NO:
	1"=40'	3/5/07	cm	Figure 32

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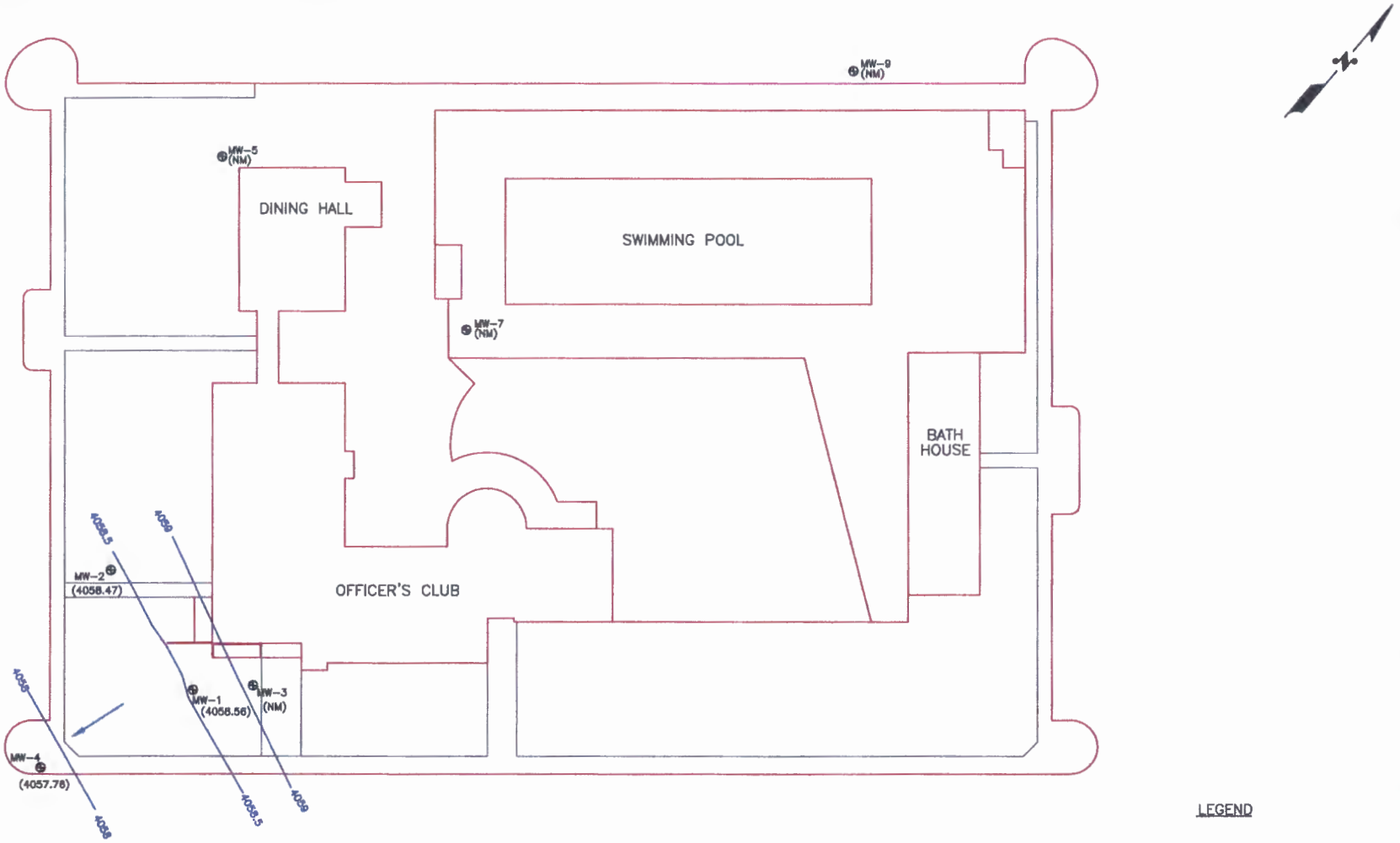

0' 20' 40' 80'

SCALE:

Drawing source: RAM GROUP INC.

LEGEND

MW-2	MONITORING WELL
	GROUNDWATER CONTOUR LINES (DASHED WHERE INFERRED)
4057.80	GROUNDWATER ELEVATION (OCTOBER 19, 2004)
	GROUNDWATER FLOW DIRECTION
NM	NOT MEASURED

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 33

SS-57 GROUNDWATER CONTOUR MAP

PROJECT NO.	SCALE	DATE	DRAWN BY:	DRAWING NO:
	1"=40'	3/5/07	CM	Figure 33

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An exposure model (EM) and a conceptual site model (CSM) were developed for the Officer's Club, Site SS-57. These models were used to determine potential present and future risks to commercial/industrial workers and construction workers. The analysis concluded that present concentrations of petroleum hydrocarbon constituents in soil, groundwater, and outdoor vapors do not pose a threat to commercial/industrial workers and construction workers. The analysis concluded that concentrations of petroleum hydrocarbon constituents in soil, groundwater, and outdoor vapors do not pose a threat to commercial/industrial workers and construction workers. Likewise, indoor inhalation risk was evaluated and the levels of petroleum hydrocarbon constituents at the site do not pose a risk by indoor inhalation.

Basis for Determination

The maximum soil, groundwater, and soil-vapor concentrations were compared with NMED SSLs, NMWQCC standards, and air inhalation target levels (New Mexico Underground Storage Tank Bureau, 2000), respectively. None of the concentrations exceeded the standards. However, NMED target levels do not account for indoor inhalation of vapors from soil or groundwater. Therefore, the Johnson & Ettinger (J&E) model was used to estimate soil and groundwater target levels protective of indoor inhalation. None of the site soil and groundwater maximum concentrations exceed these target levels. Speciation of TPH-DRO data into aromatic and aliphatic fractions was based on the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) approach. Site-Specific Target Levels (SSTLs) were calculated for each fraction for each complete routes of exposure (ROE). Neither TPH-DRO nor the carbon fractions exceeded the SSTLs for the ROEs.

Based upon the RFI investigation conducted at SWMU AOC-V, ERP Site SS-57, the Officer's Club, this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

The residual soil, groundwater, and soil-vapor concentrations are protective of current and reasonable future receptors at the site. These concentrations are anticipated to reduce in time due to natural attenuation processes further reducing the risk. **Figure 34** is a copy of the NMED October 13, 2006, letter to HAFB accepting the RFI report thus completing efforts at the site.

References

Bhate Environmental Associates, Inc. April 2006, *Final RCRA Facility Investigation Report, Officer's Club, Site SS-57, Holloman AFB, New Mexico.*

Bhate Environmental Associates, Inc. July 2005. *Risk-Based Evaluation Officer's Club, Site SS-57.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
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Fax (505) 428-2567
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 13, 2006

Ms. Debbie Hartell, Chief
Environmental Flight
49th CBS/CEV
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL OF THE FINAL RCRA FACILITY INVESTIGATION REPORT, OFFICER'S CLUB, SITE SS-57 (AOC-V), APRIL 2006
HOLLOMAN AIR FORCE BASE, EPA ID #NM6572124422
HWB-HAFB-04-012

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's September 11, 2006 response to NMED's Notice of Deficiency dated August 30, 2006 for the Officer's Club Final RCRA Facility Investigation Report, dated April 2006. The Officer's Club, Site SS-57, is shown on Table A of the Facility Permit for Container Storage Unit as Area of Concern V (AOC-V). The referenced Report is hereby approved by the NMED.

If you have any questions regarding this matter, please contact David Strasser of my staff at (505) 222-9526.

Sincerely,

John B. Kieling
Manager
Permits Management Program

JBK:dlm

cc: J. Bearzi, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region 6 (6PD-F)
G. Fish, HAFB
File: HAFB 2006 and Reading
HAFB-04-012

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SS-57 October 13, 2006 NMED NFA Letter

PROJECT NO.	SCALE	DATE	DRAWN BY: cm	CREATED BY:
	AS SHOWN	3/5/07	DRAWING NO: Figure 34	

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 34

References (continued)

Foster Wheeler Environmental Corporation and Groundwater Technology, Inc. October, 1996. *Draft Final Air Sparging and Soil Vapor Extraction Pilot Test Report for Officers Club Site SS-57, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Groundwater Technology, Inc. October 1996. *Air Sparging/Soil Vapor Extraction System, Site SS-57 Officer's Club, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Groundwater Technology. February 1997. *Final Remedial Action Plan, Officer's Club, Site SS-57, Holloman Air Force Base, New Mexico.*

Foster Wheeler. July 2002. *2001 Long-Term Groundwater Monitoring Report, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation. April 2003. TERC No. DACW45-94-D-003, Delivery Order 37, Work Authorization Directive 1; AF Project No. KWRD20027018; Submittal of Letter Report for the Risk Assessments Completed for SS-57-Officer's Club, Holloman Air Force Base, New Mexico.

Foster Wheeler Environmental Corporation. April 2003. *Phase I Human Health Risk Assessment and Ecological Screening-Level Assessment for SS-57 - Officer's Club, Holloman Air Force Base, New Mexico.*

New Mexico Environment Department. February 2004. Appendix 4-B RCRA Facility Investigation (RFI) Outline, Holloman Air Force Base, Hazardous Waste Facility Permit No. NM6572124422.

New Mexico Environment Department. January 26, 2006. Notice of Deficiency Letter from James P. Bearzi (NMED, HWB) to Debbie Hartell, Chief of Environmental Flight, 49 CES/CEV, Holloman AFB, NM.

Radian Corporation. May 1993. *Final Sample and Quality Control Summary Report (SQCSR) Officers Club Soil Investigation, Holloman Air Force Base, New Mexico.*

Radian Corporation. December 1993. *Base-wide Background Study – Sewage Lagoons and Lakes Investigation, Holloman Air Force Base, New Mexico.*

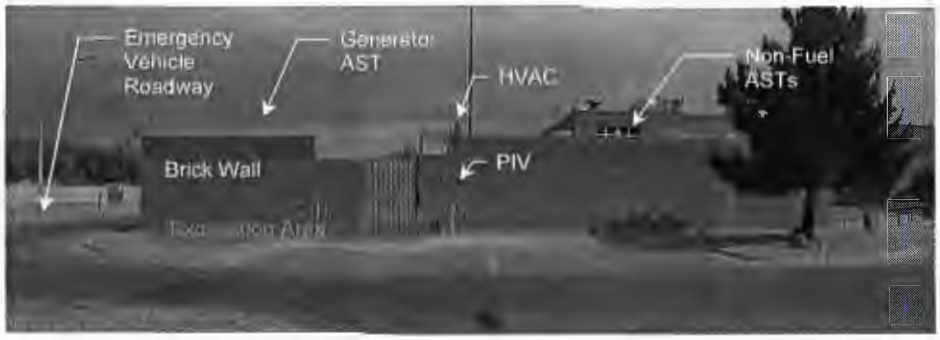
Sergent, Hauskins & Beckwith. December 1991. *Geotechnical Investigation, Officer's Club, Holloman Air Force Base, Alamogordo, New Mexico.*

Wilson & Company. June 1992. *Engineering Report for Study to Determine Source of Odor at the Officer's Club SVS 91-0206.*

J.7 SWMU AOC-S Hospital UST (ERP Site BHUST)

Location

AOC-S, the Base Hospital UST (ERP Site BHUST) is located at Building 15, the Base Hospital. The Base Hospital is located at the corner of 1st Street and Arnold Avenue on HAFB. The site is located on the north end of the hospital, adjacent to the west parking lot and the ambulance driveway. A brick and concrete block privacy wall which surrounds the hospital utility and mechanical equipment is evident from the front parking area (**Photograph 1**).



Photograph 1. Front View of Base Hospital UST Area

Photograph 2 provides detail for the interior of the walled area. Within this area there are the existing diesel fuel AST for the back-up generator, two medium size heating, ventilation, and air conditioning (HVAC) units, and two additional large ASTs to the right (south) with the contents unknown. To the immediate north, or left in **Photograph 1**, is the emergency roadway for the hospital emergency vehicles. In front of the privacy wall, and where the PCS was located, exists a concrete sidewalk.

Photograph 2. Inside View of Hospital Area

History

Records indicate the UST was installed at the Base Hospital in the early 1970s for storage of diesel fuel for the back-up generator. The UST was last used in early 1991 and abandoned by filling in place with sand on February 25, 1991. At that time, the UST abandonment was considered a clean closure. The site currently has a new 10,000-gallon AST within secondary containment, partially situated over the former UST

location. A new 7-inch steel-reinforced concrete slab that serves as a loading and unloading area for hospital maintenance covers the remainder of the area.

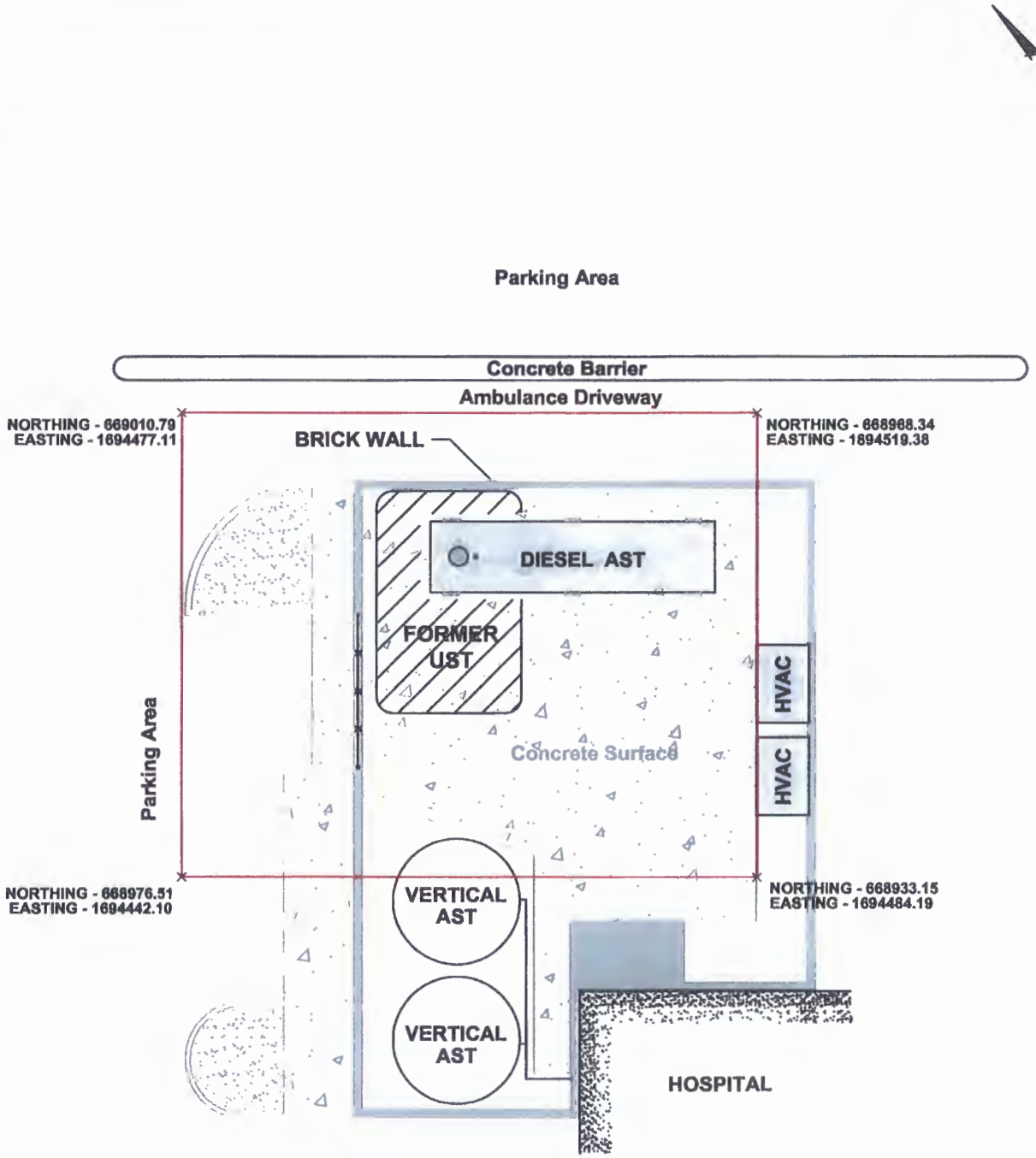
The UST was removed on July 28, 1999, and the AST was installed at the same location (**Figure 35**). During removal, contamination was identified in subsurface soils as discoloration and petroleum hydrocarbon odors, but no free product was observed on the groundwater. Two soil samples were collected from the sidewalls and bottom of the excavation in compliance with NMED UST regulations and analyzed for TPH-DRO, BTEX, and PCBs. The release was confirmed by laboratory analytical results on July 28, 1999. The NMED UST Bureau was subsequently notified of the release.

The cause of the release was undetermined. Interviews with employees indicated that the release may have been due to periodic overfilling. This was consistent with the location of the highest TPH concentrations, which appeared below the reported location of the fill port for the former UST. The release of diesel fuel was estimated at not to exceed 1,000 gallons. There was no sign of free-phase product on the water table and the extent of soil contamination suggested that the amount of released diesel fuel did not exceed the estimate.

Subsequent remediation conducted in 1999 and 2004 at the site involved the removal of PCS from the area beneath and just to the west of the AST following an additional soil sampling and investigation of the area.

Evaluation of Relevant Data

In October and November 1999, an investigation was performed at the BHUST site (Foster Wheeler, 1999). There were 16 locations with a total of 22 soil samples collected from the area during the investigation (**Figure 36**) and submitted to the laboratory for analysis. Locations were sampled at continuous 1-foot increments with intervals of the highest PID readings analyzed by a fixed-base laboratory. Analyzed samples were predominantly collected from mid depths ranging from 1 ft to a maximum depth of 10.5 ft bgs with a modal depth interval of 4 to 5 ft. Samples from three locations; SB-06, SB-13, and SB-14, demonstrated TPH levels above the NMED allowable limit of 880 mg/kg, at 1,890 mg/kg, 8,190 mg/kg, and 3,970 mg/kg, respectively. Samples from locations SB-11 and SB-07 also indicated TPH contamination, but concentrations in these samples were below 880 mg/kg. TPH concentrations were 60 mg/kg, 230 mg/kg, and 430 mg/kg, respectively. The remaining locations sampled had concentrations below the laboratory method detection limit and were reported as not-detected.



NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

NOTES

AST = Aboveground Storage Tank
UST = Underground Storage Tank
Site Boundary

The contents of the vertical ASTs are unknown.

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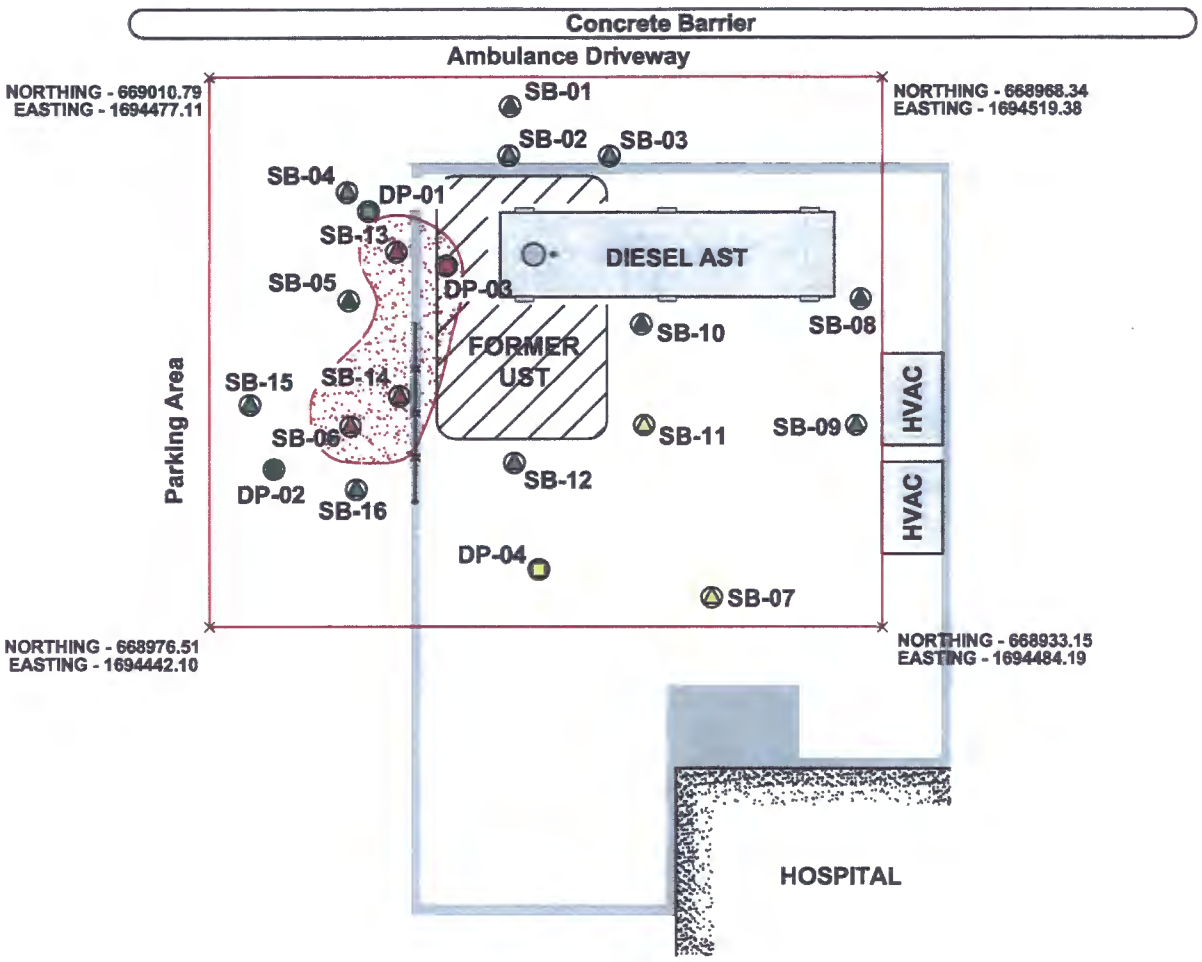
BASE HOSPITAL UST SITE LAYOUT

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 35

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 35



	Location	Depth (ft bgs)	TPH Concentration (mg/kg)
INITIAL SAMPLING	SB-01	4 - 5	ND
	SB-02	4 - 5	ND
	SB-03	4 - 5	ND
	SB-04	5 - 6	ND
	SB-05	3 - 4	ND
		5 - 6	ND
	SB-06	3 - 4	1,890
		5 - 6	ND
	SB-07	0 - 1	430
		4.5 - 5.5	ND
	SB-08	4 - 5	ND
	SB-09	4 - 5	ND
	SB-10	4 - 5	ND
		9 - 10	ND
	SB-11	7 - 8	230
		9 - 10	60
	SB-12	9.5 - 10.5	ND
	SB-13	4 - 5	8,190
		9 - 10	ND
	SB-14	7 - 8	3,970
	SB-15	6.5 - 7.5	ND
	SB-16	6.5 - 7.5	ND
SECOND SAMPLING	DP-01	2 - 3	ND
		5 - 6	ND
	DP-02	4 - 5	ND
		5 - 6	ND
	DP-03	3 - 4	2,080
		6 - 7	165
	DP-04	1 - 2	ND
		6 - 7	701

Exceeds NMED allowable limit of 880 mg/kg

LEGEND

SB-15 Soil Borehole Location (October 1999)

DP-01 Soil Borehole Location (April 2004)

Contaminated soils above NMED limit of 880 mg/kg

Site Boundary

TPH (mg/kg)

- ≥ 880 mg/kg
- > ND and < 880 mg/kg
- ND

NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

NOTES

ND	Not Detected
mg/kg	Milligrams per kilogram
NMED	New Mexico Environment Department
AST	Aboveground Storage Tank
UST	Underground Storage Tank
TPH	Total Petroleum Hydrocarbons
ft bgs	Feet below ground surface
DRO	Diesel-Range Organics

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BASE HOSPITAL UST
TPH–DRO PRE–EXCAVATION PCS DISTRIBUTION

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 36

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

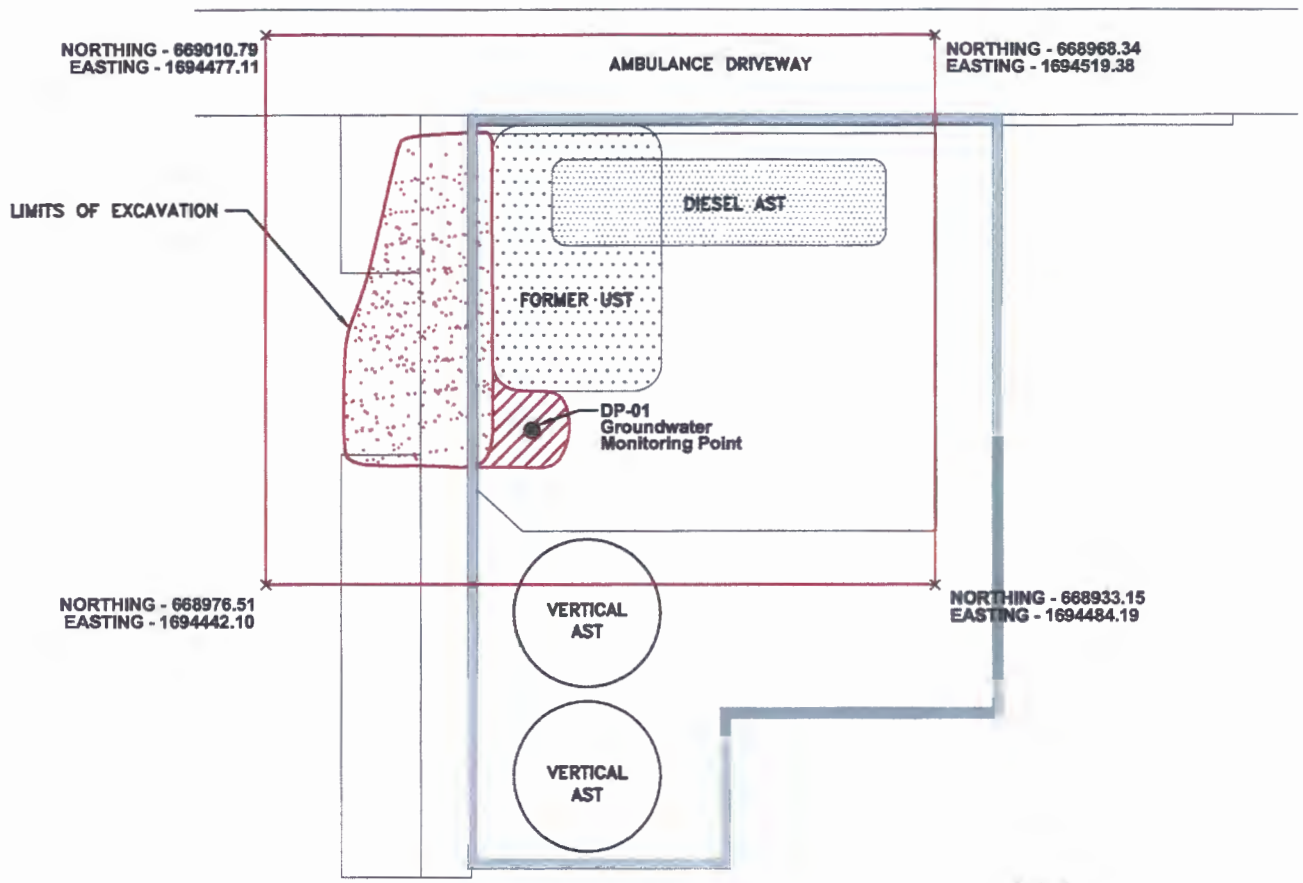
Figure 36

The area of concern for soil contamination above the NMED guidelines was limited to the proximity of SB-06, SB-13, and SB-14. These three locations are on the outside of the north wall. To further delineate the vertical and lateral boundaries of the contaminated soil, additional soil samples were collected in April 2004 and submitted to the laboratory for analysis. These are shown as locations DP-01 through DP-04 (**Figure 36**). Location DP-03 indicated TPH contamination at a concentration of 2,080 mg/kg from the 3 to 4 ft bgs interval. The soils sampled below this depth from 6 to 7 ft bgs demonstrated a sharp decline at this location having a TPH concentration of 165 mg/kg. The remaining samples collected did not indicate any petroleum hydrocarbon contamination above the NMED level for diesel. The sample from location DP-04, near the large non-fuel ASTs, had a TPH concentration of 701 mg/kg and is below the NMED allowable limit for TPH-DRO of 880 mg/kg.

VCM Excavation and Confirmation Sampling were performed in November 2004. Petroleum hydrocarbon contamination exceeding the NMED allowable limit for diesel of 880 mg/kg (*TPH Screening Guidelines*, June 24, 2003) at the site was limited to a small area west northwest of the former UST location. Initially, the estimated volume of PCS was approximately 300 cubic yards (cy). However, the actual total impacted yardage excavated was 90 cy. The limits of the final excavation are shown on **Figure 37**. Groundwater in the area of the excavation was 7.5 feet below land surface. Groundwater in the excavation did not have a sheen or other visible signs of contamination. The 90 cy of soil were transported to the FT-31 Landfarm for treatment.

To determine the effectiveness of the VCM, confirmation soil samples were collected from the sidewalls of the excavations on November 4, 2004. A total of 10 sidewall samples (9 samples plus 1 duplicate) were collected from the excavation at 7 feet bgs. The samples were analyzed for TPH as DRO, VOCs, and SVOCs. The results of the sidewall sampling for the BHUST excavation confirmation samples indicate that soils exceeding the NMED SSLs were removed from the excavation area. These analytical results are presented on **Figure 38**.

In May 2006, a temporary groundwater monitoring well (DP-01) was installed just outside of the downgradient corner of the UST excavation (**Figure 37**). A groundwater sample was collected from the site and analyzed for VOCs, SVOCs, TDS, TPH as DRO, and TAL Metals. The groundwater sample contained no VOCs, SVOCs, or TPH as DRO. The concentrations of metals detected in the sample and TDS did not exceed NMWQCC standards.



NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

LEGEND:

AREA OF EXCAVATION

AREA OVER-EXCAVATED DUE TO HIGH FIELD READINGS

AST ABOVEGROUND STORAGE TANK

UST UNDERGROUND STORAGE TANK

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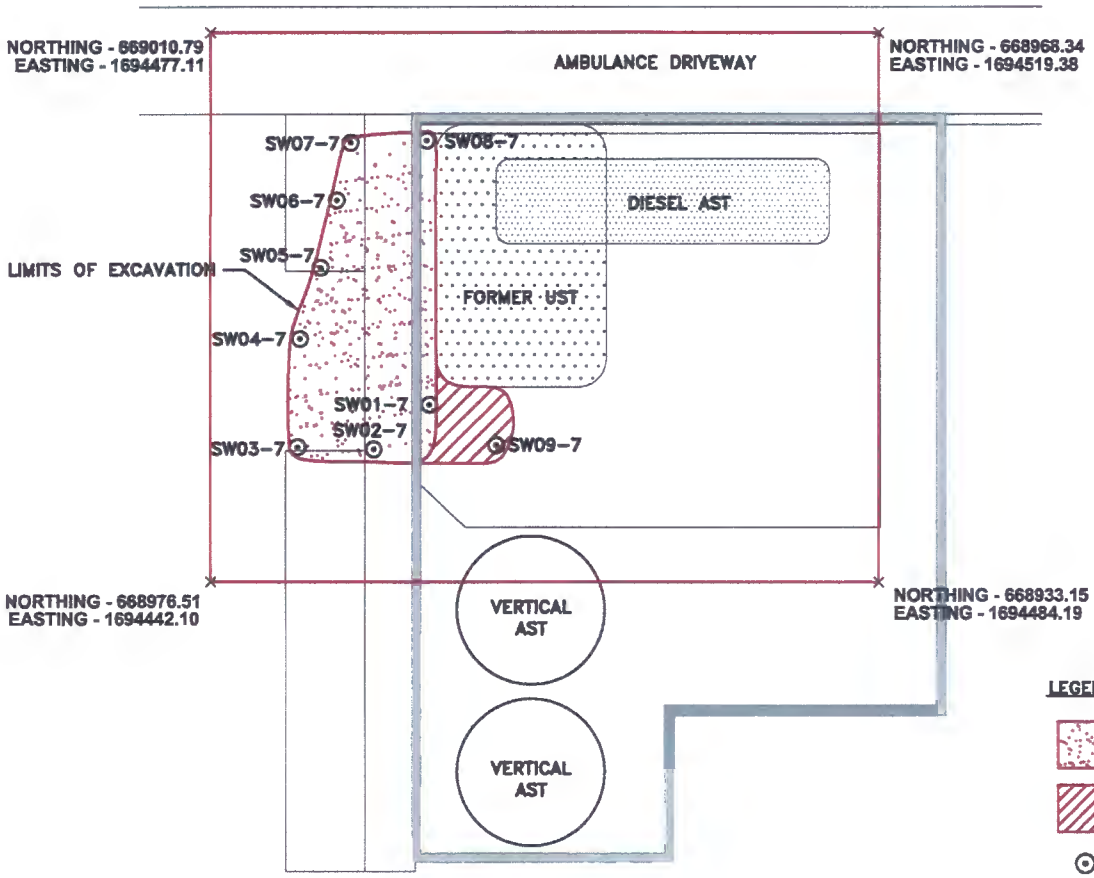
BASE HOSPITAL UST
PCS LIMITS OF EXCAVATION

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 37

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 37



Location	Depth (ft bgs)	TPH Concentration (mg/kg)
SW01-7	7	711
SW02-7	7	212
SW03-7	7	ND
SW04-7	7	23
	7	25
SW05-7	7	ND
SW06-7	7	ND
SW07-7	7	10
SW08-7	7	147
SW09-7	7	267

Exceeds NMED allowable limit of 880 mg/kg

LEGEND:

- AREA OF EXCAVATION
- AREA OVER-EXCAVATED DUE TO HIGH FIELD READINGS
- SIDEWALL SAMPLE LOCATION
- ND — NOT DETECTED
- mg/kg — MILLIGRAMS PER KILOGRAM
- NMED — NEW MEXICO ENVIRONMENT DEPARTMENT
- AST — ABOVEGROUND STORAGE TANK
- UST — UNDERGROUND STORAGE TANK
- TPH — TOTAL PETROLEUM HYDROCARBONS
- ft bgs — FEET BELOW GROUND SURFACE

NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

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BASE HOSPITAL UST
SIDEWALL CONFIRMATION SOIL SAMPLE LOCATIONS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 38

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 38

Basis for Determination

Based upon the sampling, laboratory analytical results, and documentation of excavation conducted, SWMU AOC-S (ERP Site HUST, the Hospital UST) meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

PCS identified in the previous investigations at the BHUST site were excavated and transported to the FT-31 Landfarm for treatment. Soil samples collected from the sidewalls of the excavation (confirmation samples) provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs. Further, groundwater samples collected from the site do not indicate impact by petroleum hydrocarbon constituents.

The NMED has concurred with this request for NFA in correspondence to HAFB dated August 9, 2006 (**Figure 39**).

References

Bhate Environmental Associates, June 2004. *Base Hospital UST Voluntary Corrective Measures Report, Holloman AFB, New Mexico.*

Foster Wheeler Environmental Corporation, 1999. *On-Site Investigation Report for the Petroleum-Contaminated Soil Investigation at Building 15 (Base Hospital) Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Radian Corporation, June 1995. *Draft Final Phase II RCRA Facility Investigation Report, Table 1 Solid Waste Management Units*, Holloman Air Force Base, New Mexico, Volume I.

HAFB, July 2006, Letter from HAFB to NMED with groundwater characterization (DP-01) data from BHUST, Holloman AFB, NM.

New Mexico Water Quality Control Commission, September 15, 2002, *New Mexico Water Quality Control Commission Regulations* (20.6.2 NMAC).

NMED, 1995, *Guidance for Evaluation of NFA (No Further Action Proposals).*

NMED (New Mexico Environment Department), June 24, 2003, *New Mexico Environment Department TPH Screening Guidelines.*

Radian Corporation, 1993, *Phase I RCRA Facility Investigation.*

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BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 9, 2006

Ms. Debbie Hartell
Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

SUBJECT: RESPONSE TO NOTICE OF DEFICIENCY: BASE HOSPITAL UST VOLUNTARY CORRECTIVE MEASURES COMPLETION REPORT, JULY 2005
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-05-010

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the **Permittee's**) July 19, 2006 response to NMED's January 12, 2006 Notice of Deficiency for the Base Hospital Underground Storage Tank (UST) Voluntary Corrective Measures Completion Report dated July 2005. The Base Hospital UST site is shown on Table A of the Facility Permit for Container Storage as AOC-8.

Following review of the subject report NMED has determined that this site appears to be suitable for a No Further Action (NFA) petition. Therefore, the Permittee may propose this site for NFA based on NMED's NFA Criterion 5: "The site has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use."

If you have any questions regarding this matter, please contact David Strasser at (505) 222-9576 or at the above address.

Sincerely,

Cornelius Amindyas
HAFB Project Leader
Permits Management Program

CA/dcs

cc: J. Bearzi, NMED HWB
J. Kieling, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region VI (6PD-F)
D. Griffin, HAFB

File: Reading and HAFB, 2006

bhate associates ENGINEERING, SCIENCE AND CONSTRUCTION	**Base Hospital UST** **August 9, 2006 NMED NFA Letter**				Statement of Basis 2007 10 SWMUs Holloman AFB, NM
	PROJECT NO.	SCALE AS SHOWN	DATE 3/5/07	DRAWN BY: cm DRAWING NO: Figure 39	CREATED BY:
					Figure 39

APPENDIX IV-A

SUMMARY OF SOILID WASTE MANAGEMENT UNITS

TABLE B

The Following is a list of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Not Currently Requiring Corrective Action.

SWMU/AOC	DESCRIPTION	COMMENT
1	Building 55 Oil/Water Separator	Site NFAd in February 2001
2	Building 121 Oil/Water Separator	Site NFAd in February 2001
3	Building 130 Oil/Water Separator	Site NFAd in February 2001
5	Building 137 Oil/Water Separator	Site NFAd in February 2001
6	Building 193Oil/Water Separator	Site NFAd in February 2001
7	Building 198 Oil/Water Separator	Site NFAd in February 2001
9	Building 282 Oil/Water Separator	Site NFAd in February 2001
10	Building 283 Oil/Water Separator	Site NFAd in February 2001
11	Building 300 Oil/Water Separator	Site NFAd in February 2001
12	Building 304 Oil/Water Separator	Site NFAd in February 2001
13	Building 304A Oil/Water Separator	Site NFAd in February 2001
14	Building 306 Oil/Water Separator	Site NFAd in February 2001
15	Building 309 Oil/Water Separator	Site NFAd in February 2001
16	Building 315 Oil/Water Separator	Site NFAd in February 2001
17	Building 316 Oil/Water Separator	Site NFAd in February 2001
18	Building 500 Oil/Water Separator	Site NFAd in February 2001
21	Building 702 Oil/Water Separator	Site NFAd in February 2001
22	Building 704 Oil/Water Separator	Site NFAd in February 2001
23	Building 800 Oil/Water Separator	Site NFAd in February 2001
24	Building 801 Oil/Water Separator	Site NFAd in February 2001
25	Building 805 Oil/Water Separator	Site NFAd in February 2001
26	Building 809 Oil/Water Separator	Site NFAd in February 2001
27	Building810 Oil/Water Separator	Site NFAd in February 2001
28	Building 822 Oil/Water Separator	Site NFAd in February 2001
29	Building 827 Oil/Water Separator	Site NFAd in February 2001
30	Building 830 Oil/Water Separator	Site NFAd in February 2001
31	Building 855 Oil/Water Separator	Site NFAd in February 2001
32	Building 868 Oil/Water Separator	Site NFAd in February 2001
33	Building869 Oil/Water Separator	Site NFAd in February 2001
34	Building 902 Oil/Water Separator	Site NFAd in February 2001
35	Building 903 Oil/Water Separator	Site NFAd in February 2001
36	Building 1000 Oil/Water Separator	Site NFAd in February 2001
37	Building 1080 Oil/Water Separator	Site NFAd in February 2001
38	Building 1080A Oil/Water Separator	Site NFAd in February 2001
39	Building 1092 Oil/Water Separator (FT31)	Site NFAd in December 2011
40	Building 1166 Oil/Water Separator	Site NFAd in February 2001
41	Sewage Drainage Pit NE of Building 864 (AOC-2)	Site NFAd in December 2011
41	Building 1266 Oil/Water Separator	Site NFAd in February 2001

42	Building 1 Waste Accumulation Area	Site NFAd in February 2001
43	Building 55 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
44	Building 121 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
45	Building 195 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
46	Building 198 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
47	Building 280 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
48	Building 282 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
49	Building 300 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
50	Asphalt Tank Spill Area (SS-68)	NFAd December 2011
50	Building 301 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
51	Building 308 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
52	Building 500 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
53	Building 638 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
54	Building 702 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
55	Building 702A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
56	Building 807 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
57	Building 809 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
58	Building 822 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
59	Building 837 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
60	Building 844 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
61	JP-4 Fuel Line Spill Site (AOC-R)	NFAd December 2011
61	Building 851 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
62	Building 855 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
63	Leaking Underground Storage Tank (AOC-S, Hospital UST)	NFAd December 2011
63	Building 867 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
64	Building 869 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
65	Building 901 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
66	Officer's Club (SS-57)	NFAd December 2011
66	Building 901Waste Accumulation Area	EPA listed the site in 1988 as a SWMU

		with no further action required.
67	PRI Bldg 1264 Solvent Burn Area (PRI-2)	NFAd December 2011
67	Building 909 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
68	PRI Bldg 1264 Solvent Burn Area (PRI-5)	NFAd December 2011
68	Building 910 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
69	Building 807 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
70	Building 1119 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
71	Building 1778A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
72	Building 11778A Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
73	Building 1266 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
74	Building 7005 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
76	DRMO Non-Hazardous Waste Drain	EPA listed the site in 1988 as a SWMU with no further action required.
77	RATSCAT Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
78	Trim pad 3 WAA	EPA listed the site in 1988 as a SWMU with no further action required.
79	Building 21 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
80	Building 55 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
81	Building 121 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
83	Building 134 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
84	Building 137 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
85	Building 283 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
86	Building 304A Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
87	Building 306 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
88	Building 309 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
89	Building 703 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
90	Building 801 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
91	Building 816 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
92	Building 822 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.

93	Building 827 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
94	Building 830 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
95	Building 902 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
96	Building 1080 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
97	Building 1119 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
98	Building 1116 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
99	Building 1266 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
100	Pad 9 Wash Rack	EPA listed the site in 1988 as a SWMU with no further action required.
102	Acid Trailer Burial Site	EPA listed the site in 1988 as a SWMU with no further action required.
103	Causeway Rubble Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
107	Main Base Substation PCB Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
110	POL Rubble Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
112	RATSCAT Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
117	Wire Spool Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
119	Building 121 Waste Oil Tank	Site NFAd in February 2001
120	Building 309 Waste Oil Tank	Site NFAd in February 2001
121	Building 316 Waste Oil Tank	Site NFAd in February 2001
124	Building 752 Waste Oil Tank	Site NFAd in February 2001
125	Building 868 Waste Oil Tank	Site NFAd in February 2001
126	Building 1000 Waste Oil Tank	Site NFAd in February 2001
127	Building 1092 Waste Oil Tank (FT-31)	Site NFAd in December 2011
128	Building 1166 Waste Oil Tank	Site NFAd in February 2001
129	Building 1191 and 1192 Spill Tanks	Site NFAd in February 2001
131	Waste Oil Bowsers	Site NFAd in February 2001
133	Building 703 Wash Rack Discharge Pit	Site NFAd in February 2001
134	Buildings 902-925 Drainage Ditch	Site NFAd in February 2001
135	Building 1092Oi/Water Separator Drainage Pit (FT-31)	Site NFAd in December 2011
138	Building 1166 Oil/Water Sep Drainage Pit	Site NFAd in February 2001
142	Wastewater Influent Chamber	Site NFAd in February 2001
143	Bar Screen	Site NFAd in February 2001
144	Comminutor	Site NFAd in February 2001
145	Grit Chamber	Site NFAd in February 2001
146	Parshall Flume Wet Well	Site NFAd in February 2001
147	Splitter Box	Site NFAd in February 2001
148	Sewage Lagoon A	Closed June 30, 2000
149	Sewage Lagoon B	Closed June 30, 2000
150	Sewage Lagoon C	Closed June 30, 2000

151	Sewage Lagoon D	Closed June 30, 2000
152	Sewage Lagoon E	Closed June 30, 2000
153	Sewage Lagoon F	Closed June 30, 2000
154	Sewage Lagoon G	Closed June 30, 2000
155	Sludge Drying Beds	Site NFAd in February 2001
156	Imhoff Tanks (5)	Site NFAd in February 2001
157	ABLE 51 PCB Storage Area	Site NFAd in February 2001
158	PCB Storage Bunker	Site NFAd in February 2001
159	Building 500 Pb Storage Shelves	Site NFAd in February 2001
160	Building 500 NiCd Battery Storage Area	Site NFAd in February 2001
161	Building 844 Battery Storage Area	Site NFAd in February 2001
162	DRMO Scrap Metal Storage Area	EPA called this site a SWMU in 1988 but did not require corrective action [1].
163	DRMO Wood Pile	EPA called this site a SWMU in 1988 but did not require corrective action [1].
164	Building 1080 Pond	Site NFAd in February 2001
165	Building 1176 Pond	Site NFAd in February 2001
167	Test Shed Launch Area Collection Basin	EPA identified it in 1988 as a SWMU without requiring further corrective action
169	Burn Kettle	EPA identified it in 1988 as a SWMU without requiring further corrective action
170	Fire Department Training Area 1	Site NFAd in December 2011
171	Fire Department Training Area 2	Site NFAd in February 2001
173	Building 198 Sand Trap	EPA listed this as a SWMU in the 1988 RFA Report
174	Building 231 Hobby Shop Silver Recovery Unit	EPA listed this as a SWMU in the 1988 RFA Report
176	Building 844 Sand Trap	EPA listed this as a SWMU in the 1988 RFA Report
178	Building 1191 Fuel Runoff Pits	Site NFAd in February 2001
180	Building 301 Outdoor Drainage Flume	Site NFAd in February 2001
182	Building Floor Drains	Site NFAd in February 2001
184	Wastewater Re-circulation Line	Site NFAd in February 2001
185	Building 332 Silver Recovery Unit	EPA identified this site as a SWMU in 1988
186	Hospital Silver Recovery Unit	EPA identified this site as a SWMU in 1988
187	West Area Silver Recovery Unit	EPA identified this site as a SWMU in 1988
188	Building 161 Acid Neutralization Unit	EPA identified this site as a SWMU in 1988
189	Building 232 Recycling Area	EPA identified this site as a SWMU in 1988
190	Building 500 Battery Neutralization Unit	EPA identified this site as a SWMU in 1988
191	Building 855 Concrete Pad	EPA identified this site as a SWMU in 1988
192	Coco Block House Disposal Well	EPA identified this site as a SWMU in 1988
193	Trash Dumpster	EPA identified this site as a SWMU in 1988
194-228	SWMUs which no Longer exist or Could not be Located	EPA identified this site as a SWMU in 1988

212	Former north Area Wash Rack	Site NFAd in February 2001
230	Building 828 Fuel Spill Site	Site NFAd in February 2001
231	Incinerator/Landfill	Site NFAd in February 2001
194-228	SWMUs which no Longer exist or Could not be Located	EPA called the site in the 1988 RFA but did not require corrective action [1].
PRI-1	Primate Research Institute (PRI) Building 1264: Waste Accumulation Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
PRI-3	PRI Building 1264: Biological Incinerator	EPA called the site in the 1988 RFA but did not require corrective action [1].
PRI-4	PRI Building 1264: Quarantine Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-BBMS	Bare Base Mobility Squadron Spill Area	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-D	SD-26 Building 882 Spills	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-G	Atlas Substation PCB Spill	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-PRI-A	Sewer Line from Primate Research Laboratory	EPA called the site in the 1988 RFA but did not require corrective action [1].
PRI-S	Primate Research Lab Borehole Disposal Site	EPA called the site in the 1988 RFA but did not require corrective action [1].
AOC-RR	Buried RR Cars.	EPA called the site in the 1988 RFA but did not require corrective action [1].

HOLLOMAN AIR FORCE BASE OPERATING AND CLOSED UNITS

OPERATING/CLOSED UNIT	DESCRIPTION	COMMENT
20,000-Pound Open Detonation (OD) Treatment Unit/SWMU #168	The OD Unit was permitted in 1997	Permitted in 1997 and is operating.
Container Storage Unit/SWMU # 75	Permit Expired July 4, 2001	Undergoing Renewal[2]
300-Pound Open Burn (OB) Unit. This site was listed in the 1988 RFA Report as SWMU 72	The OB Unit was under Interim from 1965 to 1979 status HAFB conducted risk-based closure as per approved Work Plan of 1997	NMED approved Closure of this site on February 3, 1997.

1. Unit underwent Corrective Action, was approved for NFA, and is limited by Institutional Controls

2. Unit is a Hazardous Waste Management Unit.

STATEMENT OF BASIS FOR APPROVAL OF NO FURTHER ACTION FOR TEN SOLID WASTE MANAGEMENT UNITS

RCRA CORRECTIVE ACTION PROGRAM

HOLLOMAN AFB, NEW MEXICO

Prepared By:

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Environmental Flight
550 Tabosa Avenue
Holloman Air Force Base
New Mexico

~~March 2007~~ December 2007

APPENDIX 4-A

SUMMARY OF SOILID WASTE MANAGEMENT UNITS

TABLE A

The following is the Prioritized list of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Corrective Action

SERIAL NO.	SWMU	ERP SITE ID	UNIT NAME
1	4	SD-08	Building 131 Oil/Water Separator
2	8	N/A	Building 231 Oil/Water Separator
3	19	SS-59	Building 638 Oil/Water Separator
4	20	SS-59	Building 639 Oil/Water Separator
~~5~~	~~39~~	~~N/A~~ FT-31	~~Building 1092 Oil/Water Separator~~
6	82	~~SD-08~~ N/A	Building 131 Washrack
7	101	LF-10	Building 121 Landfill
8	104	LF-29	Former Army Landfill
9	105	LF-19	Golf Course Landfill
~~10~~	~~106~~	~~LF-01~~	~~Main Base Landfill~~
11	108	LF-23	MOBSS Landfill Disposal Trench
12	109	LF-10	Old Main Base Landfill
13	111	RW-42	Radioactive Waste Disposal Area
14	113A	OT-20	Sludge Disposal Trench near Lagoons
15	113B	DP-30/SD-33	Sludge Disposal Trenches Fire Training Area
16	114	OT-03	TEL Disposal Site
17	115	LF-22	Waste Area Landfill #1 PCB Disposal Area
18	116	LF-21	West Area Landfill #2
19	118	OT-16	Building 21 Pesticides Holding Tank
20	122	N/A	Building 702 Waste Oil Tank
21	123	N/A	Building 704 Waste Oil Tank
~~22~~	~~127~~	~~FT-31~~	~~Building 1092 Waste Oil Tank~~
23	130	SS-46	Taxiway 4 Tank 28 JP-4 Underground Waste Tank
24	132	OT-16	Building 21 Entomology Leachfield
~~25~~	~~135~~	~~FT-31~~	~~Building 1092 Oil/Water Separator Drainage Tank~~
26	136	N/A	Building 1119 Washrack Drainage Area
27	137	~~SS-38~~ OT-38	Building 1166 Test Track Drain Field
28	139	~~N/A~~ OT-37	Lake Holloman
29	140	N/A	Lake Stinky
30	141	SD-27	Pad 9 Drainage Pit
31	165	SS-39	Building 1176 Pond
32	166	SD-25	MOBSS Drainage Lagoon
~~33~~	~~170~~	~~FT-31~~	~~Fire Department Training Area 1~~
34	177	SS-39	Building 1176 Sumps
35	179	SS-39	Discharge Box
36	181	SS-39	Building 1176 Drainage Trough
37	183	N/A	Air Base Sewer System
38	197	OT-14	Former Entomology Shop

SERIAL NO.	SWMU/AOC	ERP SITE ID	UNIT NAME
39	229	SS-59	Test Cell Fuel Spill Site
40	AOC-1	DP-64	Chemical Agent Site
~~41~~	~~AOC-2~~	~~N/A~~ AOC-2	~~Sewage Drainage Pit NE of Building 864~~
42	AOC-3	DP-63	Ammunition Yard Disposal Pit
43	AOC-4	N/A	West POL Fuel Spill Site
44	AOC-1001	SS-61	Building 1001 Fuel Spill Site
45	AOC-FST837	N/A	Building 837 Fuel Spill Site
46	AOC-A	OT-16	Building 21 Pesticide Rinsewater Spill Area
47	AOC-B	~~N/A~~ SS-65	Building 807 Test Cell Surface Spill Area
48	AOC-C	~~N/A~~ SS-66	Building 835 Spills
49	AOC-E	~~N/A~~ SS-67	Buildings 903-909 Sand Blast Residues
~~50~~	~~AOC-F~~	~~N/A~~ SS-68	~~Asphalt Tank Spill Area~~
51	AOC-H	SS-18	Chromic Acid Spill Area
52	AOC-I	~~OT-37~~ SS-69	Fighter Wing Flight Line Spill
53	AOC-J	SS-13	Herbicide Sodium Arsenite Spill Area
54	AOC-K	SS-12	Northeast Fuel Line Spill #1
55	AOC-L	~~N/A~~ OT-37	Early Missile Test Site
56	AOC-M	~~N/A~~ RW-70	Building 18
57	AOC-N	SS-48	Building 137 Military Gas Tank Leak
58	AOC-O	OT-45	Building 296 Old AGE Refueling Station
59	AOC-P	OT-44	Building 301 Fuel Tank Leak
60	AOC-Q	SS-17	BX Gas Station Fuel Line Leaks
~~61~~	~~AOC-R~~	~~SS-06~~	~~JP-4 Fuel Line Spill Site~~
62	AOC-RD	DP-62	Rita's Draw Disposal Pit
~~63~~	~~AOC-S~~	~~N/A~~ BHUST	~~Leaking Underground Storage Tank~~
64	AOC-T	SS-05	POL Storage Tank Spill Sites 1 & 2
65	AOC-U	N/A	Lost River Basin
~~66~~	~~AOC-V~~	~~SS-57~~	~~Officer's Club~~
~~67~~	~~PRI-2~~	~~OT-35~~	~~PRI Bldg 1264 Solvent Burn Area~~
~~68~~	~~PRI-5~~	~~OT-35~~	~~Primate Research Lab Sewer Line~~
69	PRI-A	OT-35	Primate Research Lab Sewer Line
70	AOC-838	SS-72	TCE in Groundwater up-gradient of LF-21
71	AOC 1088	SS-73	TEC in Groundwater up-gradient of SS61

TOTAL OF CORRECTIVE ACTION SITES = ~~69~~ 59 [i.e., ~~39~~ 35 SWMUs + ~~30~~ 24 AOCs].

STATEMENT OF BASIS FOR APPROVAL OF NO FURTHER ACTION FOR TEN SOLID WASTE MANAGEMENT UNITS

RCRA CORRECTIVE ACTION PROGRAM

HOLLOMAN AFB, NEW MEXICO

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ACRONYMS AND ABBREVIATIONS

AAF	Army Air Field
AFB	Air Force Base
amsl	Above mean sea level
AOC	Area of Concern
AS	Air Sparging
AST	Aboveground storage tank
ASTM	American Society foresting Materials
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
BTEX	Benzene, toluene, ethyl benzene, xylenes
BHUST	Base Hospital Underground Storage Tank
CA	Corrective Action
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES/CEV	Civil Engineering Squadron/Combat Engineer Vehicle
COPC	Chemicals of potential concern
CSM	Conceptual site model
cy	Cubic yards
DPT	Direct Push Technology
DRO	Diesel-Range Organics
EM	Exposure Model
ERP	Environmental Restoration Program
ESA	Ecological Screening Assessment
°F	Degrees Fahrenheit
ft	Feet or foot
FWENC	Foster-Wheeler Environmental Corporation
GRO	Gasoline-Range Organics
HAFB	Holloman Air Force Base
HHRA	Human Health Risk Assessment
HSWA	Hazardous and Solid Waste Amendments
HVAC	Heating, ventilation, and air conditioning
IRP	Installation Restoration Program
J&E	Johnson and Ettinger
JP-4	Jet Fuel (formula 4)
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
mg/L	Milligram per liter
$\mu g/m^3$	Micrograms per cubic meter
µg/g	Micrograms per gram
µg/kg	Micrograms per kilogram

ND	Not detected
NFA	No Further Action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	Oil-Range Organics
OWS	Oil/Water Separator
pCi/g	PicoCuries per gram
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
PCS	Petroleum-Contaminated Soils
PID	Photoionization Detector
POL	Petroleum, Oil and Lubricants
PRG	Preliminary Remediation Goals
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SI	Site Investigation
SOB	Statement of Basis
SSL	Soil Screening Level
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
T&D	Transportation and disposal
TAL	Target Analyte List
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper tolerance limit
VCM	Voluntary Corrective Measures
VOC	Volatile Organic Compounds

TPHCWG	Total Petroleum Hydrocarbon Criteria Working Group
ROEs	Routes of exposure
SSTLs	Site-Specific Target Levels

A. INTRODUCTION

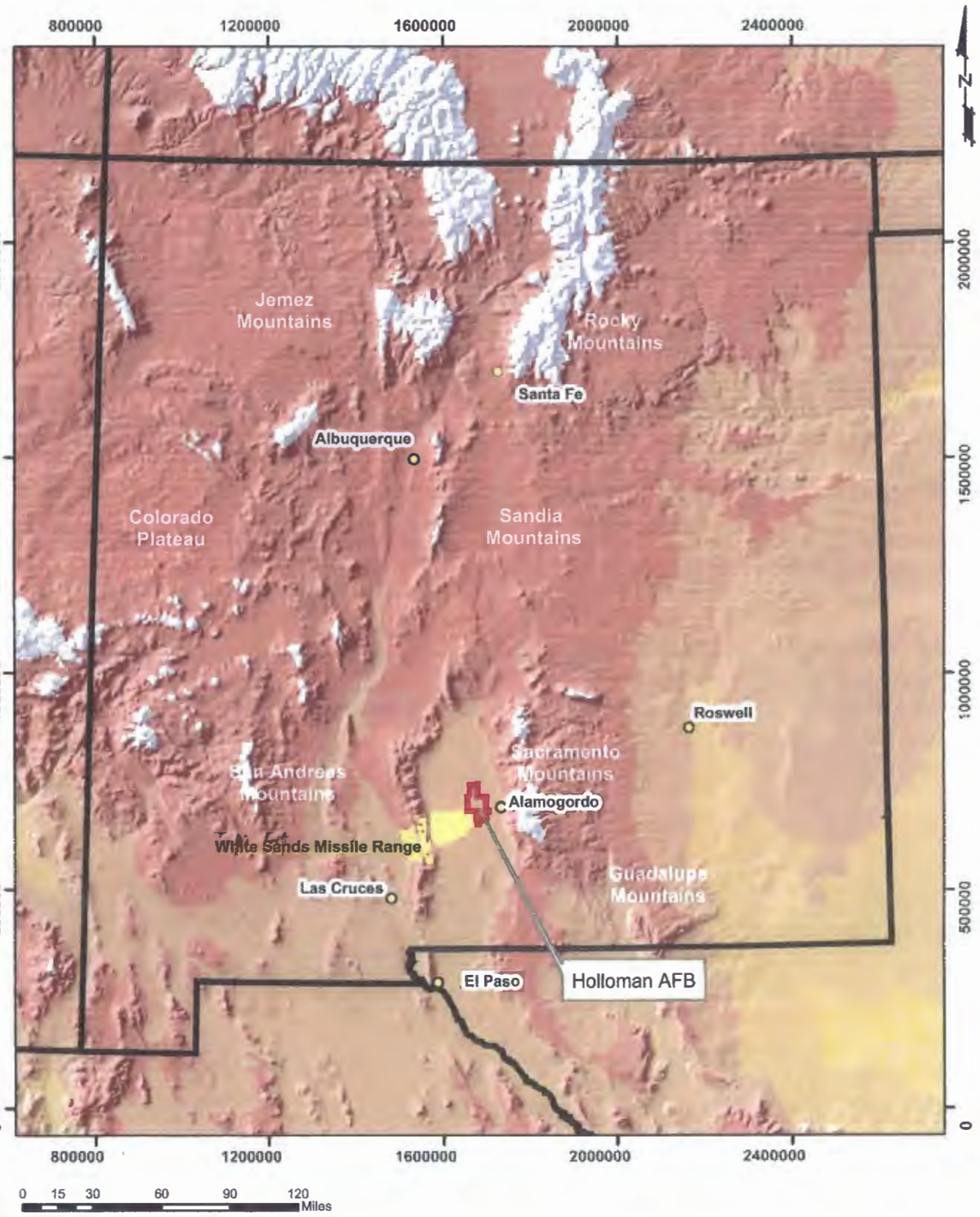
The New Mexico Environment Department (NMED) has made a final determination to approve the Holloman Air Force Base (HAFB) request to remove 10 Solid Waste Management Units (SWMUs) from the Hazardous and Solid Waste Amendments (HSWA) Corrective Action module Resource Conservation and Recovery Act (RCRA) permit No. NM 657214422-1.

B. FACILITY DESCRIPTION

HAFB is situated in south central New Mexico, in the northwest central part of Otero County, approximately 75 miles north-north-east of El Paso, Texas (**Figure 1**). HAFB has a population of 6,000 and occupies about 50,000 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the Base. Private and public owned lands border the remainder of HAFB. The major highway servicing HAFB is Highway 70, which runs southwest from the town of Alamogordo and separates HAFB from publicly owned lands to the south. Alamogordo which has a population of approximately 35,000 is located approximately 7 miles east of the base.

HAFB was first established in 1942 as Alamogordo Army Air Field (AAF). From 1942 through 1945, Alamogordo AAF served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of un-manned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed Holloman Air Force Base, in honor of the late Col. George V. Holloman; a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at HAFB and has remained since. Today, HAFB also serves as the training center for the German Air Force's Tactical Training Center.

Holloman AFB is located within the Sacramento Mountains Physiographic Province on the western edge of the Sacramento Mountains. HAFB is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet above mean sea level (amsl). The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward and of west-facing escarpments with the wide bracketed basin forming the basin and range complex. The Base is located in the Tularosa Sub-basin which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 feet amsl. The San Andres Mountains bound the basin to the west (about 30 miles) with the Sacramento Mountains approximately 10 miles to the east. At its widest, the basin is about 60 miles east to west and stretches approximately 150 miles north to south.



bhate associates
ENGINEERING, SCIENCE AND CONSTRUCTION

Holloman AFB Location Map				Statement of Basis 2007 10 SWMUs Holloman AFB, NM
PROJECT NO.	SCALE	DATE	DRAWN BY: cm	
	Shown	2/20/07	DRAWING NO: Figure 1	Figure 1

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to the Base comes from the Lost River, located in the north-central region of the Base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. HAFB is dissected by several southwest trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Rita's Draw, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the Base. Approximately 10,000 years ago, indications are of a much wetter climate. The present day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water bearing deposits over the older bedrock basement material. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin with more saline water towards the center. Two of the principal sources of potable water are a long narrow area on the upslope sides of Tularosa and Alamogordo with the other in the far southwestern part of the basin. A portion of Alamogordo's water, as well as the Base's, is supplied from Lake Bonito (which is in the Pecos River Basin).

The sedimentary rocks which make up the adjacent mountain ranges are between 500 and 250 million years old. During the period when the area was submerged under the shallow intra-continental sea, the layers of limestone, shale, gypsum, and sandstone were deposited. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago the center began to subside resulting in a vertical drop of thousands of feet leaving the edges still standing (the present day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e. Tularosa Basin). Water carrying eroded gypsum, limestone, dolomite, gravel, and other alluvial matter continues to flow into the basin with no route of exit.

The Tularosa Sub-basin is geologically described as a bolson, which is an extensive flat alluvium-floored depression, into which drainage from the surrounding mountains flows toward a central playa. The overlying alluvium generally consists of unconsolidated gravels (limestone, dolomite, and gypsum), sands, and clays. A fining sequence from the San Andreas and Sacramento Ranges towards the basin's center characterizes the area with the near surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of silty clay containing gypsum and are contiguous with the alluvial fan and eolian deposits.

The predominance of the groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream run-off along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges, and flows downgradient through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area only leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath HAFB, groundwater ranges from 5 to 50 feet. Flow for the Base is generally towards the southwest with localized influences from the variations in the topography of the Base. Near the arroyos, groundwater flows directly toward the surface drainage feature.

Groundwater quality in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas (Radian, 1993). The majority (over 70 %) of the Environmental Restoration Program (ERP) Sites / SWMUs / Areas of Concern (AOCs) located across HAFB, have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). This TDS data supports the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the New Mexico Water Quality Control Commission (NMWQCC) limit as potable water and thus, the groundwater beneath HAFB has been designated as unfit for human consumption. Likewise, U.S. Environmental Protection Agency (USEPA) guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L.

In addition, there are no potable water wells on HAFB. Potable water for the base and the city of Alamogordo is derived from the nearby Sacramento Mountains. The only production water well, used for livestock irrigation, is located approximately 12 miles southwest of Spill Site SS-61.

As a whole, New Mexico has a mild, arid to semi-arid continental climate characterized by light precipitation totals; abundant sunshine, relatively low humidity and relatively large annual and diurnal temperature range. The climate of the Central Closed Basins varies with elevation. The Base is found in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit (°F) in the summer months and middle 50s in the winter. A preponderance of clear skies and relatively low humidity permits rapid night time cooling resulting in average diurnal temperature ranges of 25 to 35°F. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 10 inches. The very low rainfall amounts resulting in the arid conditions, which with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized "dust devils". Much of the precipitation falls during the mid-summer monsoonal period

(July and August) as brief, yet frequent, intense thunderstorms culminating to 30 – 40% of the annual total rainfall.

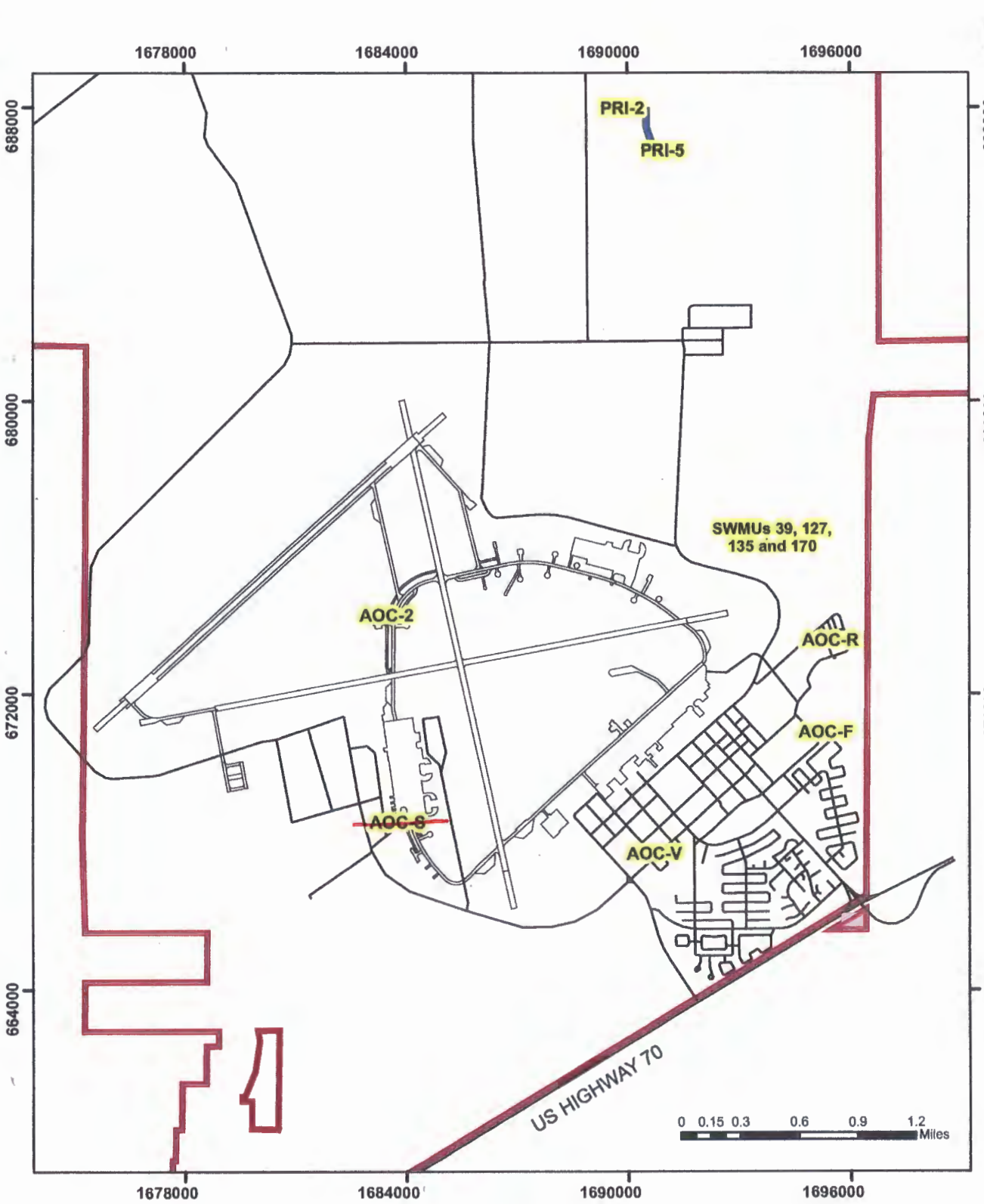
C. HISTORY OF INVESTIGATION

At HAFB, investigation and remediation of SWMUs is conducted under both the Air Force's ERP and the RCRA Corrective Action Program. The ERP program [formerly the Installation Restoration Program (IRP)] was initiated in 1983 and the RCRA Facility Assessment (RFA) was conducted in 1987. A RCRA Permit and the HSWA module was issued to HAFB in 1991 and became effective on September 25, 1991 and was revised February 24, 2004. Since the permit became effective, investigations and remediation of SWMUs and AOCs at the Base have been conducted under the RCRA Facility Investigation (RFI) and Corrective Action (CA) guidelines. Table A of Appendix 4-A of the Base RCRA Facility Permit identifies SWMUs and AOCs at the Base requiring CA. Table B of Appendix 4-A of the Base RCRA Facility Permit contains SWMUs and AOCs not currently requiring CA. Initially, approximately 236 potential SWMUs and 29 AOCs were listed on Table A. Currently, 62 sites remain on Table A. The remaining sites have been transferred through this process to Table B.

This document has been prepared to provide NMED with the basis for removing an additional 10 SWMUs and AOCs from the Base permit. **Figure 2** is a general map of the Base illustrating the locations of the ERP sites and SWMUs listed in this Statement of Basis.

D. INVESTIGATION RESULTS

The 2005 Statement of Basis resulted in the removal of seven sites from Table A of the RCRA permit. Since, the previous Statement of Basis, additional sites have undergone remediation or corrective action as directed by NMED. At present, 10 sites have been identified for No Further Action (NFA). Section J of this document contains a brief description of each of each site, the actions performed, the basis for removal from the permit, and relevant references concerning the site.



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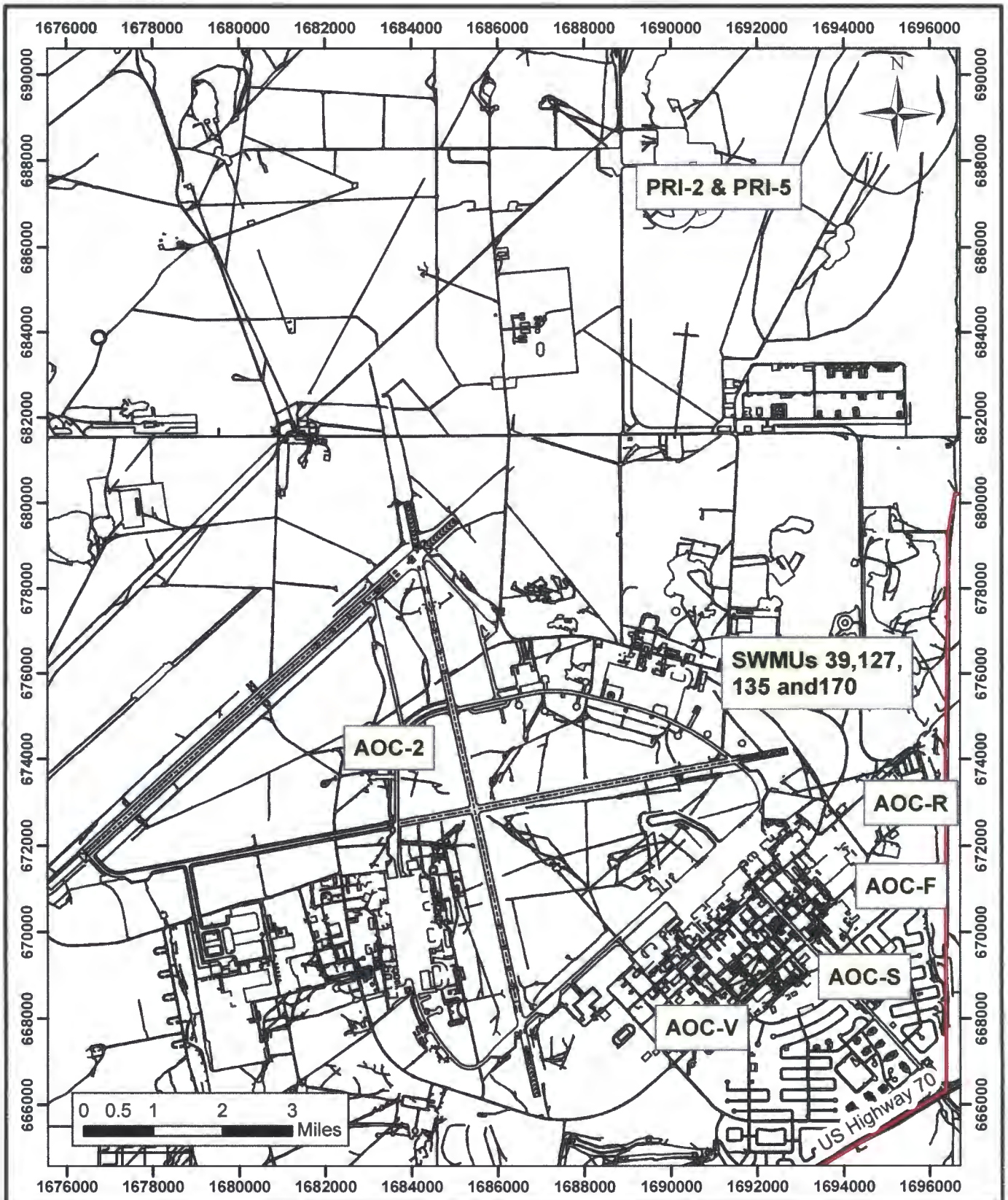
Base Map with the Locations of SWMUs for NFA				Statement of Basis 2007 10 SWMUs Holloman AFB, NM
PROJECT NO.	SCALE	DATE	DRAWN BY: cm	
	Shown	2/20/07	DRAWING NO: Figure 2	~~Figure 2~~



bhate ENVIRONMENTAL CONSTRUCTION ENERGY

Solid Waste Mangement Units for No Further Action Status

PROJECT NO	SCALE	DATE	DRAWN BY: WB
	Shown	11/28/2011	DRAWING NO. 2

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 2

H. FURTHER STEPS

The public meeting will be scheduled and notices will be posted/published as indicated in Section G. The NMED will notify all persons on the mailing list concerning the location, time, and date of the public meeting and the contact person for public written comment. When the comment period has passed and the public meeting has been conducted, the NMED will notify HAFB and each person on the public comment mailing list of the final decision. The final decision will become effective 30 days after service of the decision, unless a later date is specified or Public Hearing is requested in accordance with New Mexico Hazardous Waste Management Regulations, 20 New Mexico Administrative Code (NMAC) 4.1, Section 901. F. *Hearings*. A public meeting was held at the City of Alamogordo Civic Center on June 16, 2008. No members of the public attended or provided comment.

I. CONTACT PERSON FOR ADDITIONAL INFORMATION

Mr. John Kieling, Manager
Permits Management Program
New Mexico Environment Department, Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 428-2535 telephone
(505) 428 2567 Fax

OR

Mr. Cornelius Amindyas
New Mexico Environment Department
550 San Antonio Drive NE
Albuquerque, New Mexico 87109
(505) 222-9543 telephone
(505) 222-9510 Fax

NFA Criterion 5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Each site eligible for NFA is summarized in **Table 1**.

Table 1. List of SWMUs Proposed for NFA by Criteria

SWMU No.	SWMU Title	ERP Site No.	NFA Criteria No.
AOC-F	Asphalt Tank Spill Area	SS-68	1
PRI-2 & PRI-5	Spent Solvent Disposal Area	OT-35	5
SWMU 39 SWMU 127 SWMU 135 SWMU 170	Former Fire Training Area	FT-31	5
AOC-2	Sewage Disposal Area Taxiway G	AOC-2	5
AOC-R	JP-4 Fuel Line Spill Site	SS-06	5
AOC-V	Officer's Club	SS-57	5
AOC-S	Hospital Underground Storage Tank (UST)	HUST	5

G. PUBLIC PARTICIPATION

Requirements for public notification by the New Mexico Hazardous Waste Regulations include public notice in a local newspaper and sending notices to all persons on the facility mailing list maintained by the NMED. The notice announces the 60-day comment period for the request for permit modification. The notice indicates the date, time, and place for a public meeting. Also, the notice will provide a contact person and address for submitting written comments on the permit modification. Upon review of the request for permit modification, a list of SWMUs that NMED deems appropriate for NFA must be published in a local newspaper and public notices must be sent to all persons on the facility mailing list. As part of this process, the public may make comments to and/or request additional information from NMED. A public meeting was held at the City of Alamogordo Civic Center on June 16, 2008. No members of the public attended or provided comment.

J. DESCRIPTIONS OF SWMUs PROPOSED FOR NO FURTHER ACTION

J.1 SWMU (AOC-F), Asphalt Tank Spill Area (ERP Site SS-68)

Location

SWMU AOC-F is identified in the ERP as site SS-68, Asphalt Tank Spill Area. The 1988 RFA states that aboveground and belowground tanks were previously removed and were located to the northwest of Building 121. The December 2005 *HAFB Environmental Restoration Program Site Status Summaries Report* places the location as 200 feet northeast of Creosote Avenue. This location coincides with the current piles of asphalt that are gathered from road work across the Base and recycled. While the exact location is unknown, the most likely location of these tanks (if they ever existed) would have been at the location used to stockpile and recycle asphalt pavement. A detailed layout of this site and its surroundings is provided as **Figures 3 and 4.**

Evaluation of Relevant Information

The records searched to obtain information on AOC-F include:

- Aerial photographs taken in 1984, 1996, and 2004
- The 1988 RFA prepared by A.T. Kearney, Inc. dated September 1988
- Site visit on July 10, 2006
- HAFB Environmental Restoration Program Site Status Summaries Report (December 2005)
- Interview with Mr. Darvin St. John of the HAFB 49th CES/CEV Environmental Flight

Weathered asphalt removed from road improvement projects at HAFB has been crushed and reused since the 1980s. Typically, after it has been removed, the asphalt has been staged in an undeveloped area east of Creosote Avenue and north of the base enlisted personnel housing. Normally the asphalt is staged in piles until it is reused. This has been standard practice since the early 1980s. A tank has not been observed in the aerial photographs of the area taken in 1984, 1996, and 2004. Further, asphalt tanks are typically heated to keep the material warm and flowable for use and that would make underground tanks unlikely for this kind of operation at HAFB.

0 125 250 500 Feet

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SWMU AOC-F (SS-68) and Area Layout -1996 Aerial Photograph

PROJECT NO.	SCALE	DATE	DRAWN BY
9050360	AS SHOWN	11/20/06	MRM/CM
			DRAWING NO. Figure 3

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 3

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SWMU AOC-F (SS-68) and Area Layout -2004 Aerial Photograph

PROJECT NO	SCALE	DATE	DRAWN BY	DRAWING NO
	AS SHOWN	08/10/06	MRM/CM	Figure 4

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 4

An interview with Mr. Darvin St. John of the 49th CES/CEV, who in the 1990s was responsible for documenting the removal of many USTs at HAFB, did not recall the presence of either a UST or aboveground storage tank (AST) in this area. No ASTs or USTs are identified within this area in Base records. Currently, 6 piles of asphalt are located approximately 700 feet south of Building 121. Aerial photographs from years 1996 and 2004 confirm the storage of asphalt in this area but do not confirm the presence of any tanks. No releases of hazardous constituents have been documented related to this site.

Basis for Determination

NFA is requested for AOC-F SS-68, Asphalt Tank Spill Area, based upon Criterion 1: The SWMU/AOC cannot be located, does not exist or is a duplicate SWMU/AOC.

A source of contamination cannot be tied to this location. After contacting personnel familiar with the presence and removal of USTs at HAFB, and searching the records at the HAFB Office of Real Property, there remains no evidence of USTs or ASTs at this site and there is no documentation of releases to the environment. Storage of asphalt for reuse is not considered a hazardous waste practice. If a tank was present at the site during the 1988 RFA, it could have been a portable tank for fueling equipment or some other type of portable unit for processing the asphalt.

References

A.T. Kearny, 1988 *RCRA Facility Assessment Report*, HAFB, New Mexico.

Bhate Environmental Associates, Inc. (Bhate), 2007, *Confirmatory Sampling Work Plan Multiple Sites*, HAFB, New Mexico.

J.2 SWMUs AOC-PRI-2 & PRI-5, Spent Solvent Disposal Area (ERP Site OT-35)

Location

AOC-PRI-2 & PRI-5 (ERP Site OT-35) are the Building 1264 Solvent Burn Area (AOC-PRI-2) and the Building 1264 Solvent Disposal Area (AOC PRI-5). The two sites are co-located and have been investigated as one unit. The Spent Solvent Disposal Area (OT-35) is located immediately south and within the confines of the new Primate Research Laboratory (Buildings 1264 and 1265) approximately 2 miles north of the Main Base Area (**Figure 5**). The Site topography is relatively flat, and the area is sparsely vegetated.

History

Spent solvents had reportedly been disposed of intermittently on the ground and ignited in an area south of Building 1264 during the 1950s and 1960s. The spent solvents were generated as part of the on-site laboratory operations and consisted of xylenes, methanol, toluene, and acetone. Spent solvents may also have contained small quantities of radioactive tracers (carbon-14, iodine-125, and tritium). Based on interviews and site visits with longtime Primate Research Laboratory employees, three potential solvent disposal areas were identified. The disposal sites include:

- An area of stressed vegetation immediately north of Building 1264 (site AOC-PRI-2) where scintillation cocktails were reportedly disposed of on the ground,
- A slightly vegetated area north of Building 1269 where stained soils were observed,
- An area several hundred yards south of Building 1269 that was identified as the former solvent evaporation area (site AOC-PRI-5) where solvents were set out in evaporation pans for disposal (Radian, 1993).

Evaluation of Relevant Information

A records search for Site OT-35 (AOC-PRI-2 &5) was conducted by CH_2M Hill in 1982 (CH_2M Hill. August 1983). The records search concluded that the site did not present any significant concern for adverse effects on health or the environment. The site was investigated in December 1992 and February 1993 during a Site Investigation (SI) conducted by Radian Corporation. The field investigations were conducted before construction was completed at the primate research facility.

The following Investigation activities have been performed at the OT-35 site (Radian, 1993):

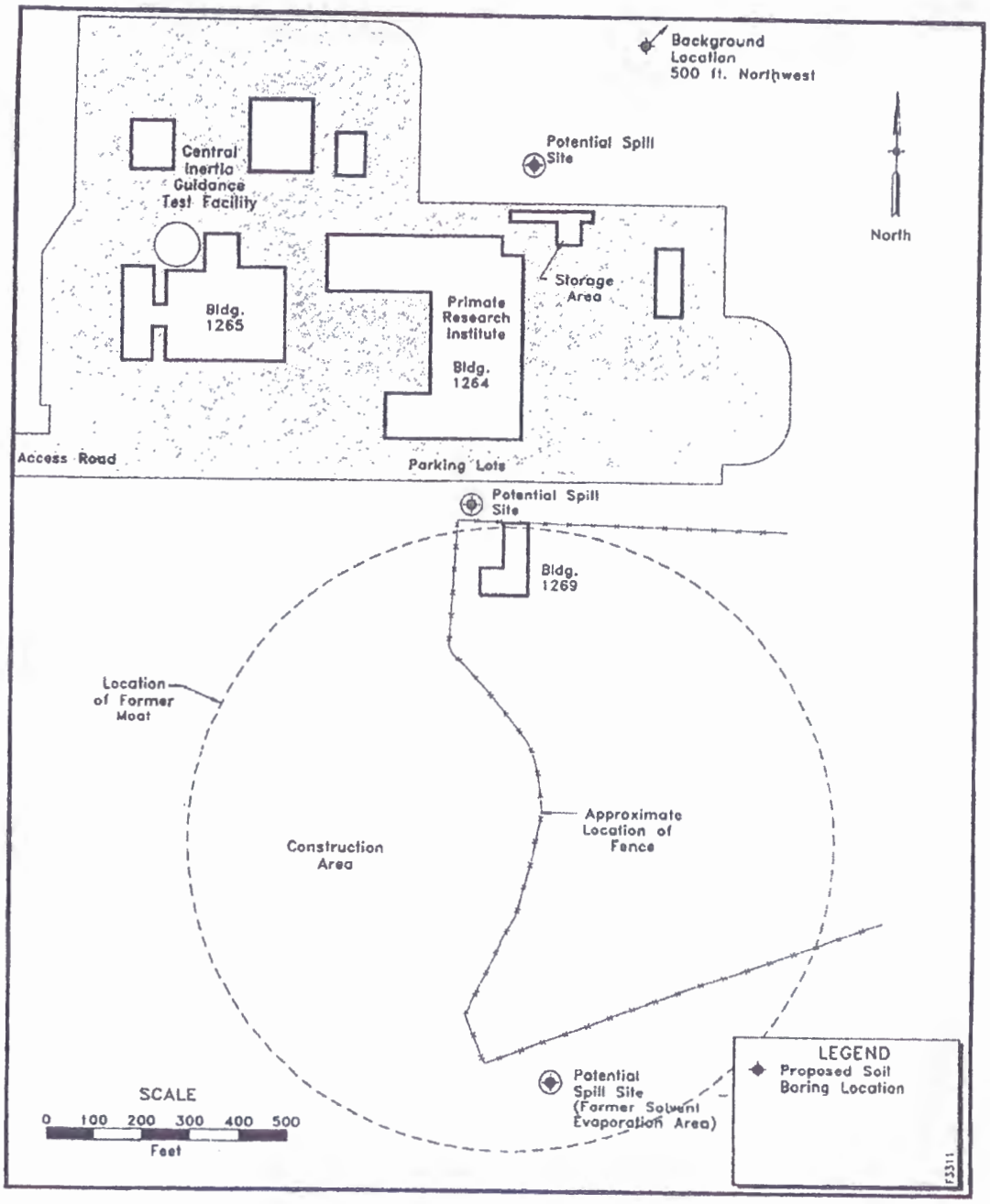
- A passive soil-gas survey using the PETREX sampling technique was conducted at the site using 15 samplers. Five samplers were installed at each of the three potential disposal sites (Radian, 1993).
- One soil boring was drilled into each of the three potential disposal sites (BH-35-01 through BH-35-03). Two subsurface soil samples were collected from each borehole and submitted for chemical analysis: the surface sample (0 to 4.5 ft feet

below ground surface [ft bgs]) and a subsurface sample with the most visible contamination or the highest photoionization detector (PID) reading. These soil samples were analyzed for volatile organic compounds (VOCs), gross alpha and beta radioactivity, and gamma radioactivity (Radian 1993).

- One background soil sample (BH-35-04) was collected from 0 to 2 ft bgs approximately 500 ft northeast of the site and was analyzed for alpha, beta, and gamma radioactivity (Radian 1993).

The soil-gas survey identified the presence of chloroform vapors in soil-gas samplers installed in the three disposal areas. It is reported that chloroform was used in the scintillation cocktails. It is also a common laboratory artifact. The soil-gas survey technique used is a qualitative tool (ion counts) that does not report the quantity of vapor in the vadose zone, rather the relative presence of gasses. The soil-gas survey results are presented on **Figures 6, 7, and 8**. The results of the soil-gas survey were used to locate soil borings and sampling locations as illustrated on **Figure 9**.

Table 2 summarizes the analytical results for soil samples collected from the three borings. No VOCs were detected in the soil samples. Review of gross alpha, gross beta, and gamma radiation results for the six soil samples collected during the OT-35 SI indicates that detected radioactivity levels were comparable to background levels found at HAFB. Concentrations of gross alpha and gross beta ranged from not detected (ND) to 21.21 picoCuries per gram (pCi/g) and ND to 19.51 pCi/g, respectively. Using one half of the detection limit for the not detected data, the average concentrations of gross alpha and gross beta for these soil samples is 10.1 pCi/g and 11.3 pCi/g, respectively. These average concentrations are within and below the background ranges for gross alpha (4.6 to 15.4 pCi/g) and gross beta (18.0 to 21.1 pCi/g) detected in the background samples collected during the Preliminary Assessment (PA) conducted at Site RW-42 (Radian, 1993. In addition, the single detection of gamma radiation (0.33 pCi/g) is estimated and is well below the reporting limit (100 pCi/g). Additionally, Iodine-125 and Tritium-3 radioactive tracers historically used at OT-35 have relatively short half-lives. The half-lives of Iodine-125 and Tritium-3 are 60 days and 12.3 years, respectively. As the OT-35 disposal sites have been inactive for over 30 years there has been approximately an eighty percent (80%) degradation (decay) of Tritium-3 and 99% decay of Iodine-125. Although Carbon-14 has a half life of 5,730 years, Carbon-14 has never been considered a carcinogen. Furthermore, these radioactive tracers are not alpha emitters. Iodine-125 emits gamma particles while Carbon-14 and Tritium-3 emit beta particles, therefore the gross alpha levels found at OT-35 are naturally occurring (International Commission on Radiological Protection, 2002).



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OT-35 Features and Proposed Soil Boring Locations
Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY
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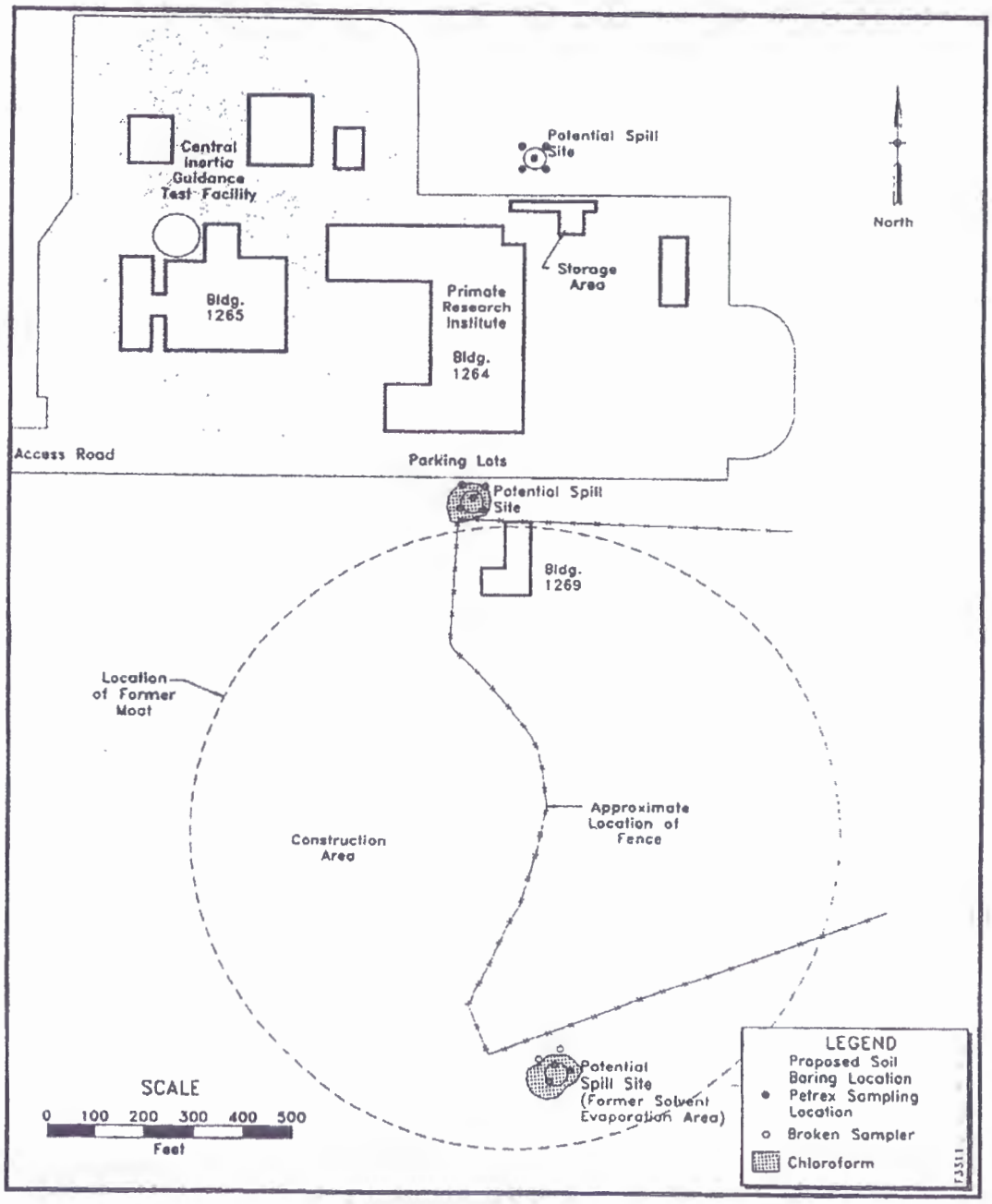
Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 5



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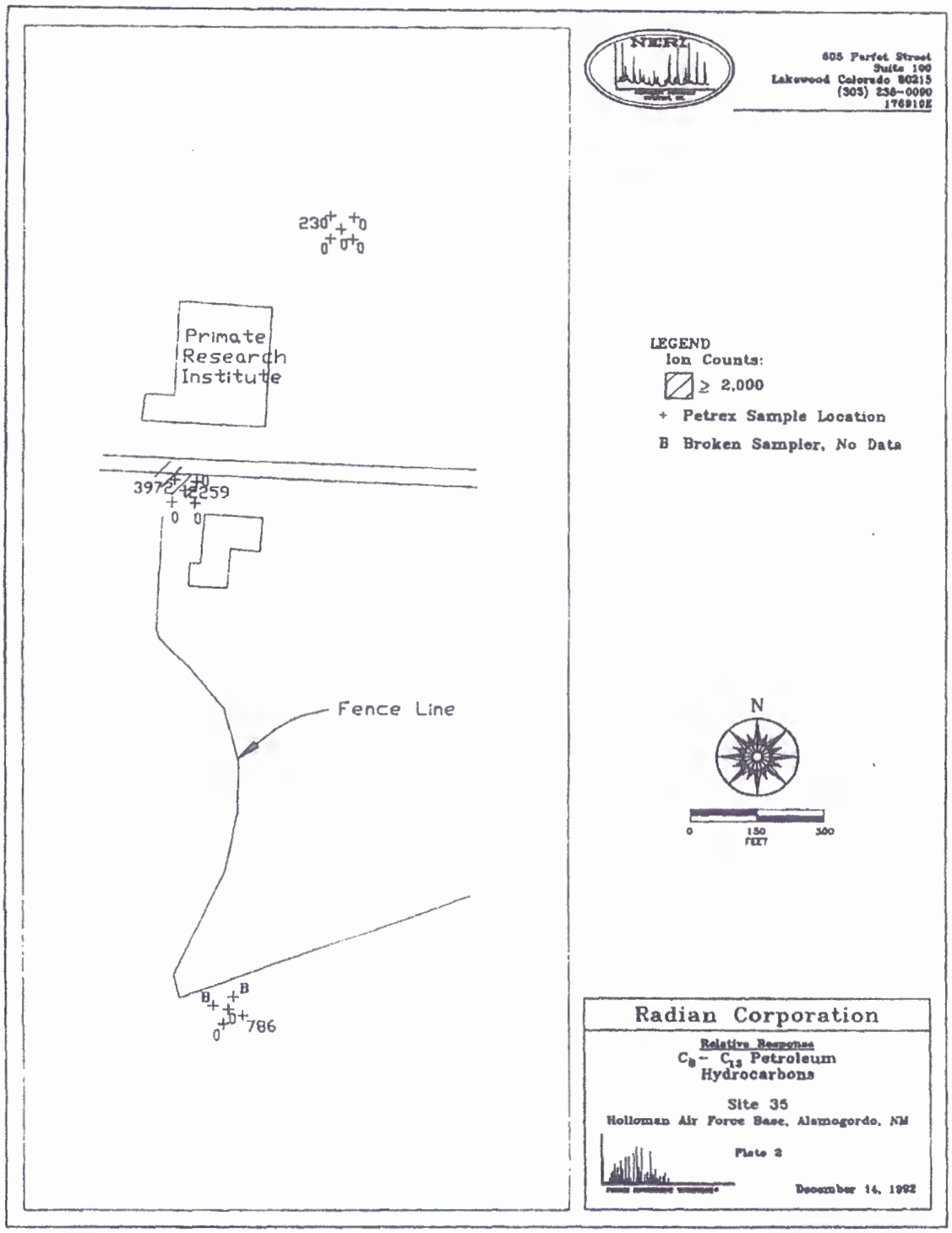
OT-35 Passive Soil-Gas Results

Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 6

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 6



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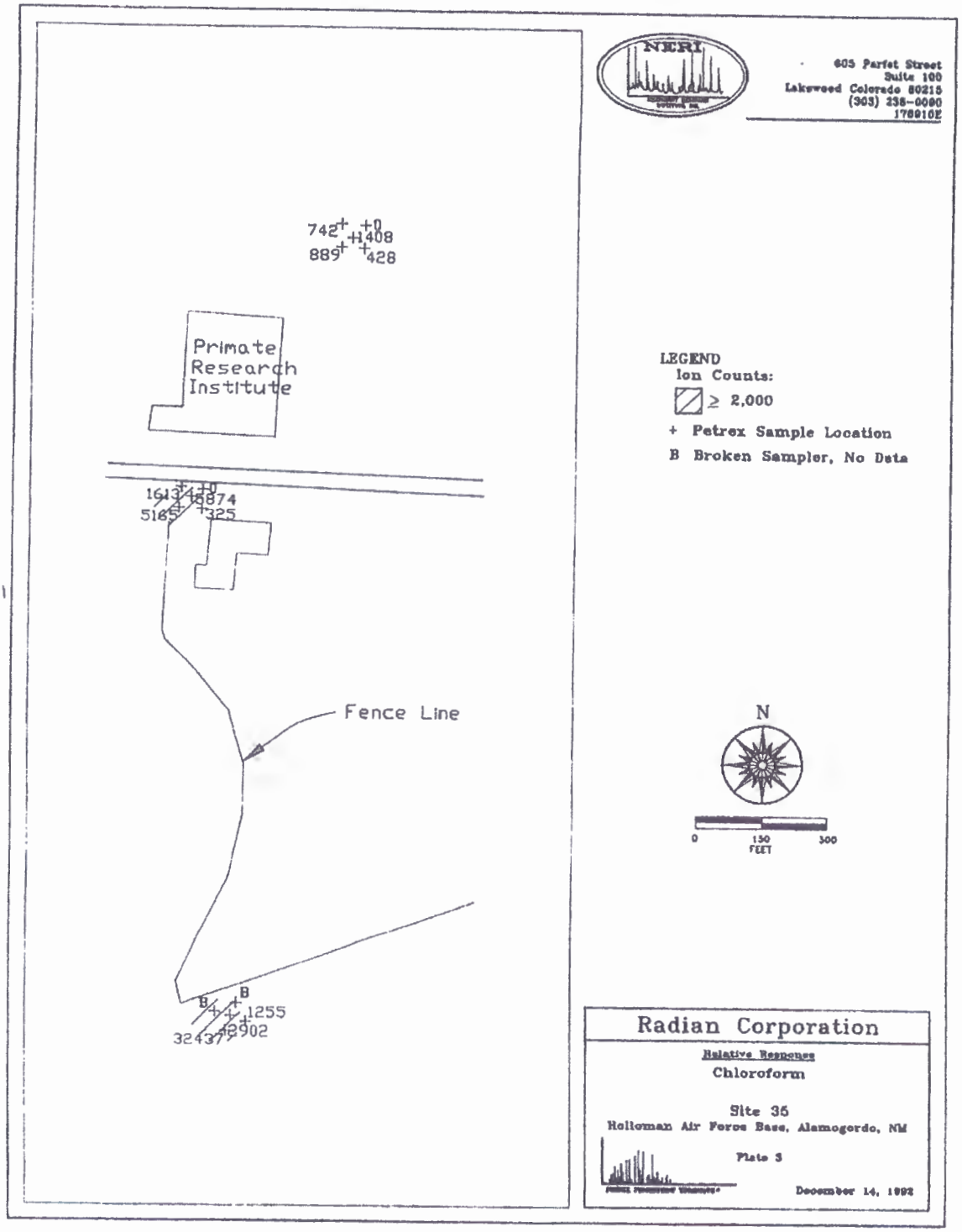
OT-35
Relative Responses - Hydrocarbons
Source: Radian 1993

PROJECT NO.	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO. Figure 7

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 7



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OT-35
Relative Responses - Chloroform
Source: Radian 1993

PROJECT NO.	SCALE	DATE	DRAWN BY
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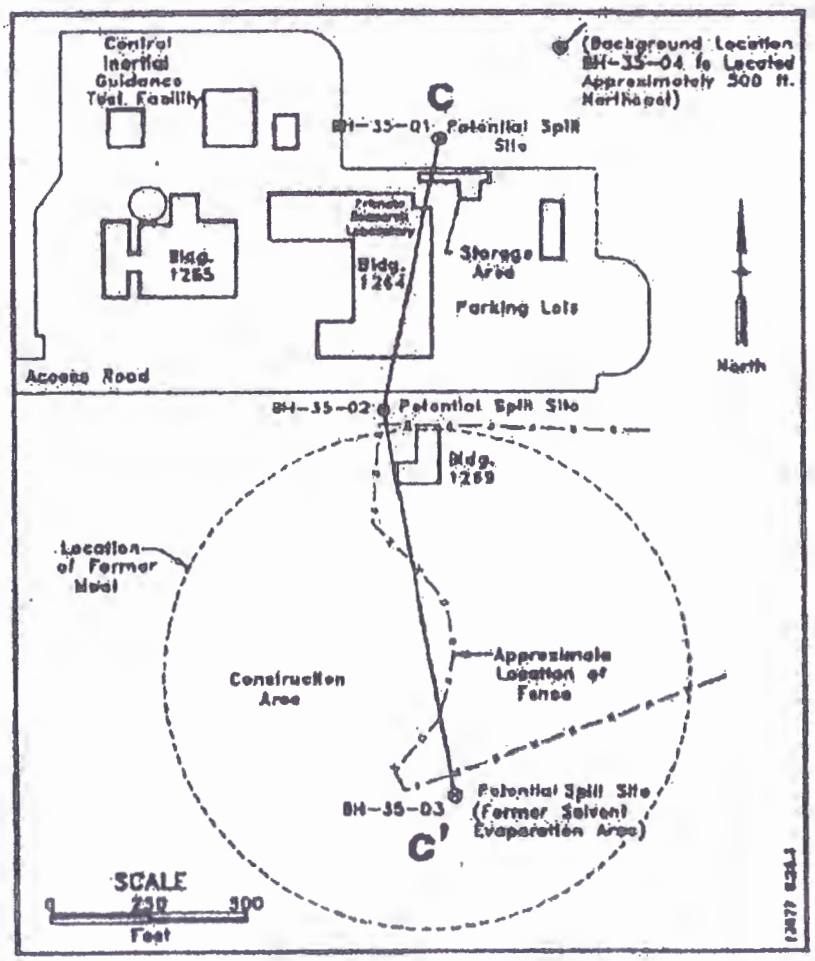
			DRAWING NO. Figure 8

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 8



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Site OT-35 Soil Boring Locations

Source: Radian 1993

PROJECT NO	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 9

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 9

Table 2. Summary of Soil Analytical Results for ERP Site OT-35 (SWMUs PRI-2 & 5)

Location	Depth (ft)	Gross Alpha (pCi/g)	RL (pCi/g)	Gross Beta (pCi/g)	RL (pCi/g)	Total Gamma (pCi/g)	RL (pCi/g)	VOCs (µg/kg)
BH-35-01	0-2	21.21	3.97	19.08	5.18	0.33	100	ND
	25-27	15.08	3.83	19.51	5.15	ND	100	ND
BH-35-02	2.5- 4.5	4.01	3.52	5.83	5.43	ND	100	ND
	10 – 12	12.06	3.51	17.94	5.47	ND	100	ND
BH-35-03	0-2	6.61	3.16	ND	5.05	ND	100	ND
	5-7	ND	3.0	ND	5.5	ND	100	ND
BH-35-04	0-2	7.87	2.93	5.95	5.61	ND	100	ND

Note: RL = Reporting Limit, µg/kg = micrograms per kilogram
Source: Radian, 1993

The subsurface conditions at Site OT-35 were defined by direct sampling and observation of the drill cuttings for the three soil borings conducted by Radian during the Site Investigation (Radian, 1993). The OT-35 site stratigraphy consists primarily of two broadly defined lithologic units. The upper-most unit consists of 10 ft of silt and silty sand that is underlain by 25 ft of clay. Interbedded lenses of sand and silt, ranging in thickness from 1 to 6 ft, occur within the clay layer. Based on the HAFB base-wide potentiometric surface, groundwater is estimated to be approximately 35 to 40 ft bgs in the vicinity of OT-35. The *Draft Final Preliminary Assessment and Site Investigation Report, Investigation of Four Waste Sites* (Radian 1993) determined that there are no risks to human health or the environment and recommended NFA for OT-35.

Basis for Determination

NFA is requested for AOC-PRI-2 and AOC-PRI-5 (OT-35) based upon the following Criterions:

- 1 - The SWMU/AOC cannot be located, does not exist or is a duplicate SWMU/AOC
- 5 - The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use

Presently, the sites investigated in 1993 have been graded and incorporated into the new primate research facility. This facility has rendered the site inaccessible because of the structures present and the requirements of primate management. Many of these animals are old and under protective care. The site has limited access (a fenced boundary) in order to provide these animals with minimal disturbance.

References

Bhate, 2006, *Accelerated Corrective Measures Work Plan*, Holloman Air Force Base, New Mexico.

CH_2M Hill. August 1983. *Installation Restoration Program, Records Search for Holloman Air Force Base, New Mexico*

International Commission on Radiological Protection. 2002. CD1: Database of Dose Coefficients: Workers and Members of the Public. (http://www.cea.fr/gb/publications/Clefs48/pdfgb/109a11.pdf).

Radian Corporation. November 1993. *Draft Final Preliminary Assessment and Site Investigation Report, Investigation of Four Waste Sites*, Holloman Air Force Base, NM.

Radian Corporation. June 1992. *Draft Final Remedial Investigation (RI) Report, Investigation, Study and Recommendation for 29 Waste Sites*, Holloman Air Force Base, NM.

J.3 SWMUs 39, 127, 135, and 170, Former Fire Training Area (ERP Site FT-31)

Location

The Former Fire Training Area, ERP Site FT-31, is comprised of the following four 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, located at the Fire Training Area, was removed from Appendix 4-A of the HAFB RCRA Permit.

Site FT-31, is located north of the Main Base Area and west of the former Main Base Landfill (**Figure 10**). 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 UST by definition, which supplied jet fuel (JP-4) to propagate training fires and was not listed as a SWMU. The tank resided in a concrete vault that was below ground surface; however, the tank was visible on all sides.

History

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. The start date of these activities at the site is unknown. 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. 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 of the site.

Current Use

The FT-31 site is the current location of the FT31 Land Farm. On June 14, 2004 Holloman Air Force Base (New Mexico) was granted discharge permit DP 1446 to operate a landfarm for petroleum contaminated soil (PCS) at the closed Fire Training Area Site (FT-31) by the New Mexico Environment Department (NMED). On November 6, 2009, NMED renewed the operating permit (DP 1446) for the landfarm and its expansion. The new configuration allows for 16 cells containing 720 cubic yards each (11,520yards/lift). The operating permit requires that monitoring of subsurface

conditions at the site (both soil and groundwater) be conducted in accordance with the approved discharge application and permit approval conditions listed in the November 9, 2009 authorization.

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FT-31 Site Layout Map

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO: Figure 10

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Figure 10

The *Installation Restoration Program Records Search* (CH_2M 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 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 VOCs and semi-volatile organic compounds (SVOCs) contamination and recommended further study. Investigations for the *Final Remedial Investigation Report for Installation Restoration Program Sites* (Walk, Haydel & Associates, 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 Remedial Investigation (RI) report concluded that extensive soil and groundwater 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* (Radian, 1993) was conducted at SWMUs 39, 127, and 135 in the northern part of the site. 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* (Foster Wheeler Environmental Corporation [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 petroleum-contaminated soils (PCS) were performed between 1996 and 1999. 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 Soil Screening Levels (SSLs) for PCS and related hazardous constituents. Limited excavation of PCS began in 1999 while the bioventing system was still operational. Excavation activities to remove recalcitrant PCS accelerated in January 2003 and were completed in July 2003. In 2005, additional investigations to address groundwater conditions were at the southeastern perimeter of the site. The completed VCM report was submitted to NMED in April 2006. The report was approved and the site was made eligible for NFA by NMED in October 2006. Excavated soil was transported offsite to a permitted landfarm facility. Clean soil was imported and used to backfill the VCM excavations.

Evaluation of Relevant Information

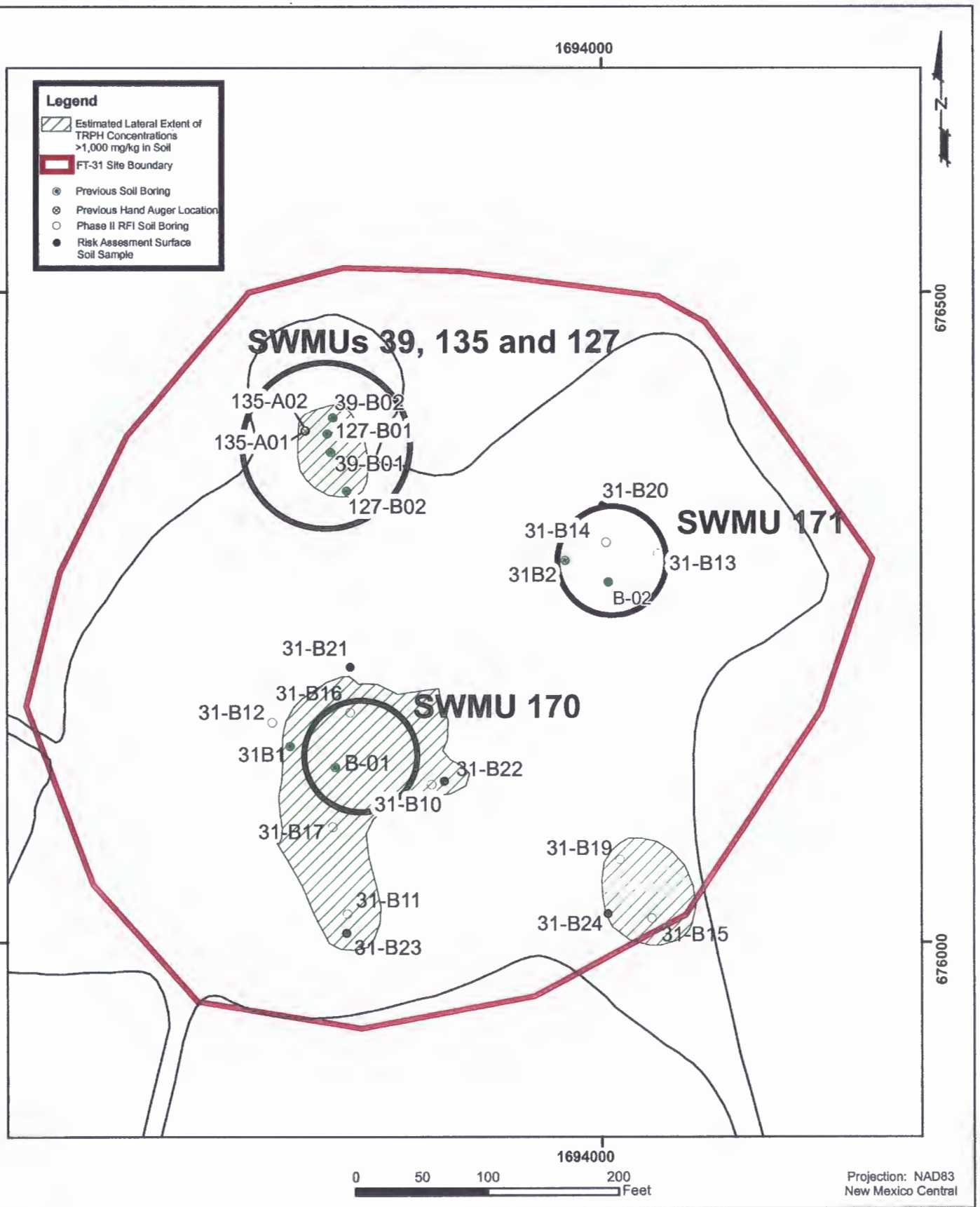
Several investigations were conducted at Site FT-31. Prior to the VCM, the most comprehensive representation of the nature and extent of PCS and other constituents was presented in the *Table 1 Phase II RFI Report* (FWENC, 1995). The data presented in *Table 1 Phase II RFI* was representative of site conditions prior to remedial efforts carried out by the VCM. The analytical results for soil data compiled in the *Table 1 Phase II RFI* are graphically represented on **Figures 11** and **12. Figure 11** 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 12** provides a series of idealized cross sections illustrating the vertical extent of PCS using the maximum TPH concentrations reported. TPH concentrations in soil beneath SWMUs 39, 127, and 135 ranged from 1,130 mg/kg to 31,800 mg/kg. TPH 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 UST 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 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). An estimate of the volume of PCS present at FT-31 was calculated based upon the delineation provided in **Figure 11** and **Figure 12**. The conservative estimate was calculated by determining the area of contamination from the map provided in **Figure 11** and multiplying it by the depth to groundwater (21 feet). The conservative estimate of the total volume of PCS that was present at all the SWMUs plus the JP-4 UST was approximately 17,800 cubic yards.

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 on **Figure 13**.

Soil excavated during the VCM were field screened with a 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.

To determine the effectiveness of the VCM, confirmation soil samples were collected from the sidewalls of the excavations. Excavation confirmation samples were analyzed by the offsite laboratory for TPH Diesel-Range Organics (DRO), TPH Gasoline-Range Organics (GRO) and TPH Oil-Range Organics (ORO) by Method 8015, VOCs by Method 8260B, and SVOCs by Method 8270C. The results of the laboratory analyses were reviewed and compared to the SSLs to determine completeness of PCS removal or the disposition of PCS soil.



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FT-31 Extent of PCS
[Phase II RFI (FWENC, 1995)]

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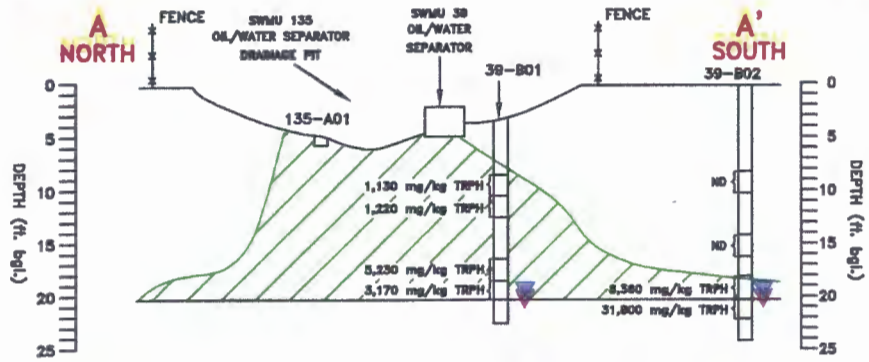
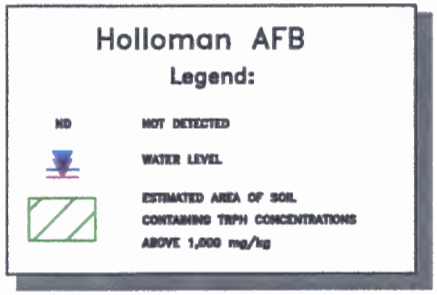
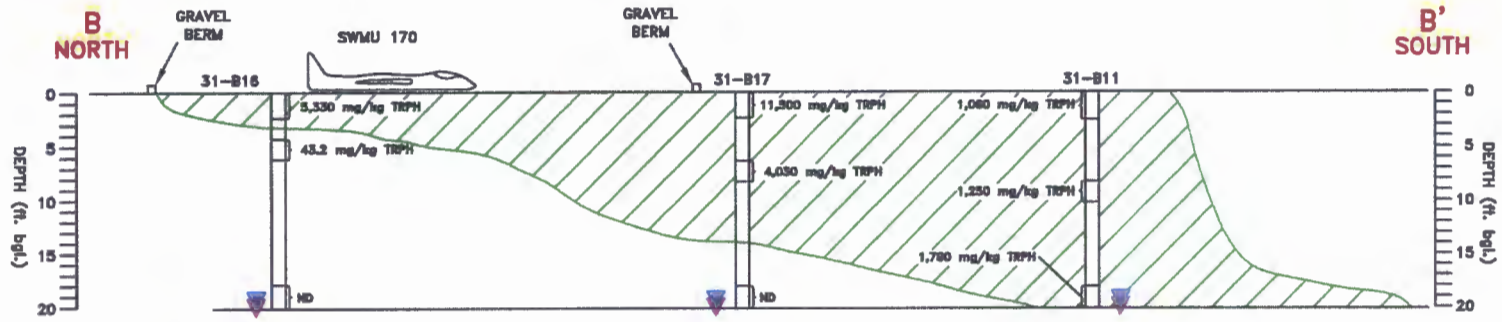
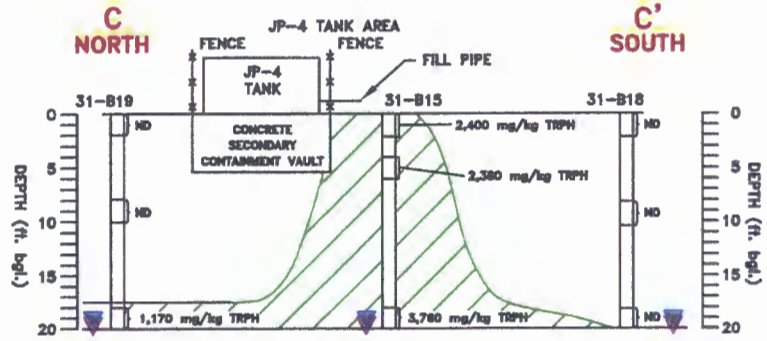
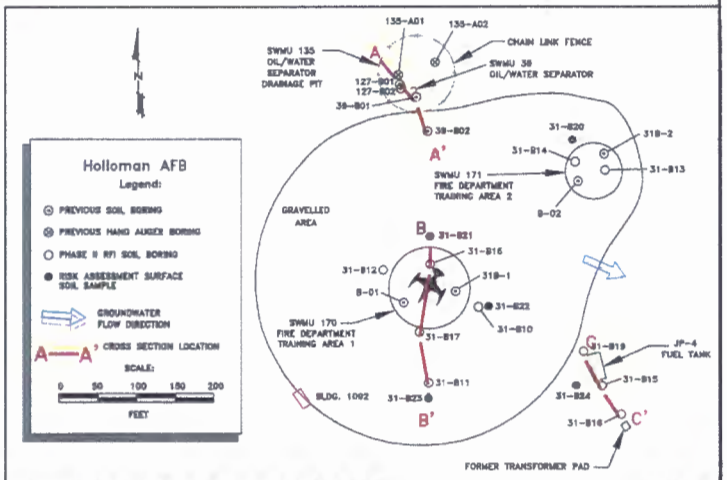
Figure 11











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FT-31 CROSS SECTIONS
DELINEATION OF PCS

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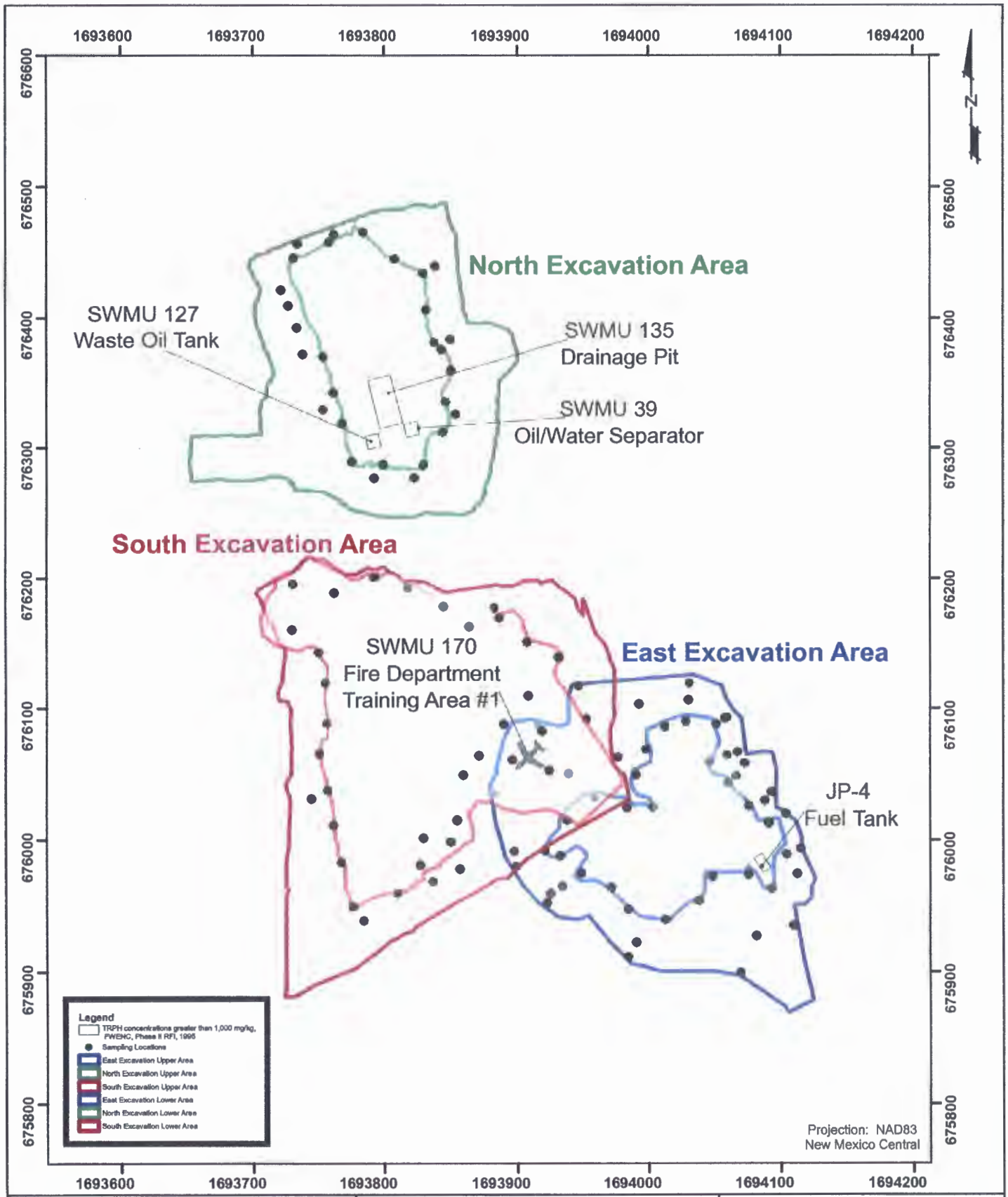
Figure 12



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FT-31 Excavation Areas With Confirmation Sample Locations

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Figure 13

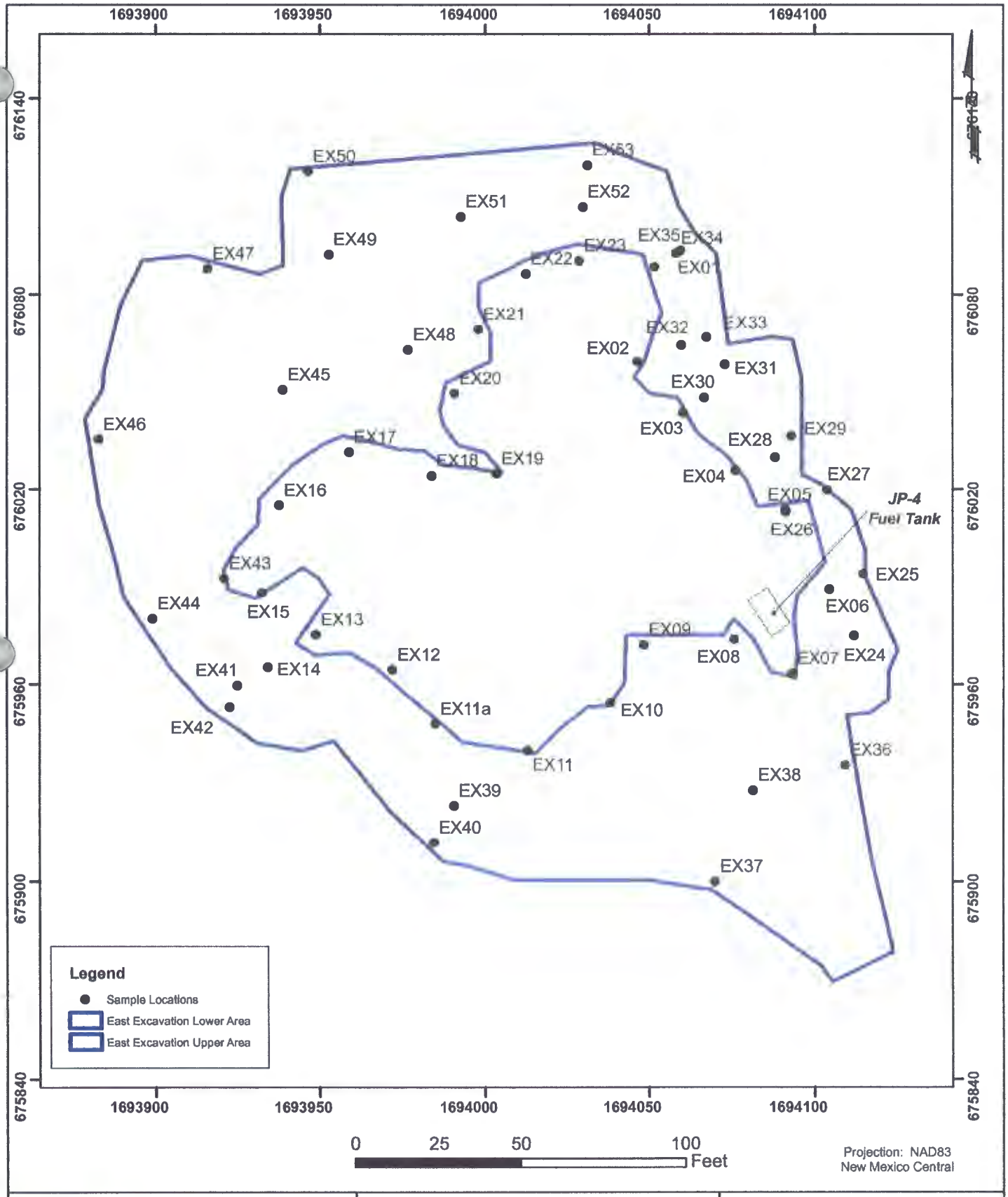
Hundreds of soil samples and several groundwater samples were collected to implement the VCM. These samples were used to document the completeness of the VCM excavations, the conditions of the PCS excavated and the quality of groundwater at the site. They document the successful removal of all PCS in excess of NMED SSLs. The tabulated results of these analyses required 58 pages in the original VCM Report. Therefore, these summary tables have been attached as Appendix A.

The east excavation, which encompassed SWMU 170 and the former location of the UST that contained JP-4, was the first excavation at FT-31. Approximately 2,030 cubic yards (2,298 tons) of PCS were excavated and transported offsite for disposal. "Suspect" soil was sampled and determined to be less than the NMED SSLs for PCS and was returned to the excavation as backfill. Confirmation samples were collected at 53 locations at varying depths from the sidewalls along the perimeter of the east excavation (**Figure 14**). Concentrations in these samples did not exceed the associated SSLs. The results of the confirmation sampling for the east excavation are presented in **Table 3-1** located in **Appendix A**.

Excavation and removal activities began at the south excavation in March 2003, and were completed 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 and 13,275 cubic yards (15,000 tons) of PCS were excavated and transported offsite for disposal. Confirmation samples were collected at 36 locations at varying depths from the sidewalls along the perimeter of the south excavation (**Figure 15**). Concentrations in these samples did not exceed the associated SSLs. The results of the confirmation sampling for the south excavation confirmation samples are presented in **Table 3-2** of **Appendix A**.

The north excavation encompasses the area of SWMUs 39 and 127. Excavation and removal activities began in June 2003 and were completed 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 the excavation was 7,470 cubic yards and approximately 2,750 cubic yards (3,100 tons) of PCS were excavated and transported offsite for disposal. Confirmation samples were collected at a total of 29 locations at varying depths from the sidewalls along the perimeter of the north excavation (**Figure 16**). Concentrations in these samples did not exceed the associated SSLs. The results of the north excavation confirmation samples are presented in **Table 3-3** located in **Appendix A**.

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. The excavation was graded to existing surface topography and slightly arched to provide drainage for storm water run-off.



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FT-31 East Excavation Area

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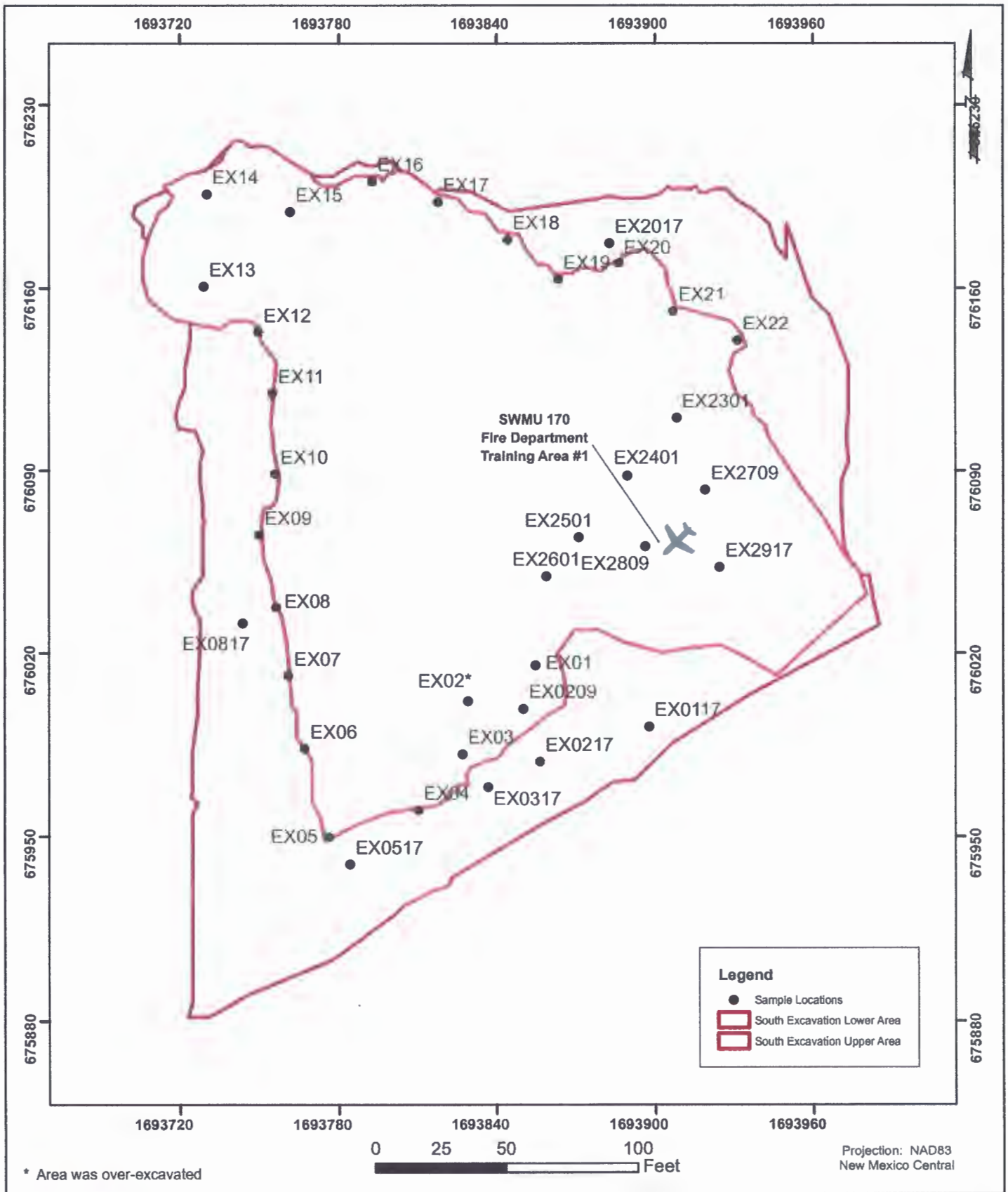
Figure 14



* Area was over-excavated

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FT-31 South Excavation Area

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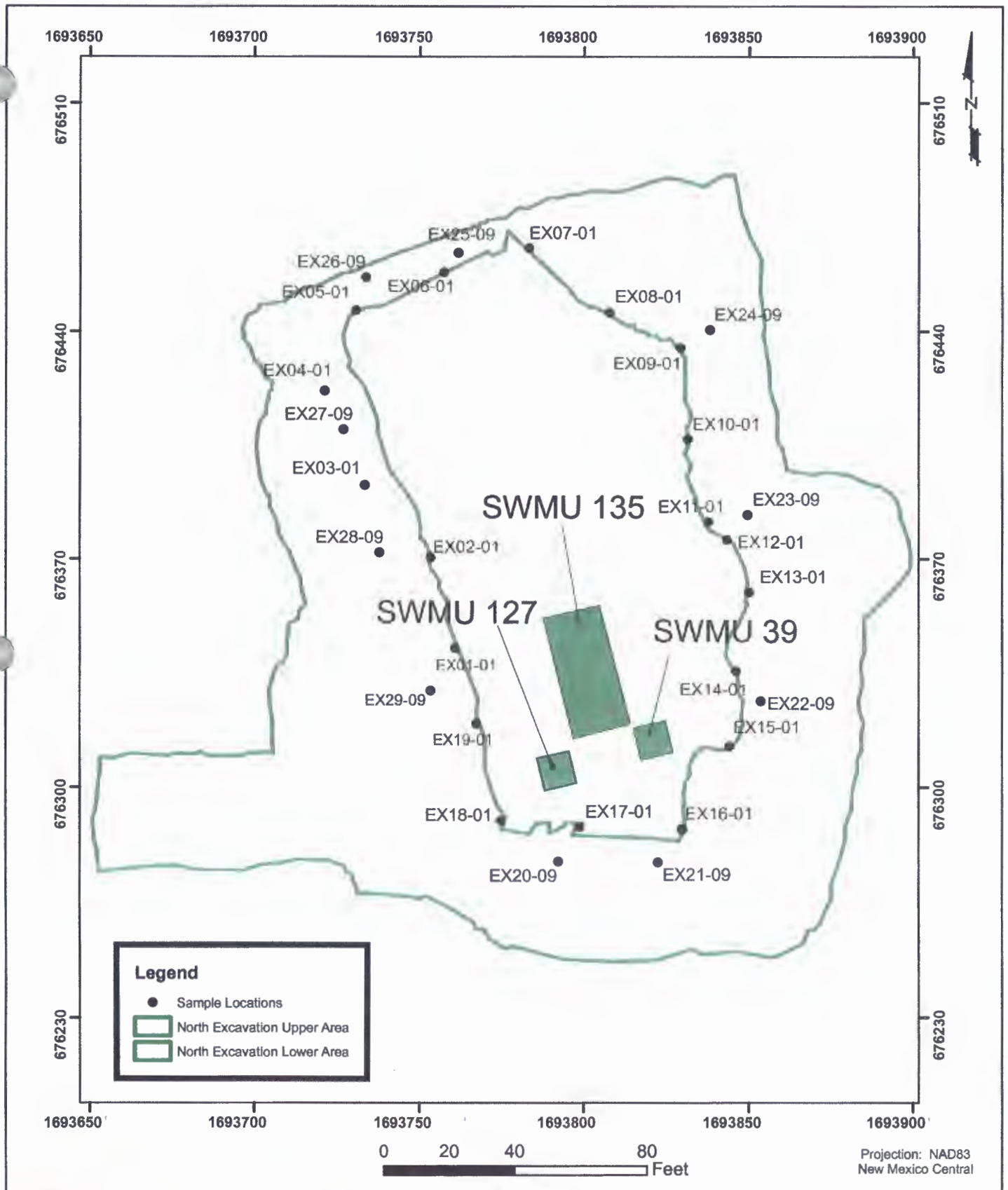
Figure 15



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FT-31 North Excavation Area

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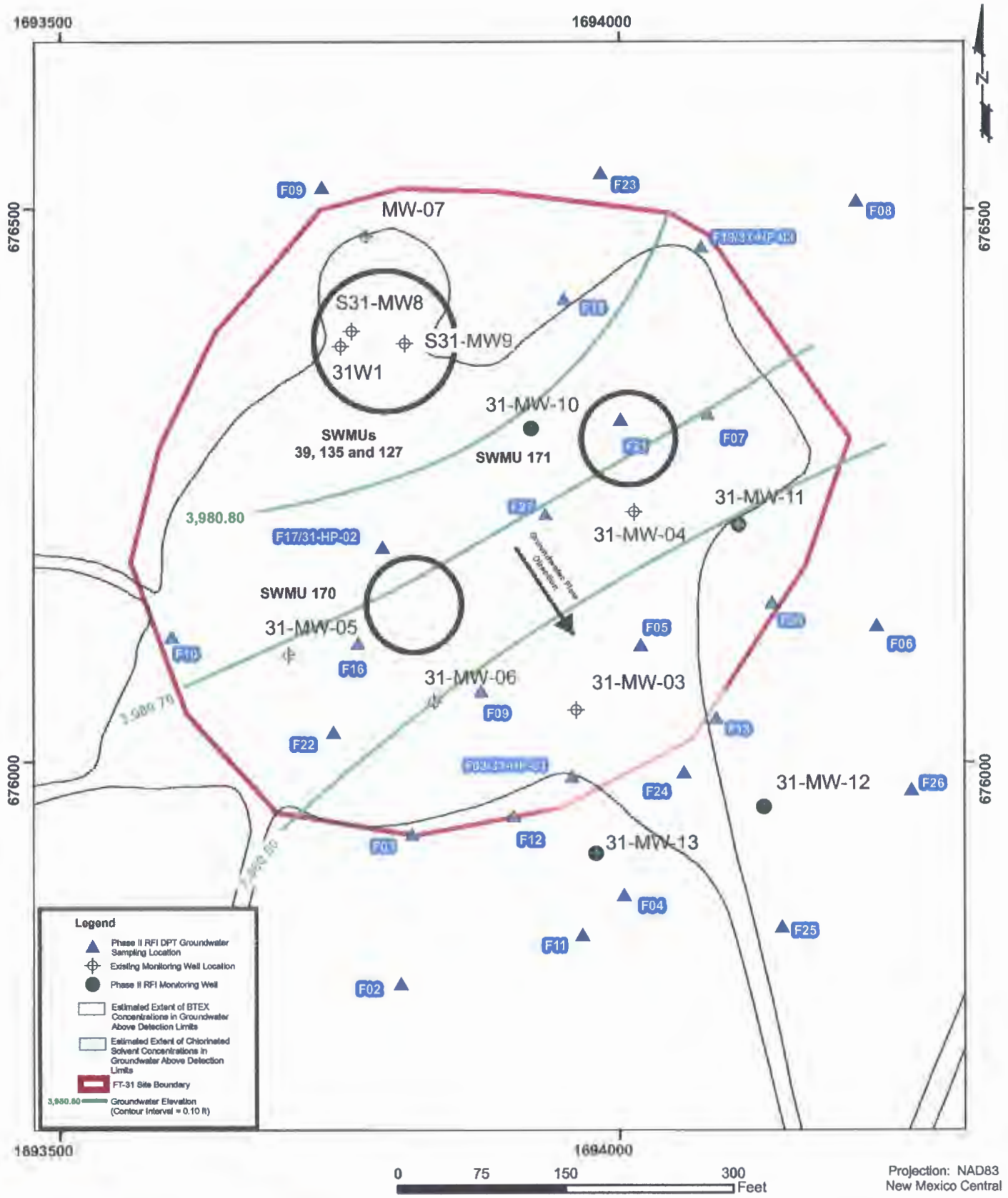
Figure 16

Groundwater samples were collected from several wells at the Site during the Table 1 Phase II RFI. Several wells identified VOCs and SVOCs. These results are summarized in **Table 3-6** located in **Appendix A** and **Figure 17.**

In 2005, groundwater samples were collected from wells MW-10 and MW-13 to determine the current concentrations of petroleum related constituents and TDS. Further, at the direction of NMED, three additional groundwater monitoring wells (MW-14, MW-15, and MW-16) were installed south of MW-13 to delineate the presence of VOCs identified in MW-13. Additional data concerning the presence of VOCs and the presence of TDS at the Site were derived from the Landfarm groundwater monitoring wells (LM-01, LM-02, LM-03, and LM-04) located on the Site. Well locations and a potentiometric surface map (January 2006) is included as **Figure 18**. Groundwater flow in the area of FT-31 is to the southeast.

TDS in groundwater at the site exceeds the NMWQCC (20.6.2 NMAC) standard for potable groundwater in all wells (average concentration of 20,000 mg/L) except well MW-16 which contained TDS at 8,990 mg/L. Well MW-13 contained the maximum concentrations of VOCs. At MW-13, benzene was detected at a concentration of 86.5 µg/L, sec-butylbenzene at 0.87 µg/L, 1,1-dichloroethane at 11.0 µg/L, 1,1-dichloroethene at 10.1 µg/L, isopropylbenzene at 2.8 µg/L, naphthalene at 7.2 µg/L, and trichloroethene at a concentration of 1.1 µg/L. Diethylphthalate, 2-methylnaphthalene, and naphthalene were the SVOCs detected at concentrations of 3.0 µg/L, 2.3 µg/L, and 6.4 µg/L, respectively. Wells LM-01 through LM-04 and MW-14 through MW-16 contained no VOCs or SVOCs. Well MW-15 contained one VOC, toluene at 0.53 µg/L which is significantly below all applicable standards.

Concentrations of metals in samples from the monitoring wells (MW-14, MW-15, and MW-16) were compared to NMWQCC standards for potable groundwater, even though the concentration of TDS is above the 10,000 mg/L standard. Concentrations of four metals were detected above the NMWQCC standards. Lead was detected above the standard of 100 µg/L, at a concentration of 114 µg/L in the sample collected from MW-15; however, lead was not above the standard in the duplicate sample from this well. The standard for iron of 1,000 µg/L was exceeded in each sample collected from the new wells MW-14, MW-15, and MW-16. Concentrations ranged from 20,200 µg/L to 137,000 µg/L. Manganese was also exceeded in each of the samples collected. It was detected at concentrations ranging from 565 µg/L in the sample from MW-14 to 3,130 µg/L in the sample from MW-15. The standard for manganese is 200 µg/L. Selenium was also above the standard of 50 µg/L in each of the samples collected. Selenium concentrations ranged from 76.3 µg/L to 170 µg/L.



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FT-31 Groundwater Analytical Results [Phase II RFI (FWENC, 1995)]

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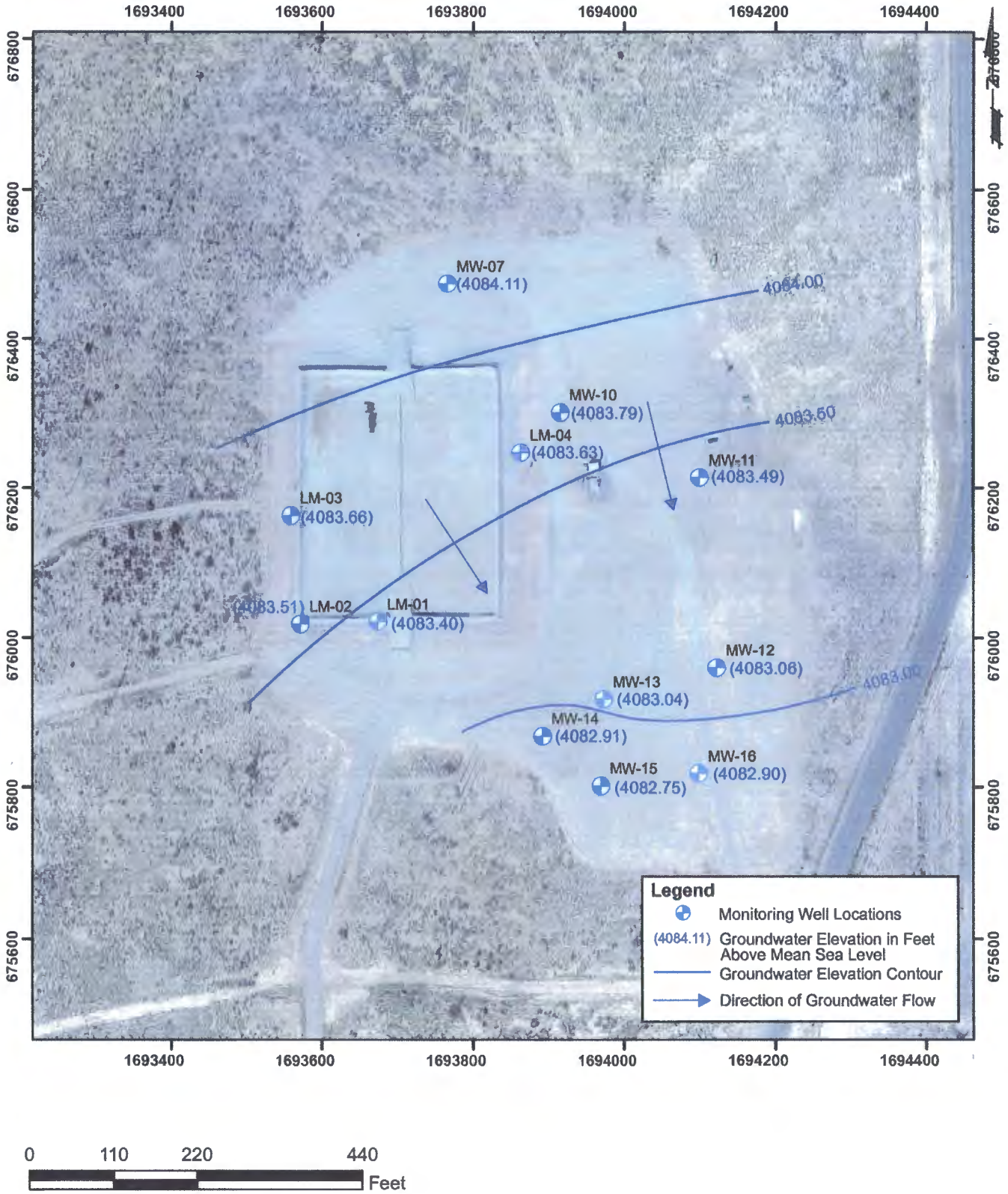
Figure 17



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FT-31 POTENTIOMETRIC SURFACE MAP (JANUARY 2006)

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Figure 18

Basis for Determination

PCS identified in the Table 1 Phase II RFI for FT-31 (SWMUs 39, 127, 135, and 170) and the JP-4 fuel UST 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 consistently exceeds the NMWQCC standard for potable groundwater.

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

The SWMUS at site FT-31 meet the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use. **Figure 19** is a copy of the September 27, 2006, NMED letter to HAFB indicating the site is eligible for NFA.

References

Bhate Environmental, April 2006, *FT-31 Voluntary Corrective Measures Completion Report, Holloman AFB, New Mexico.*

CH_2M Hill, August 1983, *Installation Restoration Program Records Search, Holloman AFB, New Mexico.*

FWENC, June 1995, *Table 1 Phase II RFI Report, Holloman AFB, New Mexico.*

FWENC, June 2003, *Closure Report for the Excavations at FT-31 – South Area and the West POL Yard, Holloman Air Force Base, New Mexico.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone (505) 428-2500
Fax (505) 428-2567
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 27, 2006

Ms. Debbie Hartell, Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

RE: APPROVAL OF THE RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION FT-31 VOLUNTRARY CORRECTIVE MEASURES COMPLETION REPORT (SWMUs 39, 127, 135, AND 170), APRIL 2006 HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422 HWB-HAFB-05-002

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) May 5, 2006 response to NMED's July 27, 2005 Request For Supplemental Information for the FT-31 Voluntary Corrective Measures (VCM) Completion Report, dated February 2005, for the removal of petroleum-contaminated soils. The FT-31 site is shown on Table A of the Facility Permit for Container Storage Unit as Solid Waste Management Units 39, 127, 135 and 170. The subject document is hereby approved by the NMED.

It should be noted that post-VCM groundwater at this site contains contaminants (volatile organic compounds and metals) at concentrations in excess of the NM Water Quality Control Commission's human health standards for groundwater. However, pursuant to 20.6.2.3103 NMAC, these standards only apply to groundwater with total dissolved solids (TDS) concentrations of less than 10,000 mg/L. The TDS concentrations at this site range from 23,700 mg/L to 35,400 mg/L. In addition, due to the remote location of this site, there are no current or potential exposure pathways (e.g. dermal contact, vapor inhalation or construction worker exposure) that would require the evaluation of potential exposure risk. Additionally, this site is the current location of a permitted petroleum-contaminated soil treatment landfarm regulated by

the NMED Groundwater Quality Bureau through a Groundwater Discharge Permit, which requires regular groundwater monitoring.

If you have any questions regarding this matter, please contact David Strasser of my staff at (505) 222-9526 or at the above address.

Sincerely,

John E. Kieling
Manager
Permits Management Program

JEK:dcs

cc: J. Bearzi, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region 6 (6PD-F)
D. Griffin, HAFB
File: HAFB 2006 and Reading
HWB-HAFB-05-002

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				DRAWING NO: Figure 19		Figure 19

References (continued):

FWENC, January 2003, *Revised Final Letter Work Plan for Petroleum-Contaminated Soil Excavation at SS-17, FT-31, and The West POL Yard, Holloman Air Force Base, New Mexico.*

NMED, February 2004, *Technical Background Document for the Development of Soil Screening Levels, Revision 2.* Hazardous Waste Bureau, Ground Water Quality Bureau, and the Voluntary Remediation Program.

NMED, June 24, 2003, *New Mexico Environment Department TPH Screening Guidelines.*

Radian Corporation, 1993, *Phase I RCRA Facility Investigation*, Holloman AFB, New Mexico.

Walk, Haydel and Associates, December 1989, *Final Remedial Investigation Report for Installation Restoration Program Sites.*

J.4 SWMU AOC-2, Sewage Disposal Area Taxiway G

Location

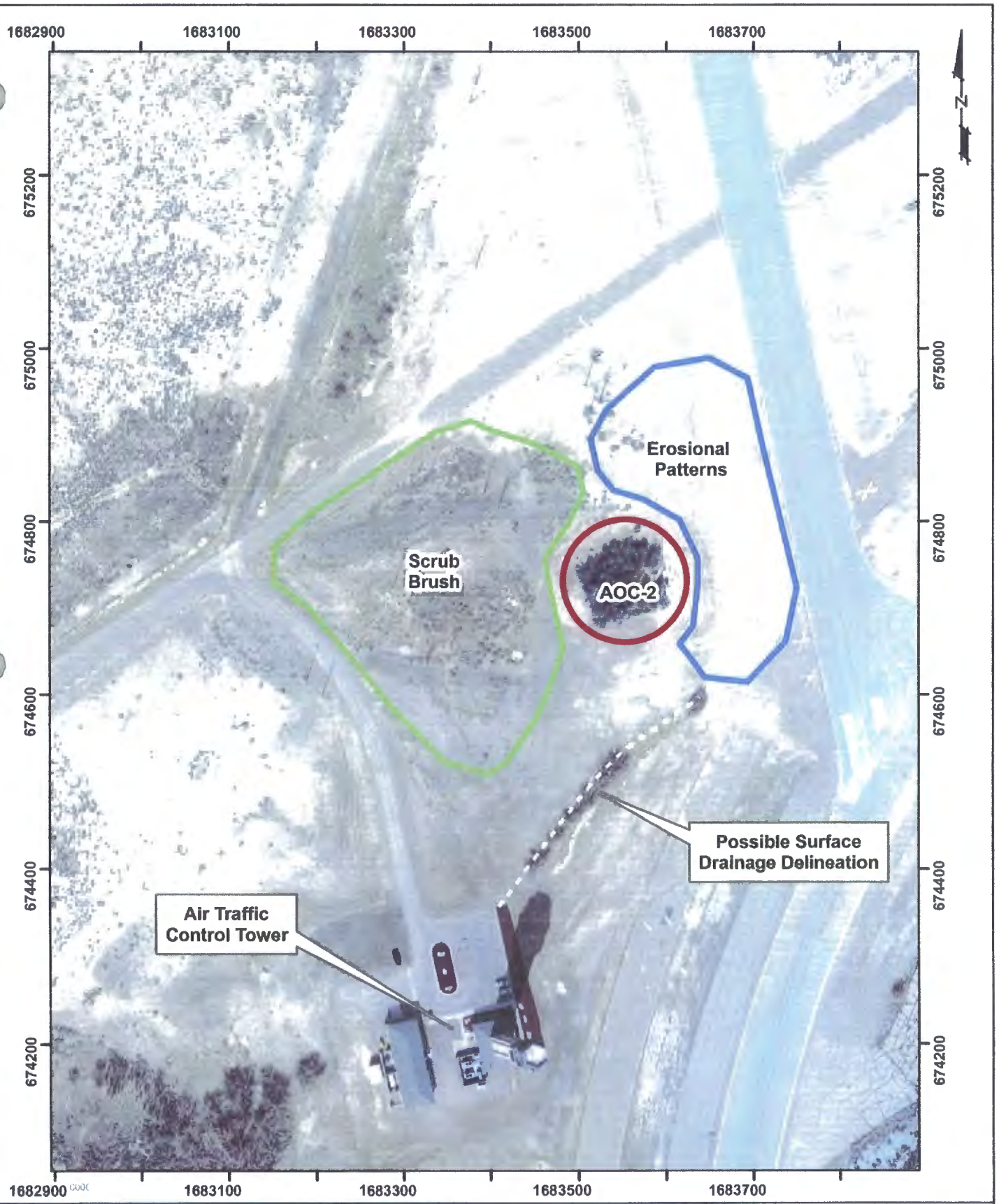
AOC-2 is located on the western part of the main base, across Taxiway G. AOC-2 is approximately 110 feet in diameter with primarily salt cedars comprising the vegetation and is slightly depressed topographically as compared to the surrounding area. The site boundary is defined by a wire fence with signage indicating the area to be a former sewage disposal area. The site is approximately 900 feet northeast of the existing air traffic control tower, Building 864. A site location photomap with the surface features visible is provided as **Figure 20**.

Prior to the 2004 and 2005 RFI efforts, no previous information relating to the environmental status of the site existed. It is inferred that disposal activities were terminated prior to 1984 although no documentation of disposal records are presently available to corroborate this assertion. Additionally, no regulatory permits, violations, or documents pertaining to AOC-2 were found that disclosed information on the purpose or past uses of the site. If the former air traffic tower was a source of disposal to the site, it has since been removed.

Relevant Information

Interviews of Base personnel were conducted in 2004 as part of the document review process. Personnel from the 49th Civil Engineering Squadron (CES) were interviewed concerning potential dumping, burial, or storage of wastes at the site. To the recollection of the personnel interviewed, there was no dumping, burial, or storage of hazardous wastes at the site. Each individual questioned had been stationed at HAFB for at least 30 years.

Aerial photographs from 1945, 1982, and 1997 were shown to CES personnel during the interviews. The photos show the former air traffic control tower that was located immediately west of AOC-2. There has been no indications from the documentation reviewed that disposal of any substance from the former tower to the area, septic or otherwise, has occurred in the past. No historical documents were found pertaining to the purpose or past uses of the site. No potential receptors have been identified for the soil, surface, and air media. It is inferred that only the groundwater media would have the potential to impact potential receptors; however, due to the large distances, even this is unlikely. In summary, based on the interviews, site reconnaissance, and the presence of the sewage disposal sign, the site may have been plumbed to the former control tower for sanitary purposes; however, no direct evidence is available to confirm this assertion.



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AOC-2 Surface Features

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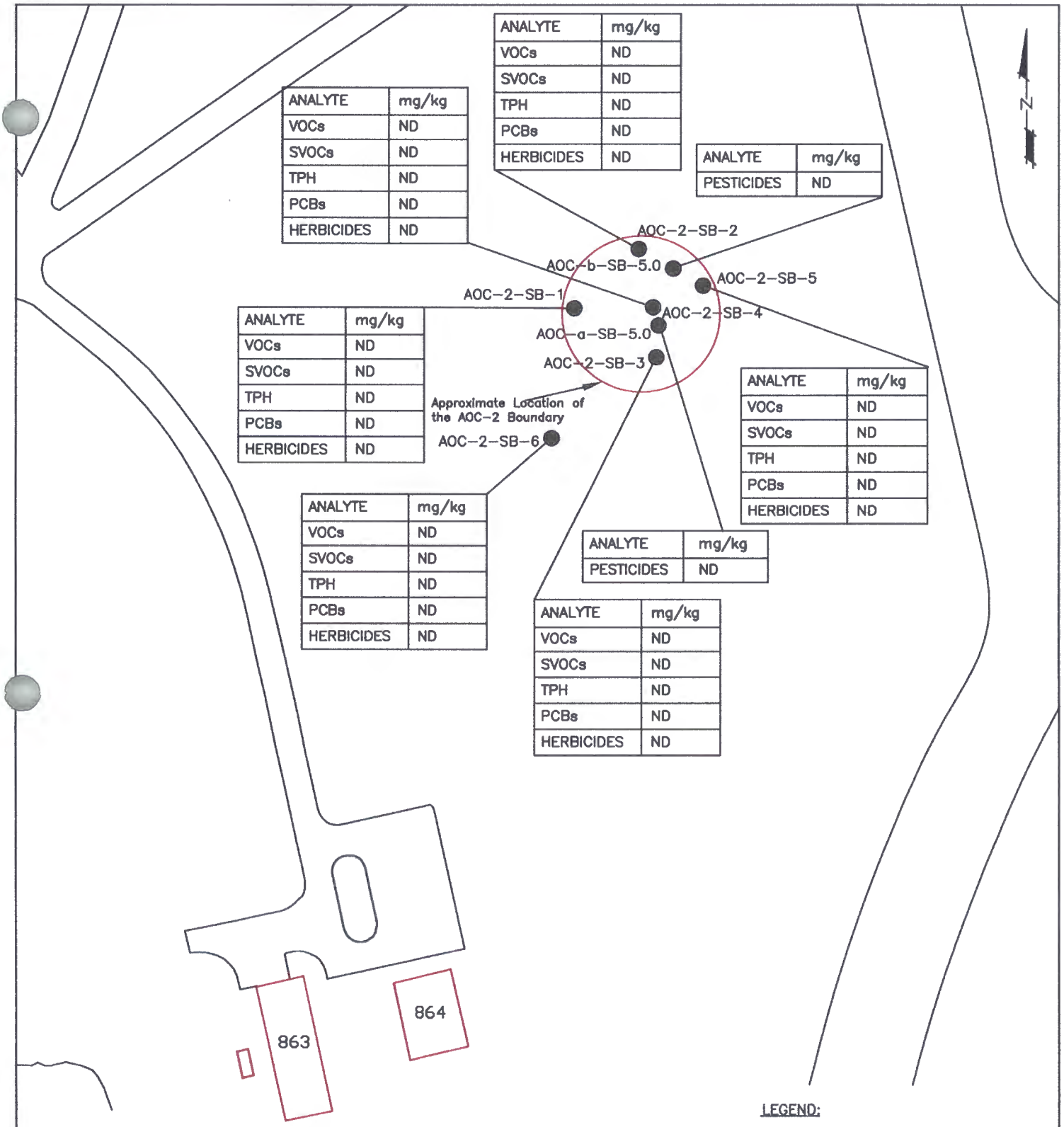
Figure 20

RFI field activities were conducted in 2004. To facilitate the production and review of this document, figures summarizing the results and tables comparing the relevant results to regulatory standards have been included in the text. During the RFI, soil borings were advanced, and soil and groundwater samples were collected from selected locations at the site to determine the nature and extent of possible contamination. In May 2004, six soil borings (SB-1 through SB-6) were advanced around AOC-2 (**Figure 21**). These soil borings were sampled continuously to a depth of approximately 20 feet bgs. Two shallow boreholes (A and B) were advanced within the AOC-2 boundary using a hand auger. Temporary monitoring wells were installed in each of the six deep soil borings for the purpose of collecting groundwater samples. Groundwater samples were collected from each of the monitoring wells. The soil and groundwater samples were analyzed for VOCs; SVOCs; TPH-GRO, TPH-DRO, and TPHORO; RCRA-8 metals; polychlorinated biphenyls (PCBs); herbicides; and pesticides. Additionally, groundwater samples were also analyzed for TDS and nitrate and nitrite.

Analytical results for samples collected from AOC-2 indicate that no VOCs, SVOCs, PCBs, herbicides, TPH, or pesticides were detected above the method detection limits. However, several RCRA-8 metals were detected. Summaries of these soil results are illustrated on **Figures 21** and **22**. Each metal concentration was compared to the Base-wide upper tolerance limits (UTLs) (Radian, 1993) and then to the Residential SSLs (NMED, February 2004). As summarized in **Table 3**, arsenic, barium, cadmium, chromium, lead, and silver were all detected at low concentrations in the soil samples. Of these detections, two occurrences of arsenic (4.12 milligrams per kilogram [mg/kg] in SB03-3 and 4.91 mg/kg in SB-04-3) are below the base-wide UTL (6.88 mg/kg), but exceed the SSL (3.90 mg/kg). Two occurrences of silver (1.6 mg/kg in SB-04-9 and 0.86 mg/kg in SB-04-3) exceeded the base-wide UTL of 0.73 mg/kg though each is well below the SSL of 391 mg/kg. Because selenium and mercury were not detected in any soil samples they were not included in the table.

Analytical results for groundwater samples collected from AOC-2 indicate that with the exception of low levels of several RCRA-8 metals, no VOCs, SVOCs, TPH, pesticides, or herbicides were detected. Each metal concentration has been compared to the base-wide UTLs for total metals in groundwater (Radian, 1993), the NMWQCC Groundwater Standards (NMAC 20.6.2), EPA Maximum Contaminant Levels (MCLs), and EPA Region 6 Preliminary Remediation Goals (PRGs). Cadmium, lead, mercury, and silver were not detected in groundwater at the site. Analytical results for groundwater are summarized on **Figures 23** and **24**. Comparisons of groundwater results with the applicable regulatory standards and background values is presented in **Table 4**.



ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
PESTICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

ANALYTE	mg/kg
PESTICIDES	ND

ANALYTE	mg/kg
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- ● SOIL BORING LOCATIONS
- ▭ BUILDINGS
- ND NOT DETECTED
- mg/kg MILLIGRAMS PER KILOGRAM

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AOC-2 SOIL ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 21

Statement of Basis 2007
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Figure 21

SAMPLE	SB-01-4	SB-01-10
METALS	mg/kg	mg/kg
ARSENIC	3.52	3.22
BARIUM	13.6	30.1
CADMIUM	ND	ND
CHROMIUM	1.44	4.13
LEAD	ND	0.64
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

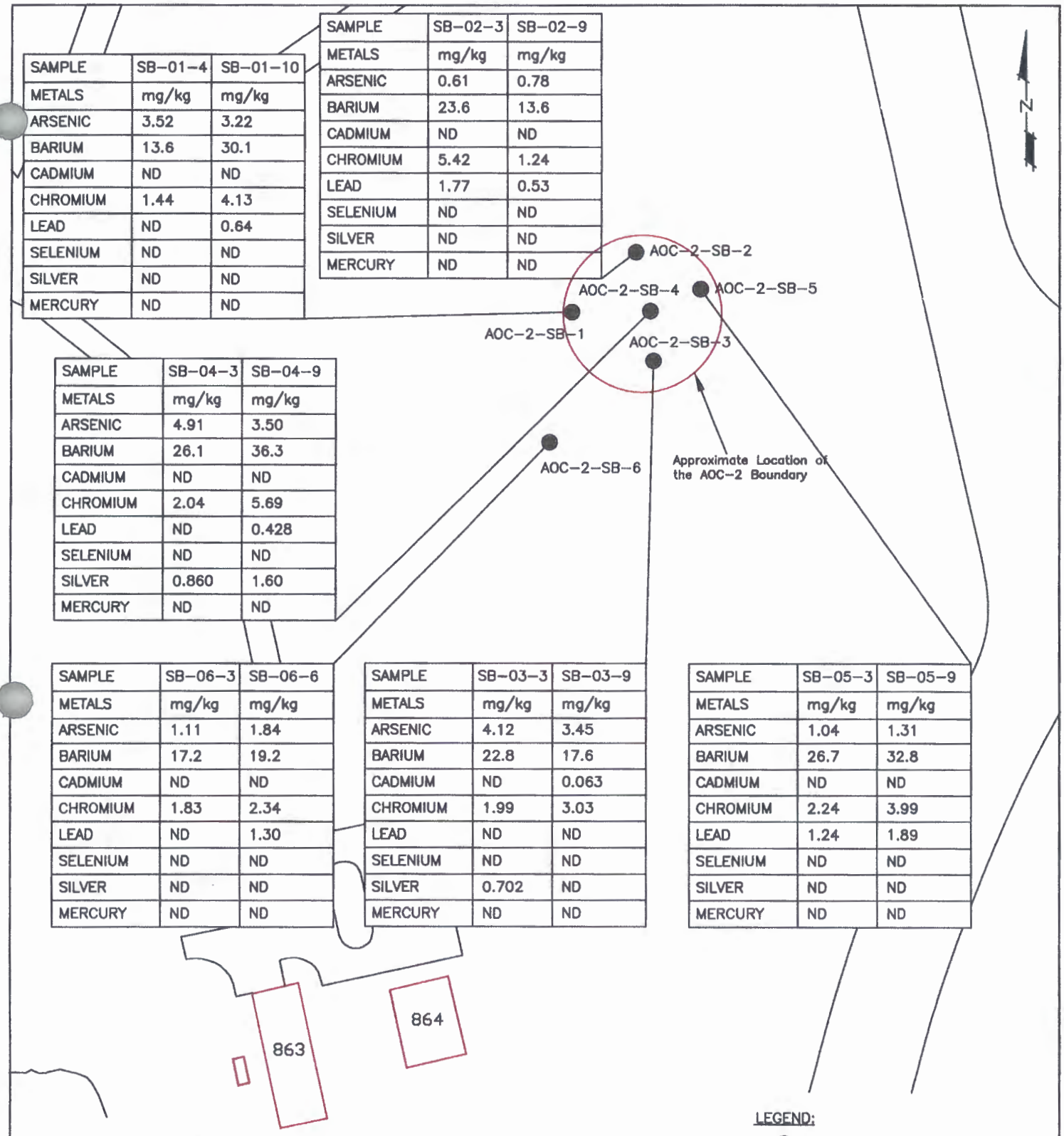
SAMPLE	SB-02-3	SB-02-9
METALS	mg/kg	mg/kg
ARSENIC	0.61	0.78
BARIUM	23.6	13.6
CADMIUM	ND	ND
CHROMIUM	5.42	1.24
LEAD	1.77	0.53
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

SAMPLE	SB-04-3	SB-04-9
METALS	mg/kg	mg/kg
ARSENIC	4.91	3.50
BARIUM	26.1	36.3
CADMIUM	ND	ND
CHROMIUM	2.04	5.69
LEAD	ND	0.428
SELENIUM	ND	ND
SILVER	0.860	1.60
MERCURY	ND	ND

SAMPLE	SB-06-3	SB-06-6
METALS	mg/kg	mg/kg
ARSENIC	1.11	1.84
BARIUM	17.2	19.2
CADMIUM	ND	ND
CHROMIUM	1.83	2.34
LEAD	ND	1.30
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND

SAMPLE	SB-03-3	SB-03-9
METALS	mg/kg	mg/kg
ARSENIC	4.12	3.45
BARIUM	22.8	17.6
CADMIUM	ND	0.063
CHROMIUM	1.99	3.03
LEAD	ND	ND
SELENIUM	ND	ND
SILVER	0.702	ND
MERCURY	ND	ND

SAMPLE	SB-05-3	SB-05-9
METALS	mg/kg	mg/kg
ARSENIC	1.04	1.31
BARIUM	26.7	32.8
CADMIUM	ND	ND
CHROMIUM	2.24	3.99
LEAD	1.24	1.89
SELENIUM	ND	ND
SILVER	ND	ND
MERCURY	ND	ND



NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- ● SOIL BORING LOCATIONS
- ▭ BUILDINGS
- ND NOT DETECTED
- mg/kg MILLIGRAMS PER KILOGRAM

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AOC-2 RCRA-8 METALS
SOIL ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 22

Statement of Basis
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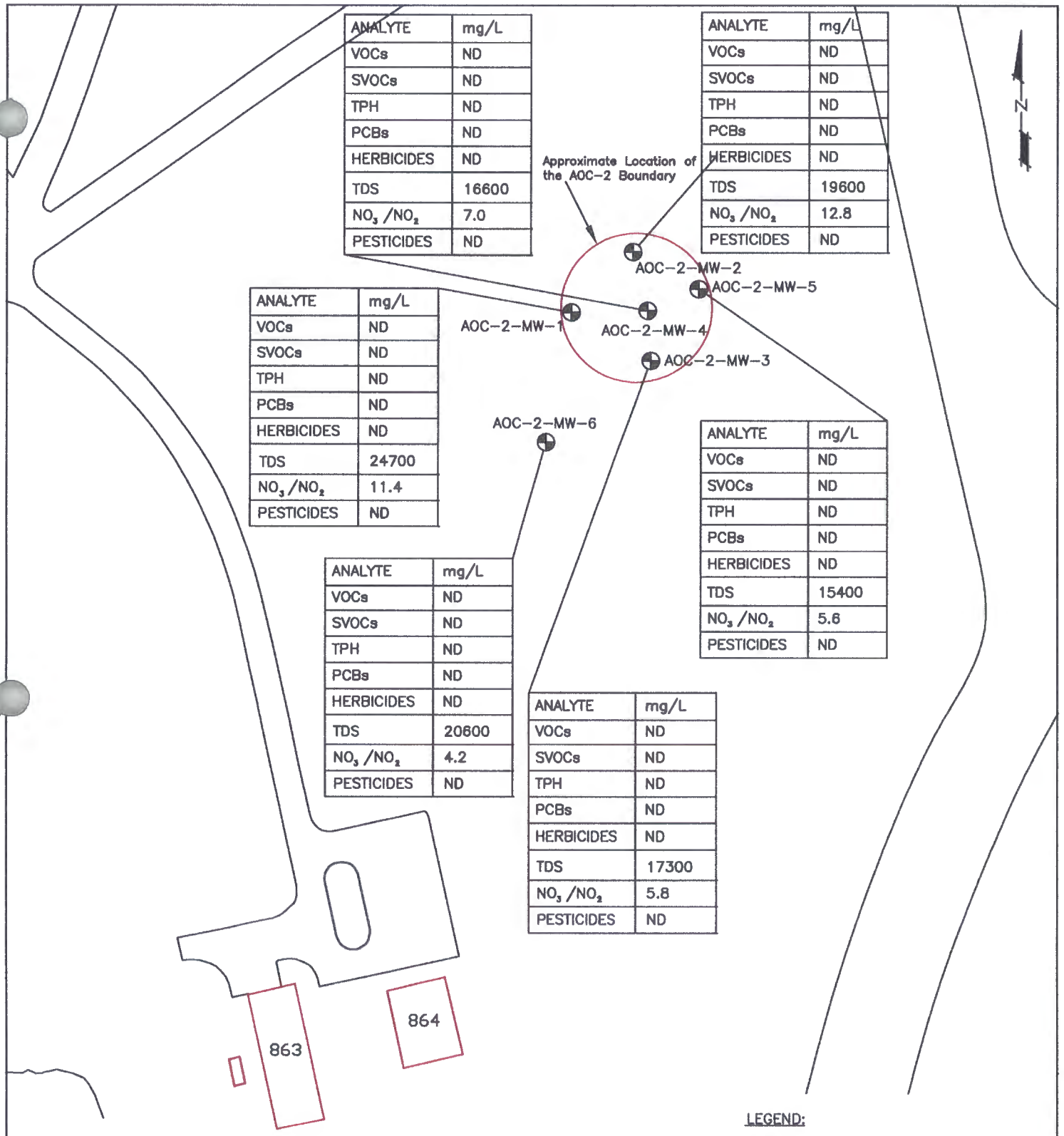
Figure 22

Table 3. Comparison of AOC-2 Soil Analytical Results to Base-wide Background Levels and NMED SSLs

Analyte	Arsenic	Barium	Cadmium	Chromium	Lead	Silver
Number of samples with detections	14 (including duplicates)	14 (including duplicates)	1	14 (including duplicates)	9 (including duplicates)	3
Range	0.61 to 4.91 mg/kg	13.6 to 36.3 mg/kg	0.063 mg/kg	1.24 to 5.69 mg/kg	0.428 to 1.89 mg/kg	0.702 to 1.6 mg/kg
High	SB-04-3	SB-04-9	SB-03-9	SB-04-9	SB-05-9	SB-04-9
Base-wide UTL	6.88 mg/kg	84.36 mg/kg	1.04 mg/kg	6.6 mg/kg	*	0.73 mg/kg
NMED SSL	3.9 mg/kg	5,450 mg/kg	74.1 mg/kg	234 mg/kg	400 mg/kg	391 mg/kg
Exceed UTL	No	No	No	No	N/A	Yes
Exceed SSL	Yes	No	No	No	No	No

Notes: * calculated UTL was a non-positive value, which is not a usable value for screening.
N/A = Not Applicable



ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	16600
NO_3/NO_2	7.0
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	19600
NO_3/NO_2	12.8
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	24700
NO_3/NO_2	11.4
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	15400
NO_3/NO_2	5.6
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	20600
NO_3/NO_2	4.2
PESTICIDES	ND

ANALYTE	mg/L
VOCs	ND
SVOCs	ND
TPH	ND
PCBs	ND
HERBICIDES	ND
TDS	17300
NO_3/NO_2	5.8
PESTICIDES	ND

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

- MONITORING WELL LOCATIONS
- BUILDINGS
- ND NOT DETECTED
- mg/L MILLIGRAMS PER LITER

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AOC-2 GROUNDWATER ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 23

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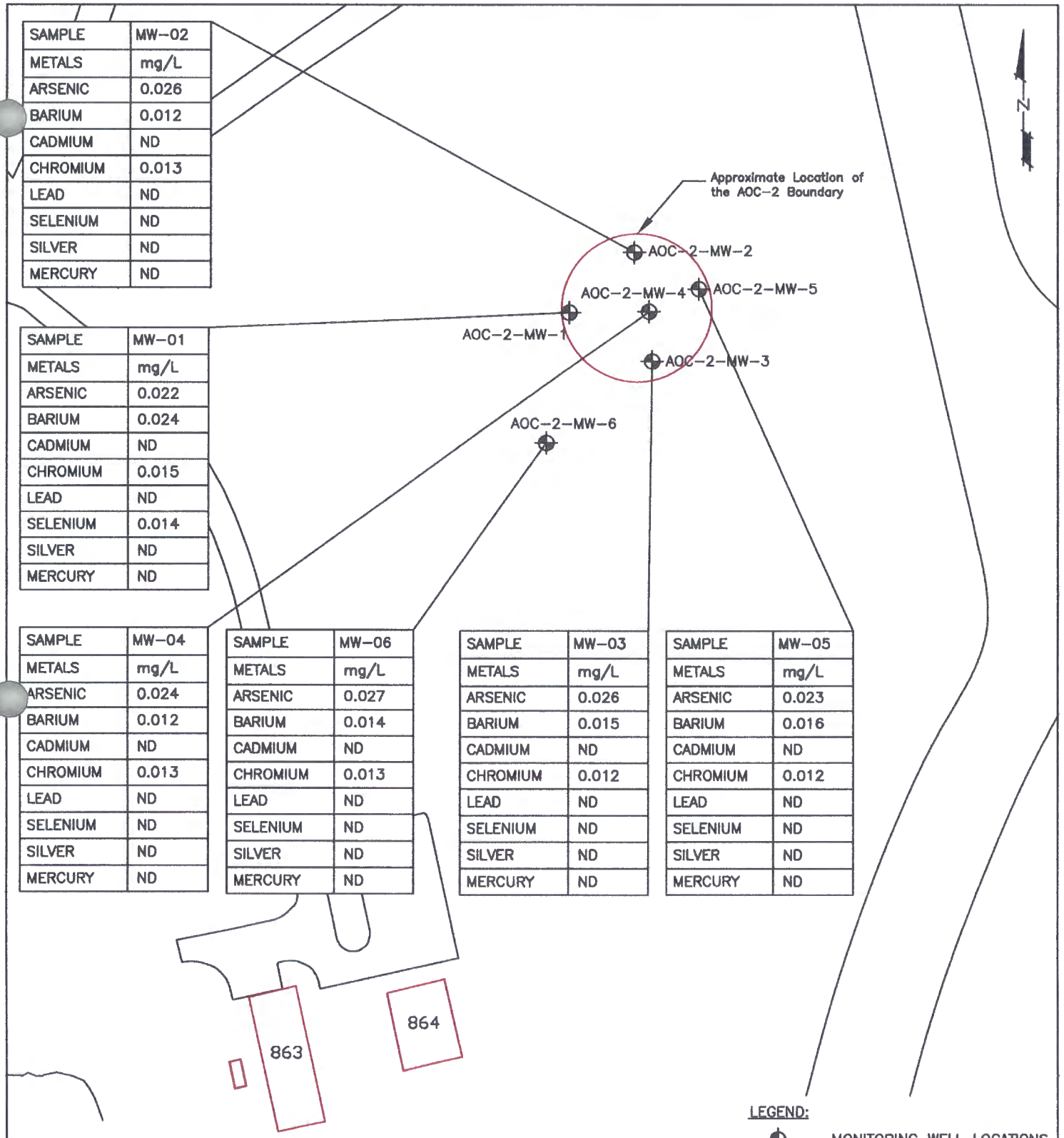
Holloman AFB, NM

Figure 23



SAMPLE	MW-02
METALS	mg/L
ARSENIC	0.026
BARIUM	0.012
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-01
METALS	mg/L
ARSENIC	0.022
BARIUM	0.024
CADMIUM	ND
CHROMIUM	0.015
LEAD	ND
SELENIUM	0.014
SILVER	ND
MERCURY	ND

SAMPLE	MW-04
METALS	mg/L
ARSENIC	0.024
BARIUM	0.012
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-06
METALS	mg/L
ARSENIC	0.027
BARIUM	0.014
CADMIUM	ND
CHROMIUM	0.013
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-03
METALS	mg/L
ARSENIC	0.026
BARIUM	0.015
CADMIUM	ND
CHROMIUM	0.012
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

SAMPLE	MW-05
METALS	mg/L
ARSENIC	0.023
BARIUM	0.016
CADMIUM	ND
CHROMIUM	0.012
LEAD	ND
SELENIUM	ND
SILVER	ND
MERCURY	ND

NOTE: This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated.

LEGEND:

⊕	MONITORING WELL LOCATIONS
▭	BUILDINGS
ND	NOT DETECTED
mg/L	MILLIGRAMS PER LITER

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AOC-2 RCRA-8 METALS
GROUNDWATER ANALYTICAL RESULTS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM/MRM
	1"=100'	3/5/07	DRAWING NO: Figure 24

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10 SWMUs
Holloman AFB, NM

Figure 24

Table 4. SWMU AOC-2 Comparison of Groundwater Analytical Results for Metals with Applicable Regulatory Standards

Analyte	Arsenic	Barium	Chromium	Selenium
Number of samples with detections	6	6	6	1
Range	0.022 to 0.027 mg/L	0.012 to 0.024 mg/L	0.012 to 0.015 mg/L	0.014 mg/L
High	MW-06	MW-01	MW-01	MW-01
Base-wide UTL	0.0723 mg/L	0.9293 mg/L	0.234 mg/L	0.0793 mg/L
NMWQCC	0.1 mg/L	1.0 mg/L	0.05 mg/L	0.05 mg/L
EPA MCLs	0.01 mg/L	2.0 mg/L	0.1 mg/L	0.05 mg/L
EPA Region 6 PRG	0.000045 mg/L	2.6 mg/L	0.11 mg/L	0.18 mg/L
Exceed Base-wide UTL	No	No	No	No
Exceed NMWQCC	No	No	No	No
Exceed MCL	Yes	No	No	No
Exceed Region 6 PRG	Yes	No	No	No

Nitrate/nitrite as nitrogen concentrations ranged from 4.2 to 12.8 mg/L in the groundwater samples. The nitrate/nitrite concentrations in wells MW-01 (11.4 mg/L) and MW-02 (12.8 mg/L) exceeded the NMWQCC standard and the MCL of 10 mg/L. There is no base-wide UTL for nitrate but data presented in the January 2004 *Long Term Groundwater Monitoring Program for ERA Sites: Groundwater Quality Evaluation, Holloman Air Force Base, New Mexico* (Tetra Tech FW, 2004) suggests a background nitrate concentration of 3.44 mg/L (data from well MW-BG-4 located upgradient of AOC 2). The relatively narrow extent of nitrate concentrations above the MCL would suggest there is no continuing source. The NMWQCC Regulations apply to groundwater with TDS concentrations less than or equal to 10,000 mg/L (20.6.2.3101 NMAC). TDS concentrations in samples from wells MW-01 through MW-06 were above 10,000 mg/L with concentrations ranging from a low of 15,400 mg/L at MW-05 to a high of 24,700 mg/L at MW-01. Each of the wells exceeds the allowable limits for TDS for the groundwater to be considered a viable drinking water source.

Basis for Determination

AOC-2 is located in an isolated area near Taxiway G with the nearest structure, an air traffic control tower, Building 864. Document searches, personnel interviews, and field investigation activities have revealed no indication of previous activity which would

create a need for further investigations. There was no indication of a release to the soil or groundwater pathways. Analytical results for soil samples collected do not exceed the NMED SSLs. Groundwater analytical results do not exceed NMWQCC standards except for nitrate with a maximum concentration of 12.8 mg/L. The RFI Report concluded that the presence of nitrate above the NMWQCC standard of 10 mg/L is not considered a risk due to the naturally high TDS concentrations and the lack of an ongoing discharge at the site. TDS concentrations in each of the monitoring wells exceed the NMWQCC standard of 10,000 mg/L which indicates the shallow groundwater at AOC-2 cannot be used for human consumption.

Based upon the RFI investigation conducted at SWMU AOC-2, this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use. **Figure 25** is a copy of the letter from NMED indicating the site is eligible for NFA status.

References

Bhate, 2005, Revised Final Facility Investigation Site AOC-2 Holloman AFB, New Mexico

Radian Corporation. December 1993. *Base-wide Background Study – Sewage Lagoons and Lakes Investigation*, Holloman Air Force Base, NM.

Tetra Tech FW. January 2004. Letter Report *Long Term Groundwater Monitoring Program for ERA Sites: Groundwater Quality Evaluation*, *Holloman Air Force Base, New Mexico*.

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
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BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

January 25, 2006

Ms. Debbie Hartell
Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

SUBJECT: APPROVAL OF RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION, RFI REPORT ON AOC-2
HOLLOMAN AIR FORCE BASE EPA ID# NM6572124422
HWB-HAFB-05-001

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has completed review of Holloman Air Force Bases's (the Permittee's) November 18, 2005 Revised Final RCRA Facility Investigation (RFI) Report for Area of Concern (AOC) 2. The Permittee submitted this revised RFI Report in response to NMED's Request for Supplemental Information (RSI), dated July 25, 2005. This RSI was issued after review of the initial RFI Report dated February 2005.

Based on NMED's review of this response, it has been determined that AOC-2 appears to be suitable for a No Further Action (NFA) petition. Therefore, the Permittee may propose this site for NFA based on NMED's NFA Criterion 5, which states, "*The AOC has been characterized and/or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.*"

If you have any questions regarding this matter, please contact David Strasser at (505) 222-9526.

Sincerely,

Cornelius Amindyas
HAFB Project Leader
Permits Management Program

CA/dca

cc: J. Bearzi, Chief, NMED, HWB
J. Kieling, NMED, HWB
W. Moats, NMED, HWB
D. Strasser, NMED, HWB
D. Tellez, EPA, Region 6 (6PD-F)
D. Holmquist, HAFB

File: HAFB 2006 and Reading

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AOC-2 January 25, 2006 NMED NFA Letter					Statement of Basis 2007 10 SWMUs Holloman AFB, NM
PROJECT NO.	SCALE AS SHOWN	DATE 3/5/07	DRAWN BY: cm	CREATED BY:	Figure 25
			DRAWING NO: Figure 25		

J.5 SWMU AOC-R JP-4 Fuel Line Spill Site (ERP Site SS-06)

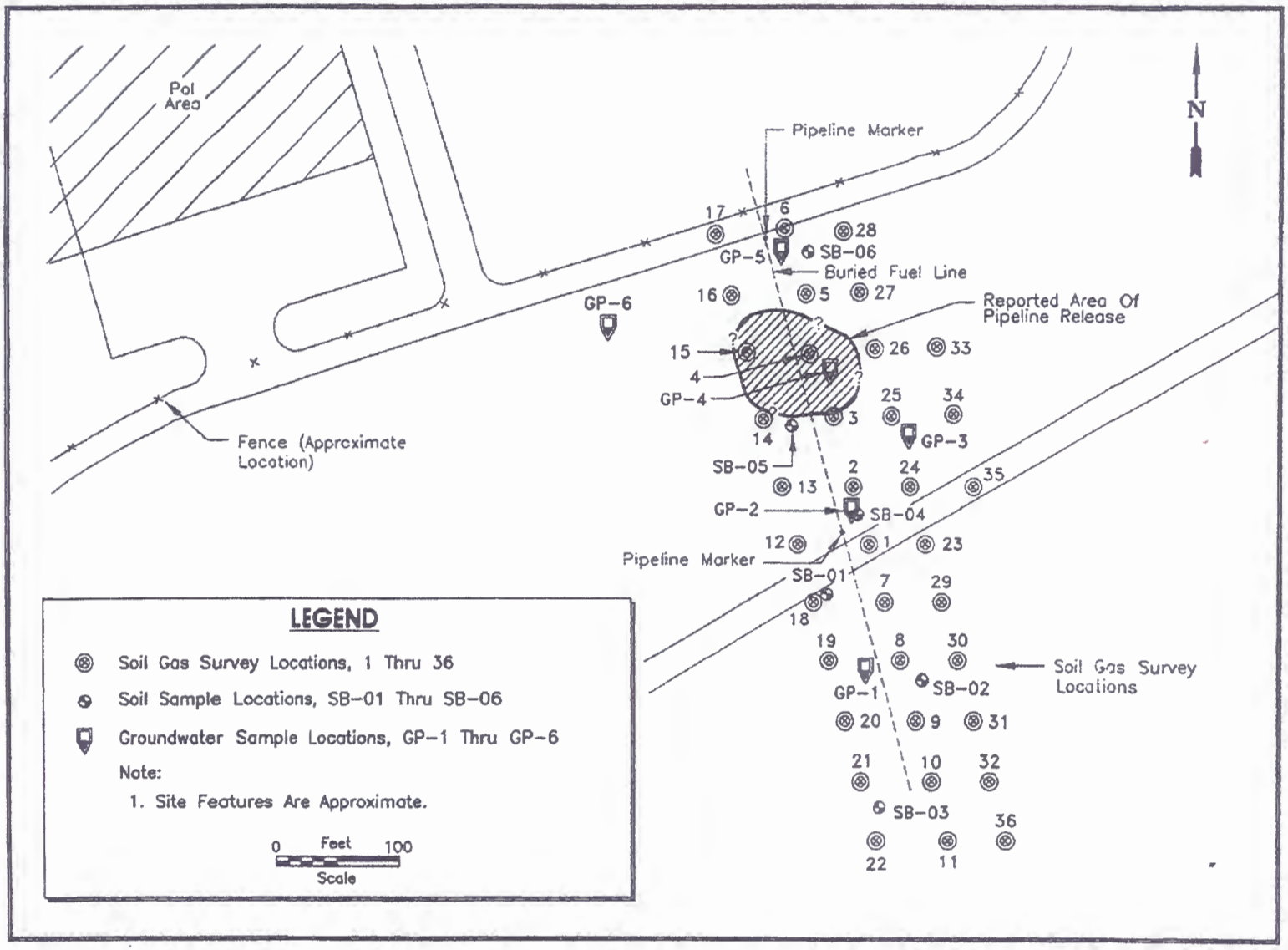
Location
SWMU AOC-R, JP-4 Fuel Spill Site (ERP Site SS-06) is located along the eastern boundary of the Base, in the Main Base Area near Building 1254 (**Figure 26**). The site is situated approximately 200 feet south of the Petroleum, Oil, and Lubricants (POL) storage area.

History
In 1979, a road grader accidentally hit and ruptured the JP-4 fuel line leading to the POL storage areas. Approximately 8,000 gallons of JP-4 spilled onto the ground before the release could be stopped. Cleanup operations were immediately performed and the majority of the jet fuel was reportedly recovered.

A records search for Site SS-06 was conducted by CH_2M Hill in 1982. The site was not considered to present a significant risk and further investigation of the site was not recommended at that time. A SI was conducted at SS-06 in March 1995 by Ebasco Services, Inc. The objective of the SI was to determine the presence or absence of contaminants in the soil and groundwater related to the 1979 JP-4 release from the pipeline.

The scope of work for the SS-06 SI included the following field activities:

- Thirty-six (36) soil-vapor points (SS-06-SG-1 through SS-06-SG-36) were installed in a rectangular pattern around the spill area. Soil-vapor samples were analyzed by an on-site mobile laboratory for benzene, toluene, ethylbenzene, and xylene (BTEX) constituents and TPH as JP-4.
- Six soil boring locations (SS-06-SB-01 through SS-06-SB-06) were drilled in a pattern that straddled the pipeline. Two samples, one from the groundwater interface and the other from the highest headspace VOC reading were selected for analysis. Soil samples were analyzed for TPH, VOCs, and Target Analyte List (TAL) metals. One sample for each boring was also selected for geotechnical analysis.
- Six temporary monitoring well points (GP-01 through GP-06) were installed during the SI. Groundwater samples were collected from wells GP-01, GP-02, and GP-03. Wells GP-04, GP-05, and GP-06 did not contain water and were not sampled. The three groundwater samples were analyzed for VOCs, dissolved TAL metals, and field parameters (pH, temperature, and specific conductance).



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SS-06 Site Map and Sample Locations

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 26

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 26

Evaluation of the Relevant Data

Results from the soil-vapor survey did not identify areas of potential soil and/or groundwater contamination. TPH was detected in only one sample (SG-36) with a concentration of 22 µg/L (micrograms per liter of air). Benzene and toluene concentrations ranged from not detected (<0.05 µg/L) to 0.14 µg/L and 1.20 µg/L, respectively at soil-vapor point SG-1. Total BTEX concentrations ranged from 0.24 µg/L (SG-31) to 2.05 µg/L (SG-1). However, total BTEX concentrations in the field blanks ranged from 0.45 µg/L to 1.13 µg/L. **Figure 27** is a site map summarizing the soil-vapor survey results.

No VOCs or TPH constituents were detected above the reporting limits in each of the 12 soil samples collected at SS-06, and all of the TAL metal concentrations were below their respective SSLs. No VOCs except acetone (17 µg/L) were detected in the three groundwater samples and duplicate samples analyzed. Zinc and lead were the only TAL metals detected above the Base-wide UTLs with concentrations of 3.4 mg/L and 0.063 mg/L, respectively. **Figures 28** and **29** summarize the results from soil and groundwater analyses respectively.

The subsurface conditions at SS-06 were defined by direct sampling and observation of the six soil borings. The lithology at SS-06 consists of fine grained materials, mostly inorganic silts and clayey sands with abundant gypsum crystals. The unconsolidated material varies from a light brown sand or clayey sand near the surface to a red silt with depth. Groundwater was encountered from 9 to 13 feet during borehole and direct push techonology (DPT) sampling but some wells at this depth did not produce enough water for sampling. A hard caliche layer is located above the groundwater table

Basis for Determination

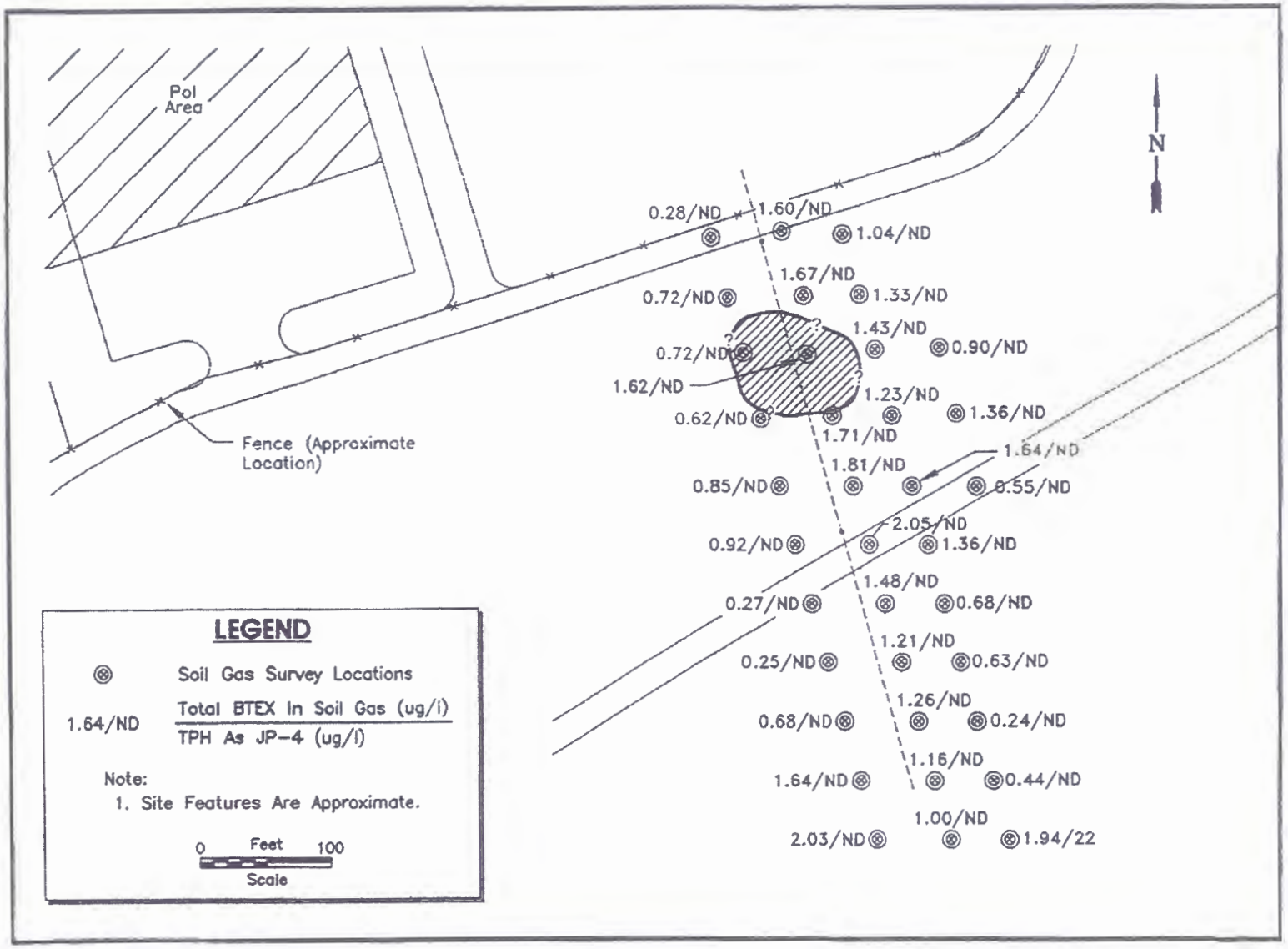
No petroleum related constituents were detected in the soil or groundwater samples collected during the investigation. The data indicates that the 1979 release did not impact the subsurface.

Based upon the investigation conducted at SWMU AOC-R (ERP Site SS-06), this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

References

CH_2M Hill. August 1983. *Installation Restoration Program Records Search for Holloman Air Force Base, New Mexico.*

Ebasco Services, Inc. (Foster Wheeler Environmental Corp), 1995. *Draft Final Site Investigation Report, Sites SS-06, SD-15, AOC-RR, and AOC-BBMS.* Holloman AFB, New Mexico.



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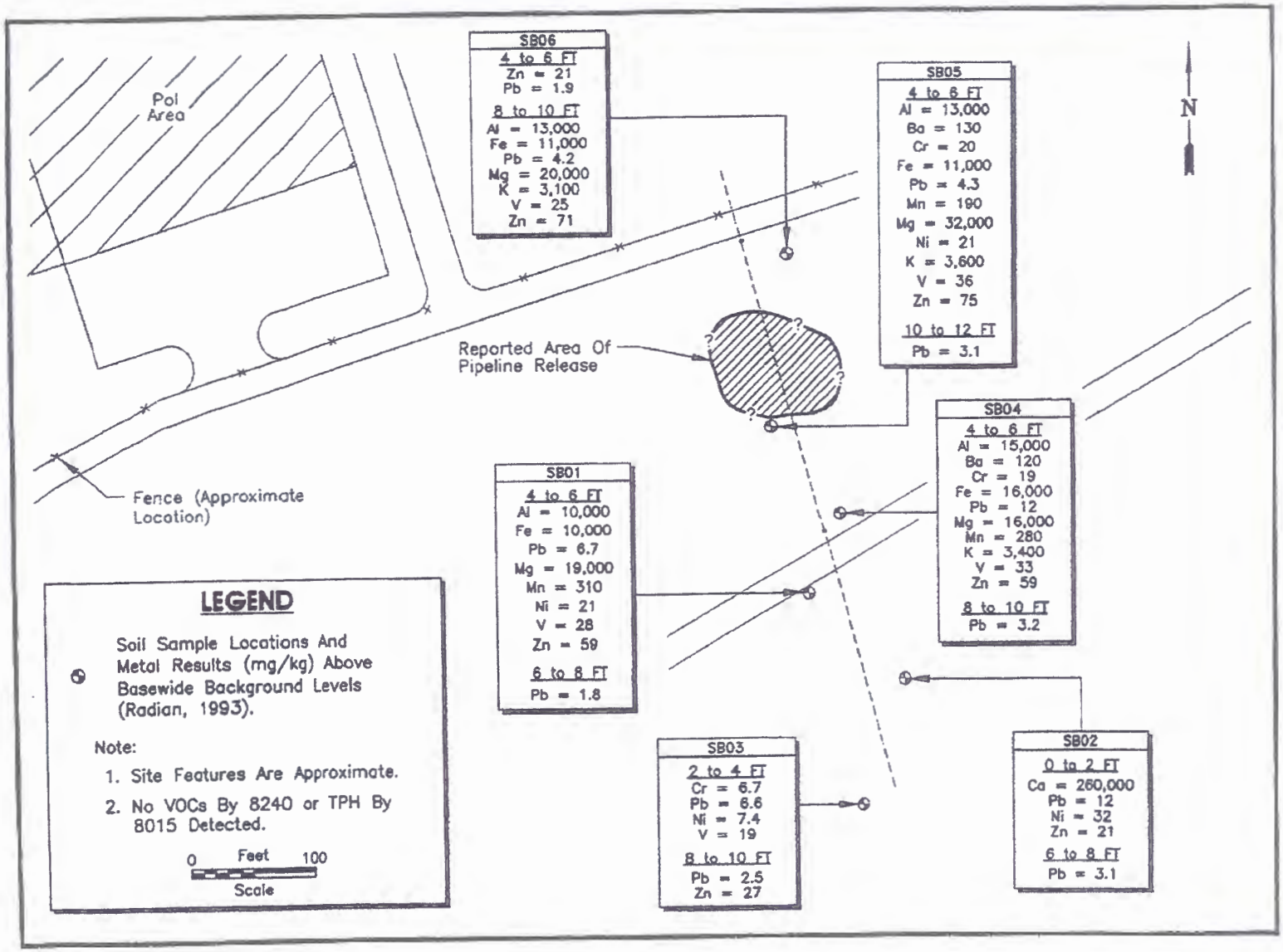
SS-06 Soil-Vapor Survey Results, March 1995

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 27

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 27



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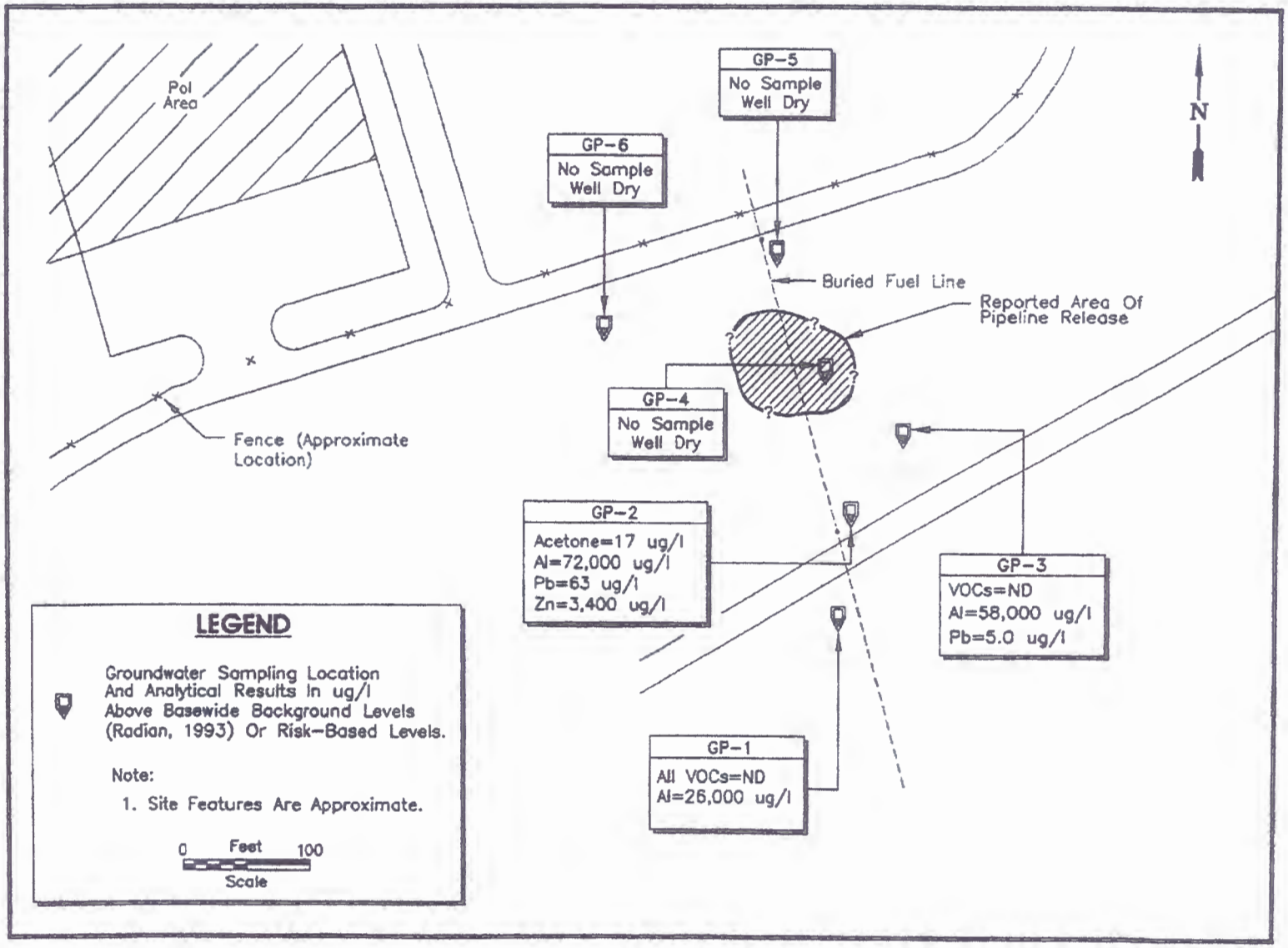
SS-06 Soil Analytical Results, March 1995

Source: FWENC, 1995

PROJECT NO.	SCALE	DATE	DRAWN BY
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 28

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 28



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SS-06 Groundwater Analytical Results, April 1995

Source: FWENC, 1995

PROJECT NO	SCALE	DATE	DRAWN BY:
	AS SHOWN	3/5/07	cm
			DRAWING NO Figure 29

Statement of Basis 2007
10 SWMUs
Holloman AFB, NM

Figure 29

J.6 SWMU AOC-V, Officer's Club (ERP Site SS-57)

Location

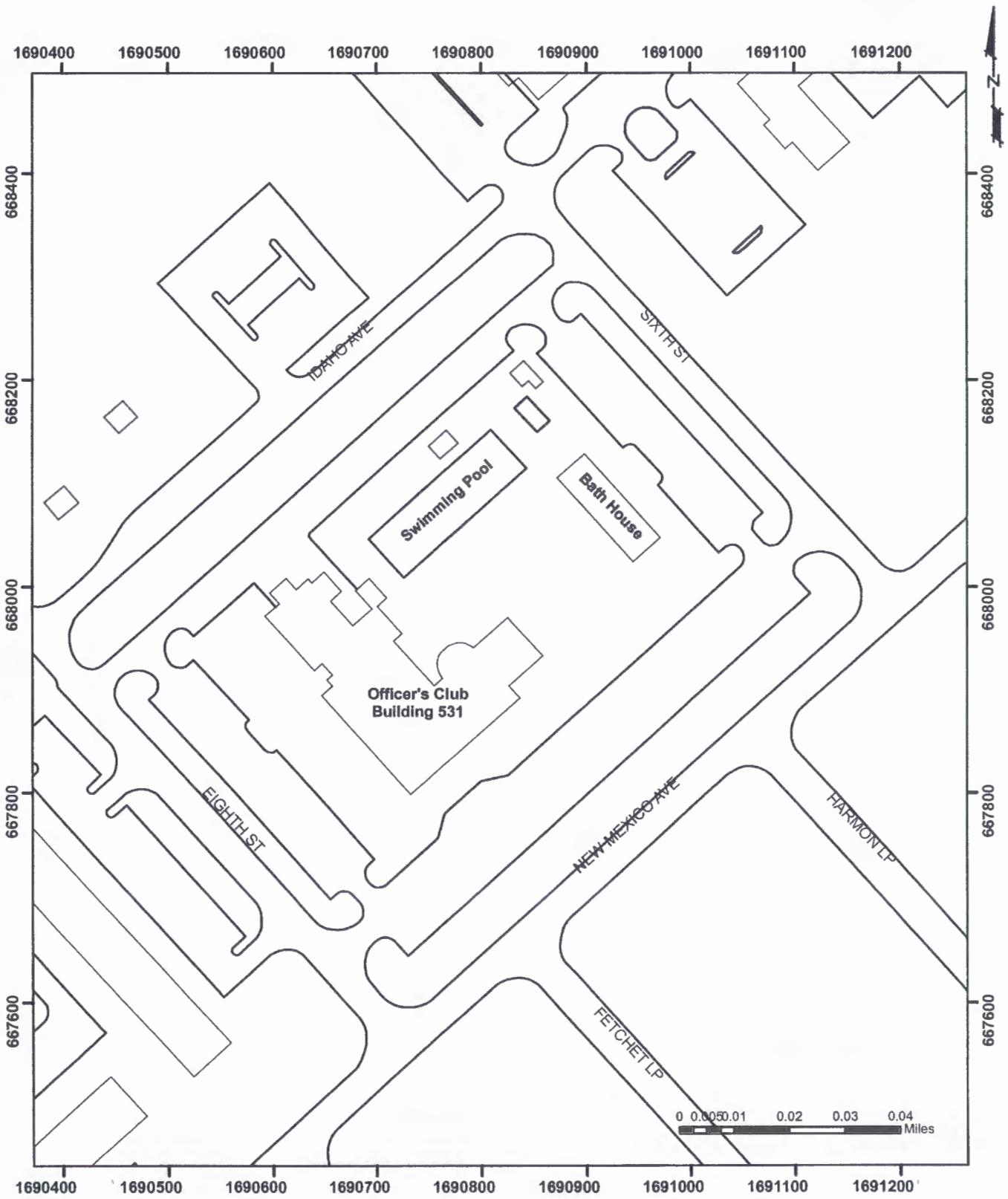
The Officer's Club (Building No. 531 ERP Site SS-57) is located at the corner of West 8th Street and West New Mexico Avenue, HAFB (**Figure 30**). The grounds around the Officer's Club are landscaped along the southwestern and western sides of the building while the northern and eastern portions of the site are paved with asphalt and concrete. The Officer's Club was designed in early 1957 and constructed as an addition to an existing dining hall. Remodeling and additions in 1985 and 1991 detected leaks from the swimming pool along with hydrogen sulfide odors. Site SS-57 was identified in the fall of 1991 when hydrogen sulfide odors were assumed to result from the natural anaerobic organic degradation of diesel fuel hydrocarbons which leaked from an UST prior to 1991. This UST was located near the southwestern corner of the Officer's Club and was removed prior to 1991.

History

From 1991 to 2004, the Officer's Club (Site SS-57) was the subject of a series of environmental investigations related to evaluating the soil and groundwater conditions to determine the cause of the hydrogen sulfide odors present in the Officer's Club. The first investigation was geotechnical and conducted in 1991. Two investigations were conducted in 1992 to determine the lateral and vertical extent of hydrocarbon contamination and the hydrogen sulfide gas. In 1996, an Air Sparging/Soil Vapor Extraction (AS/SVE) pilot test to determine the feasibility of using AS in conjunction with SVE to minimize the hydrogen sulfide generation (FWENC and Groundwater Technology, Inc., 1996). A system was installed in late 1996 and operated at the site until 2002. In 2002, a risk assessment and follow on investigation were conducted to better characterize the remaining hydrocarbons at the site. Additional characterization to document current subsurface conditions and support a risk assessment were performed in 2004. The results from the 2004 risk assessment and investigation demonstrated that conditions at the site were remediated below risk based standards. Soil boring and monitoring well locations for all the investigations are shown on **Figure 31.**

Evaluation of Relevant Information

A geotechnical investigation was performed in October 1991 to evaluate soil and groundwater conditions to determine the source of hydrogen sulfide odors emanating from the subsurface below the Officer's Club. Nine soil borings (B-1 to B-9) were advanced to depths ranging from approximately 1 to 29 feet below existing grade. Three monitoring wells (MW-5, MW-7, and MW-9) were installed at three of the nine borings. These borings and monitoring wells identified the presence of hydrocarbons (diesel fuel) in soil and groundwater samples collected from these wells.



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SS-57 Location Map

PROJECT NO	SCALE	DATE	DRAWN BY:
	Shown	2/20/07	cm
			DRAWING NO: Figure 30

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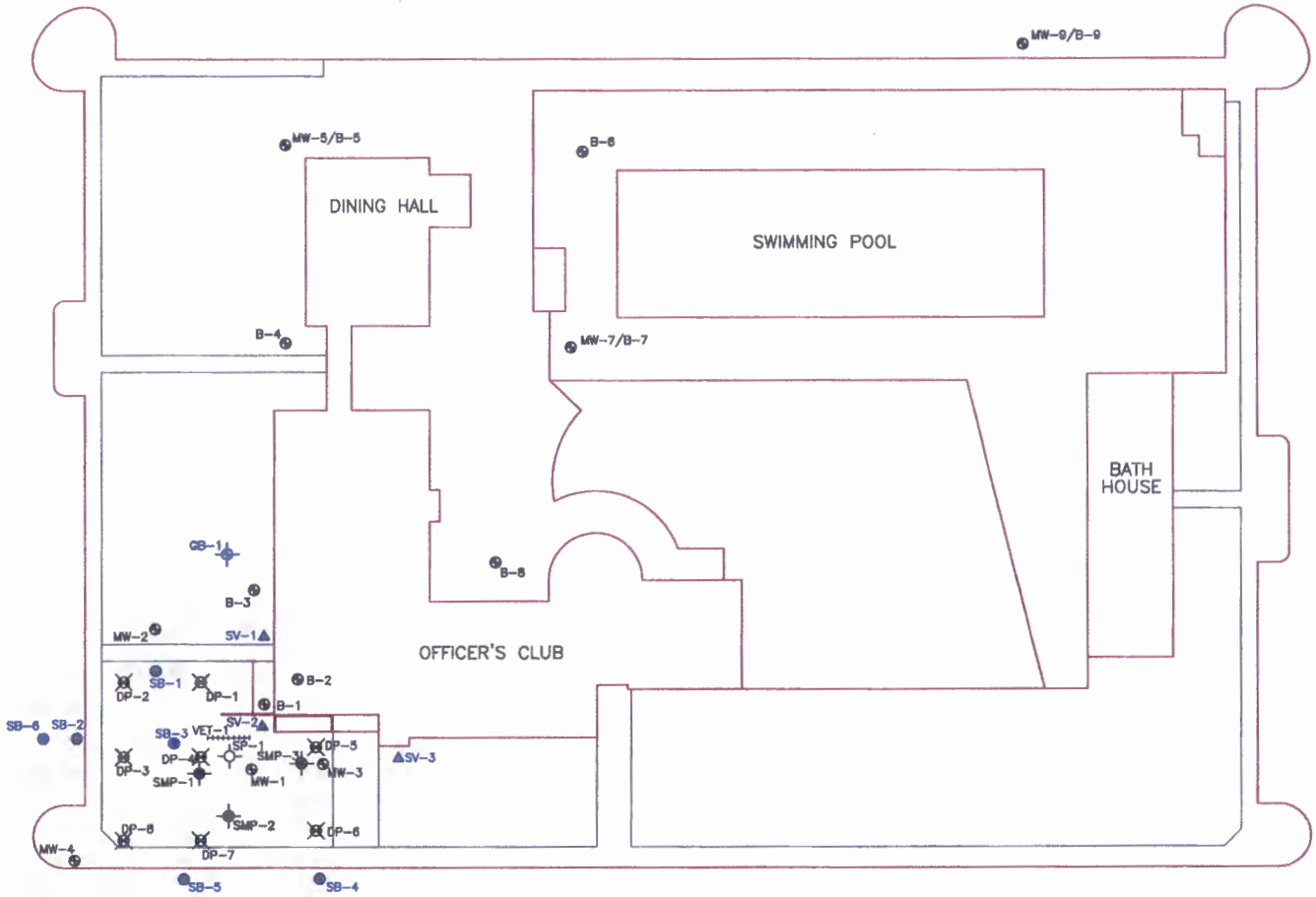
Figure 30



0' 20' 40' 80'

SCALE:

Drawing source: RAM GROUP INC.

LEGEND

- SOIL BORING
- SOIL VAPOR BORING
- GEOTECHNICAL BORING
- MW-2 MONITORING WELL
- B-2 BORING
- SPARGE POINT
- SPARGE MONITORING POINT
- DIRECT PUSH WELL
- VAPOR EXTRACTION TRENCH

NOTES:

Blue symbols indicate 2004 RFI

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Figure 31

SS-57 SAMPLE LOCATION MAP

PROJECT NO.	SCALE	DATE	DRAWN BY:	DRAWING NO:
	1"=40'	3/5/07	CM	Figure 31

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The subsurface investigation conducted in 1992 consisted of drilling four vertical borings (VB-01 to VB-04) and two angle borings (AB-01 and AB-02) near the southern corner of the Officer's Club. Soil samples were collected from the surface to 31 feet below ground surface. The objectives of this investigation were to better define the horizontal and vertical extent of the hydrocarbon contamination, determine the source of the offensive odor and to gather data necessary to enable the selection of a remedial action for the site. Twenty-five soil samples were collected and analyzed for TPH as diesel using Modified American Society for Testing and Materials (ASTM) Method D3328 and thirteen soil samples were analyzed for a bacteria enumeration study and a biological screening. The investigation concluded that the maximum TPH as diesel concentration was encountered at 18 feet bgs in boring AB-02 with a concentration of 12,000 micrograms per gram (µg/g). It appears from the 1992 investigation that most of the contamination exists primarily in the saturated zone. Diesel concentrations greater than 1,000 µg/g were detected in 14 of the 25 subsurface soil samples collected and analyzed. The report determined that the remedial alternative with the highest potential to reduce soil, water, and air contamination at the Officers Club was biosparging and SVE.

A pilot study was conducted at the site in 1996. Four existing wells, three new monitoring wells, and a triple nested sparge well were sampled for the study. The groundwater samples were analyzed for TPH as diesel by Modified ASTM Method D3328, dissolved iron by EPA Method 6010A, and sulfate by Modified EPA Method 375.4. An AS/SVE pilot test was conducted to determine the feasibility of using air sparging in conjunction with SVE to minimize the hydrogen sulfide generation.

TPH as diesel concentrations ranged from less than 10 mg/kg (MW-04) to 4,800 mg/kg (SMP-03) and were generally greatest at the 14 to 19-foot bgs sampling interval. Based on these results, it appeared that the TPH impact to the soil was limited to the southwest lawn of the Officer's Club and extended to a depth of 20 feet bgs. Groundwater samples were collected from seven monitoring wells (MW-1 through MW-4, and MW-5, MW-7, and MW-9) and the sparge well (SP-01) at all three screened intervals. TPH as diesel concentrations ranged from <100 to 9,700 µg/L with the highest concentration in MW-3. Based on the analytical results for the AS/SVE pilot test air samples, air emission rates of approximately 0.14 pound per hour TPH (as gasoline) was expected from the AS/SVE remediation system. The maximum hydrogen sulfide removal rate during the pilot tests was 0.0043 pounds per day (FWENC and GTI, 1996).

The AS/SVE system was installed in 1996 and operated until 1999. The AS/SVE system performance/long term monitoring was conducted from 1997 to 1999 at SS-57. System performance monitoring consisted of collecting subsurface soil samples at various locations for determining the effectiveness of the AS/SVE system.

In July 2002, 16 soil samples were collected from 8 soil borings (DP-1 to DP-8) at SS-57 to adequately characterize the nature and extent of contamination in the source area in order to conduct a human health risk assessment (HHRA) and ecological screening assessment (ESA). The assessments were performed to evaluate the magnitude and

probability of threats to public health and the environment posed by site-related chemicals in untreated soil and groundwater (Foster Wheeler, 2003). Groundwater samples were not collected during the 2002 event. A complete discussion of the HHRA and the ESA was presented in the *Phase I Human Health Risk Assessment and Ecological Screening-Level Assessment for SS-57- Officers Club, Holloman Air Force Base, New Mexico* (Foster Wheeler, 2003). This assessment, however, was determined to not be representative of subsurface conditions. Additional data collection was deemed necessary to completely evaluate the site for suitability for risk-based closure.

In 2004, RFI activities were conducted at SS-57. The purpose of this RFI was to collect soil, groundwater, and soil-vapor data to characterize the current site conditions for a comprehensive site-specific risk assessment. Data from this investigation was used to determine whether the residual soil and groundwater concentrations of petroleum hydrocarbons result in an unacceptable risk. Data collected before June 2002 was not considered representative of current site conditions due to the natural biodegradation of petroleum hydrocarbons. Additionally, data collected during the operation of the AS/SVE system would be biased to the low end and would not be representative of static or current conditions. Although the pre June 2002 data was not used quantitatively, it was used qualitatively to develop the data acquisition plan for the risk assessment.

In February 2004, five shallow soil borings (SB-01 to SB-05) were advanced in the vicinity of the source area at SS-57 (**Figure 32**). The soil borings were advanced using a DPT rig. Two soil samples were collected from each borehole at various intervals from 2 to 10 feet bgs. In addition, two soil samples were collected from each of the three dual completion soil-vapor borings (SV-1 to SV-3). In August 2004, one additional borehole (SB-6) was drilled 10 feet west of SB-2 to a depth of six feet bgs. Groundwater samples were collected from each of the five soil borings (SB-1 to SB-5) and monitoring wells MW-1 to MW-5 and MW-7. Six soil-vapor samples were collected from three dual completion soil-vapor borings (SV-1 to SV-3) that were advanced adjacent to the basement area at the Officer's Club. Soil-vapor samples were collected in order to assess the potential for exposure to VOCs via indoor air.

The soil samples collected during this RFI were analyzed for VOCs, SVOCs, TPH, and carbon fractions to identify chemicals of potential concern (COPCs). Based on the review of soil data collected in July 2002, February 2004, and August 2004 the following was observed:

- Twenty-seven subsurface soil samples were collected from borings DP-1 to DP-7, SB-1 to SB-6, and SV-1 to SV-3.
- Acetone, carbon disulfide, chrysene, ethylbenzene, diethylphthalate, fluoranthene, 2-methylnaphthalene, phenanthrene, TPH, hexane, indeno(1,2,3-c,d)pyrene, isopropylbenzene, xylenes, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, and pyrene were detected in the subsurface soil.

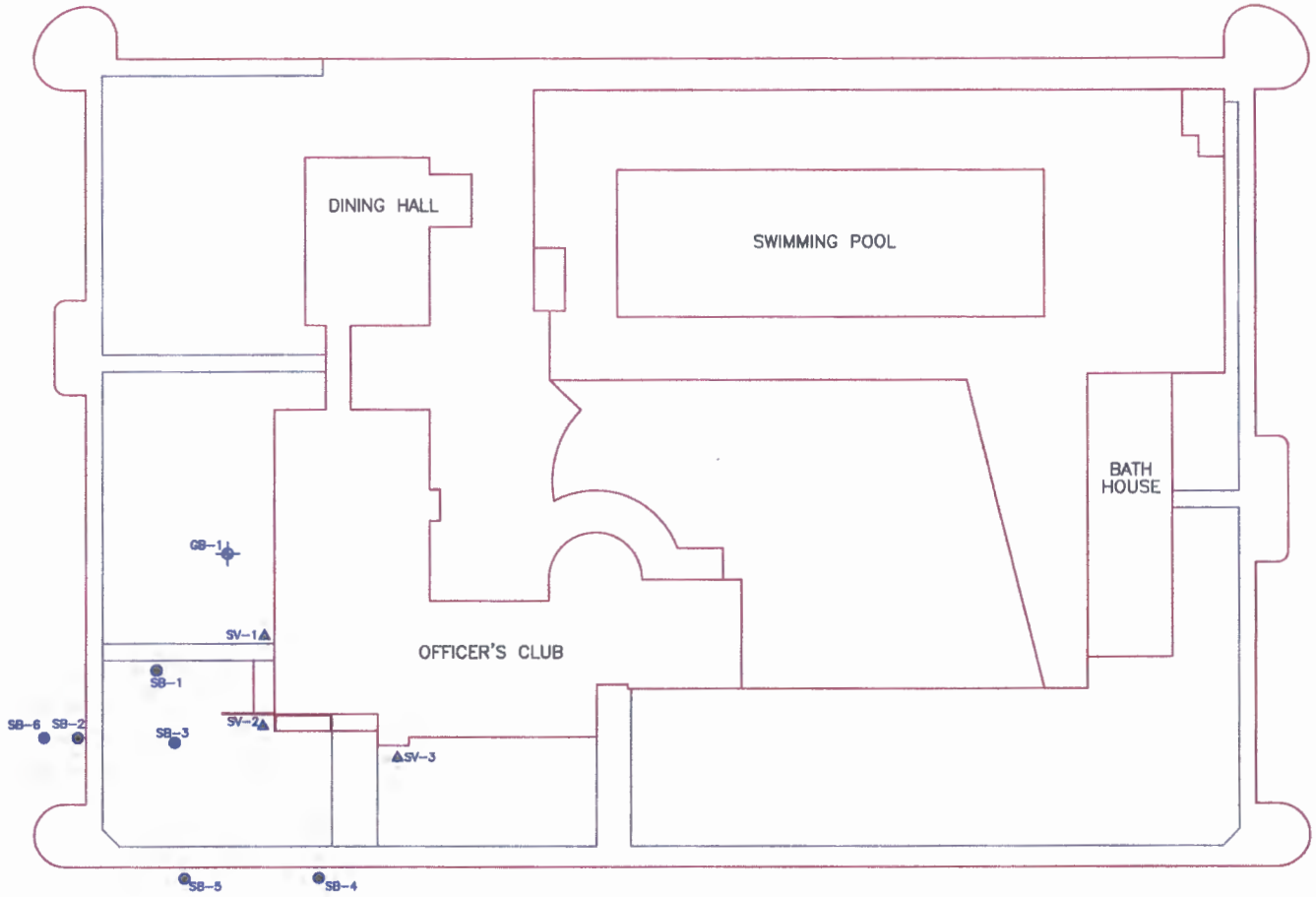
- The maximum depth of soil analysis was at 12 feet bgs for boring DP-4. TPH-DRO and TPH-ORO were detected.
- The maximum TPH-DRO concentration observed was 9,350,000 µg/kg at 6-8 feet bgs in SB-2.
- Except for TPH-DRO, none of the maximum soil concentrations exceeded the NMED SSLs.

The groundwater samples collected during this investigation were analyzed for TPH, VOCs, and TDS. Based on the review of groundwater data collected in February and August 2004 and February 2006, the following was observed:

- The 11 groundwater samples collected from borings SB-1 to SB-5, and monitoring wells MW-1 through MW-5, and MW-7 were analyzed for VOCs and TPH.
- TPH-DRO, acetone, benzene, 2-butanone, carbon disulfide, chloroform, cyclohexane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichlorodifluoromethane, ethylbenzene, isopropylbenzene, methylcyclohexane, trichloroethene, trichlorofluoromethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylenes were detected in the groundwater samples referenced above.
- The maximum TPH-DRO concentration of 3,600 µg/L was observed in the sample from SB-3.
- Except for TPH-DRO, none of the maximum groundwater concentrations exceeded the groundwater standards.
- The four groundwater samples collected from monitoring wells MW-1 to MW-4 in February 2006 were analyzed for TDS. TDS concentrations ranged from 2,040 mg/L (MW-1) to 4,590 mg/L (MW-4).
- Groundwater flow direction is southward at the site (**Figure 33**).

Soil-Vapor analytical results are summarized as follows:

- Six soil-vapor samples were collected from the soil-vapor borings (two each from locations SV-1 to SV-3).
- TPH-GRO, 2-propanol, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, acetone, chloroform, toluene, m/p-xylene, o-xylene, and naphthalene were detected in the soil-vapor samples.
- The maximum TPH-GRO concentration of 530 micrograms per cubic meter (µg/m^3) was observed in the sample from SV-2.
- A toluene concentration of 5.2 µg/m^3 was detected at 3 feet bgs at soil-vapor boring location SV-3.



0' 20' 40' 80'

SCALE:

Drawing source: RAM GROUP INC.

LEGEND

- SOIL BORING
- SOIL VAPOR BORING
- GEOTECHNICAL BORING

NOTES:

Blue symbols indicate 2004 RFI

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Figure 32

SS-57 RFI SOIL AND SOIL-VAPOR

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	1"=40'	3/5/07	cm	Figure 32

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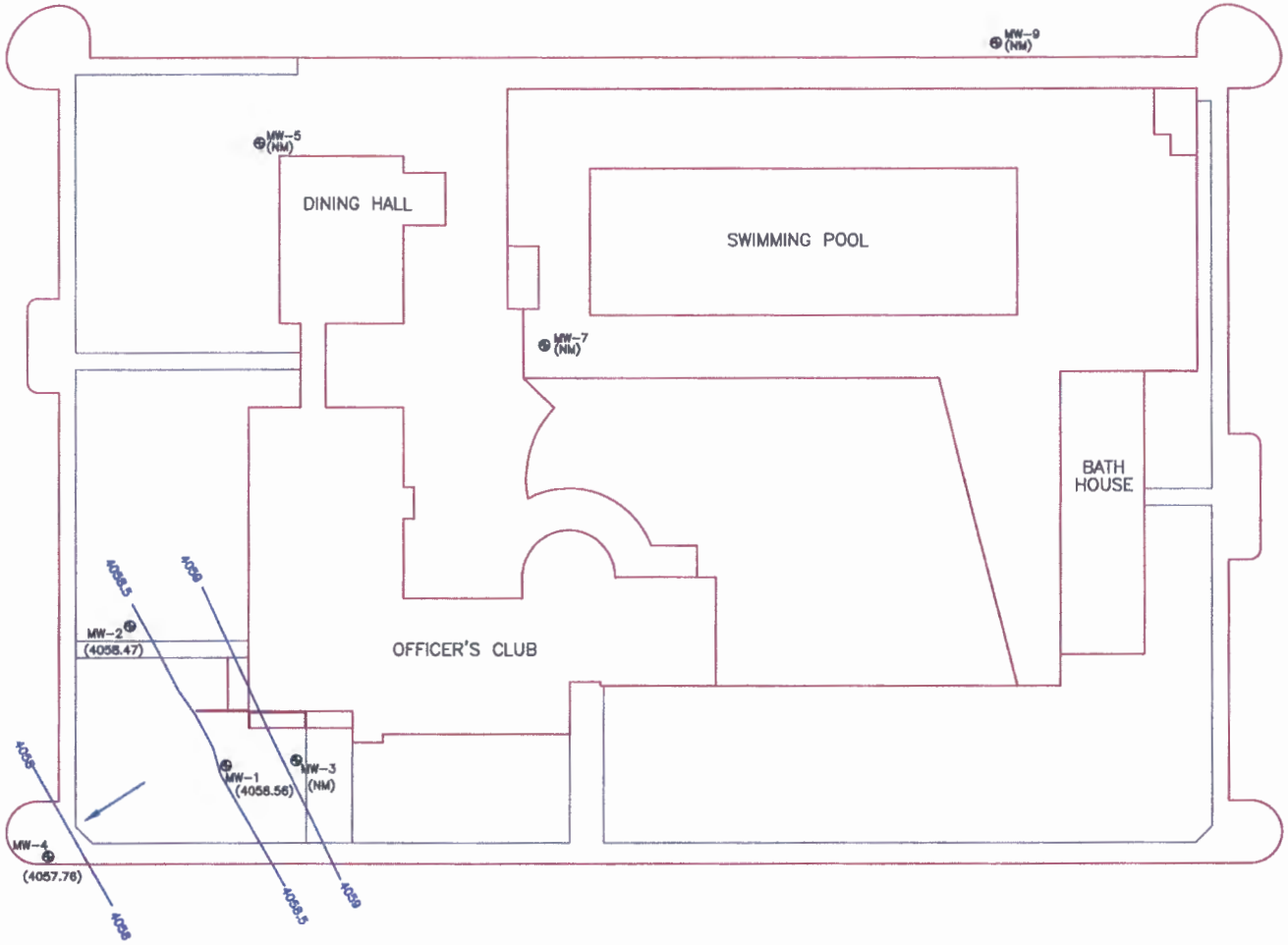

0' 20' 40' 80'

SCALE:

Drawing source: RAM GROUP INC.

LEGEND

MW-2	MONITORING WELL
	GROUNDWATER CONTOUR LINES (DASHED WHERE INFERRED)
4057.80	GROUNDWATER ELEVATION (OCTOBER 19, 2004)
	GROUNDWATER FLOW DIRECTION
NM	NOT MEASURED

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Figure 33

SS-57 GROUNDWATER CONTOUR MAP

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	1"=40'	3/5/07	CM	Figure 33

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An exposure model (EM) and a conceptual site model (CSM) were developed for the Officer's Club, Site SS-57. These models were used to determine potential present and future risks to commercial/industrial workers and construction workers. The analysis concluded that present concentrations of petroleum hydrocarbon constituents in soil, groundwater, and outdoor vapors do not pose a threat to commercial/industrial workers and construction workers. The analysis concluded that concentrations of petroleum hydrocarbon constituents in soil, groundwater, and outdoor vapors do not pose a threat to commercial/industrial workers and construction workers. Likewise, indoor inhalation risk was evaluated and the levels of petroleum hydrocarbon constituents at the site do not pose a risk by indoor inhalation.

Basis for Determination

The maximum soil, groundwater, and soil-vapor concentrations were compared with NMED SSLs, NMWQCC standards, and air inhalation target levels (New Mexico Underground Storage Tank Bureau, 2000), respectively. None of the concentrations exceeded the standards. However, NMED target levels do not account for indoor inhalation of vapors from soil or groundwater. Therefore, the Johnson & Ettinger (J&E) model was used to estimate soil and groundwater target levels protective of indoor inhalation. None of the site soil and groundwater maximum concentrations exceed these target levels. Speciation of TPH-DRO data into aromatic and aliphatic fractions was based on the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) approach. Site-Specific Target Levels (SSTLs) were calculated for each fraction for each complete routes of exposure (ROE). Neither TPH-DRO nor the carbon fractions exceeded the SSTLs for the ROEs.

Based upon the RFI investigation conducted at SWMU AOC-V, ERP Site SS-57, the Officer's Club, this site meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

The residual soil, groundwater, and soil-vapor concentrations are protective of current and reasonable future receptors at the site. These concentrations are anticipated to reduce in time due to natural attenuation processes further reducing the risk. **Figure 34** is a copy of the NMED October 13, 2006, letter to HAFB accepting the RFI report thus completing efforts at the site.

References

Bhate Environmental Associates, Inc. April 2006, *Final RCRA Facility Investigation Report, Officer's Club, Site SS-57, Holloman AFB, New Mexico.*

Bhate Environmental Associates, Inc. July 2005. *Risk-Based Evaluation Officer's Club, Site SS-57.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone (505) 428-2500
Fax (505) 428-2567
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 13, 2006

Ms. Debbie Hartell, Chief
Environmental Flight
49th CES/CEV
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL OF THE FINAL RCRA FACILITY INVESTIGATION REPORT, OFFICER'S CLUB, SITE SS-57 (AOC-V), APRIL 2006
HOLLOMAN AIR FORCE BASE, EPA ID #NM6572124422
HWB-HAFB-04-012

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's September 11, 2006 response to NMED's Notice of Deficiency dated August 30, 2006 for the Officer's Club Final RCRA Facility Investigation Report, dated April 2006. The Officer's Club, Site SS-57, is shown on Table A of the Facility Permit for Container Storage Unit as Area of Concern V (AOC-V). The referenced Report is hereby approved by the NMED.

If you have any questions regarding this matter, please contact David Strasser of my staff at (505) 222-9526.

Sincerely,

John E. Kieling
Manager
Permits Management Program

JEK:dlm

cc: J. Bearzi, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region 6 (6PD-F)
G. Fish, HAFB
File: HAFB 2006 and Reading
HAFB-04-012

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SS-57 October 13, 2006 NMED NFA Letter

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	AS SHOWN	3/5/07	DRAWING NO: Figure 34	

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Figure 34

References (continued)

Foster Wheeler Environmental Corporation and Groundwater Technology, Inc. October, 1996. *Draft Final Air Sparging and Soil Vapor Extraction Pilot Test Report for Officers Club Site SS-57, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Groundwater Technology, Inc. October 1996. *Air Sparging/Soil Vapor Extraction System, Site SS-57 Officer's Club, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Groundwater Technology. February 1997. *Final Remedial Action Plan, Officer's Club, Site SS-57, Holloman Air Force Base, New Mexico.*

Foster Wheeler. July 2002. *2001 Long-Term Groundwater Monitoring Report, Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation. April 2003. TERC No. DACW45-94-D-003, Delivery Order 37, Work Authorization Directive 1; AF Project No. KWRD20027018; Submittal of Letter Report for the Risk Assessments Completed for SS-57-Officer's Club, Holloman Air Force Base, New Mexico.

Foster Wheeler Environmental Corporation. April 2003. *Phase I Human Health Risk Assessment and Ecological Screening-Level Assessment for SS-57 - Officer's Club, Holloman Air Force Base, New Mexico.*

New Mexico Environment Department. February 2004. Appendix 4-B RCRA Facility Investigation (RFI) Outline, Holloman Air Force Base, Hazardous Waste Facility Permit No. NM6572124422.

New Mexico Environment Department. January 26, 2006. Notice of Deficiency Letter from James P. Bearzi (NMED, HWB) to Debbie Hartell, Chief of Environmental Flight, 49 CES/CEV, Holloman AFB, NM.

Radian Corporation. May 1993. *Final Sample and Quality Control Summary Report (SQCSR) Officers Club Soil Investigation, Holloman Air Force Base, New Mexico.*

Radian Corporation. December 1993. *Base-wide Background Study – Sewage Lagoons and Lakes Investigation, Holloman Air Force Base, New Mexico.*

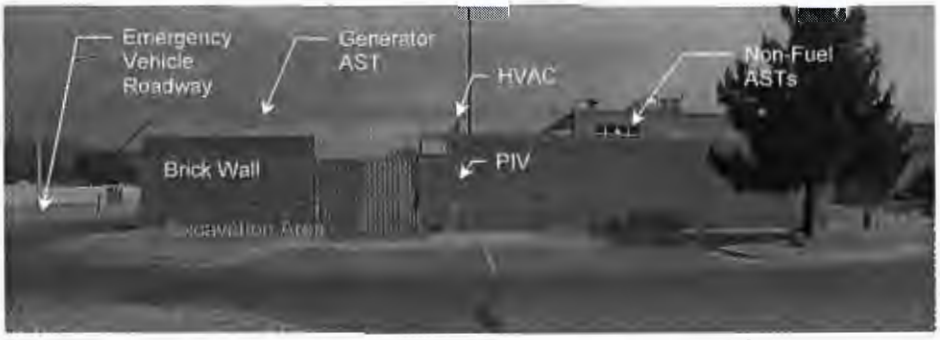
Sergent, Hauskins & Beckwith. December 1991. *Geotechnical Investigation, Officer's Club, Holloman Air Force Base, Alamogordo, New Mexico.*

Wilson & Company. June 1992. *Engineering Report for Study to Determine Source of Odor at the Officer's Club SVS 91-0206.*

J.7 SWMU AOC-S Hospital UST (ERP Site BHUST)

Location

AOC-S, the Base Hospital UST (ERP Site BHUST) is located at Building 15, the Base Hospital. The Base Hospital is located at the corner of 1st Street and Arnold Avenue on HAFB. The site is located on the north end of the hospital, adjacent to the west parking lot and the ambulance driveway. A brick and concrete block privacy wall which surrounds the hospital utility and mechanical equipment is evident from the front parking area (**Photograph 1**).



Photograph 1. Front View of Base Hospital UST Area

Photograph 2 provides detail for the interior of the walled area. Within this area there are the existing diesel fuel AST for the back-up generator, two medium size heating, ventilation, and air conditioning (HVAC) units, and two additional large ASTs to the right (south) with the contents unknown. To the immediate north, or left in **Photograph 1**, is the emergency roadway for the hospital emergency vehicles. In front of the privacy wall, and where the PCS was located, exists a concrete sidewalk.

Photograph 2. Inside View of Hospital Area

History

Records indicate the UST was installed at the Base Hospital in the early 1970s for storage of diesel fuel for the back-up generator. The UST was last used in early 1991 and abandoned by filling in place with sand on February 25, 1991. At that time, the UST abandonment was considered a clean closure. The site currently has a new

10,000-gallon AST within secondary containment, partially situated over the former UST location. A new 7-inch steel-reinforced concrete slab that serves as a loading and unloading area for hospital maintenance covers the remainder of the area.

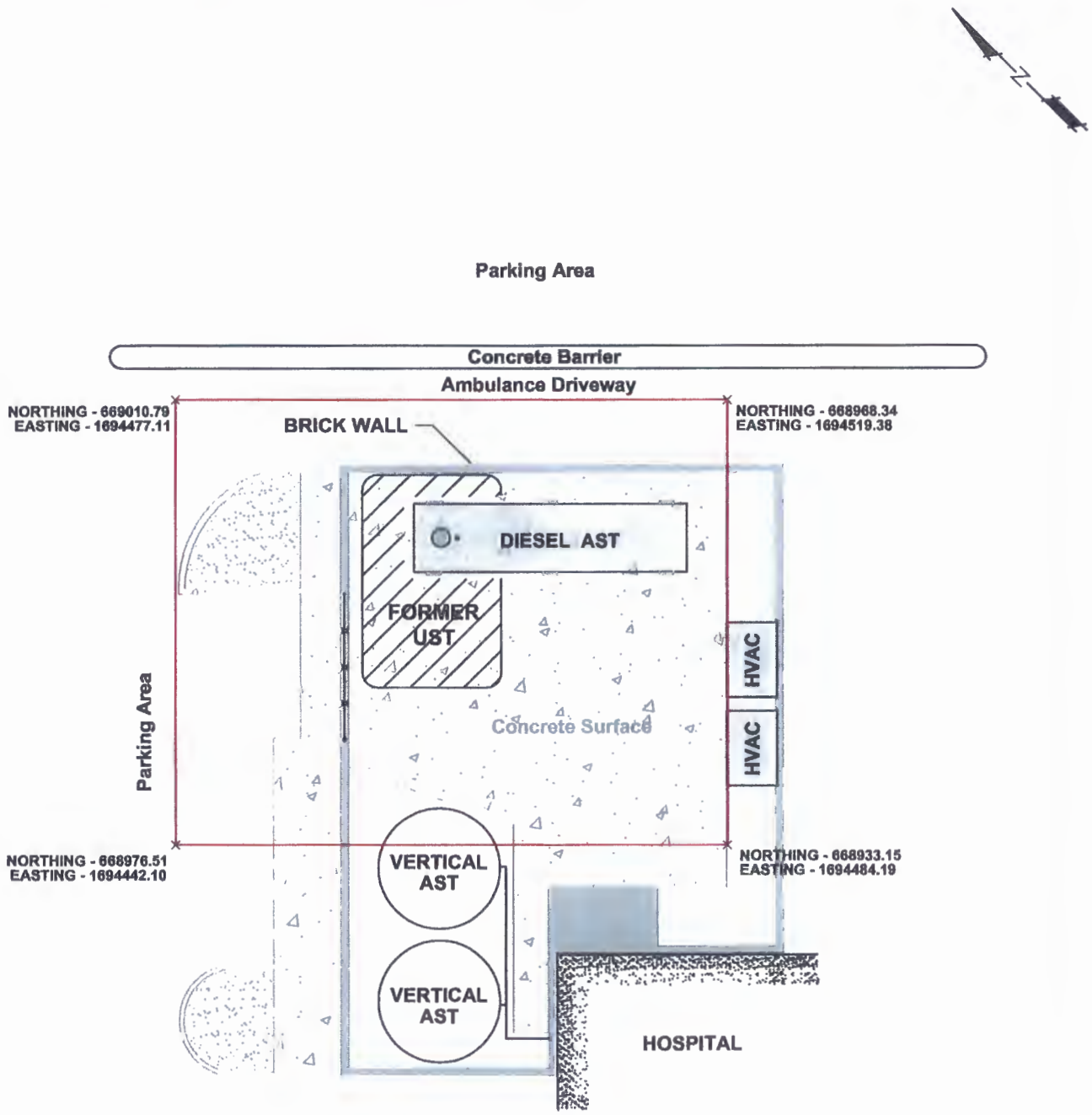
The UST was removed on July 28, 1999, and the AST was installed at the same location (**Figure 35**). During removal, contamination was identified in subsurface soils as discoloration and petroleum hydrocarbon odors, but no free product was observed on the groundwater. Two soil samples were collected from the sidewalls and bottom of the excavation in compliance with NMED UST regulations and analyzed for TPH-DRO, BTEX, and PCBs. The release was confirmed by laboratory analytical results on July 28, 1999. The NMED UST Bureau was subsequently notified of the release.

The cause of the release was undetermined. Interviews with employees indicated that the release may have been due to periodic overfilling. This was consistent with the location of the highest TPH concentrations, which appeared below the reported location of the fill port for the former UST. The release of diesel fuel was estimated at not to exceed 1,000 gallons. There was no sign of free-phase product on the water table and the extent of soil contamination suggested that the amount of released diesel fuel did not exceed the estimate.

Subsequent remediation conducted in 1999 and 2004 at the site involved the removal of PCS from the area beneath and just to the west of the AST following an additional soil sampling and investigation of the area.

Evaluation of Relevant Data

In October and November 1999, an investigation was performed at the BHUST site (Foster Wheeler, 1999). There were 16 locations with a total of 22 soil samples collected from the area during the investigation (**Figure 36**) and submitted to the laboratory for analysis. Locations were sampled at continuous 1-foot increments with intervals of the highest PID readings analyzed by a fixed-base laboratory. Analyzed samples were predominantly collected from mid depths ranging from 1 ft to a maximum depth of 10.5 ft bgs with a modal depth interval of 4 to 5 ft. Samples from three locations; SB-06, SB-13, and SB-14, demonstrated TPH levels above the NMED allowable limit of 880 mg/kg, at 1,890 mg/kg, 8,190 mg/kg, and 3,970 mg/kg, respectively. Samples from locations SB-11 and SB-07 also indicated TPH contamination, but concentrations in these samples were below 880 mg/kg. TPH concentrations were 60 mg/kg, 230 mg/kg, and 430 mg/kg, respectively. The remaining locations sampled had concentrations below the laboratory method detection limit and were reported as not-detected.



NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

NOTES

AST = Aboveground Storage Tank
UST = Underground Storage Tank
Site Boundary

The contents of the vertical ASTs are unknown.

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BASE HOSPITAL UST SITE LAYOUT

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	1"=20'	3/5/07	DRAWING NO: Figure 35

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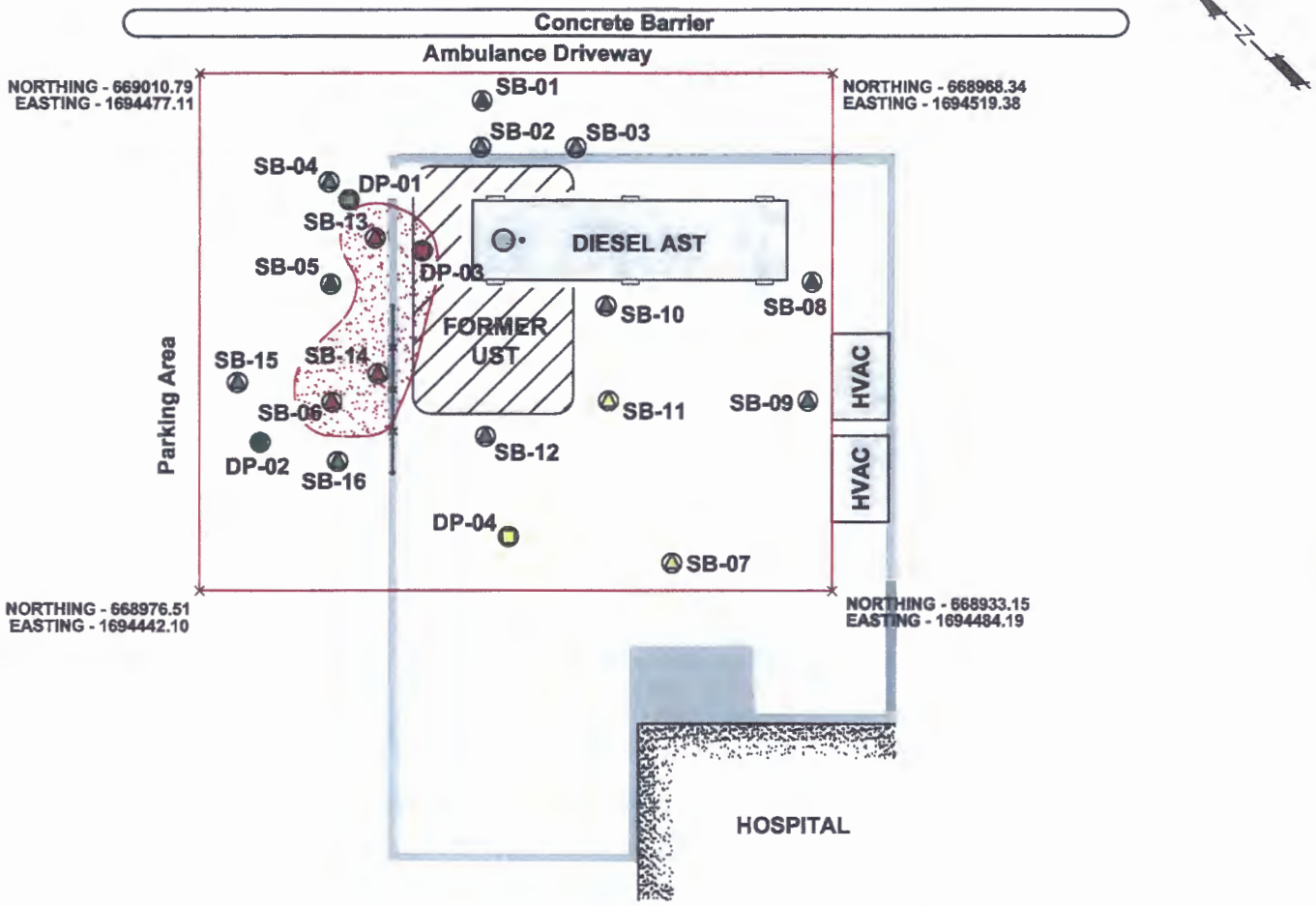
Figure 35



	Location	Depth (ft bgs)	TPH Concentration (mg/kg)
INITIAL SAMPLING	SB-01	4 - 5	ND
	SB-02	4 - 5	ND
	SB-03	4 - 5	ND
	SB-04	5 - 6	ND
	SB-05	3 - 4	ND
		5 - 6	ND
	SB-06	3 - 4	1,890
		5 - 6	ND
	SB-07	0 - 1	430
		4.5 - 5.5	ND
	SB-08	4 - 5	ND
	SB-09	4 - 5	ND
	SB-10	4 - 5	ND
		9 - 10	ND
	SB-11	7 - 8	230
		9 - 10	60
	SB-12	9.5 - 10.5	ND
	SB-13	4 - 5	8,190
		9 - 10	ND
	SB-14	7 - 8	3,970
	SB-15	6.5 - 7.5	ND
	SB-16	6.5 - 7.5	ND
SECOND SAMPLING	DP-01	2 - 3	ND
		5 - 6	ND
	DP-02	4 - 5	ND
		5 - 6	ND
	DP-03	3 - 4	2,080
		6 - 7	165
	DP-04	1 - 2	ND
		6 - 7	701

Exceeds NMED allowable limit of 880 mg/kg

LEGEND

SB-15 Soil Borehole Location (October 1999)

DP-01 Soil Borehole Location (April 2004)

Contaminated soils above NMED limit of 880 mg/kg

Site Boundary

TPH (mg/kg)

- ≥ 880 mg/kg
- > ND and < 880 mg/kg
- ND

NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

NOTES

ND	Not Detected
mg/kg	Milligrams per kilogram
NMED	New Mexico Environment Department
AST	Aboveground Storage Tank
UST	Underground Storage Tank
TPH	Total Petroleum Hydrocarbons
ft bgs	Feet below ground surface
DRO	Diesel-Range Organics

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BASE HOSPITAL UST
TPH–DRO PRE–EXCAVATION PCS DISTRIBUTION

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	1"=20'	3/5/07	DRAWING NO: Figure 36

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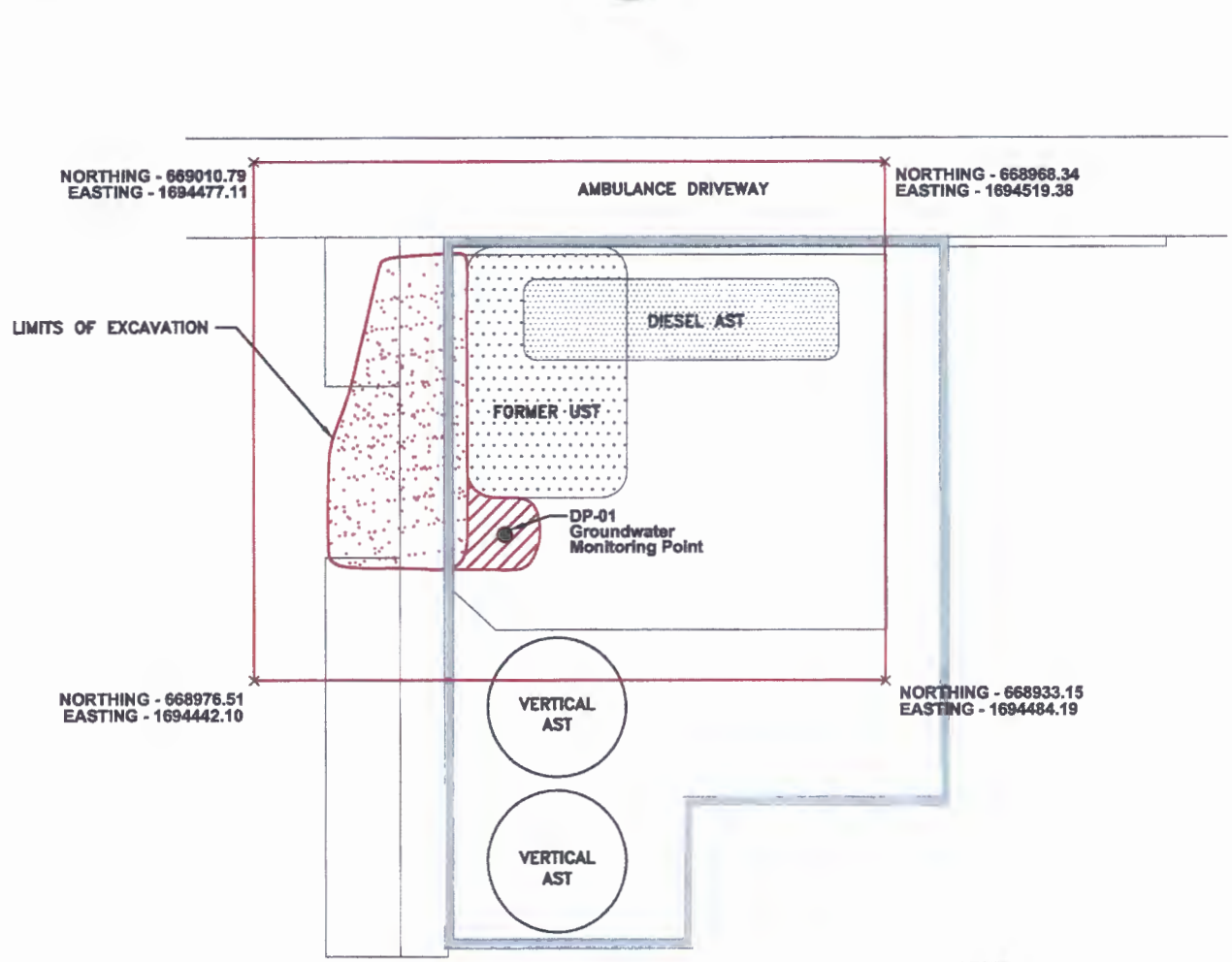
Figure 36

The area of concern for soil contamination above the NMED guidelines was limited to the proximity of SB-06, SB-13, and SB-14. These three locations are on the outside of the north wall. To further delineate the vertical and lateral boundaries of the contaminated soil, additional soil samples were collected in April 2004 and submitted to the laboratory for analysis. These are shown as locations DP-01 through DP-04 (**Figure 36**). Location DP-03 indicated TPH contamination at a concentration of 2,080 mg/kg from the 3 to 4 ft bgs interval. The soils sampled below this depth from 6 to 7 ft bgs demonstrated a sharp decline at this location having a TPH concentration of 165 mg/kg. The remaining samples collected did not indicate any petroleum hydrocarbon contamination above the NMED level for diesel. The sample from location DP-04, near the large non-fuel ASTs, had a TPH concentration of 701 mg/kg and is below the NMED allowable limit for TPH-DRO of 880 mg/kg.

VCM Excavation and Confirmation Sampling were performed in November 2004. Petroleum hydrocarbon contamination exceeding the NMED allowable limit for diesel of 880 mg/kg (*TPH Screening Guidelines*, June 24, 2003) at the site was limited to a small area west northwest of the former UST location. Initially, the estimated volume of PCS was approximately 300 cubic yards (cy). However, the actual total impacted yardage excavated was 90 cy. The limits of the final excavation are shown on **Figure 37**. Groundwater in the area of the excavation was 7.5 feet below land surface. Groundwater in the excavation did not have a sheen or other visible signs of contamination. The 90 cy of soil were transported to the FT-31 Landfarm for treatment.

To determine the effectiveness of the VCM, confirmation soil samples were collected from the sidewalls of the excavations on November 4, 2004. A total of 10 sidewall samples (9 samples plus 1 duplicate) were collected from the excavation at 7 feet bgs. The samples were analyzed for TPH as DRO, VOCs, and SVOCs. The results of the sidewall sampling for the BHUST excavation confirmation samples indicate that soils exceeding the NMED SSLs were removed from the excavation area. These analytical results are presented on **Figure 38**.

In May 2006, a temporary groundwater monitoring well (DP-01) was installed just outside of the downgradient corner of the UST excavation (**Figure 37**). A groundwater sample was collected from the site and analyzed for VOCs, SVOCs, TDS, TPH as DRO, and TAL Metals. The groundwater sample contained no VOCs, SVOCs, or TPH as DRO. The concentrations of metals detected in the sample and TDS did not exceed NMWQCC standards.



NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

LEGEND:

AREA OF EXCAVATION

AREA OVER-EXCAVATED DUE TO HIGH FIELD READINGS

AST ABOVEGROUND STORAGE TANK

UST UNDERGROUND STORAGE TANK

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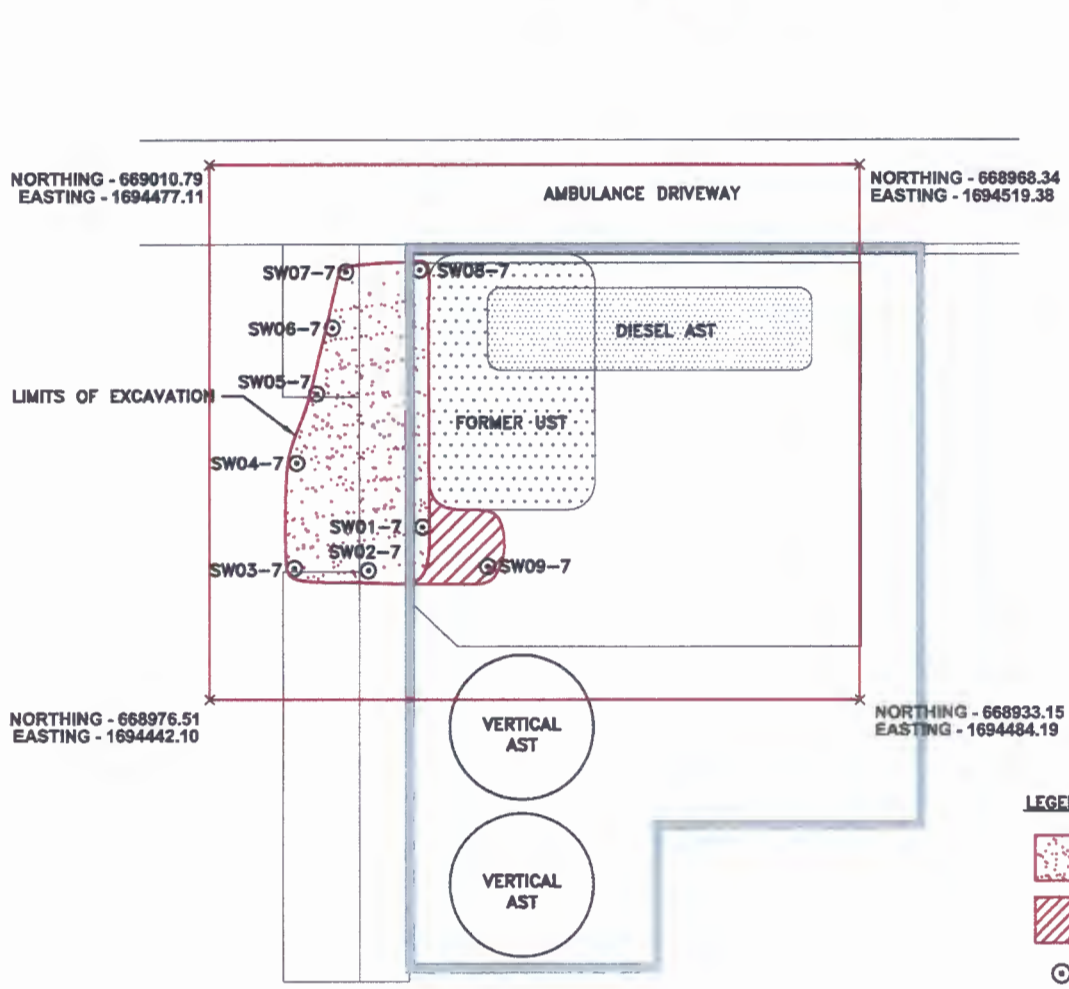
BASE HOSPITAL UST
PCS LIMITS OF EXCAVATION

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 37

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 37



Location	Depth (ft bgs)	TPH Concentration (mg/kg)
SW01-7	7	711
SW02-7	7	212
SW03-7	7	ND
SW04-7	7	23
	7	25
SW05-7	7	ND
SW06-7	7	ND
SW07-7	7	10
SW08-7	7	147
SW09-7	7	267

Exceeds NMED allowable limit of 880 mg/kg

LEGEND:

- AREA OF EXCAVATION
- AREA OVER-EXCAVATED DUE TO HIGH FIELD READINGS
- ⊙ SIDEWALL SAMPLE LOCATION
- ND NOT DETECTED
- mg/kg MILLIGRAMS PER KILOGRAM
- NMED NEW MEXICO ENVIRONMENT DEPARTMENT
- AST ABOVEGROUND STORAGE TANK
- UST UNDERGROUND STORAGE TANK
- TPH TOTAL PETROLEUM HYDROCARBONS
- ft bgs FEET BELOW GROUND SURFACE

NOTES:

This information is depicted to provide visual aid within the context of this report and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.

All coordinates are in NAD 1983 New Mexico Central State Plane

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BASE HOSPITAL UST
SIDEWALL CONFIRMATION SOIL SAMPLE LOCATIONS

PROJECT NO.	SCALE	DATE	DRAWN BY: CM
	1"=20'	3/5/07	DRAWING NO: Figure 38

STATEMENT OF BASIS 2007
10 SWMUs
HOLLOMAN AFB, NM

Figure 38

Basis for Determination

Based upon the sampling, laboratory analytical results, and documentation of excavation conducted, SWMU AOC-S (ERP Site HUST, the Hospital UST) meets the requirements for NFA based on Criterion #5: The SWMU/AOC has been characterized or remediated in accordance with current applicable State or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

PCS identified in the previous investigations at the BHUST site were excavated and transported to the FT-31 Landfarm for treatment. Soil samples collected from the sidewalls of the excavation (confirmation samples) provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs. Further, groundwater samples collected from the site do not indicate impact by petroleum hydrocarbon constituents.

The NMED has concurred with this request for NFA in correspondence to HAFB dated August 9, 2006 (**Figure 39**).

References

Bhate Environmental Associates, June 2004. *Base Hospital UST Voluntary Corrective Measures Report, Holloman AFB, New Mexico.*

Foster Wheeler Environmental Corporation, 1999. *On-Site Investigation Report for the Petroleum-Contaminated Soil Investigation at Building 15 (Base Hospital) Holloman Air Force Base, New Mexico.*

Foster Wheeler Environmental Corporation and Radian Corporation, June 1995. *Draft Final Phase II RCRA Facility Investigation Report, Table 1 Solid Waste Management Units*, Holloman Air Force Base, New Mexico, Volume I.

HAFB, July 2006, Letter from HAFB to NMED with groundwater characterization (DP-01) data from BHUST, Holloman AFB, NM.

New Mexico Water Quality Control Commission, September 15, 2002, *New Mexico Water Quality Control Commission Regulations* (20.6.2 NMAC).

NMED, 1995, *Guidance for Evaluation of NFA (No Further Action Proposals).*

NMED (New Mexico Environment Department), June 24, 2003, *New Mexico Environment Department TPH Screening Guidelines.*

Radian Corporation, 1993, *Phase I RCRA Facility Investigation.*

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
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BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 9, 2006

Ms. Debbie Hartell
Chief
Environmental Flight
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

SUBJECT: RESPONSE TO NOTICE OF DEFICIENCY: BASE HOSPITAL UST VOLUNTARY CORRECTIVE MEASURES COMPLETION REPORT, JULY 2005
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-05-010

Dear Ms. Hartell:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the **Permittee's**) July 19, 2006 response to NMED's January 12, 2006 Notice of Deficiency for the Base Hospital Underground Storage Tank (UST) Voluntary Corrective Measures Completion Report dated July 2005. The Base Hospital UST site is shown on Table A of the Facility Permit for Container Storage as AOC-S.

Following review of the subject report NMED has determined that this site appears to be suitable for a No Further Action (NFA) petition. Therefore, the Permittee may propose this site for NFA based on NMED's NFA Criterion 5: "The site has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use."

If you have any questions regarding this matter, please contact David Strasser at (505) 222-9526 or at the above address.

Sincerely,

Cornelius Amindyas
HAFB Project Leader
Permits Management Program

CA/dcs

cc: J. Bearzi, NMED HWB
J. Kieling, NMED HWB
D. Strasser, NMED HWB
D. Tellez, EPA Region VI (6PD-F)
D. Griffin, HAFB

File: Reading and HAFB, 2006

bhate associates ENGINEERING, SCIENCE AND CONSTRUCTION	**Base Hospital UST August 9, 2006 NMED NFA Letter**					Statement of Basis 2007 10 SWMUs Holloman AFB, NM
	PROJECT NO.	SCALE AS SHOWN	DATE 3/5/07	DRAWN BY: cm	CREATED BY:	Figure 39
				DRAWING NO: Figure 39		

APPENDIX 4-A

SUMMARY OF SOILID WASTE MANAGEMENT UNITS

TABLE A

The following is the Prioritized list of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Requiring Corrective Action

SERIAL NO.	SWMU	ERP SITE ID	UNIT NAME
1	4	SD-08	Building 131 Oil/Water Separator
2	8	N/A	Building 231 Oil/Water Separator
3	19	~~SS-59~~	Building 638 Oil/Water Separator
4	20	~~SS-59~~	Building 639 Oil/Water Separator
~~5~~	~~39~~	~~N/A~~ FT-31	~~Building 1092 Oil/Water Separator~~
6	82	~~SD-08~~ N/A	Building 131 Washrack
7	101	LF-10	Building 121 Landfill
8	104	LF-29	Former Army Landfill
9	105	LF-19	Golf Course Landfill
~~10~~	~~106~~	~~LF-01~~	~~Main Base Landfill~~
11	108	LF-23	MOBSS Landfill Disposal Trench
12	109	LF-10	Old Main Base Landfill
13	111	RW-42	Radioactive Waste Disposal Area
14	113A	OT-20	Sludge Disposal Trench near Lagoons
15	113B	DP-30/SD-33	Sludge Disposal Trenches Fire Training Area
16	114	OT-03	TEL Disposal Site
17	115	LF-22	Waste Area Landfill #1 PCB Disposal Area
18	116	LF-21	West Area Landfill #2
19	118	OT-16	Building 21 Pesticides Holding Tank
20	122	N/A	Building 702 Waste Oil Tank
21	123	N/A	Building 704 Waste Oil Tank
~~22~~	~~127~~	~~FT-31~~	~~Building 1092 Waste Oil Tank~~
23	130	SS-46	Taxiway 4 Tank 28 JP-4 Underground Waste Tank
24	132	OT-16	Building 21 Entomology Leachfield
~~25~~	~~135~~	~~FT-31~~	~~Building 1092 Oil/Water Separator Drainage Tank~~
26	136	N/A	Building 1119 Washrack Drainage Area
27	137	~~SS-38~~ OT-38	Building 1166 Test Track Drain Field
28	139	~~N/A~~ OT-37	Lake Holloman
29	140	N/A	Lake Stinky
30	141	SD-27	Pad 9 Drainage Pit
31	165	SS-39	Building 1176 Pond
32	166	SD-25	MOBSS Drainage Lagoon
~~33~~	~~170~~	~~FT-31~~	~~Fire Department Training Area 1~~
34	177	SS-39	Building 1176 Sumps
35	179	SS-39	Discharge Box
36	181	SS-39	Building 1176 Drainage Trough
37	183	N/A	Air Base Sewer System
38	197	OT-14	Former Entomology Shop

SERIAL NO.	SWMU/AOC	ERP SITE ID	UNIT NAME
39	229	SS-59	Test Cell Fuel Spill Site
40	AOC-1	DP-64	Chemical Agent Site
~~41~~	~~AOC-2~~	~~N/A~~ AOC-2	~~Sewage Drainage Pit NE of Building 864~~
42	AOC-3	DP-63	Ammunition Yard Disposal Pit
43	AOC-4	N/A	West POL Fuel Spill Site
44	AOC-1001	SS-61	Building 1001 Fuel Spill Site
45	AOC-FST837	N/A	Building 837 Fuel Spill Site
46	AOC-A	OT-16	Building 21 Pesticide Rinsewater Spill Area
47	AOC-B	~~N/A~~ SS-65	Building 807 Test Cell Surface Spill Area
48	AOC-C	~~N/A~~ SS-66	Building 835 Spills
49	AOC-E	~~N/A~~ SS-67	Buildings 903-909 Sand Blast Residues
~~50~~	~~AOC-F~~	~~N/A~~ SS-68	~~Asphalt Tank Spill Area~~
51	AOC-H	SS-18	Chromic Acid Spill Area
52	AOC-I	~~OT-37~~ SS-69	Fighter Wing Flight Line Spill
53	AOC-J	SS-13	Herbicide Sodium Arsenite Spill Area
54	AOC-K	SS-12	Northeast Fuel Line Spill #1
55	AOC-L	~~N/A~~ OT-37	Early Missile Test Site
56	AOC-M	~~N/A~~ RW-70	Building 18
57	AOC-N	SS-48	Building 137 Military Gas Tank Leak
58	AOC-O	OT-45	Building 296 Old AGE Refueling Station
59	AOC-P	OT-44	Building 301 Fuel Tank Leak
60	AOC-Q	SS-17	BX Gas Station Fuel Line Leaks
~~61~~	~~AOC-R~~	~~SS-06~~	~~JP-4 Fuel Line Spill Site~~
62	AOC-RD	DP-62	Rita's Draw Disposal Pit
~~63~~	~~AOC-S~~	~~N/A~~ BHUST	~~Leaking Underground Storage Tank~~
64	AOC-T	SS-05	POL Storage Tank Spill Sites 1 & 2
65	AOC-U	N/A	Lost River Basin
~~66~~	~~AOC-V~~	~~SS-57~~	~~Officer's Club~~
~~67~~	~~PRI-2~~	~~OT-35~~	~~PRI Bldg 1264 Solvent Burn Area~~
~~68~~	~~PRI-5~~	~~OT-35~~	~~Primate Research Lab Sewer Line~~
69	PRI-A	OT-35	Primate Research Lab Sewer Line
70	AOC-838	SS-72	TCE in Groundwater up-gradient of LF-21
71	AOC 1088	SS-73	TEC in Groundwater up-gradient of SS61

TOTAL OF CORRECTIVE ACTION SITES = ~~69~~ 59 [i.e., ~~39~~ 35 SWMUs + ~~30~~ 24 AOCs].