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

29 Sep 2015

DeAnna Rothhaupt
Chief Holloman AFB Environmental
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SEP 29 2015

NMED
Hazardous Waste Bureau

New Mexico Environment Department
Attn: Mr. John Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

Dear Mr. Kieling,

Holloman AFB is pleased to submit the Final Request for Class III Permit Modification for Correct Action Complete at Eighteen Corrective Action Sites for your review. The following sites are addressed in this submittal:

- SWMU 101 (LF-10)
- SWMU 109 (LF-10)
- SWMU 113A (OT-20)
- SWMU 114 (OT-03)
- SWMU 118 (OT-16)
- SWMU 132 (OT-16)
- AOC-A (OT-16)
- SWMU 183
- AOC-1 (DP-64)
- AOC-3 (DP-63)
- AOC-4
- AOC-C (SS-66)
- AOC-K (SS-12)
- AOC-M (RW-70)
- AOC-O (OT-45)
- AOC-U
- AOC-838 (SS-72)
- AOC-1088 (SS-73)

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 me (575) 572-3931 or by email at deanna.rothhaupt@holloman.af.mil.

Sincerely

DEANNA ROTHHAUPT, GS-12, DAFC

Attachment:
Final Request for Class III Permit Modification for Correct Action Complete at Eighteen Corrective Action Sites

cc:

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Final September 2015

REQUEST FOR CLASS III PERMIT MODIFICATION FOR CORRECTIVE ACTION COMPLETE AT EIGHTEEN CORRECTIVE ACTION SITES

HOLLOMAN AIR FORCE BASE
NEW MEXICO

RCRA PERMIT NO. NM6572124422

Prepared for:

49 CES/CEIE
Holloman Air Force Base
New Mexico

U.S. Army Corps of Engineers
Albuquerque, New Mexico

Prepared by:

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EXECUTIVE SUMMARY

The United States Air Force and Holloman Air Force Base (HAFB) (Permittee) is requesting a change in status from Corrective Action Required to Correction Action Complete (CAC) for eighteen (18) Corrective Action Sites, seven (7) Solid Waste Management Units (SWMUs) and eleven (11) Areas of Concern (AOCs) from the New Mexico Environment Department (NMED). This action is in accordance with New Mexico Hazardous Waste Act (Section 74-4-1 et seq., NMSA 1978, as amended, 1992) and the New Mexico Administrative Code. These eighteen (18) SWMUs and AOCs are listed on the Permittee's Hazardous Waste Facility Resource Conservation and Recovery Act (RCRA) Part B Permit (Permit No. NM6572124422) pursuant to 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulation (CFR) §270.42 (c) of the Hazardous and Solid Waste Amendments of 1984).

If the change in status is approved, the Permittee requests NMED to initiate a Class 3 Permit Modification to the HAFB RCRA Permit (Permit No. NM6572124422). The modification would modify Part 4 of the Permit to move these SWMUs and AOCs from Appendix 4-A Table A (List of Solid Waste Management Units / Areas of Concern) to Appendix 4-A Table B (List of SWMUs/AOCs with Corrective Action Complete Without Controls) or Table C (List of SWMUs/AOCs with Corrective Action Complete With Controls). The eighteen SWMUs and AOCs are shown in Attachment 1.

The proposed Class 3 Permit Modification Request (PMR) would grant CAC status with controls for two (2) SWMUs. The following SWMUs would move from Appendix 4-A Table A to Table C:

- SWMU 101 – Building 121 Landfill – ERP Site LF-10
- SWMU 109 – Old Main Base Landfill – ERP Site LF-10

The proposed Class 3 PMR would grant CAC without controls for five (5) SWMUs and eleven (11) AOCs. The following SWMUs and AOCs would move from Appendix 4-A Table A to Table B:

- SWMU 113A – Sludge Disposal Trenches near Lagoons – ERP Site OT-20
- SWMU 114– TEL Disposal Site – ERP Site OT-03
- SWMU 118 – Building 21 Pesticides Holding Tank – ERP Site OT-16
- SWMU 132– Building 21 Entomology Leachfield – ERP Site OT-16
- AOC-A – Building 21 Pesticide Rinse-water Spill Area – ERP Site OT-16
- SWMU 183– Base-Wide Sewer System- ERP Site N/A
- AOC-1– Chemical Agent Site – ERP Site DP-64
- AOC-3 – Ammunition Yard Disposal Pit – ERP Site DP-63
- AOC-4 – West POL Fuel Spill Site – ERP Site N/A
- AOC-C – Building 835 Spills – ERP Site SS-66
- AOC-K – Northeast Fuel Line Spill Site # 1 – ERP Site SS-12
- AOC-M – Building 18 Product Storage Tank – ERP Site RW-70
- AOC-O – Building 296 Old AGE Refueling Station – ERP Site OT-45
- AOC-U – Lost River Basin- ERP Site N/A
- AOC-838 – TCE Groundwater Contamination Upgradient of LF-21 - ERP Site SS-72
- AOC-1088 – TCE Groundwater Contamination Upgradient of SS-61- ERP Site SS-73

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LIST OF ACRONYMS

AMSL	Above Mean Sea Level
ACC	Air Combat Command
ACM	Accelerated Corrective Measures
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFMC	Air Force Materiel Command
AFSC	Air Force Systems Command
AGE	Aerospace Ground Equipment
AVGAS	Aviation Gasoline
AOC	Area of Concern
AST	Aboveground storage tank
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
BX	Base Exchange
CAC	Corrective Action Complete
CAIS	Chemical Agent Identification Sets
CCD	Customer Concept Document
CES	Civil Engineering Squadron
CFR	Code of Federal Regulation
CMS	Corrective Measures Study
COPC	Chemicals of Potential Concern
CY	Cubic Yards
DLADS	Defense Logistics Agency Disposition Services
DoD	Department of Defense
DPT	Direct Push Technology
DQOs	Data Quality Objectives
DRO	Diesel range organics
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FT	Feet
GPD	Gallons per day
GRO	Gasoline Range Organics
HAFB	Holloman Air Force Base
HSWA	Hazardous and Solid Waste Amendments
HWB	Hazardous Waste Bureau

I/I	Infiltration and Inflow
IRP	Installation Restoration Program
IWPMP	Industrial Wastewater Pretreatment Management Plan
JP-4	Jet Propulsion fuel, Type 4
LUC	Land Use Controls
LEL	Lower Explosive Limit
LTM	Long –Term Monitoring
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
µg/L	Micrograms per liter
MD	Munitions Debris
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
MOGAS	Motor Gasoline/ Mobility Gasoline
NPDES	National Pollution Discharge Elimination System
NFA	No Further Action
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NOA	Notice of Approval
NOD	Notice of Deficiency
NPS	National Park Service
OD	Open Detonation
OWS	Oil/Water Separator
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PCS	Petroleum-Contaminated Soils
PDI	Pre-Design Investigation
PMR	Permit Modification Request
POL	Petroleum, Oil, and Lubricants
RA	Risk Assessment
RCWM	Recovered Chemical Warfare Material
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan

SAR	SWMU Assessment Report
SI	Site Investigation
SQ FT	Square feet
SSFR	Site Specific Final Report
SSLs	Site Screening Levels
SVOCs	Semi Volatile Organic Compounds
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TDS	Total Dissolved Solids
TEL	Tetraethyl Lead
TCE	Trichloroethene
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
UXO	Unexploded Ordnance
VCM	Voluntary Corrective Measures
VOCs	Volatile Organic Compounds
WAP	Waste Analysis Plan
WOT	Waste Oil Tank
WSMR	White Sands Missile Range
WSNM	White Sands National Monument
WWTP	Waste Water Treatment Plant

1. INTRODUCTION

The United States Air Force and Holloman Air Force Base (HAFB) (Permittee) is requesting a change in status from Corrective Action Required to Correction Action Complete (CAC) for eighteen (18) Corrective Action Sites, seven (7) Solid Waste Management Units (SWMUs) and eleven (11) Areas of Concern (AOCs) from the New Mexico Environment Department (NMED). This action is in accordance with New Mexico Hazardous Waste Act (Section 74-4-1 et seq., NMSA 1978, as amended, 1992) and the New Mexico Administrative Code. These eighteen (18) SWMUs and AOCs are listed on the Permittee's Hazardous Waste Facility Resource Conservation and Recovery Act (RCRA) Part B Permit (Permit No. NM6572124422) pursuant to 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulation (CFR) §270.42 (c) of the Hazardous and Solid Waste Amendments of 1984).

If the change in status is approved, the Permittee requests NMED to initiate a Class 3 Permit Modification to the HAFB RCRA Permit (Permit No. NM6572124422). The modification would modify Part 4 of the Permit to move these SWMUs and AOCs from Appendix 4-A Table A (List of Solid Waste Management Units / Areas of Concern) to Appendix 4-A Table B (List of SWMUs/AOCs with Corrective Action Complete Without Controls) or Table C (List of SWMUs/AOCs with Corrective Action Complete With Controls). The eighteen SWMUs and AOCs are shown in Attachment 1.

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- SWMU 114– TEL Disposal Site – ERP Site OT-03
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- SWMU 132– Building 21 Entomology Leachfield – ERP Site OT-16
- AOC-A – Building 21 Pesticide Rinse-water Spill Area – ERP Site OT-16
- SWMU 183– Base-Wide Sewer System – ERP Site N/A
- AOC-1– Chemical Agent Site – ERP Site DP-64
- AOC-3 – Ammunition Yard Disposal Pit – ERP Site DP-63
- AOC-4 – West POL Fuel Spill Site – ERP Site N/A
- AOC-C – Building 835 Spills – ERP Site SS-66
- AOC-K – Northeast Fuel Line Spill Site # 1 – ERP Site SS-12
- AOC-M – Building 18 Product Storage Tank – ERP Site RW-70
- AOC-O – Building 296 Old AGE Refueling Station – ERP Site OT-45
- AOC-U – Lost River Basin – ERP Site N/A
- AOC-838 – TCE Groundwater Contamination Upgradient of LF-21 – ERP Site SS-72
- AOC-1088 – TCE Groundwater Contamination Upgradient of SS-61 – ERP Site SS-73

The following sites addressed have been under investigation since the early 1990s. Based on the information collected, NMED has concurred that the sites qualify for CAC (formerly classified by the NMED as No Further Action [NFA]). CAC requests were based on one of the five NMED CAC criteria presented below (Appendix 4-B of HAFB's RCRA Permit No NM6572124422):

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

CAC 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 hazardous substances controlled under the Comprehensive Environmental Response, Compensation, and Liability Act.

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

CAC 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).

CAC Criterion 5: The SWMU/AOC has been characterized or remediated in accordance with the 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 CAC criteria for the subject sites are identified in the Table A.1.1 below:

A.1.1 Corrective Action Complete Criteria

SWMU/AOC No.	ERP SITE	UNIT NAME	CAC Criterion No.
101	LF-10	Building 121 Landfill	3
109	LF-10	Old Main Base Landfill	3
113A	OT-20	Sludge Disposal Trenches near Lagoons	5
114	OT-03	TEL Disposal Site	5
118	OT-16	Building 21 Pesticides Holding Tank	5
132	OT-16	Building 21 Entomology Leachfield	5
AOC-A	OT-16	Building 21 Pesticide Rinse-water Spill Area	5
183	N/A	Base-Wide Sewer System	5
AOC-1	DP-64	Chemical Agent Site	5
AOC-3	DP-63	Ammunition Yard Disposal Pit	5
AOC-4	N/A	West POL Fuel Spill Site	5
AOC-C	SS-66	Building 835 Spills	5
AOC-K	SS-12	Northeast Fuel Line Spill Site # 1	5
AOC-M	RW-70	Building 18 Product Storage Tank	5
AOC-O	OT-45	Building 296 Old AGE Refueling Station	5
AOC-U	N/A	Lost River Basin	5
AOC-838	SS-72	TCE Groundwater Contamination Upgradient of LF-21	5
AOC-1088	SS-73	TCE Groundwater Contamination Upgradient of SS-61	5

A. FACILITY DESCRIPTION

A.1 HISTORY AND GEOGRAPHY

HAFB was initiated as a temporary facility developed to provide gunnery and bomber training to aircrews during the Second World War. The Base mission was altered in the postwar years to the development of pilotless aircraft, guided missiles, and associated equipment. In the late 1950s the base was transferred to the Air Force Systems Command (AFSC) and designated as the Air Force Missile Development Center. On January 1, 1971, the base mission expanded to provide lead-in fighter training for the 479th Tactical Training Wing and its components.

Currently, HAFB hosts the Air Combat Command (ACC) 49th Wing, which includes pilot training, mobility support, and combat support operations. The primary Air Force Materiel Command (AFMC) component located at HAFB is the 46th Test Group, which is responsible for evaluation of propulsion and navigational systems for aircraft, space vehicles, and missiles. A variety of tenant organizations are assigned to HAFB, including the 4th Space Control Squadron and Detachment 4, and the 50th Weather Squadron.

Holloman Air Force Base (HAFB) is located on approximately 60,000 acres of land in Otero County, south-central New Mexico, of which 52,411 acres are deemed main base Holloman and 7,332 acres are deemed Boles Wells Water System Annex. HAFB lands are situated in the northern Chihuahuan Desert in the region known as the Tularosa Basin that is bounded on the east and west by the Sacramento and San Andres Mountains respectively. HAFB is located adjacent to White Sands Missile Range (WSMR), and White Sands National Monument (WSNM) is located west of the Base. Regional water supplies are derived from Bonito Lake, located approximately 60 miles north of the base and the Boles, Douglas, and San Andres Well Fields located 14 miles to the southeast.

The nearest population center to HAFB is the city of Alamogordo, located approximately seven miles to the east. Regional metropolitan centers include El Paso, Texas, located 75 miles south-southwest, Las Cruces, New Mexico, located 65 miles to the southwest, and Albuquerque, New Mexico, located 210 miles north of the facility. The primary transportation route for the facility is Highway 70 that traverses the southern boundary of the base in a northeasterly direction. The general location of HAFB is depicted in Figure A-1.1.

A.2 GROUNDWATER QUALITY

The following information was obtained from the *Draft Final Remedial Investigation (RI) Report, Investigation, Study and Recommendation for 29 Waste Sites, Holloman Air Force Base, New Mexico* (Radian, 1992) unless otherwise cited.

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, 1992). The majority (over 70 %) of the ERP Sites / SWMUs / 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 HAFB 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 (therefore, the naturally occurring groundwater at HAFB is not regulated). 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 based on the USEPA document, *Final Draft Guidelines for Groundwater Classification Under USEPA Groundwater Protection Strategy* (USEPA, 1986). Because the Tularos is a closed basin, its groundwater does not discharge or connect to any adjacent aquifer of a higher class.

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 main portion of the Base (Radian, 1992).

A.3 CORRECTIVE ACTION SITES

Following is a brief description of each of the eighteen (18) ERP sites that have been proposed for change to CAC status and to be moved from Appendix 4-A Table A to Table B or Table C of the HAFB RCRA hazardous waste operating permit. With the exception of SWMU-183, the location of each ERP site is illustrated on Figure A-1.2. SWMU-183 represents the entire HAFB sewer system and is therefore displayed separately on Figure C-5.1.

A.3.1 SWMU Nos. 101 and 109 - ERP Site LF-10

ERP Site LF-10 consists of two SWMUs, SWMU 101 is listed as Building 121 Landfill and SWMU 109 is listed as the Old Main Base Landfill. LF-10 is located in the southeastern portion of HAFB, southeast of the airfield, and bounded to the west by Creosote Avenue and to the north by Arkansas Avenue (Figure A-1.2). LF-10 consists of approximately 20 acres and currently encompasses the area adjacent to the present day Civil Engineer Squadron (CES) 316 complex (Building 121) and Building 120. A chain-link fence surrounds the CES complex and supporting lots and access is restricted to authorized personnel.

LF-10 was utilized from 1942 to 1958. During the time of use, the landfill received domestic solid waste from the base and possibly drums containing waste oils and solvents. A Base incinerator was located in the area and the ash from its operation was also buried in the landfill. Landfilling was conducted using trench and fill methods. The landfill was closed in 1958 in accordance with U.S. Department of Defense (DoD) protocols in place at that time (Tetra Tech, 2011). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site LF-10 see subsection C.1 of this report.

A.3.2 SWMU NO. 113A – ERP Site OT-20

SWMU 113A is listed as the Sludge Disposal Trenches near Lagoons, also identified as ERP Site OT-20 is located east of Pond B at the former sewage lagoons in the south central area of the Base (Figure A-1.2). Historically, all settled solids from the grit chamber located at the head of the Sewage Treatment Lagoons have been buried in the three excavation pits just east of Pond B. This practice occurred from the beginning of Base operations to approximately 1984. The pits were reported to be approximately 2 ft wide, 5 ft deep, and 40 ft long and were dug perpendicular to the pond (Bhate, 2008b). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site OT-20 see subsection C.2 of this report.

A.3.3 SWMU NO. 114 – ERP Site OT-03

SWMU 114 is listed as the Tetraethyl Lead (TEL) Disposal Site, also identified as ERP Site OT-03. OT-03 is located outside the east perimeter fence of the POL storage facilities (Figure A-1.2). It was utilized to dispose of the bottom sludge from fuel storage tanks containing aviation gasoline (AVGAS) and jet propulsion fuel, Type 4 (JP-4). From 1955 to 1975 wastes such as leaded fuel tank sludge, rusted metal fragments, rags, and hand tools were disposed of in the pit. The approximate extent of the disposal pit was thought to be 10 ft by 6 ft with an assumed depth of 4 ft (Bhate, 2008d). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site OT-03 see subsection C.3 of this report.

A.3.4 SWMU NOS. 118, 132, AND AOC A – ERP Site OT-16

SWMU Nos. 118, 132, and AOC-A, listed as Building 21 Pesticides Holding Tank, Building 21 Entomology Leachfield, and Building 21 Pesticide Rinse-water Spill Area, respectively, are collectively identified as ERP Site OT-16. OT-16 encompasses former Building 21, a former truck wash rack (SWMU 79), a former pesticide plastic holding tank (SWMU 118), a former disposal pit (SWMU 132), and a former transformer pad (AOC-A) in the southeastern portion of the Main Base Area (Figure A-1.2). The site covered at area approximately 0.5 acres in size. All concrete structures and features were demolished and removed in the mid-1990s. The site currently consists of a gravel and concrete-paved vehicle parking area and a large concrete pad used by the Honor Guard for training (Tetra Tech, 2010). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site OT-16 see subsection C.4 of this report.

A.3.5 SWMU NO. 183 – ERP Site N/A

SWMU 183 is listed as Base-Wide Sewer System. It is a subsurface system constructed in 1947 that comprises of approximately 165,000 linear ft. of sewer line and serves both residential and industrial facilities at HAFB. The Base-Wide Sewer System is divided into 10 Sub-Basins and includes 715 active and 131 inactive (abandoned and removed) manholes, 24 lift (pumping) stations, and hundreds of variably contributing sources distributed throughout the entire base. Waste sources contributing to potential contamination of SWMU-183 include direct discharges from industrial/operational facilities and domestic structures, as well as pass-through discharges from additional waste management systems such as OWSs. The sewer collects and transports both sanitary and mixed industrial wastes to the HAFB's wastewater treatment plant (WWTP), which was constructed in 1996, and is located at the central-southern boundary of HAFB. A site location map of the Base-Wide Sewer System is provided in Figure C-5.1.

Historically industrial operation facilities at HAFB produced a variety of wastes, many of which were discharged into the sewer system. In a prior industrial wastewater pretreatment study the industrial wastewater discharges of 55 industrial facilities were assessed to identify chemicals of potential concern (COPCs) that were being introduced into the wastewater system. The study identified a number of COPCs, including:

• Volatile organic compounds (VOCs);
• Semi-volatile organic compounds (SVOCs);
• Petroleum, oil, and lubricants (POLs);
• Oil and grease;
• Heavy metals;
• Herbicides and pesticides;
• Total Suspended Solids (TSS);
• Biological oxygen demand (BOD) and chemical oxygen demand (COD);
• Phosphates, sulfides, and chlorides; and
• Possible radionuclides (Carbon-14, tritium, iodine 125, radium 226, and radium 228).

Common waste generating activities had included vehicle, aircraft, equipment, and floor washing; x-ray and photo processing; and fuel canister rinsing. Many of these facilities used pretreatment features such as grit chambers, grease traps, holding ponds, and OWSs before wastes were discharged into the sewer system (NationView, 2012). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of SWMU-183 see subsection C.5 of this report.

A.3.6 AOC-1 – ERP Site DP-64

AOC-1 is listed as Chemical Agent Site and is identified as ERP Site DP-64. It is located in the northeastern portion of HAFB on the north side and adjacent to the former Main Base Landfill (LF-01) (Figure A-1.2). The total area of the DP-64 site is approximately 5.5 acres and is partially surrounded by a chain-link fence.

During the 1950s, the Chemical Test Squadron from Edgewood Maryland flew missions to HAFB, although no documentation has been found to indicate the testing of any chemical agents occurred at DP-64, M4 sulfur mustard vapor detection kits and detonation chemical agent identification sets (CAIS) were historically used at HAFB. CAIS kits were widely used by the Army for training purposes. In the 1996 *Survey and Analysis Report, Second Edition*, (U.S. Army Program Manager for Chemical Demilitarization, 1996) Alamogordo Army Air Base was identified as a location where CAIS had been recovered. DP-64 site was discovered in 2000 when a pedestrian walking in the area discovered several broken vials and two intact vials containing a clear to yellowish liquid (Bhate 2012). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site DP-64 see subsection C.6 of this report.

A.3.7 AOC-3 – ERP Site DP-63

AOC-3 is listed as Ammunition Yard Disposal Pit and identified as ERP Site DP-63. It is located on the eastern side of HAFB to the northeast of the runway area, in the north portion of the Ammunition Storage Facility (Figure A-1.2). Site DP-63, is comprised of three separate disposal areas designated as the East, West, and North disposal pits. Originally, the disposal pit areas were located immediately north and outside of the facility, but during an expansion of the storage yard in the 1960s, DP-63 became part of the Ammunition Storage Facility (with the exception of the North Area). During past operations, munitions were placed into the disposal pits with diesel fuel and wood pallets and ignited to render the ordnance inert. Fuel may have seeped into the soil directly below the disposal areas. The types of ordnance that were treated include munitions ranging from 20-caliber to 50-caliber small arms rounds and grenades (Bhate, 2008a). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site DP-63 see subsection C.7 of this report.

A.3.8 AOC-4 – ERP Site N/A

AOC-4 is listed as West POL Yard Fuel Spill. The site consists of four 50,000-gallon ASTs housed within a secondary containment concrete berm, and aboveground and underground product transmission lines. The facility was used to store and distribute JP-8 jet fuel to tanker trucks. AOC-4 is located on the western portion of the Main Base Area adjacent to Building 871 (Figure A-1.2). In August 1999, the West POL Yard facility's leak-detection system indicated that JP-8 was leaking underground south of the ASTs. A subsequent pressure test performed on an 8-inch underground feed line confirmed the presence of a leak beneath the concrete pad of the fueling area. As a result, the fueling pad was shut down by draining fuel lines and closing valves (NationView, 2010). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of AOC-4 see subsection C.8 of this report.

A.3.9 AOC-C – ERP Site SS-66

AOC-C is listed as Building 835 Spills and identified as ERP Site SS-66. It is located in a vacant lot on the north end of the flight line, on the western portion of the Main Base Area, 65 ft west of the former Building 835 (Figure A-1.2). The site had been identified as an oil and rust-stained area approximately 20 ft by 30 ft in size, located on the north side of Building 835. Building 835 was built in 1954 and was demolished in 2001. At the facility, metal parts were heated and quenched in oil for the purpose of hardening or softening the metals. At times the quenching oil would drip onto the concrete both inside and outside the building. Oil stains on the concrete pads outside the north side of the building were visible in the aerial photograph taken in 1996 (Bhate, 2008c). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site SS-66 see subsection C.9 of this report.

A.3.10 AOC-K – ERP Site SS-12

AOC-K is listed as Northeast Fuel Line Spill Site #1 and identified as ERP Site SS-12. It is located immediately east of the main housing area at HAFB (Figure A-1.2). In 1975, approximately 2,000 gallons of JP-4 were spilled at the site as a result of a line rupture due to excessive pressure in the main pipeline that serves the HAFB POL area. The majority of fuel was reportedly collected in a pit and pumped into a truck shortly after the spill. In 1992, petroleum product was allegedly encountered while installing a utility trench west and upgradient of the pipeline (Bhate, 2008b). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site SS-12 see subsection C.12 of this report.

A.3.11 AOC-M – ERP Site RW-70

AOC-M is listed as Building 18 Product Storage Tank and identified as ERP Site RW-70. The site was identified as a gasoline leak from an underground storage tank (UST) located next to Building 18 at the Old BX Service Station (AOC-Q). The UST was located 50 feet northwest of Building 18 and has been included in the remediation activities conducted at AOC-Q. The site is located in a densely populated portion of HAFB across from the Base Medical Facility (Figure A-1.2).

The BX Service Station operated from the early 1950s until 2000. It featured a gas station, convenience store, and a car wash. In 1981, gas leaks from the USTs were discovered and an investigation was initiated that led to the removal of five underground tanks in 1992. These underground tanks were replaced with three aboveground tanks. In 2000, a new BX Station was built further north on First Street. The original BX Station was taken out of service that same year so that the entire area could be remediated through petroleum contaminated soil (PCS) excavation and removal activities (Bhate, 2008c). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site RW-70 see subsection C.11 of this report.

A.3.12 AOC-O – ERP Site OT-45

AOC-O is listed as Building 296 Old Aerospace Ground Equipment (AGE) Refueling Station and identified as ERP Site OT-45 (formerly Site 51). The site is located near the intersection of West Delaware Avenue and West Fourth Street, south of the Building 296 parking lot in a densely populated portion of HAFB (Figure A-1.2).

The Old AGE Refueling Station consisted of three USTs (two 12,500 gallon tanks and one 10,000 gallon tank) that stored Motor Gasoline/ Mobility Gasoline (MOGAS), diesel, and JP-4. The site was also equipped with a pump island and fuel dispensing station. The Refueling Station including the three USTs was removed in the 1980s during the renovation of Building 296. It was replaced with a parking lot and landscaped area (Bhate, 2008d). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site OT-45 see subsection C.12 of this report.

A.3.13 AOC-U – ERP Site N/A

AOC-U is listed as Lost River Basin. The Lost River Basin is a large intermittent drainage basin that receives runoff from various upgradient SWMUs and AOCs of the Base (Figure A-1.2). It was considered an environmentally sensitive area under agreement between HAFB, White Sands

Missile Range (WSMR), the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the New Mexico Department of Game and Fish (NMDGF) for the protection of the threatened White Sands pupfish.

Surface water generally flows from the east to the west during the rainy season (late July through September). The Lost River Basin receives annual runoff from a large portion of the Base including six (6) ERP sites that contain nine (9) SWMUs and AOCs sites located along its perimeter, some of which are CAC without controls (OT-04, LF-40, and DP-62). Based on their proximity to the Lost River Basin and its tributaries several of these ERP sites may have contributed contaminants via surface water runoff and/or groundwater infiltration into the Basin over time. The six (6) potential contributing ERP sources listed below:

1. OT-04 (SWMU 102) – Acid Trailer Disposal Site
2. DP-62 (AOC-RD) – Rita Draw Disposal Pit
3. OT-37 (AOC-L) – Early Missile Test Site
4. OT-38 (SWMU 137) – Test Sled Maintenance Area
5. SS-39 (SWMUs 165, 177, 179, and 181) – Missile Fuel Spill Area
6. LF-40 (SWMU 103) – Causeway Rubble Disposal Area

Due to the potential for contamination from multiple sites and the size of the area contributing to AOC-U, the nature and extent of soil and groundwater contamination resulting from historical releases from up gradient ERP sites had not been completely defined. Further RFI activities were conducted in to determine if the adjacent ERP sites had impacted the soil and water quality within the Lost River Basin watershed (NationView, 2013). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of SWMU 183 see subsection C.13 of this report.

A.3.14 AOC-838 – ERP Site SS-72

AOC-838 is listed as TCE Groundwater Contamination Upgradient of LF-21 and identified as ERP Site SS-72 (Figure A-1.2). SS-72 is identified as the area just north of groundwater monitoring well MW21-01 which is an upgradient well for an ERP site listed as ERP site LF-21 (SWMU 116 - West Area Landfill #2).

Trichloroethene (TCE) groundwater contamination was discovered during the sampling of monitoring wells MW-21-01, -02, -03, and -04 that were installed as part of the 10 year Long – Term Monitoring (LTM) Program. The four wells were installed to meet monitoring commitments for LF-21. Previously the solvent TCE had only been detected in the upgradient well MW-21-01 above the Maximum Contaminant Level (MCL) for TCE in drinking water. Therefore an investigation of the area upgradient of monitoring well MW-21-01 was conducted to determine potential sources of contamination.

Aerial photographs taken in 1945, 1972, 1979, 1984, 1996, and 2004 from the area upgradient of monitoring well MW-21-01 were reviewed for signs of spills or maintenance facilities that operated in earlier periods. This review only indicated that the area stretching approximately 800 ft north of this well has remained cleared and undeveloped since 1945. The nearest buildings (800, 806, 816, and 817) where maintenance activities occurred which likely used TCE as a degreaser are near the flight line about 900 ft to the northeast. No records exist documenting a release of TCE in the area of SS-72. As a result, SS-72 was designated to be investigated separately as its own site (Bhate, 2008c). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site SS-72 see subsection C.14 of this report.

A.3.15 AOC-1088 – ERP Site SS-73

AOC-1088 is listed as TCE Groundwater Contamination Upgradient of SS-61 and is identified as ERP Site SS-73. It is located in the central part of HAFB in an industrial area (Figure A-1.2). SS-61 is located north of two hangars, Buildings 1079 and 1080. SS-73 is generally known to be an open area located about 150 ft east of the concrete pad that is part of Site SS-61.

Site SS-73 results from the occurrence of TCE that was measured in well SS61-MW02 on several occasions as part of Phase I and II RFIs conducted in 1996 and 1997 for SS-61. The source of contamination at SS-61 was determined to be from an AVGAS distribution system that had existed at the site consisting of ASTs, USTs, and leaking distribution lines. The site has undergone extensive remediation including excavation and treatment of PCS, and in-situ remediation of remaining PCS and groundwater with an enhanced bio-remediation system.

In 1999, during groundwater sampling and analysis conducted for RI activities at SS-61, TCE was discovered in well SS61-MW02. This was a location where there was no known source for TCE. As a result, SS-73 was designated to be investigated separately as its own site (Bhate, 2008c). For more discussion concerning the location, history, land use conditions, relevant information from previous investigations, and the statement of basis for CAC determination of ERP Site SS-73 see subsection C.15 of this report.

A.3.16 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) January 2008a, *Final DP-63 Accelerated Corrective Measures Completion Report Holloman Air Force Base, New Mexico.*

Bhate. April 2008b. *Final Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20 Holloman, AFB, New Mexico.*

Bhate. May 2008c. *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS73).* Holloman AFB, New Mexico.

Bhate. November 2008d. *Final Accelerated Corrective Measures Completion Report Sites OT-03 and OT-45, Multiple Sites, Holloman Air Force Base, New Mexico.*

Bhate. February 2012. *Final RCRA Facility Investigation Report, Chemical Agent Disposal Site (DP-64), Holloman Air Force Base, New Mexico*.

NationView LLC. (NationView) June 2010. *Final West POL Yard Accelerated Corrective Measures Completion Report, Holloman Air Force Base, New Mexico.*

NationView. May 2012. *Final RCRA Facility Investigation Report SWMU 183 – Basewide Sewer System, Holloman Air Force Base, New Mexico*.

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

Tetra Tech, Inc. (Tetra Tech) June 2010. *April 2009 – January 2010 Long-Term Monitoring Report for OT-16 (SWMUs 118 and 132 and AOC A), DP-30/SD (SWMU 113B), and SS-39 (SWMUs 165, 167, 177, 179, and 181), Holloman Air Force Base, New Mexico*.

Tetra Tech. November 2011. *Supplemental RCRA Facility Investigation Report Addendum for LF-10, Old Main Base Landfill (SWMU 109) and Building 121 Landfill (SWMU 101), Holloman Air Force Base, New Mexico*.

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B. HISTORY OF ENVIRONMENTAL COMPLIANCE

Investigation and remediation of SWMUs and AOCs at Holloman AFB is conducted under both the Air Force ERP and the RCRA Corrective Action Program. The ERP, formerly called the Installation Restoration Program (IRP), was initiated in 1983 and the RCRA Facility Assessment (RFA) was conducted in 1987. A Hazardous and Solid Waste Amendments (HSWA) permit was issued to Holloman AFB in 1991 and became effective on September 25, 1991. In January 1996, NMED received authorization from the United States Environmental Protection Agency (EPA) for corrective action under the HSWA and became the administrative authority for this action.

The HSWA portion of the RCRA permit identified sites at HAFB requiring a Remedial Investigation (RI)/RCRA Facility Investigation (RFI). RFI activities were conducted in two phases. The Phase I RFI was conducted between 1987 and 1992; Phase II of the RFI was conducted between 1992 and 1995. A total of 236 potential SWMUs and 29 AOCs were investigated. Additionally five remote sites such as radar sites, well fields, and reservoirs were investigated under the RFI. A total of 265 sites were identified and investigated during this process. At the completion of the RFI and RFA processes and through the use of decision documents 119 SWMUs and AOCs remained Corrective Action Required status in Appendix 4-A of the RCRA permit. The following has occurred between 1999 to present:

- 1999, Holloman AFB submitted a request to remove 104 SWMUs and AOCs from the RCRA permit. NMED determined that 69 of the 104 SWMUs and AOCs were considered appropriate for removal due to sufficient documentation describing the conditions at these sites.
- February 2001, NMED granted a Class 3 PMR to remove 69 sites from HAFB's RCRA Permit.
- February 24, 2004, the Holloman HSWA RCRA permit was renewed.
- November 29, 2005, an additional seven sites—six SWMUs and one AOC—were approved for CAC [formerly No Further Action (NFA)] status and re-located from Appendix 4-A Table A to Appendix 4-A Table B.
- March 12, 2013, the NMED approved a Class 3 PMR to reassign eighteen sites- nine SWMUs and nine AOCs from Appendix 4-A Table A to Appendix 4-A Table B and approved the addition of sixteen AOCs to Appendix 4-A Table A of the permit.
- 26 February 2015, the HAFB RCRA permit renewal application was submitted to the NMED. It is currently under review. There are 59 sites currently remaining on the list of SWMUs/AOC (Table A) of the operating permit.

In summary Tables A, B, and C of Appendix 4-A of HAFB's RCRA permit outline the status of all corrective units at HAFB. Table A identifies active SWMUs and AOCs requiring further investigation and remediation, Table B contains the SWMUs and AOCs no longer requiring Corrective Action that do not require any controls to limit future land use, and Table C contains a list of sites that no longer require Corrective Action but have institutional controls to limit future land use.

On October 29, 2012, the NMED changed the title of Table B to *List of SWMUs/AOCs with Corrective Action Complete Without Controls* and added a new Table C, *SWMUs/AOCs with Corrective Action Complete With Controls*. This was done so that the Tables would be consistent with the status designation of the United States Environmental Protection Agency's (EPA) Final Guidance on Completion of Corrective Action Activities at RCRA Facilities (Federal Register, Volume 68, Number 37). The titles of Tables B and C were also modified to be consistent with this guidance and the definitions found in 20.4.2.7 NMAC (*Hazardous Waste Permit and Corrective Action Fees*).

If approved, this permit modification request would grant CAC status for seven (7) SWMUs and eleven (11) AOCs, and modify Part 4 of the Permit to move these SWMUs and AOCs from Appendix 4-A Table A (List of Solid Waste Management Units / Areas of Concern) to Appendix 4-A Table B (List of SWMUs/AOCs with Corrective Action Complete Without Controls) or Table C (List of SWMUs/AOCs with Corrective Action Complete With Controls).

Of the 18 sites two (2) sites listed as SWMU Nos. 101 and 109 (ERP site LF-10) are proposed to be moved to Table C of Appendix 4-A. The remaining 16 sites are proposed to be moved to Tables B of Appendix 4-A.

C. DESCRIPTION OF SWMU AND AOC SITES

Section C describes the location, history, evaluation of relevant information, and the basis for determination for each SWMU and AOC proposed for CAC in this document. More detailed descriptions of the particulars for each SWMU and AOC can be found in the accompanying references constituting the Administrative Record.

Following the SWMU and AOC unit descriptions are three tables (Tables A, B, and C) from Appendix 4-A of HAFB's RCRA Permit summarizing the status of all corrective units at HAFB.

- Table A titled List of Solid Waste Management Units / Areas of Concern provides a listing of active SWMUs and AOCs that require further corrective action.
- Table B titled List of SWMUs/AOCs with Corrective Action Complete Without Controls was changed on October 29, 2012 at the request of HAFB, and
- Table C, SWMUs/AOCs with Corrective Action Complete With Controls was added to subsequent permit modification requests.

Table C was added pursuant to EPA Final Guidance on Completion of Corrective Action Activities at RCRA Facilities (Federal Register, Volume 68, Number 37) and the titles of Tables B and C were modified to be consistent with this guidance and the definitions found in 20.4.2.7 NMAC (Hazardous Waste Permit and Corrective Action Fees). It should be noted that Corrective Action Complete (CAC) status was formerly referred to as "no further action" (NFA) status and is used synonymously throughout this permit modification request.

C.1 SWMU Nos. 101 and 109 - ERP Site LF-10

The following information was obtained from the *Supplemental RCRA Facility Investigation Report Addendum for LF-10, Old Main Base Landfill (SWMU 109) and Building 121 Landfill (SWMU 101), Holloman Air Force Base, New Mexico* (Tetra Tech, 2011) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.1.1 LOCATION/UNIT DESCRIPTION

ERP Site LF-10 consists of two SWMUs, SWMU 101 listed as Building 121 Landfill and SWMU 109 listed as the Old Main Base Landfill. LF-10 is located in the southeastern portion of HAFB, southeast of the airfield, and bounded to the west by Creosote Avenue and to the north by Arkansas Avenue (Figure A-1.2). LF-10 consists of approximately twenty (20) acres and currently encompasses the area adjacent to the present day Civil Engineer Squadron (CES) 316 complex (Building 121) and Building 120. A chain-link fence surrounds the CES complex and supporting lots and access is restricted to authorized personnel. A site map of LF-10 is provided in Figure C-1.1.

Outside the fenced-in area LF-10 is primarily undeveloped. The surface is composed of packed-soil with sporadic fragments of former sanitary disposal items (e.g., ceramic plates, silverware, piping, wiring, bottle fragments, tires, etc.). The area is sparsely vegetated, with shrubs occurring almost exclusively along the southern edge of the Building 121 chain-link fence where a drainage swale is present. Several wooden utility poles cross the western and southern portion of the site. The southern portion of the former landfill is used as a material recycling stockpile area by the Base.

C.1.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

LF-10 was utilized from 1942 to 1958. During that time, the landfill received domestic solid waste from the base and possibly drums containing waste oils and solvents (WH&A, 1990). A Base incinerator was located in the area and the ash from its operation was also buried in the landfill. Landfilling was conducted using trench and fill methods. The landfill was closed in 1958 in accordance with U.S. Department of Defense (DoD) protocols in place at that time.

The current and anticipated future land use of LF-10 is industrial.

The following is a description of the history of remediation and investigation of LF-10.

1982 LF-10 Construction Soil Borings and Phase I Investigation

In 1982, 16 soil borings were advanced in the area of LF-10 for construction of the SPACECOM Building (Building 121). The boring logs indicate the presence of trash and debris from the former landfill area. Locations of these borings and designations of those locations where trash was found are shown in Figure C-1.2. As a result of these findings LF-10 was placed under the DoD IRP (WH&A, 1990).

A Phase I investigation was conducted by CH2M Hill. This records search concluded that further investigative work was not necessary; therefore, the site was not included in a Phase II investigation (CH2MHill, 1983).

1987 LF-10 Subsurface Investigation

In November 1987 a subsurface investigation was conducted by HAFB to determine why Building 121 was exhibiting signs of differential settling and concrete distress. Seven borings were advanced predominantly south of Building 121. Landfill material was encountered in four borings south of the building and in one boring east of the building. The locations of the 1987 borings, as well as 1982 borings advanced in support of the Building 121 construction effort, are shown on Figure C-1.2. Boring logs are not located in the Administrative record, and no samples were obtained for lab analysis. The 1987 subsurface investigation concluded that trash existed under the majority of the hardstand with a maximum thickness of approximately 10 feet, and that trash lenses were variable and intermittent across the site (WH&A, 1990). As a result of this investigation, a remedial investigation (RI) was conducted.

1988 LF-10 Remedial Investigation

RI field activities were conducted to further investigate the potential level of contamination at the site and to establish the subsurface extent of the landfill, and to support a proposed construction project. During the RI, seven monitoring wells, designated MW-1 through MW-7, were installed, 14 soil borings advanced into the subsurface to a depth of 30 ft, and the drilling of three Dennison cores were obtained (Radian, 1992a, 1992b). The RI monitoring well and soil boring locations are also depicted on Figure C-1.3.

During the RI, the general boundaries of the landfill were determined in the field by visual observations and test borings. Monitoring wells MW-2 through MW-5 were installed in areas not observed to contain fill material, thus encircling the landfill (WH&A, 1990).

Soil samples were obtained and analyzed for total metals, cyanide, base/neutral/acid extractable (BN/AE), semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and, pesticides, polychlorinated biphenyls (PCBs), pesticides, and total recoverable petroleum hydrocarbons (TRPH). Samples from the depth intervals 7.5 to 10.5 feet bgs were within the landfill material and exhibited elevated PID readings. The sample from depth interval 13.5 to 15 feet bgs appears to have been collected at the water table interface.

Low levels of VOCs were detected in the two soil samples exhibiting elevated PID readings; at 15.0 to 16.5 feet bgs. All results were below NMED SSLs. Only one BN/AE, di-n-butylphthalate (a common laboratory contaminant), was detected well below NMED SSLs. All metals were determined in the RI to be within background ranges. A comparison to current human health-based NMED SSLs shows that manganese was above the construction worker SSL in four samples (one being a duplicate). The construction worker SSLs are very low, due to inhalation pathway of particulates potentially generated during construction activities. The samples where manganese construction worker SSLs were exceeded were either at the water table interface, within the capillary fringe and moist, or below the water table and saturated, indicating minimal potential for dust generation and risk. Analytical results of the soil samples are presented in Table C.1.1.

Analytical results of the RI groundwater sampling were analyzed for VOCs, BN/AE compounds, pesticides, polychlorinated biphenyls (PCBs), TRPH, and metals. Analytical results were compared to NMGWQ standards and U.S. EPA MCLs. TDS concentrations at LF-10 are well above 10,000 mg/L, and these comparisons are for reference only, since 10,000 mg/L defines the applicability of groundwater standards pursuant to NMAC 20.6.2.3101.

VOCs were not present in any of the samples. BN/AE and pesticide compounds were detected at low concentrations in upgradient wells, but, none were present in downgradient wells. Low concentrations of TRPH were detected in MW-3 and MW-4, but no targeted contaminants were present based on the VOC and BN analyses.

Three downgradient wells contained total metals above background/upgradient concentrations and groundwater standards. MW-1, screened immediately below landfill material, contained manganese at a concentration above the NMGWQ human health standard. Manganese was also present above the standard in MW-6. Nickel was present in MW-1 at a concentration slightly above the NMGWQ irrigation standard. Mercury was marginally above the NMGWQ human health standard. All other downgradient concentrations of metals were below background and/or upgradient concentrations.

The LF-10 RI risk assessment selected benzene, 2-butanone, 2,4-dinitrotoluene, phenol, aldrin, heptachlor epoxide, beryllium, cadmium, chromium, nickel, 1-ethyl-2-methyl-benzene and 1,3,5 trimethyl-benzene as “indicator chemicals” or chemicals of concern for the site. The exposure assessment identified only one possible quantifiable exposure pathway for these indicator chemicals: leaching from contaminated subsurface soil to groundwater, with contaminated subsurface soil the source, leaching the mechanism, and groundwater the release transport medium. A hypothetical off-base well locally downgradient of the site was chosen as the worst case exposure point. The route of concern selected was ingestion of groundwater by livestock, the receptor. Modeling was used to determine concentrations of indicator chemicals at the exposure point and concentrations were compared with standards and criteria. Heptachlor epoxide, 2-butanone, 1-ethyl-2-methyl-benzene and 1,3,5-trimethyl-benzene do not have standards or criteria; therefore, a toxicity assessment was performed for all these chemicals. To attain toxic doses of these chemicals, a receptor would have to ingest more than 111,400 liters of groundwater at the exposure point.

Based on the risk assessment, it was concluded unlikely that a receptor would be adversely affected from constituents LF-10, and it was concluded that LF-10 posed no significant risk to public health or the environment (WH&A, 1990).

1990 LF-10 Record of Decision

In April 1990, HAFB submitted a Record of Decision (ROD) to NMED. Based on the findings of the 1988 RI and Baseline Risk Assessment, no further investigative work was recommended for LF-10. On 26 September 1991 the NMED concurred with the 1990 ROD in a letter of correspondence with the understanding that:

- Contaminants towards the northwest of LF-10 would be correlated with, and explained by, future IRP investigations (NMED, 1991).
- Long-term monitoring (LTM) was recommended by NMED as a condition of this Record of Decision (Ebasco/GTGS, 1995).

1995 – 2003 LF-10 Long Term Monitoring

Biennial groundwater LTM was conducted at LF-10 between 1995 and 2003 on four of the seven wells located at LF-10. Sampling was conducted on one upgradient well (MW-2) and three downgradient wells (MW-3, MW-4, and MW-6). The results are presented in Table C.1.1.

Samples collected from these wells were analyzed for dissolved RCRA metals, VOCs, and organochlorine pesticides. Based on the lack of detections of the majority of constituents, NMED approved the recommendations in the 2001 LTM Report to limit 2003 sampling to arsenic, barium, manganese, and selenium. Of the analytes detected during the five sampling events, arsenic, chromium, and lead exceeded their respective background values in at least one sample during the LTM program at LF-10. Lead exceeded the EPA MCL during the August 1995 sampling event. Lead did not exceed any established screening value in the four subsequent sampling events. Subsequent reviews of the LTM reports indicate that chromium did not exceed established background levels. Based on the LTM results, the 2003 LTM Report recommended the closeout of LF-10 (Bhate, 2003).

2004 Statement of Basis

A Statement of Basis (SOB) summary was submitted by HAFB in February 2004 requesting site closure for LF-10 and for the removal of LF-10 from the RCRA permit. Upon submittal of the SOB, NMED conducted a site walk of LF-10 and concluded that LTM could be suspended but

NFA would only be considered after additional characterization of the landfill waste (HGL, 2007).

2007 LF-10 Supplemental RCRA Facility Investigation

Supplemental RFI activities were conducted between September 2005 and May 2006 to obtain additional site-specific physical and analytical data. The Supplemental RFI included a non-invasive geophysical survey to identify former disposal pits/trenches and define the landfill boundary, a passive soil gas survey across the landfill area, and a subsurface soil investigation. The soil gas survey results were used to locate boring for direct push technology (DPT) subsurface soil sampling and analysis (HGL, 2006).

Soil samples were selectively analyzed for RCRA metals, BN/AE, organochlorine pesticides, PCBs, SVOCs, VOCs, total petroleum hydrocarbons (TPH-diesel range organicx (DRO), and TPH-gasoline range organics (GRO). Five metals (arsenic, barium, chromium, lead, and mercury) TPH-DRO, fluoranthene, and three VOCs (n-butylbenzene, naphthalene, and p-cymene) were detected in various soil samples. Lead was detected above the background. No detections exceeded either the NMED SSLs or EPA Regional Screening Levels (RSLs) (HGL, 2007).

Based on the results obtained during the 1988 RI, 10 years of compliance LTM, and the Supplemental RFI, the 2007 Supplemental RFI recommended NFA status for LF-10. Land-use controls (LUCs) were recommended to prevent future residential use. Additionally, it was recommended that methane monitoring be conducted within Building 121 to ensure that methane is not present within Building 121 at unacceptable levels [greater than 25 percent of the lower explosive limit (LEL)] (HGL, 2007).

2011 LF-10 Supplemental RFI Addendum

Between January 10 and February 5, 2011 Supplemental RFI activities were conducted at LF-10 in which 19 exploratory trenches were excavated to further characterize landfill materials. Methane monitoring for methane was conducted within Building 121. Eighteen soil samples were collected and analyzed for VOCs, SVOCs, and metals (Tetra Tech, 2011).

Landfill waste was found in numerous trenches. Based on historical borings and trenching, the landfill encompasses an area of approximately 20 acres and encompasses three (3) sides of Building 121. Only arsenic and manganese concentrations exceeded NMED SSLs or EPA RSLs at a few locations, but the arsenic concentrations are low and appear to be background and manganese concentrations appear to be naturally occurring in combination with iron. The 2008-2010 LTM sampling showed only arsenic exceeds in groundwater at both up- and downgradient monitoring locations. Methane or other toxic gases were not detected in Building 121 at levels of concern (Tetra Tech, 2011).

C.1.3 EVALUATION OF RELEVANT INFORMATION

LF-10 has been the subject of numerous investigations designed to define the boundaries of the former landfill, characterize the environmental media at LF-10 (i.e., soil, air, and groundwater), and characterize the waste material within LF-10. Included in these investigations have been the advancement of 53 soil borings, excavation of 19 exploratory trenches, 139 passive soil gas samples, compliance groundwater monitoring spanning 9 years, air monitoring within Building 121, a non-invasive geophysical survey, and at least 34 subsurface soil sample locations across the site.

Soil borings, exploratory trenching, and a geophysical survey have determined that a significant portion of LF-10 is underlain with linear trenches containing municipal debris (glass bottles, wood, paper, nylon rope, vinyl, scrap metal, concrete, gravel, rubber, porcelain, bricks, tires, flooring tile, asphalt, wiring, electronics, fabrics, dishes, ash, camera film, battery remains, shoes, and other miscellaneous trash), which was periodically burned prior to disposal. No containers that would have potentially stored hazardous waste were discovered during site investigations.

Soil sampling activities have been conducted at LF-10 during three investigations. Samples collected during these three sampling events were selectively analyzed for metals, cyanide, BN/AE, pesticides, PCBs, SVOCs, VOCs, TPH-DRO, and TPH-GRO. Numerous analytes have been detected in samples collected at LF-10 (Tetra Tech, 2011); however, only arsenic and manganese have been detected at concentrations that exceeded the NMED SSLs or EPA RSLs. Locations of the soil samples and exceedances are shown on Figure C-1.2.

Both arsenic and manganese are commonly found, naturally occurring metals. Given the lack of other constituent exceedances at the locations where arsenic exceeded NMED Residential SSLs and the nominal exceedances of arsenic it is likely that the exceedances of arsenic are attributable to natural background concentrations. Manganese is often found in nature in combination with iron. When comparing the manganese concentrations with iron concentrations, good correlation between manganese and iron is exhibited (Tetra Tech, 2011), with the exception of manganese at sample location 8A25-524, which is the location where manganese exceeded the NMED Construction SSL. At this location, manganese may be attributable to an anthropogenic source. During the 1988 RI, landfill debris was identified at this location. The major anthropogenic source of manganese that may have contributed to concentrations at LF-10 include the disposal of materials containing manganese in either the original form or in ash deposited from the Base incinerator.

Groundwater occurs beneath LF-10 as a shallow unconfined aquifer within the underlying silt, silty sand, and clay sediments. Depth to water at the site in 2003 (excluding monitoring well MW-5, several hundred ft to the northeast) ranged from approximately 6.7 ft bgs to 10.9 feet bgs. Field slug tests were performed during the RI to estimate aquifer hydraulic conductivity at the site. Using an average hydraulic conductivity of 0.886 ft per day (ft/day) (as determined by the slug tests), a hydraulic gradient of 0.003 feet per foot (ft/ft) (from the 2003 LTM event), and an estimated porosity of 30 percent, the linear groundwater flow velocity across the site is estimated to be 0.009 ft/day, or 3.3 feet per year (ft/yr).

Groundwater beneath LF-10 was sampled during the 1988 RI and for five biennial sampling events (1995 through 2003). Historically, groundwater samples at LF-10 have been analyzed for metals, cyanide, pesticides, PCBs, SVOCs, VOCs, and TRPH. During the 1988 RI, several analytes exceeded the EPA MCL and/or the NMWQCC Standards. The constituents that exceeded the established groundwater standards occurred in wells located downgradient/cross-gradient and upgradient of the landfill area. Based on 1995 through 2003 compliance LTM results, the LF-10 target analyte list was reduced, with NMED approval, to arsenic, barium, manganese, and selenium. Since the initial rounds of groundwater sampling conducted in 1988 and 1995, only arsenic was observed in the 1997, 1999, 2001, and 2003 samples above the current EPA MCL and NMWQCC Standard. Arsenic exceeded in wells upgradient and downgradient/cross-gradient of the landfill area.

According to the Final 2003 LTM Report, TDS concentrations at LF-10 are above 10,000 mg/L (Bhate, 2003). Because arsenic does not appear to be a waste component at LF-10 and because other contaminants are absent in groundwater, elevated arsenic concentrations are considered likely related to high TDS concentrations and not to a release from LF-10. A TDS concentration above 10,000 mg/L is the point where groundwater is no longer considered a potential domestic or agricultural water supply. Following the 2003 LTM Report, NMED agreed to suspend LTM at the site. The LTM analytical results are summarized in Table C.1.1.

Air monitoring within Building 121 has determined that methane is not present at unacceptable levels. The highest recorded concentration for methane within Building 121 was 0.3 percent, which is lower than 25 percent of the LEL (1.1 percent). Methane gas is not present at concentrations that pose an explosive hazard.

C.1.4 BASIS OF DETERMINATION

Buried waste material is present in trenches that are covered by soil at LF-10. In addition analytical results from soil and groundwater sampling have indicated that various chemicals constituents are present in environmental media at LF-10. Because the site is a former landfill, closure will include land use controls (LUCs) to prevent future residential use. Analytical data show that chemical impacts to soil outside of the trenches are very limited. Only manganese in soil sample 8A25-524 appears to be a site-related contaminant that has impacted soil outside of the trenches. Due to the limited detection of manganese above the construction worker SSL and the limited potential for manganese transport through soil or to groundwater (Tetra Tech, 2011), manganese is not expected to leach into groundwater. In addition, due to documented high TDS concentrations in site groundwater, it is not suitable for domestic use. Air monitoring conducting in Building 121 located adjacent to, or on top of, landfill trenches did not detect the presence of toxic or hazardous conditions due to vapor intrusion to the building.

Long term groundwater monitoring has shown the presence of arsenic in groundwater. However, arsenic was detected in only four soil samples at concentrations consistent with HAFB background level for arsenic. Arsenic is also found in wells upgradient of the site, concentrations in groundwater have been relatively consistent for wells within or near landfill boundary verses EPA MCL and NMWQCC drinking water criteria, the groundwater velocity is low (estimated at 3.3 ft/yr), and the groundwater is not useable for domestic purposes due to high TDS content.

Therefore, HAFB requested NFA for Site LF-10 based upon Criterion #3 which states:

> "*No release to the environment has occurred or is likely to occur in the future from the SWMU/AOC*"

CAC status (NMED's new classification of NFA) with controls was granted by NMED on March 5, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC with controls for LF-10 is presented in the section NMED Letters of Approval at the end of this document.

C.1.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) September 2003. *Final 2003 Long-Term Groundwater Monitoring Report, Holloman AFB, New Mexico*.

CH2M Hill, Inc. August 1983. *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico*.

Electric Bond and Share Company (EBASCO) Services, Inc. and Groundwater Technology Government Services, Inc. (GTGS). June 1995. *Draft Final Chemical Data Acquisition Plan, Long Term Groundwater Monitoring Program, Holloman Air Force Base, New Mexico.*

HydroGeoLogic, Inc. (HGL) March 2006. *Supplemental RCRA Facility Investigation, addendum, Passive Soil Gas and Geophysical Survey Results, Technical Memorandum.*

HGL. July 2007. *Supplemental RCRA Facility Investigation, LF-10 (SWMUs 101 and 109) and LF-29 (SWMU 104), Holloman Air Force Base, Alamogordo, New Mexico*.

New Mexico Environment Department (NMED) September 26, 1991. *IRP Document Review: October 1990 Draft Decision Documents – Sites 1, 10, 25, 31, 50, 53, 55. Correspondence to Mr. Roger Wilkson, IRP Program Coordinator 833rd CSG/DEV, Holloman Air Force Base, New Mexico.*

NMED. March 5, 2012. Approval, *Supplemental RCRA Facility Investigation Report Addendum for LF-10, Old Main Base Landfill (SWMU 109) and Building 121 Landfill (SWMU 101), Holloman Air Force Base, New Mexico, EPA ID# NM6572124422*.

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

Radian. 1992b. *Final Remedial Investigation (RI) Report, Volume II of III, Appendices A, B, C, and D, Investigation, Study and Recommendation for 29 Waste Sites, Holloman Air Force Base, NM.*

Tetra Tech, Inc. November 2011. *Supplemental RCRA Facility Investigation Report Addendum for LF-10, Old Main Base Landfill (SWMU 109) and Building 121 Landfill (SWMU 101), Holloman Air Force Base, New Mexico*.

Walk, Haydel & Associates, Inc. (WH&A) November 1990. *Decision Documents, Installation Restoration Program, Holloman Air Force Base, Alamogordo, New Mexico.*

C.2 SWMU NO. 113A – ERP Site OT-20

The following information was obtained from the *Final Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20 Holloman, AFB, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.2.1 LOCATION/UNIT DESCRIPTION

SWMU 113A, the Sludge Disposal Trenches near Lagoons, ERP Site OT-20, is located east of Pond B at the former sewage lagoons in the west corner of the Base (Figure A-1.2). From the beginning of Base operations to approximately 1984, all settled solids from the grit chamber located at the headworks of the wastewater treatment plant were buried in three distinct pits just east of Pond B. The pits were reported to be approximately 2 ft wide, 5 ft deep, and 40 ft long and were dug perpendicular to the pond. A site map insert of OT-20 is provided in Figure C-2.1.

C.2.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

The current and anticipated future land use of OT-20 is industrial.

The following is a description of the history of remediation and investigation of OT-20.

1983 OT-20 Records Search

The *Installation Restoration Program, Records Search for Holloman Air Force Base, New Mexico* (CH2M Hill, 1983) indicated that small amounts of solvents and heavy metals may have been associated with the disposal grit material. The OT-20 record search concluded that the site was not considered to present any significant concern for adverse effects on health or the environment.

1991 OT-20 Remedial Investigation

The site was investigated in September 1991 during the RI conducted by Radian (Radian, 1992). Several long narrow trenches were dug to locate the burial sites and soil samples were collected and analyzed to characterize the grit and surrounding soil. Grit was identified in several trenches at depths up to 8 ft bgs.

Based on subsurface soil sample results, the grit waste placed into the disposal pits contained a variety of organic constituents. Organochlorine pesticides 4,4'-DDE, aldrin, endosulfan II, endrin aldehyde, heptachlor epoxide, and gamma-BHC were all detected below their respective NMED SSLs. Heptachlor was detected above the SSL in soil boring SB-20-03. The only herbicide detected was dicamba.

The poly-chlorinated biphenyl (PCB) aroclor 1254 was detected in the samples collected from each soil boring. Aroclor 1254 concentrations exceeded the NMED SSL in the samples collected from SB-20-02 and SB-20-03. All other PCBs were not detected. Four VOCs (benzene, methylene chloride, toluene, and xylenes) were detected in soil samples and laboratory blanks at estimated concentrations. All metals detected in the subsurface soil samples were below their respective NMED SSLs (Radian, 1992). The RI report recommended NFA for Site

OT-20. An Accelerate Corrective Measures (ACM) investigation was conducted in 2007 to further investigate and characterize the site (Bhate, 2008).

2007 OT-20 Accelerated Corrective Measures

Objectives of the additional investigation activities at this site were to confirm the locations of the three sewage grit disposal trenches, characterize the sewage grit for potential source removal, and evaluate the current onsite groundwater conditions. Three borings and four monitoring wells were installed and sampled to characterize the site (Bhate, 2008).

Soil samples collected from soil borings OT20-DP01 through OT20-DP03 during the ACM investigation were analyzed for VOCs, SVOCs, TPH (GRO, DRO, and ORO), pesticides, PCBs, herbicides, and RCRA metals. Analytical results for soil are summarized in Table C.2.1. Two VOCs were detected in the OT-20 soil boring samples; PCE and naphthalene. Both of these VOCs were detected below the NMED SSLs. TPHs were analyzed and the maximum detected was TPH-DRO, however, TPH-GRO was not detected above the method detection limit in any of the OT-20 soil samples. The herbicide 2-Methyl-4-Chlorophenoxyacetic Acid (MCPA) was detected in the duplicate sample collected from OT20-DP02. Although there is not an NMED SSL for MCPA this estimated concentration was below the USEPA Region 6 Human Health Medium Specific Screening Level for MCPA. All other herbicides were not detected above their method detection limits. Additionally, all pesticides, PCBs, and SVOCs were also not detected above their method detection limits. Five of the eight RCRA metals were detected above the method detection limits. The maximum concentrations of barium, cadmium, chromium, arsenic, and lead were all below their respective NMED SSLs.

The groundwater samples collected from four monitoring wells were analyzed for VOCs, SVOCs, pesticides, PCBs, herbicides, RCRA metals, and TDS. Groundwater analytical results are presented in Table C.2.2. The monitoring well locations are shown on Figure C-2.2. Nine VOCs (acetone, benzene, 2-butanone, chloromethane, methylene chloride, 4-methyl-2-pentanone, PCE, TCE, and naphthalene) were detected above the method detection limit. PCE was the only VOC detected above the USEPA MCL and/or the NMWQCC screening level. In order to determine the extent of the PCE groundwater contamination detected in wells OT20-MW02 and MW03, an additional well (OT20-MW04) was installed approximately 85 ft downgradient (south) of MW03. The sample from well OT-20-MW04 had detections of PCE and naphthalene and an estimated concentration of TCE; all other VOCs were not detected in this well.

Two SVOCs (Di-n-butyl phthalate and bis[2-Ethylhexyl]phthalate) were detected in monitoring wells OT20-MW04 and OT20-MW01, respectively. No other SVOCs were detected during this sampling event. Four herbicides were detected above the method detection limit. The maximum concentrations of dalapon, dichlorprop, MCPP, and 2,4-DB were all below applicable USEPA MCLs or NMWQCC standards. In addition, all pesticides and PCBs were not detected. Four RCRA metals were detected above the method detection limits. The maximum concentrations of selenium, barium, cadmium, and chromium were all below their respective USEPA MCLs and NMWQCC standards. TDS concentrations ranged from 30,000 mg/L (OT20-MW01) to 64,000 mg/L (OT20-MW02) and exceeded the NMWQCC standard of 1,000 mg/L at each well. Due to the concentrations of tetrachloroethene that were detected in OT20-MW02 and OT20-MW03 above the USEAP MCL, a site- specific risk based evaluation was performed (Bhate, 2008).

Risk Based Evaluation

A risk based evaluation was performed during the ACM investigation which included the following methodology:

- Compilation of soil and groundwater data – Data compiled (1991 through 2007);
- Identification of chemicals of potential concern (COPCs) – 10 chemicals in soil and 19 chemicals in groundwater identified;
- Development of exposure model (EM) – EM potential receptor and exposure pathways determined for commercial/industrial worker since no potential receptors identified for current land use and future land use is expected to be commercial/industrial;
- Identification of target levels – Target levels identified for the following: (i) indoor inhalation of vapors form subsurface soil for commercial/industrial worker; (ii) indoor inhalation of vapors from groundwater for commercial/industrial worker, (iii) combined pathways from soil for construction worker, (iv) combined pathways from groundwater for construction worker, (v) dermal contact with groundwater for construction worker, (vi) outdoor inhalation of vapors from groundwater for construction worker;
- Calculation of representative concentrations – maximum detected soil and groundwater concentrations obtained; and
- Comparison of representative concentrations with target levels – maximum detected soil and groundwater concentrations compared to target soil and groundwater levels, respectively.

The maximum detected soil and groundwater concentrations were compared with the soil target levels and groundwater target levels respectively. The maximum detected soil concentrations did not exceed the soil target levels for any of the COPCs. The maximum detected PCE concentration in groundwater exceeded the target level for indoor inhalation of vapors from groundwater for future commercial/industrial workers. However, the average concentration of PCE did not exceed the target levels for the indoor inhalation pathway from groundwater for commercial/industrial workers (Bhate, 2008).

C.2.3 EVALUATION OF RELEVANT INFORMATION

The analytical results from soil samples collected at Site OT-20 during the ACM investigation did not indicate any VOCs, SVOCs, TPH, PCBs, herbicides, pesticides, or RCRA metals in excess of the NMED SSLs. With the exception of PCE detected above the USEPA MCL in monitoring wells OT20-MW02 and OT20-MW03 there were no other exceedences (VOCs, SVOCs PCBs, herbicides, pesticides, or RCRA metals) detected above the USEPA MCLs or NMWQCC standards in the groundwater samples collected at Site OT-20. As a result of the two PCE exceedences detected in groundwater, a risk assessment was performed for potential future commercial/industrial workers and construction workers.

The TDS data collected from the four OT-20 monitoring wells are above 10,000 mg/L for each well, therefore as per NMED regulations the shallow groundwater is not considered potable and the groundwater pathway is considered incomplete (Bhate, 2008).

C.2.4 BASIS OF DETERMINATION

The maximum detected soil and groundwater concentrations were compared with the soil target levels and groundwater target levels respectively. The maximum detected soil concentrations did not exceed the soil target levels for any of the COPCs. The average concentration of PCE did not exceed the target levels for the indoor inhalation pathway from groundwater for commercial/industrial workers. Therefore, the current groundwater concentration is protective of future on-site commercial/industrial workers and future on-site construction workers. Therefore, HAFB requested NFA for Site OT-20 based upon Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on June 27, 20102 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for OT-20 is presented in the section NMED Letters of Approval at the end of this document.

C.2.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) June 2007. *Final Accelerated Corrective Measures Work Plan Multiple Sites, Holloman, AFB, New Mexico.*

Bhate April 2008. *Final Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20 Holloman, AFB, New Mexico.*

CH2M Hill, Inc. August 1983 *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico*.

New Mexico Environment Department (NMED) June 27, 2012, Approval: Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20, April 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-004).

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

C.3 SWMU NO. 114 – ERP Site OT-03

The following information was obtained from the *Final Accelerated Corrective Measures Completion Report Sites OT-03 and OT-45, Multiple Sites, Holloman Air Force Base, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.3.1 LOCATION/UNIT DESCRIPTION

SWMU 114 is listed as the Tetraethyl Lead (TEL) Disposal Site and ERP Site OT-03. OT-03 is located outside the east perimeter fence of the Petroleum Oil and Lubricants (POL) storage facilities (Figure A-1.2). It was utilized to dispose of the bottom sludge from fuel storage tanks (aviation gasoline [AVGAS], and jet propulsion fuel, Type 4 [JP-4]). From 1955 to 1975, wastes such as leaded fuel tank sludge, rusted metal fragments, rags, and hand tools were disposed of in the pit. The approximate extent of the disposal pit was thought to be 10 ft by 6 ft with an assumed depth of 4 ft.

C.3.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

In January 1980, the HAFB Bioenvironmental Engineering Department collected and analyzed eight soil samples from the OT-03 pit and surrounding area. The highest total lead concentrations (3,750 parts per million [ppm] and 1,500 ppm) were detected in the samples collected from within the pit. Lead was also detected at concentrations ranging from 157 to 550 ppm in samples collected from outside the pit (Andreoli, 1980).

A record search for Site OT-03 was conducted for the site. The record search concluded that the site was not considered to present a significant concern for adverse effects on health or the environment (CH2M Hill, 1983).

The current and anticipated future land use of OT-03 is industrial.

The following is a description of the history of remediation and investigation of OT-03.

1991 OT-03 Remedial Investigation

The site was reinvestigated in November 1991 (Radian, 1992). During that investigation, activities included trenching (two trenches 120 feet long) to locate and define the pit, collection and analysis of sidewall samples from the pit, and installation of a deep soil boring and a monitoring well. Total lead was detected in all the samples at concentrations ranging between 1.7 to 38 milligrams per kilogram (mg/kg). In the two subsurface soil samples that were collected for analysis; lead was detected in the 0 to 6 ft bgs waste interval at 50 mg/kg and at 48 mg/kg in the underlying soil. These concentrations were both well below the current NMED SSL for lead. Arsenic was also detected in one subsurface one soil sample with a concentration of 4.3 mg/kg, exceeding the current NMED SSL. All other metals detected in the waste and underlying undisturbed interval were measured at values less than their respective NMED SSLs. Two VOCs were also detected in both the waste and underlying soil sample, with the higher concentrations (1,600 micrograms per kilogram [µg/kg] of ethylbenzene and 3,300 µg/kg of xylenes) detected in the underlying soil sample.

The groundwater sample collected from one well contained lead (0.019 mg/L) and antimony (0.13 mg/L) were detected above their USEPA MCLs however, the lead in the sample is suspected to be a laboratory contaminant. Benzene (4,500 micrograms per liter [µg/L]), ethylbenzene (1,600 µg/L), and xylenes (700 µg/L) had the highest concentrations of detected VOCs. Additionally, TDS was recorded at a concentration of 14,000 mg/L, which exceeds the NMWQCC limit of 10,000 mg/L for potable water. The RI Report determined that the site should proceed to implementation of an IRP remedial action/RCRA corrective action remedy (Radian, 1992).

2007 OT-03 Accelerated Corrective Measures

ACM operations consisting of excavation of the pit and confirmation sampling was performed in order to obtain CAC for the site. Subsurface excavation operations for petroleum contaminated soil (PCS) began at OT-03 in August 2007 and excavated soil was stockpiled along the edge of the pit. The approximate area of the final excavation at OT-03 was 100 square ft to an average depth of 9 ft bgs. Figure C-3.1 shows the boundaries of the excavated area. The calculated volume removed from the OT-03 excavation was approximately 25 cubic yards. Five confirmation soil samples were collected from the sidewalls around the perimeter and on the floor bottom of the excavation. Additionally, three samples of stockpiled soil from spoils at OT-03 were collected for laboratory analysis. A summary of the results for the OT-03 excavation confirmation samples are presented in Table C.3.1.

No VOCs were detected above the method detection limits, and only one SVOC (diethylphthalate) was detected in the 5 confirmation samples collected. The singular detection of diethylphthalate was well below the NMED SSL. Additionally, total petroleum hydrocarbons (TPH) were analyzed for gasoline range organics (GRO) ($C_6 – C_{10}$), diesel range organics (DRO) ($C_{10} – C_{22}$), and oil range organics (ORO) ($>C_{22} – C_{36}$). The combined TPH concentrations at all of the confirmation samples were well below the NMED TPH Screening Guideline for Unknown oil.

Samples of stockpiled soil from the excavation were collected and analyzed to characterize the soil for offsite disposal. Onsite restoration activities at OT-03 included backfilling the excavation with clean soil (Bhate, 2008).

C.3.3 EVALUATION OF RELEVANT INFORMATION

PCS from OT-03 was excavated and transported for offsite disposal in August 2007. Confirmation soil samples collected from the sidewalls and bottom of the excavation at Site OT-03 provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs or NMED TPH Screening Guidelines for Unknown oil.

C.3.4 BASIS OF DETERMINATION

Based upon the previous site characterization and documentation of the additional excavation and disposal provided; NFA was requested for the POL Tank Sludge Burial Site (Bhate, 2008). NFA for Site OT-03 was requested based under Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on August 13, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for OT-03 is presented in the section NMED Letters of Approval at the end of this document.

C.3.5 REFERENCES

Andreoli, R.J., 2Lt, USAF, BSC. August 1980. Letter Report regarding *Evaluation of P.O.L. Tetraethyl Lead Disposal Site*.

Bhate Environmental Associates, Inc. (Bhate) June 2007. *Final Accelerated Corrective Measures Work Plan, Multiple Sites, Holloman Air Force Base, New Mexico.*

Bhate November 2008. *Final Accelerated Corrective Measures Completion Report Sites OT-03 and OT-45, Multiple Sites, Holloman Air Force Base, New Mexico.*

CH2M Hill, Inc. August 1983. *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico*.

New Mexico Environment Department (NMED) August 13, 2012, Approval: Accelerated Corrective Measures Completion Report, Sites OT-03 and OT-45, November 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-010).

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

C.4 SWMU NOS. 118, 132, AND AOC A – ERP Site OT-16

The following information was obtained from the *April 2009 – January 2010 Long-Term Monitoring Report for OT-16 (SWMUs 118 and 132 and AOC A), DP-30/SD (SWMU 113B), and SS-39 (SWMUs 165, 167, 177, 179, and 181), Holloman Air Force Base, New Mexico* (Tetra Tech, 2010) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.4.1 LOCATION/UNIT DESCRIPTION

SWMU Nos. 118, 132, and AOC-A are listed as Building 21 Pesticides Holding Tank, Building 21 Entomology Leachfield, and Building 21 Pesticide Rinse-water Spill Area, respectively, are also identified as ERP Site OT-16. OT-16 was located at former Building 21 in the southeastern portion of the Main Base Area and covered at area approximately 0.5 acres in size (Figure A-1.2). OT-16 encompasses former Building 21, a former truck wash rack (SWMU 79), a former pesticide plastic holding tank (SWMU 118), a former disposal pit (SWMU 132), and a former transformer pad (AOC-A). All concrete structures and features were demolished and removed in the mid-1990s. The site currently consists of a gravel and concrete-paved vehicle parking area and a large concrete pad used by the Honor Guard for training. Four monitoring wells are currently present on-site. A map of the site layout of OT-16 is provided in Figure C-4.1.

C.4.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Prior to its conversion into an entomology shop in 1977, Building 21 was a power plant that contained six (6) diesel generators and several transformers for power generation. After its conversion, Building 21 was utilized as the Base herbicide and pesticide storage facility. The weighing and mixing of the chemicals prior to application was conducted within the shop. From 1977 to 1980, rinse water from washing pesticide mixing equipment was discharged to a septic tank drain field located on the northwest side of the building (CH2M Hill, 1983). After 1980, rinse water and unused pesticides were collected in a 12-gal plastic aboveground holding tank (SWMU 118). Activities within the Entomology Shop ceased in 1992.

The current and anticipated future land use of OT-16 is industrial.

The following is a description of the history of remediation and investigation of OT-16

1992 OT-16 Remedial Investigation

OT-16 was identified as a potential contaminant source during an Installation Restoration Program (IRP) records search conducted in 1983 (CH2M Hill, 1983). A Phase I RI was conducted in 1992 (Radian, 1992). Based on the baseline risk assessment for OT-16, the RI concluded that no action was necessary, but recommended additional site characterization.

1994 – 1997 OT-16 RCRA Facility Investigations

A Phase II RFI conducted in 1994 included additional sampling and recommended a conditional NFA determination based on the remediation of TPH-contaminated soils that were discovered during the Phase II RFI. In 1996, approximately 107 tons of TPH-contaminated soil and 111 tons of polychlorinated biphenyls (PCB)-contaminated soil were excavated and removed from the site.

1997 - 2005 OT-16 Long Term Monitoring

Biennial LTM of the site monitoring wells began in 1997. In 2005, an LTM Report requested NFA under Criterion 5 (Bhate, 2006). This request was denied by NMED, which requested eight more quarters of groundwater data prior to approving the NFA request.

C.4.3 EVALUATION OF RELEVANT INFORMATION

As requested by NMED, eight quarterly groundwater sampling events were conducted between 2008 and 2010 (Tetra Tech, 2010). During the eight sampling events at OT-16, only dieldrin and gamma-BHC were detected in groundwater. Detections of dieldrin occurred only at two monitoring wells. Detections of dieldrin were less frequent than during the previous sampling events (1997-2005).

Groundwater analytical results from the last eight LTM sampling events are summarized in Table C.2.2. EPA MCLs and NMWQCC Standards are also included in the table for comparison purposes. Dieldrin was consistently detected at monitoring wells MW16-01 and MW16-2, but did not exceed either the EPA MCL or the NMWQCC Standard. Dieldrin was not detected during LTM sampling at monitoring wells MW16-03 and MW16-04 that represent downgradient locations. Gamma-BHC was detected only during the January 2010 sampling event in monitoring well MW16-02; the detected concentration was below both the EPA MCL and the NMWQCC Standard. Pesticides have not exceeded the applicable groundwater standards during any of the last eight LTM sampling events at OT-16.

Although the TDS values of groundwater at site OT-16 did not typically exceed the 10,000 mg/L threshold during the 2009 through 2010 sampling events, the site groundwater is not considered suitable as a potable water source for the following reasons:

- TDS values have exceeded 10,000 mg/L during earlier LTM sampling events.
- TDS values have ranged widely since LTM began in 2008 (2,340 to 14,000 mg/L) indicating a possible dilution source (i.e., storm water concentration, water line leak, sewer line leak).
- TDS concentrations at OT-16, which are mostly below 10,000 mg/L, are not typical of the groundwater in surrounding areas at HAFB. This isolated area of TDS values below 10,000 mg/L is another indication that groundwater is potentially being diluted by other water sources.

C.4.4 BASIS OF DETERMINATION

The groundwater data show that OT-16 is not acting as a source area for pesticides and no longer poses a threat to groundwater quality. Further characterization of groundwater contamination at OT-16 is not needed. A request for NFA was requested based under Closure Criterion #5 which states:

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

On 24, May 2012, the NMED concurred with the LTM conclusion and CAC status (NMED's new classification of NFA) was granted by NMED on May 24, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for OT-16 is presented in the section NMED Letters of Approval at the end of this document.

C.4.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) May 2006. Final 2005 Long-Term Groundwater Monitoring Report, Holloman AFB, New Mexico.

CH2M Hill, Inc. August 1983. *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico.*

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C.5 SWMU NO. 183 – ERP Site N/A

The following information was obtained from the *Final RCRA Facility Investigation Report SWMU 183 – Basewide Sewer System, Holloman Air Force Base, New Mexico* (NationView, 2012) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2014).

C.5.1 LOCATION/UNIT DESCRIPTION

SWMU 183 is listed as Base-Wide Sewer System. It is a subsurface system constructed in 1947 that comprises approximately 165,000 linear ft of sewer line and serves both residential and industrial facilities at HAFB. The Base-Wide Sewer System is divided into ten (10) Sub-Basins and includes 715 active and 131 inactive (abandoned and removed) manholes, 24 lift (pumping) stations, and hundreds of variably contributing sources distributed throughout the entire base. Waste sources contributing to potential contamination of SWMU-183 include direct discharges from industrial/operational facilities and domestic structures, as well as pass-through discharges from additional waste management systems such as OWSs. The sewer collects and transports both sanitary and mixed industrial wastes to the HAFB's wastewater treatment plant (WWTP), which was constructed in 1996 to process 1.5 million gallons per day (gpd), and is located at the central-southern boundary of HAFB (Radian, 1998). Because the sewer system is extensive and covers the entire base it is displayed only on the site map. The site map of the Base-Wide Sewer System is provided in Figure C-5.1.

C.5.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Historically industrial operation facilities at HAFB produced a variety of wastes, many of which were discharged into the sewer system. In a prior industrial wastewater pretreatment study the industrial wastewater discharges of fifty-five industrial facilities were assessed to identify chemicals of potential concern (COPCs) that were being introduced into the wastewater system. The study identified a number of COPCs, including:

- Volatile organic compounds (VOCs);
- Semi-volatile organic compounds (SVOCs);
- Petroleum, oil, and lubricants (POLs);
- Oil and grease;
- Heavy metals;
- Herbicides and pesticides;
- Total Suspended Solids (TSS);
- Biological oxygen demand (BOD) and chemical oxygen demand (COD);
- Phosphates, sulfides, and chlorides; and
- Possible radionuclides (Carbon-14, tritium, iodine 125, radium 226, and radium 228).

Common waste generating activities had included vehicle, aircraft, equipment, and floor washing; x-ray and photo processing; and fuel canister rinsing. Many of these facilities used pretreatment features such as grit chambers, grease traps, holding ponds, and OWSs before wastes were discharged into the sewer system (Ecology & Environment, 1998). Plates 1 and 2 in Attachment 2 of this report show the locations of all the buildings identified as discharging

COPCs into the sewer system as well as the HAFB-designated Sewer Sub-Basins each locate within.

Suspected Sewer Release Locations

There are currently three areas within the HAFB sewer system where suspected releases are thought to have occurred due to reported breaks in the sewer line (shown on Plates 1 and 2 – Attachment 2).

The current and former Primate Research Institutes are located in Sub-Basins 8 and 9 of the HAFB sewer system respectively. Two sewer line collapses have been reported, downgradient of the facilities, along the main north-south trending sewer lines conveying effluent from both facilities. These sewer line collapse areas are presented on Plate 1 (Attachment 2) as Suspected Sewage Release Areas #1 and #2. COPCs which have historically been used at the current and former Primate Research Institutes include carbon-14, iodine-125, radium 226 and 228, tritium tracers, and solvents. These COPCs may have entered the sewer system at either or both facilities in the past (over 30 years ago), and subsequently been released into the subsurface at the collapsed sections.

Additionally, a third sewer line break reportedly occurred within the central portion of Sub-Basin 5 of the HAFB sewer system. This potential release location is labeled as the Suspected Sewer/Natural Gas Release Area on Plate 2 (Attachment 2). It is unknown what specific COPCs may have been discharged from this reported break.

The current and anticipated future land use of SWMU 183 is industrial.

The following is a description of the history of remediation and investigation of SWMU-183.

1995 RCRA Facility Investigation

In April 1995 a Phase II RFI Work Plan was developed in response to an EPA policy wherein sewer systems were to be treated and characterized as SWMUs (FWEC/Radian, 1995). A series of remedial actions to remove OWS units, removal and/or capping of associated piping, contaminated soil excavation, and OWS system removal throughout HAFB associated with the base-wide sewer system has occurred since the mid-1990s (EBASCO, 1995).

1997 Industrial Wastewater Pretreatment Study

In 1997 an industrial wastewater pretreatment study was conducted in support of developing an Industrial Wastewater Pretreatment Management Plan (IWPMP) and Customer Concept Document (CCD) (Ecology & Environment, 1998). The scope of the three-phase study was to:

1. Identify wasterwater sources and COPCs from the industrial activities at the base;
2. Develop a sampling and analysis plan (SAP) and associated Health and Safety Plan (HASP) for the purpose of collecting detailed industrial wastewater and treatment works characterization data, develop a Pollution Prevention Technical Report, and develop a Pretreatment Management Technical Report; and

3. Develop a Pre-Concept Analysis and Design, a CCD technical report, and environmental justification for the project.

Fifty-five industrial facilities, comprising approximately eighty buildings, were surveyed (Ecology & Environment, 1998). The study represents the most comprehensive understanding of the nature and likely source of various wastes historically discharged into the sewer, and therefore, served as a substantive guidance for the development of the 2012 RFI (NationView, 2012).

1998 Infiltration and Inflow Study

In 1998 an infiltration and inflow (I/I) study was conducted on the HAFB sewer system to determine if the system had excessive groundwater infiltration or storm water inflow that could potentially lead to regulatory noncompliance. Three phases of field work were conducted, including:

1) sewage flow, rainfall monitoring, and manhole inspections;
2) smoke testing, and;
3) TV inspection and dyed-water flooding.

Structural and hydraulic problems were identified; more significantly, the main problem identified was excessive inflow into the system (Radian, 1998). The following study findings were pertinent to the physical condition of the sewer system as potentially relevant to the 2005 RFI:

Structural Condition

Although most of the active lines in the sewer system were determined to have been repaired or replaced, there were still a number of lines that were in critical and serious structural condition which needed to be addressed. Some sections of sewer line in the southern portion of the base could have been impacted by hydrogen sulfide generated in the lines and were corroded.

Hydraulic Condition

Some of the newer sewer lines were determined to be in good structural condition, but have poor hydraulics. Mismatched inverts, very low slopes, and sagging had all contributed to a buildup of debris in the lines. The majority of lines observed contained debris, some with accumulations of up to 30% of the pipe diameter. Despite this, most of the lines were determined to have sufficient capacity to convey the required flows. A minor number of lines were observed to exceed their capacity as evidenced by in manhole surcharging (i.e., no surface discharge).

Steady Infiltration

Flow monitoring data indicated that approximately 542,000 gpd of steady I/I enters the sewer system. The average base flow measured (sewage generation rates not including I/I) for the facility was approximately 485,000 gpd. These data indicated that I/I volumes exceeded the average base flow, and was also greater than what was generally considered to be excessive. The majority of I/I to the system was determined to be groundwater capture via service lines and laterals located beneath the water table. This situation is most prevalent in the southeastern area of HAFB (main base area) where the depth to groundwater is relatively shallow (5 ft or less).

Stormwater Inflow and Infiltration

During the smoke testing conducted in select portions of the system, approximately 30 sources of possible stormwater inflow were identified. It was concluded that stormwater inflow at HAFB is not a significant concern due to the small amount of regional rainfall. Only four lines were found to exceed the line capacity following a large rainfall.

2005 Environmental Assessment for Wastewater Utilities Privatization

In 2005 the Air Force conducted an Environmental Assessment (EA) to analyze and evaluate the possibility of selling the HAFB wastewater collection and treatment system to an outside private entity. The purpose of the proposed action was to meet Congressional and Office of the Secretary of Defense (OSD) mandates regarding the privatization of non-combat military activities, including utilities.

The EA analyzed ten (10) resource areas for both the proposed action and the no action alternative. The resource areas included: physiography, geology, and topography; soils; water resources; biological resources; air quality; land use; socioeconomic conditions; and cultural resources.

The EA analysis concluded that, as long as the functioning of the HAFB wastewater collection and treatment system remained substantially the same, there would be no significant environmental impacts resulting from the proposed action. No significant environmental impacts were identified, however, it was determined that the transfer could potentially cause significant regulatory, economic, and/or mission risk and was not sold (NationView, 2012).

Oil/Water Separator (OWS) Removals

A series of investigations and corrective actions to remove OWSs have been conducted at HAFB since the mid-1990s. These corrective actions have included removal of OWS units, removal and/or capping of associated piping, removal of contaminated soils, and replacing select OWS systems or connecting building discharges directly to the sewer system. Each of the OWS systems are regulated RCRA SWMUs listed in the HAFB RCRA operating permit.

2009 Conceptual Site Model

Various information and data from these previous programs was used to develop the Initial Conceptual Site Model (CSM). The Initial CSM development efforts were used to create the following summary description, as well as Figure C-5.2, a detailed 3-dimensional representation of the CSM.

SWMU 183 is a subsurface sewer system that serves the developed portions of the approximately 60,000-acre property comprising HAFB. The system is comprised of:

- Approximately 165,000 linear feet of sewer line constructed of various materials,

- 715 active and 131 inactive (abandoned/removed) manholes,
- 24 lift (pumping) stations and force mains,
- 17 wash racks,
- 18 active and 23 inactive oil/water separators,
- WWTP, and
- Hundreds of variably contributing sources distributed throughout the entire Base, including discharges from 55 operational facilities as well as domestic structures.

Although the WWTP is part of the sewer system, it is regulated under a separate NPDES permit, and therefore, is not part of SWMU 183. The WWTP was designed for flows of 1.5 MGD and has experienced actual flows of approximately 1.0 MGD. The operations-related contribution to the sewer is estimated at 58,000 gpd or 6% of the total flow. Flows attributable to the permanent and commuter populations (sanitary waste) is estimated at 427,000 gpd or 42% of the total. Steady infiltration and inflow is estimated at 542,000 gpd or 52% of the total (Radian, 1998).

2010 RCRA Facility Investigations

In 2010, Phase I and II field activities were conducted at SWMU 183 in order to identify potential releases to subsurface soil at the most probable sewer line locations and to collect sufficient analytical data for a human health and ecological RA.

During the Phase I investigation, 52 soil borings were advanced at critical junctions along 165,000 linear feet of sewer line within the 10 Sub-Basins that comprise the HAFB sewer system illustrated in Attachment 2 (Plates 1 and 2). The borehole sampling locations were selected based on the following criteria:

- Major sewer pipe junctions
- Downgradient from suspected releases
- Downgradient from SWMUs with suspected or known releases
- Location where two sewer lines with different diameters and/or construction material connect

Phase I soil samples were analyzed for the following:

- VOCs
- SVOCs
- TPH
- Target Analyte List (TAL) Metals
- PCBs
- Nitrate
- Sulfate
- Chloride
- Moisture Content

Sub-Basins 4, 8, and 9 have unique COPCs that required additional sampling parameters. In addition to the analyses listed above the following analyses were included for Sub-Basins 4, 8, and 9:

- Pesticides and Herbicides (Sub-Basin 4 only)
- Radionuclides (Carbon-14, Tritium, Radium 226 and 228) (Sub-Basins 8 and 9 only)
- Perchlorate (Sub-Basin 8 only)

A variance for relocating four DPT boreholes was executed during the performance of the Phase I SWMU 183 RFI. During the Phase II investigation, nine (9) soil borings were advanced at the Phase I borehole locations containing COPCs which exceeded the applicable soil screening criteria (Plate 2 - Attachment 2). Each of the nine (9) Phase II soil borings was converted into a permanent monitoring well to determine if there were any impacts to groundwater quality. All of the Phase II soil and groundwater samples were analyzed for the following analyses:

- VOCs
- SVOCs
- TPH
- TAL Metals
- PCBs
- Nitrate
- Sulfate
- Chloride
- Percent Solids (soil only)
- Pesticides and Herbicides (Sub-Basin 4 only)
- TDS (groundwater only)

Evaluation of the relevant Phase I and II Investigation sample analyses is presented in the following Sub-Section. Soil and groundwater sampling results are presented in Figures C-5.3 through C-5.8 taken from the final RFI report submitted to the NMED (NationView, 2012).

C.5.3 EVALUATION OF RELEVANT INFORMATION

The following is a summary of the relevant results from the RCRA Facility Phase I and II field activities presented *Final RCRA Facility Investigation Report, SWMU 183 – Basewide Sewer System, Holloman Air Force Base, New Mexico* (NationView, 2012).

A total of 59 soil samples (including duplicates) were collected from the Phase I soil borings. The Phase I soil samples were analyzed for Sub-Basin specific COPCs specified in the previous section. With the exception of eight arsenic detections (Sub-Basins 1, 4, and 10) and one detection of combined TPH-GRO, - DRO and –ORO (Sub-Basin 1), all detections of VOCs, SVOCs, TPH, TAL metals, PCBs, nitrate, sulfate chloride, pesticides, herbicides, radionuclides, and perchlorate were below their applicable Residential NMED SSLs/USEPA RSLs or NMED TPH Screening Guidelines. Arsenic concentrations for 8 of the 9 samples were above the NMED SSL and the approved NMED background level. However, the Phase II subsurface soil sample result for arsenic for soil sample SWMU183-DP54-9 (same soil boring location as SWMU183- DP18) was detected below the NMED SSL. Therefore, this data suggests that these exceedences are most likely due to the natural variability of soil geochemistry and are not due to a release from the sewer. Furthermore, the singular combined concentration of TPH-GRO, DRO, and –ORO detected in the duplicate soil sample has a combined TPH concentration in the primary sample which is well below the TPH Screening Guideline for and unknown oil.

During the Phase II investigation a total of ten soil samples were collected from nine soil borings advanced in Sub-Basins 1, 4 and 10 (Plate 2 - Attachment 2). The Phase II soil samples were analyzed for Sub-Basin specific COPCs. These soil borings were drilled adjacent to the Phase I boreholes which had arsenic and TPH detections that exceeded their applicable screening criteria. With the exception of two detections of arsenic (Sub-Basins 1 and 10), all detections of VOCs, SVOCs, TPH, TAL metals, PCBs, nitrate, sulfate, chloride, pesticides, and herbicides were below their applicable Residential NMED SSLs/USEPA RSLs or NMED TPH Screening Guidelines. The two detections of arsenic were slightly above the NMED SSL and the approved NMED background level and most likely represent the natural variability of soil geochemistry and are not due to a release from the sewer.

Each of the nine Phase II soil borings was converted into a permanent monitoring well to determine if there were any impacts to groundwater quality. The Phase II groundwater samples were analyzed for Sub-Basin specific COPCs specified. All detected concentrations of SVOCs, TPH fractions, and PCBs were well below their respective water quality action levels. With the exception of TCE, all VOCs were not detected or were below the USEPA MCLs. TCE was detected at and slightly above the USEPA MCL in Sub-Basin 10 and Sub-Basin 1. As the sewer line is below the water table in Sub-Basins 1 and 10 it is unlikely that these detections represent a release from the sewer line as the gradient is inward from the aquifer into the sewer (Figure C-5.1). Therefore, these two detections of TCE are most likely due to the adjacent ERP sites (OT-20 [located upgradient of Sub-Basin 1 and SS-69 [located upgradient of Sub-Basin 10]) with known existing TCE groundwater contamination. The portion of the HAFB sewer system located within Sub-Basins 1 and 10 is below the water table. Therefore, low levels of TCE groundwater contamination may be infiltrating the sewer line in the vicinity of ERP Sites OT-20 (Sub-Basin 1) and SS-69 (Sub-Basin 10) which is further diluted by the average 1.0 MGD flow to the HAFB WWTP which is located adjacent to Sub-Basins 1 and 10 within the southern portion of HAFB. Furthermore, the HAFB WWTP is meeting the discharge requirements as specified by the National Pollutant Discharge Elimination System (NPDES) Permit No. NM0029971 (USEPA, 2006) in compliance with the provisions of the Clean Water Act.

In addition, arsenic and/or manganese were detected above their applicable USEPA MCL or USEPA Secondary MCL in Sub-Basin 1, 4, and 10 groundwater samples. Arsenic was detected in one groundwater sample (Sub-Basin 10) above the USEPA MCL but below the HAFB Basewide Background Upper Tolerance Limit (UTL) which indicates that this exceedence most likely represents the natural variability of groundwater geochemistry at HAFB. Eight monitoring wells had manganese concentrations above the USEPA Secondary MCL. These detections of manganese are most likely due to the natural variability of groundwater geochemistry and are not related to a release from the sewer as the sewer line is below the water table within Sub-Basins1, 4, and 10. Additionally, the National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause aesthetic effects (such as taste, odor, or color) in drinking water (USEPA, 2009).

TDS concentrations within Sub-Basins 1, 4, and 10 ranged from 3,140 mg/L to 41,500 mg/L. As previously discussed, TDS concentrations below 10,000 mg/L are due to anthropogenic influences (i.e., leaking underground water lines) as Sub-Basins 1, 4, and 10 are located within the developed portion of HAFB which contains numerous water lines. Furthermore, groundwater with TDS concentrations greater than 10,000 mg/L is classified by the USEPA as a Class III B aquifer which is designated as unfit for human consumption (USEPA, 1986).

C.5.4 BASIS OF DETERMINATION

Based on the determination that no source area was detected above the current NMED SSLs at SWMU 183 through additional characterization activities (soil and groundwater sampling), excavation of contaminated soil was not required for SWMU 183 for site closure. HAFB submitted a request to the NMED for NFA status (NationView, 2012). NFA was requested based under Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on June 13, 2014 (NMED, 2014). The letter from NMED to HAFB indicating CAC without controls for SWMU-183 is presented in the section NMED Letters of Approval at the end of this document.

C.5.5 REFERENCES

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Foster Wheeler Environmental Corporation (FWEC) and Radian Corporation. April 1995. *Phase II RCRA Facility Investigation Work Plan; Air Base Sewer System*.

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USEPA. August 29, 2006. *Holloman Air Force Base Wastewater Treatment Plant,National Pollutant Discharge Elimination System, NPDES Permit No. NM0029971.*

USEPA. May 2009. *National Priority Drinking Water Regulations.* EPA 816-F-09-004.

C.6 AOC-1 – ERP Site DP-64

The following information was obtained from the *Final RCRA Facility Investigation Report, Chemical Agent Disposal Site (DP-64), Holloman Air Force Base, New Mexico* (Bhate, 2012) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2013).

C.6.1 LOCATION/UNIT DESCRIPTION

AOC-1 is listed as Chemical Agent Site and ERP Site DP-64. It is located in the northeastern portion of HAFB on the north side and adjacent to the former Main Base Landfill (LF-01) (Figure A-1.2). The total area of the DP-64 site is approximately 5.5 acres and is partially surrounded by a chain-link fence. A site map of DP-64 is provided in Figure C-6.1.

During the 1950s, the Chemical Test Squadron from Edgewood Maryland flew missions to HAFB, although, no documentation has been found to indicate the testing of any chemical agents occurred at DP-64, M4 sulfur mustard vapor detection kits and detonation chemical agent identification sets (CAIS) were historically used at HAFB. CAIS kits were widely used by the Army for training purposes. In the 1996 *Survey and Analysis Report, Second Edition*, (U.S. Army Program Manager for Chemical Demilitarization, 1996) Alamogordo Army Air Base was identified as a location where CAIS had been recovered.

C.6.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

The current and anticipated future land use of DP-64 is industrial.

The following is a description of the history of remediation and investigation of DP-64.

2000 DP-64 Ordnance Discovery

DP-64 site was discovered in 2000 when a pedestrian walking in the area discovered several broken vials and two intact vials containing a clear to yellowish liquid walking north of the closed Main Base Landfill (LF-01) site during a revegetation project at LF-01. Upon reporting the findings, the vials were located, recovered, and transported for analysis. The analysis indicated that was on vial contained 5 percent of the chemical warfare agent Lewisite in chloroform (Zapata, 2005).

2004 DP-64 Ordnance and Explosives Removal Action

A Chemical Safety Submission (CSS) (FWEC, 2003) which was then supplemented by the two work plans were prepared for removal of the ordnance and explosives at HAFB. In 2004, investigative and removal activities were conducted at DP-64 and the results were submitted in the *Final Site Specific Final Report* [SSFR] *for Ordnance and Explosive Removal Action at Holloman Air Force Base New Mexico*. During the SSFR activities, all CAIS components, munitions, and debris were classified and recovered by HAFB Explosive Ordnance Disposal (EOD) personnel (Zapata, 2005).

Geophysical Survey

The final SSFR work plan, field activities included a detailed surface search and debris removal action, a subsurface geophysical survey to locate subsurface anomalies, and excavation of the identified subsurface anomalies.

The initial surface search conducted by unexploded ordnance (UXO) specialists resulted in the discovery of one intact glass ampoule and several broken shards of glass from CAIS kits. Two soil samples were collected from under the intact ampoule and under the area where the broken ampoule was identified (Figure C-6.2). The analytical results from the soil samples indicated negative results for chemical agents and agent breakdown products. The total surface search at DP-64 included, 24 grids, each 100 feet (ft) by 100 ft in area.

A subsurface geophysical investigation was conducted at DP-64. The investigation encompassed an area of 400 ft by 600 ft (5.5 acres). The geophysical survey identified 123 subsurface anomalies that that were later excavated. One hundred twenty-one (121) of the anomalies, were identified as scrap metal, and were attributed to the former Main Base Landfill, LF-01. The remainder of the anomalies were excavated and removed by the HAFB Explosive Ordnance Disposal (EOD) personnel for disposal.

According to the Final SSFR, a total of fifteen CAIS kit components were recovered, packaged, and stored during this field effort. Seventeen electric blasting caps, seven M3 grenade igniters, and seven complete and partial M69 incendiary bomblets were also recovered by HAFB EOD personnel for disposal during the surface and subsurface investigations. The Zapata investigation concluded that a widespread threat of Munitions and Explosives of Concern (MEC) or Recovered Chemical Warfare Material (RCWM) in the area surrounding DP- 64 was unlikely due to the fact that the surrounding acreage had been disturbed in the past by the construction of roads and a capped landfill adjacent to the site.

On April 14, 2006, the NMED issued a Notice of Deficiency (NOD) letter for the Final SSFR. In the NOD the NMED requested that additional sampling be conducted at DP-64. NMED requested additional soil sampling at five geophysical anomalies associated with previous “burn pit” locations (Figure C-6.3).

2008 DP-64 RCRA Facility Investigation

The *RFI Work Plan, Chemical Agent Disposal Site (DP-64), Holloman Air Force Base, New Mexico* (Bhate, 2008) was designed based on the 2006 NOD letter. On January 30, 2008, an NOD was issued for the DP-64 RFI Work Plan (Bhate, 2008) by the NMED, in which the NMED requested a minimum of three groundwater monitoring wells be installed at the DP-64 site and sampled for VOCs, SVOCs, RCRA Metals, Explosives, Nitrates/Nitrites, and TDS. This NOD letter also requested that metals detected in the DP-64 soil samples be compared to the NMED SSLs (NMED, 2009) and the NMED approved background levels (NMED, 2011).

In order to meet the objectives identified by NMED, HAFB performed the following activities:

- Installed four new monitoring wells;

- Advanced five soil borings and collected fifteen soil samples (3 per borehole) to characterize soil conditions at geophysical anomalies 104, 105, 109, 112, and 137;
- Collected a groundwater sample from one existing down-gradient monitoring well to the south of DP-64;
- Collected groundwater samples from the four new monitoring wells;
- Analyzed soil samples for VOCs, SVOCs, RCRA metals, and Explosives; and
- Analyzed groundwater samples for VOCs, SVOCs, RCRA metals, Explosives, Nitrate/Nitrite, and TDS.

The objectives of the RFI at DP-64 were to:

1) Determine if any soil, and/or groundwater contamination exist at the site,
2) Delineate the current horizontal and vertical extent of the potential contamination, and
3) Collect the proper data meeting the data quality objectives (DQOs) to support closure of the site.

The ultimate objective was to achieve approval for site closure from NMED. Soil and groundwater analytical results are summarized in Tables C.6.1 and C.6.2 respectively. The soil and groundwater sampling locations from this investigation are shown on Figures C-6.4 and C-6.5.

Soil Analytical Results

The residential SSLs established in the *NMED Technical Background Document for Development of Soil Screening Levels Revision 5.0* (NMED, 2009) were used as the primary action levels or VOCs, SVOCs, Explosives, and RCRA metals.

Three VOCs were detected above the method detection limit (MDL) in the seventeen soil samples collected. Estimated results (less than the RL [J]) of 1,1-dichloroethylene toluene were detected. Both VOCs were detected well below their respective NMED SSLs (NMED, 2009). Methylene chloride (a common laboratory contaminant) was also detected in the majority of the seventeen soil samples submitted for analysis but were “J” qualified. Additionally no SVOCs were detected in any of the soil samples.

One explosive was detected above the MDL in one of the seventeen soil samples collected. 2,6 - Dinitrotoluene was detected in soil sample DP64-SB06-17-a, however, this estimated detection of 2,6-dinitrotoluene was well below the NMED SSL (NMED, 2009).

Each of the eight RCRA metals was detected above the MDL. The maximum detections of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver were well below their respective NMED SSLs (NMED, 2009). As shown on Table C.6.1, two metals (cadmium and selenium) exceeded their respective NMED approved background levels (NMED, 2011).

Groundwater Analytical Results

Three RCRA metals were detected above their respective MDLs in the groundwater samples collected at site DP-64. Maximum concentrations of barium and selenium were detected well below their respective USEPA MCLs and NMWQCC Standards. Arsenic, detected at an estimated detection below the RL (RL was elevated due to matrix interference). Arsenic exceeded the USEPA MCL and the NMED approved background level for filtered constituents in groundwater (NMED, 2011). However, it should be noted that the estimated concentration of arsenic falls within the range of dissolved arsenic detections in groundwater samples collected from twenty-four wells across the base in the Basewide Background Study (NationView/Bhate JV III, 2011). Because this estimated concentration of arsenic falls within this range it most likely represents the natural variability of groundwater geochemistry occurring across the base.

Sec-butylbenzene was the only VOC detected above the MDL in the groundwater samples collected during this RFI field effort. The detection of sec-butylbenzene does not exceed any applicable USEPA MCLs or NMWQCC standards (NMAC 20.6.2.3103). No SVOCs or explosives were detected in any of the groundwater samples collected.

The six groundwater samples collected were also analyzed for nitrite, nitrate, and TDS. Nitrite was not detected above the MDL in any of the groundwater samples collected. Nitrate was detected in all the monitoring wells. However, the maximum nitrate concentration, detected in the duplicate sample collected from monitoring well DP64-MW03, was below the USEPA MCL and the NMWQCC Standard. TDS values exceeded the NMWQCC standard of 1,000 mg/L in each well. Groundwater with TDS greater than 10,000 mg/L is classified by the USEPA as Class III B (USEPA, 1986), which is designated unfit for human consumption.

C.6.3 EVALUATION OF RELEVANT INFORMATION

All debris associated with the Chemical Agent Disposal Site DP-64, was characterized and removed in 2004 as described in the SSFR (Zapata, 2004). Analytical results from the seventeen soil samples collected during the RFI, at five geophysical anomalies requiring additional investigation, did not contain VOCs, SVOCs, explosives, or RCRA metals above NMED SSLs (NMED, 2009). With the exception of a singular estimated arsenic detection, in the groundwater sample collected from one monitoring all other analyses did not exceed the USEPA MCLs or NMWQCC standards, in any of the groundwater samples. Although this estimated detection of arsenic exceeded the USEPA MCL, it is below the calculated UTL, and most likely represents the natural variability of groundwater geochemistry across the base. Furthermore, TDS values were well above 10,000 mg/L in all five (5) wells sampled, making the groundwater unfit for human consumption.

C.6.4 BASIS OF DETERMINATION

Based on the additional characterization activities (soil and groundwater sampling) conducted during the RFI, no source area was detected above the current NMED SSLs at DP-64. Therefore, excavation of contaminated soil was not required for DP-64 for site closure (Bhate, 2012). NFA was requested based under Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on October 8, 2013 (NMED, 2013). The letter from NMED to HAFB indicating CAC without controls for DP-64 is presented in the section NMED Letters of Approval at the end of this document.

C.6.5 REFERENCES

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C.7 AOC-3 – ERP Site DP-63

The following information was obtained from the *Final DP-63 Accelerated Corrective Measures Completion Report Holloman Air Force Base, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.7.1 LOCATION/UNIT DESCRIPTION

AOC-3 Ammunition Yard Disposal Pit, ERP Site DP-63, is comprised of three separate disposal areas designated as the East, West, and North disposal pits. The DP-63 Site is located in the northern portion of the Ammunition Storage Facility on the eastern side of HAFB (Figure A-1.2). A site map of DP-63 is provided in Figure C-7.1.

C.7.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

During past operations munitions were placed into the disposal pits with diesel fuel and wood pallets and ignited to render the ordnance inert. Fuel may have seeped into the soil directly below the disposal areas. The types of ordnance that were treated include munitions ranging from 20-caliber to 50-caliber small arms rounds and grenades. Base environmental personnel performed a visual inspection of the area during the summer of 1997 and found scrap metal fragments from disposed munitions exposed on the ground surface throughout the area as a result of erosion. Originally, the disposal pit areas were located immediately north and outside of the facility, but during an expansion of the storage yard in the 1960s, DP-63 became part of the Ammunition Storage Facility (with the exception of the North Area).

The current and anticipated future land use of DP-63 is industrial.

The following is a description of the history of remediation and investigation of DP-63.

2000 DP-63 Preliminary Assessment/Site Inspection

A PA/SI at DP-63 was performed by Foster Wheeler Environmental Corporation (FWEC, 2001) to evaluate any soil and/or groundwater contamination at the site. The PA/SI field activities included:

- A records search was performed to determine the areas of potential concern,
- A geophysical survey was performed to locate buried metal debris, and
- Four (4) direct push technology (DPT) sampling locations selected for soil and groundwater sampling to determine the extent of any soil and/or groundwater contamination at the East and West Areas.

During the soil sampling events TRPH was detected in nine (9) of the twelve (12) soil samples. All TRPH concentrations were below the NMED TPH Screening Guidelines. All VOC and SVOC detections were below their NMED SSLs. Pesticides and PCBs were not detected in any of the soil samples.

TAL metals were detected in all 12 samples collected during the PA/SI field investigation. With the exception of one arsenic detection arsenic at 20 ft bgs from borehole DP03 and one detection of manganese at 46 to 47 ft bgs from borehole DP02, all other TAL metals concentrations were below their respective NMED SSLs. The concentration of arsenic exceeded the NMED SSL and most likely represents the natural variability in soil geochemistry. The detection of manganese that exceeded the NMED residential SSL, however, two samples collected at 7 and 17 ft bgs had detections significantly lower that the NMED screening level. This would indicate that the detection of manganese at 46 to 47 ft bgs was not related to a release from the East disposal pit and that it likely represents the natural soil geochemistry (FWEC, 2001).

Analytical results confirmed that the groundwater at DP-63 contains no explosives and the free-phase fuel product was not observed in any of the groundwater samples, however, the low concentrations of organic constituents (carbon disulfide and 2-butanone) in a couple of the soil samples indicates that the groundwater has been potentially impacted by dissolved constituents (FWEC, 2001).

2001- 2002 DP-63 Remedial Investigation

A RI of the three disposal areas was conducted at DP-63 in 2002. DPT borings were advanced at fifteen locations and five monitoring wells were installed. Results of the field work, the human health risk assessment, and the ecological risk assessment were presented in the *Draft Report for the Remedial Investigation of DP-63 – Disposal Pit 63,* Foster Wheeler, December 2002.

Soil samples were analyzed for VOCs, SVOCs, explosives, TAL metals, cyanide, and TPH-GRO, DRO, and ORO. Groundwater samples collected were analyzed for VOCs, SVOCs, explosives, TAL metals, and TDS.

In August 2001, five monitoring wells were installed to assess the groundwater quality in the North and East disposal pit areas. An upgradient well was installed to establish background concentrations for the site. Two monitoring wells were installed at the North and East disposal pit areas. Groundwater samples collected were analyzed for VOCs, SVOCs, explosives, TAL metals, and TDS.

With the exception of benzene all detected VOCs were below their respective USEPA MCLs and NMWQCC standards. Benzene was detected in the groundwater samples collected from MW02 and MW03. No SVOCs or explosive constituents were identified above detection limits in any of the groundwater samples. NMWQCC standards were exceeded for two metals (iron and manganese) detected in groundwater samples.

A total of 67 soil samples were collected. TPHs were detected in 10 of the 67 soil samples collected in each of the three disposal pit areas (East, West, and North) from 0.5 to 21 ft bgs. However, no TPH concentrations were above the NMED TPH Screening Guidelines.

All VOCs detected were reported below the NMED SSLs and with either "J" or "B" data qualifiers indicating that the analyte was also detected in the laboratory method blank or was an estimated value. Two SVOCs were detected in the soil boring samples. Bis(2-ethylhexyl)phthalate and diethyl-phthalate were detected in low concentrations in eight soil samples collected from the North, East, and West disposal pit areas well below their respective

NMED SSLs. Also, lead and arsenic exceeded NMED SSLs in a limited number of samples and did not correlate with the other contaminants. The RI report concluded the presence of these metals most likely represents the natural variability of soil geochemistry (FWEC, 2002).

2005-2006 DP-63 Munitions and Explosives of Concern Remedial Action

Between September 2005 and September 2006 Munitions and Explosives of Concern (MEC) removal activities were performed at the three disposal pits within Site DP-63. The methods, procedures, and removal of MD, UXO from the three DP-63 disposal pit areas, and the asbestos-containing material that was discovered in the North pit are is described in the *Draft After Action Report Disposal Pit 63 (DP-63) Holloman Air Force Base, New Mexico* (Bhate, 2006).

Soil excavation and mechanical screening of soil was performed in the East, West, and North disposal pits. UXO personnel performed clearance of excavation activities. Gray transite tiles were discovered during the surface clearance and temporarily suspended operations in the North pit. An asbestos abatement crew was contracted to remove the gray transite tiles and transport them to a Class D landfill.

The total of MEC located and removed from the DP-63 Site during this project included one 7.62 millimeter (mm) small arms round, one MK2 grenade fuse, one partial flare, four squibs, forty 0.50-caliber cartridges, and one 0.30-caliber cartridge. Munitions debris (MD) located and removed from each of the three disposal pit areas during this project totaled 13,540 pounds (lbs). All MEC encountered during project operations were removed from the DP-63 Site and released to HAFB explosive ordinance disposal (EOD) personnel for safe disposition (Bhate, 2006).

2006 - 2007 Accelerated Corrective Measures Investigation

The purpose of additional ACM source area characterization was to collect soil and groundwater data to fill data gaps and to remove PCS through excavation. Excavation operations for the removal of MEC, asbestos, and petroleum contaminated soil was conducted in three phases. To determine the effectiveness of the ACM Remedial Action, confirmation soil samples were collected from the sidewalls and bottoms of the excavations at a frequency of two samples per 18 linear ft of sidewall for TPH, VOCs, SVOCs, TAL metals and explosives analysis. Soil samples were collected from the stockpiled soil to determine the appropriate classification of the soil.

Following site characterization site restoration activities for the project included backfilling the excavations with clean soil stockpiled during the excavation (backfill for the east and west disposal pits) and additional clean soil from the HAFB FT-31 Landfarm (backfill for the North pit disposal pit) (Bhate, 2008).

C.7.3 EVALUATION OF RELEVANT INFORMATION

East Pit Soil Sampling

Confirmation samples were collected at a total of 5 locations from the sidewalls along the perimeter and the bottom of the East disposal pit excavation (Figure C-7.2). With the exception of one copper detection, concentrations in these samples did not exceed the associated SSLs for all analyses (VOCs, SVOCs, TPH, Explosives, and TAL metals). Copper was detected in the sidewall sample collected at DP63East-2 with a concentration which exceeds the NMED SSL. This detection of copper was most likely due to the presence of a brass shell casing fragment present in the sample aliquot. As a result of this elevated detection of copper, a second sidewall sample (DP63E-2) was collected adjacent to the original sidewall sample (DP63East-2) and analyzed for TAL metals. Although copper was detected below the NMED SSL in the second sample, lead was detected above the NMED SSL. Due to the elevated detection of lead found in the re-sampling of sidewall sample DP63East-2, a site-specific risk based evaluation was performed for the east disposal pit. A summary of the results for the East disposal pit excavation confirmation samples are presented in Table C.7.1.

A risk assessment was conducted on COPCs in the East pit. For the two chemicals which the maximum soil concentrations exceeded the target levels, the average concentrations were calculated. The average concentrations were compared with target levels. The average soil concentrations of copper and lead did not exceed the target levels for combined pathway from soil for commercial/industrial workers and construction workers. Therefore, the current soil concentration is protective of future on-site commercial/industrial workers and future on-site construction workers.

West Pit Soil Sampling

The approximate area of the final excavation at the West disposal pit was 748 square ft to an average depth of 3 ft bgs. Figure C-7.3 shows the boundaries of the excavated West disposal pit. The calculated volume removed from the West pit excavation was about 80 cubic yards.

Confirmation samples were collected at a total of 8 locations from the sidewalls along the perimeter and the bottom of the West disposal pit excavation (Table C.7.2). With the exception of one estimated thallium detection, concentrations in these samples did not exceed NMED SSLs. Thallium was detected in the excavation floor bottom sample collected at DP63West-9 with an estimated concentration which slightly exceeds the NMED SSL. This detection of thallium most likely represents the natural variability in soil geochemistry.

North Pit Soil Sampling

The North disposal pit area at Site DP-63 was actually comprised of two smaller disposal pits (Figure C-7.4). The approximate area of the final excavation of the pit to the west in the North disposal pit area was 325 square ft with an average depth of 9 ft bgs. The calculated volume removed from this excavation was 110 cubic yards. The approximate area of the final pit to the east in the North disposal pit area was 450 square ft with an average depth of 9 ft bgs. The calculated volume removed from this excavation was 150 cubic yards. Based on a thorough visual inspection of the excavation sidewalls and bottoms, all of the transite tile fragments were removed from both of the North area disposal pits during this excavation event. A total of 260 cubic yards of asbestos/petroleum contaminated soil were removed from the North pit disposal area and transported to an approved disposal facility during the excavation.

A third phase of PCS excavation was conducted at the North disposal pit in early June 2007. On June 5, 2007 the area between the two smaller disposal pits was excavated. As this soil was not contaminated with transite tiles, the PCS was transported to the HAFB Landfarm at FT-31.

Approximately 100 cubic yards of PCS were removed during this phase of excavation at the North disposal pit.

Confirmation samples were collected at a total of thirteen locations from the sidewalls along the perimeter and the bottom of the North disposal pit excavation. With the exception of one detection of lead and one detection of benzo(a)pyrene, concentrations in these samples did not exceed the associated NMED SSLs. Lead was detected in the sidewall sample collected at DP63North-7 with a concentration which exceeds the NMED SSL. This detection of lead was most likely due to the presence of an isolated lead bullet fragment present in the sample aliquot. As a result of this elevated detection of lead, a second sidewall sample was collected adjacent to the original sidewall sample (DP63North-7) and analyzed for TAL metals (DP63North 7). Lead and all of the TAL metals were detected below their respective NMED SSLs in the second sidewall sample.

Benzo(a)pyrene was detected in the sidewall sample collected at DP63North-4 with a concentration which exceeds the NMED SSL. The location of this sidewall sample was along the east side of the western North disposal pit (Figure C-7.4). As a result of this NMED SSL exceedence, the soil that remained between the two North disposal pits (approximately 100 cubic yards) was excavated and transported to the HAFB FT-31 Landfarm for treatment in June 2007. A summary of the analytical results for the North disposal pit excavation confirmation samples are presented in Table C.7.3.

Additional Characterization Outside the Pits

In 2005 and 2006, additional characterization soil borings and groundwater monitoring wells were installed adjacent to the three pits in order characterize soil and groundwater post excavation of the pits. Primarily, the additional characterization was to address manganese and arsenic exceeding background conditions. Analytical results from soil samples are summarized in Figure C-7.5. Groundwater analytical results are summarized in Figure C-7.6. Arsenic and manganese were detected in several soil samples with no correlation to the burn pits and instead most likely represent the natural variability in soil geochemistry. Likewise, groundwater at the site has naturally occurring TDS values ranging from 17,600 mg/L to 37,100 mg/L (Bhate, 2008).

C.7.4 BASIS OF DETERMINATION

PCS and asbestos-contaminated soil from the DP-63 disposal pits was excavated and transported for offsite disposal or for treatment (HAFB FT-31 Landfarm). Confirmation soil samples collected from the sidewalls and floor bottoms of each excavation provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs and NMED TPH Screening Guidelines. Analytical results from groundwater samples collected at the site did not contain VOCs, SVOCs, TPH, or explosives above reporting limits. TDS in groundwater at the site ranges from 17,600 to 37,100 mg/L which exceeds the NMWQCC standard for potable groundwater (10,000 mg/L).

Based upon the sampling, laboratory analytical results, the East disposal pit risk-based evaluation, and documentation of excavation and disposal provided; NFA was requested for DP-63 by HAFB based upon NMED Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on June 7, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for DP-63 is presented in the section NMED Letters of Approval at the end of this document.

C.7.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) September 2006, *Final Voluntary Corrective Measures Work Plan Disposal Pit 63 (DP-63) Holloman Air Force Base, New Mexico.*

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FWEC. December 2002. *Draft Report for the Remedial Investigation of DP-63 – Disposal Pit 63, Holloman Air Force Base, New Mexico.*

New Mexico Environment Department. (NMED) April 14, 2006. Notice of Deficiency: Voluntary Corrective Measures Work Plan, Disposal Pit 63 (DP-63), February 2006 Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-06-001).

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NMED. June 7, 2012, Approval: DP-63 Accelerated Corrective Measures Completion Report, January 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-001).

C.8 AOC-4 – ERP Site N/A

The following information was obtained from the *Final West POL Yard Accelerated Corrective Measures Completion Report, Holloman Air Force Base, New Mexico* (NationView, 2010) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2011).

C.8.1 LOCATION/UNIT DESCRIPTION

AOC-4, the West POL Yard Fuel Spill Site is located on the southwest portion of HAFB on the western portion of the Main Base Area adjacent to Building 871 (Figure A-1.2). The site consists of four 50,000-gallon ASTs housed within a secondary containment concrete berm, and aboveground and underground product transmission lines. The facility was used to store and distribute JP-8 jet fuel to tanker trucks. A site map of AOC-4 is provided in Figure C-8.1.

C.8.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

In August 1999, the West POL Yard facility's leak-detection system indicated that JP-8 was leaking underground south of the ASTs. A subsequent pressure test performed on an 8-inch underground feed line confirmed the presence of a leak beneath the concrete pad of the fueling area. As a result, the fueling pad was shut down by draining fuel lines and closing valves.

The current and anticipated future land use is industrial.

The following is a description of the history of remediation and investigation of AOC-4.

August 1999 Test Pit Investigation

Upon shutting down the fueling pad in August 1999, two test pits were excavated by Base Environmental Management personnel to a depth of approximately 10 ft bgs. Five soil samples were collected from inside the test pits and analyzed for TPH. Soil sample TPH results for the two test pits ranged from 250 to 11,440 mg/kg. Free product was observed on the groundwater surface inside the excavation on the east side of the concrete driveway (FWEC, 2003).

November 1999 Subsurface Soil Investigation

In October and November 1999, an investigation was conducted at the site and thirty soil borings were drilled and subsurface soil samples were collected to delineate the extent of TPH in soil and the extent of free product in groundwater. During sampling in October, older residual contamination was discovered as dark gray stained soil. Analysis of the stained soil indicated that the petroleum was JP-4 and that the contamination was older than previously reported. Additional drilling and sampling took place at the site to delineate the extent of all TPH contamination. The recommendation of the 1999 study was to excavate the contaminated soil at the site and remove free product from groundwater (FWEC, 2003).

January 2003 Soil Excavation

Excavation and removal activities were conducted in January 2003. The original scope required the excavation of approximately 500 cubic yards of soil for offsite disposal, but additional excavation was required because unexpected contamination was discovered in the area of the concrete driveway. Approximately 1,300 cubic yards of soil was removed, stockpiled, and sampled. The boundary of the entire excavation conducted in 2003 is shown on Figure C-8.1. Approximately 1,200 cubic yards (1,430 tons) of soil which contained TPH at concentrations greater than the NMED TPH Screening Guidelines was transported offsite for disposal.

A total of 19 confirmation samples (WPOL-EX01 through WPOL-EX-19) were collected from the sidewalls along the perimeter of the excavation. Soil samples were analyzed for TPH, VOCs and SVOCs. TPH-DRO was detected above NMED TPH Screening Guidelines for Kerosene and Jet Fuel in samples WPOL-EX01, -EX02, -EX03, -EX18, and -EX19. These samples were collected along the north and northeast wall of the excavation immediately adjacent to the south/southwest side of the concrete containment wall. Additionally, TPH-DRO was detected above the TPH Screening Guidelines in the excavation sidewall sample WPOL-EX07 at the southeast portion of the excavation. Sidewall samples (WPOL-EX04, -EX05, -EX06, -EX08, -EX09a, -EX09b, -EX12a, and -EX13 through -EX17) collected around the rest of the perimeter of the excavation had TPH concentrations below the NMED Screening Guidelines (FWEC, 2003).

2005 Soil boring Investigation

In October 2005, a soil sampling event was conducted to characterize the extent of potential PCS beneath the southern half of the secondary containment structure. During this sampling event, twenty-one shallow boreholes were installed through the concrete floor of the secondary containment area. The boreholes were located adjacent to the two southern aboveground tanks and the southern containment wall, and were completed with a hand auger, since access was not available for a drill rig. Soils were field screened for VOCs, using soil-headspace screening techniques to aid in the selection of sample intervals. Soil samples selected for laboratory analysis were analyzed for TPH, VOCs and SVOCs.

Low concentrations of fifteen VOCs and five SVOCs were detected above their method detection limits but none were above their respective NMED SSLs. TPH was analyzed for GRO ($C_6 - C_{10}$), DRO ($C_{10} - C_{22}$), and ORO ($>C_{22} - C_{36}$). Concentrations of TPH-GRO and TPH-DRO were detected in several of the samples collected. TPH-ORO was detected in only three samples. The maximum combined TPH concentration detected in the sample collected from 52 to 56 inches bgs at location WPOL-SB07. However, this combined TPH concentration is below the NMED Screening Guideline for Kerosene and Jet Fuel.

2006 Accelerated Corrective Measures Excavation Activities

Additional soil was excavated from the West POL Yard in October 2006, and further confirmation sampling was performed along the sidewalls of the two additional excavations. The approximate area of the final ACM excavations was 600 square ft with an average depth of 6 ft bgs. The combined calculated volume removed from these 2 excavations was approximately

180 cubic yards. Of this volume, approximately 20 cubic yards of soil were determined by visual inspection and PID screening to be clean and thus stockpiled for potential return to the pit. A sample of this stockpiled soil was collected for laboratory analysis to confirm the absence of PCS before being returned to the excavation. Approximately 160 cubic yards of PCS were excavated and transported offsite for disposal. Approximately 160 cubic yards of clean imported fill material was placed in the excavation at the completion of the sidewall confirmation sampling and analysis.

Confirmation samples were collected at a total of 14 locations from the sidewalls along the perimeter of this excavation (Figure C-8.2). Samples were analyzed for VOCs, SVOCs, and TPH (GRO, DRO, and ORO). The analytical results (detections only) are summarized in Table C.8.1. All VOCs and SVOCs detected in the confirmation samples collected were below their respective NMED SSLs.

TPH was analyzed for GRO, DRO, and ORO. The TPH-GRO and DRO fractions were detected in the majority of the sidewall samples collected. TPH-ORO was detected above the method detection limit in only one of the confirmation soil samples collected at the West POL Yard. The combined TPH-GRO and DRO concentrations for the samples collected at WPOL-SW20, WPOL-SW26, WPOL-SW27, and WPOL-SW28 were each above the NMED TPH Screening Guideline for Kerosene and Jet Fuel. These sidewall samples were located along the northern wall of the excavation immediately adjacent to the southernmost storage tank. Excavation activities could not continue further without completely removing the USTs as the excavation extended up to the tank containment wall. Therefore, due to these elevated detections of TPH along the northern sidewall (WPOL-SW20, -SW26, -SW27, and –SW28) of the excavation, a site-specific risk based evaluation was performed for the West POL Yard.

C.8.3 EVALUATION OF RELEVANT INFORMATION

2007 Groundwater Assessment

Groundwater samples collected from WPOL-MW01 through WPOL-MW04 were analyzed for VOCs, SVOCs, TPH (GRO, DRO, and ORO), and TDS. Monitoring well locations with selected results are shown on Figure C-8.3.

Low concentrations of eight VOCs were detected in two of the monitoring wells (WPOL-MW03 and WPOL-MW04) that were sampled in April 2007. The maximum concentrations of acetone, n-butylbenzene, sec-butylbenzene, isopropylbenzene, and methyl ethyl ketone did not exceed any applicable NMWQCC groundwater standards or USEPA MCLs. In addition, low estimated concentrations of three other VOCs (tert-butylbenzene, naphthalene, and n-propylbenzene) were detected below the reporting limit and were qualified with a J. All other VOCs were not detected above their method detection limits.

The TPH fraction for DRO (C_{10} – C_{22}) was detected in the groundwater samples collected at WPOL-MW03 and WPOL-MW04 . ORO (>C_{22} – C_{36}) was detected in all of the four wells and the duplicate sample. The other TPH fraction (GRO [C_6 – C_{10}]) was not detected in the groundwater samples collected at the West POL Yard. The maximum combined TPH-DRO and ORO concentration of the four groundwater samples collected was detected below the NMED

TPH Screening Guidelines for Kerosene and Jet Fuel in potable groundwater.

TDS concentrations ranged exceeded the NMWQCC Human Health Standard. Furthermore, the upgradient well (WPOL-MW01) which represents background for the site, contained the highest TDS concentration.

C.8.4 BASIS OF DETERMINATION

Confirmation soil samples collected from the sidewalls of the excavation provide documentation of the complete removal of soil containing petroleum hydrocarbons, VOCs, or SVOCs in excess of the NMED SSLs and NMED TPH Screening Guidelines for Kerosene and Jet Fuel, from outside the secondary containment area around the ASTs. Remaining PCS found underneath the containment area near the southern most AST could not be removed, and as a result, a risk assessment was performed for potential future commercial/industrial workers and construction workers. Furthermore, analytical results from groundwater samples collected at the site do not contain VOCs, SVOCs, or TPH above any NMWQCC groundwater standards or USEPA MCLs (Figure C-8.3).

The maximum detected soil and groundwater concentrations were compared with the soil target levels and groundwater target levels respectively. The maximum detected groundwater concentrations did not exceed the groundwater target levels for any of the COPCs. The maximum detected 1,3,5-trimethylbenzene and TPH (C10-C36) concentrations in soil exceeded the target levels for combined pathways from surface soil by commercial/industrial worker and for combined pathways from soil by construction worker. However, the average soil concentrations of 1,3,5-trimethylbenzene and TPH (C10-C36) did not exceed the target levels for combined pathways from surficial soil by commercial/industrial worker and for combined pathways from soil by construction worker. Therefore, the current soil concentration is protective of the current and future commercial/industrial worker and future construction worker.

Based upon the sampling, laboratory groundwater analytical results, the risk-based evaluation, and documentation of the additional excavation and disposal provided; NFA was requested by HAFB for the West POL Yard (AOC-4) based upon NMED Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on January 26, 2011 (NMED, 2011). The letter from NMED to HAFB indicating CAC without controls for AOC-4 is presented in the section NMED Letters of Approval at the end of this document.

C.8.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) December 2006. *Groundwater Monitoring Work Plan, West POL Yard, Holloman Air Force Base, New Mexico*.

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FWEC. 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.*

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New Mexico Environment Department (NMED) January 26, 2011, Approval of the Response to the Notice of Disapproval, Final West POL Yard Accelerated Corrective Measures Completion Report, Holloman Air Force Base, June 2010 (HWB-HAFB-08-008).

C.9 AOC-C – ERP Site SS-66

The following information was obtained from the *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73) Holloman AFB, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.9.1 LOCATION/UNIT DESCRIPTION

AOC-C, Building 835 Spills, ERP Site SS-66, is located 65 ft west of Building 835 (Figure A-1.2). Building 835 was demolished in 2001. Today the area where Building 835 stood is vacant land located on the north end of the flight line and about 60 feet southwest of Building 809. The 1988 RFA identifies the site as an oil and rust-stained area approximately 20 ft by 30 ft in size, located on the north side of Building 835. A groundwater potentiometric site map is provided in Figure C-9.1 which shows the monitoring wells located at ERP Site SS-66.

C.9.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

According to HAFB records, Building 835 was built in 1954 and was demolished in 2001. The building consisted of a concrete foundation and floor with sheet metal walls and roof and was 3,600 square ft in size. At the facility, metal parts were heated and quenched in oil for the purpose of hardening or softening the metals. Sometimes, the quenching oil would drip onto the concrete both inside and outside the building. Oil stains on the concrete pads outside the north side of the building are visible in the aerial photograph taken in 1996. A visit to this location was made on July 12, 2006. No visible signs of hydrocarbon staining, stressed vegetation or rust were observed in the area surrounding the former building. Most likely the area was disturbed during the demolition of the building in 2001.

The current and anticipated future land use of SS-66 is industrial.

The following is a description of the history of remediation and investigation of SS-66.

2007 SS-66 Confirmatory Sampling

In 2007, five soil borings were advanced at Site SS-66 to install groundwater monitoring wells and collect subsurface soil samples to characterize conditions at the site to support closure of the site based on guidance from the NMED. Soil and groundwater analytical results are listed in Tables C.9.1 and C.9.2, respectively.

C.9.3 EVALUATION OF RELEVANT INFORMATION

Soil samples were analyzed for VOCs; SVOCs; PCBs; TPH-GRO, DRO, and ORO; and TAL metals. None of the soil samples indicated concentrations exceeding the NMED SSLs for any of the constituents of concern. Two groundwater samples were collected and analyzed for VOCs; SVOCs; PCBs; TPH-GRO, DRO, and ORO; TAL metals; and TDS. Only one of the samples indicated a concentration of methylene chloride above the USEPA MCL, however, this constituent was detected in the associated laboratory blank and is a common laboratory contaminant. None of the other constituents indicated concentrations above the USEPA MCL, however, the TDS results indicated concentrations exceeding the NMWQCC (1,000 µg/L) (Figure C-9.2).

C.9.4 BASIS OF DETERMINATION

The analytical results from the soil and groundwater samples collected at Site SS-66 during this investigation did not contain any VOCs, SVOCs, TPH, PCBs, or TAL metals in excess of NMED SSLs, NMWQCC standards, or USEPA MCLs. Therefore, HAFB requested NFA for Site SS-66 based upon Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on July 18, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for SS-66 is presented in the section NMED Letters of Approval at the end of this document.

C.9.5 REFERENCES

A.T. Kearney, Inc. September 1988. *RCRA Facility Assessment Preliminary Review/Visual Site Inspection Report.* Holloman AFB, New Mexico.

Bhate Environmental Associates, Inc. (Bhate) July 2007. *RCRA Facility Assessment Confirmatory Sampling Work Plan, Multiple Sites*. Holloman AFB, New Mexico.

Bhate. May 2008. *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73), Holloman AFB, New Mexico*.

New Mexico Environment Department (NMED) July 18, 2012, Approval: RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72, and SS-73), May 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-006).

C.10 AOC-K – ERP Site SS-12

The following information was obtained from the *Final Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20 Holloman, AFB, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.10.1 LOCATION/UNIT DESCRIPTION

Site AOC-K, the Northeast Fuel Line Spill Site #1, ERP Site SS-12, is located immediately east of the main housing area at HAFB (Figure A-1.2). In 1975, approximately 2,000 gallons of JP-4 were spilled at the site as a result of a rupture (due to excessive pressure) in the main pipeline that serves the HAFB POL area. The majority of fuel was reportedly collected in a pit and pumped into a truck shortly after the spill. In 1992, petroleum product was allegedly encountered while installing a utility trench west and upgradient of the pipeline. A site map of SS-12 is provided in Figure C-10.1.

C.10.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Multiple phases of investigation were conducted at the site between 1982 and 2008. The following is a description of the history of remediation and investigation of SS-12.

A record search for Site SS-12 was conducted in 1982 (CH2MHill, 1983). The site was not considered to present a significant concern for adverse effects on health or the environment. The site was initially investigated in November 1992 and February 1993 during the Site Investigation (SI). The SI focused on two principal areas of possible contamination:

- the segment of the JP-4 pipeline that ruptured in 1975 and
- an area where the alleged fuel product was encountered during the sewer installation.

The current and anticipated future land use of SS-12 is industrial.

1992-1993 SS-12 Site Investigation

The SI was conducted during 1992-1993 and focused on two principal areas of possible contamination. A passive soil-gas survey was conducted at the site. During the installation of the samplers, visibly contaminated soil was observed along the pipeline at a depth of 1 ft bgs. A second, real-time soil-gas survey was conducted to obtain more information. Six soil borings were installed to collect soil samples (one per borehole) for chemical analysis. Three of the soil borings were completed as monitoring wells (WL-12-01 through WL-12-03). The soil-gas surveys at Site SS-12 indicated potential contamination along both the pipeline in the vicinity of the storm sewer drainage and the storm sewer between two houses in the Base housing area (Buildings 2461 and 2464).

Kerosene was detected in one soil sample from a boring located adjacent to the JP-4 pipeline and near a ditch that received runoff from the storm sewer. The kerosene detection was more likely a result of runoff from the storm sewer that accumulates in the ditch (FWEC, 1996). With the exception of a singular, low level estimated detection (likely laboratory contaminant); TPH was not detected in any of the other four soil samples collected at the site.

Groundwater samples contained maximum concentrations of Benzene and toluene adjacent to the JP-4 pipeline. These results are well below NMWQCC standards and USEPA MCLs. A qualitative risk assessment determined the site did not pose a potential risk to human health and the environment and recommended site closure. NMED reviewed the results of the SI and requested additional sampling.

1994 SS-12 Additional Investigation

To address the NMED's concerns, additional sampling was performed in 1994. Two soil borings were drilled and soil samples collected from within and below a gray soil layer identified during the SI. Six additional soil samples were collected and analyzed for VOCs, SVOCs, and TRPH. Visible staining was noted from approximately 0 to 11 ft bgs in the soil borings. The only VOCs or SVOCs detected were low concentrations of acetone and methylene chloride which are common laboratory contaminants. The maximum concentration of TRPH was detected in the one sample which is below the NMED TPH Screening Guideline for Kerosene and Jet Fuel (FWEC, 1996). However, the NMED requested a more comprehensive investigation to obtain site closeout.

2007 SS-12 Accelerated Corrective Measures

Objectives of the additional investigation at Site SS-12 were to delineate any potential PCS source area and to evaluate the current groundwater conditions of the site. To meet these objectives twelve soil borings (SS12-DP01 to SS12-DP12) were drilled and sampled along with a round of groundwater samples collected from three previously installed monitoring wells (WL-12-01 through WL-12-03). Further, two geotechnical samples were collected from upgradient borings to provide geotechnical data for a risk based assessment. Field work was conducted in June 2007.

SS-12 analytical results for soil are listed in Table C.10.1. Ten VOCs and two SVOCs were detected above the method detection limits in samples collected from the twelve soil borings. However, all of these detected concentrations were well below their respective NMED SSLs.

TPHs were analyzed for GRO, DRO, and ORO. TPH-GRO and TPH-DRO were detected above the method detection limit. TPH-ORO was not detected above the method detection limit in any of the SS-12 soil samples. The maximum concentrations of TPH-GRO and DRO were detected in the subsurface soil sample collected from DP08 at 5 feet bgs. The combined TPH-GRO and DRO concentration for this sample was below the NMED TPH Screening Guideline for Kerosene and Jet fuel.

Six of the eight RCRA metals were detected above the method detection limit. Maximum concentrations of these six metals were detected in samples collected from 10 ft bgs at DP04, 9 ft bgs at DP06, and 5 ft bgs at DP11. The maximum concentrations of barium, cadmium, chromium, arsenic, mercury, and lead were all detected below their respective NMED SSLs.

Groundwater samples were collected from the three existing monitoring wells (WL-12-01, WL-

12-02, and WL-12-03). Groundwater analytical results are presented in Table C.10.2. Low concentrations of seven VOCs, one SVOC, and two RCRA metals were detected above the method detection limit. All detected concentrations are well below NMWQCC standards and USEPA MCLs. TDS concentrations and exceeded the NMWQCC standard of 1,000 mg/L at each well.

C.10.3 EVALUATION OF RELEVANT INFORMATION

The additional investigation performed in 2007 was designed to assess any likely locations and or sources of contamination associated with this site. The analytical results from soil and groundwater samples collected at SS-12 during the SI (Radian, 1992-1993), the additional sampling event (1994), and the ACM investigation (2007) did not contain any VOCs, SVOCs, TPH, or RCRA metals in excess of NMED SSLs, NMED TPH Screening Guidelines, NMWQCC standards, or USEPA MCLs.

C.10.4 BASIS OF DETERMINATION

The analytical results from soil and groundwater samples collected at SS-12 during previous investigations and the ACM investigation did not contain any VOCs, SVOCs, TPH, or RCRA metals in excess of NMED SSLs, NMWQCC standards, or USEPA MCLs. Therefore, NFA for Site SS-12 was requested by HAFB based upon Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on June 27, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for SS-12 is presented in the section NMED Letters of Approval at the end of this document.

C.10.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) June 2007. *Final Accelerated Corrective Measures Work Plan Multiple Sites, Holloman, AFB, New Mexico.*

Bhate. April 2008. *Final Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20 Holloman, AFB, New Mexico.*

CH2M Hill, Inc. August 1983. *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico*.

Foster Wheeler Environmental Corporation (FWEC) and Radian International LLC. June 1996. *Technical Memorandum Installation Restoration Sites SS-12, SD-27, and OT-45.*

New Mexico Environment Department (NMED) June 27, 2012, Approval: Accelerated Corrective Measures Completion Report, Sites SS-12 and OT-20, April 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-004).

Radian Corporation. February 1993. *Chemical Data Acquisition Plan (CDAP), Investigation of Four Waste Sites, Holloman Air Force Base, NM.*

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

C.11 AOC-M – ERP Site RW-70

The following information was obtained from the *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73) Holloman AFB, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.11.1 LOCATION/UNIT DESCRIPTION

AOC-M is identified Building 18 Product Storage Tank and ERP site RW-70. This UST has been included in the remediation activities conducted at ERP Site SS-17, AOC-Q (The Old BX Service Station). The 1988 RFA identified this site as a gasoline leak from an underground gasoline storage tank located next to Building 18 at the Old BX Service Station (AOC-Q) (A.T. Kearney, 1988). The UST was located 50 feet northwest of Building 18. The site is located in a densely populated portion of HAFB across from the Base Medical Facility (Figure A-1.2). A site map of RW-70 is provided in Figure C-11.1.

C.11.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

The current and anticipated future land use of RW-70 is industrial.

The following is a description of the history of remediation and investigation of RW-70.

The BX Service Station featured a gas station, convenience store, and a car wash and operated since the early 1950s. In 1981, gas leaks from the USTs were discovered and an investigation was initiated that led to the removal of five underground tanks in 1992. These underground tanks were replaced with three aboveground tanks that were installed so that the BX Station could continue to operate. A new BX Station was built further north on First Street in 2000 and the original BX Station was taken out of service that same year so that the entire area could be remediated by excavating and removing for disposal the PCS underneath.

Building 18 along with the associated above ground structures were demolished in 2003. Soil in the vicinity of RW-70 has been excavated and removed during the remediation of USTs associated with AOC-Q, ERP Site SS-17 (approximately 31,000 cubic yards). Figure C-11.1 is a site map indicating the position of RW-70 and the extent of the SS-17 excavation which has completely enveloped this site.

C.11.3 EVALUATION OF RELEVANT INFORMATION

During the site visit conducted by Bhate on July 10, 2006 of RW-70 it was confirmed that no operations at this location, other than the soil excavation and removal activities associated with remediation of the PCS, were taking place at this location. All structures, tanks, and ancillary equipment associated with the former operation of the BX Station have been removed.

C.11.4 BASIS OF DETERMINATION

In the Final RFA Report, because the source of contamination at site RW-70 has been completely removed, HAFB requested NFA for Site RW-70 based upon Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on July 18, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for RW-70 is presented in the section NMED Letters of Approval at the end of this document.

C.11.5 REFERENCES

A.T. Kearney, September 1988. *RCRA Facility Assessment Preliminary Review/Visual Site Inspection Report.*

Bhate Environmental Associates, Inc. (Bhate) May 2008. *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73), Holloman AFB, New Mexico*.

New Mexico Environment Department (NMED) July 18, 2012, Approval: RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72, and SS-73), May 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-006).

C.12 AOC-O – ERP Site OT-45

The following information was obtained from the *Final Accelerated Corrective Measures Completion Report, Sites OT-03 and OT-45, Holloman Air Force Base, New Mexico* (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.12.1 LOCATION/UNIT DESCRIPTION

AOC-O, Site OT-45 (formerly Site 51) the Old Aerospace Ground Equipment (AGE) Refueling Station is located near the intersection of West Delaware Avenue and West Fourth Street, south of the Building 296 parking lot (Figure A-1.2). The Old AGE Refueling Station consisted of three USTs (two 12,500 gallon tanks and one 10,000 gallon tank) that stored gasoline, diesel, and JP-4. The site was also equipped with a pump island and fuel dispensing station.

The Refueling Station including the three USTs was removed in the 1980s during the renovation of Building 296 and was replaced with a parking lot and landscaped area. The condition of the USTs when removed is unknown. A site map of OT-45 is provided in Figure C-12.1.

The site was not identified in the IRP Records Search (CH2MHill, 1983). However, during the excavation of a utility trench at the site, liquid hydrocarbons were discovered floating on the water table. Subsequently, the site was added to the Corrective Action Program and became known as AOC-O.

C.12.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Multiple phases of investigation were conducted at the site between 1984 and 2008. The following is a description of the history of remediation and investigation of OT-45.

The current and anticipated future land use is industrial.

1984 OT-45 Phase II- Confirmation/Quantification Stage 1 Investigation

The site was investigated in September 1984 during the Phase II - Stage 1 Investigation by Dames & Moore. The soil had a strong fuel odor that decreased in intensity at depth. Total halogenated volatiles (TOX) concentrations were above the detection limit in all samples collected. All of the samples were negative for phenolics and only one sample contained oil and grease. The groundwater sample collected from monitoring well 51W1 showed moderate levels of total organic carbon (TOC) and relatively high levels of oil and grease, phenolics, and TOX (Dames & Moore, 1987). As a result a RI was then was then conducted.

1988 OT-45 Remedial Investigation

Walk, Haydel & Associates drilled and sampled six (6) soil borings and groundwater monitoring wells during RI activities conducted in 1988 and 1989. Low levels of petroleum related compounds and volatile organics were detected in the soil samples collected to depths of 15 ft bgs. The highest levels of VOC contamination (benzene, chlorobenzene, ethylbenzene, styrene, toluene, and 1,1,2,2-tetrachloroethane) were detected in B2 at 5 ft bgs. SVOCs were all below the detection limits except for the 5 ft sample at B2 where 2-methylnaphthalene and naphthalene were found. The highest concentration of TRPH was detected in soil sample B2 and the highest concentration of lead was detected in two soil samples, B4 and B5.

Analysis of groundwater samples from existing well 51W1 and the five new monitoring wells (MW1 through MW5) contained a variety of solvents including 1,1-dichloroethane, PCE, and TCE as well as benzene, toluene, ethylbenzene, and xylenes (BTEX) constituents. Further, six inches of floating product was found in the RI Stage II sample from MW2, which was also sampled (Walk, Haydel & Associates, 1989).

1991 OT-45 Remedial Action

A remedial action excavation of the PCS at the Old AGE Refueling Station was performed in September 1991 by IT Corporation. Approximately 3,320 cubic yards of PCS and approximately 10,000 gallons of wastewater were removed. The excavation covered an area approximately 200 ft long by 65 ft wide and roughly 6.5 ft deep. The excavation was backfilled with clean fill and was restored (IT Corporation, 1991).

1994 OT-45 Confirmation Sampling

Confirmation sampling was conducted at Site OT-45 in 1994 to ensure that the remaining levels of TRPH in the soil surrounding the PCS excavation did not exceed the 1,000 mg/kg cleanup standard (standard at that time). A soil boring was drilled on each side of the rectangular shaped outline of the PCS excavation area. Subsurface soil samples were initially collected from four soil borings. The subsurface soil samples collected during the confirmation sampling event determined aggregate sum of TPH-GRO and TPH-DRO exceeded the Base-specific cleanup level of 1,000 mg/kg. The exact volume of TRPH contamination above 1,000 mg/kg was not quantified. However, it was believed to be very limited and site closeout was recommended for OT-45. NMED rejected this assertion and recommended complete delineation and remediation of the remaining PCS above the NMED SSL.

2007 and 2008 OT-45 Accelerated Corrective Measures

Nine (9) boreholes were installed and sampled around the formerly excavated area, to delineate the extent of remaining PCS contamination for source area removal (Figure C-12.2). A round of groundwater samples were collected from five existing monitoring wells (S51-MW1, S51-MW3 through S51-MW5, and S51-MW7). The TPH-GRO fraction was detected in every sample and exceeded the TPH Screening Guideline for Unknown oil. VOCs also exceed NMED SSLs at several locations. Based upon the soil sample analysis, an excavation plan was developed for the site to remove additional PCS.

C.12.3 EVALUATION OF RELEVANT INFORMATION

The six (6) groundwater samples and the monitoring well locations with selected results are shown on Figure C-12.3 and Table C.12.1. Sixteen VOCs were detected in the groundwater samples. However, TCE was the only VOC detected above its respective USEPA MCL and/or the NMWQCC screening level. TCE was detected, in the upgradient monitoring well S51-

MW3, with a concentration slightly above the USEPA MCL. Monitoring well S51-MW3 is upgradient and subsequent investigations have identified Site SS-18 located upgradient of OT-45 as the likely source. The only SVOC detected in the six groundwater samples collected at OT-45 was bis(2-ethylhexy)phthalate but is likely a laboratory artifact. TDS concentrations exceeded the NMWQCC standard of 1,000 mg/L at each well. TDS concentrations below 10,000 mg/L at Site OT-45 are most likely due to leaking water lines which run along the Delaware Avenue.

In February 2008, approximately 2,875 cubic yards of PCS were excavated from the site. Figure C-12.4 shows boundaries of the excavated area. Fifty-one (51) sidewall confirmation soil samples were collected from around the perimeter of the excavation and three (3) confirmation soil samples were also collected from the floor of the excavated pit. Sample locations are also shown on Figure C-12.4. The 51 sidewall samples and 3 bottom confirmation samples collected during the excavation were analyzed for VOCs, SVOCs, and TPH (GRO, DRO, and ORO). A summary of the results for the OT-45 excavation confirmation samples are presented in Table C.12.2. Thirteen (13) VOCs and two (2) SVOCs were detected above the method detection limits. However, all of these detected concentrations were well below their respective NMED SSLs and NMED TPH Screening Guidelines for Unknown oil.

Site restoration activities at Site OT-45 included backfilling the excavation with clean soil from the HAFB FT-31 Landfarm. The backfill was compacted with a track hoe and the excavation was graded to match existing surface topography. The removed portion of the parking area was re-asphalted, along with sidewalks and gutters replaced.

C.12.4 BASIS OF DETERMINATION

A risk assessment was performed on remaining constituents in soil and groundwater. Although TCE slightly exceeded the USEPA MCL in one groundwater sample, the maximum detected groundwater concentration did not exceed the groundwater target levels for TCE or any of the other COPCs. The average soil concentrations of 1,2,4-trimethylbenzene and benzene did not exceed the target levels for indoor inhalation of vapors from subsurface soil by commercial/industrial workers.

Based upon the sampling, laboratory groundwater analytical results, the risk based assessment, and documentation of the additional excavation and disposal in the Final ACM Report; NFA was requested by HAFB for Site OT-45. NFA for site OT-45 was based upon NMED Closure Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on August 13, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for OT-45 is presented in the section NMED Letters of Approval at the end of this document.

C.12.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) June 2007. *Final Accelerated Corrective Measures Work Plan, Multiple Sites, Holloman Air Force Base, New Mexico.*

Bhate. November 2008. *Final Accelerated Corrective Measures Completion Report, Sites OT-03 and OT-45, Holloman Air Force Base, New Mexico.*

CH2M Hill, Inc. August 1983. *Installation Restoration Program (IRP) Records Search for Holloman Air Force Base, New Mexico*.

Dames & Moore. March 1987. *Installation Restoration Program, Phase II – Confirmation/Quantification Stage 1, Report (April 1984 to March 1985) for Holloman Air Force Base, New Mexico 88330*.

Foster Wheeler Environmental Corporation and Radian International LLC. June 1996. *Technical Memorandum Installation Restoration Sites SS-12, SD-27, and OT-45.*

IT Corporation. 1991. *Holloman Air Force Base Alamagordo, New Mexico Closing Report.*

New Mexico Environment Department (NMED) August 13, 2012, Approval: Accelerated Corrective Measures Completion Report, Sites OT-03 and OT-45, November 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-010).

Walk, Haydel & Associates, Inc. December 1989. *Final Remedial Investigation Report, Holloman Air Force Base, New Mexico.*

C.13 AOC-U – ERP Site N/A

The following information was obtained from the *Final RCRA Facility Investigation Report AOC-U, Lost River Basin Holloman Air Force Base, New Mexico* (NationView, 2013) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2015).

C.13.1 LOCATION/UNIT DESCRIPTION

AOC-U is listed as the Lost River Basin. The Lost River Basin is a large intermittent drainage basin that receives runoff from various upgradient SWMUs and AOCs of the Base. It is located within the northern portion of HAFB and illustrated on Figure A-1.2. Surface water generally flows from the east to the west during the rainy season (late July through September). The Lost River Basin is considered an environmentally sensitive area under agreement between HAFB, White Sands Missile Range (WSMR), the National Park Service (NPS), the U.S. Fish and Wildlife Service (USFWS), and the New Mexico Department of Game and Fish (NMDGF) for the protection of the threatened White Sands pupfish (NationView, 2013).

The Lost River Basin receives annual runoff from a large portion of the Base including six ERP sites that contain nine SWMUs and AOCs sites located along its perimeter, some of which have already been determined by NMED CAC without controls (OT-04, LF-40, and DP-62). Based on their proximity to the Lost River Basin and its tributaries several of these ERP sites may have contributed contaminants via surface water runoff and/or groundwater infiltration into the Basin over time. A brief description of the six potential contributing ERP sources is listed below:

- **OT-04 (SWMU 102) Acid Trailer Disposal Site** – Site OT-04 is located adjacent to an arroyo known as Ritas Draw, which is a tributary of the Lost River. During the late 1950s, various types of materials including rocket propellants and other fuel components were buried on this one-half acre tract.
- **DP-62 (AOC-RD) – Rita Draw Disposal Pit** – Site DP-62 is located 300 feet (ft) east of Site OT-04. Ritas Draw contains numerous smaller arroyos and terminates into the Lost River. Two partially buried empty drums were discovered during a field reconnaissance of the area in 1998.
- **OT-37 (AOC-L) Early Missile Test Site –** The Early Missile Test Site was used to develop rocket and missile systems from 1947 to 1955 and is located along the southern side of the Lost River Basin. The site includes three vertical launch pads and an inclined test track. Fuels used at these sites included JP-4, kerosene, and solid rocket propellants. There are several arroyos adjacent to these launch facilities that drain directly into the Lost River Basin.
- **OT-38 (SWMU 137) Test Sled Maintenance Area** – The Test Sled Maintenance Area is located near the Building 1166 Test Track Drain Field. Waste oils, solvents, and paint strippers used in the sled industrial maintenance area (Building 1166) may have migrated via the surface water or groundwater pathways into adjacent Lost River Basin arroyos.
- **SS-39 (SWMUs 165, 177, 179, and 181) Missile Fuel Spill Area** – The Missile Fuel Spill Area is located south of the test sled launch area near Building 1176, along the northern side of the Lost River Basin. The launch pad was constructed in 1960 with

concrete drains that delivered spilled oxidizers and fuels that were diluted with water and flushed into the Lost River. This practice ceased in 1975 when catch basins were installed to collect the spilled liquid fuels.

- **LF-40 (SWMU 103) Causeway Rubble Disposal Area** – The Causeway Rubble Disposal Area was located south of the Sled Test Track Area along the perimeter of the Lost River Basin. This site was used for stockpiling concrete rubble for use as a base construction material for a road that crosses the Lost River Basin southwest of the test track launch pad.

Previous investigations have identified a number of contaminants of concern that have impacted the soil and groundwater at the ERP sites upgradient of the Lost River Basin including:

- VOCs (e.g., trichloroethene [TCE])
- Metals (e.g., arsenic and lead)
- TPH
- Perchlorate

During the 2006 Supplemental RFI conducted at SS-39, TCE, perchlorate, arsenic, and lead were detected above current action levels in groundwater samples collected from wells located along the boundary of the Lost River Basin (HGL, 2007).

C.13.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Due to low rainfall and high evaporation, surface water at HAFB is limited and, therefore, is not used for domestic or municipal purposes nor is it used for recreation or agriculture. The ponds in the southern part of the Base receive effluent from the National Pollution Discharge Elimination System (NPDES) permitted Wastewater Treatment Plant (WWTP) and are saline (normally about half the salinity of seawater), sulfate-rich, and very rich in nutrients. These ponds provide habitat for numerous plant and wildlife species, so water quality of these receiving waters is important. Future land use at AOC-U is not expected to differ significantly from current land use practices.

Due to the potential for contamination from multiple sites and the size of the area contributing to AOC-U, the nature and extent of soil and groundwater contamination resulting from historical releases from up gradient ERP sites had not been completely defined before the RFI conducted in 2011 (NationView, 2013). Multiple phases of investigation were conducted at the six ERP sites contributing to the Lost River Basin. A description of the key findings from the previous investigations conducted at each site that may represent potential releases into the Lost River Basin (AOC-U) is presented on the following pages.

The current and anticipated future land use of AOC-U is open space.

The following is a description of the history of remediation and investigation of AOC-U.

1988 AOC-U RCRA Facility Assessment

The RCRA Facility Assessment (RFA) Report (A.T. Kearney, 1988) initially identified the Lost River Basin as an AOC that warranted further investigation. Releases of hazardous wastes or constituents to the soil from the adjacent test sled launch area (SS-39) were observed during the visual site inspection.

1993 AOC-U RCRA Facility Investigation ERP SS-39 and LF-40

A RFI conducted by Radian in 1993 included hand auger samples collected at locations where contaminated surface water runoff may have entered the basin from upgradient potential source areas (SS-39 and LF-40) (Radian, 1994). Samples were collected at the mouth of five small drainages, and were collected 100 ft into the basin from each of these drainages. The results of a previous RFI conducted at 29 different waste sites (Radian, 1992), which included upgradient sites SS-39 and LF-40, were used to establish the analytical sampling requirements for each of the five drainages. Based on the contaminants identified at the upgradient source areas, the soil samples were analyzed for one or more of the following: VOCs, SVOCs, TRPH, and metals.

Four VOCs were detected at concentrations below the current NMED SSLs (NMED, 2012a). SVOCs and TRPH were not detected in any of the samples collected during the RFI. Eight metals were detected above the detection limit, however, with the exception of arsenic; the maximum detection for each metal was below its current NMED residential SSL. Arsenic was detected in soil samples at concentrations above the SSL.

A risk assessment was conducted during the AOC-U RFI to determine the need for further investigation. The presence of acetone in samples collected downgradient of SS-39 indicated a limited release into the basin; however the concentrations of all detected constituents were below the risk-based trigger criteria. The risk assessment concluded it was unlikely that AOC-U posed a significant risk to human health or the environment.

Groundwater samples have been collected within the Lost River Basin (AOC-U) during previous investigations conducted at Site SS-39 (Missile Fuel Spill Area). Several of these groundwater samples contained detections of TCE and perchlorate that exceeded current NMED and/or USEPA action levels. These results of exceedences are presented in Figures C-13.3 through C-13.5.

The following summarize the previous investigations that were conducted at each of the six ERP Sites that are located upgradient from the Lost River Basin.

OT-04 (SWMU 102) Acid Trailer Disposal Site

SWMU 102, Acid Trailer Burial Site is listed on Table B (sites not requiring Corrective Action) of the HAFB RCRA Permit. OT-04 is located adjacent to Ritas Draw, which is an arroyo that drains into the Lost River (Figure C-13.2). In 1958, it was reported that two empty fuming nitric acid transport trailers and waste materials were dumped and buried on a one-half acre tract of land along three small side channels of Ritas Draw arroyo. The majority of the waste at OT-04 may have originated from the former Unconventional Fuels Storage Area located one-half mile to the south. The Unconventional Fuels Storage Area housed propellants, oxidizers, and other fuel components that were used for rocket and sled tests conducted at HAFB (Radian, 1992).

OT-04 was initially identified as an Installation Restoration Program (IRP) site in the IRP Records Search conducted in 1983 (CH2M Hill, 1983). The RFA Report (A.T. Kearney, 1988) identified OT-04 as SWMU 102 and concluded that the potential for a release was low to all media since the nitric acid trailers had been rinsed prior to burial.

1992 OT-04 Remedial Investigation

The site was initially investigated during the 29 Waste Sites RI conducted by Radian in 1991. During the RI an electromagnetic (EM) survey was performed to determine the locations of buried waste. Based on the results of the EM survey, 19 test pits were dug. Solid rocket boosters, laboratory equipment, over 100 amber bottles containing chemicals, metal debris, and an empty stainless steel tank trailer were encountered in the exploratory pits. Several of the amber bottles contained picric acid (an explosive) and were subsequently exploded in place by the Base Explosive Ordnance Detachment (Radian, 1992).

Four monitoring wells were installed around the perimeter of the site to determine if a release to the groundwater had occurred. Groundwater samples were analyzed for VOCs, TRPH, metals, TDS, and water quality parameters (Radian, 1992).

No VOCs or TRPH constituents were detected above the NMWQCC standard or USEPA MCL. Selenium and antimony were the only metals detected above the NMWQCC groundwater standard or USEPA MCL. Selenium was detected in monitoring downgradient well located within the Lost River drainage area at a concentration which slightly exceeds the current MCL and the NMWQCC standard. Antimony was detected above the USEPA MCL. Nitrate-nitrite detections exceeded the current USEPA MCL and NMWQCC nitrate standard. Chloride concentrations exceeded the NMWQCC standard in all four monitoring wells. TDS concentrations exceeded the current NMWQCC standard of 1,000 mg/L and are above 10,000 mg/L for a Class IIIB water resource (groundwater designated as unfit for human consumption [USEPA, 1986]).

A risk assessment (RA) was conducted for OT-04 as part of the RI. The RA concluded that an unacceptable risk to the White Sands pupfish may exist due to the selenium concentrations detected in the downgradient well. Because of the uncertainty surrounding the selenium detected in this groundwater sample, further investigation was recommended to assess background water quality.

1994 OT-04 RCRA Facility Investigation

The following additional investigations were conducted at OT-04 (SWMU-102) to address the concerns raised by the RI (FWENC, 1995).

- A voluntary corrective action in 1994
- A Base-wide background study in 1993
- The Phase II RFI in 1994

To eliminate the threat to public safety identified during the RI, a 5 ft high chain link fence surrounding the debris area was erected in 1994. As part of the voluntary corrective action, all surficial debris was located, identified, and removed (Human Factors Applications, Inc., 1994). A study was conducted in 1993 to determine the background concentrations of selected inorganic compounds present in the soil and groundwater at HAFB. An additional monitoring well was installed near OT-04 as part of the study. The 1993 background UTL for total selenium in groundwater was calculated to be 0.079 mg/L.

During the Phase II RFI, groundwater samples were collected from three existing wells and one background well. Each of the groundwater samples collected during the RFI was analyzed for total selenium. The maximum concentration of selenium (0.054 mg/L) was detected in the downgradient well. Although this detection was slightly above the NMWQCC standard and USEPA MCL it was below the 1993 HAFB background UTL.

1995 OT-04 NFA Decision Document

The IRP Site OT-04 Decision Document for NFA was prepared and approved by NMED in 1995 (Radian, 1995).

<u>DP-62 (AOC-RD) – Rita Draw Disposal Pit</u>

AOC-RD or Ritas Draw Disposal Pit is listed on Table B of the HAFB RCRA Permit. Site DP-62 is located approximately 300 ft east of the Acid Trailer Burial Site (OT-04) and is located within three arroyos that drain into Ritas Draw (Figure C-13.2). During a field reconnaissance of the Ritas Draw area, two drums were discovered. These drums were believed to be related to the early missile testing that occurred at HAFB during the 1950s. The drums were empty with no evident soil staining, and the original content of the drums was unknown. As a result of this finding, a Preliminary Assessment/Site Inspection (PA/SI) was conducted in 1998 (GTI, 1998).

1998 DP-62 Preliminary Assessment/Site Inspection

The purpose of the PA/SI was to determine if a release had occurred at the DP-62 site. A geophysical survey was conducted to locate other possible drums related to missile testing that occurred at HAFB during the 1950s. Based upon the results of the geophysical survey, four boreholes were advanced at the site (GTI, 1998b). The geophysical survey identified five anomalies indicating metallic objects. Based on these results, four soil borings were advanced at the locations suspected contain metallic debris.

The four borings were completed and two soil samples were collected from each boring. Each soil sample was analyzed for VOCs, SVOCs, explosives, and TAL metals. No VOCs, SVOCs, and explosives were detected in the soil samples with the exception of acetone and 2-butanone, however all detections were below their current SSLs. Arsenic and thallium were the only TAL metals detected above their current NMED residential SSLs (NMED, 2012a).

Two of the soil borings encountered groundwater and were converted into temporary groundwater sampling points. The groundwater samples collected were also analyzed for VOCs, SVOCs, explosives, and TAL metals. VOCs, SVOCs, and explosives were not detected above groundwater action levels in the two groundwater samples. Antimony and manganese were the only TAL Metals detected above the NMWQCC standards or applicable USEPA MCLs. The PA/SI Report concluded that there were no indications of a release at the site (GTI, 1998b).

2004 DP-62 RCRA Facility Investigation

A RFI was conducted at DP-62 in 2004 (Bhate, 2004) to address NMED concerns that not enough data had been collected from areas immediately adjacent to metallic debris identified from the PA/SI geophysical survey. Five shallow soil samples from boreholes were advanced adjacent to the areas of exposed drums (Bhate, 2004). The soil samples were analyzed for VOCs, SVOCs, TPH, and RCRA metals.

No VOCs, SVOCs, and TPH fractions (GRO, DRO, and ORO) were detected above the laboratory method detection limits (MDLs). Five of the eight RCRA metals were detected above the MDL. The maximum detection for each metal was below its respective current NMED residential SSL (NMED, 2012a). As a result of this sampling event, the drums exposed on the surface were removed and recycled as scrap metal. Based on the findings from the PA/SI and the RFI, the RFI Report concluded that the site did not pose any unacceptable risks and recommended NFA for DP-62 (Bhate, 2004).

2005 NFA DP-62 Statement of Basis

Based on the findings from the previous investigations Ritas Draw Disposal Pit (AOC-RD) was selected for NFA along with six other SWMUs and AOCs by HAFB in 2005.

<u>OT-37 (AOC-L) Early Missile Test Site</u>

AOC-L is listed as the Early Missile Test Site on Table A of the HAFB RCRA Permit. The Early Missile Test Site is located east of the Test Sled Maintenance Area along the southern side of the Lost River Basin (Figure C-13.2). The Early Missile Test Site was used to develop rocket and missile systems from 1947 to 1955. The test site covers an area of approximately 160 acres and includes three block houses, the inclined test track, three vertical launch pads, and four transformer concrete pads (transformers have been removed). Fuels used at these sites included JP-4, kerosene, solid rocket propellants, and PCBs were contained in the transformer dielectric fluid.

In 1983, OT-37 was initially identified as an IRP site in the IRP Records Search (CH2M Hill, 1983). The Early Missile Test Site was later identified as AOC-L in the RFA Report (A.T. Kearney, 1988) which stated that contaminant releases to the soil were probable.

1991 OT-37 Remedial Investigation

OT-37 was initially investigated during the 29 Waste Sites RI conducted by Radian Corporation in 1991. The RI focused on potential releases to the environment from the four former step-down transformers and the launch facilities. During the RI, seven soil borings and six monitoring wells were installed at the inclined track and the vertical launch pads. Two soil samples were collected from each soil boring and analyzed for VOCs, metals, and petroleum hydrocarbons. The groundwater samples collected from the six monitoring wells were analyzed for VOCs, metals, common anions, and TDS. Additionally, one surface soil sample collected from each transformer station was collected for PCB and petroleum hydrocarbon analysis. The results and conclusions of the RI (Radian, 1992) are discussed below.

Transformer Stations

TRPH was detected in the surface soil samples collected from each of the four stepdown transformer locations. All TRPH detections with the exception of one were below the current TPH Screening Guidelines for a dielectric fluid (NMED, 2012a). PCBs were detected at three of the former transformer locations. All PCB detections were below their respective SSLs with the exception of one, (Aroclor 1260) which exceeded current NMED residential SSL (NMED, 2012a).

Vertical Launch Pad Facilities and the Inclined Test Track

Several VOCs were detected in the deeper soil samples across the site but at levels below their respective residential SSLs (NMED, 2012a). TRPH was detected in 5 of the 14 subsurface soil samples. With the exception of one sample collected all TRPH results were less the TPH Screening Guidelines, residential direct exposure for unknown oil (NMED, 2012a). However it was not detected in the sample collected in the same borehole at a deeper interval. The metals detected in the soil samples collected from the seven soil borings at OT-37 were all below their respective residential SSLs.

With the exception of four antimony detections, all VOCs and metals detected in the groundwater samples were all below the current NMWQCC Groundwater Standards (NMAC 20.6.2.3103) and USEPA MCLs (USEPA, 2009). TDS concentrations exceeded the NMWQCC standard for each well. However, each of these TDS concentrations is also above the Class IIIB water resource indicating that the groundwater is unfit for human consumption (USEPA, 1986). Most of the concentrations of chloride, sulfate, fluoride, and nitrate (anions) also exceeded their respective NMWQCC standards in all of the OT-37 monitoring wells. The elevated anion concentrations are likely due to the naturally elevated TDS found in the groundwater at the site. However, nitrate-nitrite concentrations exceeded the current NMWQCC standard and USEPA MCL for nitrate in all the monitoring well samples. Due to the nature of potential contaminant sources at OT-37, the high nitrate-nitrite values may not be simply attributed to the naturally elevated TDS.

The RI Report (Radian, 1992) recommended implementation of a RCRA corrective action remedy and that a pre-design investigation may be warranted to determine the extent of remediation required at OT-37.

2007 OT-37 Accelerated Corrective Measures Investigation

In 2007 an ACM investigation was conducted at OT-37 to fill in the data gaps identified during the RI. The ACM investigation consisted of re-sampling two hand auger locations from the RI, drilling 10 shallow DPT boreholes around the perimeter of the four concrete transformer pads, and drilling eight deep boreholes at each vertical launch pad and the inclined test track. Four of the deep soil borings were converted into permanent monitoring wells. A round of groundwater samples were collected from four existing monitoring wells and from the four new wells. Additionally, a sample of the tar that sporadically covers the ground surface in the vicinity of the inclined test track was collected for analysis (Bhate, 2007).

The following subsections provide a brief summary of the results from the ACM investigation. The complete results and conclusions for the OT-37 ACM investigation are included in the *Final Release Assessment Report Site OT-37* (NationView, 2011a).

Transformer Pad Soil Results

Twenty two samples collected from the ten shallow soil borings were analyzed for TPH (GRO, DRO, and ORO) and PCBs. The combined concentrations of the TPH fractions for each sample were below the TPH screening guidelines, residential direct exposure for unknown oil (NMED, 2012a). The maximum concentration of PCBs (Aroclor 1260) was below the current NMED SSL (NMED, 2012a). PCBs were not detected in the two hand auger borings that were re-sampled and the tar like substance found on the ground surface surrounding the inclined test track.

Vertical Launch Pad Facilities and the Inclined Test Track Soil Results

Eighteen soil samples collected from eight soil borings advanced around the perimeter of the four former launch facilities were analyzed for VOCs, SVOCs, TPH (GRO, DRO, and ORO), PCBs, perchlorate, and RCRA metals. No PCBs were detected above the MDL and all VOCs, SVOCs, and perchlorate were detected at concentrations well below the current NMED residential SSLs (NMED, 2012a). Only estimated concentrations of TPH-GRO and TPH-DRO were detected in the subsurface soil samples. Five RCRA metals were detected above the MDL. With the exception of arsenic, each RCRA metal was detected below its respective residential SSL (NMED, 2012a). Arsenic was detected in eight soil samples collected from five soil borings above the SSL. These detections of arsenic are slightly above the SSL and most likely represent the natural variability in soil geochemistry.

Groundwater Analytical Results

Groundwater samples were collected from eight monitoring wells and analyzed for VOCs, SVOCs, RCRA metals, PCBs, perchlorate, and TDS. All detected VOCs and SVOCs were well below the USEPA MCLs and the NMWQCC standards. PCBs were not detected in any of the groundwater samples. Perchlorate was detected in each groundwater sample. However all perchlorate detections were below the USEPA Interim Drinking Water Health Advisory standard (USEPA, 2008). Five RCRA metals were detected above the MDL. With the exception of arsenic, the other RCRA metals were detected below their respective USEPA MCLs and NMWQCC groundwater standards. Arsenic was detected in 4 of the 10 groundwater samples collected above the USEPA MCL. TDS concentrations exceeded the NMWQCC standard at each well. TDS concentrations also exceeded 10,000 mg/L in seven of the eight OT-37 monitoring wells.

2010 OT-37 Accelerated Corrective Measures Addendum Investigation

In 2010 the ACM Addendum Investigation was conducted to characterize the quantity, concentration, and extent of nitrate, perchlorate, and arsenic previously detected above action levels in groundwater and soil samples collected at the three vertical launch facilities and the inclined test track at OT-37. The second objective of the ACM Addendum expanded investigation was to determine if historical detections of nitrate in groundwater (1991 RI and the

2008 HAFB Background Study) were from a geogenic (natural) or an anthropogenic (human) source. The ACM Addendum expanded investigation consisted of collecting composite surface soil samples at 16 locations around the perimeter of each of the vertical launch facilities and inclined test track. Nine deep boreholes were drilled both up and downgradient of the vertical launch facilities and inclined test track. Each of the nine deep soil borings were converted into permanent monitoring wells. A round of groundwater samples were collected from 18 onsite monitoring wells and analyzed for TAL metals, perchlorate, nitrate, ammonia, TDS, and specific conductivity. Additionally, seven groundwater samples were collected from selected monitoring wells for isotopic nitrate (δ15Nnitrate [delta-nitratenitrogen] and δ18Onitrate [delta-nitrate-oxygen]) analysis. The seven groundwater samples were also analyzed for isotopic tritium (to determine the age of the groundwater), chloride, sulfate, and alkalinity.

Composite Surface Soil Results

Eighteen composite surface samples collected from the sixteen locations around the perimeter of each of the three vertical launch facilities and the inclined test track were analyzed for TAL metals, perchlorate, and nitrate. With the exception of lead, each TAL metal was detected below its respective residential SSL (NMED, 2012a). Lead was detected in one soil sample above the SSL. Perchlorate was detected in three surface soil samples at concentrations below the NMED SSL. Nitrate was detected in 16 surface soil samples at concentrations well below the current NMED SSL.

Subsurface Soil Results

Twenty subsurface soil samples collected from the nine hollow stem auger borings located both up and downgradient of the vertical launch facilities and the inclined test track were analyzed for TAL metals, perchlorate, and nitrate. None of the TAL metals or nitrate concentrations detected in these samples exceeded current NMED SSLs. Perchlorate was not detected in any subsurface soil samples collected.

Groundwater Analytical Results

Groundwater samples were collected from 18 monitoring wells and analyzed for TAL metals, perchlorate, nitrate, ammonia, TDS and specific conductivity. Additionally, eight groundwater samples (including one duplicate) were collected from monitoring wells for isotopic nitrate (δ15Nnitrate and δ18Onitrate), isotopic tritium, chloride, sulfate, and alkalinity analysis. Five of the TAL metals (aluminum, arsenic, lead, manganese, and thallium) were detected above their respective USEPA MCLs and/or NMWQCC groundwater standards. TDS concentrations ranged exceeded the NMWQCC standard and the USEPA Secondary Drinking Water Standard in all the monitoring wells. Perchlorate was detected above the USEPA Interim Drinking Water Health Advisory standard in one groundwater sample and duplicate sample located downgradient within the Lost River Basin.

Nitrate concentrations exceeded the USEPA MCL and the NMWQCC groundwater standard in 17 of the 18 groundwater samples collected during this investigation. Ammonia was detected above the MDL in one groundwater samples. Currently there are no applicable action levels (USEPA or NMWQCC) or other applicable screening criteria available for ammonia. Specific conductivity concentrations ranged from 5,990 to 26,900 micromhos per centimeter (µmhos/cm) with an average specific conductivity of 15,767 µmhos/cm. Chloride and sulfate were detected above their USEPA Secondary MCLs but were below their HAFB groundwater UTLs in each of the seven groundwater samples collected during this sampling event.

Isotopic nitrate (δ15Nnitrate and δ18Onitrate) and tritium analysis indicated that the nitrate detected at OT-37 was potentially geogenic in nature. For a detailed discussion covering the isotopic analyses performed on OT-37 groundwater samples, along with conclusions drawn from this data, refer to the *Final Release Assessment Report Site OT-37, Holloman Air Force Base, New Mexico* (NationView, 2011a). Based on data collected during the 2011 AOC-U RFI, the source of nitrate observed in groundwater at both Site OT-37 and within the Lost River Basin does not appear to be from a geogenic (natural) source (NationView, 2013).

OT-38 (SWMU 137) Test Sled Maintenance Area

Site OT-38, the Test Sled Maintenance Area is list on Table A of the HAFB RCRA Permit as SWMU 137, Building 1166 Test Track Drain Field. OT-38 is located adjacent to the Test Sled Track and north of the Lost River Basin (Figure C-13.2). From 1951, when the test track became operational, until 1979, waste oils, solvents, and paint strippers used in the sled industrial maintenance area (Building 1166) were suspected of being discharged into the area's septic tank drain field (cesspool) behind Building 1166. Since 1979, all wastes have been accumulated in 55-gallon drums and turned over to the Defense Logistics Agency Disposition Services (DLADS) for disposal or recycling. Personnel from the Exterior Plumbing Department indicated that the cesspool consisted of an unlined cavity below the ground surface that was about 6 ft deep and 10 ft long. In the late 1980s, the cesspool was replaced with a septic tank and leach field (approximately 150 ft of perforated polyvinyl chloride [PVC] pipe) which was installed at the former cesspool location. The personnel that installed the septic tank reported that wastes were not apparent in the former cesspool location.

OT-38 was initially identified as an IRP site in the IRP Records Search conducted in 1983 (CH2M Hill, 1983). The Test Sled Maintenance Area was later identified as SWMU 137 in the RFA Report (A.T. Kearney, 1988). The RFA Report stated that there was a high potential for releases to the soil and groundwater from hydrocarbon constituents.

1991 OT-38 Remedial Investigation

OT-38 was initially investigated during the 29 Waste Sites RI conducted in 1991 (Radian, 1992). The RI focused on a potential release to the environment from the former cesspool (drain field). Field activities conducted during the OT-38 RI included the installation of two soil borings adjacent to the former cesspool and three monitoring wells to determine whether a release to the groundwater had occurred. A composite soil sample was collected from each soil boring and analyzed for VOCs, metals, and petroleum hydrocarbons. The groundwater samples collected from the three monitoring wells were analyzed for VOCs, metals, TDS, and water quality parameters. The results and conclusions of the RI are briefly discussed below.

All metals that were detected in the four composite soil samples were below their respective residential SSLs (NMED, 2012a). Petroleum hydrocarbons were detected in each of the soil samples. TRPH was detected in one soil sample above the TPH Screening Guideline for unknown oil (NMED, 2012a). All detected VOCs were estimated concentrations below their respective residential SSLs (NMED, 2012a).

VOCs detected in the groundwater samples collected from the three monitoring wells were all below their respective NMWQCC Groundwater Standards and USEPA MCLs. With the exception of a singular antimony detection, above the USEPA MCL, all metals were below their respective NMWQCC groundwater standards and USEPA MCLs. TDS concentrations exceeded the NMWQCC standard for each well. However, the average TDS concentration for these wells exceeds the allowable limits for TDS for the groundwater to be considered a viable drinking water source (Class IIIB water resource). Additionally, most of the concentrations for chloride, sulfate, fluoride, and nitrate (anions) also exceeded their respective NMWQCC standards. Excluding the nitrate-nitrite, the elevated anion concentrations at OT-38 are likely due to the naturally elevated TDS found in the groundwater at the site. Nitrate-nitrite concentrations exceeded the NMWQCC standard and USEPA MCL by over 10 times. Concentrations of nitrate-nitrite this high in groundwater potentially point to an anthropogenic source of nitrate.

The RI Report (Radian, 1992) determined that there were no risks to human health or the environment and recommended NFA for OT-38.

2007 OT-38 Accelerated Corrective Measures Investigation

In 2007 an ACM investigation was conducted at OT-38 to fill in the data gaps identified in the RI Report (Radian, 1992). The OT-38 ACM investigation consisted of advancing three shallow boreholes around the boundary of the former cesspool and three additional boreholes along the length of the existing drainpipe. Groundwater samples were collected from the three previously installed monitoring wells.

The following provide a brief summary of the results for the OT-38 ACM investigation. The complete results and conclusions for the OT-38 ACM investigation were included in the ACM Multiple Sites Completion Report.

Soil Results

Eighteen soil samples collected from six soil borings were analyzed for VOCs, SVOCs, TPH (GRO, DRO, and ORO), PCBs, and RCRA metals. Only estimated concentrations of VOCs, SVOCs, and TPH fractions were detected, and all detections were well below the NMED residential SSLs and the TPH screening guidelines for unknown oil. PCBs were not detected in any of the soil samples. With the exception of arsenic, each RCRA metal was detected below its respective NMED residential SSL (NMED, 2012a). Arsenic was detected in one soil sample above the SSL. This detection of arsenic was slightly above the SSL and most likely represents the natural variability in soil geochemistry.

Groundwater Results

Groundwater samples were collected from the three previously installed monitoring wells and analyzed for VOCs, SVOCs, PCBs, perchlorate, RCRA metals, and TDS. All detected VOCs and SVOCs were below the USEPA MCLs and the NMWQCC standards. PCBs were not detected in any of the groundwater samples. Perchlorate was detected in each groundwater sample, however, perchlorate detections were all below the USEPA Interim Drinking Water Health Advisory standard (USEPA, 2008). Three RCRA metals were detected above the MDL. With the exception of arsenic, all other RCRA metals were detected below their respective USEPA MCLs and NMWQCC groundwater standards. Arsenic was detected in one groundwater sample slightly above the USEPA MCL. TDS concentrations exceeded the NMWQCC standard. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater beneath HAFB has been designated as unfit for human consumption.

<u>SS-39 Missile Fuel Spill Area</u>

The Missile Fuel Spill Area (SS-39) comprises four SWMUs (165, 177, 179, and 181) that are listed on Table A of the HAFB RCRA Permit. SS-39 is located immediately south of Building 1176 along the northern perimeter of the Lost River Basin (Figure C-13.2). SS-39 is located downgradient of Building 1176 which is part of the Test Sled Facility. Historically, spilled oxidizers and fuels were delivered to separate drains, diluted with water, and flushed into the Lost River. In 1975, catch basins were installed to collect spilled liquid fuels.

Initially, during the IRP Records Search (CH2M Hill, 1983), SS-39 was limited only to the Test Sled Launch Area Collection Basin. This was a 30 ft by 20 ft surface impoundment that collected water used for reducing the velocity of vehicles on the sled test track. Fuel spills from the test track had reportedly been flushed into the Test Sled Launch Area Collection Basin. As a result of the RCRA Facility Assessment (A.T. Kearney, 1988), SS-39 was expanded to include the Discharge Box (SWMU 179), the Building 1176 Drainage Troughs (SWMU 177) and Drainage Sumps (SWMU 181), and the Building 1176 Pond (SWMU 165). SWMU 165 was identified and photographed between Building 1176 and the Lost River Basin (A.T. Kearney, 1988) however the pond's exact location has subsequently never been determined.

1991 SS-39 Remedial Investigation

The SS-39 Missile Fuel Spill Area was initially investigated during the 29 Waste Sites RI conducted in 1991 (Radian, 1992). The SS-39 RI consisted of completing two soil borings, five hand auger borings, and the installation and sampling of four monitoring wells located within outfalls and drainages throughout the site. Soil samples were analyzed for VOCs, metals, and petroleum hydrocarbons and groundwater samples were analyzed for VOCs, metals, TDS, and anions. The results and conclusions of the RI are briefly summarized below.

Lead and arsenic were detected above current NMED SSLs in soil samples collected near the oxidizer and propellant spill outfalls. With the exception of tetrachloroethene (PCE) and TCE, all VOCs were detected below their respective NMED residential SSL (NMED, 2012a). Tetrachloroethene was detected in one soil sample collected from the Building 1176 drainage sump borehole above the SSL. Trichloroethene was detected in two soil samples collected from the Building 1176 drainage sump boreholes above the SSL. Additionally, TPH was detected above the TPH Screening Guideline for the residential direct exposure of unknown oil (NMED, 2012a) in two soil samples.

Metals were not detected in groundwater samples above the NMWQCC standards or the USEPA MCLs. VOCs were detected in groundwater above current action levels in a monitoring well downgradient of the Building 1176 drainage sump. VOCs detected were above the NMWQCC standards and/or USEPA MCLs included TCE, carbon tetrachloride, 1,1,1-trichloroethane [1,1,1-TCA], and 1,1-dichloroethene [1,1-DCE]. TDS concentrations exceeded the NMWQCC standard. Nitrate-nitrite concentrations exceeded the NMWQCC standard and USEPA MCL for nitrate, in three of the four groundwater samples. Chloride and sulfate were detected above their USEPA Secondary MCLs in three of the four wells sampled during this event, but were below their HAFB groundwater UTLs. Fluoride was detected above the NMWQCC Groundwater Standard in two wells.

The RI Report (Radian, 1992) concluded that this evaluation indicated an unacceptable risk.

1993 SS-39 RCRA Facility Investigation

To address the concerns of the RI, Radian performed a RFI in 1993 to further delineate the VOCs, petroleum hydrocarbons, and metals contamination that was identified during the RI. During the RFI (Radian, 1994) soil samples were collected from 10 soil borings and hand auger locations installed along drainage ditches and below oxidizer and propellant outfalls. Soil samples were analyzed for SVOCs and metals. Groundwater samples were collected from 15 temporary sampling locations using DPT methods and field screened for VOCs. Eight groundwater samples were then submitted for off-site confirmation analysis for Halogenated VOCs.

VOCs and metals were not detected in any of the RFI soil samples above the NMED residential SSLs. The groundwater data indicated that TCE was above the USEPA MCL at six locations. 1,1,1-TCA and 1,1-dichloroethane (1,1-DCA) were detected above the NMWQCC standards at one location. Additionally, vinyl chloride was detected above the NMWQCC standard.

Additionally data was collected from flora and fauna from the Lost River Basin to support an ecological risk assessment. The assessment concluded that there was not an unacceptable risk to ecological receptors. Therefore a Decision Document for NFA was prepared and submitted in September 1995, but was never signed by NMED.

1998 SS-39 Additional Groundwater Sampling Event

In May/June 1998 groundwater samples from 16 locations were collected to delineate the extent of the TCE plume that was previously characterized during the RI and RFI studies conducted. The work was performed to fulfill a request for supplemental information by the NMED based on the RFI Report. Groundwater samples were analyzed for VOCs. Soil samples were not collected for chemical analysis.

TCE was detected above NMWQCC standard and/or the USEPA MCL at seven locations. These TCE detections were from sampling points located south-southwest of Building 1176. The downgradient extent of the TCE plume was delineated by sample points which yielded non-detectable TCE results. With the exception of benzene, all other VOCs were detected below the reporting limit (RL). The additional Groundwater Sampling Report recommended NFA for SS-39 based on this data (GTI, 1998a).

1997 through 2005 SS-39 Groundwater Long Term Monitoring

Long Term Monitoring (LTM) at Site SS-39 began in 1997 and continued on a biennial basis until December 2005. The data from the 2005 LTM Report (Bhate, 2006) shows that TCE, carbon tetrachloride, and chloroform had been consistently detected in a monitoring well located downgradient of Building 1176. Following review of the 2003 LTM Report and previous site investigation reports, NMED determined that an additional investigation was required to fill in data gaps at SS-39.

2006 SS-39 Supplemental RCRA Facility Investigation

Supplemental RFI activities were performed at SS-39 between May and July 2006. The following information was obtained from the Supplemental RFI Report (HGL, 2007). The SS-39 Supplemental RFI included the collection of additional soil, sediment, and groundwater samples throughout the site. During the Supplemental RFI, five soil borings were advanced for the collection of additional subsurface soil samples adjacent to several of the 1991 RI borings. Eleven soil samples were collected from these borings and analyzed for unsymmetrical dimethylhydrazine (UDMH), aniline, and RCRA metals. One sediment sample was collected from the Concrete Collection Basin and analyzed for SVOCs, UDMH, aniline, and RCRA metals.

As part of the Supplemental RFI, four permanent monitoring wells were installed along the edge of the Lost River Basin. Additionally, five hand augered pre-pack monitoring wells were installed to collect groundwater samples from within the Lost River Basin. During this investigation, one round of groundwater samples was collected for offsite analysis from the nine new wells and one previously installed monitoring well. During the July 2006 Supplemental RFI groundwater sampling event, the 10 monitoring wells were sampled for VOCs, RCRA metals (total and dissolved), perchlorate, UDMH, aniline, and TDS. A summary of the sample results from the Supplemental SS-39 RFI is presented below.

Sediment Sampling

Three SVOCs and six RCRA metals were detected in the sediment sample collected from the Concrete Collection Basin. Of the detected SVOCs and metals, only lead was detected at a concentration exceeding a NMED residential SSL (NMED, 2012a).

Subsurface Soil Sampling

Two subsurface soil samples were collected from each of the five boreholes from approximately. UDMH and aniline were not detected in the subsurface soil samples. Of the seven RCRA metals detected, two (arsenic and lead) were detected above the NMED residential SSLs in two samples.

Groundwater Sampling

During the July 2006 Supplemental RFI groundwater sampling event, 13 VOCs, 1 metal, and perchlorate were detected in the SS-39 monitoring wells. UDMH and aniline were not detected in groundwater samples collected during the Supplemental RFI sampling event. Of the 13 detected VOCs, TCE was the only constituent detected above the USEPA MCL and the NMWQCC standard. TCE was detected in groundwater above the USEPA MCL in six monitoring. Barium (total) was the only RCRA metal to be detected in groundwater during the Supplemental RFI and was below the respective NMWQCC standard and USEPA MCL. Dissolved metals data for the July 2006 groundwater sampling event were rejected by the laboratory, and therefore not reported (HGL, 2007).

At the request of NMED, the groundwater was also analyzed for perchlorate and TDS. Perchlorate was detected in each SS-39 groundwater sample and detected in several wells at concentrations above the USEPA Interim Drinking Water Health Advisory standard (USEPA, 2008). All of the TDS concentrations within the TCE plume exceeded the NMWQCC standard and are above 10,000 mg/L. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater beneath HAFB has been designated as unfit for human consumption.

LF-40 Causeway Rubble Disposal Area

The Causeway Rubble Disposal Area is a SWMU, and is listed on Table B (CAC without controls) of the HAFB RCRA Permit as SWMU 103. LF-40 is located south of the Sled Test Track Area and south of OT-38 (Figure C-13.2). This disposal area was a staging area for construction debris including concrete, steel reinforcing bars, and asphalt from the Sled Test Track that was used as a base construction material staging area for the causeway that crosses the west end of the Lost River Basin. LF-40 was approximately ¼-mile long, 40 ft wide and five ft high.

LF-40 was initially identified as an IRP site in the IRP Records Search conducted in 1983 (CH2M Hill, 1983). Since no hazardous material was known to be associated with the concrete rubble and construction debris, the site was not rated in the IRP Records Search Report. The RFA Report (A.T. Kearney, 1988) identified LF-40 as SWMU 103 and concluded that there was no potential for release to any environmental media as there was no evidence that hazardous wastes or constituents had ever been managed at this unit.

1993 LF-40 NFA Decision Document

Based on the findings stated in the IRP Records Search and RFA Reports, the Causeway Rubble Disposal Area, LF-40 (SWMU 103) was selected for NFA. The IRP Site LF-40 Decision Document for NFA was prepared and approved by NMED in 1993 (EA Engineering, 1993).

2011 AOC-U RCRA Facility Investigation

The primary objective of the 2011 RFI conduced was to determine if the adjacent ERP sites had impacted the soil and water quality within the Lost River Basin. The Lost River Basin is considered an environmentally sensitive area under agreement between HAFB, WSMR, the NPS, the USFWS, and the NMDGF to protect the Threatened White Sands pupfish. In order to meet the RFI objective it was necessary to delineate of the horizontal extent of VOCs, SVOCs, TPH, TAL metals, and perchlorate detected above action levels in soil and groundwater sample throughout the Lost River Basin, complete a human health and ecological site specific risk assessment, and collect the proper data to meet data quality objectives (DQOs) to support closure and ultimately achieve CAC status (NationView, 2013).

The following activities were performed under the 2011 RFI:

- Advanced 50 strategically placed hand auger boreholes within AOC-U to facilitate groundwater sample collection.
- Collected groundwater samples from the 50 hand augered boreholes in order to identify potential releases to groundwater.
- Analyzed groundwater samples for VOCs, SVOCs, TPH, TAL metals, nitrate, perchlorate, and TDS.
- Collection of one additional groundwater sample from a suspicious standpipe located adjacent to the Southern Vertical Launch Pad at Site OT-37 and analyzed for nitrate only.
- Collected three surface water samples from two distinct reaches of permanent water present within AOC-U.
- Analyzed surface water for VOCs, SVOCs, TPH, TAL metals, nitrate, perchlorate, TDS, potential of hydrogen (pH), hardness.
- Collected soil samples at 21 locations based on nitrate and perchlorate groundwater regulatory exceedences.
- Collect two surface soil samples at potential source areas identified while performing RFI sampling activities.
- Analyzed soil samples for VOCs, SVOCs, TPH, TAL metals, nitrate, perchlorate, and moisture content.
- Two geotechnical soil samples were collected from soil borings to provide site geotechnical data.

C.13.3 EVALUATION OF RELEVANT INFORMATION

This following presents the groundwater, surface water, and soil analytical results from the RFI field activities completed at AOC-U between February and July 2011 in order to present the nature and extent of contamination found in groundwater, surface water, and soil during this investigation. Groundwater, surface water, subsurface soil, and surface soil sampling locations from this investigation are shown on Figures C-13.6 and C-13.7. The groundwater, surface water, subsurface soil (geochemical and geotechnical) and surface soil analytical results collected during this RFI are summarized in Tables C.13.1 through C.13.4.

Groundwater Analytical Results

Grab groundwater samples were collected from 50 hand augered soil borings located throughout the Lost River Basin (Figure C-13.6). The AOC-U groundwater samples were analyzed for VOCs, SVOCs, TPH, TAL metals, nitrate, perchlorate, and TDS. Additionally, a grab groundwater sample was re-sampled in July 2011 and analyzed for nitrate and perchlorate in order to confirm initial laboratory results from March 2011. A second grab groundwater sample was collected in July 2011 from a suspicious standpipe located adjacent to the Southern Vertical Launch Pad at Site OT-37 and analyzed for nitrate only. The analytical results for constituents detected above the MDL are presented in Table C.13.1.

VOCs, SVOCs, and TPHs

Low and estimated concentrations of six VOCs were detected above the MDL in 10 groundwater samples (Figure 13.8). Bromomethane was the only VOC detected above the reporting detection limit (RDL) and was detected in one sample. There is no established NMWQCC standard or USEPA MCL for bromomethane. All other detected VOCs were below their respective USEPA MCL or NMWQCC standard.

Estimated concentrations of six SVOCs (benzyl alcohol, bis(2-ethylhexyl)phthalate, di-n-butyl phthalate, fluorene, phenanthrene, and pyrene) were detected in five groundwater samples above the MDL (Figure 13.8). The six detected SVOCs do not have applicable USEPA MCLs or NMWQCC standards for comparison.

Low and estimated concentrations of TPH-DRO (C10 – C22) and/or ORO (C22 – C36) were detected in 20 groundwater samples above the MDL (Figure 13.8). TPH-GRO (C6 – C10) was not detected in any of the AOC-U grab groundwater samples. Five samples had concentrations of TPH-DRO and/or ORO above the RDL. The maximum combined TPH-GRO, DRO and ORO concentration was well below the NMED TPH screening guideline for kerosene and jet fuel.

TAL Metals

A total of fourteen (14) dissolved (filtered) TAL metals were detected in groundwater above the MDL. Four of these TAL metals (antimony, arsenic, chromium and manganese) were also detected above their respective USEPA MCLs, Secondary MCLs, NMWQCC groundwater standards, and/or NMED approved background levels (Table C.13.1). In addition, there were four dissolved metals (cobalt, copper, nickel, and zinc) which were detected above their respective NMED approved background levels (NMED, 2011a) but below their applicable action levels. Figures C-13.8 through C-13.10 present the distribution of dissolved TAL metals detected in groundwater which exceeded applicable USEPA MCLs and/or NMWQCC groundwater standards at AOC-U. The antimony, arsenic, chromium, and manganese exceedences in many of the groundwater samples collected most likely represent the natural variability of groundwater throughout AOC-U as the geographic distribution of detections is ubiquitous (Figures C-13.8 through C-13.10).

Nitrate, Perchlorate, and TDSs

Nitrate was detected in all but one of the 57 AOC-U groundwater samples (51 locations) above the MDL (Figure 13.8). The one location in which nitrate was not detected above the MDL was in grab sample, collected from a suspicious standpipe located adjacent to the Southern Vertical Launch Pad at Site OT-37. Nitrate concentrations exceeded the USEPA MCL and the

NMWQCC groundwater standard in 25 samples (21 locations). The highest representative nitrate concentration in groundwater was observed at sample location down-gradient of SS-39.

In general, the nitrate detections above the regulatory screening criteria were in the vicinity of ERP Sites where historical rocket testing or maintenance occurred. Nitrate was also detected in groundwater samples which were collected upgradient of all ERP Sites, specifically within the upgradient tributaries of the Lost River within Malone Draw and Ritas Draw. Figures C-13.11 and C-13.12 present the distribution of nitrate detected in groundwater which exceeded the USEPA MCLs and NMWQCC groundwater standards within the western/central and eastern portions of the Lost River Basin, respectively.

Perchlorate was detected in 45 samples (39 locations) above the MDL. Perchlorate was detected above the USEPA Interim Drinking Water Health Advisory (USEPA, 2008) in 9 samples (7 locations). The perchlorate detections above the Interim Drinking Water Health Advisory standard were located downgradient of ERP Sites SS-39, OT-37, DP-62, and OT-04. Additionally, low levels of perchlorate were detected in upgradient groundwater samples collected in Malone Draw (upgradient tributary of the Lost River). Figures C-13.11 and C-13.12 present the distribution of perchlorate detected in groundwater which exceeded the Interim Drinking Water Health Advisory within the western/central and eastern portions of the Lost River Basin, respectively.

The widespread nature of nitrate and perchlorate exceedences could be attributable to voluminous vapor clouds containing by-products of solid rocket propellants produced during repeated launch exercises which were dispersed by the prevailing winds to areas surrounding launch facilities. These thick vapor clouds dispersed locally by wind along with inevitable misfires, in which rockets did not follow their intended path, and subsequently were not recovered, could justify such a broad distribution of nitrate and perchlorate exceedences within AOC-U.

Total Dissolved Solids

TDS concentrations for all AOC-U groundwater samples exceeded the NMWQCC standard of 1,000 mg/L and the USEPA Secondary Drinking Water Standard (500 mg/L). There were 37 samples (34 locations) which had TDS concentrations above the HAFB Total Groundwater UTL of 65,956.58 mg/L (NationView|Bhate JV III, 2011) (Figure C-13.8). The average TDS concentration for the 55 groundwater samples analyzed for TDS during this sampling event was 109,798 mg/L which exceeds the NMWQCC groundwater standard for potable water.

The TDS analysis measures the amount of dissolved minerals in water. TDS is primarily comprised of inorganic salts where the principal constituents are common cations (calcium, magnesium, sodium, potassium, and iron) and anions (carbonate, chloride, sulfate, and nitrate) which are found in high concentrations throughout the Tularosa Basin (McLean, 1970).

USEPA guidelines (USEPA, 1986) have identified groundwater exceeding 10,000 mg/L as a Class IIIB water resource. Due to the high average TDS in the AOC-U groundwater, it is not a potential source of drinking water or of any beneficial human use. As a result of this classification the human ingestion of groundwater located beneath the Lost River Basin is considered an incomplete pathway. Figures C-13.8 through C-13.10 present the spatial distribution of TDS detected in the groundwater within the western, central, and eastern sections of the Lost River Basin. As shown on Figure C-13.10 the lowest TDS concentrations were detected in the upgradient tributaries of the Lost River within Malone Draw and Ritas Draw. The highest concentrations of TDS were detected within the distal end of the Lost River within the Lost River Basin (Figure C-13.8). The maximum concentrations of TDS were located adjacent to the Causeway. This trend clearly illustrates that TDS concentrations significantly increase as the Lost River flows from Malone and Ritas Draws downgradient (east to west) into the Lost River Basin.

Surface Water Analytical Results

Three grab surface water samples were collected from three reaches of the Lost River, where water was encountered (Figure C-13.7). The AOC-U surface water samples were analyzed for VOCs, SVOCs, TPH, TAL metals, nitrate, perchlorate, TDS, pH, and hardness (which include calcium and magnesium). The analytical results for constituents detected above the MDL are presented on Table C.13.2.

VOCs, SVOCs, and TPHs

One VOC (acetone) was detected above the MDL (Table C.13.2). A low estimated concentration of acetone was detected in a surface water sample; however, there are no applicable surface water screening levels for acetone. No other VOCs or SVOCs were detected during surface sampling event. Three samples had concentrations of TPH-DRO and/or ORO above the MDL. However, there is no applicable TPH surface water screening guideline (NMWQCC or USEPA). The maximum combined TPH-GRO, -DRO,and -ORO concentration detected was well below the NMED TPH groundwater screening guideline for kerosene and jet fuel.

TAL Metals

A total of 11 TAL metals were detected in surface water above the MDL. Two of these TAL metals (antimony and manganese) were also detected above their respective USEPA (USEPA, 2009) and/or NMWQCC (NMAC 20.6.4.900) surface water quality standards (Table 7-2). Antimony was detected in four samples (three locations) above the USEPA and the NMWQCC surface water standards. Manganese was detected in 2 samples (2 locations) above the USEPA surface water standard. Figure C-13.13 presents the distribution of TAL metals detected in surface water which exceeded the applicable USEPA and/or NMWQCC surface water quality standards at the three sample locations in the Lost River Basin.

The most upgradient surface water samples within AOC-U g/L) with detections above the USEPA and NMWQCC surface water quality standards is located is approximately 830 ft upgradient of the nearest ERP Site (OT-04). These detections of antimony and manganese most likely represent the natural variability in surface water geochemistry and appear to be geogenic in nature.

Nitrate and Perchlorate

Nitrate and perchlorate were detected in each of the surface water samples above the MDL (Table 7-2). However, each of these detections was below the USEPA and the NMWQCC surface water standard. The maximum concentration of both nitrate and perchlorate were detected in a surface water sample which was collected at the mouth of the Lost River Basin, downgradient from ERP Site OT-37 (C-13.13)

Water Quality Parameters -Total Dissolved Solids, pH, and Hardness

TDS concentrations exceeded the USEPA surface water standard (Figure C-13.9) in each sample. The average TDS concentration for the three surface water samples (excluding the duplicate) collected during this event was 42,667 mg/L which also exceeds the USEPA surface water standard. There are no applicable NMWQCC surface water standards for TDS in surface water. Saline water with a concentration of 35,000 mg/L or greater is characterized as seawater (USBOR, 2003). Measurements of pH ranged were within the USEPA limits established for fresh water (5 to 9). Figure C-13.13 presents the distribution of TDS detected in the four Lost River surface water samples.

AOC-U surface water samples were sampled for hardness (including calcium and magnesium). The average hardness concentration for the surface water samples collected during this event was 12,477 mg/L. There are no standards for water hardness, calcium, or magnesium. However, water hardness above 180 mg/L is classified as very hard by the U.S. Department Interior (U.S. Geological Survey [USGS], 2009).

Soil Analytical Results

Subsurface soil samples were collected from 21 hand augered soil borings located throughout the Lost River Basin. The AOC-U subsurface soil samples were analyzed for VOCs, SVOCs, TPH, TAL metals, nitrate, and perchlorate. In addition, two surface soil samples were collected from potential source areas identified while performing RFI sampling activities (Figure C-13.6). Surface soil samples were analyzed for nitrate and perchlorate only. The analytical results for constituents detected above the MDL are presented on Table C.13.3. Additionally, subsurface soil samples that were collected from two boreholes were analyzed for bulk density, fractional organic carbon, moisture content, and specific gravity to establish geotechnical information for AOC-U. The geotechnical analytical results are presented in Table C.13.4.

Subsurface soil sampling locations were selected based on the analytical results from the February/March 2011 groundwater sampling event. Groundwater sample locations which contained exceedences of one or more analytes (excluding TDS) were subsequently selected for confirmation subsurface soil sampling.

VOCs, SVOCs, and TPHs

A total of nine VOCs, and two SVOCs were detected above the MDL in the 24 subsurface soil samples collected. One or more VOCs were detected at low or estimated concentrations above the MDL in each of the 21 boreholes (Table C.13.3). One SVOC was detected at low, estimated concentrations above the MDL within 3 of the 21 boreholes (Table C.13.3). However, all detected VOCs and SVOCs were below their applicable NMED residential SSLs (NMED, 2012a) or USEPA RSLs (USEPA, 2012). Based on the soil analytical data, a VOC and SVOC soil source area was not identified within AOC-U.

Low, estimated concentrations of TPH fractions GRO (C6 – C10), DRO (C10 – C22), and/or ORO (C22 – C36) were detected above the MDL in 10 samples collected from 9 of the 21 boreholes (Table C.13.3). The combined concentration is below the NMED TPH Screening Guideline for Kerosene and Jet fuel (NMED, 2012a). Based on the data, a TPH soil source area was not identified within AOC-U.

TAL Metals

Each of the 23 TAL metals were detected above the MDL in the subsurface soil samples collected during this sampling event. As shown in Table C.13.3 with the exception of arsenic and thallium, all detected TAL metals were below their respective NMED residential SSLs (NMED, 2012a) or USEPA RSLs (USEPA, 2012). The singular isolated exceedence of arsenic was detected slightly above the SSL and the NMED approved background level (Figure C-13.14). The singular isolated exceedence of thallium was detected above the NMED residential SSL but below the NMED approved background level (Figure C-13.14).

There were detections of eight TAL metals above the NMED approved background level which had concentrations below their respective NMED SSLs and USEPA RSLs (aluminum, beryllium, cadmium, cobalt, copper, lead, nickel, and zinc). There were detections of two metals above the NMED approved background level for which NMED SSLs and USEPA RSLs have not been established (sodium and magnesium). Detections of TAL metals in subsurface soil are summarized in Table C.13.3. Figure C-13.14 presents the distribution of TAL metals detected in subsurface soil which exceeded applicable NMED SSLs or USEPA RSLs within the western, central, and eastern sections of the Lost River Basin.

Nitrate and Perchlorate

Nitrate was detected above the MDL in 20 of the 24 subsurface soil samples with concentrations (Table C.13.3). Low and estimated concentrations of perchlorate were detected above the MDL in 9 of the 24 subsurface soil samples. However, all nitrate and perchlorate detections were well below their current NMED residential SSLs (NMED, 2012a).

Surface Soil

Surface soil samples were collected at potential source areas identified while performing RFI sampling activities. Two surface samples were collected where nitrate and perchlorate exceedences were detected in groundwater samples. One was collected adjacent to a spent rocket booster which was located approximately 150 ft north of a groundwater sample and the other sample collected from an area where used rocket boosters were historically stored on wooden pallets outside of Building 1168, approximately 370 ft north of another groundwater sample. Surface soil sampling locations are illustrated on Figure C-13.7 and results are summarized in Table C.13.3.

Nitrate and Perchlorate

Nitrate was detected above the MDL in both of the surface soil samples collected, each significantly below the NMED residential SSL (NMED, 2012a). Although not an exceedence, the nitrate in the surface soil samples ranged from greater than 5 times to greater than 10 times the highest nitrate concentration observed in the subsurface soil samples.

Perchlorate was detected above the MDL in both of the surface soil samples, each below the NMED residential SSL (NMED, 2012a). The sample location (AOCU-SA02) was located near an area where used rocket boosters were historically stored on wooden pallets outside of Building 1168. Although the perchlorate concentration observed in sample AOCU-SA02 does not exceed the NMED SSL, it is clearly elevated (greater than 2.9 orders of magnitude above [or 9,800 times] the highest perchlorate concentration observed in subsurface soil), and likely indicates a nearby source area.

Figure C-13.15 is a 2002 aerial photograph which illustrates the proximity of surface soil sample AOCU-SA02 to a historical storage area for used rocket boosters located adjacent to Building 1168. Additionally, the groundwater sample locations shown (AOCU-GW20, -GW22, and –GW24) contained the highest nitrate, second highest perchlorate, and highest perchlorate concentrations, respectively. Figure C-13.15 also shows an approximate location of SWMU 165 (Building 1176 Pond), which is part of Site SS-39. SWMU 165 was identified and photographed between Building 1176 and the Lost River Basin (A.T. Kearney, 1988) however the pond's exact location has subsequently never been determined.

Geotechnical Soil Samples

Two geotechnical samples were collected and analyzed for bulk density, fractional organic carbon, percent solids, and specific gravity. The geotechnical analytical results are presented in Table C.13.4.

Perchlorate and Ecological Risk

A large amount of data regarding perchlorate toxicological effects on wildlife exists. Most data shows no deleterious effects except at exposures high enough to cause mortality. Morphological and hormonal changes are observed at sub-lethal levels, but ill-effects (growth, reproduction, etc.) have not typically been identified. Published reports contain many caveats indicating experiments that were too brief or did not examine all possible negative effects (Salice et al., 2007), however, the following summarizes the importance for eco-risk analysis to the Lost River Basin (NationView, 2013):

- Sub-lethal effects were not found, indicating low-level exposures are relatively safe.
- Authors provided No Observable Adverse Effect Level (NOAEL) projected concentrations higher than what was found in surface water in the Lost River Basin.
- Data indicate fish; in particular, have a high tolerance for perchlorate.

The highest surface water value for the perchlorate sampling in the Lost River Basin was 10 μg/L. 10 μg/L in surface water is not environmentally-relevant with respect to wildlife exposures. Fish, in particular, have been well-studied and appear to have a relatively high tolerance for perchlorate (NationView, 2013).

C.13.4 BASIS OF DETERMINATION

Concentrations of four TAL metals were identified in groundwater above their applicable regulatory criteria during the AOC-U RFI sampling events. Due to the ubiquitous geographic distribution of the metals exceedences they most likely represent natural variability of groundwater throughout the Lost River Basin. Concentrations of nitrate and/or perchlorate were detected above their applicable regulatory action level screening criteria in 25 groundwater samples (20 locations) out of 57 groundwater samples (51 locations) collected during the AOC-U RFI sampling events. Nitrate and perchlorate detections observed above applicable action levels were generally located in the vicinity of ERP Sites where historical rocket testing or maintenance occurred (Figures C-13.11 and C-13.11).

Although one likely point source of nitrate and perchlorate was identified outside of Building 1168 (Figure C-13.15), it cannot be accountable for the general occurrence of these compounds throughout AOC-U. The widespread nature of nitrate and perchlorate exceedences could be attributed to voluminous vapor clouds containing by-products of solid rocket propellants produced during repeated launch exercises which were dispersed by the prevailing winds to areas surrounding the launch facilities. These thick vapor clouds dispersed locally by wind along with inevitable misfires, in which rockets did not follow their intended path, and subsequently were not recovered, could justify such a broad distribution of nitrate and perchlorate exceedences within AOC-U. Due to the extensive area covered by sample locations during this RFI, all exceedences of nitrate and/or perchlorate were ultimately bounded by downgradient control points. Furthermore, the average AOC-U TDS concentration (109,798 mg/L) exceeds the NMWQCC groundwater standard for potable water (10,000 mg/L) by 11-fold and is classified by the USEPA as a Class IIIB aquifer which is designated as unfit for human consumption (USEPA, 1986). Therefore AOC-U groundwater is not a potential source of drinking water or of any beneficial human use and human ingestion of groundwater at this site is considered an incomplete pathway.

The Lost River Basin is considered an environmentally sensitive area under agreement between HAFB, WSMR, the NPS, the USFWS, and the NMDGF to protect the Threatened White Sands pupfish. Per this interagency agreement, the Lost River Basin has been designated as Essential Fish Habitat and is therefore protected from both development and recreational use. That being said, a viable exposure pathway to humans does not exist within the Lost River Basin. The only feasible exposure pathway for wildlife to COPCs present within AOC-U is through surface water. As discussed in the previous section, the level of perchlorate present in the surface water of AOC-U (maximum detection of 10 µg/L) is not environmentally-relevant with respect to wildlife exposures (NationView, 2013).

Based upon the subsurface soil sampling, surface soil, groundwater, and surface water characterization activities within AOC-U Criterion #5 was accomplished. The RCRA Facility Investigation determined that risk to human health or ecological receptors within AOC-U do not exist. Criterion #5 states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on May 14, 2015 (NMED, 2015). The letter from NMED to HAFB indicating CAC without controls for AOC-U is presented in the section NMED Letters of Approval at the end of this document.

C.13.5 REFERENCES

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C.14 AOC-838 – ERP Site SS-72

The following information was obtained from the *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73), Holloman AFB, New Mexico*. (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.14.1 LOCATION/UNIT DESCRIPTION

AOC-838, Site SS-72 is also known as TCE in Groundwater Upgradient of LF-21. The location of Site SS-72 is identified as the area just north of groundwater monitoring well MW21-01 (Figure A-1.2) which is an upgradient well for LF-21, or SWMU 116 (West Area Landfill #2). SS-72 is presented in Figure C-14.1.

C.14.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Trichloroethene (TCE) groundwater contamination was discovered during the sampling of monitoring wells MW-21-01, -02, -03, and -04 that were installed as part of the 10 year Long – Term Monitoring (LTM) Program. The four wells were installed to meet monitoring commitments for LF-21. Previously the solvent TCE had only been detected in the upgradient well MW-21-01 above the Maximum Contaminant Level (MCL) for TCE in drinking water. Therefore an investigation of the area upgradient of monitoring well MW-21-01 was conducted to determine potential sources of contamination.

Aerial photographs taken in 1945, 1972, 1979, 1984, 1996, and 2004 from the area upgradient of monitoring well MW-21-01 were reviewed for signs of spills or maintenance facilities that operated in earlier periods. This review only indicated that the area stretching approximately 800 ft north of this well has remained cleared and undeveloped since 1945. The nearest buildings (800, 806, 816, and 817) where maintenance activities occurred which likely used TCE as a degreaser are near the flight line about 900 ft to the northeast. No records exist documenting a release of TCE in the area of SS-72. As a result, SS-72 was designated to be investigated separately as its own site.

The current and anticipated future land use of SS-72 is industrial.

The following is a description of the history of remediation and investigation of SS-72.

C.14.3 EVALUATION OF RELEVANT INFORMATION

2007 Investigation of the Site

Objectives of the Confirmatory Sampling at Site SS-72 were to determine if any soil, and/or groundwater contamination currently exist at the site, delineate the current horizontal and vertical extent of the contamination (if present), and to collect the proper data meeting the data quality objectives to support closure of the site based on guidance from the NMED. In April 2007, three direct-push technology (DPT) soil borings (SS72-DP01 through SS72-DP03) were advanced at Site SS-72. One soil sample was collected from the interval above groundwater for laboratory analysis. Groundwater samples were collected from three monitoring wells installed in these DPT borings, (SS72-DP01 through SS72-DP03) shown on Figure C-14.1.

The three soil samples collected were analyzed for VOCs and SVOCs. None of the soil samples indicated concentrations exceeding the NMED SSLs for any of the constituents of concern (i.e. TCE). The three groundwater samples collected from SS72-DP01 and SS72-DP03 were analyzed for VOCs and TDS. Soil and groundwater analytical results are presented in Table C.14.1 and Table C.14.2, respectively. None of the samples indicated concentrations above the USEPA MCL, however, the TDS results indicated concentrations exceeding the NMWQCC (1,000 mg/L) in all of the wells.

C.14.4 BASIS OF DETERMINATION

The analytical results from the soil and groundwater samples collected at SS-72 during this investigation did not contain any VOCs or SVOCs in excess of NMED SSLs, NMWQCC standards, or USEPA MCLs. Therefore, HAFB requested NFA for Site SS-72 based upon Criterion #5 which states:

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

CAC status (NMED's new classification of NFA) was granted by NMED on July 18, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for SS-72 is presented in the section NMED Letters of Approval at the end of this document.

C.14.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) May 2006. *2005 Long Term Groundwater Monitoring Report*. Holloman AFB, New Mexico.

Bhate. July 2007. *RCRA Facility Assessment Confirmatory Sampling Work Plan, Multiple Sites*. Holloman AFB, New Mexico.

Bhate. May 2008. *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS7-3), Holloman AFB, New Mexico*.

New Mexico Environment Department (NMED) July 18, 2012, Approval: RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72, and SS-73), May 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-006).

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

C.15 AOC-1088 – ERP Site SS-73

The following information was obtained from the *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS-73), Holloman AFB, New Mexico*. (Bhate, 2008) unless otherwise cited. The subject matter has already been approved by the NMED (NMED, 2012).

C.15.1 LOCATION/UNIT DESCRIPTION

AOC-1088 is listed as TCE Groundwater Contamination Upgradient of SS-61 and is identified as ERP Site SS-73. It is located in the central part of HAFB in an industrial area (Figure A-1.2). SS-61 is located north of two hangars, Buildings 1079 and 1080. SS-73 is generally known to be an open area located about 150 ft east of the concrete pad that is part of Site SS-61. SS-73 is presented in Figure C-15.1.

In 1999, during groundwater sampling and analysis conducted for RI activities at SS-61, TCE was discovered in well SS61-MW02. This was a location where there was no known source for TCE. As a result, SS-73 was designated to be investigated separately as its own site.

C.15.2 HISTORY/CURRENT AND ANTICIPATED FUTURE LAND USE

Site SS-73 results from the occurrence of TCE that was measured in well SS61-MW02 on several occasions. Site SS-61 resulted from the occurrence of VOCs in well MW-29-05 which is part of Site LF-29 (the Old Army Landfill) located downgradient of SS-61. The source of contamination at SS-61 was determined to be from an aviation gasoline distribution system that had existed at the site consisting of aboveground storage tanks (ASTs), USTs, and leaking distribution lines. The site has undergone extensive remediation including excavation and treatment of approximately 100,000 cubic yards of PCS, and in-situ remediation of remaining PCS and groundwater with an enhanced bio-remediation system.

The current and anticipated future land use of SS-73 is open area.

The following is a description of the history of remediation and investigation of SS-73.

C.15.3 EVALUATION OF RELEVANT INFORMATION

Investigations of Adjacent Sites

Contamination was initially detected in the vicinity of SS-61 during the Phase II RFI conducted at nearby SWMU 104, the Former Army Landfill (LF-29) in 1995 (Radian, 1995). Four (4) additional groundwater monitoring wells (MW-29-05 through MW-29-08) were installed in 1997 and a complete round of groundwater sampling and analysis was conducted (eight (8) monitoring wells). The results showed that MW-29-05 contained benzene, 1,2-dichloroethane (1,2-DCA), 2,4,6-trinitrotoluene (TNT), and 1,3,5-trinitrobenzene at. Since the source of groundwater contamination was expected to be to the southeast of MW-29-05 and to the east of Building 1001, SS-61 was identified and subsequent Phase I and II RFIs were conducted in 1996 and 1997 at SS-61 by Foster & Wheeler Environmental Corporation and Groundwater Technology, Inc.

(FWEC & GTI). During these investigations, TCE was measured in well SS61-MW02 and measured in DPT groundwater sampling point DP-20 (FWEC & GTI, 1997). During the RI of SS-61 in 1999 TCE was also reported in well SS61-MW02 (FWEC, 1999). Since there was no known or obvious source for the TCE, it was separated from SS-61 and designated as Site SS-73 to be investigated separately.

2006 -2007 SS-73 RFI Investigation

In 2006, an abbreviated sampling plan was prepared to collect preliminary data that could be used for the RFI work plan for SS-73. Two (2) groundwater samples at locations upgradient of monitoring well SS61-MW02 were collected and analyzed for VOCs and TDS. The VOCs were reported below detection levels in all soil samples. The TDS levels measured between 8,970 and 21,600 mg/L.

In 2007, five (5) DPT soil borings (SS73-DP04 through SS73-DP08) were advanced at Site SS-73. One soil sample, with the highest photo-ionization detector (PID) reading, was collected from each boring for laboratory analysis. Groundwater samples were collected from all new temporary monitoring wells (SS73-DP04 and SS73-DP08).

Objectives of the Confirmatory Sampling at Site SS-73 were to determine if any soil, and/or groundwater contamination currently exist at the site and delineate the current horizontal and vertical extent of the contamination (if present).

Soil samples collected were analyzed for VOCs, SVOCs, and TPH-GRO, DRO, and ORO. The subsurface soil samples collected during this investigation were collected from intervals ranging from 10 to 23 ft bgs. None of the soil samples indicated concentrations exceeding the NMED SSLs for any of the constituents.

The five (5) groundwater samples collected from SS73-DP04 and SS73-DP08 were analyzed for VOCs and TDS. One VOC constituent, TCE, was detected in two of the groundwater samples from SS73-DP06 and SS73-DP07 above the USEPA MCL. None of the other VOC constituents were detected above the NMWQCC standards or USEPA MCLs. The TDS results indicated concentrations exceeding the NMWQCC (1,000 µg/L) in all of the wells (Figure C-15.2). Due to the concentrations of TCE that were detected in SS73-DP06 and SS73-DP07 above the USEPA MCL, a site-specific risk based evaluation was performed.

The TDS data collected from four (4) of the five (5) SS-73 temporary monitoring wells were above 10,000 mg/L. Therefore the shallow groundwater is not considered potable. The maximum detected soil and groundwater concentrations were compared with the soil target levels and groundwater target levels respectively. The maximum detected soil concentrations did not exceed the soil target levels for any of the COPCs. The maximum detected TCE concentration in groundwater did not exceed the target levels for indoor inhalation of vapors from groundwater for the future resident or for outdoor inhalation of vapors from groundwater for the future construction worker. Therefore, the current groundwater concentration is protective of the future on-site resident and future on-site construction worker.

C.15.4 BASIS OF DETERMINATION

The analytical results from soil samples collected at SS-73 during this investigation did not contain any VOCs, SVOCs, or TPH in excess of the NMED SSLs. The maximum detected TCE concentration in groundwater did not exceed the target levels for indoor inhalation of vapors from groundwater for the future resident or for outdoor inhalation of vapors from groundwater for the future construction worker. Therefore, the current groundwater concentration is protective of the future on-site resident and future on-site construction worker. Therefore, HAFB requested NFA for Site SS-73 based upon Criterion #5 which states:

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

CAC status (NMEDs new classification of NFA) was granted by NMED on July 18, 2012 (NMED, 2012). The letter from NMED to HAFB indicating CAC without controls for SS-73 is presented in the section NMED Letters of Approval at the end of this document.

C.15.5 REFERENCES

Bhate Environmental Associates, Inc. (Bhate) 2005. *Monitored Natural Attenuation Report for SS-61 (AOC-1001) Holloman AFB, New Mexico*

Bhate. 2006. *Memorandum Scope of Work for Soil and Groundwater Sampling.*

Bhate. 2006. *Final Voluntary Corrective Measures Work Plan Site SS-61 Soil Remediation.*

Bhate. May 2008. *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72 and SS7-3), Holloman AFB, New Mexico*.

Foster Wheeler Environmental Corporation and Groundwater Technology Inc. (FWEC & GTI) December 1997. *Draft Final Phase I and II RCRA Facility Investigation Report Site AOC 1001, Holloman AFB, New Mexico*.

Foster Wheeler Environmental Corporation. (FWEC) August 1999. *Final Phase I Remedial Investigation Report for Spill Site 61. Holloman AFB, New Mexico*.

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

New Mexico Environment Department (NMED) July 18, 2012, Approval: RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites (SS-66, SS-68, RW-70, SS-72, and SS-73), May 2008, Holloman Air Force Base, EPA ID# NM6572124422 (HWB-HAFB-08-006).

FIGURES

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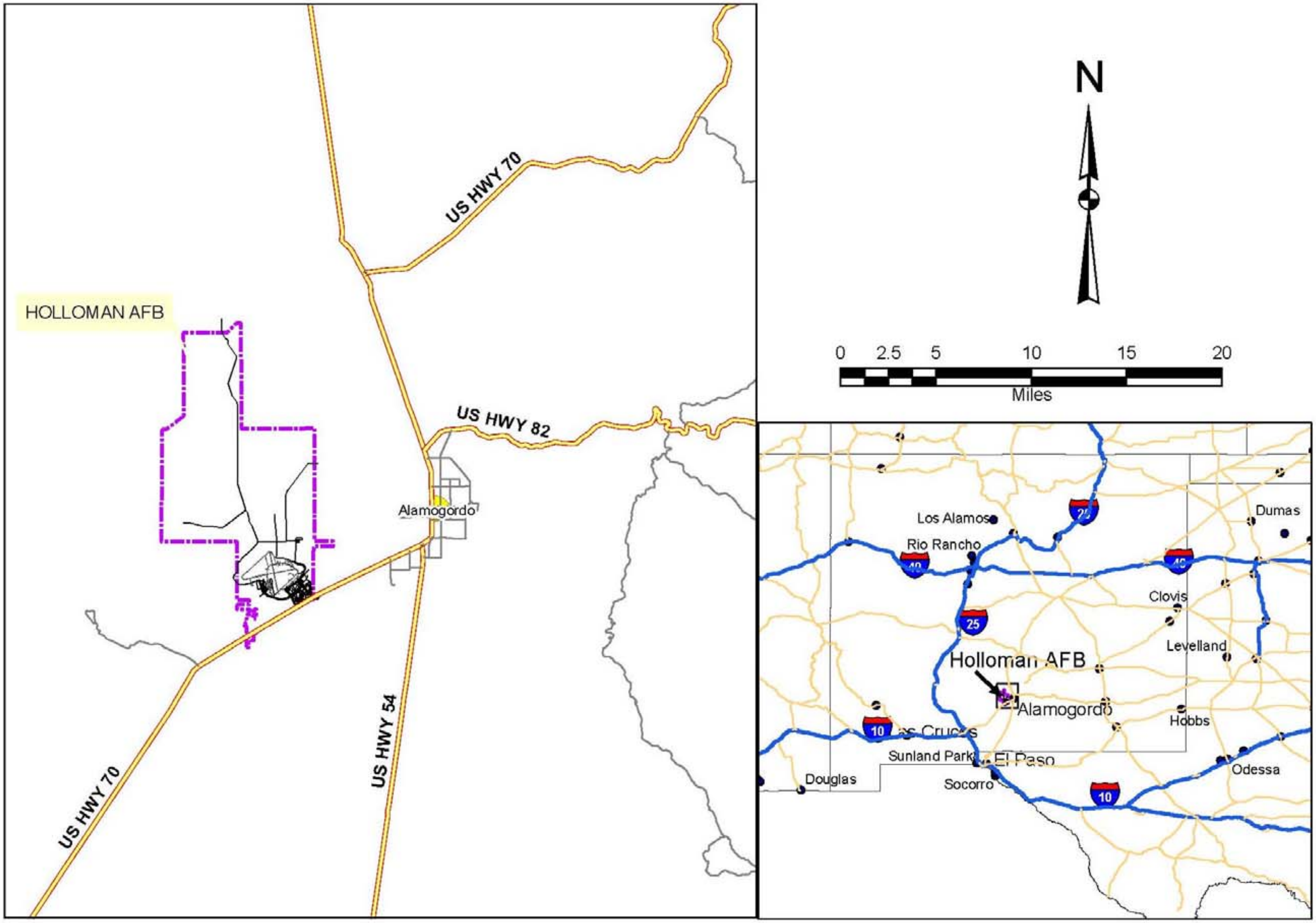

Figure A-1.1. General Location of Holloman Air Force Base, New Mexico

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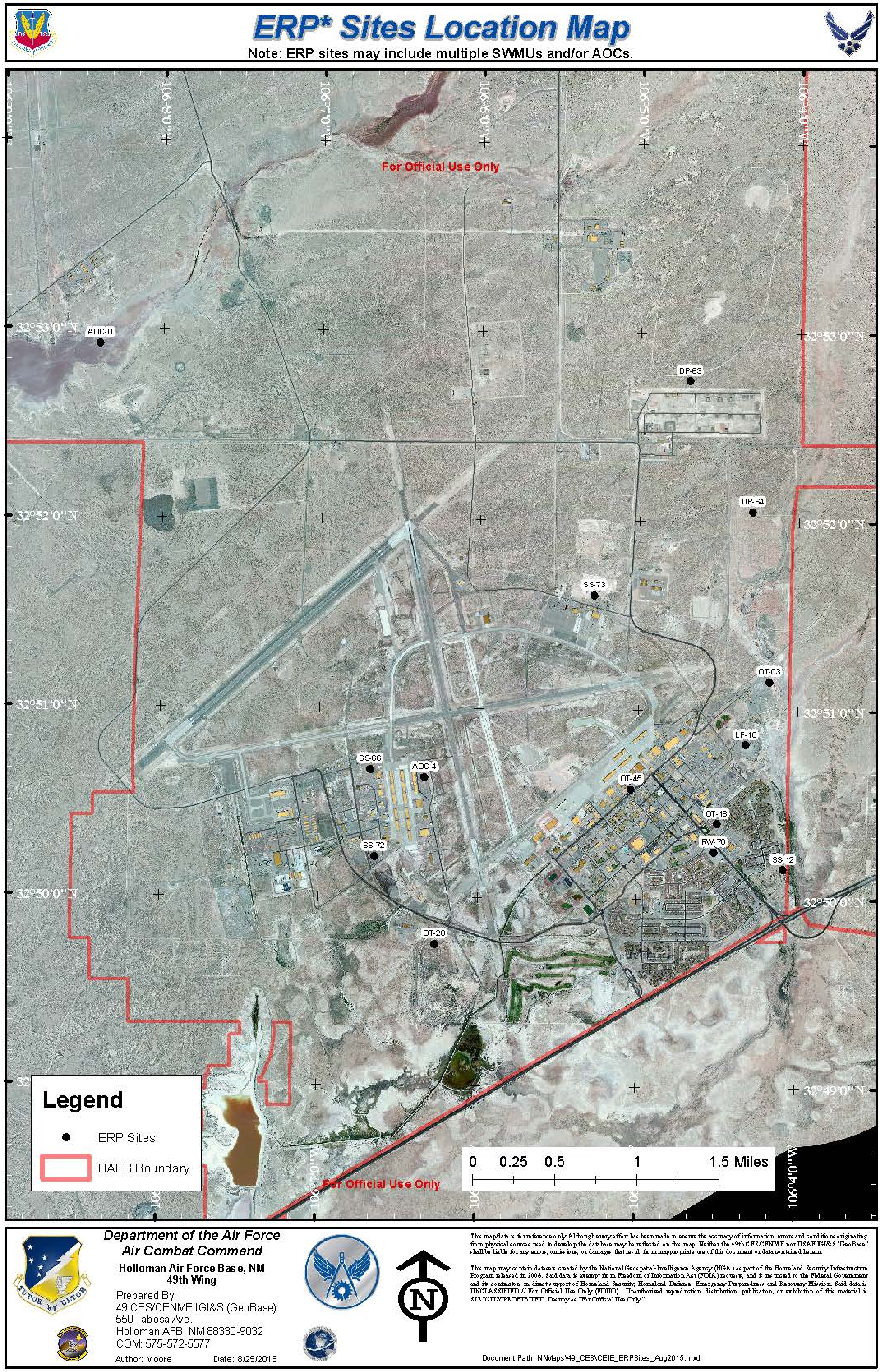

Figure A-1.2. ERP* Sites Location Map

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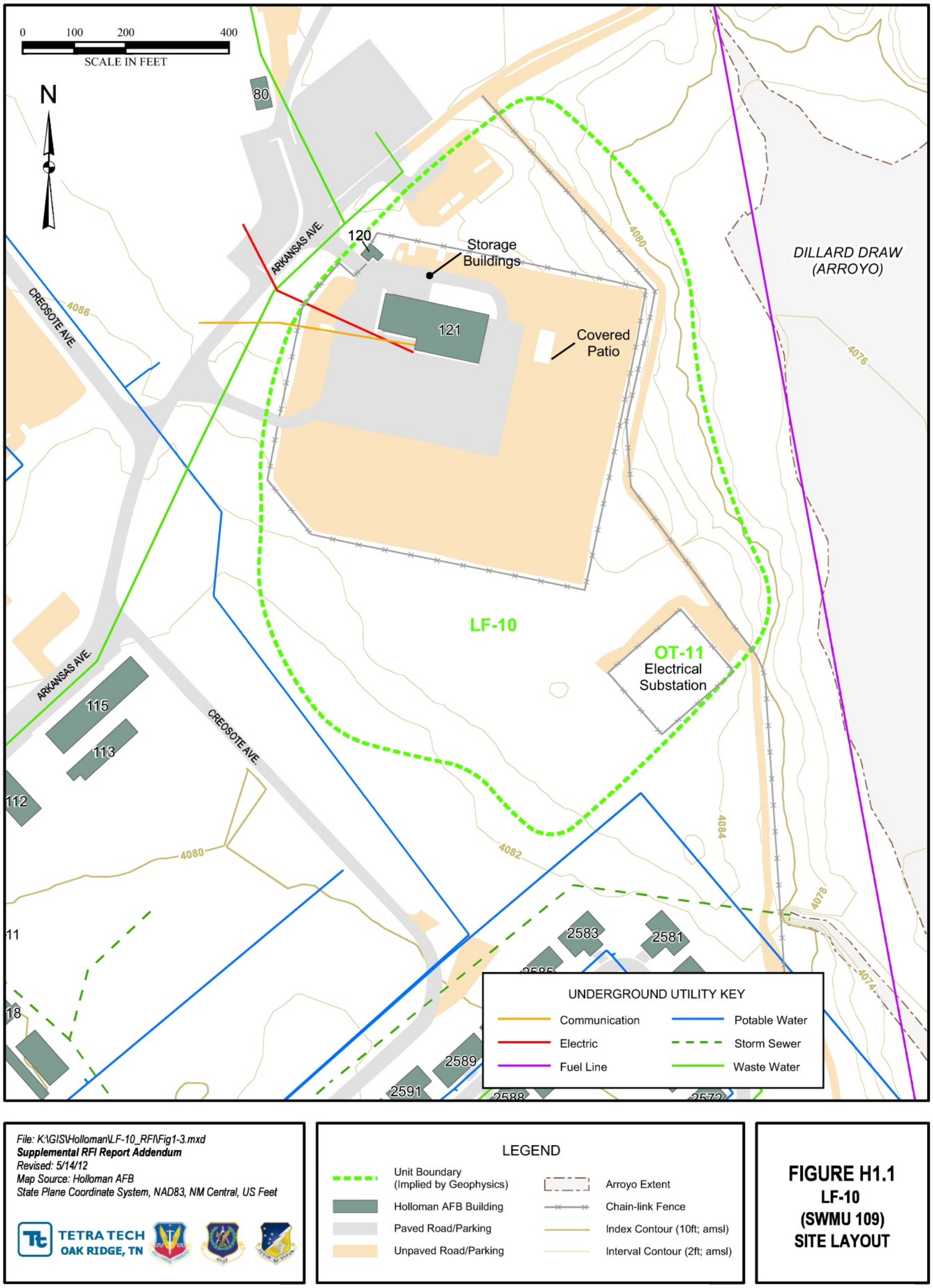


Figure C-1.1 SWMU Nos. 101 and 109 -LF-10 Site Layout, Holloman AFB

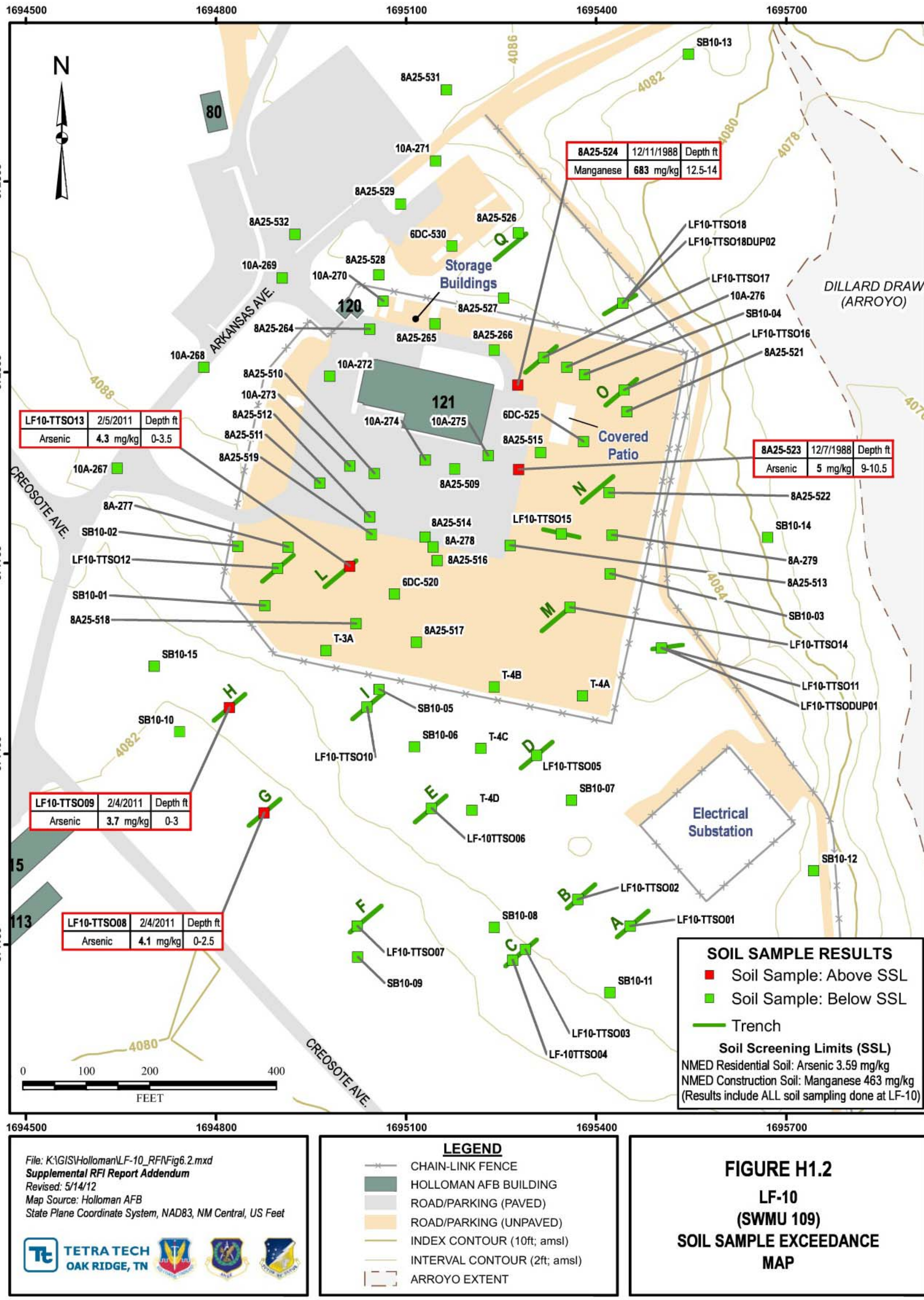


Figure C-1.2 SWMU Nos. 101 and 109 - LF-10 Soil Sample Exceedence Map

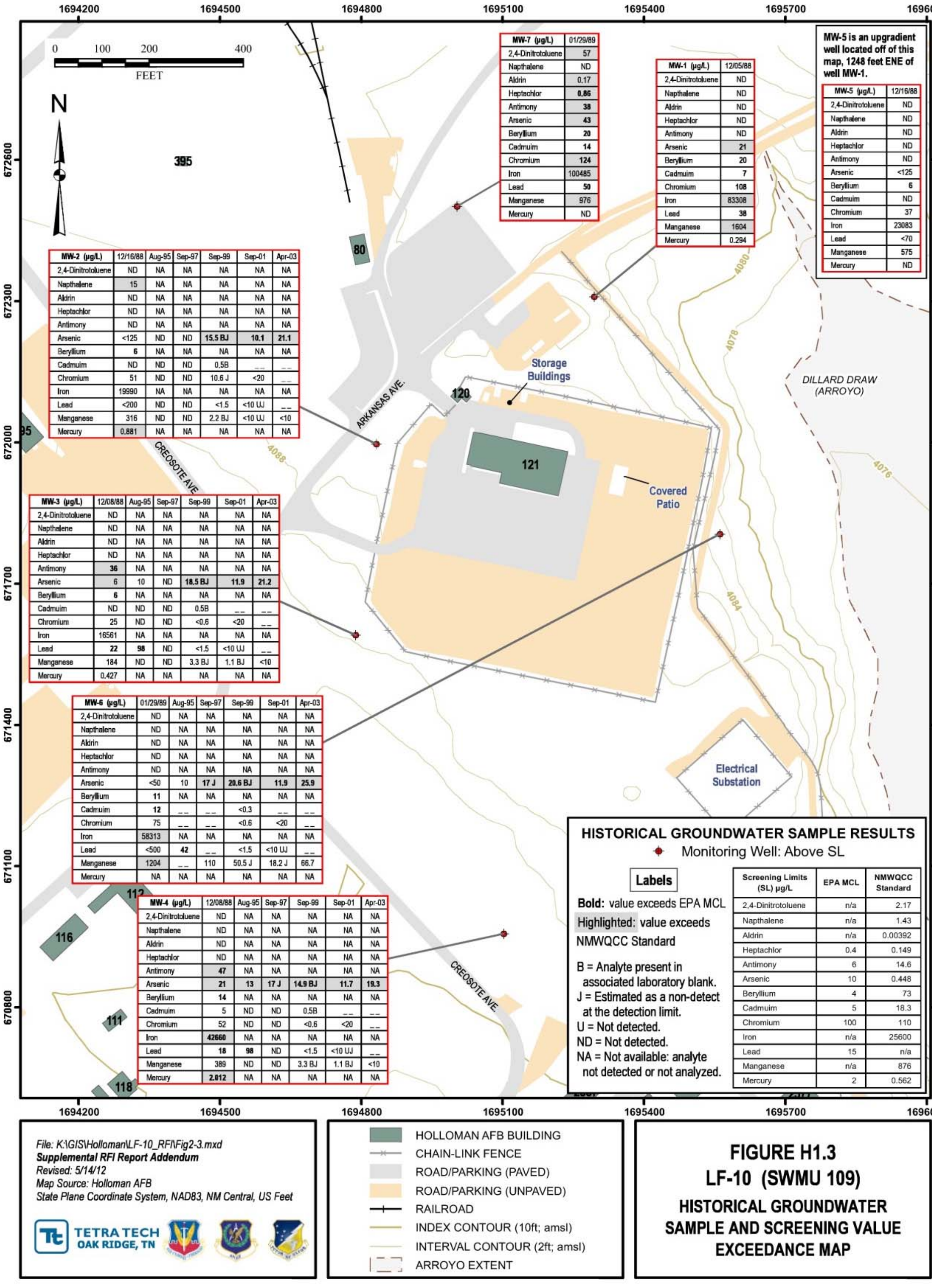


Figure C-1.3 SWMU Nos. 101 and 109 - LF-10 Historical Groundwater Sample and Screening Value Exceedence Map

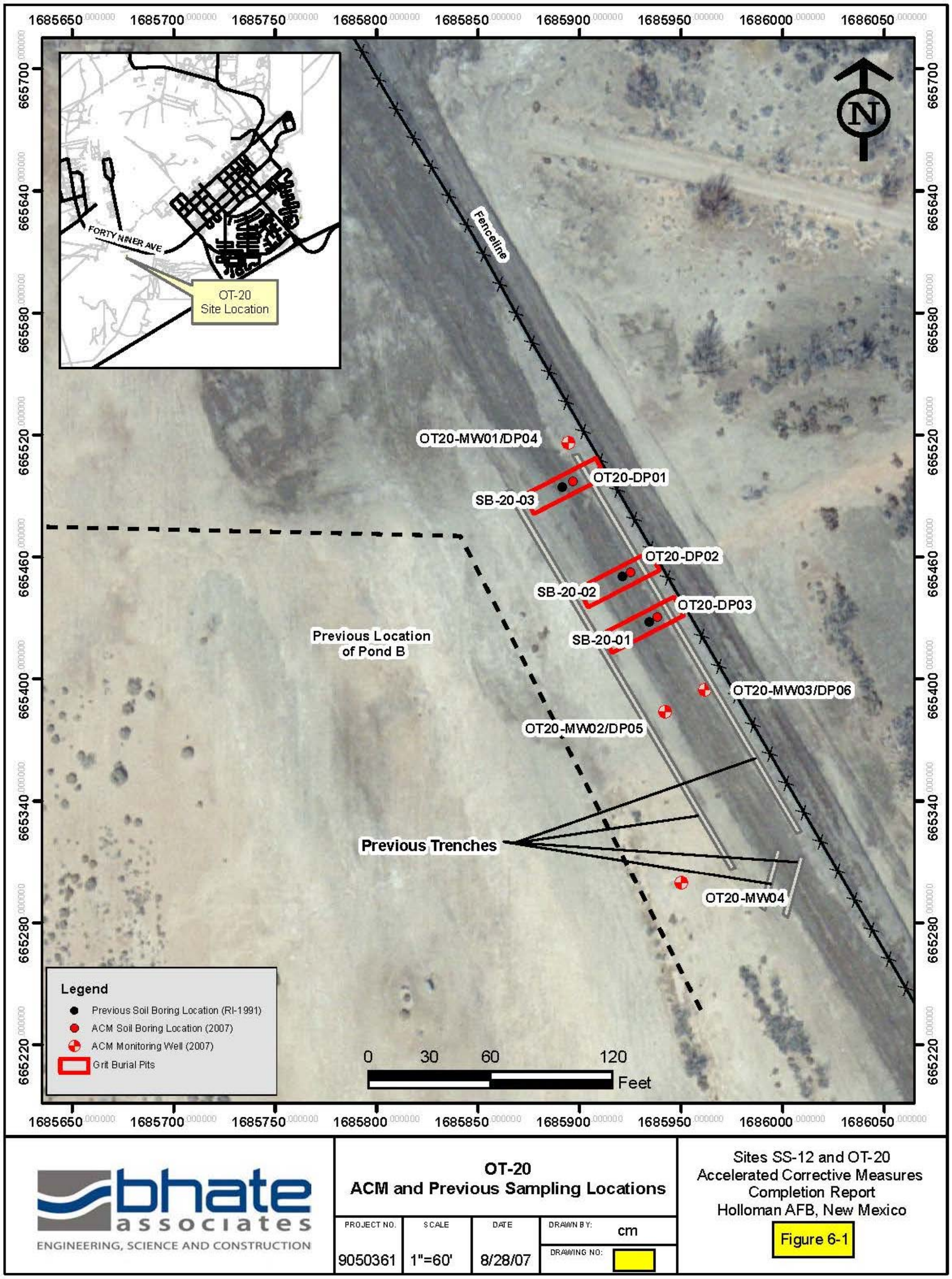


Figure C-2.1 SWMU No. 113A - OT-20 ACM and Previous Sampling Locations

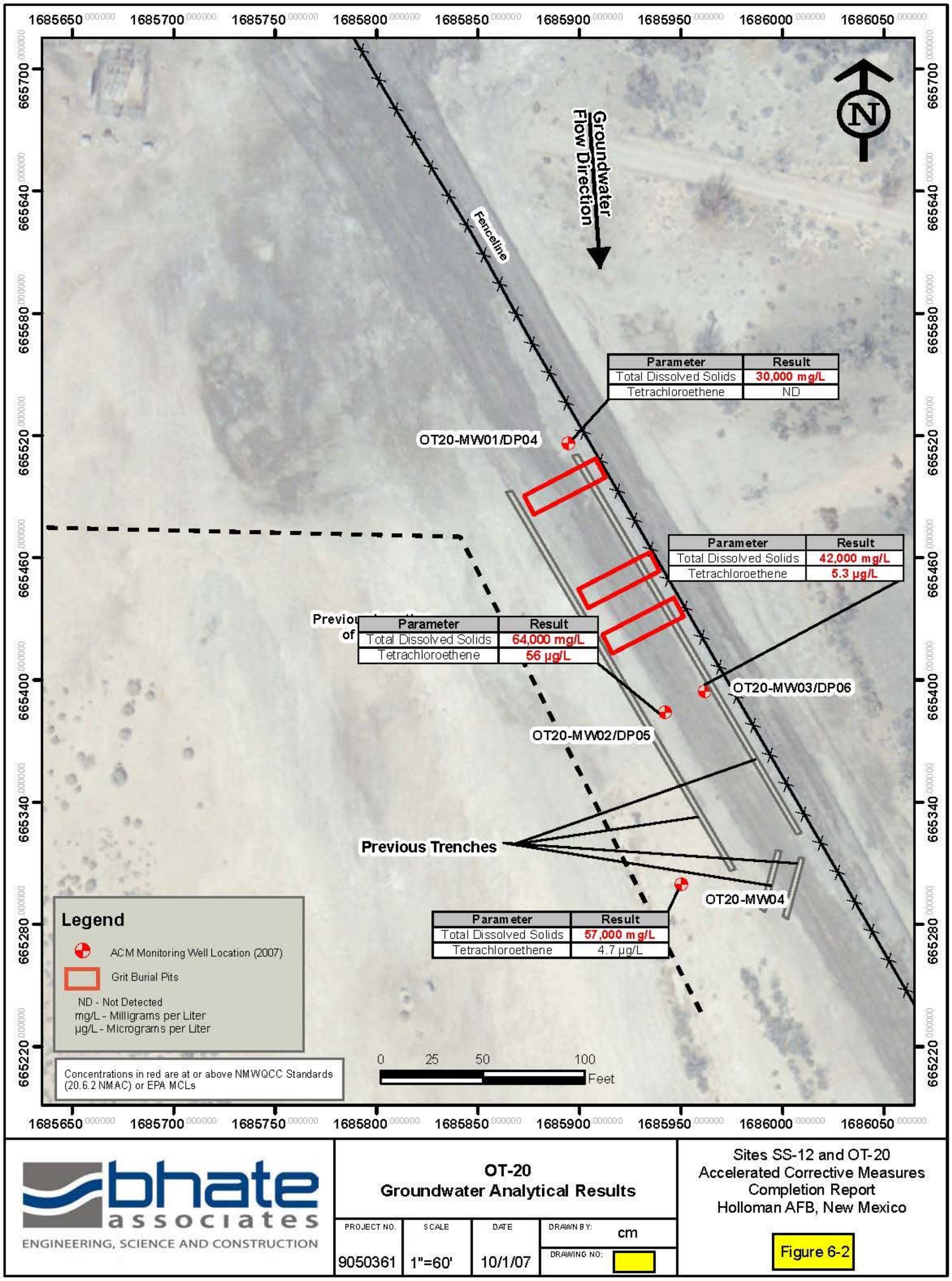


Figure C-2.2 SWMU No. 113A - OT-20 Groundwater Analytical Results

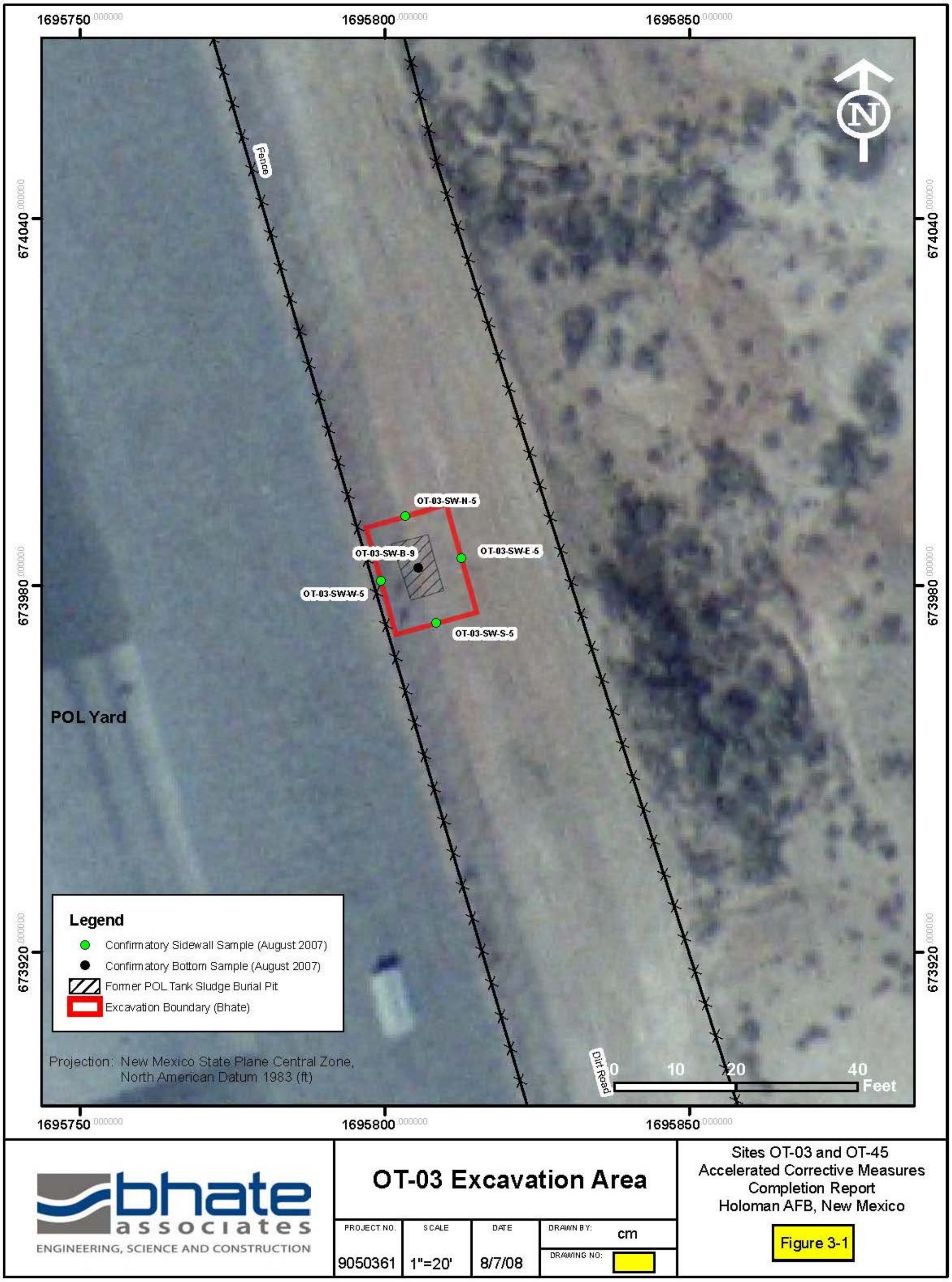


Figure C-3.1 SWMU No. 114 - OT-03 Excavation Area

Figure C-4.1 SWMU Nos. 118, 132, and AOC A - OT-16 Site Layout, Holloman AFB

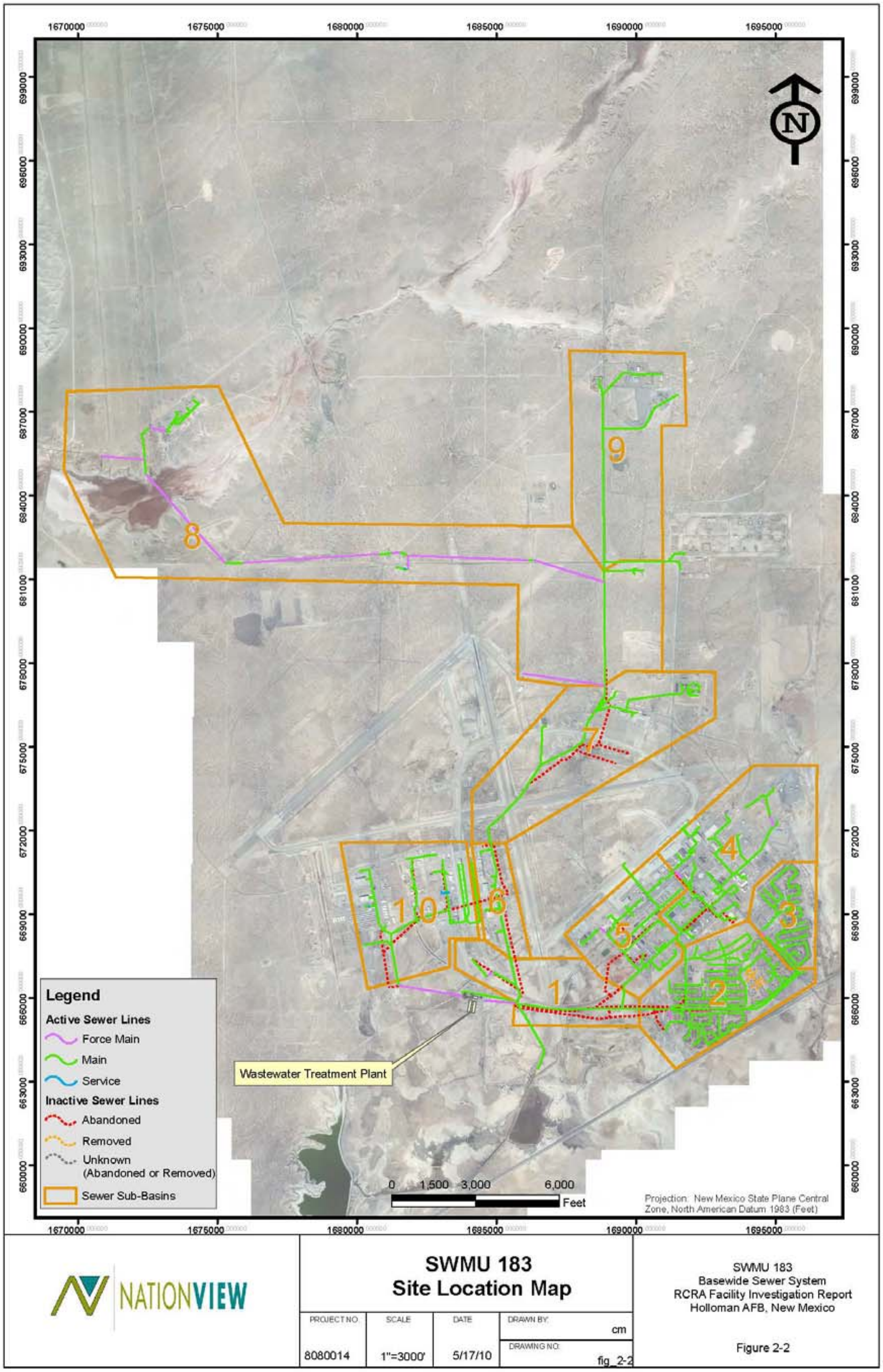


Figure C-5.1 SWMU 183 Site Location Map

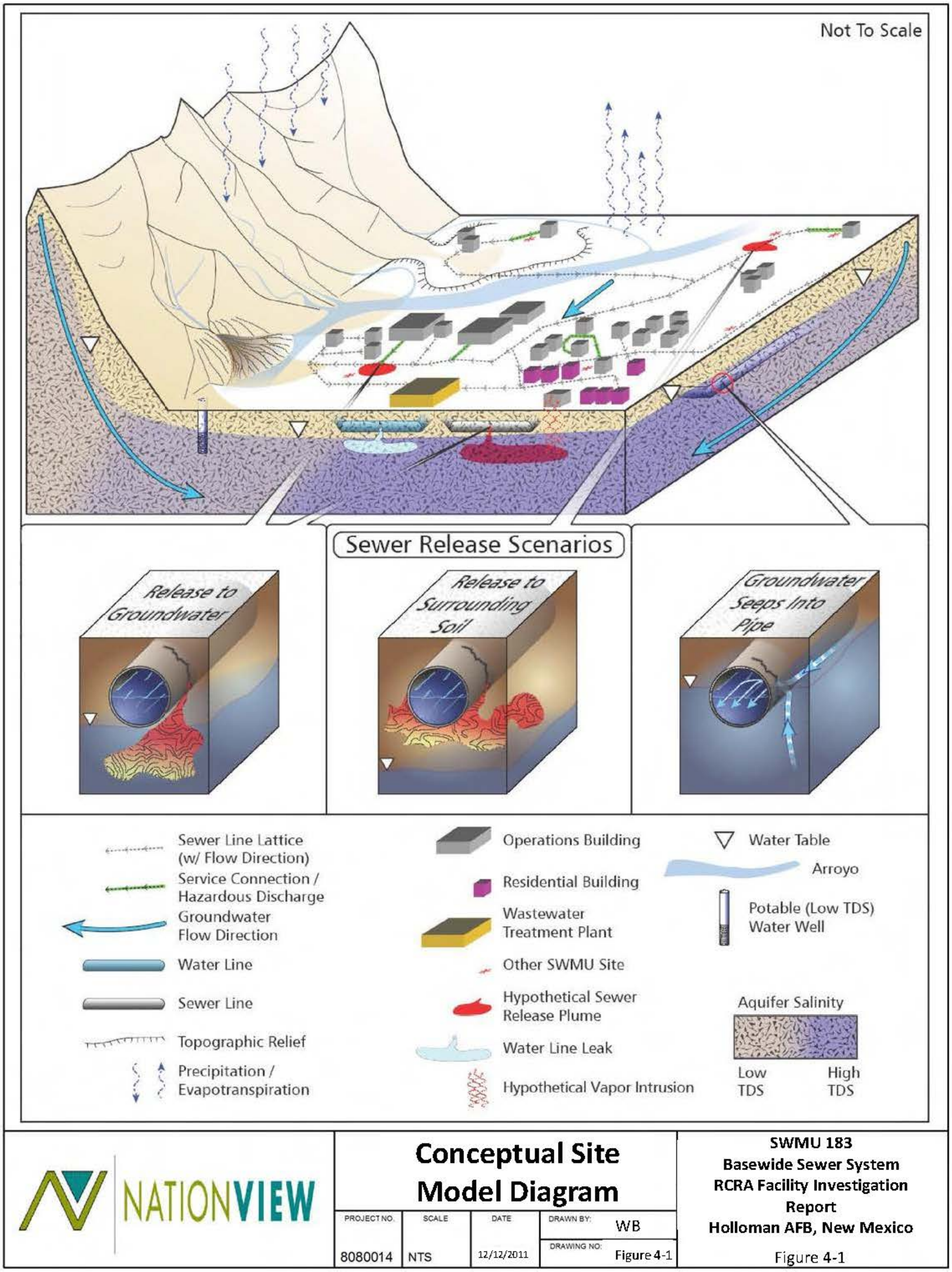


Figure C-5.2 SWMU 183 Conceptual Site Model Diagram

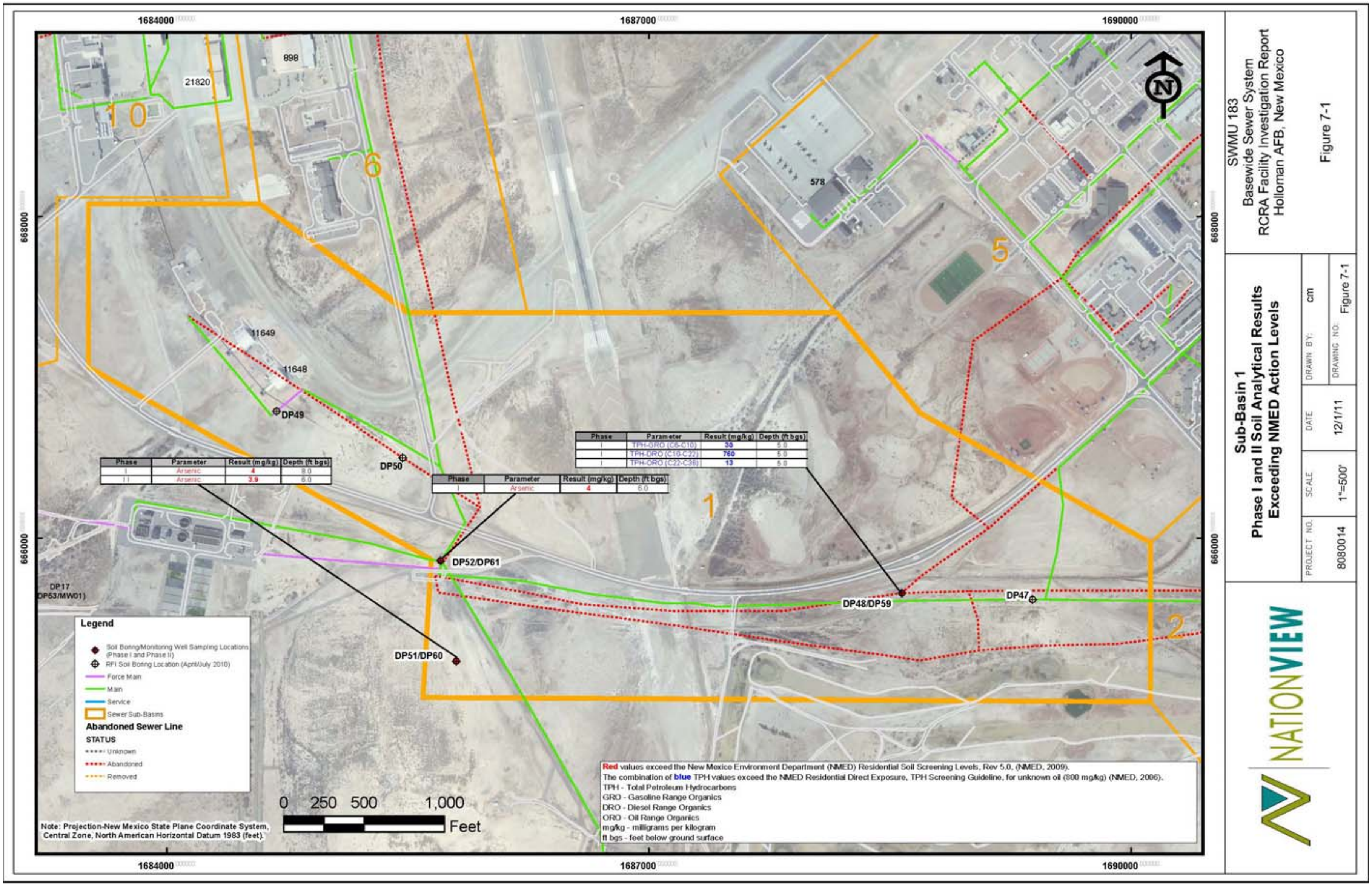


Figure C-5.3 Sub-Basin 1 Phase I and II Soil Analytical Results Exceeding Action Levels

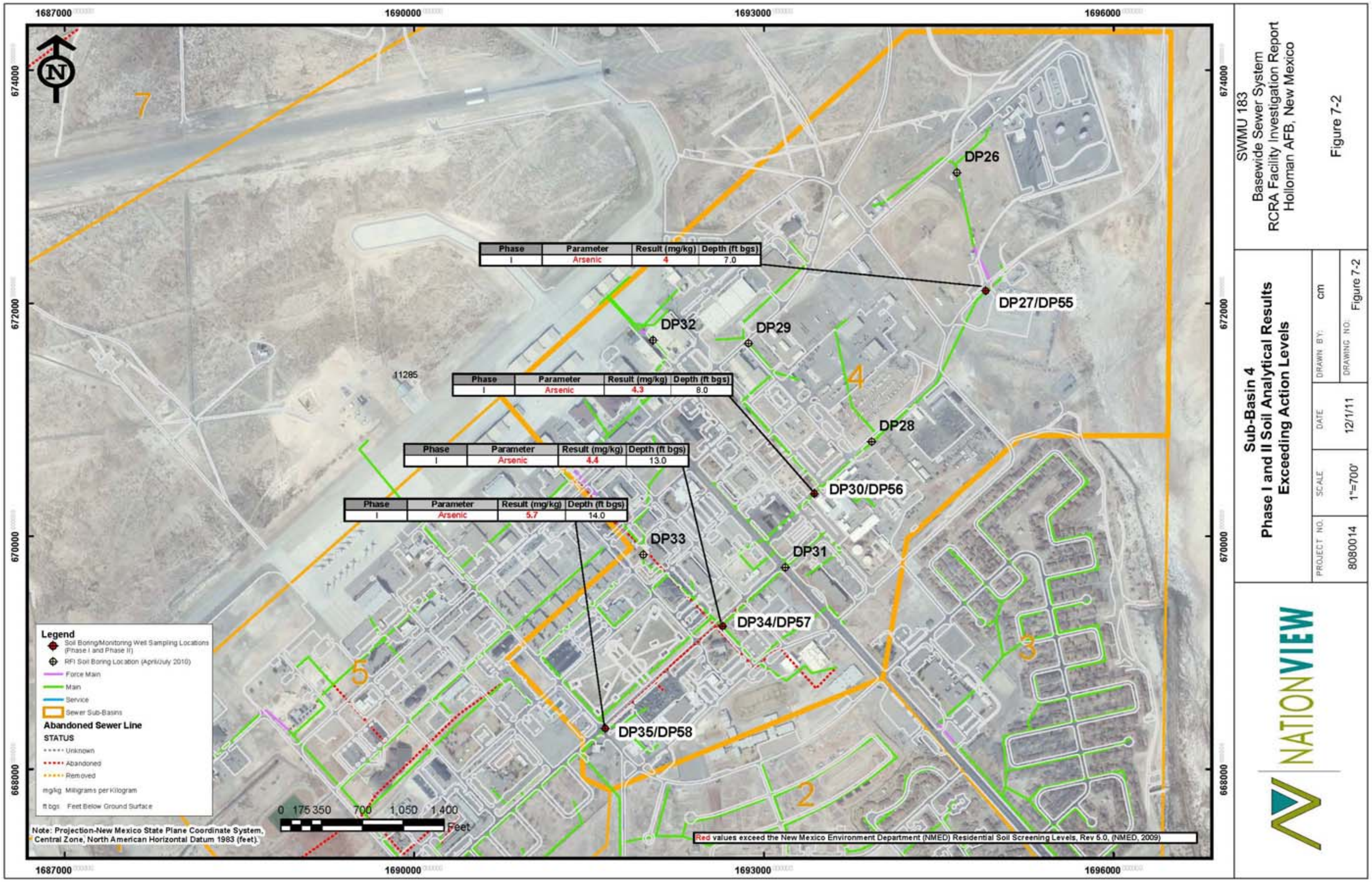


Figure C-5.4 Sub-Basin 4 Phase I and II Soil Analytical Results Exceeding Action Levels

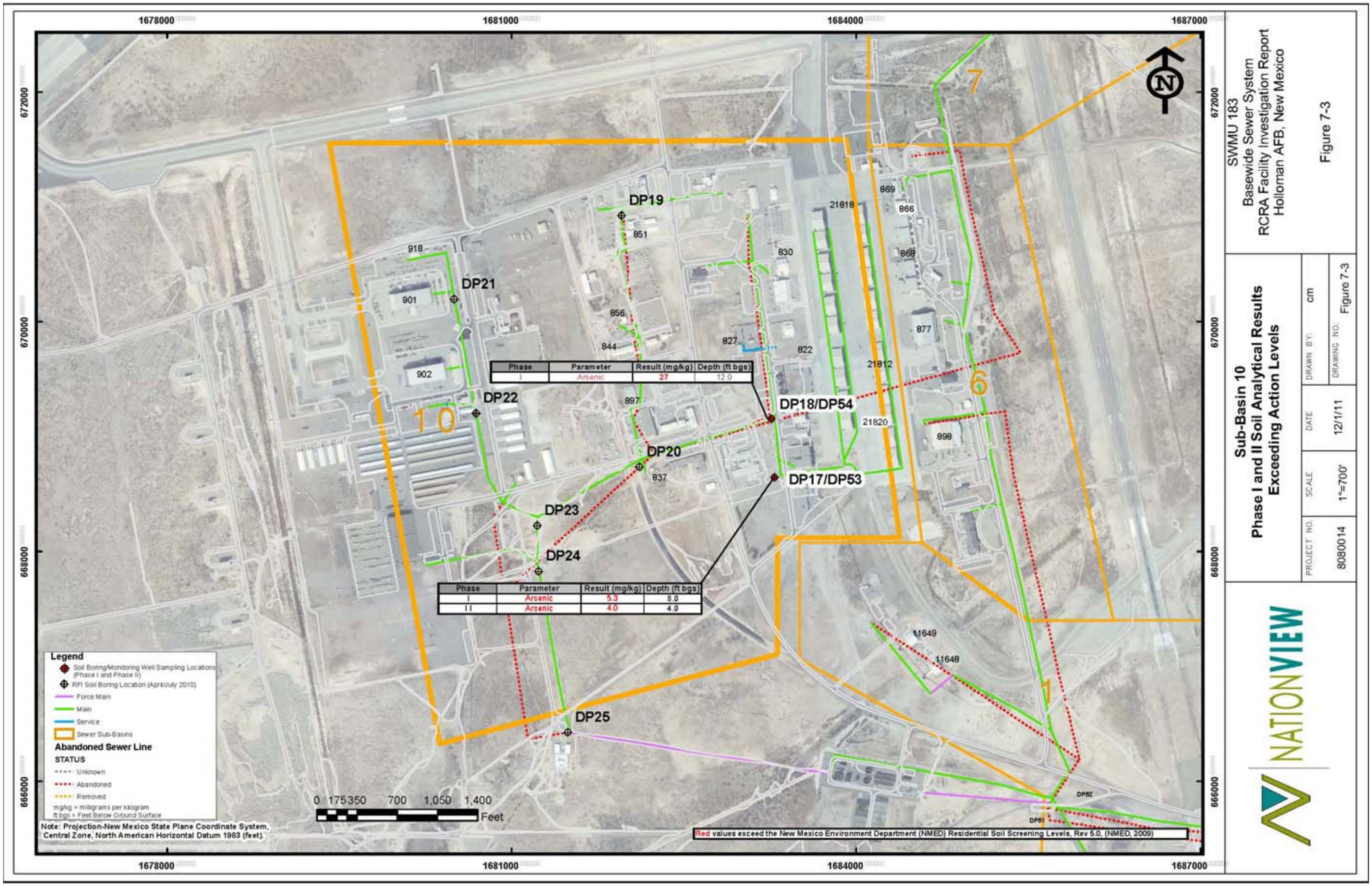


Figure C-5.5 Sub-Basin 10 Phase I and II Soil Analytical Results Exceeding Action Levels

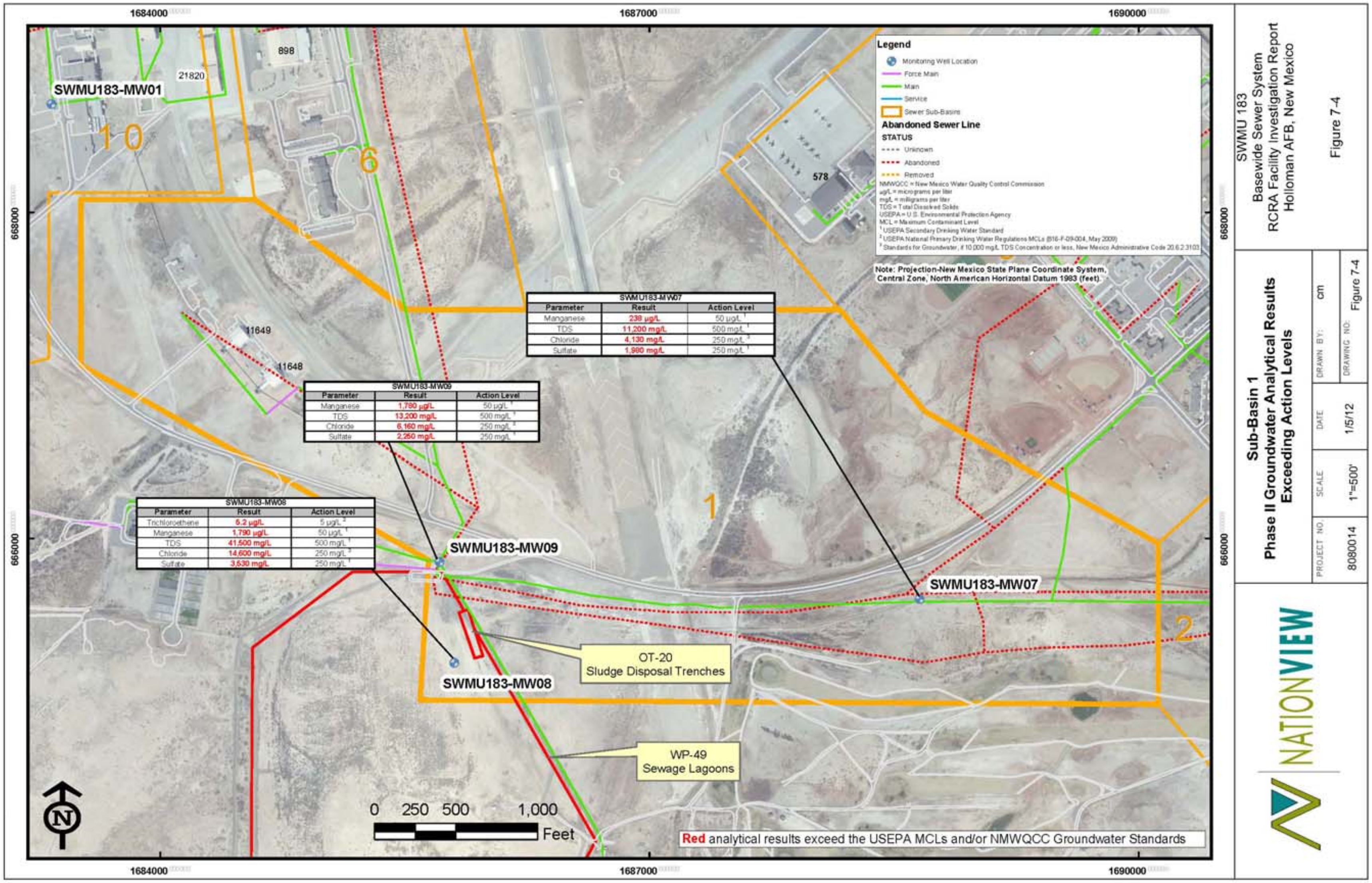


Figure C-5.6 Sub-Basin 1 Phase II Groundwater Analytical Results Exceeding Action Levels

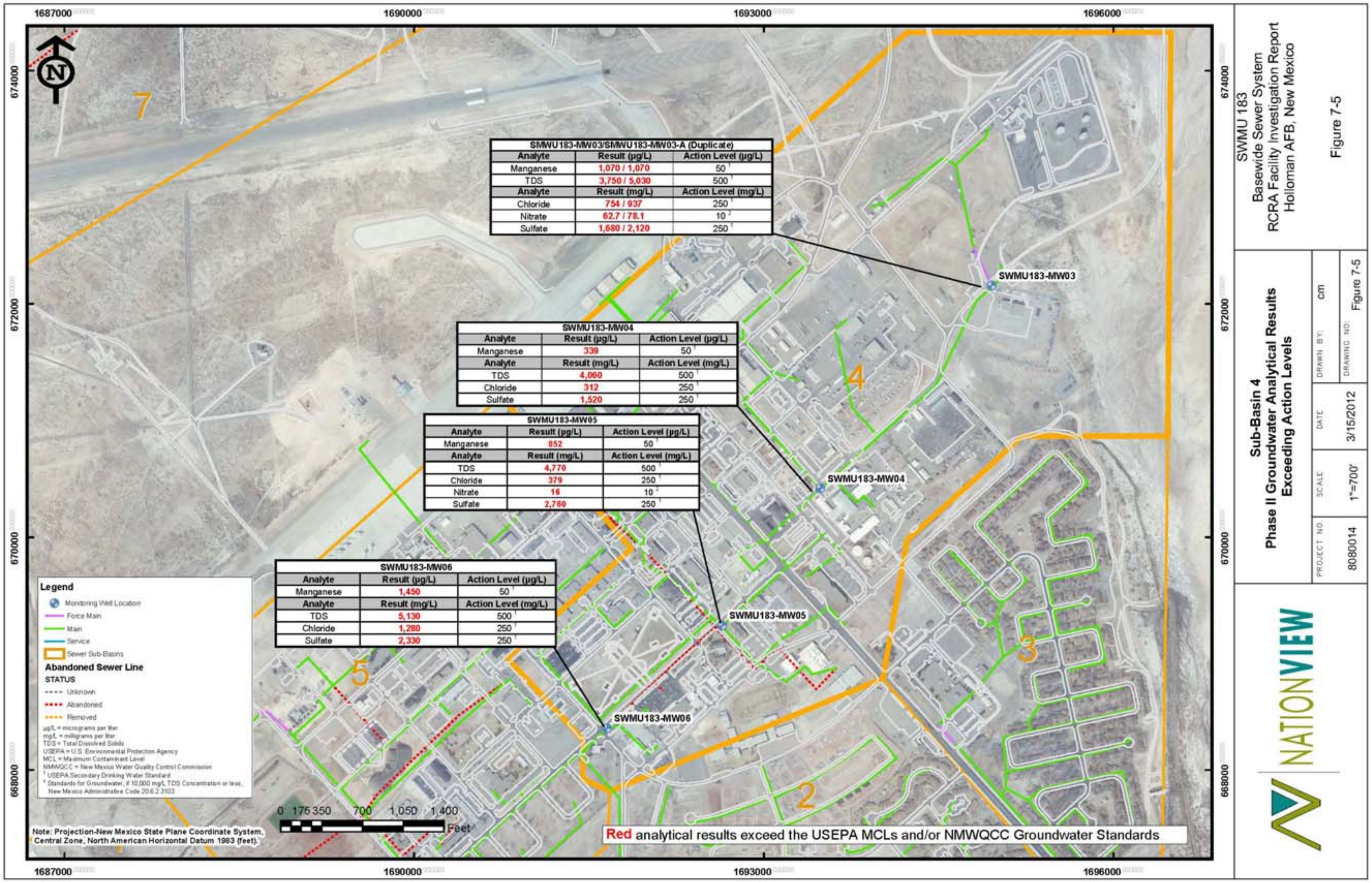


Figure C-5.7 Sub-Basin 4 Phase II Groundwater Analytical Results Exceeding Action Levels

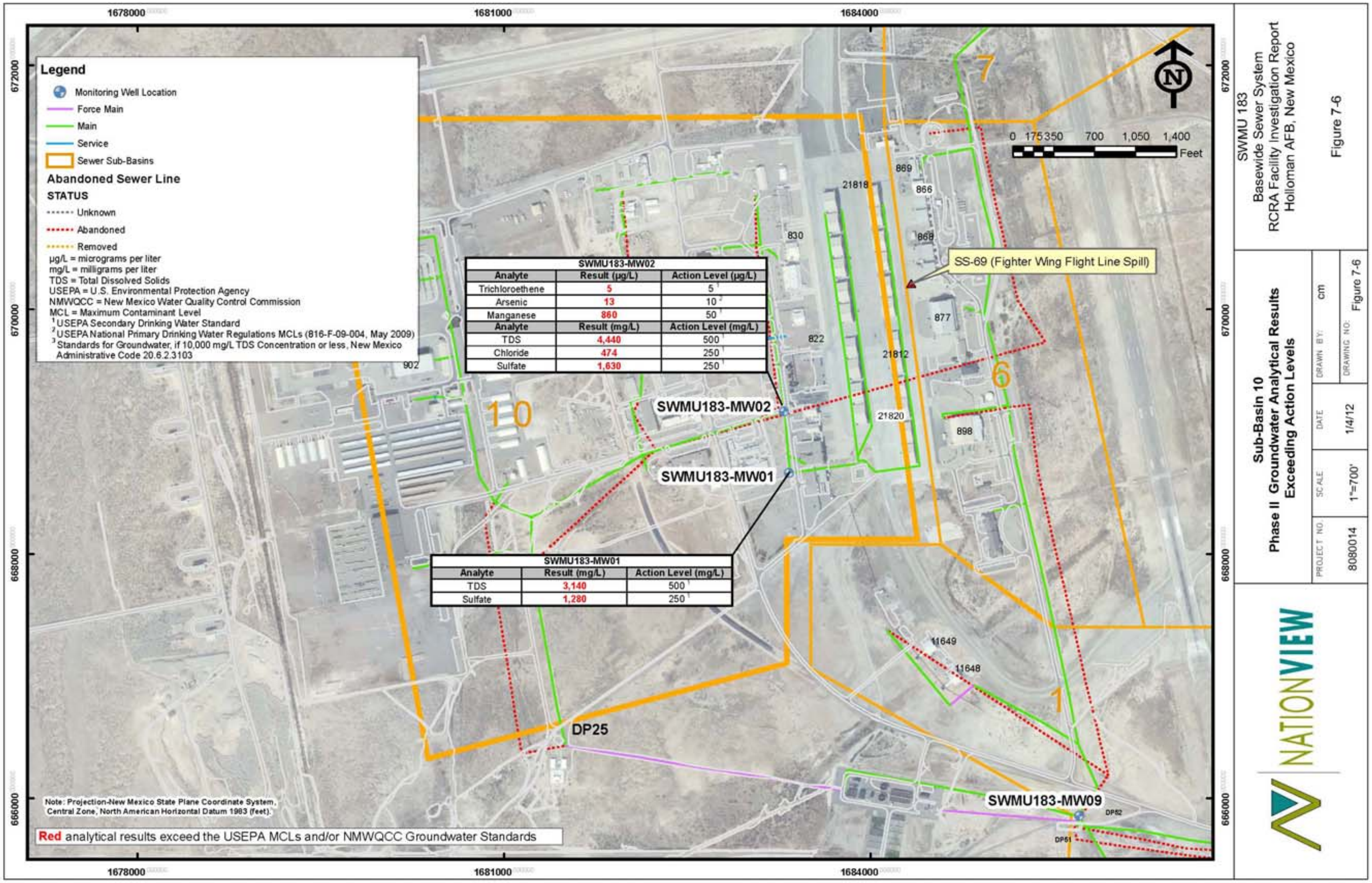


Figure C-5.8 Sub-Basin 10 Phase II Groundwater Analytical Results Exceeding Action Levels

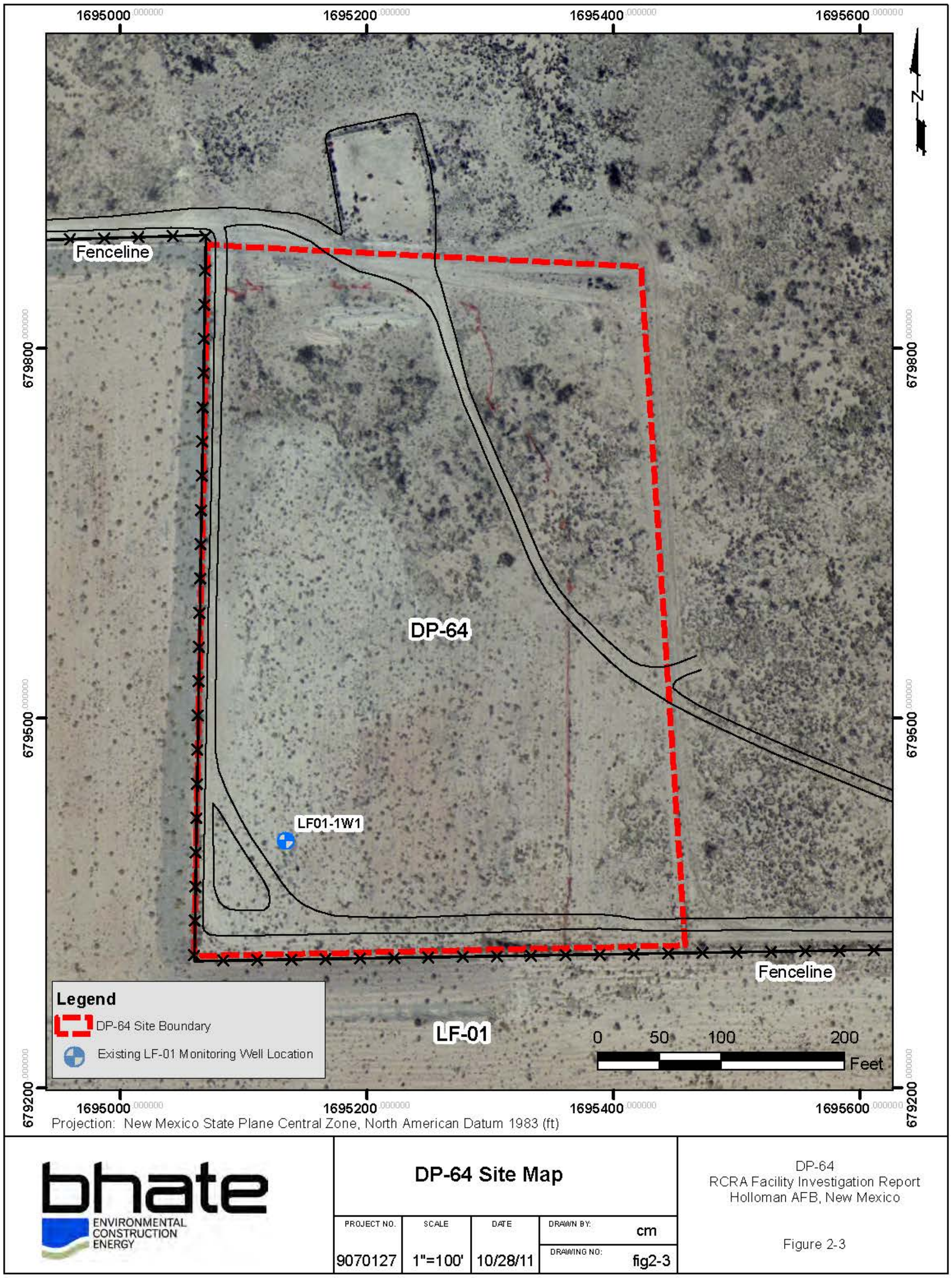


Figure C-6.1 AOC-1 - DP-64 Site Map

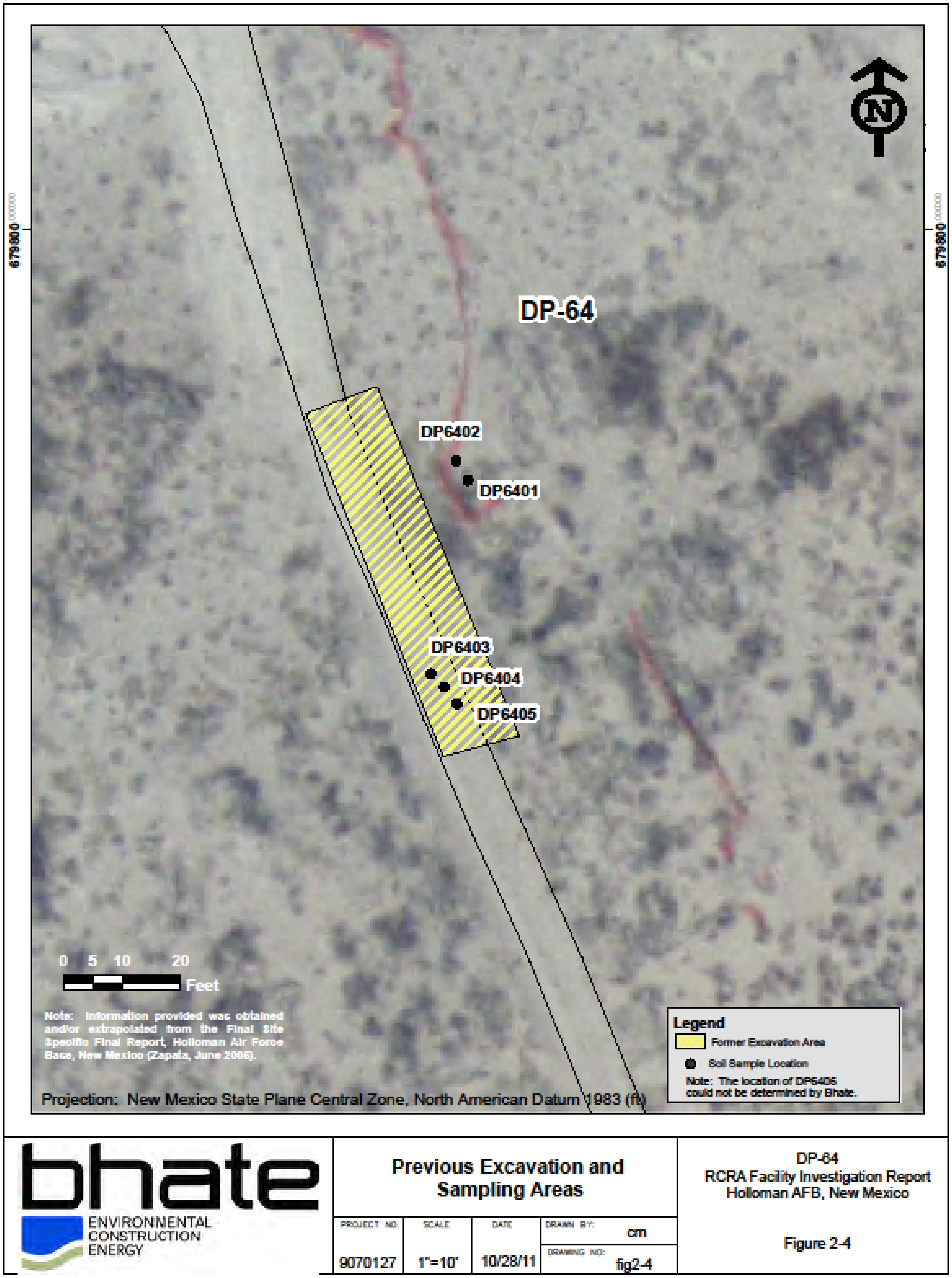


Figure C-6.2 AOC-1 - DP-64 Previous Excavation and Sampling Areas

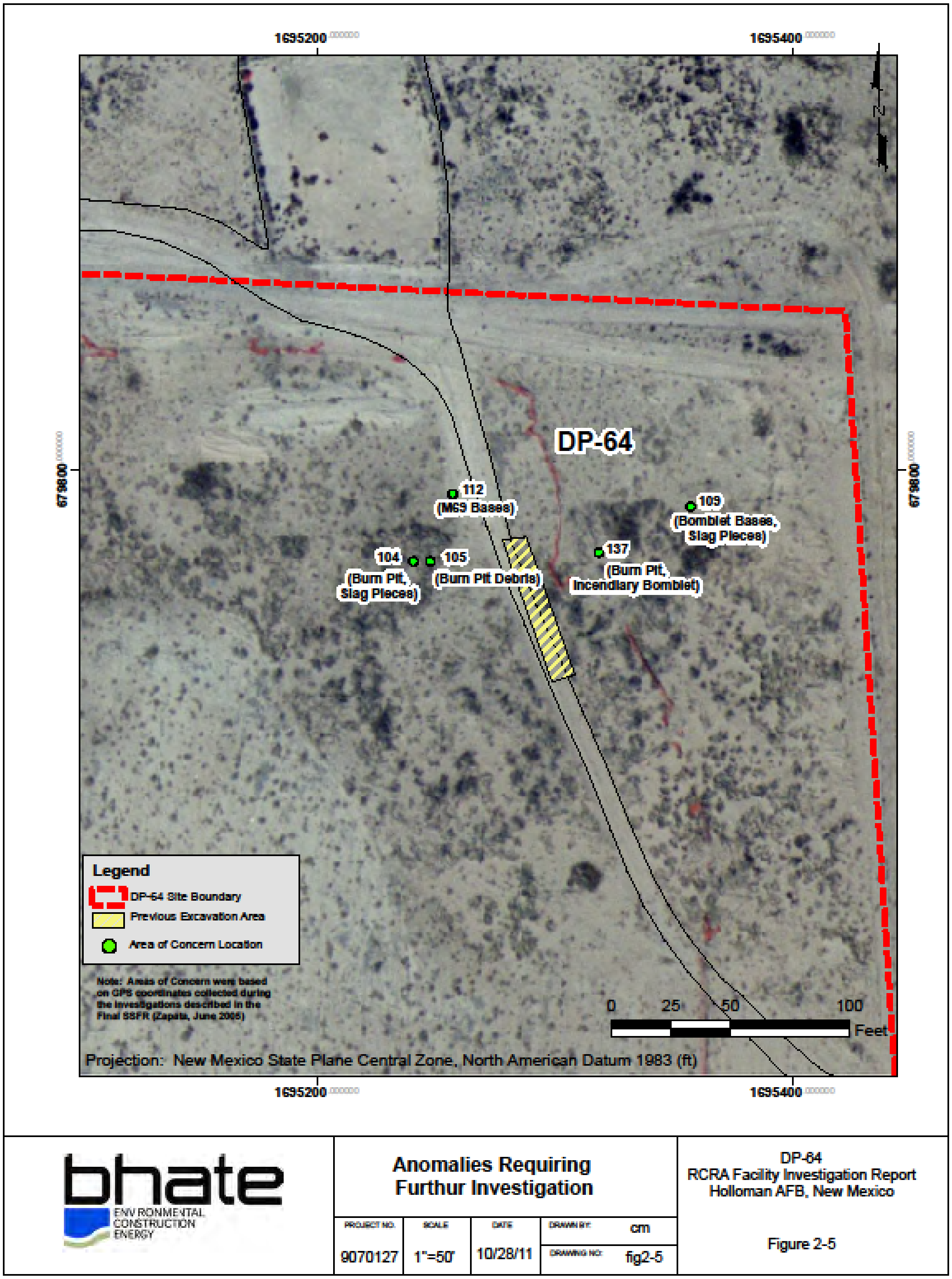
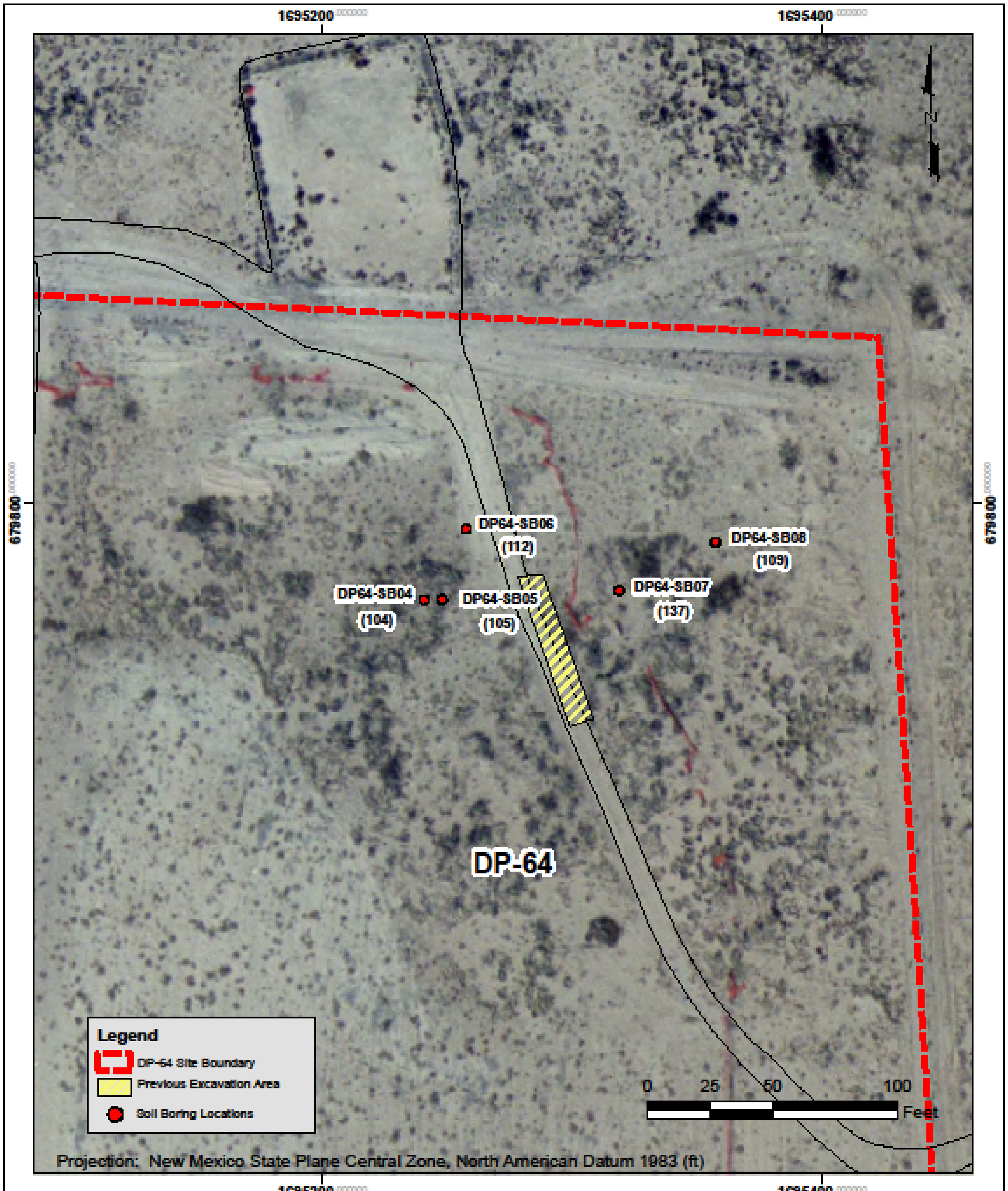


Figure C-6.3 AOC-1 - DP-64 Anomalies Requiring Further Investigation



bhate ENVIRONMENTAL CONSTRUCTION ENERGY	DP-64 Soil Boring Location Map				DP-64 RCRA Facility Investigation Report Holloman AFB, New Mexico
	PROJECT NO. 9070127	SCALE 1"=50'	DATE 10/28/11	DRAWN BY: cm; DRAWING NO: fig_4-1	Figure 4-1

Figure C-6.4 AOC-1 - DP-64 Soil Boring Location Map

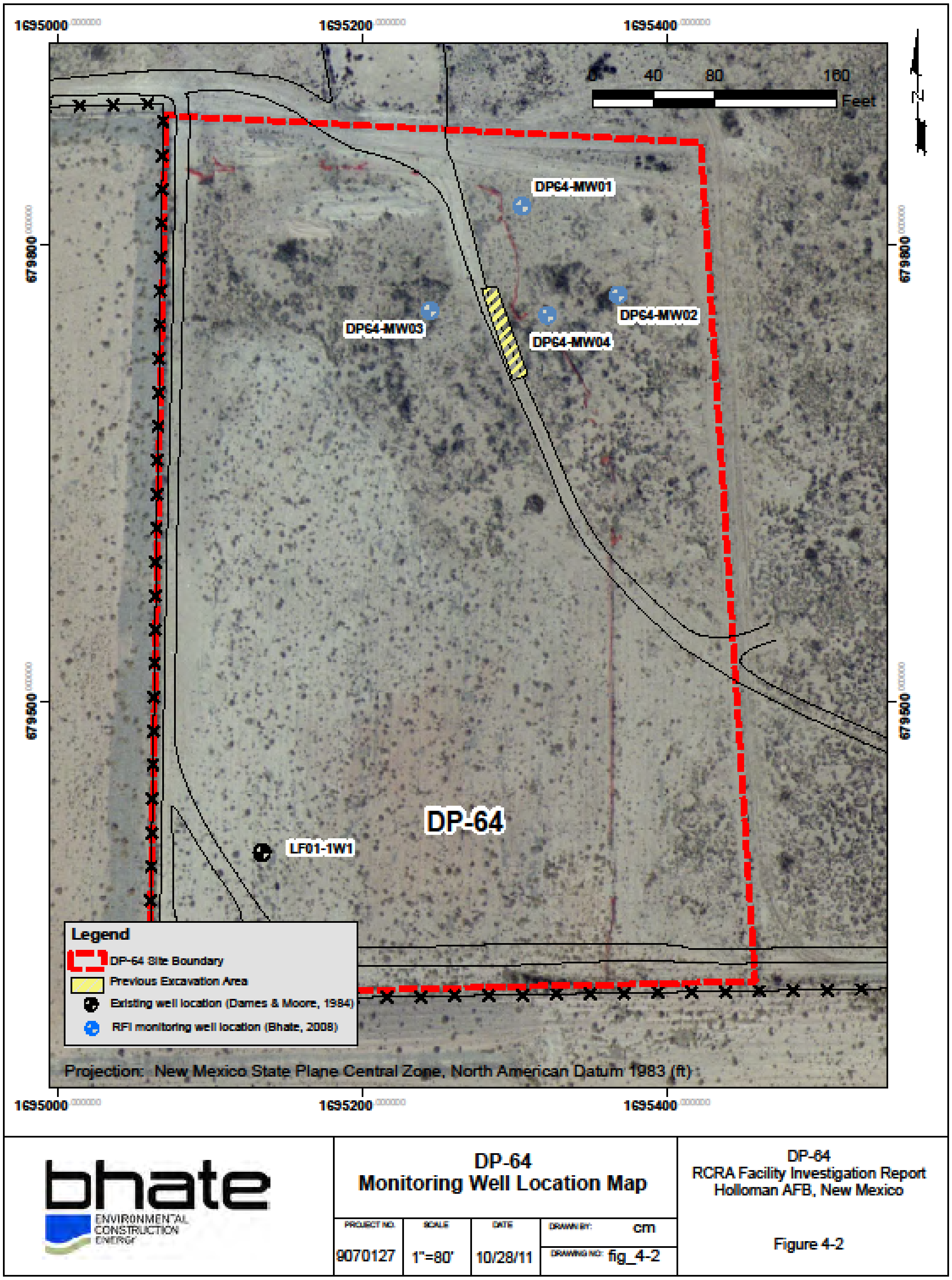


Figure C-6.5 AOC-1 - DP-64 Monitoring Well Location Map

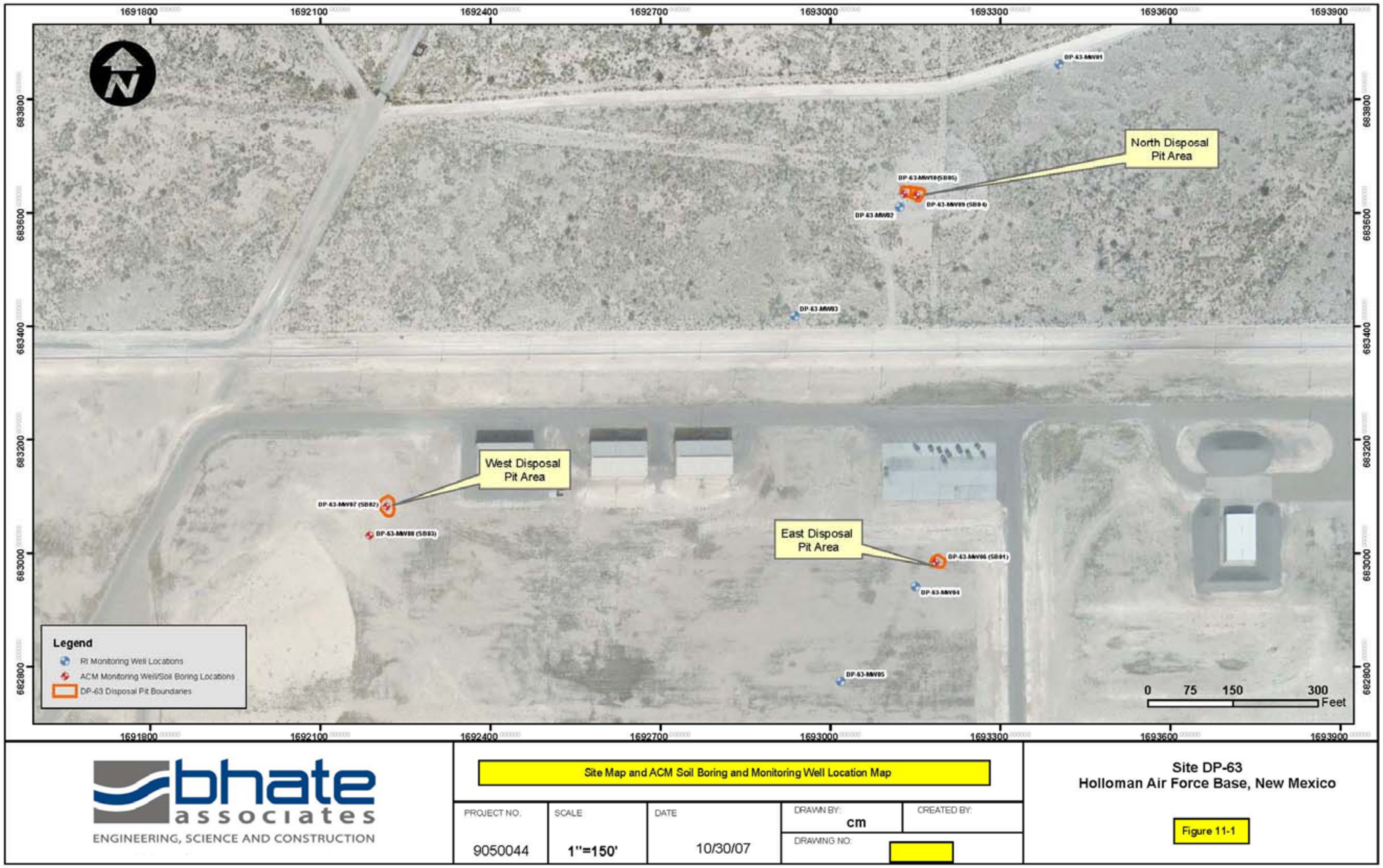


Figure C-7.1 AOC-3 - DP-63 Site Map and ACM Soil Boring and Monitoring Well Location Map

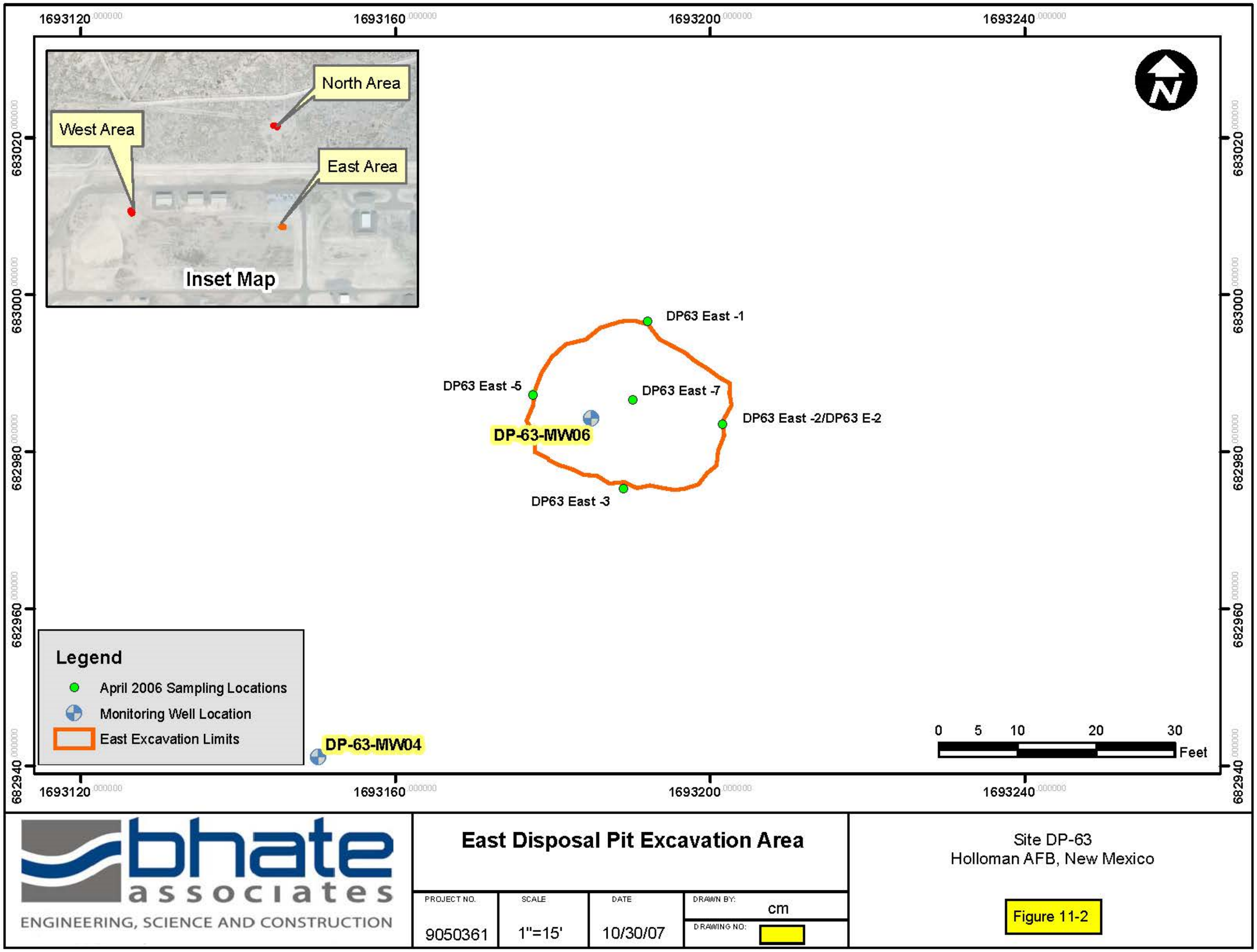


Figure C-7.2 AOC-3 - DP-63 East Disposal Pit Excavation Area

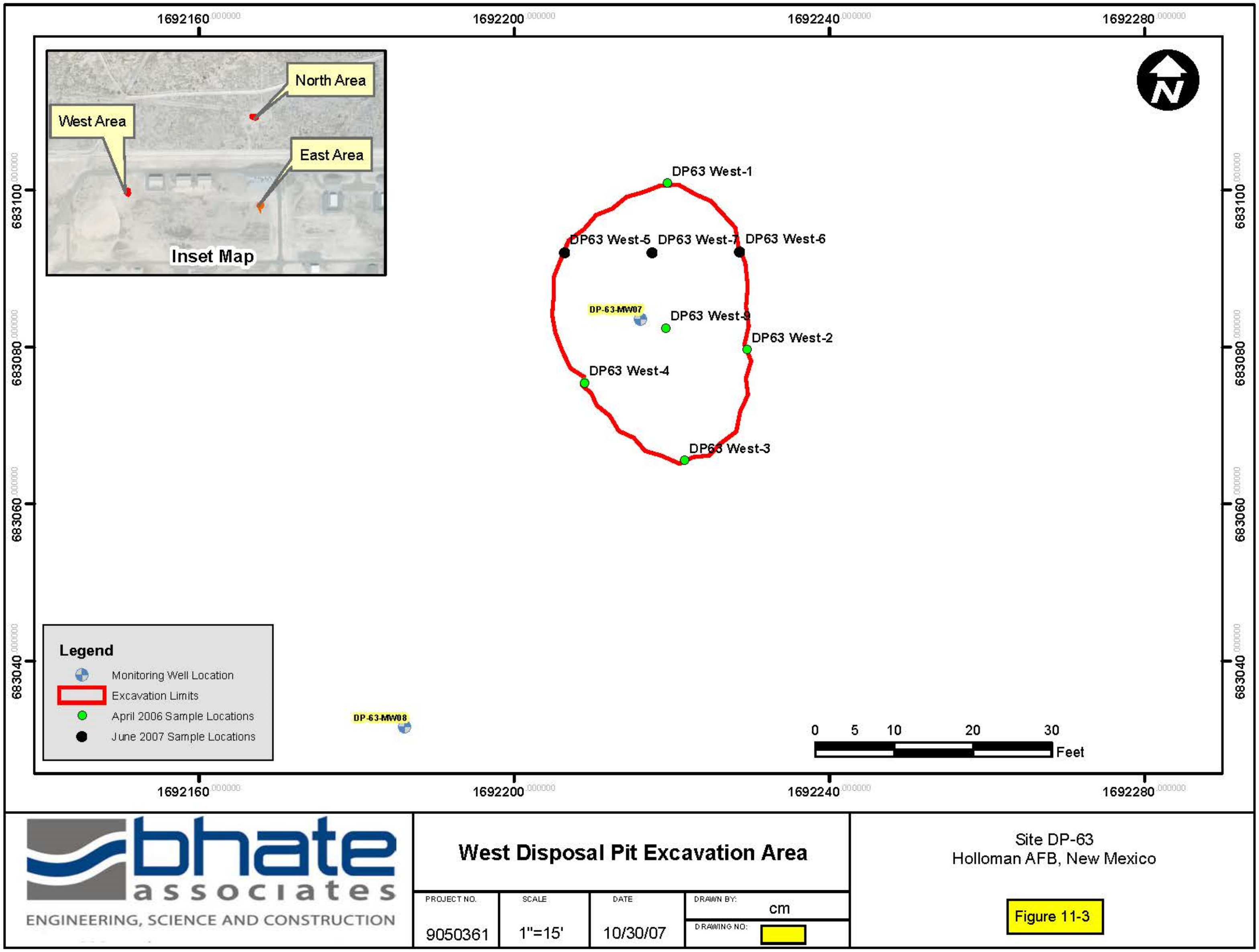


Figure C-7.3 AOC-3 - DP-63 West Disposal Pit Excavation Area

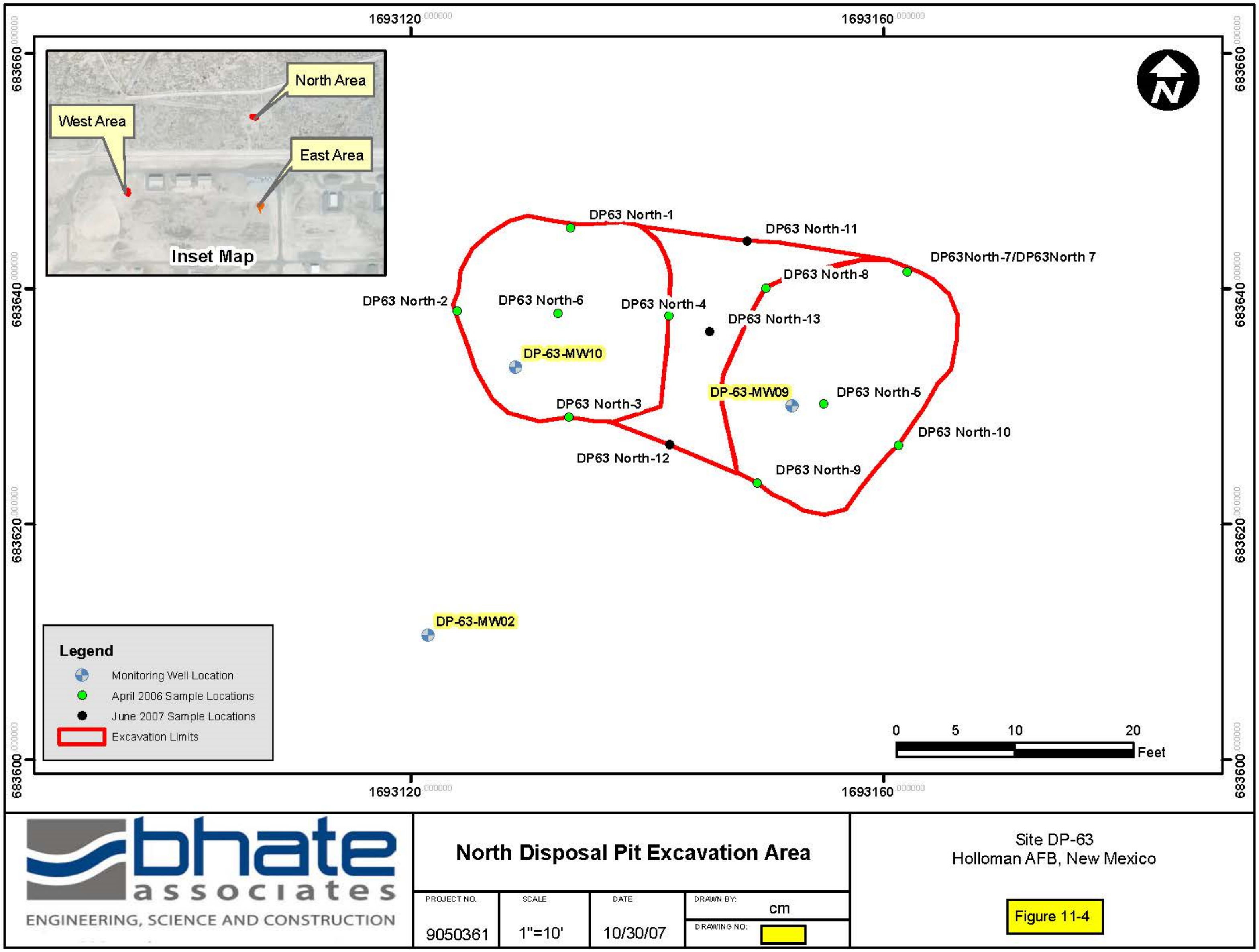


Figure C-7.4 AOC-3 - DP-63 North Disposal Pit Excavation Area

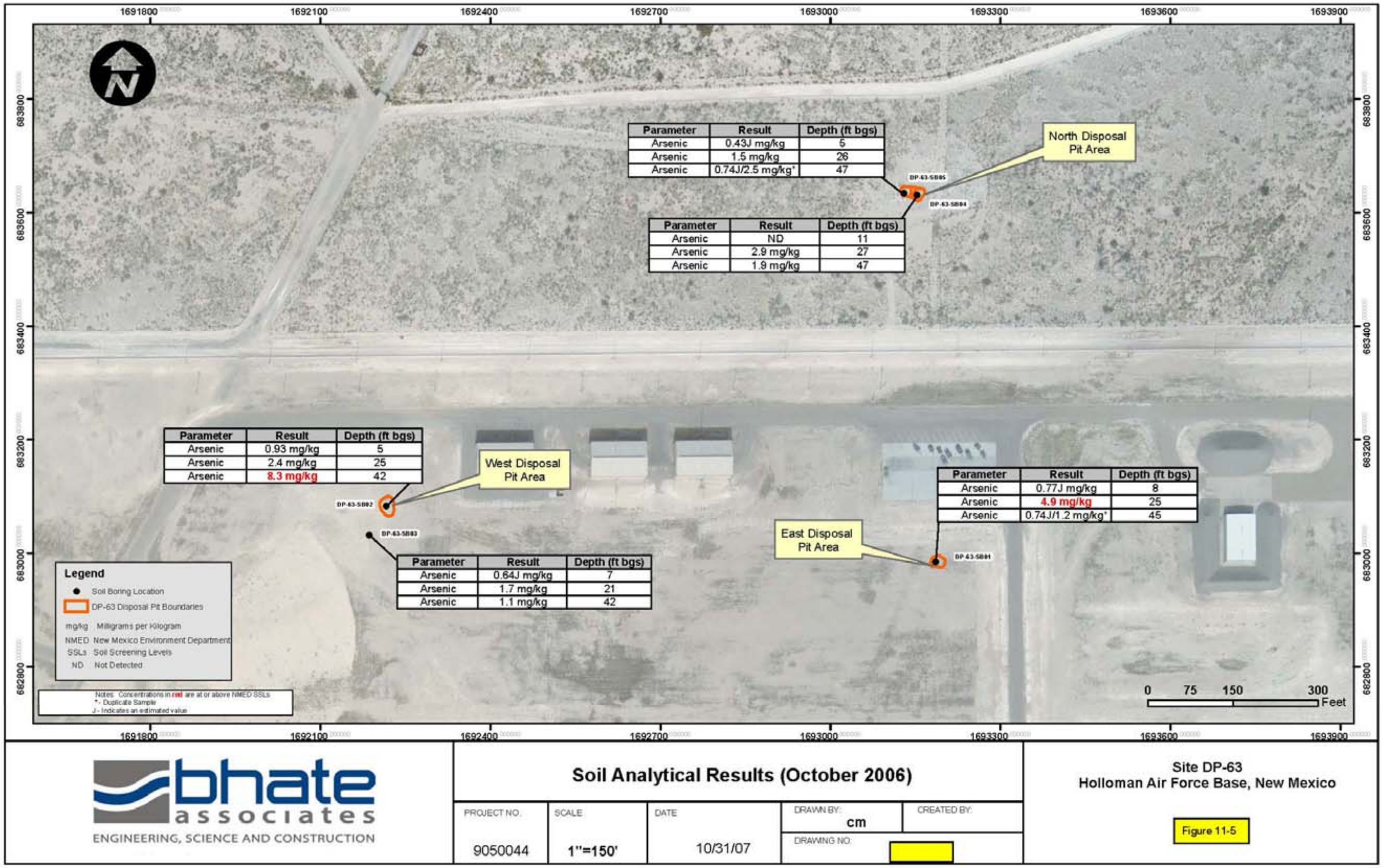


Figure C-7.5 AOC-3 - DP-63 Soil Analytical Results (October 2006)

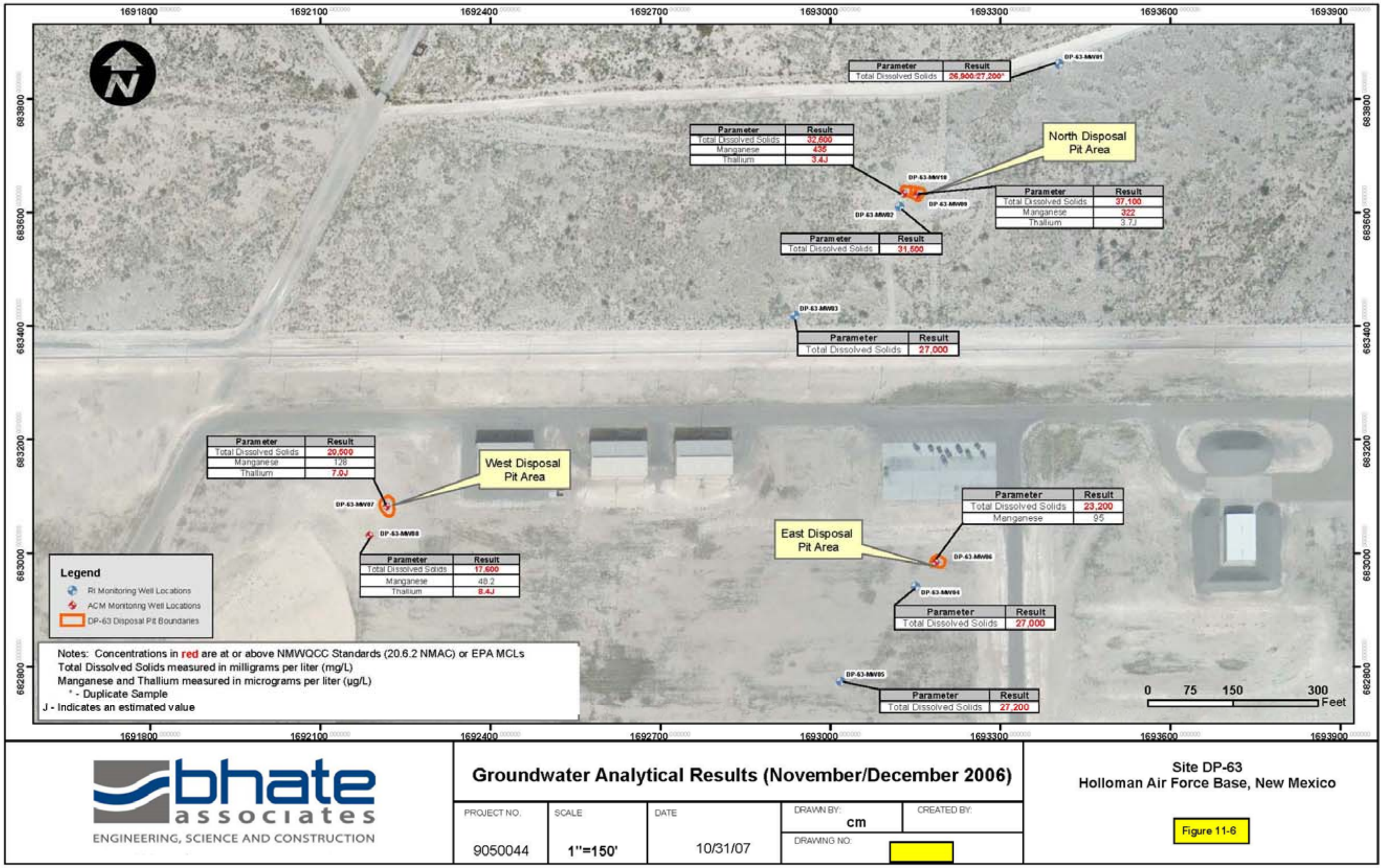


Figure C-7.6 AOC-3 - DP-63 Groundwater Analytical Results (November/December 2006)

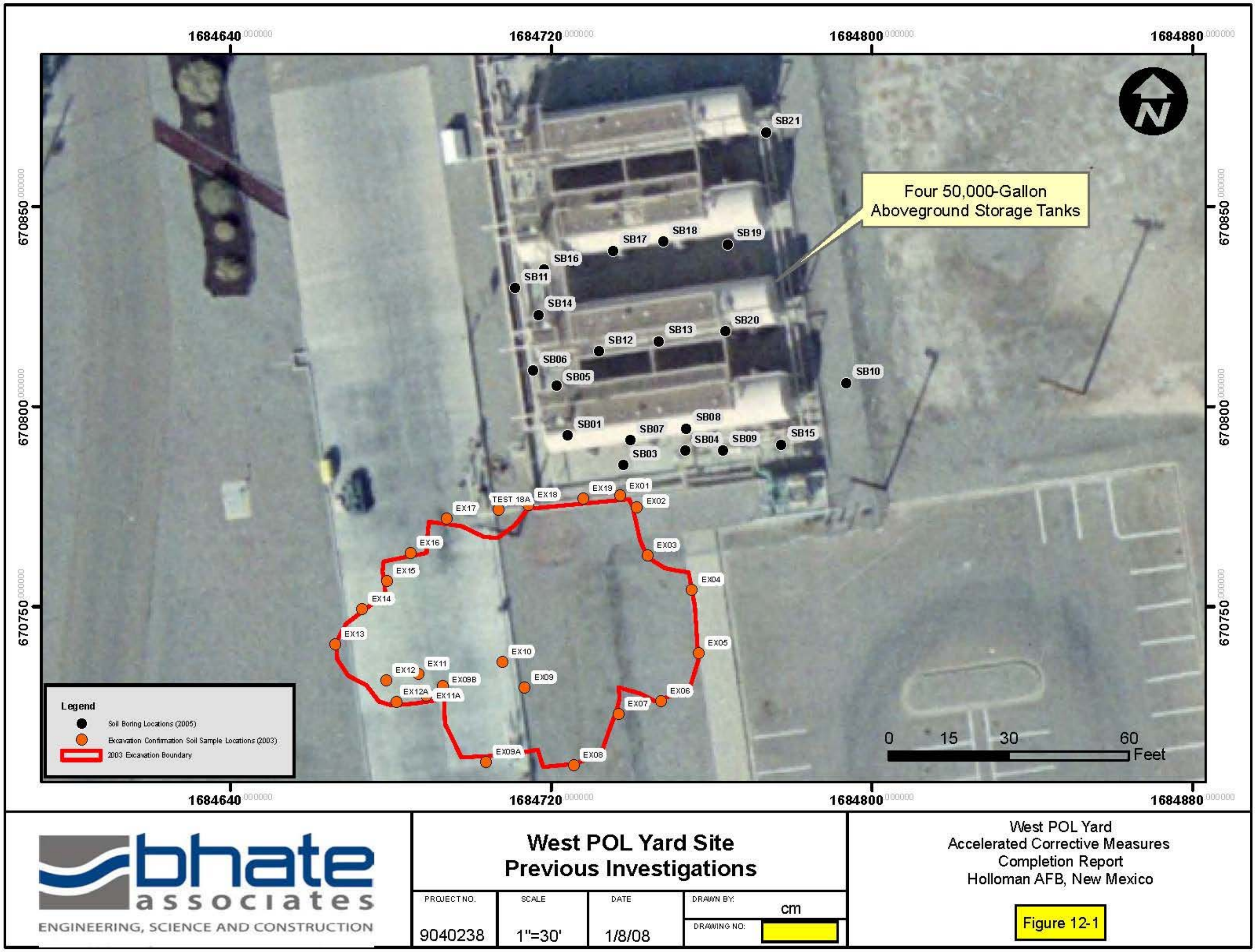


Figure C-8.1 AOC-4 - West POL Yard Site Previous Investigations

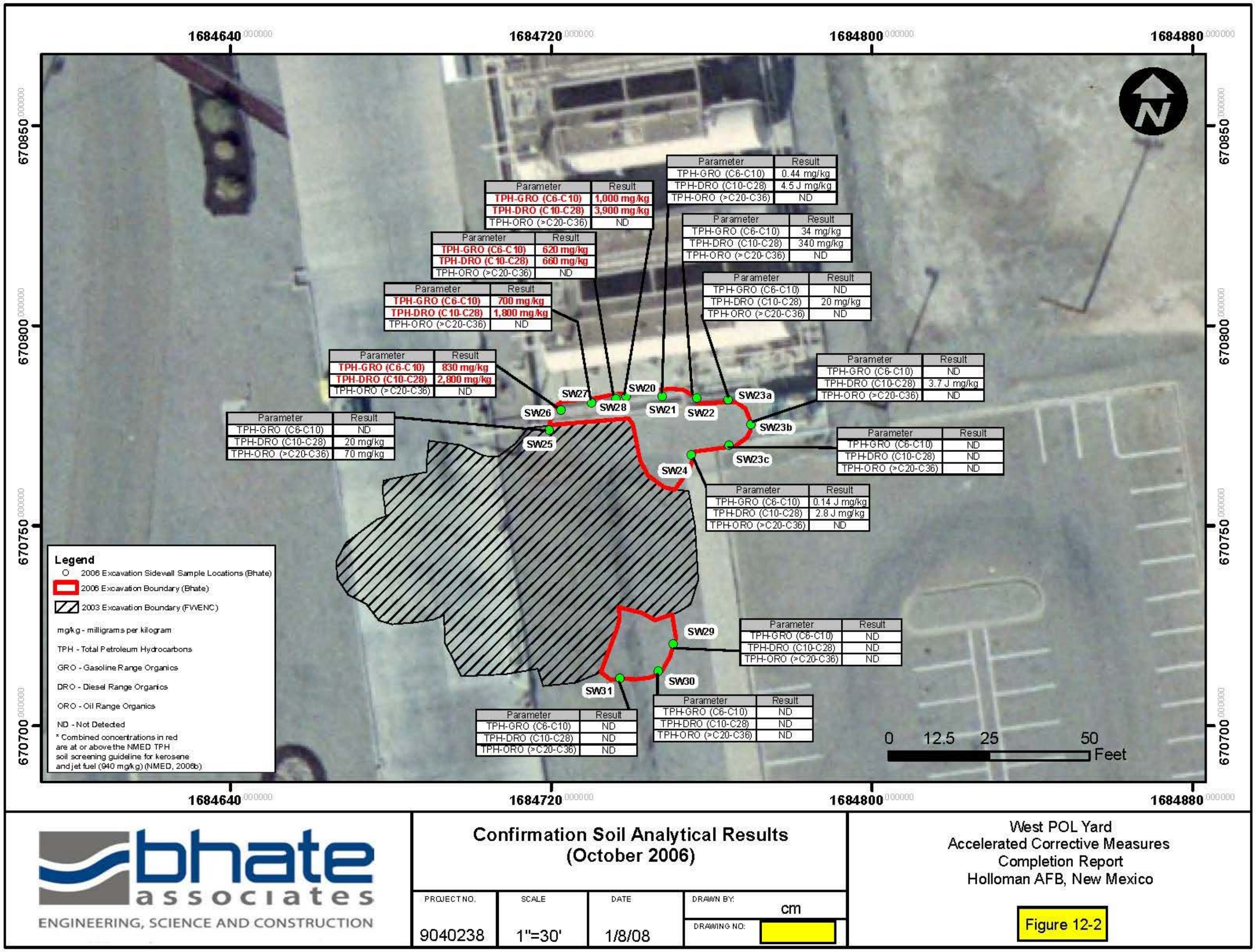


Figure C-8.2 AOC-4 - West POL Yard Confirmation Soil Analytical Results (October 2006)

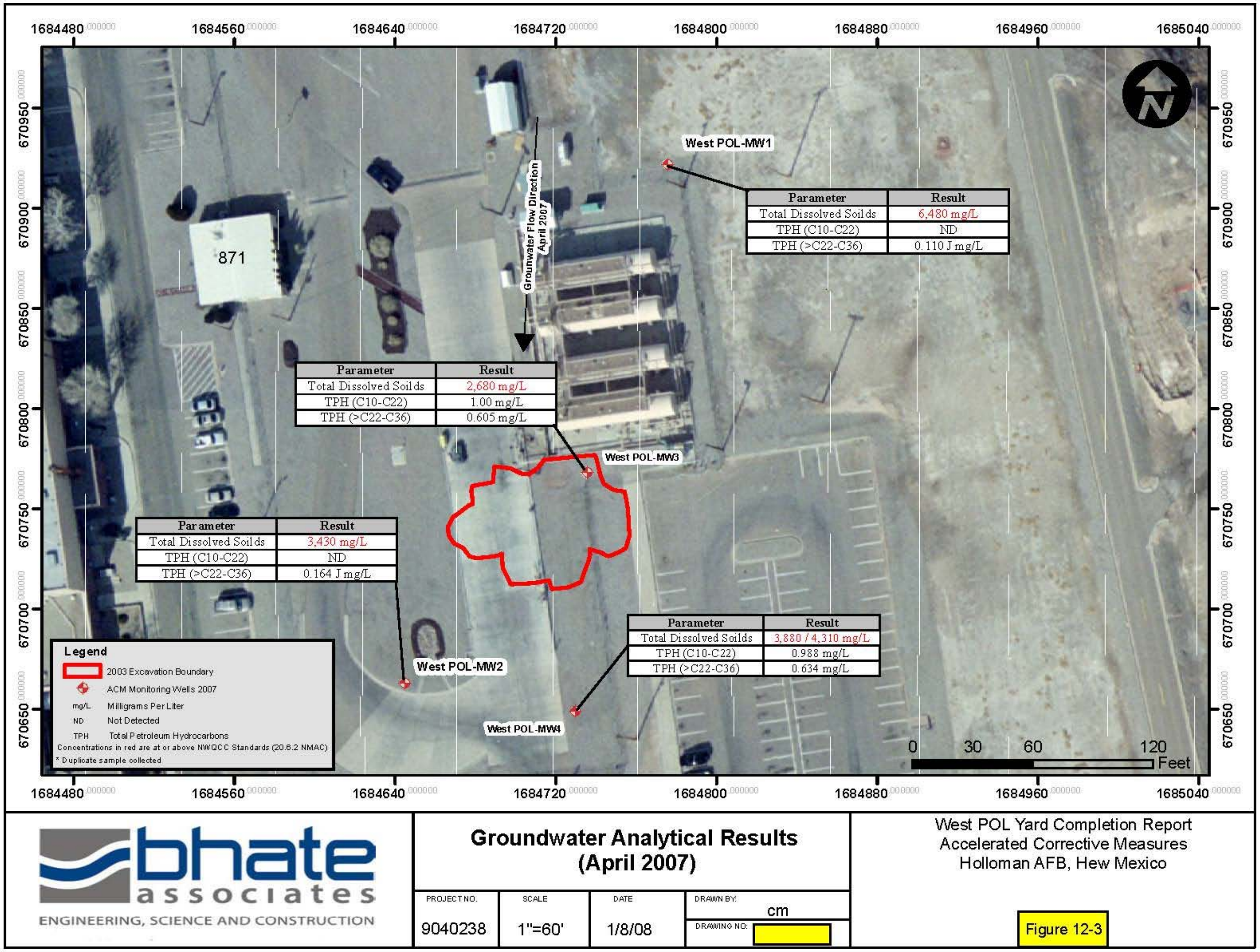


Figure C-8.3 AOC-4 - West POL Yard Groundwater Analytical Results (April 2007)

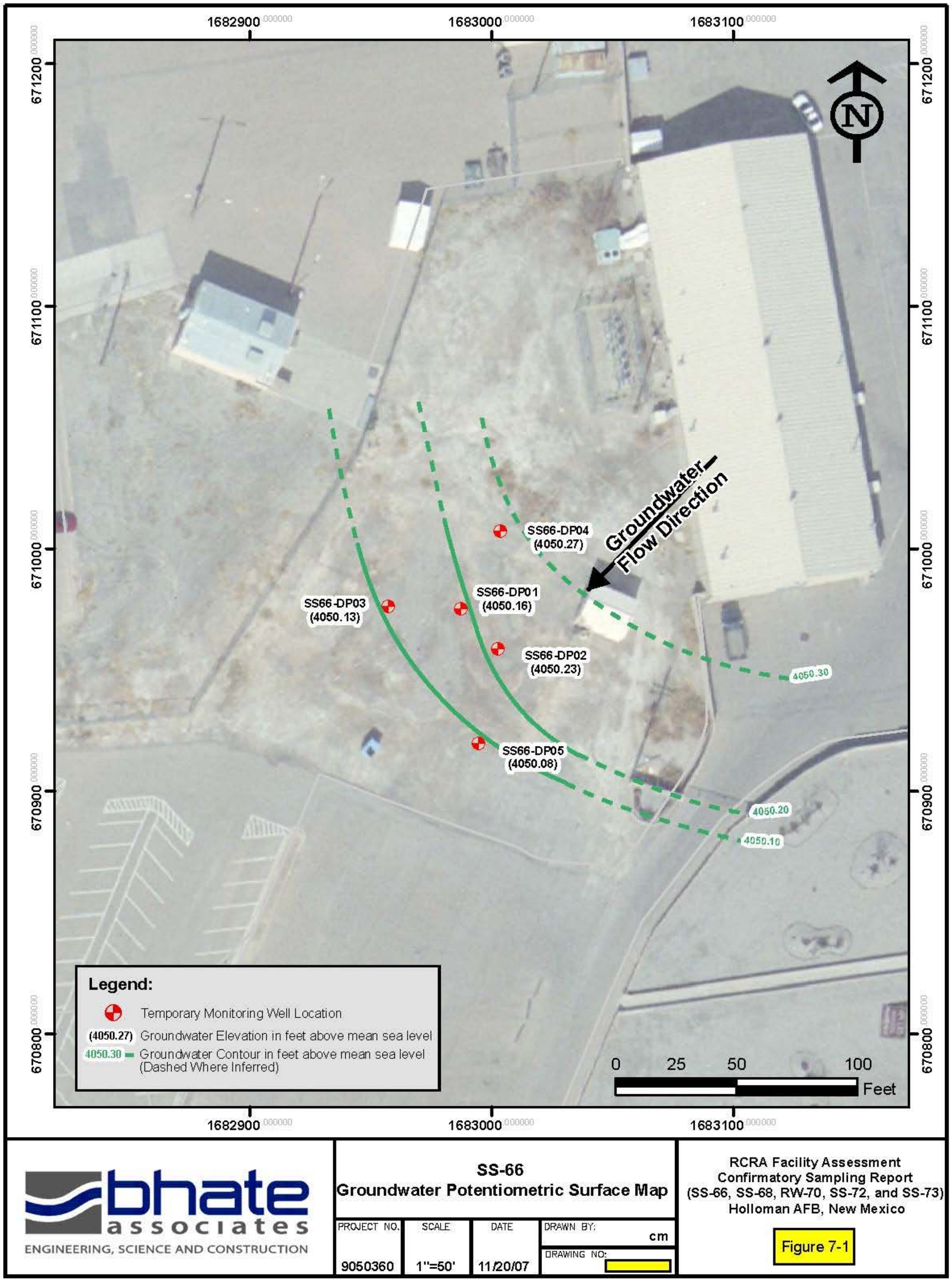


Figure C-9.1 AOC-C - SS-66 Groundwater Potentiometric Surface Map

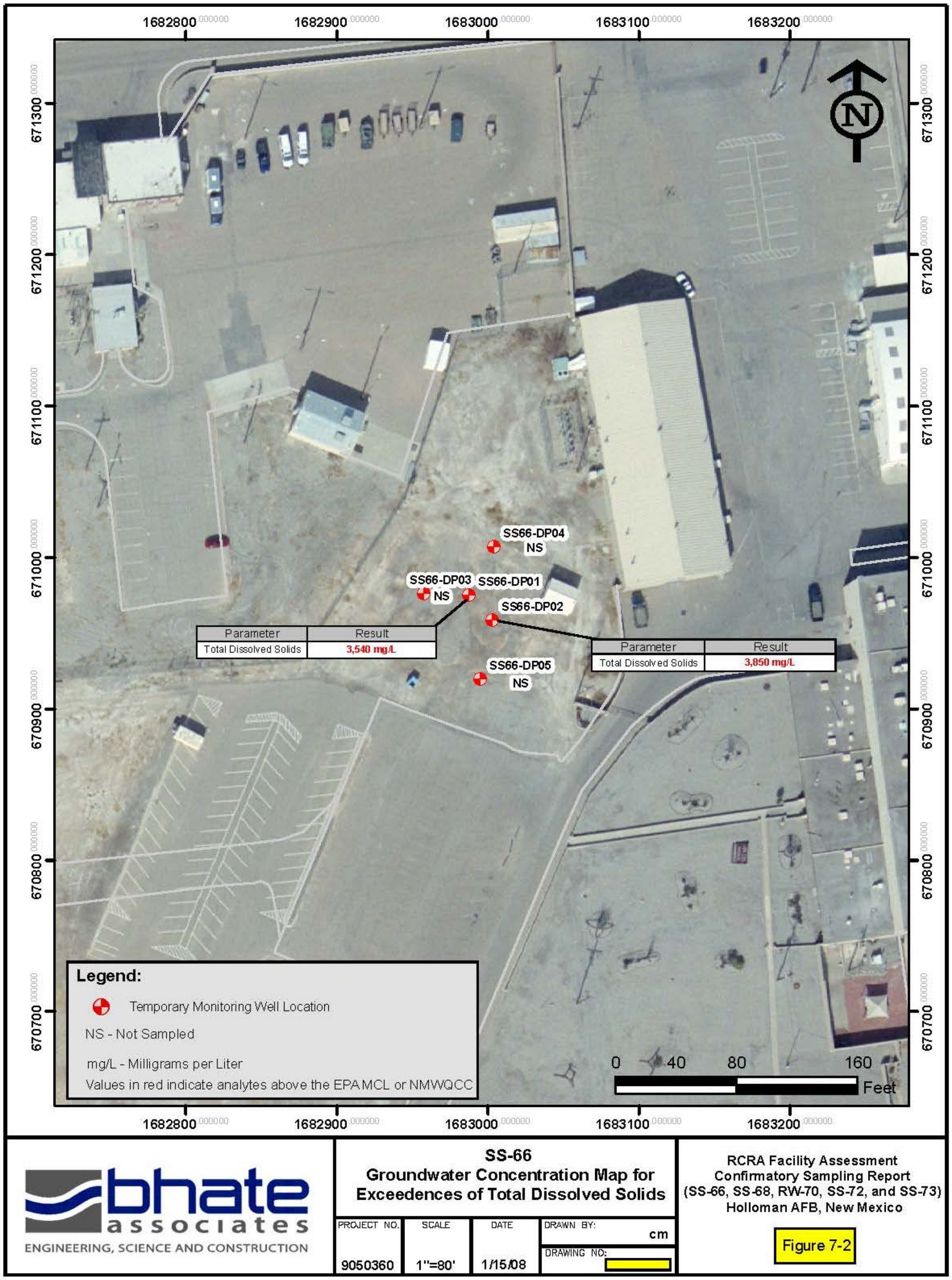


Figure C-9.2 AOC-C - SS-66 Groundwater Concentration Map for Exceedences of TDSs

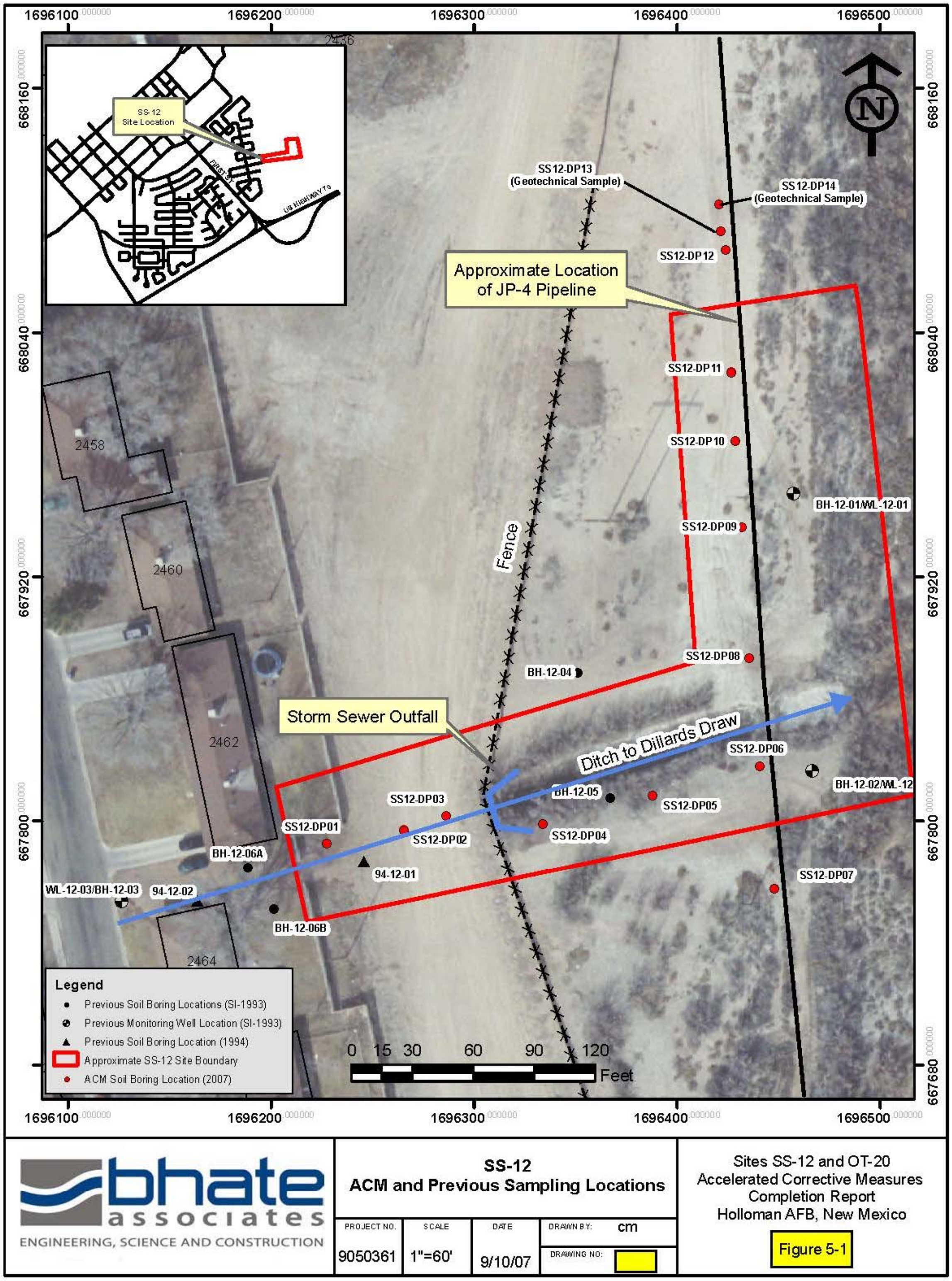


Figure C-10.1 AOC-K - SS-12 ACM and Previous Sampling Locations

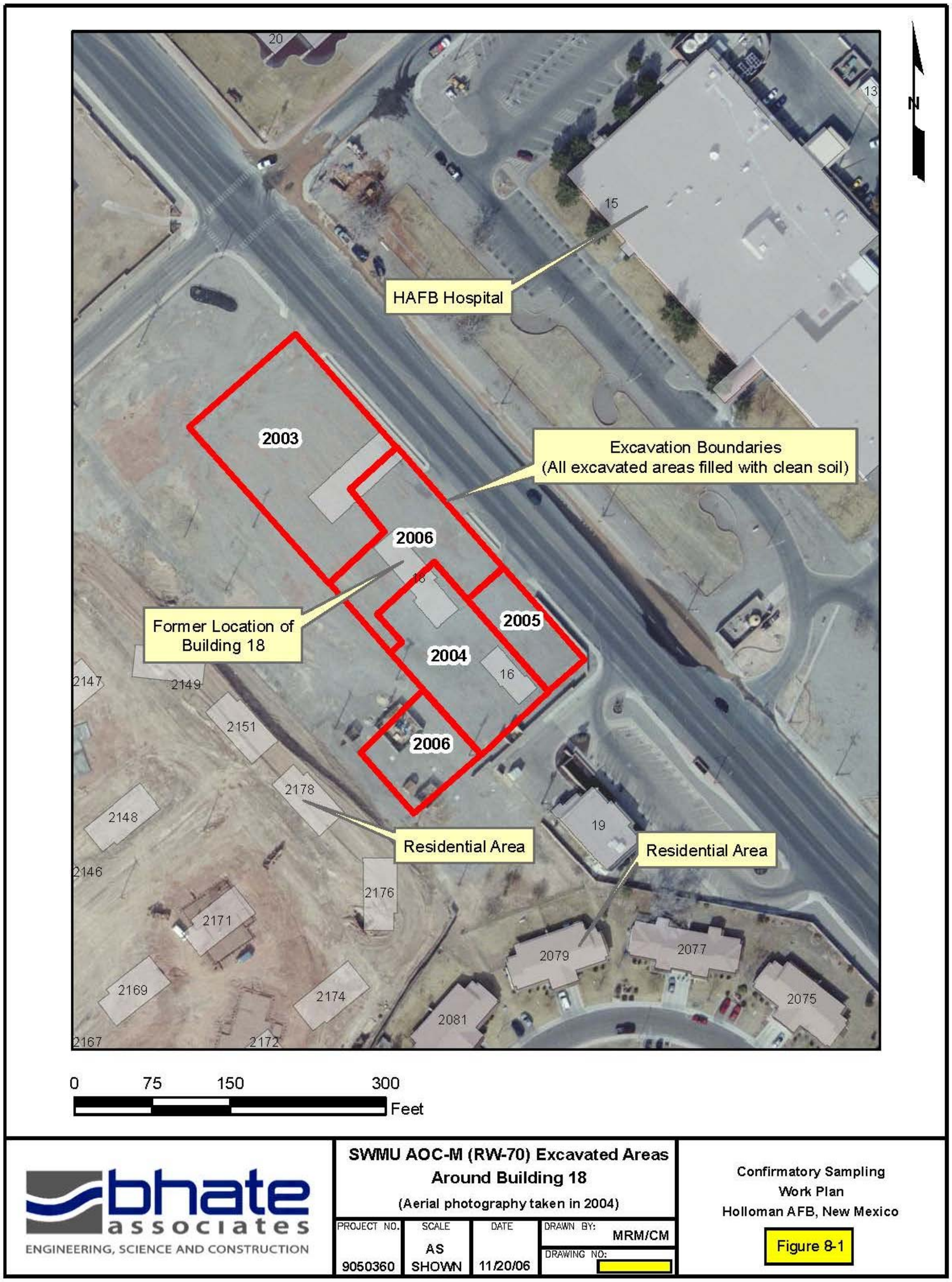


Figure C-11.1 AOC-M - RW-70 Excavated Areas Around Building 18

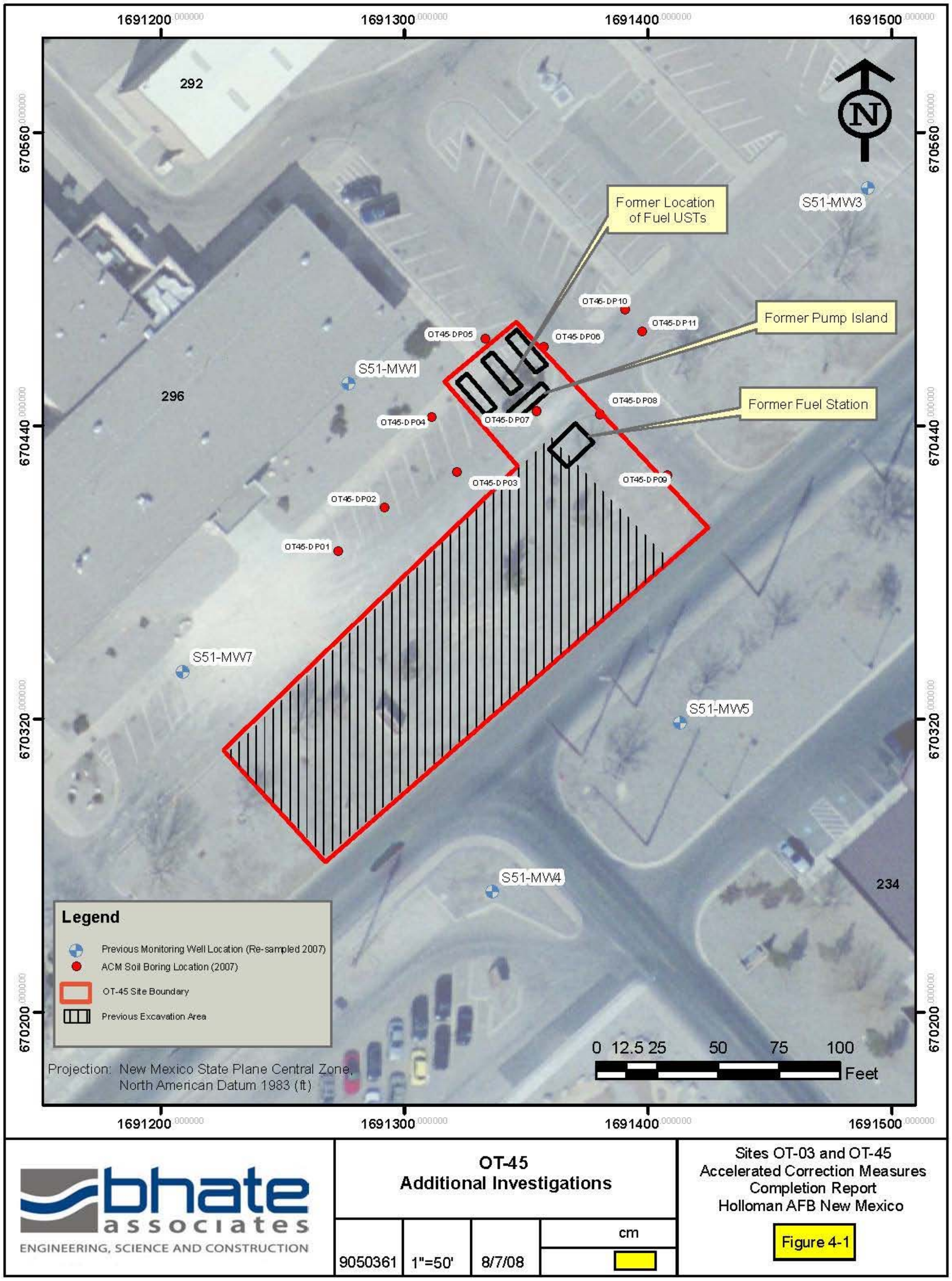


Figure C-12.1 AOC-O - OT-45 Additional Investigations

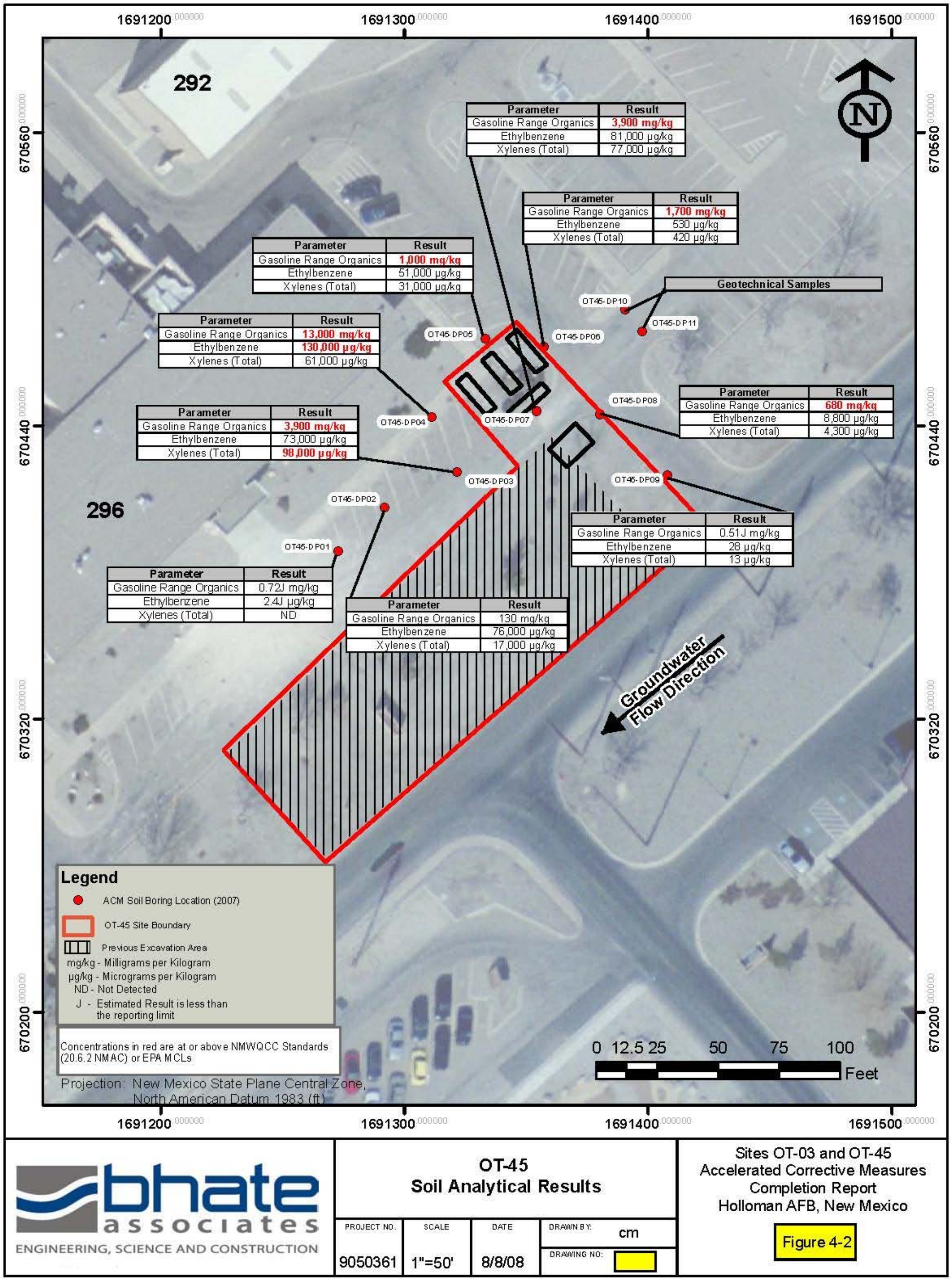


Figure C-12.2 AOC-O - OT-45 Soil Analytical Results

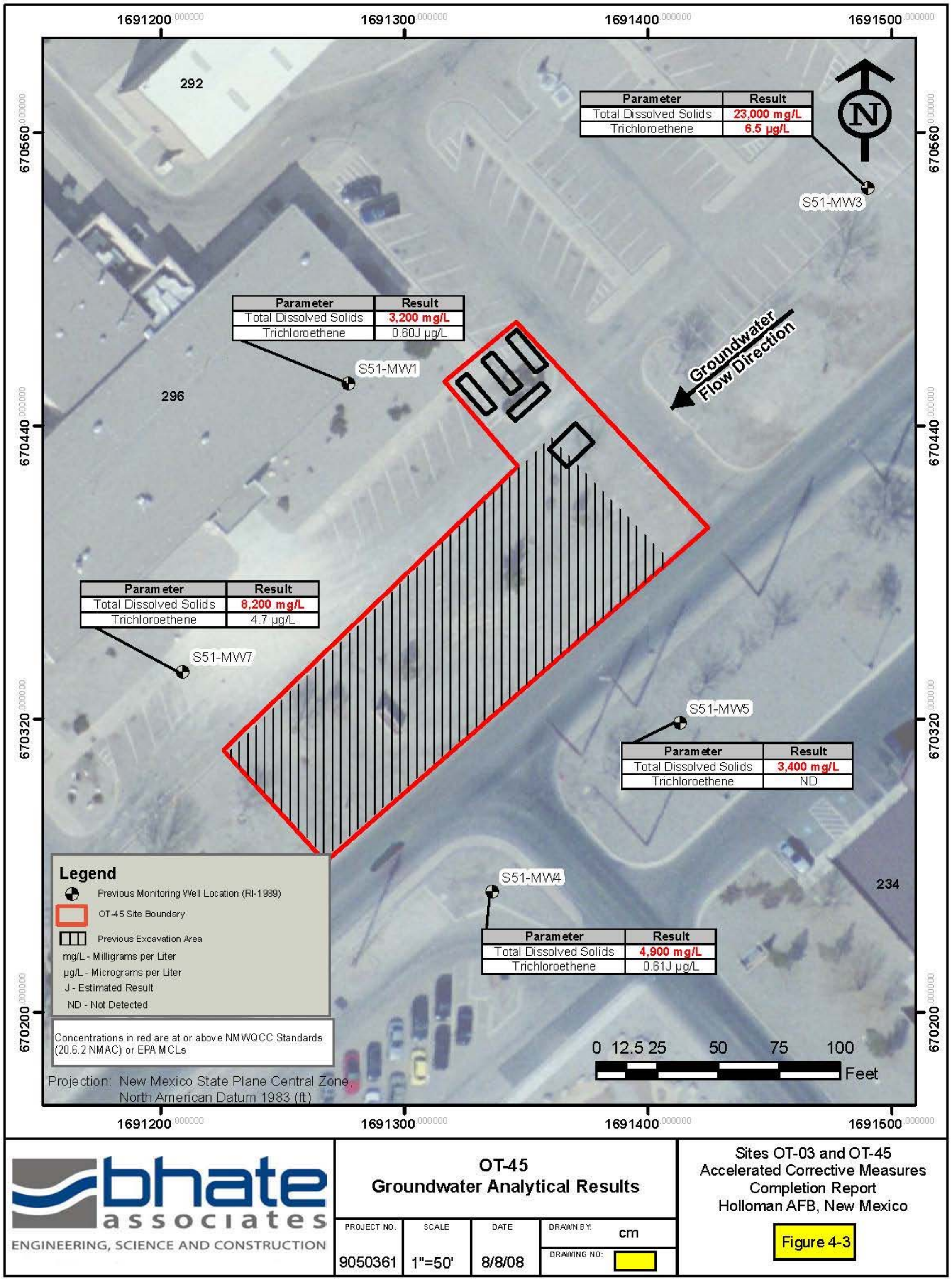


Figure C-12.3 AOC-O - OT-45 Groundwater Analytical Results

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Figure C-12.4 AOC-O - OT-45 Excavation Areas (October 1991 and February 2008)

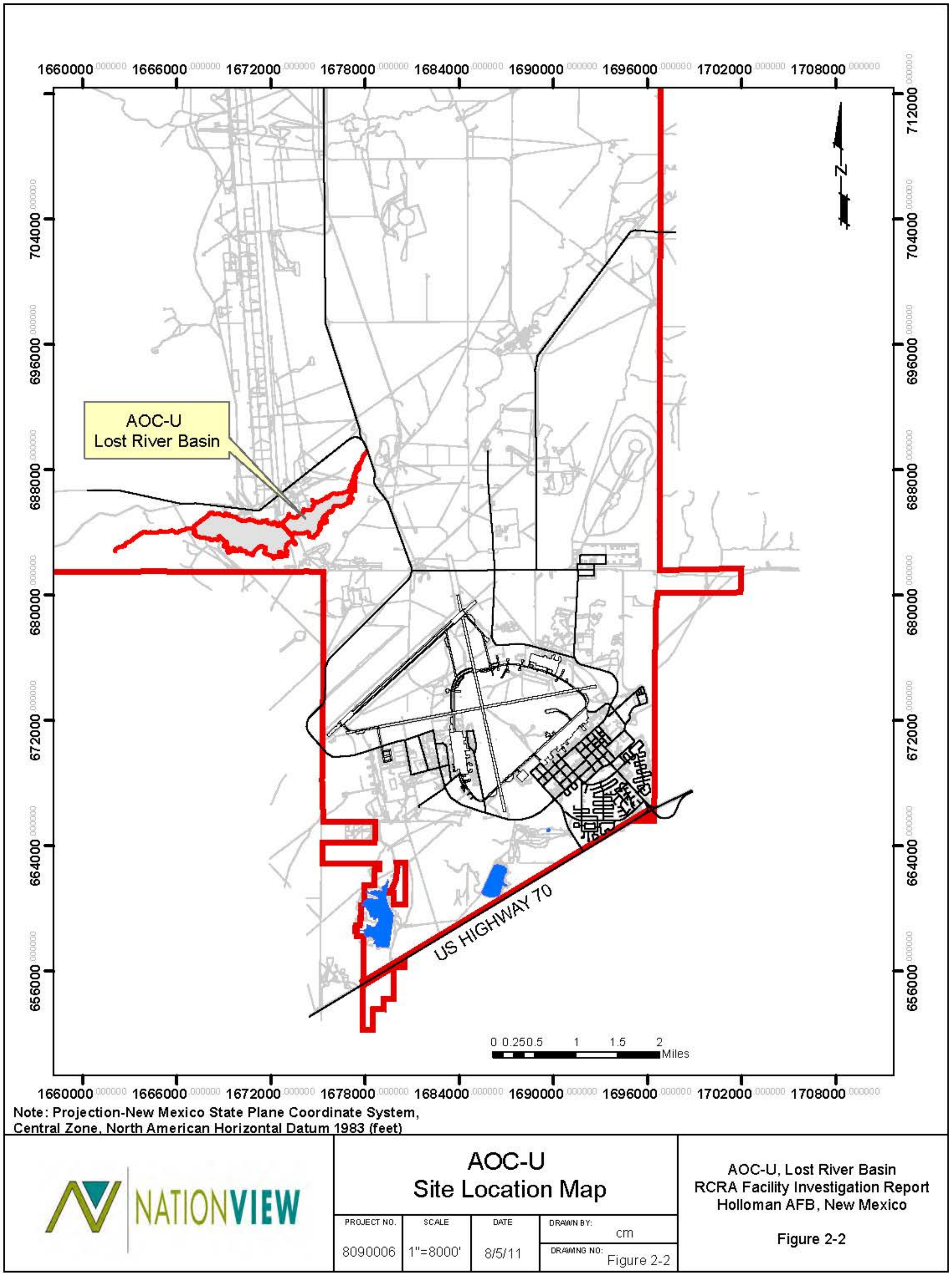


Figure C-13.1 AOC-U Site Location Map

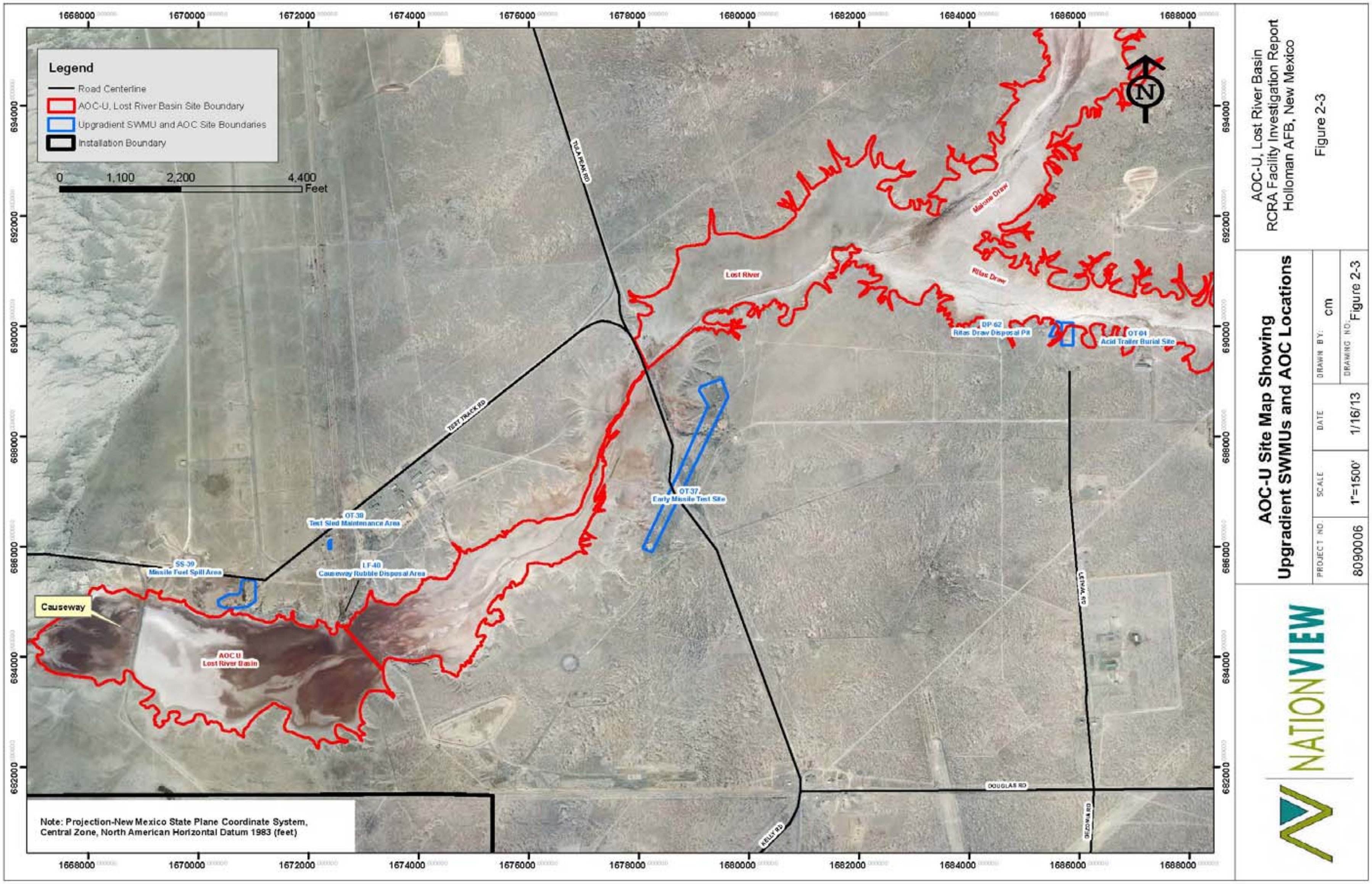


Figure C-13.2 AOC-U Site Map Showing Upgradient SWMUs and AOC Locations

Figure C-13.3 1993 Groundwater Analytical Results Above NMWQCC and/or USEPA Action Levels (Radian, 1993)

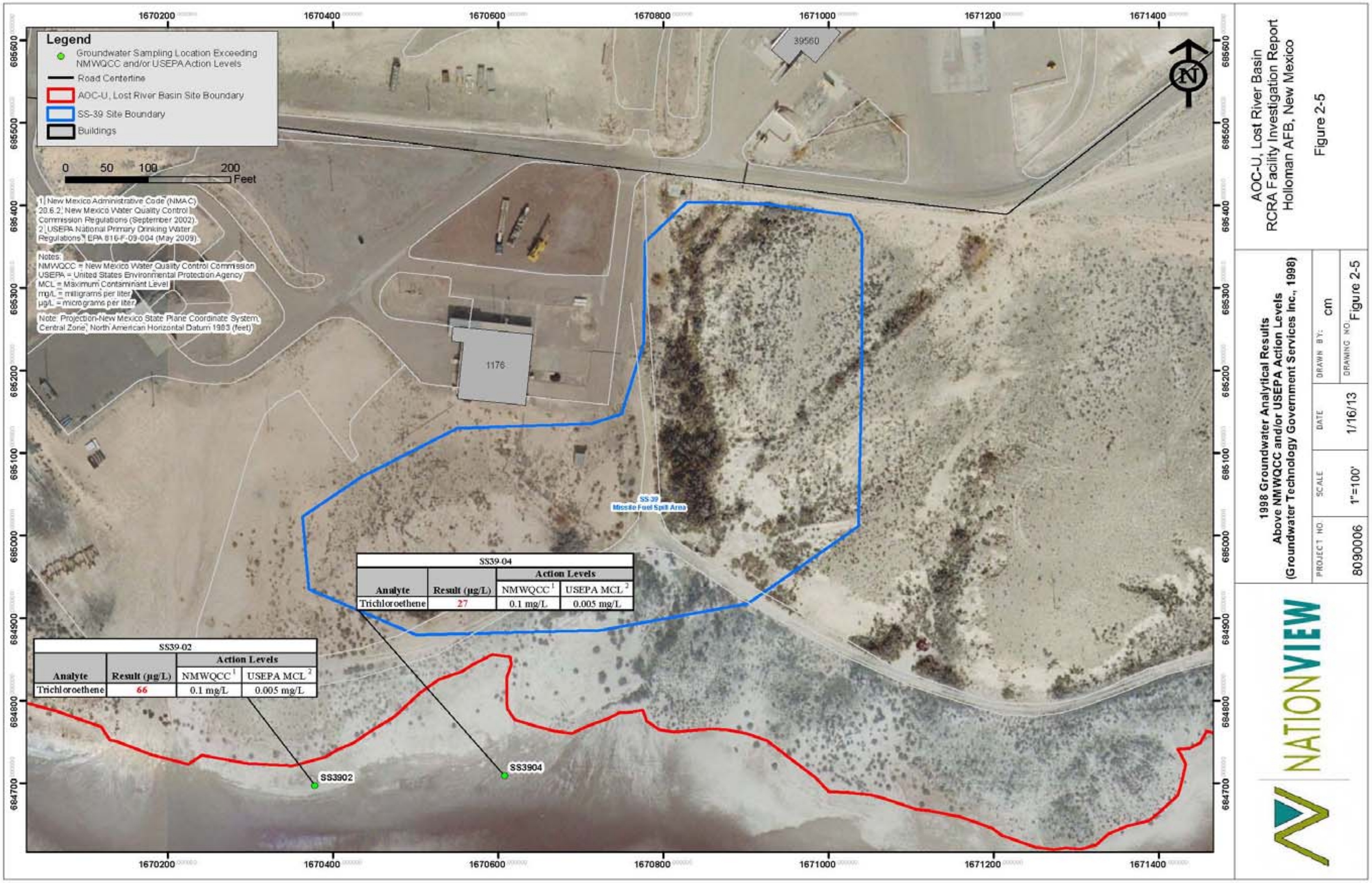
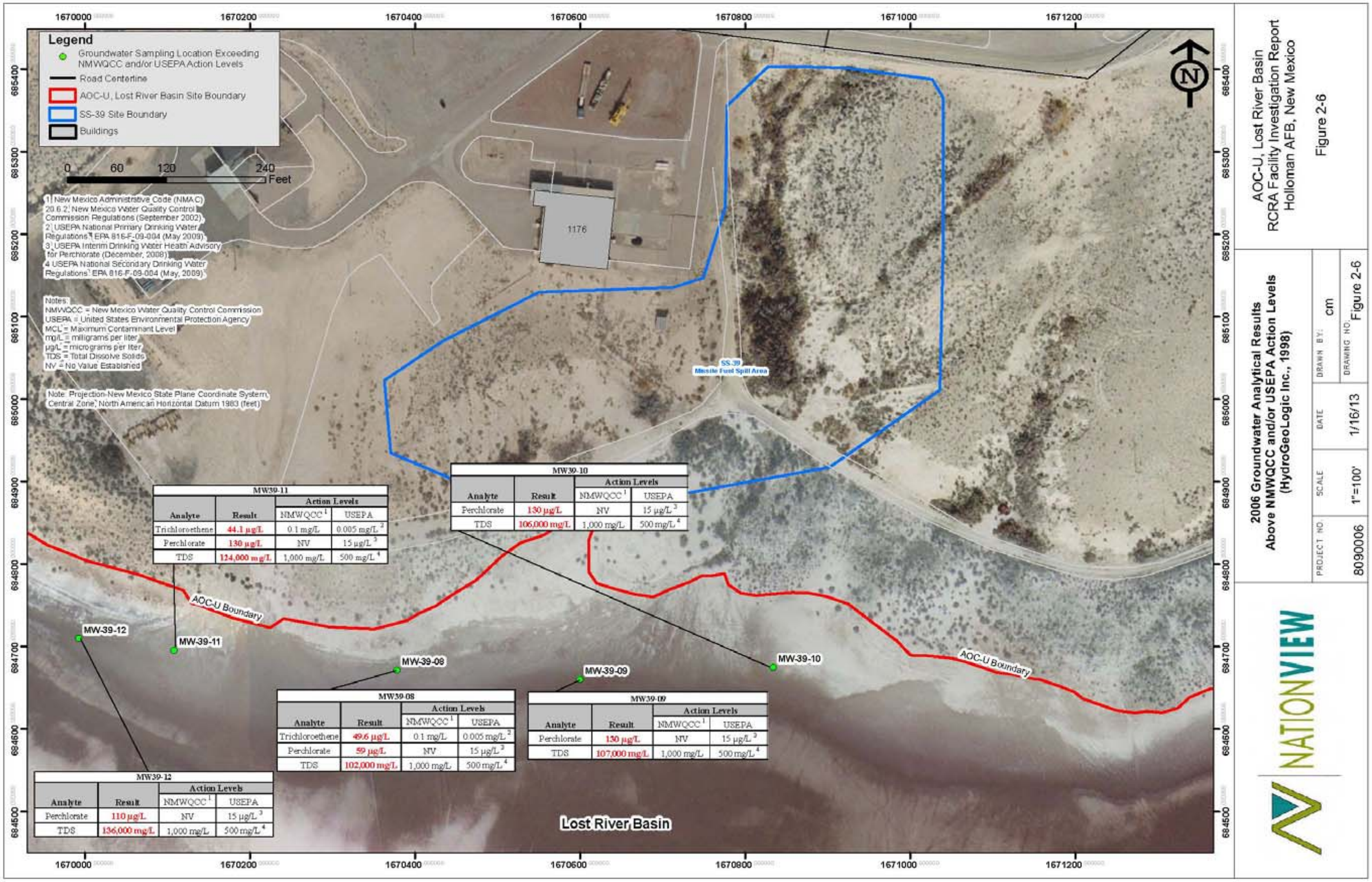


Figure C-13.4 1998 Groundwater Analytical Results Above NMWQCC and/or USEPA Action Levels (Groundwater Technology Government Services, Inc., 1998)



MW39-11			
Analyte	Result	Action Levels NMWQCC[1]	USEPA
Trichloroethene	44.1 µg/L	0.1 mg/L	0.005 mg/L[2]
Perchlorate	130 µg/L	NV	15 µg/L[3]
TDS	124,000 mg/L	1,000 mg/L	500 mg/L[4]

MW39-10			
Analyte	Result	Action Levels NMWQCC[1]	USEPA
Perchlorate	130 µg/L	NV	15 µg/L[3]
TDS	106,000 mg/L	1,000 mg/L	500 mg/L[4]

MW39-08			
Analyte	Result	Action Levels NMWQCC[1]	USEPA
Trichloroethene	49.6 µg/L	0.1 mg/L	0.005 mg/L[2]
Perchlorate	59 µg/L	NV	15 µg/L[3]
TDS	102,000 mg/L	1,000 mg/L	500 mg/L[4]

MW39-09			
Analyte	Result	Action Levels NMWQCC[1]	USEPA
Perchlorate	130 µg/L	NV	15 µg/L[3]
TDS	107,000 mg/L	1,000 mg/L	500 mg/L[4]

MW39-12			
Analyte	Result	Action Levels NMWQCC[1]	USEPA
Perchlorate	110 µg/L	NV	15 µg/L[3]
TDS	136,000 mg/L	1,000 mg/L	500 mg/L[4]

Figure C-13.5 2006 Groundwater Analytical Results Above NMWQCC and/or USEPA Action Levels (HydroGeoLogic, Inc., 2006)

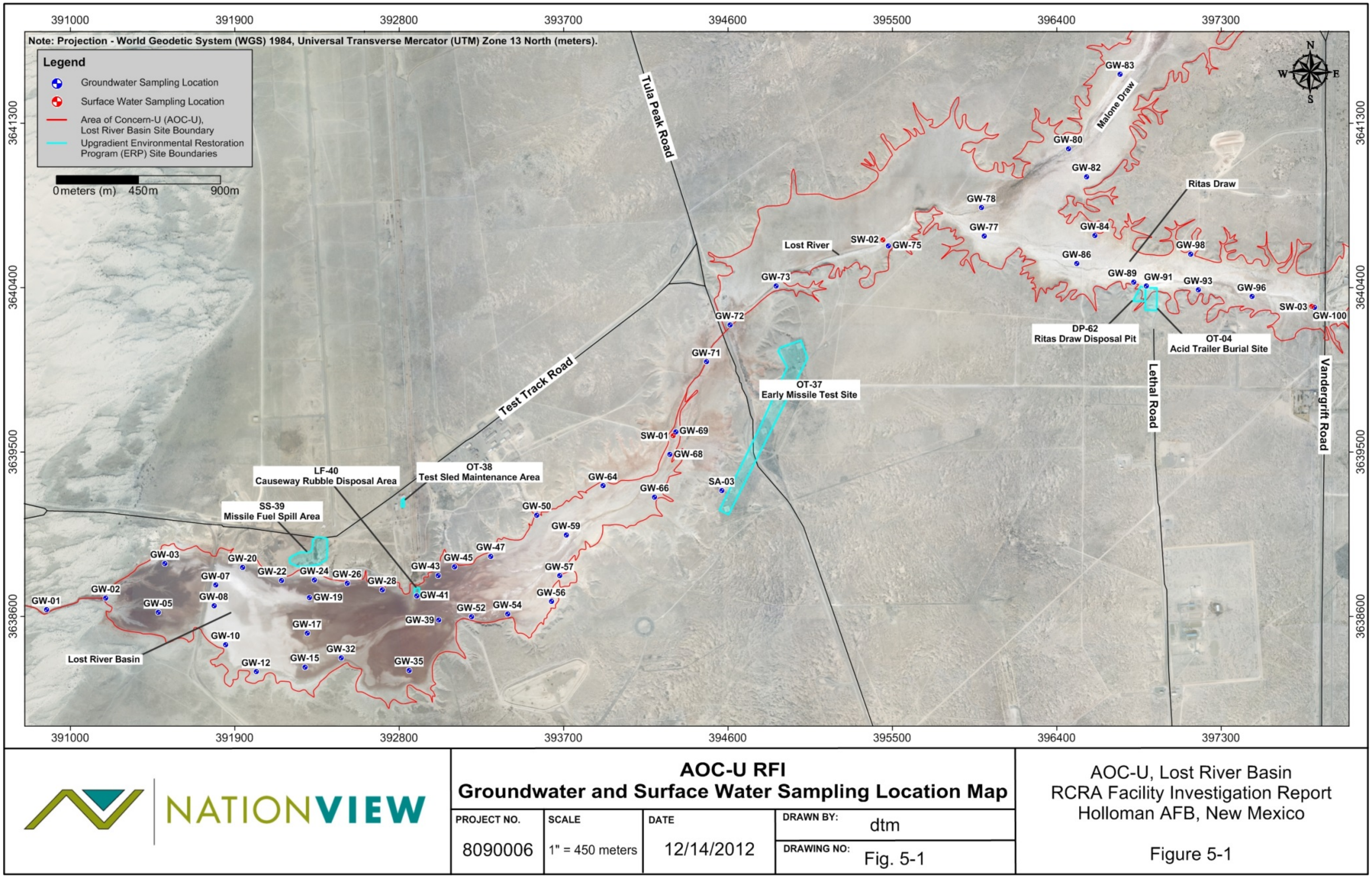
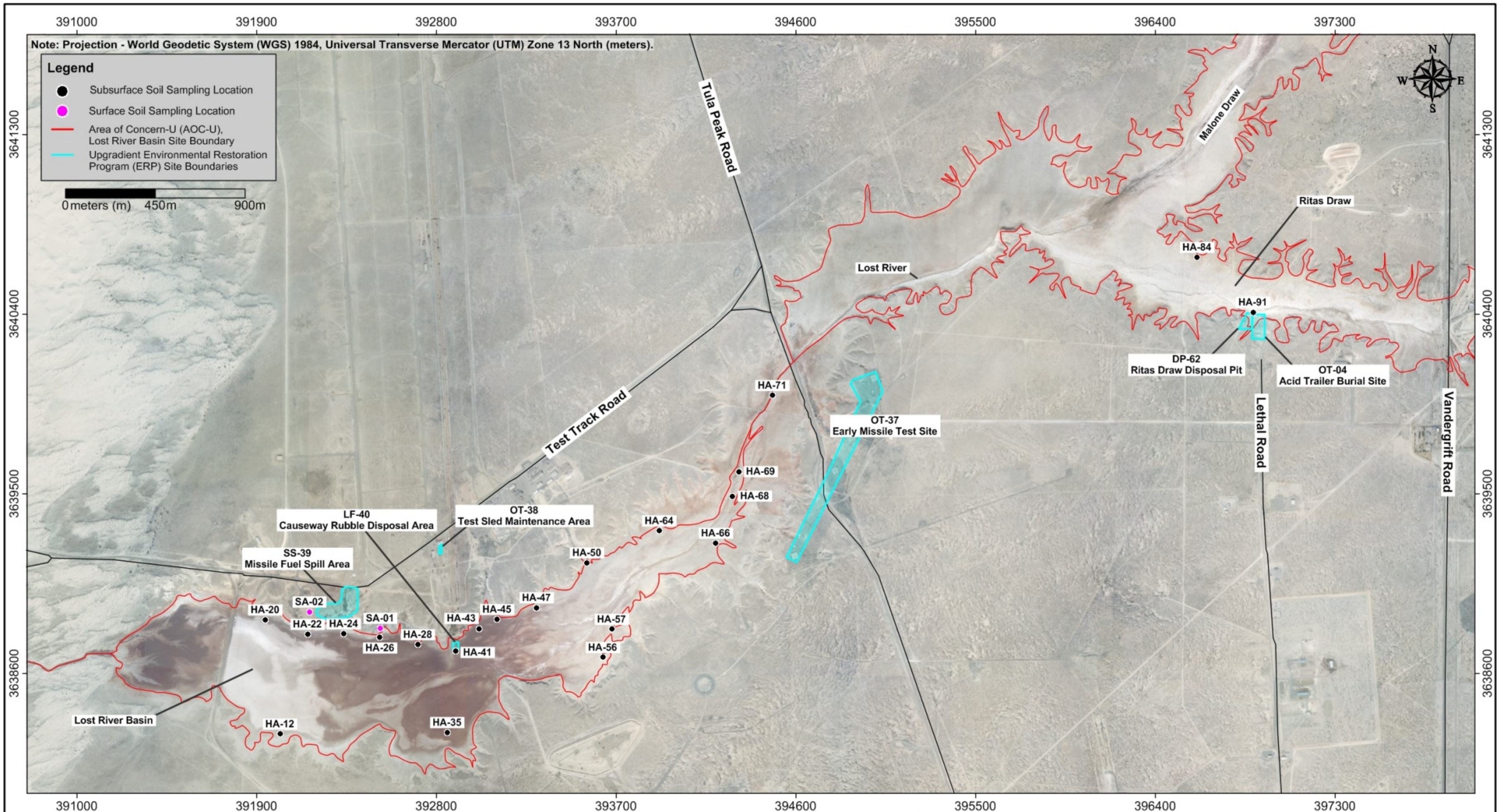


Figure C-13.6 AOC-U RFI Groundwater and Surface Water Sampling Location Map



NATIONVIEW

AOC-U RFI
Subsurface and Surface Soil Sampling Location Map

PROJECT NO.	SCALE	DATE	DRAWN BY: dtm
8090006	1" = 450 meters	12/14/2012	DRAWING NO: Fig. 5-2

AOC-U, Lost River Basin
RCRA Facility Investigation Report
Holloman AFB, New Mexico

Figure 5-2

Figure C-13.7 AOC-U RFI Subsurface and Surface Soil Sampling Location Map

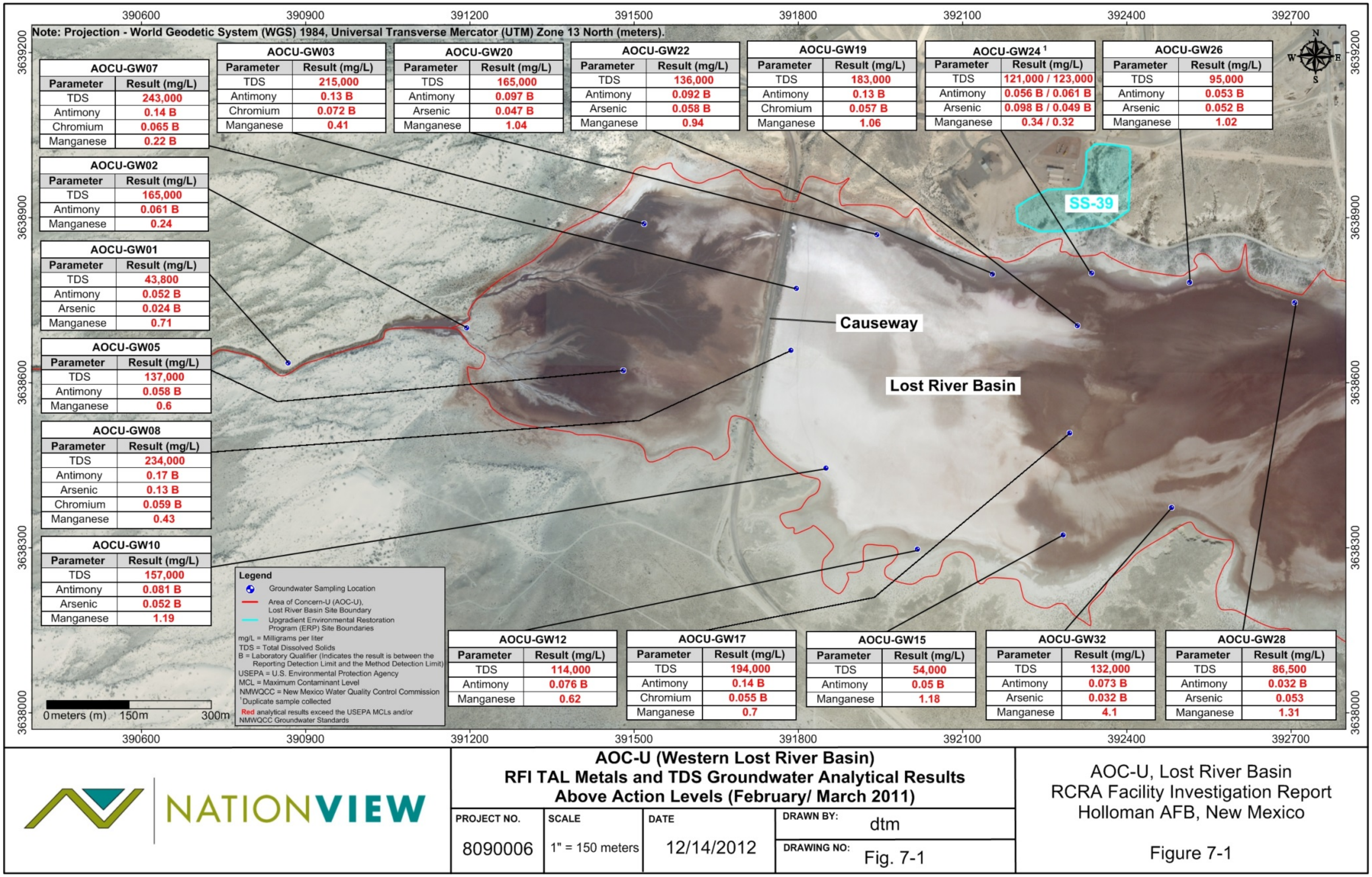


Figure C-13.8 AOC-U (Western Lost River Basin) RFI TAL Metals and TDS Groundwater Analytical Results Above Action Levels (February/March 2011)

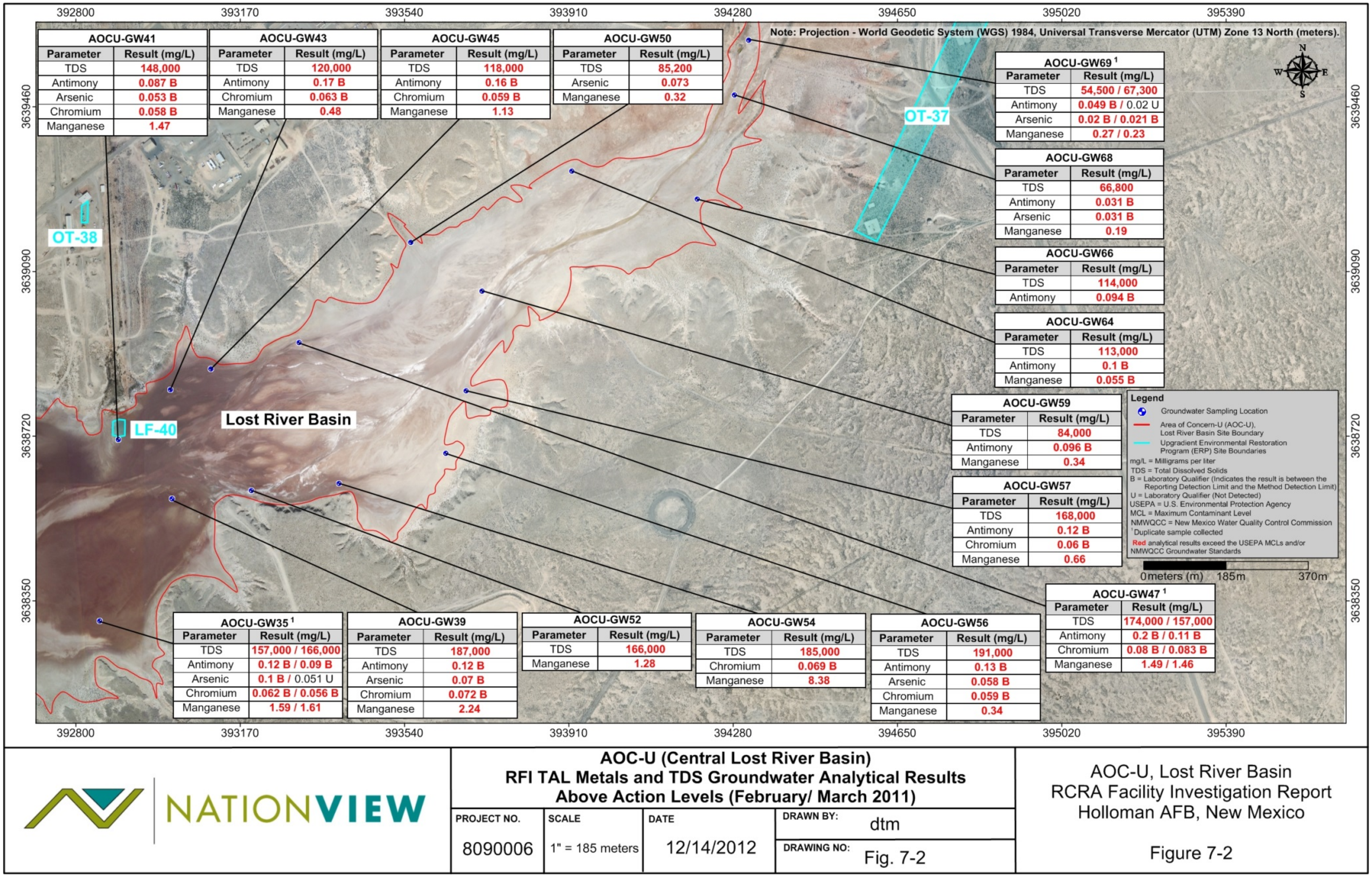


Figure C-13.9 AOC-U (Central Lost River Basin) RFI TAL Metals and TDS Groundwater Analytical Results Above Action Levels (February/March 2011)

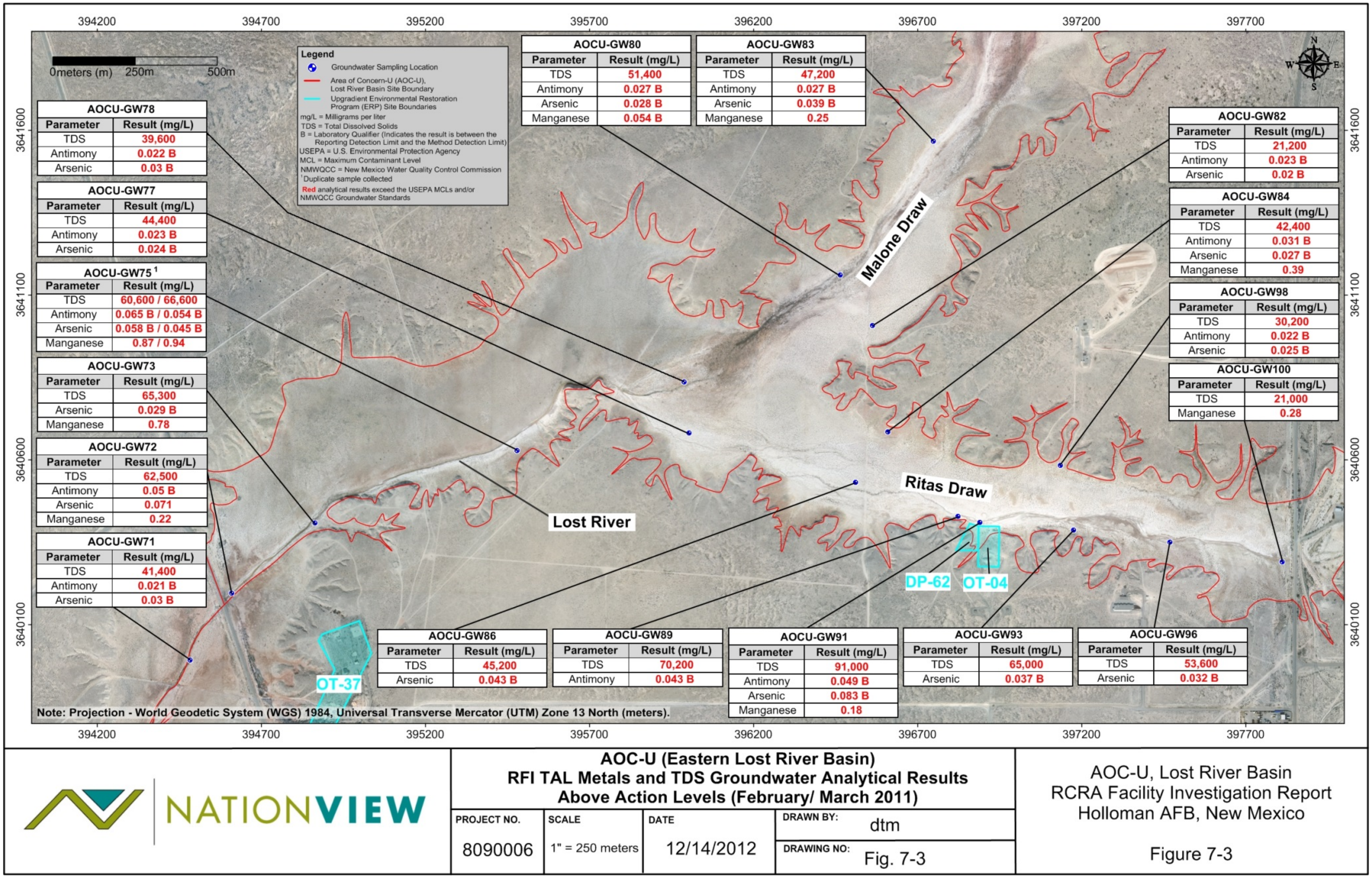


Figure C-13.10 AOC-U (Eastern Lost River Basin) RFI TAL Metals and TDS Groundwater Analytical Results Above Action Levels (February/March 2011)

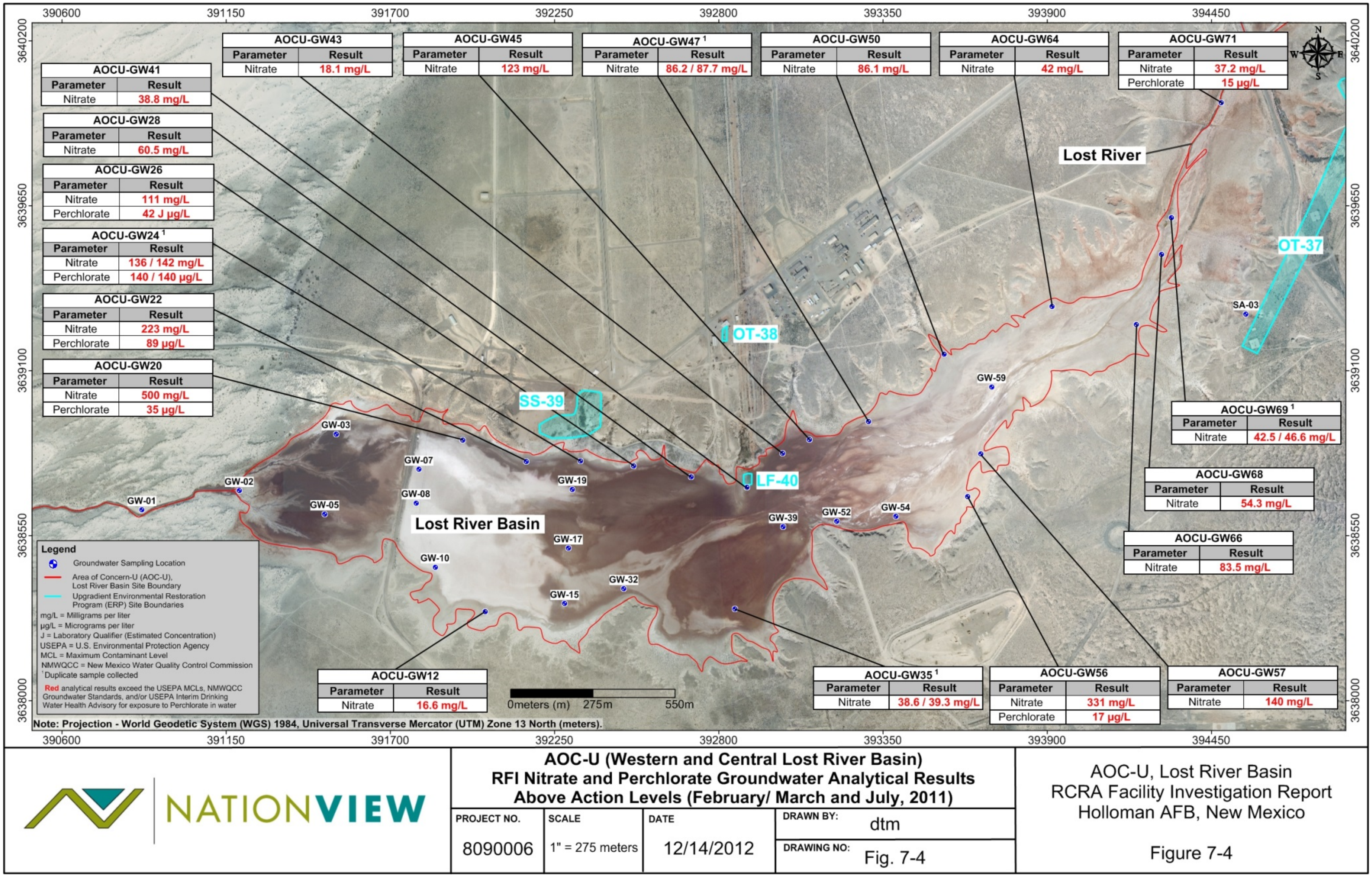


Figure C-13.11 AOC-U (Western and Central Lost River Basin) RFI Nitrate and Perchlorate Groundwater Analytical Results Above Action Levels (February/March and July, 2011)

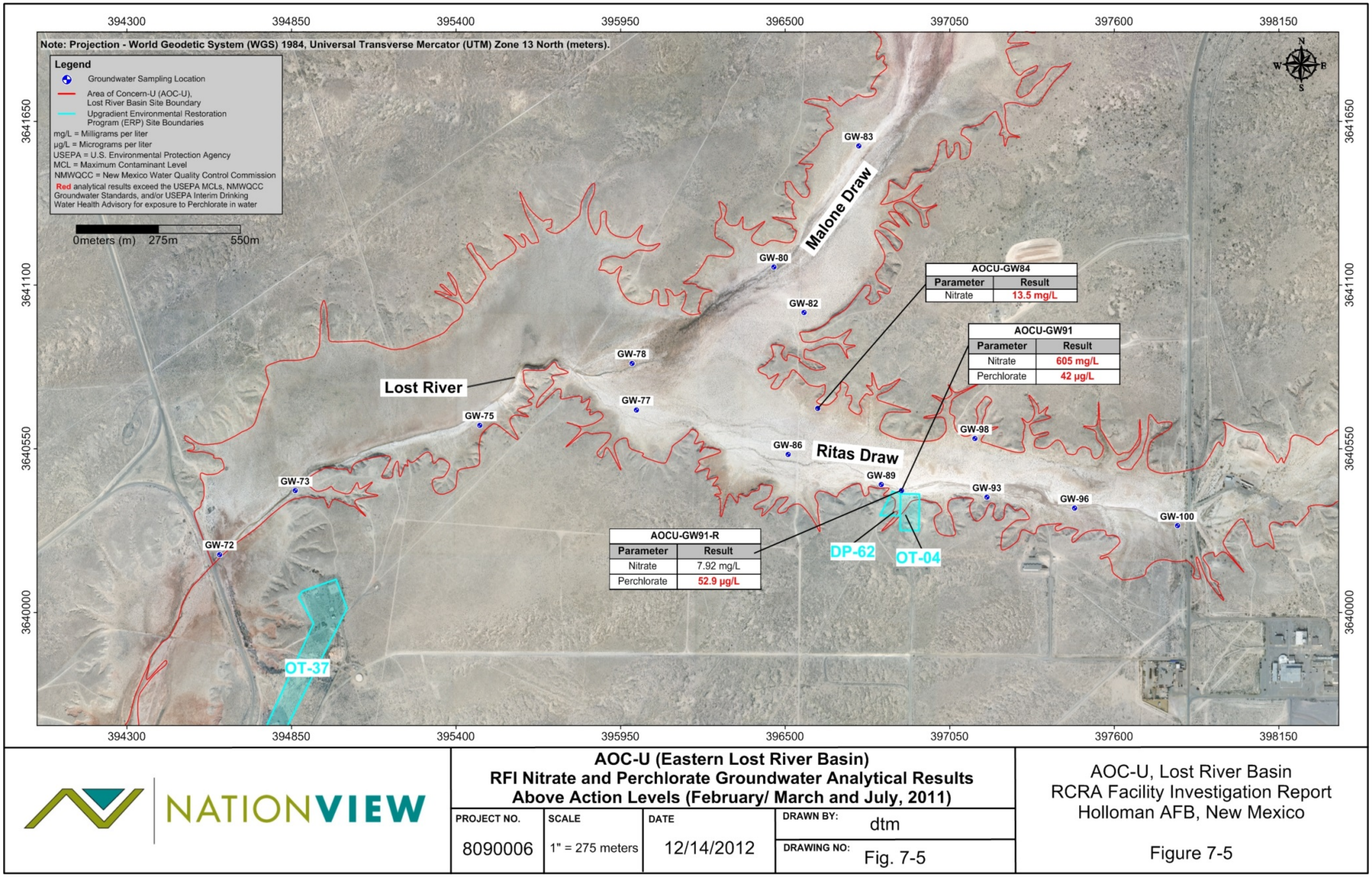


Figure C-13.12 AOC-U (Eastern Lost River Basin) RFI Nitrate and Perchlorate Groundwater Analytical Results Above Action Levels (February/March and July, 2011)

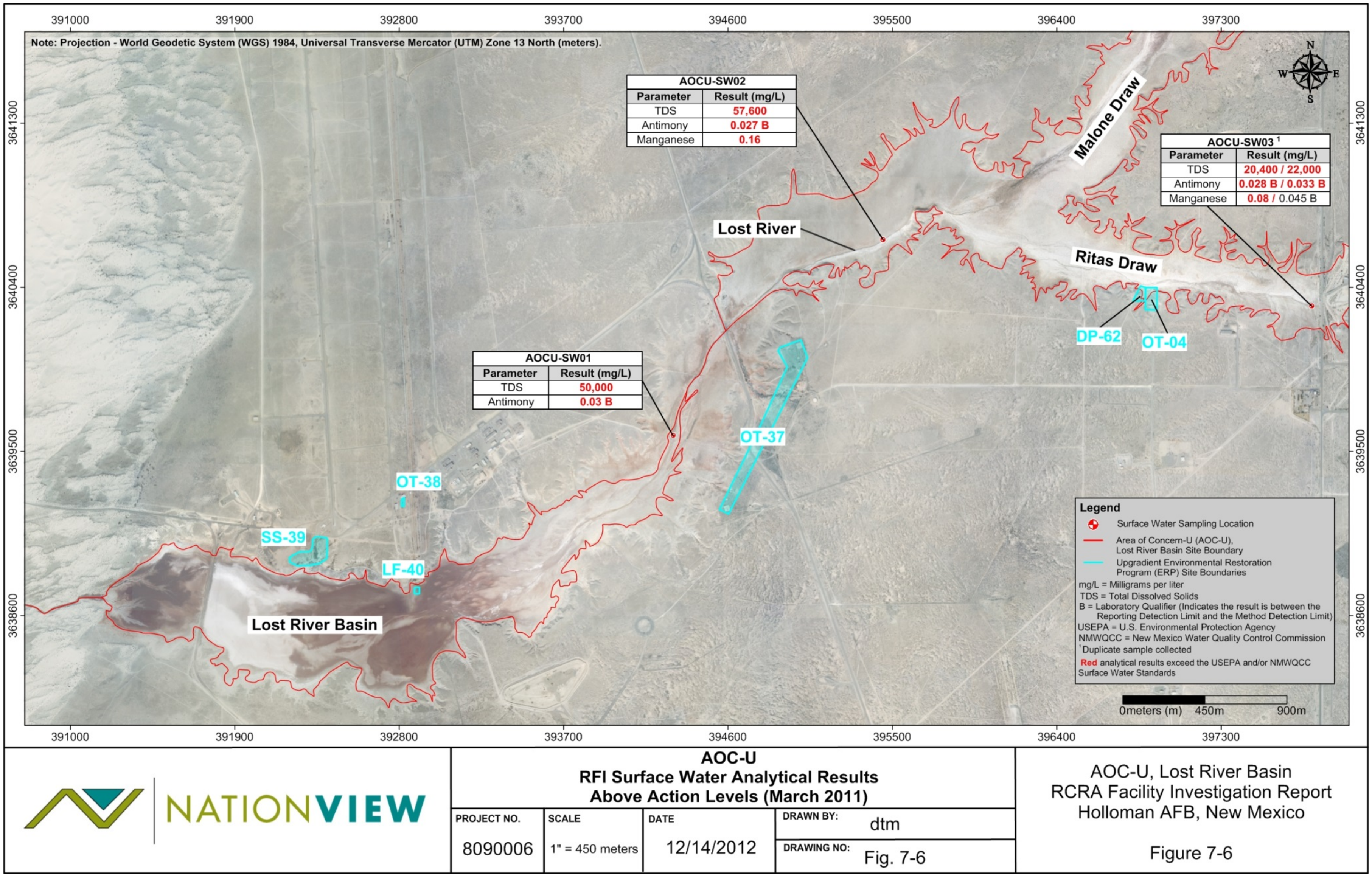
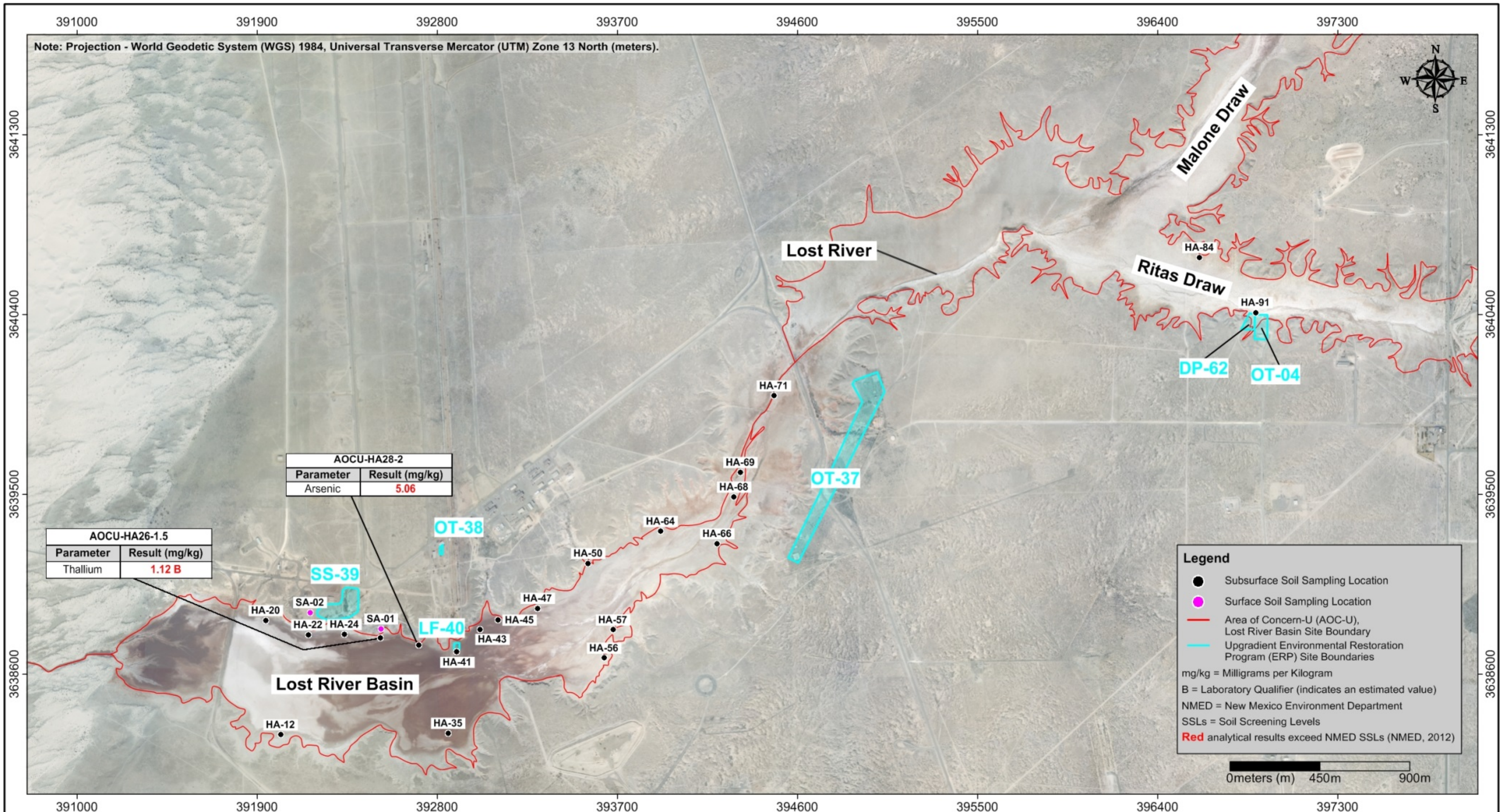


Figure C-13.13 AOC-U RFI Surface Water Analytical Results Above Action Levels (March 2011)



NATIONVIEW

AOC-U
RFI Subsurface and Surface Soil Analytical Results Above Action Levels (July 2011)

PROJECT NO.	SCALE	DATE	DRAWN BY: dtm
8090006	1" = 450 meters	12/14/2012	DRAWING NO: Fig. 7-7

AOC-U, Lost River Basin
RCRA Facility Investigation Report
Holloman AFB, New Mexico

Figure 7-7

Figure C-13.14 AOC-U RFI Subsurface and Surface Soil Analytical Results Above Action Levels (July 2011)

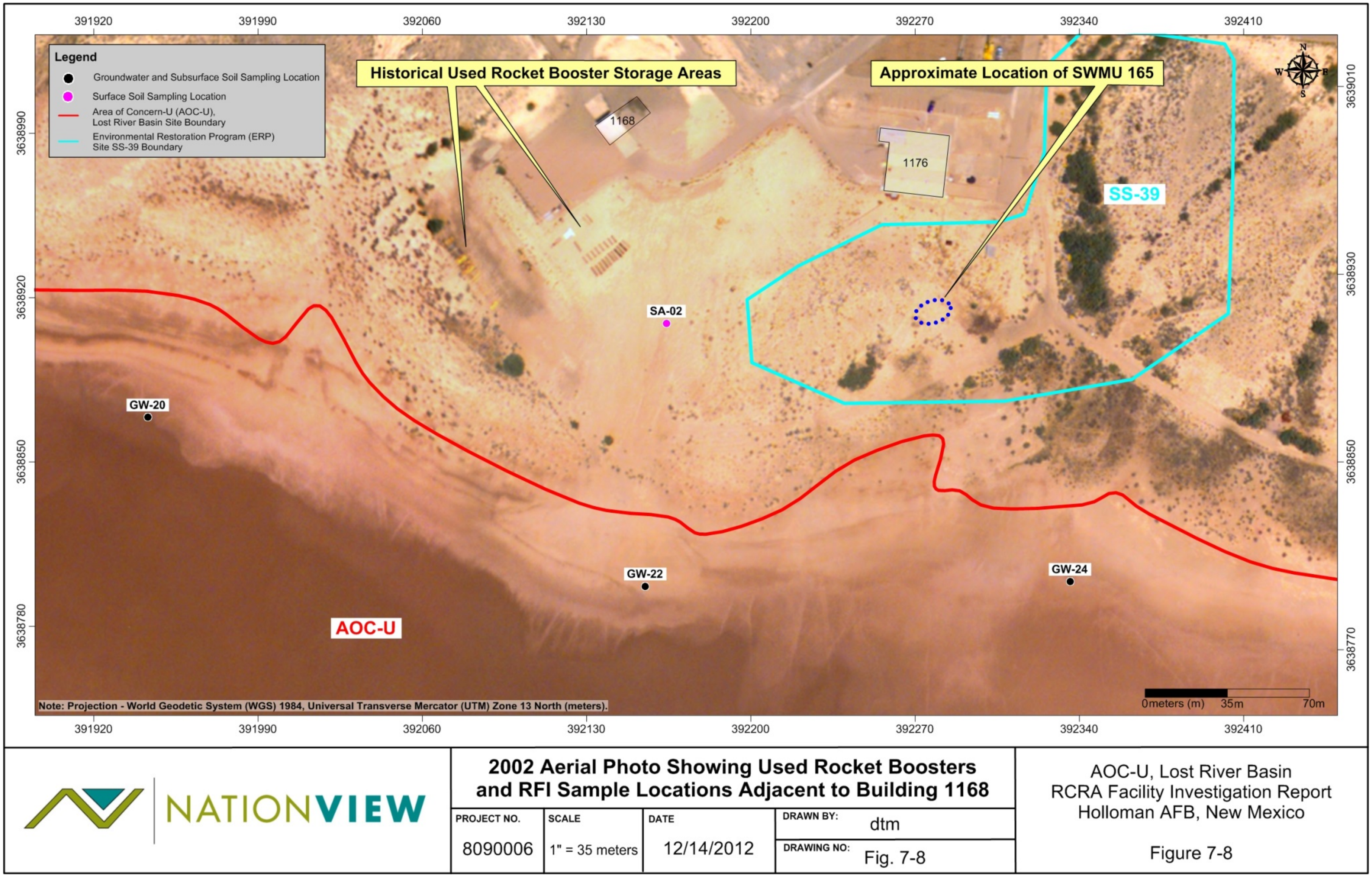


Figure C-13.15 2002 Aerial Photo Showing Used Rocket Boosters and RFI Sample Locations Adjacent to Building 1168

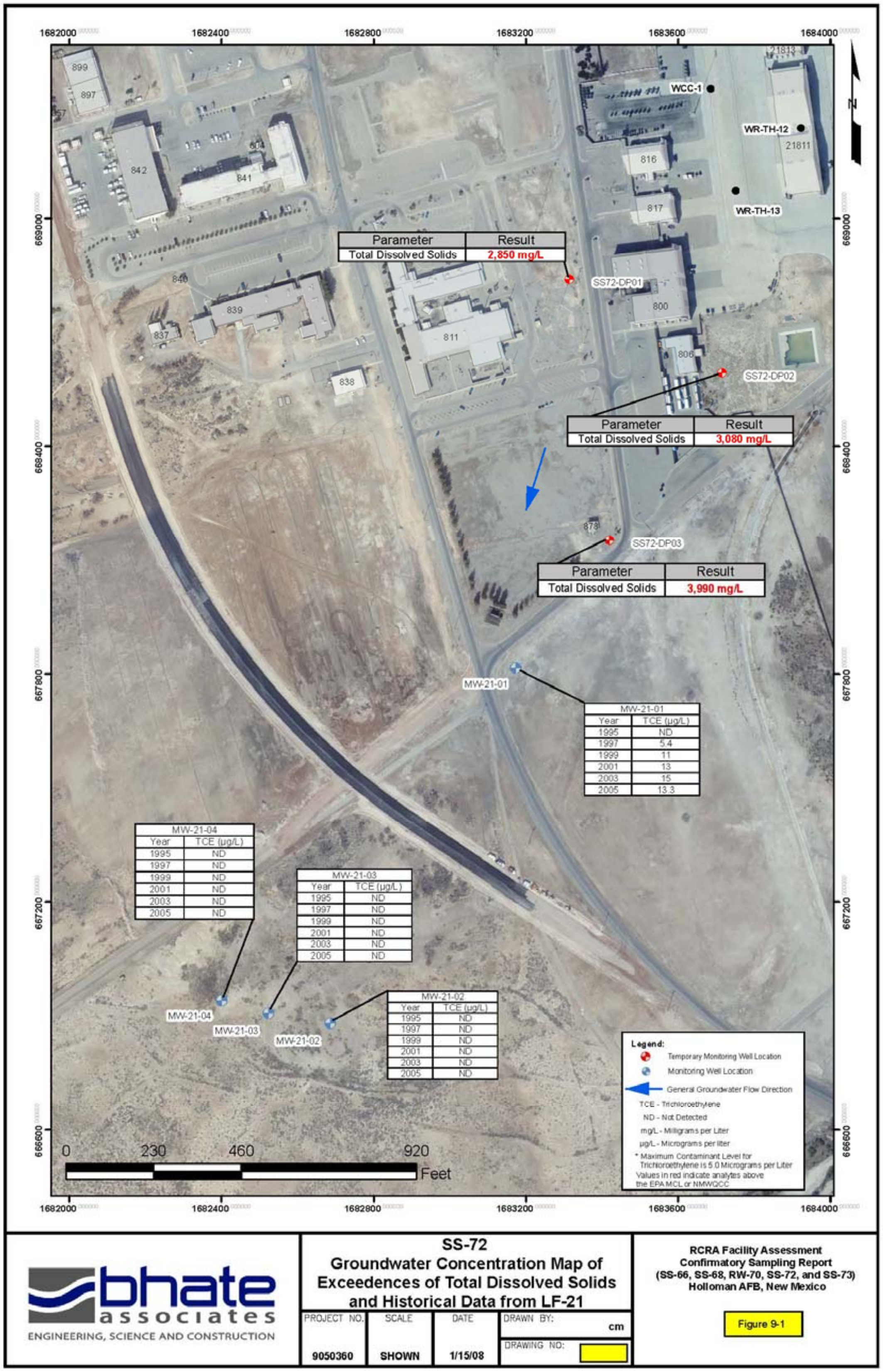


Figure C-14.1 AOC-838 - SS-72 Groundwater Concentration Map of Exceedences of TDS & Historical Data from LF-21

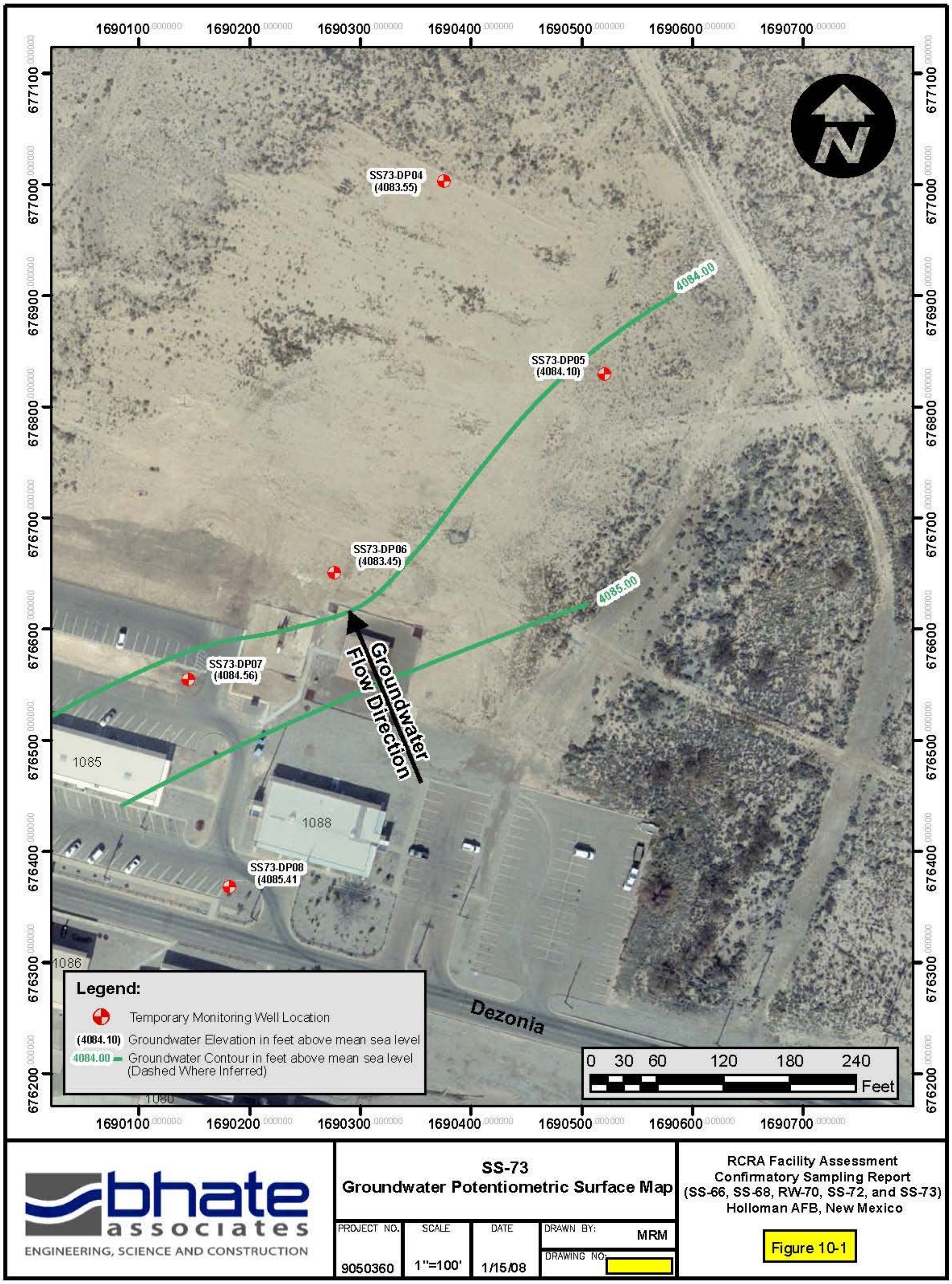


Figure C-15.1 AOC-1088 - SS-73 Groundwater Potentiometric Surface Map

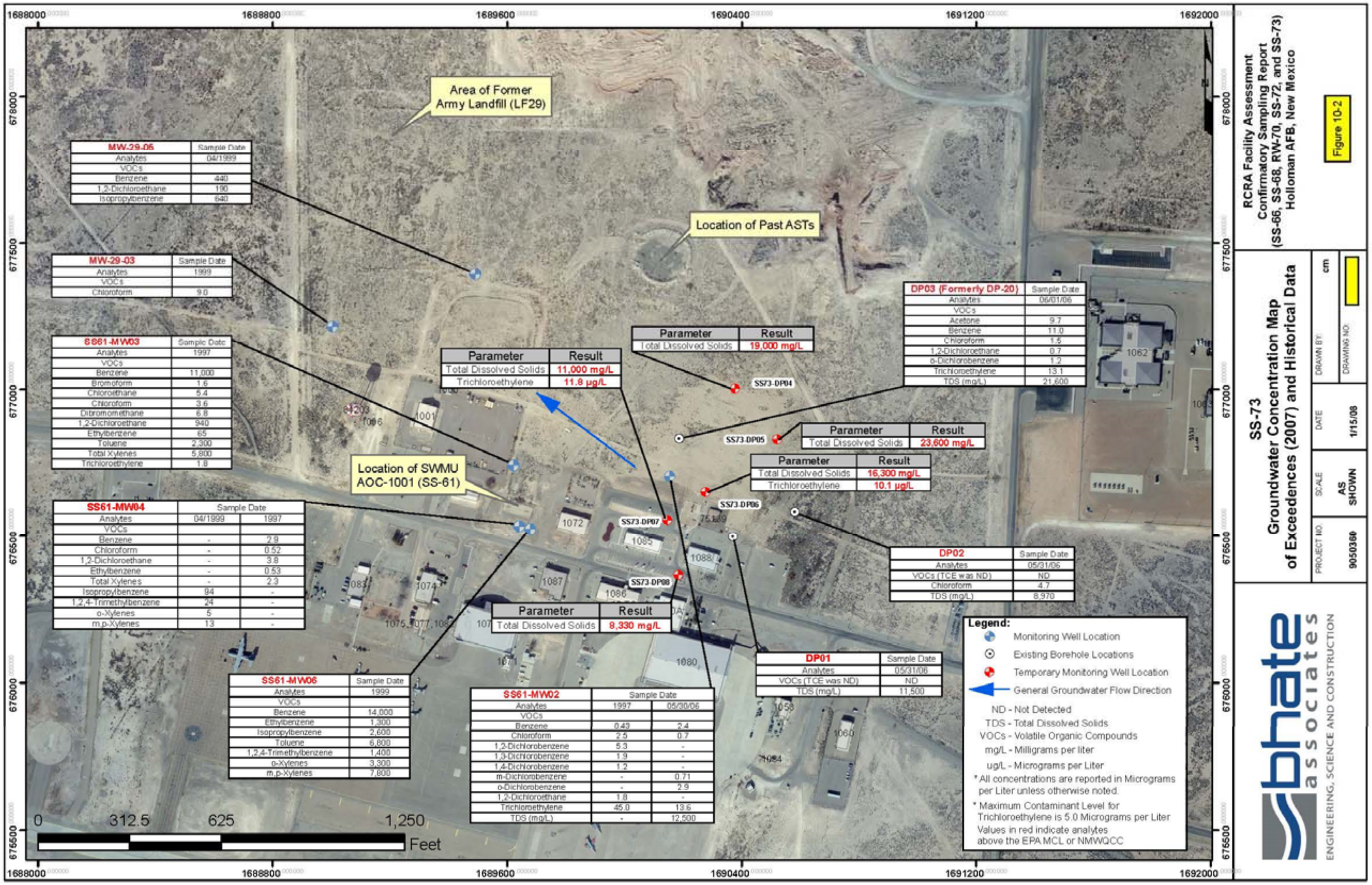


Figure C-15.2 AOC-1088 - SS-73 Groundwater Concentration Map of Exceedences (2007) & Historical Data

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TABLES

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Table C.1.1
SWMU Nos. 101 and 109 - LF-10 Long Term Groundwater Monitoring Analytical Results

Analyte	Background[1]	EPA MCL[2]	NMWQCC Standard[3]	MW-2 (Upgradient)					MW-3					MW-4				
				Aug-95	Sep-97	Sep-99	Sep-01	Apr-03	Aug-95	Sep-97	Sep-99	Sep-01	Apr-03	Aug-95	Sep-97	Sep-99	Sep-01	Apr-03
Volatile Organic Compounds (µg/L)																		
	n/a	n/a	21,800	ND	ND	<5	--	--	ND	ND	<5	--	--	--	--	1 J	--	--
1,2-Dichloroethane	n/a	5	1.49	ND	ND	<3	--	--	ND	ND	<3	--	--	--	--	<3	--	--
Methylene	n/a	n/a	n/a	6.6UB	ND	<3	--	--	ND	ND	<3	--	--	--	--	<3	--	--
Metals (µg/L)																		
Arsenic	10	10	0.448	ND	ND	***15.5 B (J)***	***10.1***	***21.1***	10	ND	***18.5 B (J)***	***11.9***	***21.2***	***13***	***17 J***	***14.9 B (J)***	***11.7***	***19.3***
Barium	38	2000	7,300	ND	ND	11.4 B (J)	9.5 B	8.09 J	ND	ND	13.5 B (J)	12.1	9.6 J	--	20	30.9 B (J)	28.4	9.88 J
Cadmium	5	5	18.3	ND	ND	0.5B	--	--	ND	ND	0.5B	NA	--	--	--	1.2 B	--	--
Chromium	12	100	110	ND	ND	10.6 (J)	<20	--	ND	ND	<0.6	<20	--	--	--	1.2 B (J)	<20	--
Lead	9	15	n/a	ND	ND	<1.5	<10 (UJ)	--	***98***	ND	<1.5	<10 (UJ)	--	***150***	--	<1.5	<10 (UJ)	--
Manganese	50	n/a	876	ND	ND	2.2 B (J)	<10 (UJ)	<10	ND	ND	3.3 B (J)	1.1 B (J)	<10	--	80	*114 J*	*80.2 (J)*	*71.3*
Selenium	50	50	183	ND	ND	14.6 B (J)	7.9 B	6.41 UJ	ND	ND	14.2 B (J)	8.5 B	<19	--	--	12.7 B (J)	8.4 B	<13.9
Silver	10	n/a	183	ND	ND	<0.5	--	--	ND	ND	6.2 B (J)	--	--	--	--	1.4 B (J)	--	--
Organochlorine Pesticides (µg/L)																		
All	n/a	n/a	n/a	ND	ND	--	--	--	ND	ND	--	--	--	--	--	--	--	--

Notes:

Italicized results represent values which exceed background values.

Bold results represent values which exceed EPA MCLs

Highlighted results represent values which exceed NMWQCC Standards

[1] Background values are from the NMED Partial Approval of the Basewide Background Study Report, January 2009 letter to Holloman AFB, August 12, 2011.

[2] EPA MCL - United States Environmental Protection Agency Maximum Contaminant Level. From January 2011 Edition of the Drinking Water Standards and Health Advisories.

[3] NMWQCC Standard - New Mexico Water Quality Control Commission. These values are Tap Water Screening Values from Table A-1: NMED Soil Screening Levels, Technical Background Document for Development of Soil Screening Levels, Revision 5.0, July 2009.

µg/L - micrograms per liter

n/a - not available

-- not analyzed

ND - not detected

(UJ) - Estimated value detected less than the Contract-Required Detection Limit, but greater than the reporting limits.

(J) - Estimated as a non-detect at the detection limit.

(B) - Analyte present in associated laboratory blank.

Table C.1.1
SWMU Nos. 101 and 109 - LF-10 Long Term Groundwater Monitoring Analytical Results

Analyte	Background(1)	EPA MCL(2)	NMWQCC Standard(3)	MW-6 Aug-95	MW-6 Sep-97	MW-6 Sep-99	MW-6 Sep-01	MW-6 Apr-03
Volatile Organic Compounds (µg/L)								
	n/a	n/a	21,800	--	--	<5	--	--
1,2-Dichloroethane	n/a	5	1.49	--	--	1 J	--	--
Methylene	n/a	n/a	n/a	--	--	<3	--	--
Metals (µg/L)								
Arsenic	10	10	0.448	10	***17 J***	***20.6 B (J)***	***11.9***	***25.9***
Barium	38	2000	7,300	--	--	12.2 B (J)	11.4	8.29 J
Cadmium	5	5	18.3	--	--	<0.3	--	--
Chromium	12	100	110	--	--	<0.6	<20	--
Lead	9	15	n/a	***42***	--	<1.5	<10 (UJ)	--
Manganese	50	n/a	876	--	*110*	*50.5 (J)*	18.2 (J)	*66.7*
Selenium	50	50	183	--	--	10.6 B (J)	3.9 B	<11.2
Silver	10	n/a	183	--	--	<0.5	--	--
Organochlorine Pesticides (µg/L)								
All	n/a	n/a	n/a	--	--	--	--	--

Notes:

Italicized results represent values which exceed background values.

Bold results represent values which exceed EPA MCLs

Highlighted results represent values which exceed NMWQCC Standards

(1) Background values are from the NMED Partial Approval of the Basewide Background Study Report, January 2009 letter to Holloman AFB, August 12, 2011.

(2) EPA MCL - United States Environmental Protection Agency Maximum Contaminant Level. From January 2011 Edition of the Drinking Water Standards and Health Advisories.

(3) NMWQCC Standard - New Mexico Water Quality Control Commission. These values are Tap Water Screening Values from Table A-1: NMED Soil Screening Levels, Technical Background Document for Development of Soil Screening Levels, Revision 5.0, July 2009.

µg/L - micrograms per liter

n/a - not available

-- not analyzed

ND - not detected

(UJ) - Estimated value detected less than the Contract-Required Detection Limit, but greater than the reporting limits.

(J) - Estimated as a non-detect at the detection limit.

(B) - Analyte present in associated laboratory blank.

Table C.2.1
SWMU No. 113A - OT-20 Soil Analytical Data (June 2007)

Client Sample ID:	Soil Screening Levels	0T20-DP01-5	0T20-DP02-5	0T20-DP02-5A	0T20-DP03-5
Lab Sample ID:	NMED Residential[1]	D7F090156-017	D7F090156-018	D7F090156-019	D7F090156-020
Date Sampled:		6/8/2007	6/8/2007	6/8/2007	6/8/2007
Analyte		Result	Result	Result	Result
General Chemistry		%	%	%	%
Percent Moisture	NV	24	25	26	26
RCRA Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Barium	15,600	84	96	90	85
Cadmium	39	0.21 J	0.25 J	0.24 J	0.18 J
Chromium	234	9.4	10	10	9.9
Arsenic	3.9	3.4	3.4	3.8	3.3
Lead	400	4.4	5.1	4.7	4.4
Pesticides	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
All	NV	ND	ND	ND	ND
Herbicides	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
MCPA	NV	ND	ND	2,100 J	ND
PCBs	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
All	NV	ND	ND	ND	ND
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Diesel Range Organics (C10-C22)	NV	2.2 J	2.4 J	2.1 J	2.3 J
Gasoline Range Organics (C6 -C10)	NV	0.60 J	ND	0.55 J	ND
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Tetrachloroethene	12.5	ND	ND	ND	8.8
Naphthalene	79.5	1.0 J	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg
All	NV	ND	ND	ND	ND

Notes:
NMED = New Mexico Environment Department
PCB = Polychlorinated Biphenyls
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E).
ND = Not Detected
NV = No Value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

Table C.2.2
SWMU No. 113A - OT-20 Groundwater Analytical Data (June – August 2007)

Client Sample ID:	Groundwater Screening Levels		OT20-MW01	0T20-MW01	OT20-MW02	0T20-MW02	OT20-MW03	OT20-MW03-A	OT20-MW04
Lab Sample ID:	NMWQCC[1]	EPA MCL	D7F120221-008	D7G260168-013	D7F120221-007	D7G260168-014	D7F120221-005	D7F120221-006	D7H250232-001
Date Sampled:			6/10/2007	7/25/2007	6/10/2007	7/25/2007	6/10/2007	6/10/2007	8/24/2007
Analyte			Result	Result	Result	Result	Result	Result	Result
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Dissolved Solids	1,000	500 [2]	NS	**30,000 Q**	NS	**64,000 Q**	**42,000 Q**	**45,000 Q**	**57,000 Q**
RCRA Metals	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Selenium	50	50	NS	ND	NS	8.0 J	ND	ND	ND
Barium	1,000	2,000	NS	50	NS	51	41	41	59 J
Cadmium	10	5	NS	1.4 J	NS	1.4 J	1.5 J	2.0 J	ND
Chromium	50	100	NS	3.2 J	NS	ND	ND	ND	ND
Pesticides	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
All	NV	NV	NS	ND	NS	ND	ND	ND	ND
Herbicides	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dalapon	NV	200	NS	6.2	NS	2.4	ND	0.51 J	ND
Dichlorprop	NV	NV	NS	0.56 J	NS	ND	ND	ND	ND
MCPP	NV	NV	NS	92 J	NS	120 J	ND	ND	ND
2,4-DB	NV	NV	NS	0.34 J	NS	ND	ND	ND	ND
PCBs	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
All	NV	NV	NS	ND	NS	ND	ND	ND	ND
Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Acetone	NV	NV	39	ND	31	ND	ND	ND	ND
Benzene	10	5	0.19 J	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	NV	NV	9.9	ND	8.2	ND	ND	ND	ND
Chloromethane	NV	NV	1.5 J	ND	1.0 J	0.49 J	ND	0.43 J	ND
Methylene chloride	100	5	ND	0.38 J	ND	0.42 J	ND	ND	ND
4-Methyl-2-pentanone	NV	NV	0.76 J	ND	0.73 J	ND	ND	ND	ND
Tetrachloroethene	20	5	ND	ND	4.6	**56**	**5.3**	3.4	4.7
Trichloroethene	100	5	ND	ND	ND	0.27 J	ND	ND	0.21 J
Naphthalene	30	NV	ND	ND	ND	ND	ND	ND	0.24 J
Semi-Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
bis(2-Ethylhexyl)phthalate	NV	NV	NS	1.2 J	NS	ND	ND	ND	ND
Di-n-butyl phthalate	NV	NV	NS	ND	NS	ND	ND	ND	1.6 J

Notes:
NMWQCC = New Mexico Water Quality Control Commision
RCRA = Resource Conservation and Recovery Act
USEPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
µg/L = micrograms per liter
mg/L = milligrams per liter
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E).
ND = Not Detected
NV = No Value
Q = Elevated reporting limit. The reporting limit is elevated due to high analyte levels.
[1]Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA Secondary Drinking Water Standard
Bold value indicate analytes above USEPA MCL and/or New Mexico Groundwater Quality Standard.

Table C.3.1
SWMU No. 114 - OT-03 Excavation Soil Confirmation Analytical Results (August 2007)

Client Sample ID:	Soil Screening Levels	OT-03-SW-N-5	OT-03-SW-E-5	OT-03-SW-S-5	OT-03-SW-W-5	OT-03-SW-B-9
Lab Sample ID:	NMED	LR195631	LR195631	LR195631	LR195631	LR195631
Date Sampled:	Residential[1]	08/14/2007	08/14/2007	08/14/2007	08/14/2007	08/14/2007
Analyte		Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	3.2 J	4.5 J	ND
Diesel Range Organics (C10-C22)	800 [2]	ND	1.2	ND	ND	ND
Volatile Organic Compounds (VOCs)	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
All VOCs	NV	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Diethylphthalate	48,900	1,800	ND	ND	ND	1,670

Notes:
NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated Result
ND = Not Detected
NV = No Value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels (Revision 4.0, June 2006)

Table C.4.1
SWMU Nos. 118, 132, and AOC A - OT-16 Excavation Soil Confirmation Analytical Results (August 2007)

		Sample Name:	**MW16-01**																					
		Date Collected:	04/01/2008		04/01/2008		07/11/2008		07/11/2008		10/07/2008		10/07/2008		01/06/2009		01/06/2009		04/09/2009		04/09/2009		07/06/2009	
		Sampling Company:	Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech	
		QC Type:	Regular		Field Duplicate		Regular		Field Duplicate		Regular		Field Duplicate		Regular		Field Duplicate		Regular		Field Duplicate		Regular	
Analyte	**NMWQCC[1]**	**EPA MCL[2]**	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
General Chemistry (mg/L)																								
Solids, total dissolved[3]	n/a	n/a	3010		3120		3380		3420		3210		3490		3130		3370		3700		3630		2340	J
Pesticides (µg/L)																								
Alpha-BHC	0.106666667	n/a	0.0098	U	0.0097	U	0.01	U	0.0097	U	0.0097	U	0.0097	U	0.0098	U	0.0097	U	0.0096	U	0.0096	U	0.01	U
Dieldrin	0.042	n/a	0.016	J	0.015	J	0.013	J	0.014	J	0.014	J	0.013	J	0.0098	U	0.011	J	0.0096	U	0.0096	U	0.01	U
Gamma-BHC (lindane)	0.610909091	0.2	0.0098	U	0.0097	U	0.01	U	0.0097	U	0.0097	U	0.0097	U	0.0098	U	0.0097	U	0.0096	U	0.0096	U	0.01	U

		Sample Name:	**MW16-01**										**MW16-02**											
		Date Collected:	07/06/2009		10/06/2009		10/06/2009		01/05/2010		01/05/2010		04/01/2008		07/11/2008		10/07/2008		01/06/2009		04/09/2009		07/06/2009	
		Sampling Company:	Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech	
		QC Type:	Field Duplicate		Regular		Field Duplicate		Regular		Field Duplicate		Regular		Regular		Regular		Regular		Regular		Regular	
Analyte	**NMWQCC[1]**	**EPA MCL[2]**	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
General Chemistry (mg/L)																								
Solids, total dissolved[3]	n/a	n/a	5400	J	3020		3100		2720		2570		5010		3880		4440		4840		5760		6470	J
Pesticides (µg/L)																								
Alpha-BHC	0.106666667	n/a	0.01	U	0.01	U	0.01	U	0.01	U	0.0097	U	0.0098	U	0.01	U	0.0097	U	0.0096	U	0.048	U	0.01	U
Dieldrin	0.042	n/a	0.01	U	0.02	J	0.015	J	0.01	U	0.0097	U	0.0098	U	0.011	J	0.011	J	0.0096	U	0.048	UJ	0.01	U
Gamma-BHC (lindane)	0.610909091	0.2	0.01	U	0.01	U	0.01	U	0.01	U	0.0097	U	0.0098	U	0.01	U	0.049	U	0.0096	U	0.048	U	0.01	U

		Sample Name:	**MW16-02**				**MW16-03**															
		Date Collected:	10/06/2009		01/05/2010		04/01/2008		07/11/2008		10/07/2008		01/06/2009		04/09/2009		07/06/2009		10/06/2009		01/05/2010	
		Sampling Company:	Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech	
		QC Type:	Regular		Regular		Regular		Regular		Regular		Regular		Regular		Regular		Regular		Regular	
Analyte	**NMWQCC[1]**	**EPA MCL[2]**	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
General Chemistry (mg/L)																						
Solids, total dissolved[3]	n/a	n/a	5120		4170		3580		3490		3230	J	3440	J	3180		6170	J	4690		2380	
Pesticides (µg/L)																						
Alpha-BHC	0.106666667	n/a	0.01	U	0.01	U	0.0097	U	0.01	U	0.0098	U	0.0098	U	0.0096	U	0.01	U	0.01	U	0.0098	U
Dieldrin	0.042	n/a	0.01	U	0.01	U	0.0097	U	0.01	U	0.0098	U	0.0098	U	0.0096	U	0.01	U	0.01	UJ	0.0098	U
Gamma-BHC (lindane)	0.610909091	0.2	0.01	U	0.097	J	0.0097	U	0.01	U	0.0098	U	0.0098	U	0.0096	U	0.01	U	0.01	U	0.0098	U

Table C.4.2
SWMU Nos. 118, 132, and AOC A - OT-16 Long-Term Monitoring Groundwater Analytical Results

		Sample Name:	MW16-04															
		Date Collected:	04/01/2008		07/11/2008		10/07/2008		01/06/2009		04/09/2009		07/06/2009		10/06/2009		01/05/2010	
		Sampling Company:	Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech		Tetra Tech	
		QC Type:	Regular		Regular		Regular		Regular		Regular		Regular		Regular		Regular	
Analyte	**NMWQCC[(1)]**	**EPA MCL[(2)]**	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
General Chemistry (mg/L)																		
Solids, total dissolved[(3)]	n/a	n/a	3330		4230		4230		14000		4200		6120	J	5590		4450	
Pesticides (µg/L)																		
Alpha-BHC	0.106666667	n/a	0.0096	U	0.0098	U	0.0097	U	0.0097	U	0.039	U	0.01	U	0.01	U	0.0097	U
Dieldrin	0.042	n/a	0.0096	U	0.0098	U	0.0097	U	0.0097	U	0.039	U	0.01	U	0.01	UJ	0.0097	U
Gamma-BHC (lindane)	0.610909091	0.2	0.0096	U	0.0098	U	0.0097	U	0.0097	U	0.039	U	0.01	U	0.01	U	0.0097	U

Notes:
(1) NMAC 20.6.2.3103
(2) December 2009 U.S. EPA Maximum Contaminant Level (MCL)
(3) Groundwater with TDS concentrations above 10,000 mg/L is not considered a potential domestic or agricultural water supply (NMAC, 20.6.2.3101).
EPA - United States Environmental Protection Agency
J - estimated value
mg/L - milligrams per liter
n/a - not available
NMWQCC - New Mexico Water Quality Control Commission
Q - analytical result qualifier
Result - reported analytical concentration
µg/L - micrograms per liter
U - not detected; UJ - estimated non-detect

Table C.6.1
AOC-1 - DP-64 Soil Analytical Data (October 2006)

Client Sample Identification:	Soil Screening Levels	Basewide Background	DP64-SB04-2			DP64-SB04-18			DP64-SB04-36			DP64-SB05-2			DP64-SB05-18			DP64-SB05-36		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	F61083-1			F61083-2			F61083-3			F61024-4			F61024-5			F61024-6		
Date Sampled:			10/22/2008			10/22/2008			10/22/2008			10/22/2008			10/22/2008			10/22/2008		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,1-Dichloroethylene	618	NV	1.5	U	UJ	1.7	U	UJ	1.6	U	UJ	1.5	U		1.5	U		1.6	U	
Methylene chloride	199	NV	5.9	JB	J	6.4	U	UJ	6.0	U	UJ	28.1	B	J	28.3	B	J	23.6	B	J
Toluene	5,570	NV	1.1	U	UJ	1.3	U	UJ	1.2	U	UJ	1.2	U		1.1	U		1.3	U	
Semi-Volatile Organic Compounds (SW846 8270C)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
All SVOCs	NV	NV	ND	U		ND	U		ND	U	UJ	ND	U		ND	U		ND	U	
Explosives (SW846 8330A)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
2,6-Dinitrotoluene	61.2	NV	49	U		50	U		47	U		45	U		52	U		45	U	
RCRA Metals Analysis (SW846 6010B/7471A)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Arsenic	3.9	3.7	2.2			2.4			3.3			0.94	U		1.8	J		1.9		
Barium	15,600	169.3	67.4		J	47.9		J	34.7		J	90.1		J	70.5		J	45.7		J
Cadmium	77.9	0.3	0.051	U		0.055	U		0.058	J		0.10	J	J	0.18	J	J	0.13	J	J
Chromium	219	25	2.5		J	8.4		J	5.3		J	2.4		J	8.2		J	6.7		J
Lead	400	10.9	2.8	J	J	5.2	J	J	3.9	J	J	1.6	J	J	3.1	J	J	2.3	J	J
Mercury	7.71	10.8	0.011	U		0.013	U		0.012	U		0.011	U		0.013	U		0.013	U	
Selenium	391	1.4	0.64	U	UJ	0.68	U	UJ	0.67	U	UJ	2.0	J		2.0	J		1.4	J	
Silver	391	1.1	0.062	U	UJ	0.066	U	UJ	0.065	U	UJ	0.063	U		0.061	U		0.067	U	
General Chemistry	%	%	%			%			%			%			%			%		
Solids, Percent (SM19 2540B)	NV	NV	95.4			91.5			90.3			94.8			93.3			88.4		

Notes:

NMED = New Mexico Environment Department
UTL = Upper Tolerance Limit
SVOC = Semi-Volatile Organic Compounds
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
% = percent
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers
B = Analyte detected in associated method blank
J = Indicates an estimated result
U = Not detected
ND = Entire analyte list not detected
Client Sample Nomenclature
DP64 = Chemical Agent Disposal Site 64
SB = Soil Boring
a = sample suffix denoting a field duplicate sample
The final digit equals the depth of the sample interval (feet below ground surface)

[1] NMED, December 2009. Technical Background Document for Development of Soil Screening Levels, Revision 5.0.
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)

Bold value indicate analytes above NMED Soil Screening Levels (Rev 5.0, December 2009)
Indicates analytical results at or above the NMED Approved Background Level, but below the NMED Residential SSL

Table C.6.1
AOC-1 - DP-64 Soil Analytical Data (October 2006)

Client Sample Identification:	Soil Screening Levels	Basewide Background	DP64-SB06-2			DP64-SB06-17			DP64-SB06-17-a			DP64-SB06-35			DP64-SB07-2			DP64-SB07-2-a		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	F61023-1			F61023-2			F61023-3			F61023-4			F61112-1			F61112-2		
Date Sampled:			10/22/2008			10/22/2008			10/22/2008			10/22/2008			10/22/2008			10/22/2008		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,1-Dichloroethylene	618	NV	1.7	U		1.5	U		1.7	U		2.1	J	J	1.5	U	UJ	1.6	U	UJ
Methylene chloride	199	NV	19.9	B	J	19.9	B	J	44.2	B	J	30.6	B	J	6.0	JB	J	6.0	U	UJ
Toluene	5,570	NV	1.3	U		1.2	U		1.3	U		1.2	U		2.3	J	J	1.2	U	UJ
Semi-Volatile Organic Compounds (SW846 8270C)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
All SVOCs	NV	NV	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	
Explosives (SW846 8330A)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
2,6-Dinitrotoluene	61.2	NV	52	U		50	U		63.7	J		49	U		53	U		47	U	
RCRA Metals Analysis (SW846 6010B/7471A)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Arsenic	3.9	3.7	2.0	U		2.5	J		1.9			2.7	J		2.1	J		2.0	U	
Barium	15,600	169.3	34.2		J	52.3		J	48.9		J	73.9		J	66.8		J	52.8		J
Cadmium	77.9	0.3	0.057	U	UJ	0.062	J	UJ	0.068	J	J	0.23		J	1.6		J	0.51		
Chromium	219	25	2.2		J	3.4		J	4.4		J	9.7		J	4.6		J	4.1		J
Lead	400	10.9	2.6	U	UJ	2.4	U	UJ	3.2	J	J	4.5	J	J	3.3	J	J	2.4	U	UJ
Mercury	7.71	10.8	0.012	U		0.012	U		0.012	U		0.014	U		0.038	J		0.029	J	
Selenium	391	1.4	3.5	J		3.2	J		0.65	U		1.8	U		2.1	J		2.7	J	
Silver	391	1.1	0.068	U		0.063	U		0.063	U		0.069	U		0.12	J	J	0.15	J	J
General Chemistry	%	%	%			%			%			%			%			%		
Solids, Percent (SM19 2540B)	NV	NV	86.3			90.1			91.7			86.7			88.3			91.3		

Notes:

NMED = New Mexico Environment Department
UTL = Upper Tolerance Limit
SVOC = Semi-Volatile Organic Compounds
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
% = percent
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

B = Analyte detected in associated method blank
J = Indicates an estimated result
U = Not detected
ND = Entire analyte list not detected

Client Sample Nomenclature

DP64 = Chemical Agent Disposal Site 64
SB = Soil Boring
a = sample suffix denoting a field duplicate sample
The final digit equals the depth of the sample interval (feet below ground surface)

[1] NMED, December 2009. Technical Background Document for Development of Soil Screening Levels, Revision 5.0
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)

Bold value indicate analytes above NMED Soil Screening Levels (Rev 5.0, December 2009)

Indicates analytical results at or above the NMED Approved Background Level, but below the NMED Residential SSL

Table C.6.1
AOC-1 - DP-64 Soil Analytical Data (October 2006)

Client Sample Identification:	Soil Screening Levels	Basewide Background	DP64-SB07-16			DP64-SB07-33			DP64-SB08-2			DP64-SB08-17			DP64-SB08-34		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	F61083-4			F61083-5			F61024-1			F61024-3			F61024-2		
Date Sampled:			10/22/2008			10/22/2008			10/21/2008			10/21/2008			10/21/2008		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,1-Dichloroethylene	618	NV	1.6	U	UJ	1.5	U		1.5	U		1.8	U		1.4	U	
Methylene chloride	199	NV	6.1	U	UJ	5.7	U		8.1	JB	J	42.8	B	J	14.7	B	J
Toluene	5,570	NV	1.2	U	UJ	1.1	U		1.1	U		1.4	U		1.1	U	
Semi-Volatile Organic Compounds (SW846 8270C)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
All SVOCs	NV	NV	ND	U		ND	U		ND	U		ND	U		ND	U	
Explosives (SW846 8330A)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
2,6-Dinitrotoluene	61.2	NV	43	U		46	U		49	U		47	U		49	U	
RCRA Metals Analysis (SW846 6010B/7471A)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Arsenic	3.9	3.7	1.6			2.8			2.1			2.5	J		0.96	U	
Barium	15,600	169.3	31.9		J	29.9		J	68.6		J	38.0		J	24.9		
Cadmium	77.9	0.3	0.049	U		0.053	U		0.075	J	J	0.076	J	J	0.054	U	UJ
Chromium	219	25	2.6		J	3.3		J	4.7		J	5.0		J	2.5		J
Lead	400	10.9	2.5	J	J	2.7	J	J	4.6	J	J	2.4	U	UJ	1.2	U	UJ
Mercury	7.71	10.8	0.012	U		0.012	U		0.012	U		0.013	U		0.013	U	
Selenium	391	1.4	0.61	U	UJ	0.66	U	UJ	0.64	U		3.0	J		2.1	J	
Silver	391	1.1	0.059	U	UJ	0.064	U	UJ	0.062	U		0.063	U		0.064	U	
General Chemistry	%	%	%			%			%			%			%		
Solids, Percent (SM19 2540B)	NV	NV	96.5			90.0			95.6			91.1			89.8		

Notes:

NMED = New Mexico Environment Department
UTL = Upper Tolerance Limit
SVOC = Semi-Volatile Organic Compounds
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
% = percent
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers
B = Analyte detected in associated method blank
J = Indicates an estimated result
U = Not detected
ND = Entire analyte list not detected
Client Sample Nomenclature
DP64 = Chemical Agent Disposal Site 64
SB = Soil Boring
a = sample suffix denoting a field duplicate sample
The final digit equals the depth of the sample interval (feet below ground surface)

[1] NMED, December 2009. Technical Background Document for Development of Soil Screening Levels, Revision 5.0.
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 5.0, December 2009)
Indicates analytical results at or above the NMED Approved Background Level, but below the NMED Residential SSL

Table C.6.2
AOC-1 - DP-64 Groundwater Analytical Data (November/December 2006)

Client Sample Identification:	Groundwater Screening Levels				LF01-IW1			DP64-MW01			DP64-MW02			DP64-MW03			DP64-MW03-a			DP64-MW04		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels (Dissolved Constituents)[3]	Dissolved Metals in Groundwater UTL[4]	F60986-1			F61113-1			F61113-3			F61082-1			F61082-2			F61082-7		
Date Sampled:					10/21/2008			10/24/2008			10/23/2008			10/23/2008			10/23/2008			10/23/2008		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
sec-Butylbenzene	NV	NV	NV	NV	0.25	U		0.25	U		0.25	U		0.25	U		0.25	U		0.30	J	
Semi-Volatile Organic Compounds (SW846 8270C)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
All SVOCs	NV	NV	NV	NV	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	
Exposives (SW846 8330A)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
All Explosives	NV	NV	NV	NV	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	
RCRA Metals Analysis (USEPA 200.7/245.1)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Arsenic	100	10	10	28.53	**12.0**	J		11	U	UJ	11	U	UJ	11	U	UJ	11	U	UJ	11	U	UJ
Barium	1,000	2,000	30.2	30.13	11.5	J		22.7	J		39.6	J		25.5	J		26.1	J		50.6	J	
Selenium	50	50	25.3	25.26	6.8	U		16.5	J		14.4	J		12.6	J		12.3	J		14.8	J	
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Solids, Total Dissolved (SM19 2540C)	1,000	500[6]	NV	65,956.58	**17,800**			**15,500**			**17,300**			**16,400**			**17,200**			**17,200**		
Nitrogen, Nitrite (USEPA 300/SW846 9056)	NV	1	NV	NV	2.5	U	UJ	2.5	U	UJ	2.5	U	UJ	2.5	U	UJ	2.5	U	UJ	2.5	U	UJ
Nitrogen, Nitrate (USEPA 300/SW846 9056)	10	10	NV	NV	2.2			1.3			2.4			2.7			2.8			1.6		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
RCRA = Resource Conservation & Recovery Act of 1976
µg/L = micrograms per liter
mg/L = milligrams per liter
NV = No Value Established
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers
J = Indicates an estimated result
U = Not detected
ND = All Analytes not detected
Client Sample Nomenclature
LF01 = Former Main Base Landfill
DP64 = Chemical Agent Disposal Site 64
MW = Monitoring Well
a = sample suffix denoting a field duplicate sample

[1] Standards for Groundwater, if 10,000 mg/L Total Dissolved Solids Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView|Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
[6] USEPA Secondary Drinking Water Standard
Bold value indicate analytes above New Mexico Groundwater Quality Standard and/or the USEPA MCL
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Level
Indicates analytical results above the NMED Approved Background Level, but below the New Mexico Groundwater Quality Standard and USEPA MCL

Table C.7.1
AOC-3 - DP-63 East Disposal Pit Excavation Confirmation Soil Results (April 2006)

Client Sample ID:	Soil Screening Levels	DP63EAST-1		DP63EAST-2		DP63E-2		DP63EAST-3		DP63EAST-5		DP63EAST-7		DP63EAST-7 FD	
Lab Sample ID:	NMED	F39911-1		F39911-2		F51519-5		F39911-3		F39911-4		F39911-5		F39911-6	
Date Sampled:	Residential1	4/10/2006		4/10/2006		8/2/2007		4/10/2006		4/10/2006		4/10/2006		4/10/2006	
Sample Depth:		3 ft bgs (sidewall)		3 ft bgs (sidewall)		3 ft bgs (sidewall)		3 ft bgs (sidewall)		3 ft bgs (sidewall)		3 ft bgs (floor)		3 ft bgs (floor)	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Naphthalene	79.5	1.8	U	2.6	U	NA		3.0	U	3.2	U	2.8	J	2.9	U
Semi-Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
2,4-Dinitrotoluene	122	487		8,420		NA		8,340		2,850		274		200	
2,6-Dinitrotoluene	NV	69	U	460		NA		376		70	U	69	U	74	U
Diethyl phthalate	48,900	86	U	93	U	NA		87	U	88	U	87	U	705	
Hexachlorobenzene	3.04	164	J	80.4	J	NA		143	J	35	U	35	U	37	U
N-Nitrosodiphenylamine	993	35	U	118	J	NA		70.3	J	35	U	35	U	37	U
Total Petroleum Hydrocarbons		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
TPH (C10-C22)	NV	5.2	U	14.0		NA		53	U	5.2	U	6.32	J	5.6	U
TPH (>C22-C36)	NV	5.2	U	15.5		NA		130		5.2	U	10.5		5.73	J
Explosives	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
2,4-Dinitrotoluene	122	954		7,280		NA		4,560		2,310		3,410		411	
TAL Metals Analysis	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	77,800	2,220		1,820		2,330		3,190		2,040		1,750		1,360	
Antimony	31.3	0.28	U	1.5	J	0.44	J	1.3	J	0.29	U	2.8	U	3.0	U
Arsenic	3.9	1.1		1.8		0.97		1.1		1.0	J	3.2	U	3.3	U
Barium	15,600	20.1	J	56.8		33.5		51.9		21.0		19.0	J	20.1	J
Beryllium	156	0.40	J	0.37	J	0.14	J	0.46	J	0.35	J	1.7	J	1.7	J
Cadmium	39	0.23	J	27.0		1.9		1.6		2.1		0.32	U	0.33	U
Calcium	NV	189,000		187,000		179,000		71,900		194,000		188,000		184,000	
Chromium	234	2.1		2.3		2.3		3.3		1.8		1.5	J	1.4	J
Cobalt	1,520	0.70	J	0.94	J	0.88	J	1.2	J	0.72	J	0.78	J	0.77	U
Copper	3,130	6.7		**96,000**	E	22.8		38.5		5.6		1.2	J	6.0	J
Iron	23,500	1,840		3,210		2,050		3,000		1,600		1,690		1,240	
Lead	400	1.8	J	105		**2,710**		60.7		2.2	J	6.9	J	7.6	J
Magnesium	NV	1,620		1,900		2,350		2,690		1,870		1,260	J	1,580	J
Manganese	3,590	29.8		51.4		45.2		80.8		30.4		28.3		21.0	
Mercury	6.1	0.0054	U	0.043	J	0.01	U	0.014	J	0.0051	U	0.0056	U	0.0058	U
Nickel	1,560	1.6	J	2.6	J	1.9	J	3.2	J	1.6	J	1.4	J	1.9	J
Potassium	NV	896	J	750	J	1,310		820	J	950	J	417	J	344	J
Selenium	391	3.0	J	5.4	J	0.79	J	1.6	J	3.1	J	4.6	J	3.8	U
Silver	391	0.073	U	3.6		0.071	U	0.073	U	0.074	U	0.74	U	0.77	U
Sodium	NV	592		784		939		1,030		619		366	J	79	U
Vanadium	78.2	5.8		2.3	J	4.6		5.1	J	5.5		4.4	J	3.3	J
Zinc	23,500	36.6		2,670		183		1,330		51.2		88.9		72.1	
General Chemistry		%		%		%		%		%		%		%	
Solids, Percent	NV	95.3		88.8		97.8		93.4		94.0		95.1		87.8	

Notes:

NMED = New Mexico Environment Department
TAL = Target Analyte List
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
E = Exceeds calibration range

Q = Qualifier
U = Not detected
J = Indicates an estimated value (less than the reporting limit but greater than the method detection limit)
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0
[2] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

NV = No Value
FD = Field Duplicate
ft = feet
bgs = below ground surface
NA = Not Analyzed

Table C.7.2
AOC-3 - DP-63 West Excavation Confirmation Soil Results (April 2006/June 2007)

Client Sample ID:	Soil Screening Levels	DP63WEST-1		DP63WEST-2		DP63WEST-3		DP63WEST-3 FD		DP63WEST-4		DP63WEST-9		DP63 WEST-5		DP63 WEST-5D		DP63 WEST-6		DP63 WEST-7	
Lab Sample ID:	NMED Residential[1]	F39911-7		F39911-8		F39911-9		F39911-10		F39911-11		F39911-12		F50146-4		F50146-5		F50146-6		F50146-7	
Date Sampled:		4/10/2006		4/10/2006		4/10/2006		4/10/2006		4/10/2006		4/10/2006		6/7/2007		6/7/2007		6/7/2007		6/7/2007	
Sample Depth:		2 ft bgs (sidewall)		2 ft bgs (sidewall)		2 ft bgs (sidewall)		2 ft bgs (sidewall)		2 ft bgs (sidewall)		3 ft bgs (floor)		2 ft bgs (sidewall)		2 ft bgs (sidewall)		2 ft bgs (sidewall)		4 ft bgs (floor)	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
Volatile Organic Compounds	**mg/kg**	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
All	NV	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Semi-Volatile Organic Compounds	**mg/kg**	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
Benzo(a)anthracene	6.21	39	U	36	U	36.8	J	35	U	38	U	36	U	34	U	35	U	35	U	35	U
Benzo(b)fluoranthene	6.21	39	U	36	U	41.3	J	35	U	38	U	36	U	34	U	35	U	35	U	35	U
Chrysene	615	39	U	36	U	37.1	J	35	U	38	U	36	U	34	U	35	U	35	U	35	U
Diethyl phthalate	48,900	149	J	89	U	88	U	87	U	94	U	89	U	86	U	88	U	281	J	230	J
Fluoranthene	2,290	39	U	36	U	75.8	J	35	U	72.6	J	36	U	34	U	35	U	35	U	35	U
Total Petroleum Hydrocarbons		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
TPH (>C22-C36)	NV	11.8		5.5	U	5.3	U	5.2	U	5.7	U	5.65	J	5.3	U	5.3	U	5.5	U	5.3	U
Explosives	**mg/kg**	**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**		**µg/kg**	
All	NV	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
TAL Metals Analysis	**mg/kg**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
Aluminum	77,800	2,050		584		1,610		1,330		2,600		2,470		2,380		2,630		2,510		2,730	
Arsenic	3.90	3.5	U	3.3	U	3.2	U	3.2	U	3.5	U	3.2	U	1.1		1.4		0.89		0.28	J
Barium	15,600	42.5	J	21.1	J	27.9	J	26.1	J	52.2	J	45.4	J	38.5		43.7		38.6		24.4	
Beryllium	156	1.7	J	1.6	J	1.7	J	1.9	J	1.7	J	1.7	J	0.091	J	0.11	J	0.13	J	0.17	J
Cadmium	39	0.35	U	0.33	U	0.32	U	0.32	U	0.35	U	0.32	U	0.058	J	0.13	J	0.059	J	0.052	U
Calcium	NV	210,000		247,000		205,000		206,000		208,000		195,000		183,000		183,000		190,000		187,000	
Chromium	234	2.3	J	0.88	U	1.0	J	1.1	J	2.2	J	2.1	J	1.6		53.7		1.7		2.1	
Cobalt	1,520	1.4	J	0.77	U	0.74	U	0.74	U	1.1	J	1.1	J	0.78	J	1.2	J	0.96	J	0.94	J
Copper	3,130	55.9		2.9	J	11.1	J	13.0	J	1.2	J	11.4	J	6.0		20.1		3.8		1.2	J
Iron	23,500	2,210		469		1,400		1,340		1,950		2,030		1,480		2,490		1,590		1,890	
Lead	400.00	14.9	J	1.5	U	4.0	J	4.1	J	1.6	U	4.4	J	2.0	J	39.0		1.5	J	1.2	J
Magnesium	NV	6,250		1,560	J	3,980	J	3,920	J	13,600		5,130	J	4,740		4,950		4,590		2,250	
Manganese	3,590	34.7		10.2	J	28.0		24.8		30.2		37.5		25.1		30.3		27.2		27.5	
Mercury	6.11	0.0072	J	0.0091	J	0.013	J	0.0094	J	0.010	J	0.0058	U	0.0069	U	0.0067	U	0.0069	U	0.0070	U
Nickel	1,560	2.6	J	1.3	J	1.3	J	1.4	J	2.6	J	2.2	J	1.8	J	3.0		2.0	J	2.0	J
Potassium	NV	538	J	173	J	407	J	358	J	668	J	583	J	1,060		1,130		1,110		1,130	
Selenium	391	6.6	J	5.1	J	4.5	J	5.4	J	6.5	J	5.5	J	20	U	20	U	22	U	20	U
Silver	391	1.1	J	0.77	U	0.74	U	0.74	U	0.81	U	0.75	U	0.046	U	0.046	U	0.048	U	0.047	U
Sodium	NV	1,450	J	599	J	170	J	813	J	3,780	J	551	J	1,330		1,520		1,550		685	
Thallium	5.16	4.6	U	4.3	U	4.1	U	4.1	U	4.5	U	**5.2**	J	0.48	U	0.48	U	0.48	U	0.48	U
Vanadium	78.20	5.9	J	1.7	J	4.1	J	3.7	J	8.7	J	5.5	J	8.0		35.8		6.7		6.2	
Zinc	23,500	559		178		370		405		7.7	J	147		108		348		43.7		7.8	
General Chemistry		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**		**%**	
Solids, Percent	NV	84.9		91.0		92.9		95.1		86.8		93.1		94.7		94.9		92.1		93.9	

Notes:
NMED = New Mexico Environment Department
TAL = Target Analyte List
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
FD = Field Duplicate
NV = No Value
ft bgs = feet below ground surface

Q = Qualifier
ND = Not Detected, indicates that an entire suite of anlaytes (e.g. explosives) was not detected above the MDL
U = Not detected
J = Indicates an estimated value (less than the reporting limit but greater than the method detection limit)
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

Table C.7.3
AOC-3 - DP-63 North Excavation Confirmation Soil Results (April 2006/June 2007)

Client Sample ID:	Soil Screening Levels	DP63NORTH-1		DP63NORTH-2		DP63NORTH-3		DP63NORTH-4		DP63NORTH-5		DP63NORTH-5 FD		DP63NORTH-6		DP63NORTH-7	
Lab Sample ID:	NMED	F39808-1		F39808-2		F39808-3		F39808-4		F39811-1		F39811-2		F39808-5		F39811-3	
Date Sampled:	Residential[1]	4/5/2006		4/5/2006		4/5/2006		4/5/2006		4/5/2006		4/5/2006		4/5/2006		4/5/2006	
Sample Depth:		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		9 ft bgs (floor)		9 ft bgs (floor)		9 ft bgs (floor)		4.5 ft bgs (sidewall)	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Methylene chloride	182	10.3	J	6.1	U	6.7	U	7.6	J	8.5	J	10.5	J	6.8	U	11.4	J
Naphthalene	79.5	3.4	U	2.5	U	88.5		9.0		2.4	U	2.9	U	2.7	U	2.6	U
Toluene	252	3.4	U	2.5	U	5.3	J	2.9	U	2.4	U	2.9	U	2.7	U	2.6	U
Semi-Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Acenaphthene	3,730	40.9	J	43	U	61.0	J	249		39	U	38	U	39	U	38	U
Anthracene	22,000	97.1	J	43	U	158	J	795		39	U	38	U	39	U	38	U
Benzo(a)anthracene	6.21	163	J	43	U	316		1,450		39	U	38	U	39	U	38	U
Benzo(a)pyrene	0.621	152	J	43	U	305		**1,430**		39	U	38	U	39	U	38	U
Benzo(b)fluoranthene	6.21	172	J	43	U	324		1,550		39	U	38	U	39	U	38	U
Benzo(g,h,i)perylene	NV	115	J	86	U	214		1,020		79	U	76	U	77	U	75	U
Benzo(k)fluoranthene	62.1	69.8	J	43	U	137	J	626		39	U	38	U	39	U	38	U
Chrysene	615	165	J	43	U	304		1,420		39	U	38	U	39	U	38	U
2,4-Dinitrotoluene	122	3,590		86	U	86	U	118	J	79	U	76	U	327		75	U
2,6-Dinitrotoluene	NV	210		86	U	86	U	83	U	79	U	76	U	77	U	75	U
Dibenzo(a,h)anthracene	0.621	72	U	86	U	86	U	237		79	U	76	U	77	U	75	U
Dibenzofuran	142	36	U	43	U	43	U	172	J	39	U	38	U	39	U	38	U
Diethyl phthalate	48,900	90	U	110	U	110	U	2,590		98	U	95	U	2,440		885	
Fluoranthene	2,290	379		43	U	655		3,130		39	U	38	U	39	U	38	U
Fluorene	2,660	37.7	J	43	U	56.3	J	247		39	U	38	U	39	U	38	U
Indeno(1,2,3-cd)pyrene	6.21	118	J	86	U	229		1,090		79	U	76	U	77	U	75	U
2-Methylnaphthalene	NV	36	U	43	U	43	U	61.6	J	39	U	38	U	39	U	38	U
Naphthalene	79.5	36	U	43	U	46.1	J	150	J	39	U	38	U	39	U	38	U
Phenanthrene	1,830	332		43	U	524		2,590		39	U	38	U	39	U	38	U
Pyrene	2,290	304		86	U	542		2,640		79	U	76	U	77	U	75	U
Total Petroleum Hydrocarbons		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
TPH (C10-C22)	NV	6.53	J	6.5	U	6.4	U	184		5.9	U	5.6	U	5.9	U	5.7	U
TPH (>C22-C36)	NV	22.8		6.5	U	6.4	U	368		5.9	U	5.6	U	5.9	U	10.2	
Explosives	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
2,4-Dinitrotoluene	122	322		97	U	99	U	240	U	93	U	100	U	359		98	U
TAL Metals Analysis	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	77,800	1,960		2,020		4,170		1,880		5,030		4,730		2,900		3,870	
Antimony	31.3	0.83	J	0.35	U	3.4	J	1.0	J	0.32	U	0.31	U	0.69	J	1.1	J
Arsenic	3.9	1.0		1.3		1.6		1.8		1.4		1.3		1.6		1.5	
Barium	15,600	137		28.1		70.0		75.6		43.8		38.8		95.7		36.0	
Beryllium	156	0.16	J	0.28	J	0.36	J	0.22	J	0.34	J	0.34	J	0.28	J	0.30	J
Cadmium	39	0.30	J	0.038	U	0.63		0.99		0.13	J	0.089	J	0.21	J	0.062	J
Calcium	NV	215,000		242,000		230,000		235,000		176,000		162,000		182,000		127,000	
Chromium	234	1.7		1.7		4.4		2.7		4.9		4.6		3.2		3.7	
Cobalt	1,520	0.66	J	1.4	J	1.2	J	0.88	J	1.6	J	1.6	J	1.1	J	1.4	J
Copper	3,130	84.3		1.1	J	341		89.1		6.5		4.7		25.7		21.1	
Iron	23,500	1,260		1,470		3,710		1,990		7,610		4,670		2,010		3,130	
Lead	400	25.5		0.18	J	143		75.8		5.0	J	4.6	J	22.7		**3,140**	
Magnesium	NV	2,550		2,480		1,470		3,160		2,960		2,820		1,950		2,540	
Manganese	3,590	29.3		27.9		183		35.3		99.5		73.7		39.5		49.8	
Mercury	6.11	0.013	J	0.0067	U	0.0088	J	0.011	J	0.0064	U	0.0056	U	0.0058	U	0.0055	J
Nickel	1,560	2.0	J	2.4	J	5.6	J	2.6	J	4.1	J	4.0	J	2.7	J	3.3	J
Potassium	NV	691	J	922		742		634		3,050		2,470		765		1,240	
Selenium	391	3.9	J	3.2	J	3.6	J	4.5	J	2.6	J	2.6	J	3.0	J	2.0	J
Silver	391	0.14	J	0.089	U	0.17	J	0.17	J	0.17	J	0.14	J	0.12	J	0.31	J
Sodium	NV	1,080		3,640		979		597	J	1,720		1,420		569	J	514	J
Vanadium	78.2	4.2	J	6.0	J	3.9	J	5.8	J	8.8		8.0		5.6	J	7.6	
Zinc	23,500	93.5		5.0		680		136		36.7		23.0		52.6		20.1	
General Chemistry		%		%		%		%		%		%		%		%	
Solids, Percent	NV	92.3		76.7		77.0		79.9		84.2		87.5		83.7		86.7	

Notes:
NMED = New Mexico Environment Department
TAL = Target Analyte List
UTL = Upper Tolerance Limit
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
ft = feet
bgs = below ground surface
J = Indicates an estimated value (less than reporting limit but greater than the method detection limit)
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)
Q = Qualifier
U = Not detected
NA = Not Analyzed
C = Within linear range

Table C.7.3
AOC-3 - DP-63 North Excavation Confirmation Soil Results (April 2006/June 2007)

Client Sample ID:	Soil Screening Levels	DP63-NORTH 7		DP63NORTH-8		DP63NORTH-9		DP63NORTH-10		DP63 NORTH-11		DP63 NORTH-12		DP63 NORTH-13	
Lab Sample ID:	NMED	F51519-6		F39811-4		F39811-5		F39811-6		F50146-1		F50146-2		F50146-3	
Date Sampled:	Residential[1]	8/2/2007		4/5/2006		4/5/2006		4/5/2006		6/7/2007		6/7/2007		6/7/2007	
Sample Depth:		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		4.5 ft bgs (sidewall)		6 ft bgs (sidewall)		6 ft bgs (floor)		6 ft bgs (sidewall)	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Methylene chloride	182	NA		7.3	J	9.8	J	9.3	J	6.3	J	6.3	J	5.9	U
Naphthalene	79.5	NA		2.4	U	2.4	U	2.4	U	2.4	U	2.2	U	2.3	U
Toluene	252	NA		2.4	U	2.4	U	2.4	U	2.4	U	2.2	U	2.3	U
Semi-Volatile Organic Compounds	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Acenaphthene	3,730	NA		37	U	37	U	37	U	35	U	37	U	35	U
Anthracene	22,000	NA		37	U	37	U	37	U	35	U	37	U	35	U
Benzo(a)anthracene	6.21	NA		37	U	37	U	37	U	35	U	37	U	35	U
Benzo(a)pyrene	0.621	NA		37	U	37	U	37	U	35	U	37	U	35	U
Benzo(b)fluoranthene	6.21	NA		37	U	37	U	37	U	35	U	37	U	35	U
Benzo(g,h,i)perylene	NV	NA		75	U	74	U	74	U	71	U	73	U	69	U
Benzo(k)fluoranthene	62.1	NA		37	U	37	U	37	U	35	U	37	U	35	U
Chrysene	615	NA		37	U	37	U	37	U	35	U	37	U	35	U
2,4-Dinitrotoluene	122	NA		75	U	74	U	74	U	71	U	73	U	69	U
2,6-Dinitrotoluene	NV	NA		75	U	74	U	74	U	71	U	73	U	69	U
Dibenzo(a,h)anthracene	0.621	NA		75	U	74	U	74	U	71	U	73	U	69	U
Dibenzofuran	142	NA		37	U	37	U	37	U	35	U	37	U	35	U
Diethyl phthalate	48,900	NA		334	J	6,140		93	U	88	U	316	J	87	U
Fluoranthene	2,290	NA		37	U	37	U	37	U	35	U	72.8	J	35	U
Fluorene	2,660	NA		37	U	37	U	37	U	35	U	37	U	35	U
Indeno(1,2,3-cd)pyrene	6.21	NA		75	U	74	U	74	U	71	U	73	U	69	U
2-Methylnaphthalene	NV	NA		37	U	37	U	37	U	35	U	37	U	35	U
Naphthalene	79.5	NA		37	U	37	U	37	U	35	U	37	U	35	U
Phenanthrene	1,830	NA		37	U	37	U	37	U	35	U	65.3	J	35	U
Pyrene	2,290	NA		75	U	74	U	74	U	71	U	73	U	69	U
Total Petroleum Hydrocarbons		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
TPH (C10-C22)	NV	NA		5.6	U	5.6	U	5.6	U	5.4	U	11.4		5.3	U
TPH (>C22-C36)	NV	NA		5.6	U	8.21	J	5.6	U	5.4	U	40.1		5.3	U
Explosives	mg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
2,4-Dinitrotoluene	122	NA		97	U	96	U	96	U	88	U	84	U	71	U
TAL Metals Analysis	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	77,800	2,760		4,150		3,340		3,930		3,290		2,050		4,200	
Antimony	31.3	0.49	J	0.30	U	0.29	U	0.31	U	0.28	U	0.29	U	0.27	U
Arsenic	3.9	1.5		1.1		0.95		1.1		0.83		0.77		0.79	
Barium	15,600	39.7		34.4		27.6		35.4		25.6		21.6		33.2	
Beryllium	156	0.19	J	0.30	J	0.29	J	0.31	J	0.16	J	0.086	J	0.21	J
Cadmium	39	0.34		0.037	J	0.050	J	0.034	U	0.052	U	0.055	U	0.089	J
Calcium	NV	166,000		145,000		137,000		153,000		136,000		189,000		147,000	
Chromium	234	4.8		3.9		3.3		3.6		2.4		1.6		3.4	
Cobalt	1,520	1.1	J	1.4	J	1.1	J	1.3	J	1.1	J	1.1	J	1.2	J
Copper	3,130	133		1.7	J	7.4		1.6	J	1.9		3.6		2.4	
Iron	23,500	2,870		3,300		2,650		3,150		2,390		1,390		3,020	
Lead	400	24.7		2.2	J	2.4	J	1.5	J	1.4	J	1.6	J	2.0	J
Magnesium	NV	2,450		3,030		2,160		2,770		1,610		1,730		2,530	
Manganese	3,590	48.0		56.7		49.5		59.1		39.4		23.9		54.2	
Mercury	6.11	0.044	J	0.0059	U	0.0061	U	0.0057	U	0.0069	U	0.0071	U	0.0065	U
Nickel	1,560	2.9		3.3	J	2.6	J	3.3	J	2.4		1.9	J	2.9	
Potassium	NV	1,810		1,490		1,650		1,340		1,390		1,010		1,560	
Selenium	391	1.7	J	2.3	J	2.1	J	2.2	J	20	U	22	U	20	U
Silver	391	0.074	U	0.13	J	0.076	U	0.080	U	0.047	U	0.049	U	0.046	U
Sodium	NV	1,080		950		436	J	1,030		1,030		991		844	
Vanadium	78.2	5.6		8.6		5.9		6.9		6.6		4.8		7.3	
Zinc	23,500	422	C	10.6		12.3		10.1		6.9		7.9		9.3	
General Chemistry		%		%		%		%		%		%		%	
Solids, Percent	NV	92.7		87.4		88.3		88.0		93.4		90.7		95.7	

Notes:
NMED = New Mexico Environment Department
TAL = Target Analyte List
UTL = Upper Tolerance Limit
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value

ft = feet
bgs = below ground surface
J = Indicates an estimated value (less than reporting limit but greater than the method detection limit)
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

Q = Qualifier
U = Not detected
NA = Not Analyzed
C = Within linear range

Table C.8.1
AOC-4 - Excavation Sidewall Stockpile Soil Analytical Results (October 2006)

Client Sample ID:	Soil Screening Levels	WPOL-SW20	WPOL-SW21	WPOL-SW22	WPOL-SW23A	WPOL-SW23B	WPOL-SW23C
Lab Sample ID:	NMED	680-20904-6	680-20904-7	680-20904-8	680-21196-1	680-21196-2	680-21196-3
Date Sampled:	Residential[1]	10/5/2006	10/5/2006	10/5/2006	10/17/2006	10/17/2006	10/17/2006
Analyte		Result	Result	Result	Result	Result	Result
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
n-Butylbenzene	62.1	9100	ND	340 J	ND	ND	ND
sec-Butylbenzene	60.6	7900	1.7 J	470 J	ND	ND	ND
1-Chlorohexane	NV	ND	ND	ND	ND	ND	ND
Carbon disulfide	460	ND	3.5 J	ND	ND	ND	ND
Ethylbenzene	128	2600	ND	ND	ND	ND	ND
2-Hexanone	NV	ND	ND	ND	ND	ND	ND
Isopropylbenzene	271	2000	ND	ND	ND	ND	ND
p-Isopropyltoluene	NV	6500	ND	ND	ND	ND	ND
Methylene Chloride	182	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND
N-Propylbenzene	62.1	3400	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	58	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	4100	ND	ND	ND	ND	ND
m-Xylene & p-Xylene	82	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Benzo[g,h,i]perylene	NV	ND	ND	ND	ND	ND	ND
Fluorene	2660	170 J	ND	ND	ND	ND	ND
2-Methylnaphthalene	NV	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TPH-GRO (C6-C10)	NV	1000	0.44	34	ND	ND	ND
TPH-DRO (C10-C28)	NV	3900	4.5 J	340	20	3.7 J	ND
TPH-ORO (>C20-C36)	NV	ND	ND	ND	ND	ND	ND
General Chemistry	%	%	%	%	%	%	%
Percent Moisture	NV	34	29	30	24	23	24
Percent Solids	NV	66	71	70	76	77	76

Notes:

NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
ND = Not detected
J = Indicates an estimated value

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.8.1
AOC-4 - Excavation Sidewall Stockpile Soil Analytical Results (October 2006)

Client Sample ID:	Soil Screening Levels	WPOL-SW24	WPOL-SW25	WPOL-SW26	WPOL-SW27	WPOL-SW28	WPOL-SW29
Lab Sample ID:	NMED	680-20904-9	680-21081-1	680-21081-2	680-21081-3	680-21081-4	680-21161-1
Date Sampled:	Residential[1]	10/5/2006	10/12/2006	10/12/2006	10/12/2006	10/12/2006	10/16/2006
Analyte		Result	Result	Result	Result	Result	Result
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
n-Butylbenzene	62.1	ND	ND	21000	9200	2600	ND
sec-Butylbenzene	60.6	ND	ND	10000	4800	1600	ND
1-Chlorohexane	NV	ND	ND	ND	ND	160 J	ND
Carbon disulfide	460	ND	ND	ND	ND	ND	ND
Ethylbenzene	128	ND	ND	4900	2100	330	ND
2-Hexanone	NV	ND	ND	ND	ND	1000 J	ND
Isopropylbenzene	271	ND	ND	3500	1500	310	ND
p-Isopropyltoluene	NV	ND	ND	9800	5200	1500	ND
Methylene Chloride	182	ND	ND	ND	ND	110 J	ND
Naphthalene	79.5	ND	ND	17000	7600	3700	ND
N-Propylbenzene	62.1	ND	ND	6900	3000	620	ND
1,2,4-Trimethylbenzene	58	ND	ND	48000	22000	2200	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	8200	5000	690	ND
m-Xylene & p-Xylene	82	ND	ND	2000 J	860 J	110 J	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Benzo[g,h,i]perylene	NV	ND	29 J	ND	ND	ND	ND
Fluorene	2660	ND	ND	ND	100 J	ND	ND
2-Methylnaphthalene	NV	ND	ND	9000	6700	2800	ND
Naphthalene	79.5	ND	ND	4000 J	2600	1100	ND
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TPH-GRO (C6-C10)	NV	0.14 J	ND	830	700	620	ND
TPH-DRO (C10-C28)	NV	2.8 J	20	2800	1800	660	ND
TPH-ORO (>C20-C36)	NV	ND	70	ND	ND	ND	ND
General Chemistry	%	%	%	%	%	%	%
Percent Moisture	NV	27	16	31	29	30	30
Percent Solids	NV	73	84	69	71	70	70

Notes:
NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
ND = Not detected
J = Indicates an estimated value

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.8.1
AOC-4 - Excavation Sidewall Stockpile Soil Analytical Results (October 2006)

Client Sample ID:	Soil Screening Levels	WPOL-SW30	WPOL-SW31	WPOL-STOCKPILE
Lab Sample ID:	NMED	680-21161-2	680-21161-3	680-20904-11
Date Sampled:	Residential[1]	10/16/2006	10/16/2006	10/5/2006
Analyte		Result	Result	Result
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg
n-Butylbenzene	62.1	ND	ND	820
sec-Butylbenzene	60.6	ND	ND	1000
1-Chlorohexane	NV	ND	ND	ND
Carbon disulfide	460	ND	ND	ND
Ethylbenzene	128	ND	ND	200 J
2-Hexanone	NV	ND	ND	ND
Isopropylbenzene	271	ND	ND	380 J
p-Isopropyltoluene	NV	ND	ND	ND
Methylene Chloride	182	ND	ND	ND
Naphthalene	79.5	ND	ND	ND
N-Propylbenzene	62.1	ND	ND	710 J
1,2,4-Trimethylbenzene	58	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	330 J
m-Xylene & p-Xylene	82	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg
Benzo[g,h,i]perylene	NV	ND	ND	ND
Fluorene	2660	ND	ND	ND
2-Methylnaphthalene	NV	ND	ND	ND
Naphthalene	79.5	ND	ND	ND
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg
TPH-GRO (C6-C10)	NV	ND	ND	85
TPH-DRO (C10-C28)	NV	ND	ND	260
TPH-ORO (>C20-C36)	NV	ND	ND	ND
General Chemistry	%	%	%	%
Percent Moisture	NV	28	27	28
Percent Solids	NV	72	73	72

Notes:

NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
ND = Not detected
J = Indicates an estimated value

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.9.1
AOC-C - SS-66 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS66-DP01-5		SS66-DP01-5-a Field Duplicate		SS66-DP02-5		SS66-DP03-5		SS66-DP04-5	
Lab Sample ID:	NMED	F48695-1		F48695-3		F51969-1		F51969-2		F51969-3	
Date Sampled:	Residential[1]	4/13/2007		4/13/2007		8/20/2007		8/20/2007		8/20/2007	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
	µg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Volatile Organic Compounds											
Acetone	28,100,000	58	U	59	U	53	U	54	U	49	U
Acetonitrile	NV	58	U	59	U	53	U	54	U	49	U
Acrolein	206	29	U	29	U	27	U	27	U	25	U
Acrylonitrile	4,270	29	U	29	U	27	U	27	U	25	U
Allyl chloride	NV	5.8	U	29	U	27	U	27	U	25	U
Benzene	10,300	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Benzyl Chloride	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Bromobenzene	37,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Bromochloromethane	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Bromodichloromethane	14,400	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Bromoform	621,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
n-Butylbenzene	62,100	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
sec-Butylbenzene	60,600	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
tert-Butylbenzene	106,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Chlorobenzene	194,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Chloroethane	63,300	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Chloroform	4,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1-Chlorohexane	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
o-Chlorotoluene	202,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
p-Chlorotoluene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
2-Chloroethyl vinyl ether	NV	29	U	29	U	27	U	27	U	25	U
Carbon disulfide	460,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Carbon tetrachloride	3,470	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1-Dichloroethane	1,400,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1-Dichloroethylene	206,000	5.8	U	5.9	U	3.2	J	5.4	U	4.9	U
1,1-Dichloropropene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2-Dibromo-3-chloropropane	1,840	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2-Dibromoethane	504	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2-Dichloroethane	6,040	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2-Dichloropropane	6,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,3-Dichloropropane	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
2,2-Dichloropropane	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Dibromochloromethane	14,800	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Dichlorodifluoromethane	161,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
cis-1,2-Dichloroethylene	76,500	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
cis-1,3-Dichloropropene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
cis-1,4-Dichloro-2-Butene	NV	29	U	29	U	27	U	27	U	25	U
m-Dichlorobenzene	32,600	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
o-Dichlorobenzene	37,400	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
p-Dichlorobenzene	39,500	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
trans-1,2-Dichloroethylene	112,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
trans-1,3-Dichloropropene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Ethylbenzene	128,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Ethyl methacrylate	52,700	29	U	29	U	27	U	27	U	25	U
Freon 113	3,280,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
2-Hexanone	NV	29	U	29	U	27	U	27	U	25	U
Hexachlorobutadiene	12,200	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Hexane	38,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Isopropylbenzene	271,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
p-Isopropyltoluene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
4-Methyl-2-pentanone	NV	29	U	29	U	27	U	27	U	25	U
Methacrylonitrile	3,840	29	U	29	U	27	U	27	U	25	U
Methyl bromide	8,510	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U

Table C.9.1
AOC-C - SS-66 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS66-DP01-5		SS66-DP01-5-a Field Duplicate		SS66-DP02-5		SS66-DP03-5		SS66-DP04-5	
Lab Sample ID:	NMED	F48695-1		F48695-3		F51969-1		F51969-2		F51969-3	
Date Sampled:	Residential[1]	4/13/2007		4/13/2007		8/20/2007		8/20/2007		8/20/2007	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q	Result[2]	Q
Methyl chloride	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Methyl iodide	NV	12	U	12	U	11	U	11	U	9.8	U
Methyl methacrylate	2,920,000	29	U	29	U	27	U	27	U	25	U
Methylene bromide	179,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Methylene chloride	182,000	12	U	12	U	9.5	J	9.8	J	6.1	J
Methyl ethyl ketone	31,800,000	29	U	29	U	27	U	27	U	25	U
Methyl Tert Butyl Ether	388,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Naphthalene	79,500	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Pentachloroethane	NV	29	U	29	U	27	U	27	U	25	U
Propionitrile	NV	58	U	59	U	53	U	54	U	49	U
n-Propylbenzene	62,100	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Styrene	100,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1,1,2-Tetrachloroethane	43,200	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1,1-Trichloroethane	563,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1,2,2-Tetrachloroethane	5,550	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,1,2-Trichloroethane	11,900	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2,3-Trichlorobenzene	NV	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2,3-Trichloropropane	86	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2,4-Trichlorobenzene	69,300	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,2,4-Trimethylbenzene	58,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
1,3,5-Trimethylbenzene	24,800	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Tetrachloroethylene	12,500	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Toluene	252,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Trichloroethylene	638	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Trichlorofluoromethane	588,000	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Trans-1,4-Dichloro-2-Butene	NV	29	U	29	U	27	U	27	U	25	U
Vinyl chloride	2,250	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Vinyl Acetate	1,070,000	29	U	29	U	27	U	27	U	25	U
m,p-Xylene	82,000	12	U	12	U	11	U	11	U	9.8	U
o-Xylene	99,500	5.8	U	5.9	U	5.3	U	5.4	U	4.9	U
Semi-Volatile Organic Compounds	µg/kg	µg/kg		µg/kg		µg/kg		µg/kg		µg/kg	
Benzoic acid	NV	1,100	U	1,100	U	940	U	960	U	940	U
2-Chlorophenol	166,000	220	U	220	U	190	U	190	U	190	U
4-Chloro-3-methyl phenol	NV	220	U	220	U	190	U	190	U	190	U
2,4-Dichlorophenol	183,000	220	U	220	U	190	U	190	U	190	U
2,4-Dimethylphenol	1,220,000	220	U	220	U	190	U	960	U	190	U
2,4-Dinitrophenol	122,000	1,100	U	1,100	U	940	U	390	U	940	U
4,6-Dinitro-o-cresol	6,110	430	U	430	U	380	U	190	U	380	U
2-Methylphenol	NV	220	U	220	U	190	U	190	U	190	U
3&4-Methylphenol	NV	220	U	220	U	190	U	190	U	190	U
2-Nitrophenol	NV	220	U	220	U	190	U	960	U	190	U
4-Nitrophenol	NV	1,100	U	1,100	U	940	U	960	U	940	U
Pentachlorophenol	29,800	1,100	U	1,100	U	940	U	190	U	940	U
Phenol	18,300,000	220	U	220	U	190	U	190	U	190	U
2,4,5-Trichlorophenol	6,110,000	220	U	220	U	190	U	190	U	190	U
2,4,6-Trichlorophenol	6,110	220	U	220	U	190	U	190	U	190	U
Acenaphthene	3,730,000	220	U	220	U	190	U	190	U	190	U
Acenaphthylene	NV	220	U	220	U	190	U	190	U	190	U
Anthracene	22,000,000	220	U	220	U	190	U	190	U	190	U
Benzidine	21	2,200	U	2,200	U	1,900	U	1,900	U	1,900	U
Benzo(a)anthracene	6,210	220	U	220	U	190	U	190	U	190	U
Benzo(a)pyrene	621	220	U	220	U	190	U	190	U	190	U
Benzo(b)fluoranthene	6,210	220	U	220	U	190	U	190	U	190	U

Table C.9.1
AOC-C - SS-66 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS66-DP01-5		SS66-DP01-5-a Field Duplicate		SS66-DP02-5		SS66-DP03-5		SS66-DP04-5	
Lab Sample ID:	NMED	F48695-1		F48695-3		F51969-1		F51969-2		F51969-3	
Date Sampled:	Residential[1]	4/13/2007		4/13/2007		8/20/2007		8/20/2007		8/20/2007	
Analyte		**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**
Benzo(g,h,i)perylene	NV	220	U	220	U	190	U	190	U	190	U
Benzo(k)fluoranthene	62,100	220	U	220	U	190	U	190	U	190	U
4-Bromophenyl phenyl ether	NV	220	U	220	U	190	U	190	U	190	U
Butyl benzyl phthalate	NV	430	U	440	U	380	U	390	U	380	U
Benzyl Alcohol	NV	220	U	220	U	190	U	190	U	190	U
2-Chloronaphthalene	3,990,000	220	U	220	U	190	U	190	U	190	U
4-Chloroaniline	NV	430	U	440	U	190	U	190	U	190	U
Chrysene	615,000	220	U	220	U	190	U	190	U	190	U
bis(2-Chloroethoxy)methane	NV	220	U	220	U	190	U	190	U	190	U
bis(2-Chloroethyl)ether	2,440	220	U	220	U	190	U	190	U	190	U
bis(2-Chloroisopropyl)ether	38,700	220	U	220	U	190	U	190	U	190	U
4-Chlorophenyl phenyl ether	NV	220	U	220	U	190	U	190	U	190	U
1,2-Dichlorobenzene	37,400	220	U	220	U	190	U	190	U	190	U
1,3-Dichlorobenzene	32,600	220	U	220	U	190	U	190	U	190	U
1,4-Dichlorobenzene	39,500	220	U	220	U	190	U	190	U	190	U
2,4-Dinitrotoluene	122,000	220	U	220	U	190	U	190	U	190	U
2,6-Dinitrotoluene	NV	220	U	220	U	190	U	190	U	190	U
3,3'-Dichlorobenzidine	10,800	220	U	440	U	380	U	390	U	380	U
Dibenzo(a,h)anthracene	621	220	U	220	U	190	U	190	U	190	U
Dibenzofuran	142,000	220	U	220	U	190	U	190	U	190	U
Di-n-butyl phthalate	6,110,000	430	U	440	U	380	U	390	U	380	U
Di-n-octyl phthalate	NV	430	U	440	U	380	U	390	U	380	U
Diethyl phthalate	48,900,000	430	U	440	U	380	U	390	U	380	U
Dimethyl phthalate	100,000,000	430	U	440	U	380	U	390	U	380	U
bis(2-Ethylhexyl)phthalate	347,000	430	U	440	U	380	U	390	U	380	U
Fluoranthene	2,290,000	220	U	220	U	190	U	190	U	190	U
Fluorene	2,660,000	220	U	220	U	190	U	190	U	190	U
Hexachlorobenzene	3,040	220	U	220	U	190	U	190	U	190	U
Hexachlorobutadiene	12,200	220	U	220	U	190	U	190	U	190	U
Hexachlorocyclopentadiene	366,000	220	U	220	U	190	U	190	U	190	U
Hexachloroethane	61,100	220	U	220	U	190	U	190	U	190	U
Indeno(1,2,3-cd)pyrene	6,210	220	U	220	U	190	U	190	U	190	U
Isophorone	5,120,000	220	U	220	U	190	U	190	U	190	U
2-Methylnaphthalene	NV	220	U	220	U	190	U	190	U	190	U
2-Nitroaniline	NV	430	U	440	U	380	U	390	U	380	U
3-Nitroaniline	NV	430	U	440	U	380	U	390	U	380	U
4-Nitroaniline	NV	430	U	440	U	380	U	390	U	380	U
Naphthalene	79,500	220	U	220	U	190	U	190	U	190	U
Nitrobenzene	22,800	220	U	220		190	U	190	U	190	U
N-Nitroso-di-n-propylamine	NV	220	U	220		190	U	190	U	190	U
N-Nitrosodiphenylamine	993,000	220	U	220	U	190	U	190	U	190	U
Phenanthrene	1,830,000	220	U	220	U	190	U	190	U	190	U
Pyrene	2,290,000	220	U	220	U	190	U	190	U	190	U
1,2,4-Trichlorobenzene	69,300	220	U	220	U	190	U	190	U	190	U
Polychlorinated Biphenyls	**mg/kg**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
Aroclor 1016	3.93	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1221	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1232	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1242	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1248	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1254	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U
Aroclor 1260	1.12	0.021	U	0.022	U	0.019	U	0.019	U	0.018	U

Table C.9.1
AOC-C - SS-66 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS66-DP01-5		SS66-DP01-5-a Field Duplicate		SS66-DP02-5		SS66-DP03-5		SS66-DP04-5	
Lab Sample ID:	NMED	F48695-1		F48695-3		F51969-1		F51969-2		F51969-3	
Date Sampled:	Residential[1]	4/13/2007		4/13/2007		8/20/2007		8/20/2007		8/20/2007	
Analyte		**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
TPH-GRO (C6-C10)	NV	7.5	U	8.0	U	5.7	U	6.1	U	5.7	U
TPH-DRO (C10-C22)	NV	11	U	11	U	9.2	U	9.8	U	9.2	U
TPH-ORO (> C22-C36)	NV	11	U	7.81	J	9.2	U	9.8	U	9.2	U
TPH-Total	800	<29.5		<26.8		<24.1		<25.7		<24.1	
TAL Metals Analysis	**mg/kg**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
Aluminum	77,800	6,310		4,770		2,300		3,250		5,710	
Antimony	31.3	0.35	U	0.35	U	0.21	U	0.21	U	0.22	U
Arsenic	3.9	2.0		1.3		0.93		1.2		1.8	
Barium	15,600	52.9		59.9		35.6		31.7		75.7	
Beryllium	156	0.26	J	0.15	J	0.11	U	0.21	J	0.38	J
Cadmium	39	1.5		0.11	J	0.15	J	0.16	J	0.13	J
Calcium	NV	199,000		210,000		205,000		197,000		143,000	
Chromium	234	15.5		2.8		1.3		2		3.7	
Cobalt	1,520	2.6	J	1.5	J	0.68	J	0.93	J	1.8	J
Copper	3,130	19.7		4.5		2.4		2.1		3.9	
Iron	23,500	6,810		3,200		1,290		1,910		3,850	
Lead	400	31.8		0.90	J	0.4	J	0.88	J	18.9	
Magnesium	NV	6,550		4,820		1,430		1,440		2,560	
Manganese	3,590	127		65.4		29.5		43.2		81.3	
Mercury	6.11	0.0074	U	0.014	J	0.012	U	0.011	U	0.011	U
Nickel	1,560	7.1		3.0		1.4	J	2.0	J	3.8	
Potassium	NV	1,850		1,400		1,320		1,660		2,400	
Selenium	391	0.13	U	0.13	U	0.99	J	1.0	J	0.83	J
Silver	391	0.092	J	0.059	J	0.077	U	0.079	U	0.079	U
Sodium	NV	589	J	446	J	419	J	385	J	381	J
Thallium	5.16	0.60	U	0.60	U	2.50	U	2.60	U	0.64	U
Vanadium	78.2	9.6		7.6		4.0		5.2		8.9	
Zinc	23,500	137		10.7		5.8		8.0		17.2	
Cyanide, Total	1,220	NA		NA		0.068	U	0.068	U	0.067	U

Notes:
NA = Not Applicable (or not
NMED = New Mexico Environment Department
TAL = Target Analyte List
TPH = Total Petroleum Hydrocarbon
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ORO = Oil Range Organics
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
Q = Qualifier
U = Not detected
J = Indicates an estimated value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] If results are not detected (U) then the value is set at the Reporting Limit (RL)
Bold value indicates analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.9.2
AOC-C - SS-66 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS66-DP01		SS66-DP02	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48808-1 & F52044-3		F52073-1	
Date Sampled:			4/15/2007		8/23/2007	
Analyte			Result[2]	Q	Result[2]	Q
	µg/L	µg/L	µg/L		µg/L	
Volatile Organic Compounds						
Acetone	NV	NV	25	U	250	U
Acetonitrile	NV	NV	20	U	200	U
Acrolein	NV	NV	20	U	200	U
Acrylonitrile	NV	NV	10	U	100	U
Allyl chloride	NV	NV	10	U	100	U
Benzene	10	5	1.0	U	10	U
Benzyl Chloride	NV	NV	1.0	U	20	U
Bromobenzene	NV	NV	1.0	U	10	U
Bromochloromethane	NV	NV	1.0	U	10	U
Bromodichloromethane	NV	NV	1.0	U	10	U
Bromoform	NV	NV	1.0	U	10	U
n-Butylbenzene	NV	NV	1.0	U	10	U
sec-Butylbenzene	NV	NV	1.0	U	5.2	J
tert-Butylbenzene	NV	NV	1.0	U	4.9	J
Chlorobenzene	NV	100	1.0	U	10	U
Chloroethane	NV	NV	2.0	U	20	U
Chloroform	100	NV	1.0	U	5.4	JB
1-Chlorohexane	NV	NV	2.0	U	20	U
o-Chlorotoluene	NV	NV	1.0	U	10	U
p-Chlorotoluene	NV	NV	1.0	U	10	U
2-Chloroethyl vinyl ether	NV	NV	5.0	U	50	U
Carbon disulfide	NV	NV	2.0	U	20	U
Carbon tetrachloride	10	5	1.0	U	10	U
1,1-Dichloroethane	25	NV	1.0	U	10	U
1,1-Dichloroethylene	5	7	1.0	U	10	U
1,1-Dichloropropene	NV	NV	1.0	U	10	U
1,2-Dibromo-3-chloropropane	NV	0.2	2.0	U	20	U
1,2-Dibromoethane	0.1	0.05	1.0	U	10	U
1,2-Dichloroethane	10	5	1.0	U	10	U
1,2-Dichloropropane	NV	5	1.0	U	10	U
1,3-Dichloropropane	NV	NV	1.0	U	10	U
2,2-Dichloropropane	NV	NV	1.0	U	10	U
Dibromochloromethane	NV	NV	1.0	U	10	U
Dichlorodifluoromethane	NV	NV	1.0	U	20	U
cis-1,2-Dichloroethylene	NV	70	1.0	U	10	U
cis-1,3-Dichloropropene	NV	NV	1.0	U	10	U
cis-1,4-Dichloro-2-Butene	NV	NV	1.0	U	100	U
m-Dichlorobenzene	NV	NV	10	U	10	U
o-Dichlorobenzene	NV	600	1.0	U	10	U
p-Dichlorobenzene	NV	75	1.0	U	10	U
trans-1,2-Dichloroethylene	NV	100	1.0	U	10	U
trans-1,3-Dichloropropene	NV	NV	1.0	U	10	U
Ethylbenzene	750	700	1.0	U	10	U
Ethyl methacrylate	NV	NV	5.0	U	50	U
Freon 113	NV	NV	1.0	U	10	U
2-Hexanone	NV	NV	5.0	U	100	U
Hexachlorobutadiene	NV	NV	2.0	U	20	U

Table C.9.2
AOC-C - SS-66 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS66-DP01		SS66-DP02	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48808-1 & F52044-3		F52073-1	
Date Sampled:			4/15/2007		8/23/2007	
Analyte			Result[2]	Q	Result[2]	Q
Hexane	NV	NV	2.0	U	20	U
Isopropylbenzene	NV	NV	1.0	U	468	
p-Isopropyltoluene	NV	NV	1.0	U	10.0	U
4-Methyl-2-pentanone	NV	NV	5.0	U	50.0	U
Methacrylonitrile	NV	NV	20	U	200	U
Methyl bromide	NV	NV	2	U	20	U
Methyl chloride	NV	NV	2	U	20	U
Methyl iodide	NV	NV	5	U	50	U
Methyl methacrylate	NV	NV	5	U	50	U
Methylene bromide	NV	NV	2	U	20	U
Methylene chloride	100	5	5	U	17.3	JB
Methyl ethyl ketone	NV	NV	5	U	50	U
Methyl Tert Butyl Ether	NV	NV	1.0	U	10	U
Naphthalene	30	NV	2.0	U	6.5	JB
Pentachloroethane	NV	NV	10	U	100	U
Propionitrile	NV	NV	20	U	200	U
n-Propylbenzene	NV	NV	1.0	U	13.4	
Styrene	NV	100	1.0	U	10	U
1,1,1,2-Tetrachloroethane	NV	NV	1.0	U	10	U
1,1,1-Trichloroethane	60	200	1.0	U	10	U
1,1,2,2-Tetrachloroethane	10	NV	1.0	U	10	U
1,1,2-Trichloroethane	10	5	1.0	U	10	U
1,2,3-Trichlorobenzene	NV	NV	1.0	U	10	U
1,2,3-Trichloropropane	NV	NV	2.0	U	20	U
1,2,4-Trichlorobenzene	NV	70	1.0	U	10	U
1,2,4-Trimethylbenzene	NV	NV	2.0	U	20	U
1,3,5-Trimethylbenzene	NV	NV	2.0	U	20	U
Tetrachloroethylene	20	5	1.0	U	10	U
Toluene	750	1,000	1.0	U	10	U
Trichloroethylene	100	5	1.0	U	10	U
Trichlorofluoromethane	NV	NV	2.0	U	20	U
Trans-1,4-Dichloro-2-Butene	NV	NV	10	U	100	U
Vinyl chloride	1	2	1.0	U	10	U
Vinyl Acetate	NV	NV	10	U	100	U
m,p-Xylene	620	10,000	2.0	U	20	U
o-Xylene	620	10,000	1.0	U	10	U
Semi-Volatile Organic Compounds		µg/L	µg/L	Q	µg/L	Q
Benzoic Acid	NV	NV	25	U	28	U
2-Chlorophenol	NV	NV	5.0	U	5.6	U
4-Chloro-3-methyl phenol	NV	NV	5.0	U	5.6	U
2,4-Dichlorophenol	NV	NV	5.0	U	5.6	U
2,4-Dimethylphenol	NV	NV	5.0	U	5.6	U
2,4-Dinitrophenol	NV	NV	25	U	28	U
4,6-Dinitro-o-cresol	NV	NV	10	U	11	U
2-Methylphenol	NV	NV	5.0	U	5.6	U
3&4-Methylphenol	NV	NV	5.0	U	5.6	U
2-Nitrophenol	NV	NV	5.0	U	5.6	U

Table C.9.2
AOC-C - SS-66 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS66-DP01		SS66-DP02	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48808-1 & F52044-3		F52073-1	
Date Sampled:			4/15/2007		8/23/2007	
Analyte			Result[2]	Q	Result[2]	Q
4-Nitrophenol	NV	NV	25	U	28	U
Pentachlorophenol	NV	NV	25	U	28	U
Phenol	NV	NV	5.0	U	5.6	U
2,4,5-Trichlorophenol	NV	NV	5.0	U	5.6	U
2,4,6-Trichlorophenol	NV	NV	5.0	U	5.6	U
Acenaphthene	NV	NV	5.0	U	5.6	U
Acenaphthylene	NV	NV	5.0	U	5.6	U
Anthracene	NV	NV	5.0	U	5.6	U
Benzidine	NV	NV	25	U	28	U
Benzo(a)anthracene	NV	NV	5.0	U	5.6	U
Benzo(a)pyrene	0.7	0.2	5.0	U	5.6	U
Benzo(b)fluoranthene	NV	NV	5.0	U	5.6	U
Benzo(g,h,i)perylene	NV	NV	5.0	U	5.6	U
Benzo(k)fluoranthene	NV	NV	5.0	U	5.6	U
4-Bromophenyl phenyl ether	NV	NV	5.0	U	5.6	U
Butyl benzyl phthalate	NV	NV	5.0	U	5.6	U
Benzyl Alcohol	NV	NV	5.0	U	5.6	U
2-Chloronaphthalene	NV	NV	5.0	U	5.6	U
4-Chloroaniline	NV	NV	10	U	5.6	U
Chrysene	NV	NV	5.0	U	5.6	U
bis(2-Chloroethoxy)methane	NV	NV	5.0	U	5.6	U
bis(2-Chloroethyl)ether	NV	NV	5.0	U	5.6	U
bis(2-Chloroisopropyl)ether	NV	NV	5.0	U	5.6	U
4-Chlorophenyl phenyl ether	NV	NV	5.0	U	5.6	U
1,2-Dichlorobenzene	NV	600	5.0	U	5.6	U
1,3-Dichlorobenzene	NV	NV	5.0	U	5.6	U
1,4-Dichlorobenzene	NV	75	5.0	U	5.6	U
2,4-Dinitrotoluene	NV	NV	5.0	U	5.6	U
2,6-Dinitrotoluene	NV	NV	5.0	U	5.6	U
3,3'-Dichlorobenzidine	NV	NV	10	U	11	U
Dibenzo(a,h)anthracene	NV	NV	5.0	U	5.6	U
Dibenzofuran	NV	NV	5.0	U	5.6	U
Di-n-butyl phthalate	NV	NV	5.0	U	5.6	U
Di-n-octyl phthalate	NV	NV	5.0	U	5.6	U
Diethyl phthalate	NV	NV	5.0	U	5.6	U
Dimethyl phthalate	NV	NV	5.0	U	5.6	U
bis(2-Ethylhexyl)phthalate	NV	NV	5.0	U	5.6	U
Fluoranthene	NV	NV	5.0	U	5.6	U
Fluorene	NV	NV	5.0	U	5.6	U
Hexachlorobenzene	NV	1	5.0	U	5.6	U
Hexachlorobutadiene	NV	NV	5.0	U	5.6	U
Hexachlorocyclopentadiene	NV	50	5.0	U	5.6	U
Hexachloroethane	NV	NV	5.0	U	5.6	U
Indeno(1,2,3-cd)pyrene	NV	NV	5.0	U	5.6	U
Isophorone	NV	NV	5.0	U	5.6	U
2-Methylnaphthalene	NV	NV	5.0	U	5.6	U
2-Nitroaniline	NV	NV	10	U	11	U
3-Nitroaniline	NV	NV	10	U	11	U
4-Nitroaniline	NV	NV	10	U	11	U

Table C.9.2
AOC-C - SS-66 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS66-DP01		SS66-DP02	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48808-1 & F52044-3		F52073-1	
Date Sampled:			4/15/2007		8/23/2007	
Analyte			Result[2]	Q	Result[2]	Q
Naphthalene	NV	NV	5.0	U	5.6	U
Nitrobenzene	NV	NV	5.0	U	5.6	U
N-Nitroso-di-n-propylamine	NV	NV	5.0	U	5.6	U
N-Nitrosodiphenylamine	NV	NV	5.0	U	5.6	U
Phenanthrene	NV	NV	5.0	U	5.6	U
Pyrene	NV	NV	5.0	U	5.6	U
1,2,4-Trichlorobenzene	NV	NV	5.0	U	5.6	U
Polychlorinated Biphenyls		µg/L	µg/L		µg/L	
Aroclor 1016	NV	0.5	0.50	U	0.49	U
Aroclor 1221	NV	0.5	0.50	U	0.49	U
Aroclor 1232	NV	0.5	0.50	U	0.49	U
Aroclor 1242	NV	0.5	0.50	U	0.49	U
Aroclor 1248	NV	0.5	0.50	U	0.49	U
Aroclor 1254	NV	0.5	0.50	U	0.49	U
Aroclor 1260	NV	0.5	0.50	U	0.49	U
Total Petroleum Hydrocarbons	mg/L		mg/L		mg/L	
TPH-GRO (C6-C10)	NV	NV	0.10	U	1.42	
TPH-DRO (C10-C22)	NV	NV	0.25	U	0.116	J
TPH-ORO (> C22-C36)	NV	NV	0.25	U	0.25	U
TPH-Total	10.4	NV	<0.60		<1.79	
TAL Metals Analysis	µg/L	µg/L	µg/L		µg/L	
Aluminum	NV	NV	29.1	J	79	U
Antimony	NV	6	6.8[3]	U	3.3	U
Arsenic	100	10	2.8	U	3.7	U
Barium	1,000	2,000	20.9	J	32	J
Beryllium	NV	4	1.1	J	1.0	U
Cadmium	10	5	0.3	U	1.0	U
Calcium	NV	NV	613,000		655,000	
Chromium	50	100	2.2	J	0.95	J
Cobalt	50	NV	0.60	U	1.90	J
Copper	1,000	1,300	1.0	U	1.2	U
Iron	1,000	NV	15	U	600	U
Lead	50	15	1.7	U	2.7	J
Magnesium	NV	NV	118,000		82,000	
Manganese	200	NV	10.3	J	167	
Mercury	2	2	0.10	U	0.11	U
Nickel	200	NV	2.1	J	4.6	J
Potassium	NV	NV	10,100	J	12,900	
Selenium	50	50	2.8	U	80	U
Silver	50	NV	0.90	U	0.77	U
Sodium	NV	NV	197,000		185,000	
Thallium	NV	2	2.9[3]	UJ	6.5	U

Table C.9.2
AOC-C - SS-66 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS66-DP01		SS66-DP02	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48808-1 & F52044-3		F52073-1	
Date Sampled:			4/15/2007		8/23/2007	
Analyte			**Result[2]**	**Q**	**Result[2]**	**Q**
Vanadium	NV	NV	19.7	J	15.6	J
Zinc	10,000	NV	16.5	J	11.2	J
Cyanide, Total	200	200	0.0072	J	0.0051	J
General Chemistry	**mg/L**	**mg/L**	**mg/L**		**mg/L**	
Solids, Total Dissolved	1,000	NV	**3,540**		**3,850**	

Notes:
NA = Not Applicable (or not analyzed)
NMWQCC = New Mexico Water Quality Control Commission
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
TPH = Total Petroleum Hydrocarbon
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ORO = Organic Range Organics
TAL = Total Analyte List
µg/L = micrograms per liter
mg/L = milligrams per liter
NV = No Value
Q = Qualifier
U = Not detected
J = Indicates an estimated value
[1]Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] If results are not detected (U) then the value is set at the Reporting Limit (RL) or the Method Detection Limit (MDL) for metals
[3]RL above the MCL and/or the New Mexico Groundwater Quality Control Criteria due to exceedance of Quality Control Criteria
Bold value indicates analytes above New Mexico Groundwater Quality Standard
Bold and shaded indicates analytes above the EPA MCL

Table C.10.1
AOC-K - SS-12 Soil Analytical Results (June 2007)

Client Sample ID:	Soil Screening Levels	SS12-DP01-04	SS12-DP02-9	SS12-DP03-10	SS12-DP04-10	SS12-DP04-10A	SS12-DP05-5	SS12-DP06-9
Lab Sample ID:	NMED	D7F080187-023	D7F080187-024	D7F080187-025	D7F080187-026	D7F080187-027	D7F080187-028	D7F080187-029
Date Sampled:	Residential[1]	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007
Analyte		Result	Result	Result	Result	Result	Result	Result
General Chemistry		%	%	%	%	%	%	%
Percent Moisture	NV	19	30	17	24	23	31	32
RCRA Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Barium	15,600	71	40	74	150	130	39	120
Cadmium	39	ND	ND	0.098 J	0.14 J	0.16 J	0.073 J	0.078 J
Chromium	234	5.8	3.1	9.3	8	8.9	3.2	16
Arsenic	3.9	1.9 J	1.8 J	1.5 J	0.90 J	0.94 J	1.2 J	1.2 J
Mercury	100,000	ND	ND	ND	ND	ND	ND	ND
Lead	400	3.3	2	4.6	4.6	5.2	2.3	8.6
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Diesel Range Organics (C10-C22)	NV	2.2 J	2.3 J	1.9 J	2.4 J	2.3 J	2.6 J	2.6 J
Gasoline Range Organics (C6-C10)	NV	0.90 J	0.77 J	0.78 J	0.84 J	0.71 J	0.80 J	1.5 J
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Acetone	28,100	ND	7.7 J	11 J	23 J	23 J	49	17 J
Benzene	10.3	ND	ND	ND	0.74 J	0.81 J	ND	ND
2-Butanone (MEK)	31,800	ND	ND	2.3 J	4.7 J	4.5 J	11 J	ND
Tetrachloroethene	12.5	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	60.6	ND	ND	ND	ND	ND	ND	24
Isopropylbenzene	271	ND	ND	ND	ND	ND	ND	4.5 J
n-Propylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	106	ND	ND	ND	ND	ND	ND	1.6 J
Naphthalene	79.5	ND	ND	0.87 J	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Dibenzofuran	142	ND	ND	ND	ND	ND	ND	ND
Fluorene	2,660	ND	ND	ND	ND	ND	ND	ND

Notes:
NMED = New Mexico Environment Department
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E).
ND = Not Detected
NV = No Value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

Table C.10.1
AOC-K - SS-12 Soil Analytical Results (June 2007)

Client Sample ID:	Soil Screening Levels	SS12-DP07-9	SS12-DP08-5	SS12-DP08-5A	SS12-DP09-5	SS12-DP10-5	SS12-DP11-5	SS12-DP12-5
Lab Sample ID:	NMED	D7F080187-030	D7F090156-009	D7F090156-010	D7F090156-011	D7F090156-012	D7F090156-013	D7F090156-014
Date Sampled:	Residential[1]	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007	6/7/2007
Analyte		Result	Result	Result	Result	Result	Result	Result
General Chemistry		%	%	%	%	%	%	%
Percent Moisture	NV	33	30	28	29	30	26	25
RCRA Metals Analysis	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Barium	15,600	59	61	62	63	50	130	58
Cadmium	39	0.13 J	0.23 J	0.23 J	0.32 J	0.18 J	0.32 J	ND
Chromium	234	7.6	9.1	9.2	8.8	5.3	14	5.6
Arsenic	3.9	1.8 J	2.1 J	2.3 J	2.1 J	2.1 J	2.6 J	2.6 J
Mercury	100,000	ND	ND	ND	ND	ND	6.7 J	5.6 J
Lead	400	4.5	3.9	5.5	4	2.2	5.8	3
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Diesel Range Organics (C10-C22)	NV	2.7 J	400 J	480 J	2.5 J	2.5 J	36 J	2.2 J
Gasoline Range Organics (C6-C10)	NV	0.90 J	83 J	220 J	0.64 J	0.49 J	150 J	0.73 J
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Acetone	28,100	ND	ND	ND	ND	ND	51	56
Benzene	10.3	0.86 J	120 J	84 J	ND	ND	10	ND
2-Butanone (MEK)	31,800	ND	ND	ND	ND	ND	17 J	15 J
Tetrachloroethene	12.5	ND	ND	ND	0.96 J	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	ND	ND	29	ND
sec-Butylbenzene	60.6	ND	570	660	ND	ND	180	ND
Isopropylbenzene	271	ND	420	470	ND	ND	ND	ND
n-Propylbenzene	62.1	ND	300 J	390	ND	ND	ND	ND
tert-Butylbenzene	106	ND	ND	ND	ND	ND	25	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Dibenzofuran	142	ND	89 J	94 J	ND	ND	ND	ND
Fluorene	2,660	ND	65 J	65 J	ND	ND	ND	ND

Notes:
NMED = New Mexico Environment Department
RCRA = Resource Conservation and Recovery Act
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E).
ND = Not Detected
NV = No Value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, June 2006)

Table C.10.2
AOC-K - SS-12 Groundwater Analytical Results (June 2007)

Client Sample ID:	Groundwater Screening Levels		WL-12-01	WL-12-01-A	WL-12-02	WL-12-03
Lab Sample ID:	NMWQCC[1]	USEPA MCL	D7F080187-007	D7F080187-008	D7F090156-006	D7F120221-002
Date Sampled:			6/7/2007	6/7/2007	6/8/2007	6/9/2007
Analyte			**Result**	**Result**	**Result**	**Result**
General Chemistry	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Total Dissolved Solids	1,000	500[2]	**36,000 Q**	**26,000 Q**	**4,800 Q**	**2,400**
RCRA Metals	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Barium	1,000	2,000	17	19	20	30
Arsenic	100	10	ND	8.8 J	ND	ND
Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
1,1-Dichloroethane	25	NV	0.19 J	0.20 J	ND	ND
Tetrachloroethene	20	5	0.22 J	0.21 J	ND	ND
Trichloroethene	100	5	0.20 J	0.19 J	ND	ND
sec-Butylbenzene	NV	NV	0.27 J	0.23 J	6.1	ND
Isopropylbenzene	NV	NV	ND	ND	2.2	ND
tert-Butylbenzene	NV	NV	ND	ND	0.37 J	ND
Naphthalene	30	NV	ND	ND	0.44 J	ND
Semi-Volatile Organic Compounds	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
bis(2-Ethylhexyl)phthalate	NV	NV	ND	ND	5.0 J	ND

Notes:
NMWQCC = New Mexico Water Quality Control Commision
RCRA = Resource Conservation and Recovery Act
USEPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
µg/L = micrograms per liter
mg/L = milligrams per liter
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E).
ND = Not Detected
NV = No Value
Q = Elevated reporting limit. The reporting limit is elevated due to high analyte levels.
[1]Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA Secondary Drinking Water Standard
Bold value indicate analytes above USEPA MCL and/or New Mexico Groundwater Quality Standard.

Table C.12.1
AOC-O - OT-45 Groundwater Analytical Results (June 2007)

Client Sample ID:	Groundwater Screening Levels		S51-MW1	S51-MW3	S51-MW4	S51-MW5	S51-MW7	S51-MW7-A
Lab Sample ID:	NMWQCC[1]	USEPA MCL	D7F050154-001	D7F050154-002	D7F050154-004	D7F050154-003	D7F060363-009	D7F060363-010
Date Sampled:			6/4/2007	6/4/2007	6/4/2007	6/4/2007	6/4/2007	6/4/2007
								Duplicate
Analyte			Result	Result	Result	Result	Result	Result
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Total Dissolved Solids (TDS)	1,000	500 [2]	**3,200**	**23,000 Q**	**4,900 Q**	**3,400**	**8,200 Q**	**7,600 Q**
Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Carbon tetrachloride	10	5	ND	ND	ND	ND	2.3	3.3
Chlorobenzene	NV	100	0.77 J	ND	ND	ND	ND	ND
Chloroform	100	NV	ND	0.27 J	0.66 J	2.3	3.4	5.7
1,2-Dichlorobenzene	NV	600	0.21 J	ND	ND	ND	0.57 J	0.80 J
1,3-Dichlorobenzene	NV	NV	ND	ND	ND	ND	ND	0.27 J
1,4-Dichlorobenzene	NV	75	0.31 J	ND	ND	ND	ND	0.25 J
Dichlorodifluoromethane	NV	NV	ND	ND	ND	ND	0.45 J	0.71 J
1,1-Dichloroethane	25	NV	ND	2.5	0.20 J	ND	0.48 J	0.52 J
1,2-Dichloroethane	10	5	ND	ND	ND	ND	0.59 J	0.96 J
1,1-Dichloroethene	5	7	ND	2.8	ND	ND	ND	ND
1,2-Dichloroethene (total)	NV	NV	ND	0.18 J	ND	ND	0.44 J	0.48 J
cis-1,2-Dichloroethene	NV	70	ND	0.18 J	ND	ND	0.44 J	0.48 J
Methylene chloride	100	5	ND	0.35 J	0.39 J	0.49 J	ND	ND
Tetrachloroethene	20	5	ND	0.59 J	2	ND	ND	0.25 J
Trichloroethene	100	5	0.60 J	**6.5**	0.61 J	ND	2.9	4.7
2-Chlorotoluene	NV	NV	0.41 J	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
bis(2-Ethylhexyl)phthalate	NV	NV	3.0 J	2.6 J	ND	ND	3.1 J	ND

Notes:
NMWQCC = New Mexico Water Quality Control Commission
USEPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
µg/L = micrograms per liter
mg/L = milligrams per liter
J = Estimated result. Result is between the Method Detection Limit (MDL) and the Reporting Limit (RL), and/or qualified by the validating chemist (see Appendix E of the report).
ND = Not Detected
NV = No Value
Q = Elevated reporting limit. The reporting limit is elevated due to high analyte levels.
[1]Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA Secondary Drinking Water Standard
Bold value indicate analytes above USEPA MCL and/or New Mexico Groundwater Quality Standard

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-SW1	OT45-SW1a	OT45-SW2	OT45-SW2a	OT45-SW3	OT45-SW4	OT45-SW4a	OT45-SW5
Lab Sample ID:	NMED	LR206653	LR206904	LR206653	LR206904	LR206653	LR206653	LR206904	LR206653
Date Sampled:	Residential[1]	02/08/2008	02/12/2008	02/08/2008	02/12/2008	02/08/2008	02/08/2008	02/12/2008	02/08/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Gasoline Range Organics (C6 -C10)	800 [2]	3.1	ND	ND	2.6 J	ND	ND	44	ND
Diesel Range Organics (C10-C22)	800 [2]	ND	ND	ND	1.1 J	ND	ND	32	5.4
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	4.6 J	3.8 J	ND	3.7 J	ND	ND
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
1,2,4-Trimethylbenzene	58	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	10.3	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	128	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	271	ND	ND	ND	ND	ND	ND	254	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	21 J	ND
Toluene	252	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	62.1	ND	ND	ND	ND	ND	ND	192	ND
p-Isopropyltoluene	NV	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	60.6	ND	ND	ND	ND	3.7 J	ND	297	ND
tert-Butylbenzene	106	ND	ND	ND	ND	ND	ND	16 J	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
2-Methylnaphthalene	NV	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated Result
ND = Not Detected
NV = No Value
SW = Sidewall Sample

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels (Revision 4.0, June 2006)

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-SW5a	OT45-SW6	OT45-SW6a	OT45-SW7	OT45-SW7a	OT45-SW8	OT45-SW9	OT45-SW9a
Lab Sample ID:	NMED	LR206904	LR206653	LR206904	LR206653	LR206904	LR206654	LR206654	LR206904
Date Sampled:	Residential[1]	02/12/2008	02/08/2008	02/12/2008	02/08/2008	02/12/2008	02/08/2008	02/08/2008	02/12/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Gasoline Range Organics (C6 -C10)	800 [2]	15	33	20	4.3	ND	ND	4.2	ND
Diesel Range Organics (C10-C22)	800 [2]	62	68	6.0	ND	ND	ND	10	ND
Oil Range Organics (>C22-C36)	800 [2]	3.1 J	ND	ND	4.3 J	ND	ND	ND	4.7 J
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
1,2,4-Trimethylbenzene	58	ND	724	ND	ND	1.4 J	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	241	ND	ND	ND	ND	ND	ND
Benzene	10.3	ND	129	ND	ND	ND	2.0 J	ND	ND
Ethylbenzene	128	ND	3,050	50	ND	9.8	4.2 J	42	ND
Isopropylbenzene (Cumene)	271	4.7 J	597	34	1.4 J	6.9	ND	23	ND
Naphthalene	79.5	53	1,100	77	16	6.1	ND	8.2	ND
Toluene	252	ND	1,180	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	2,640	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	172	35	ND	4.9 J	ND	ND	ND
n-Propylbenzene	62.1	ND	950	71	2.2 J	14	ND	38	ND
p-Isopropyltoluene	NV	ND	95	ND	ND	1.5 J	ND	2.4 J	ND
sec-Butylbenzene	60.6	53	330	48	7.3	7.7	ND	15	ND
tert-Butylbenzene	106	6.4	16 J	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
2-Methylnaphthalene	NV	120 J	956	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	63 J	1,250	59 J	ND	ND	ND	ND	ND

Notes:
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J = Estimated Result
ND = Not Detected
NV = No Value
SW = Sidewall Sample

[1] NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-SW10	OT-45-SW10a	OT45-10A-OE-1	OT45-10A-OE-2	OT45-10A-OE-3	OT45-10A-OE-4	OT45-10A-OE-5	OT45-10A-OE-6
Lab Sample ID:	NMED Residential[1]	LR206654	LR206905	LR207676	LR207676	LR207676	LR207676	LR207676	LR207676
Date Sampled:		02/08/2008	02/12/2008	02/25/2008	02/25/2008	02/25/2008	02/25/2008	02/25/2008	02/25/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Gasoline Range Organics (C6 -C10)	800 [2]	8.2	476	ND	ND	ND	ND	ND	ND
Diesel Range Organics (C10-C22)	800 [2]	ND	246	6.0 J	2.6	12	ND	1.4	ND
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	118	ND	ND	ND	ND	ND
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
1,2,4-Trimethylbenzene	58	ND	223	ND	ND	2.4 J	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	10.3	ND	ND	ND	ND	ND	ND	1.5 J	ND
Ethylbenzene	128	ND	7,720	3.9 J	ND	ND	ND	6.3	ND
Isopropylbenzene (Cumene)	271	ND	1,020	1.7 J	1.2 J	1.1 J	ND	11	4.6 J
Naphthalene	79.5	4.8 J	633	ND	5.9	5.4	ND	ND	ND
Toluene	252	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	258	ND	ND	ND	ND	ND	ND
n-Propylbenzene	62.1	ND	4,410	1.9 J	ND	ND	ND	7.3	ND
p-Isopropyltoluene	NV	ND	197	ND	ND	ND	ND	ND	1.1 J
sec-Butylbenzene	60.6	ND	650	ND	12	10	ND	12	7.1
tert-Butylbenzene	106	ND	ND	ND	3.0 J	ND	ND	1.2 J	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
2-Methylnaphthalene	NV	ND	1,480	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	1,030	ND	ND	ND	ND	ND	ND

Notes:
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SW = Sidewall Sample

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-10A-OE-7	OT45-10A-OE-8	OT45-10A-OE-9	OT45-10A-OE-10	OT45-SW11	OT-45-SW11a	OT45-SW12	OT-45-SW13
Lab Sample ID:	NMED	LR207676	LR207676	LR207676	LR207676	LR206654	LR206905	LR206654	LR206905
Date Sampled:	Residential[1]	02/25/2008	02/25/2008	02/25/2008	02/25/2008	02/08/2008	02/12/2008	02/08/2008	02/12/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Organics (C6 -C10)	800 [2]	ND	8.5	4.3	ND	ND	ND	ND	ND
Diesel Range Organics (C10-C22)	800 [2]	ND	23	13	ND	7.0	ND	ND	ND
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	ND	ND	ND	ND	2.6 J	ND
Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
1,2,4-Trimethylbenzene	58	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	10.3	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	128	ND	ND	ND	4.2 J	ND	ND	ND	ND
Isopropylbenzene (Cumene)	271	6.2	ND	10	1.1 J	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	252	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	62.1	2.6 J	ND	ND	1.1 J	ND	ND	ND	ND
p-Isopropyltoluene	NV	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	60.6	1.6 J	173 J	33	ND	22	ND	ND	ND
tert-Butylbenzene	106	ND	ND	2.6 J	ND	6.0	ND	ND	ND
Semi-Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
2-Methylnaphthalene	NV	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
NMED = New Mexico Environment Department
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J = Estimated Result
ND = Not Detected
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SW = Sidewall Sample

[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT-45-SW14	OT-45-SW15	OT-45-SW16	OT45-SW17	OT45-SW18	OT45-SW19	OT45-SW20	OT45-SW21
Lab Sample ID:	NMED	LR206905	LR206905	LR206905	LR206939	LR206939	LR206939	LR206939	LR206939
Date Sampled:	Residential[1]	02/12/2008	02/12/2008	02/12/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Gasoline Range Organics (C6 -C10)	800 [2]	ND	ND	ND	ND	ND	ND	ND	ND
Diesel Range Organics (C10-C22)	800 [2]	ND	ND	ND	ND	ND	ND	ND	12
Oil Range Organics (>C22-C36)	800 [2]	2.8 J	21	4.6 J	ND	ND	ND	ND	84
Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
1,2,4-Trimethylbenzene	58	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	10.3	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	128	ND	ND	ND	ND	ND	ND	ND	5.6
Isopropylbenzene (Cumene)	271	ND	ND	ND	ND	ND	ND	ND	2.4 J
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	252	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	62.1	ND	ND	ND	ND	ND	ND	ND	2.7 J
p-Isopropyltoluene	NV	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	60.6	ND	ND	ND	ND	ND	ND	ND	1.8 J
tert-Butylbenzene	106	ND	ND	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
2-Methylnaphthalene	NV	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
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ND = Not Detected
NV = No Value
SW = Sidewall Sample

[1]NMED, June 2006. Technical Background Document for Development of Soil Screen
[2] NMED, October 2006. TPH Screening Guidelines (Unknown oil, Residential Direct I
Bold value indicate analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-SW22	OT45-SW23	OT45-SW24	OT45-SW25	OT45-SW26	OT45-SW27	OT45-SW28	OT45-SW29
Lab Sample ID:	NMED Residential[1]	LR206939	LR206939	LR206939	LR206940	LR206940	LR206940	LR206940	LR206940
Date Sampled:		02/13/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008	02/13/2008
Analyte		Result	Result	Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Organics (C6 -C10)	800 [2]	ND	ND	435	269	ND	ND	ND	93
Diesel Range Organics (C10-C22)	800 [2]	ND	ND	60	66	ND	ND	ND	25
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
1,2,4-Trimethylbenzene	58	ND	ND	3,380	250	1.1 J	ND	ND	ND
1,3,5-Trimethylbenzene	24.8	ND	ND	677 J	ND	ND	ND	ND	ND
Benzene	10.3	ND	ND	250 J	76 J	2.0 J	ND	ND	ND
Ethylbenzene	128	ND	ND	10,300	588	3.9 J	ND	ND	ND
Isopropylbenzene (Cumene)	271	ND	ND	2,250	2,000	1.8 J	ND	ND	1,190
Naphthalene	79.5	ND	ND	945 J	858	ND	ND	ND	ND
Toluene	252	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, total	82	ND	ND	1,580	ND	ND	ND	ND	ND
n-Butylbenzene	62.1	ND	ND	ND	746	ND	ND	ND	ND
n-Propylbenzene	62.1	ND	ND	3,240	3,120	2.0 J	ND	ND	1,360
p-Isopropyltoluene	NV	ND	ND	628 J	470	ND	ND	ND	ND
sec-Butylbenzene	60.6	ND	ND	1,370	1,460	1.8 J	ND	ND	1,490
tert-Butylbenzene	106	ND	ND	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
2-Methylnaphthalene	NV	ND	ND	471	397	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
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J = Estimated Result
ND = Not Detected
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[1]NMED, June 2006. Technical Background Document for Devel ing Levels, Revision 4.0.
[2] NMED, October 2006. TPH Screening Guidelines (Unknown o Exposure, Table 2b.)
Bold value indicate analytes above NMED Soil Screening Levels

Table C.12.2
AOC-O - OT-45 Excavation Confirmation Soil Analytical Results (February 2008)

Client Sample ID:	Soil Screening Levels	OT45-SW30	OT45-SW31	OT45-SW32	OT45-Bottom 1	OT45-Bottom 2	OT45-Bottom 3
Lab Sample ID:	NMED	LR206940	LR206940	LR206940	LR206654	LR206654	LR206940
Date Sampled:	Residential[1]	02/13/2008	02/13/2008	02/13/2008	02/08/2008	02/08/2008	2/13/2008
Analyte		Result	Result	Result	Result	Result	Result
Total Petroleum Hydrocarbons	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Gasoline Range Organics (C6 -C10)	800 [2]	6.5	136	ND	ND	ND	ND
Diesel Range Organics (C10-C22)	800 [2]	3.1	15	ND	3.3	ND	ND
Oil Range Organics (>C22-C36)	800 [2]	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
1,2,4-Trimethylbenzene	58	146	41	ND	9.0	ND	4.5 J
1,3,5-Trimethylbenzene	24.8	37	ND	ND	ND	ND	1.5 J
Benzene	10.3	12 J	ND	ND	3.5 J	ND	ND
Ethylbenzene	128	248	137	ND	28	ND	3.2 J
Isopropylbenzene (Cumene)	271	59	53	ND	4.7 J	ND	1.0 J
Naphthalene	79.5	28	ND	ND	ND	ND	ND
Toluene	252	ND	ND	ND	15	ND	ND
Xylenes, total	82	124	24 J	ND	28	ND	3.1 J
n-Butylbenzene	62.1	20	17 J	ND	2.8 J	ND	ND
n-Propylbenzene	62.1	86	79	ND	6.2	ND	1.9 J
p-Isopropyltoluene	NV	24	12 J	ND	1.2 J	ND	ND
sec-Butylbenzene	60.6	345	39	ND	1.8 J	ND	1.9 J
tert-Butylbenzene	106	ND	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds	**mg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**	**µg/kg**
2-Methylnaphthalene	NV	ND	ND	ND	ND	ND	ND
Naphthalene	79.5	ND	ND	ND	ND	ND	ND

Notes:

NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
J = Estimated Result
ND = Not Detected
NV = No Value
SW = Sidewall Sample

ɔpment of Soil Screening Levels, Revision 4.0.
il, Residential Direct Exposure, Table 2b.)
: (Rev 4.0, Jun 2006)

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW01			AOCU-GW01			AOCU-GW01		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103080913			21103080926			680-66263-1		
Date Sampled:					3/5/2011			3/5/2011			3/5/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.052**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.024**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.013	B		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			1,130			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.014	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.002	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.074			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			2,110		J	NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			**0.71**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.026	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			80.4			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			11,900			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U	UJ	NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.014	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	0.005	B	J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**43,800**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			0.1	U	

Client Sample Identification:	AOCU-GW02			AOCU-GW02			AOCU-GW02		
Lab Sample Identification:	21103080914			21103080927			680-66263-2		
Date Sampled:	3/5/2011			3/5/2011			3/5/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.061**	B		NA		
Arsenic	NA			0.025	U		NA		
Barium	NA			0.0011	U		NA		
Calcium	NA			776			NA		
Chromium	NA			0.018	B		NA		
Cobalt	NA			0.004	U		NA		
Copper	NA			0.014	U		NA		
Magnesium	NA			8,220		J	NA		
Manganese	NA			**0.24**			NA		
Nickel	NA			0.07	B		NA		
Potassium	NA			627			NA		
Sodium	NA			48,100			NA		
Vanadium	NA			0.0082	U	UJ	NA		
Zinc	NA			0.027	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	4.37		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**165,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.28	J	

Client Sample Identification:	AOCU-GW03			AOCU-GW03			AOCU-GW03		
Lab Sample Identification:	21103080910			21103080928			680-66263-3		
Date Sampled:	3/5/2011			3/5/2011			3/5/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	382			NA			NA		
Oil Range Organics (>C22-C36)	161			NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.13**	B		NA		
Arsenic	NA			0.063	U		NA		
Barium	NA			0.0028	U		NA		
Calcium	NA			539			NA		
Chromium	NA			**0.072**	B		NA		
Cobalt	NA			0.0099	U		NA		
Copper	NA			0.23	B		NA		
Magnesium	NA			13,700		J	NA		
Manganese	NA			**0.41**			NA		
Nickel	NA			0.12	B		NA		
Potassium	NA			481			NA		
Sodium	NA			54,700			NA		
Vanadium	NA			0.02	U	UJ	NA		
Zinc	NA			0.068	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	0.107		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**215,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.1	U	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater, *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW05			AOCU-GW05			AOCU-GW05		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103080907			21103080929			680-66263-4		
Date Sampled:					3/5/2011			3/5/2011			3/5/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	151			NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.058**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			0.025	U		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			824			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.018	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.014	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			8,290		J	NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.6**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.065	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			490			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			39,600			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U	UJ	NA		
Zinc	10	5.0[7]	23	56.28	NA			0.027	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	1.1		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**137,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			0.1	U	

Client Sample Identification:	AOCU-GW07			AOCU-GW07			AOCU-GW07		
Lab Sample Identification:	21103080908			21103080930			680-66263-5		
Date Sampled:	3/5/2011			3/5/2011			3/5/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	190			NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.14**	B		NA		
Arsenic	NA			0.063	U		NA		
Barium	NA			0.0028	U		NA		
Calcium	NA			543			NA		
Chromium	NA			**0.065**	B		NA		
Cobalt	NA			0.0099	U		NA		
Copper	NA			0.24	B		NA		
Magnesium	NA			14,000		J	NA		
Manganese	NA			**0.22**	B		NA		
Nickel	NA			0.12	B		NA		
Potassium	NA			416			NA		
Sodium	NA			57,800			NA		
Vanadium	NA			0.02	U	UJ	NA		
Zinc	NA			0.068	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	0.102		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**243,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.1	U	

Client Sample Identification:	AOCU-GW08			AOCU-GW08			AOCU-GW08		
Lab Sample Identification:	21103080911			21103080931			680-66263-6		
Date Sampled:	3/5/2011			3/5/2011			3/5/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	8.25	J		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	1.55	J		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	130			NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.17**	B		NA		
Arsenic	NA			**0.13**	B		NA		
Barium	NA			0.0028	U		NA		
Calcium	NA			496			NA		
Chromium	NA			**0.059**	B		NA		
Cobalt	NA			0.0099	U		NA		
Copper	NA			0.2	B		NA		
Magnesium	NA			15,300		J	NA		
Manganese	NA			**0.43**			NA		
Nickel	NA			0.13	B		NA		
Potassium	NA			549			NA		
Sodium	NA			67,000			NA		
Vanadium	NA			0.02	U	UJ	NA		
Zinc	NA			0.068	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	0.102		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**234,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.1	U	

Notes:
NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW10			AOCU-GW10			AOCU-GW10		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103080904			21103080932			680-66263-7		
Date Sampled:					3/4/2011			3/4/2011			3/4/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	76.3	J		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.081**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.052**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			838			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.018	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.014	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			7,840		J	NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**1.19**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.063	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			332			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			33,500			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U	UJ	NA		
Zinc	10	5.0[7]	23	56.28	NA			0.027	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	0.065		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**157,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			0.1	U	

Client Sample Identification:	AOCU-GW12			AOCU-GW12			AOCU-GW12			AOCU-GW15			AOCU-GW15			AOCU-GW15		
Lab Sample Identification:	21103080905			21103080933			680-66263-8			21103080901			21103080934			680-66263-9		
Date Sampled:	3/4/2011			3/4/2011			3/4/2011			3/4/2011			3/4/2011			3/4/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NA			**0.076**	B		NA			NA			**0.05**	B		NA		
Arsenic	NA			0.025	U		NA			NA			0.013	U		NA		
Barium	NA			0.0011	U		NA			NA			0.0029	B	J	NA		
Calcium	NA			840			NA			NA			1,120			NA		
Chromium	NA			0.028	B		NA			NA			0.01	B		NA		
Cobalt	NA			0.004	U		NA			NA			0.002	U		NA		
Copper	NA			0.16			NA			NA			0.016	B		NA		
Magnesium	NA			4,360		J	NA			NA			3,440		J	NA		
Manganese	NA			**0.62**			NA			NA			**1.18**			NA		
Nickel	NA			0.048	B		NA			NA			0.032	B		NA		
Potassium	NA			611			NA			NA			143			NA		
Sodium	NA			38,700			NA			NA			17,400			NA		
Vanadium	NA			0.0082	U	UJ	NA			NA			0.0041	U	UJ	NA		
Zinc	NA			0.027	U		NA			NA			0.014	U		NA		
General Chemistry	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	**16.6**		J	NA			NA			0.014		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**114,000**			NA			NA			**54,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NA			NA			1.3	M		NA			NA			0.1	U	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background	
Lab Sample Identification: / Date Sampled:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]
Analyte				
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L
Acetone	NV	NV	NV	NV
Benzene	0.1	0.005	NV	NV
Bromomethane	NV	NV	NV	NV
Chloromethane	NV	NV	NV	NV
Naphthalene	0.03	NV	NV	NV
Toluene	0.75	1.0	NV	NV
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L
Benzyl Alcohol	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV
Di-n-butyl phthalate	NV	NV	NV	NV
Fluorene	NV	NV	NV	NV
Phenanthrene	NV	NV	NV	NV
Pyrene	NV	NV	NV	NV
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L
Antimony	NV	0.006	6	10.00
Arsenic	0.1	0.01	10	28.53
Barium	1.0	2.0	30.2	30.13
Calcium	NV	NV	1,151,302	1,151,301.20
Chromium	0.05	0.1	2.5	2.50
Cobalt	0.05	NV	2.6	2.60
Copper	1.0	1.3	22	57.46
Magnesium	NV	NV	3,630,927	3,630,926.70
Manganese	0.2	0.05[7]	50	118.65
Nickel	0.2	NV	15.9	15.89
Potassium	NV	NV	120,480	120,479.98
Sodium	NV	NV	19,972,499	19,972,499.00
Vanadium	NV	NV	73.8	73.73
Zinc	10	5.0[7]	23	56.28
General Chemistry	mg/L	mg/L	mg/L	mg/L
Nitrate (USEPA 353.2)	10	10	NV	NV
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L
Perchlorate	NV	15[8]	NV	NV

Client Sample Identification:	AOCU-GW17			AOCU-GW17			AOCU-GW17		
Lab Sample Identification:	21103080902			21103080935			680-66263-10		
Date Sampled:	3/4/2011			3/4/2011			3/4/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	14	J		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	73.1	J		NA			NA		
Oil Range Organics (>C22-C36)	53.2	J		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.14**	B		NA		
Arsenic	NA			0.063	U		NA		
Barium	NA			0.0028	U		NA		
Calcium	NA			358			NA		
Chromium	NA			**0.055**	B		NA		
Cobalt	NA			0.0099	U		NA		
Copper	NA			0.11	B		NA		
Magnesium	NA			17,100		J	NA		
Manganese	NA			**0.7**			NA		
Nickel	NA			0.15	B		NA		
Potassium	NA			555			NA		
Sodium	NA			62,600			NA		
Vanadium	NA			0.02	U	UJ	NA		
Zinc	NA			0.068	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	0.248		J	NA			NA		
Solids, Total Dissolved (SM 2540 C)	**194,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.2	U	

Client Sample Identification:	AOCU-GW19			AOCU-GW19			AOCU-GW19		
Lab Sample Identification:	21103050406			21103050428			680-66263-11		
Date Sampled:	3/4/2011			3/4/2011			3/4/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	1.21	J		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.13**	B		NA		
Arsenic	NA			0.051	U		NA		
Barium	NA			0.0022	U		NA		
Calcium	NA			822			NA		
Chromium	NA			**0.057**	B		NA		
Cobalt	NA			0.0079	U		NA		
Copper	NA			0.26			NA		
Magnesium	NA			9,200		J	NA		
Manganese	NA			**1.06**			NA		
Nickel	NA			0.089	B		NA		
Potassium	NA			327			NA		
Sodium	NA			47,300			NA		
Vanadium	NA			0.016	U		NA		
Zinc	NA			0.054	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	5.49			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**183,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.82	M	

Client Sample Identification:	AOCU-GW20			AOCU-GW20			AOCU-GW20		
Lab Sample Identification:	21103050408			21103050429			680-66263-12		
Date Sampled:	3/4/2011			3/4/2011			3/4/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	5.38			NA			NA		
Chloromethane	2.04	J		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	53.1	J		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.097**	B		NA		
Arsenic	NA			**0.047**	B		NA		
Barium	NA			0.0011	U		NA		
Calcium	NA			899			NA		
Chromium	NA			0.014	B		NA		
Cobalt	NA			0.004	U		NA		
Copper	NA			0.014	U		NA		
Magnesium	NA			8,540		J	NA		
Manganese	NA			**1.04**			NA		
Nickel	NA			0.068	B		NA		
Potassium	NA			331			NA		
Sodium	NA			39,900			NA		
Vanadium	NA			0.0082	U		NA		
Zinc	NA			0.027	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	**500**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**165,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			**35**		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
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Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW22			AOCU-GW22			AOCU-GW22		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103050409			21103050430			680-66263-13		
Date Sampled:					3/4/2011			3/4/2011			3/4/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	3.36	J		NA			NA		
Chloromethane	NV	NV	NV	NV	1.1	J		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	54	J		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.092**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.058**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			953			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.023	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.029	B		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			7,320		J	NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.94**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.066	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			215			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			33,300			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.027	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**223**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**136,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			**89**		

Client Sample Identification:	AOCU-GW24			AOCU-GW24			AOCU-GW24			AOCU-GW24-A			AOCU-GW24-A			AOCU-GW24-A		
Lab Sample Identification:	21103050414			21103050431			680-66263-14			21103050415			21103050432			680-66263-15		
Date Sampled:	3/4/2011			3/4/2011			3/4/2011			3/4/2011			3/4/2011			3/4/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NA			**0.056**	B		NA			NA			**0.061**	B		NA		
Arsenic	NA			**0.098**	B	J	NA			NA			**0.049**	B	J	NA		
Barium	NA			0.0011	U		NA			NA			0.0011	U		NA		
Calcium	NA			860			NA			NA			836			NA		
Chromium	NA			0.0044	B	J	NA			NA			0.015	B	J	NA		
Cobalt	NA			0.004	U		NA			NA			0.0044	B	J	NA		
Copper	NA			0.014	U		NA			NA			0.015	B		NA		
Magnesium	NA			6,890			NA			NA			6,510			NA		
Manganese	NA			**0.34**			NA			NA			**0.32**			NA		
Nickel	NA			0.046	B		NA			NA			0.056	B		NA		
Potassium	NA			226			NA			NA			234			NA		
Sodium	NA			31,800			NA			NA			33,000			NA		
Vanadium	NA			0.0082	U		NA			NA			0.0082	U		NA		
Zinc	NA			0.027	U		NA			NA			0.027	U		NA		
General Chemistry	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	**136**			NA			NA			**142**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**121,000**			NA			NA			**123,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NA			NA			**140**			NA			NA			**140**		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater, *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW26			AOCU-GW26			AOCU-GW26			AOCU-GW28		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103050401			21103050420			680-66222-1			21103050418		
Date Sampled:					3/3/2011			3/3/2011			3/3/2011			3/3/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U	
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U	
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U	
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U	
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U	
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U	
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U	
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U	
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U	
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U	
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U	
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U	
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA			13	U	
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA			44.2	U	
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA			45.7	U	
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.053**	B		NA			NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.052**	B		NA			NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA			NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			994			NA			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.023	B		NA			NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA			NA		
Copper	1.0	1.3	22	57.46	NA			0.029	B		NA			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			6,120			NA			NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			**1.02**			NA			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.047	B		NA			NA		
Potassium	NV	NV	120,480	120,479.98	NA			164			NA			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			27,400			NA			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U		NA			NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.027	U		NA			NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**111**			NA			NA			**60.5**		
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**95,000**			NA			NA			**86,500**		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			**42**	J		NA		

Client Sample Identification:	AOCU-GW28			AOCU-GW28			AOCU-GW32			AOCU-GW32			AOCU-GW32		
Lab Sample Identification:	21103050423			680-66222-2			21103050417			21103050424			680-66222-3		
Date Sampled:	3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NA			NA			0.322	U		NA			NA		
Benzene	NA			NA			0.049	U		NA			NA		
Bromomethane	NA			NA			0.276	U		NA			NA		
Chloromethane	NA			NA			0.076	U		NA			NA		
Naphthalene	NA			NA			0.175	U		NA			NA		
Toluene	NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NA			NA			0.189	U		NA			NA		
Fluorene	NA			NA			0.288	U		NA			NA		
Phenanthrene	NA			NA			0.304	U		NA			NA		
Pyrene	NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	NA			NA			44.5	J		NA			NA		
Oil Range Organics (>C22-C36)	NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	**0.032**	B		NA			NA			**0.073**	B		NA		
Arsenic	**0.053**			NA			NA			**0.032**	B		NA		
Barium	0.00055	U		NA			NA			0.0063	B	J	NA		
Calcium	931			NA			NA			1,210			NA		
Chromium	0.0017	U		NA			NA			0.022	B		NA		
Cobalt	0.0021	B	J	NA			NA			0.004	U		NA		
Copper	0.0069	U		NA			NA			0.065	B		NA		
Magnesium	4,350			NA			NA			5,810			NA		
Manganese	**1.31**			NA			NA			**4.1**			NA		
Nickel	0.03	B		NA			NA			0.047	B		NA		
Potassium	157			NA			NA			201			NA		
Sodium	21,600			NA			NA			29,600			NA		
Vanadium	0.0041	U		NA			NA			0.0082	U		NA		
Zinc	0.014	U		NA			NA			0.027	U		NA		
General Chemistry	mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	NA			NA			0.146			NA			NA		
Solids, Total Dissolved (SM 2540 C)	NA			NA			**132,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NA			0.88			NA			NA			0.11	J	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
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MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
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RDL = Reporting Detection Limit
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Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
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Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater, *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
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Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW35			AOCU-GW35			AOCU-GW35			AOCU-GW35-A			AOCU-GW35-A			AOCU-GW35-A			AOCU-GW39			AOCU-GW39			AOCU-GW39		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103050411			21103050425			680-66222-4			21103050412			21103050426			680-66222-5			21103041016			21103041026			680-66222-6		
Date Sampled:					3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	3.47	J		NA			NA			3.88	J		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			1.7	J		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	84.9	J	J	NA			NA			52.3	J	J	NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	**mg/L**	**mg/L**	**µg/L**	**µg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Antimony	NV	0.006	6	10.00	NA			**0.12**	B		NA			NA			**0.09**	B		NA			NA			**0.12**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.1**	B		NA			NA			0.051	U		NA			NA			**0.07**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0022	U		NA			NA			0.0022	U		NA			NA			0.0028	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			1,130			NA			NA			1,140			NA			NA			860			NA		
Chromium	0.05	0.1	2.5	2.50	NA			**0.062**	B		NA			NA			**0.056**	B		NA			NA			**0.072**	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.0079	U		NA			NA			0.0079	U		NA			NA			0.0099	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.24			NA			NA			0.24			NA			NA			0.23	B		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			9,430			NA			NA			9,600			NA			NA			11,600			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**1.59**			NA			NA			**1.61**			NA			NA			**2.24**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.1	B		NA			NA			0.088	B		NA			NA			0.092	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			187			NA			NA			190			NA			NA			231			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			39,100			NA			NA			37,400			NA			NA			48,800			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.016	U		NA			NA			0.016	U		NA			NA			0.02	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.054	U		NA			NA			0.054	U		NA			NA			0.068	U		NA		
General Chemistry	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Nitrate (USEPA 353.2)	10	10	NV	NV	**38.6**			NA			NA			**39.3**			NA			NA			0.149			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**157,000**			NA			NA			**166,000**			NA			NA			**187,000**			NA			NA		
Perchlorate (SW846 6860)	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Perchlorate	NV	15[8]	NV	NV	NA			NA			4.5			NA			NA			4.6			NA			NA			0.2	U	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
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Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
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Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW41			AOCU-GW41			AOCU-GW41		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103041017			21103041029			680-66222-9		
Date Sampled:					3/3/2011			3/3/2011			3/3/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	109	J		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.087**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.053**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0022	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			1,310			NA		
Chromium	0.05	0.1	2.5	2.50	NA			**0.058**	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.0079	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.24			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			9,910			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**1.47**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.11	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			238			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			39,900			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.016	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.054	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**38.8**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**148,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			3.2	M	

Client Sample Identification:	AOCU-GW43			AOCU-GW43			AOCU-GW43			AOCU-GW45			AOCU-GW45			AOCU-GW45		
Lab Sample Identification:	21103041013			21103041027			680-66222-7			21103041014			21103041028			680-66222-8		
Date Sampled:	3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011			3/3/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	102	J		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NA			**0.17**	B		NA			NA			**0.16**	B		NA		
Arsenic	NA			0.063	U		NA			NA			0.051	U		NA		
Barium	NA			0.0028	U		NA			NA			0.0022	U		NA		
Calcium	NA			555			NA			NA			1,920			NA		
Chromium	NA			**0.063**	B		NA			NA			**0.059**	B		NA		
Cobalt	NA			0.0099	U		NA			NA			0.0079	U		NA		
Copper	NA			0.42			NA			NA			0.26			NA		
Magnesium	NA			5,900			NA			NA			8,860			NA		
Manganese	NA			**0.48**			NA			NA			**1.13**			NA		
Nickel	NA			0.062	B		NA			NA			0.093	B		NA		
Potassium	NA			151			NA			NA			195			NA		
Sodium	NA			48,700			NA			NA			33,300			NA		
Vanadium	NA			0.3	B		NA			NA			0.016	U		NA		
Zinc	NA			0.068	U		NA			NA			0.054	U		NA		
General Chemistry	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	**18.1**			NA			NA			**123**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**120,000**			NA			NA			**118,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NA			NA			1.9	M		NA			NA			2	M	

Notes:

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UTL = Upper Tolerance Limit
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µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
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MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
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Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
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[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW47			AOCU-GW47			AOCU-GW47			AOCU-GW47-A			AOCU-GW47-A			AOCU-GW47-A		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103041008			21103041019			680-66203-1			21103041009			21103041020			680-66203-2		
Date Sampled:					3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	57.4	J		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.2**	B	J	NA			NA			**0.11**	B	J	NA		
Arsenic	0.1	0.01	10	28.53	NA			0.063	U		NA			NA			0.063	U		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0028	U		NA			NA			0.0028	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			1,710			NA			NA			1,630			NA		
Chromium	0.05	0.1	2.5	2.50	NA			**0.08**	B		NA			NA			**0.083**	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.0099	U		NA			NA			0.0099	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.32			NA			NA			0.35			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			12,000			NA			NA			11,500			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**1.49**			NA			NA			**1.46**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.12	B		NA			NA			0.12	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			306			NA			NA			292			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			45,600			NA			NA			46,200			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.02	U		NA			NA			0.02	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.068	U		NA			NA			0.068	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**86.2**			NA			NA			**87.7**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**174,000**			NA			NA			**157,000**			NA			NA		
Perchlorate (SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			5.3			NA			NA			5.4		

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[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW50			AOCU-GW50			AOCU-GW50			AOCU-GW52			AOCU-GW52			AOCU-GW52			AOCU-GW54			AOCU-GW54			AOCU-GW54		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103041011			21103041021			680-66203-3			21103041002			21103041022			680-66203-4			21103041001			21103041025			680-66203-5		
Date Sampled:					3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	56.6	J		NA			NA			44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			0.02	U		NA			NA			0.1	U		NA			NA			0.1	U		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.073**			NA			NA			0.063	U		NA			NA			0.063	U		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.00055	U		NA			NA			0.0028	U		NA			NA			0.0028	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			2,620			NA			NA			805			NA			NA			869			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.0017	U		NA			NA			0.033	B		NA			NA			**0.069**	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.003	B		NA			NA			0.0099	U		NA			NA			0.0099	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.0069	U		NA			NA			0.15	B		NA			NA			0.34			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			4,410			NA			NA			7,740			NA			NA			10,700			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.32**			NA			NA			**1.28**			NA			NA			**8.38**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.032	B		NA			NA			0.05	B		NA			NA			0.095	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			134			NA			NA			213			NA			NA			251			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			16,000			NA			NA			42,300			NA			NA			46,300			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U		NA			NA			0.02	U		NA			NA			0.02	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.014	U		NA			NA			0.068	U		NA			NA			0.068	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**86.1**			NA			NA			0.11			NA			NA			0.139			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**85,200**			NA			NA			**166,000**			NA			NA			**185,000**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			6.2			NA			NA			0.048	J		NA			NA			0.2	U	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater, *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
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Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW56			AOCU-GW56			AOCU-GW56			AOCU-GW57			AOCU-GW57			AOCU-GW57			AOCU-GW59			AOCU-GW59			AOCU-GW59		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103030916			21103030924			680-66203-6			21103030910			21103030925			680-66203-7			21103030911			21103030926			680-66203-8		
Date Sampled:					3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.555	J		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	44.2	U		NA			NA			44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.13**	B		NA			NA			**0.12**	B		NA			NA			**0.096**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.058**	B		NA			NA			0.051	U		NA			NA			0.025	U		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0022	U		NA			NA			0.0022	U		NA			NA			0.0011	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			989			NA			NA			1,030			NA			NA			922			NA		
Chromium	0.05	0.1	2.5	2.50	NA			**0.059**	B		NA			NA			**0.06**	B		NA			NA			0.025	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.0079	U		NA			NA			0.0079	U		NA			NA			0.004	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.22			NA			NA			0.2			NA			NA			0.077	B		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			10,100			NA			NA			10,500			NA			NA			6,470			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.34**			NA			NA			**0.66**			NA			NA			**0.34**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.1	B		NA			NA			0.1	B		NA			NA			0.058	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			244			NA			NA			316			NA			NA			179			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			37,800			NA			NA			42,900			NA			NA			30,800			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.016	U		NA			NA			0.016	U		NA			NA			0.0082	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.054	U		NA			NA			0.054	U		NA			NA			0.027	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**331**			NA			NA			**140**			NA			NA			0.676			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**191,000**			NA			NA			**168,000**			NA			NA			**84,000**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			**17**			NA			NA			11			NA			NA			0.11	J	

Notes:

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MCL = Maximum Contaminant Level
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TAL = Target Analyte List
µg/L = Micrograms per liter
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M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

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[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
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[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
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[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW64			AOCU-GW64			AOCU-GW64			AOCU-GW66			AOCU-GW66			AOCU-GW66			AOCU-GW68			AOCU-GW68			AOCU-GW68		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103030913			21103030927			680-66203-9			21103030914			21103030928			680-66203-10			21103030904			21103030918			680-66162-1		
Date Sampled:					3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/2/2011			3/1/2011			3/1/2011			3/1/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA			44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.1**	B		NA			NA			**0.094**	B		NA			NA			**0.031**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			0.025	U		NA			NA			0.025	U		NA			NA			**0.031**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA			NA			0.0011	U		NA			NA			0.00055	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			2,380			NA			NA			3,400			NA			NA			1,670			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.026	B		NA			NA			0.028	B		NA			NA			0.007	B	J	NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA			NA			0.004	U		NA			NA			0.002	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.064	B		NA			NA			0.072	B		NA			NA			0.0069	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			6,290			NA			NA			5,790			NA			NA			2,290			NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			**0.055**	B		NA			NA			0.012	U		NA			NA			**0.19**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.053	B		NA			NA			0.06	B		NA			NA			0.019	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			165			NA			NA			144			NA			NA			94.2			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			24,800			NA			NA			21,000			NA			NA			11,200			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U		NA			NA			0.0082	U		NA			NA			0.0041	U		NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.027	U		NA			NA			0.027	U		NA			NA			0.014	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**42**			NA			NA			**83.5**			NA			NA			**54.3**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**113,000**			NA			NA			**114,000**			NA			NA			**66,800**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			4.4			NA			NA			4.4			NA			NA			2.8		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW69			AOCU-GW69			AOCU-GW69			AOCU-GW69-A			AOCU-GW69-A			AOCU-GW69-A			AOCU-GW71			AOCU-GW71			AOCU-GW71		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103030907			21103030919			680-66162-2			21103030908			21103030920			680-66162-3			21103030905			21103030921			680-66162-4		
Date Sampled:					3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			1.63	J		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			2.31	J		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	44.2	U		NA			NA			44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.049**	B		NA			NA			0.02	U		NA			NA			**0.021**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.02**	B		NA			NA			**0.021**	B		NA			NA			**0.03**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.00055	U		NA			NA			0.00055	U		NA			NA			0.00055	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			1,940			NA			NA			1,900			NA			NA			1,050			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.0055	B	J	NA			NA			0.0031	B	J	NA			NA			0.0093	B	J	NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.002	U		NA			NA			0.002	U		NA			NA			0.002	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.0069	U		NA			NA			0.0069	U		NA			NA			0.014	B		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			2,530			NA			NA			2,590			NA			NA			2,040			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.27**			NA			NA			**0.23**			NA			NA			0.016	B		NA		
Nickel	0.2	NV	15.9	15.89	NA			0.023	B		NA			NA			0.024	B		NA			NA			0.018	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			95.1			NA			NA			94.2			NA			NA			60			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			12,000			NA			NA			12,100			NA			NA			10,200			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U		NA			NA			0.0041	U		NA			NA			0.0041	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.014	U		NA			NA			0.014	U		NA			NA			0.014	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**42.5**			NA			NA			**46.6**			NA			NA			**37.2**			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**54,500**			NA			NA			**67,300**			NA			NA			**41,400**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			14			NA			NA			13			NA			NA			**15**		

Notes:

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USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW72			AOCU-GW72			AOCU-GW72		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103030902			21103030922			680-66162-5		
Date Sampled:					3/1/2011			3/1/2011			3/1/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.05**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.071**			NA		
Barium	1.0	2.0	30.2	30.13	NA			0.00055	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			806			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.0067	B	J	NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.002	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.0069	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			2,760			NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			**0.22**			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.021	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			103			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			16,200			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U		NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.014	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	0.011			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**62,500**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			0.18	J	

Client Sample Identification:	AOCU-GW73			AOCU-GW73			AOCU-GW73			AOCU-GW75			AOCU-GW75			AOCU-GW75		
Lab Sample Identification:	21103030901			21103030923			680-66162-6			21103021605			21103021619			680-66093-1		
Date Sampled:	3/1/2011			3/1/2011			3/1/2011			2/28/2011			2/28/2011			2/28/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA			693			NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA			98.2	J		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NA			0.02	U		NA			NA			**0.065**	B		NA		
Arsenic	NA			**0.029**	B		NA			NA			**0.058**	B		NA		
Barium	NA			0.00055	U		NA			NA			0.0011	U		NA		
Calcium	NA			767			NA			NA			710			NA		
Chromium	NA			0.0059	B	J	NA			NA			0.015	B		NA		
Cobalt	NA			0.0065	B		NA			NA			0.0076	B		NA		
Copper	NA			0.01	B		NA			NA			0.023	B		NA		
Magnesium	NA			2,140			NA			NA			4,110			NA		
Manganese	NA			**0.78**			NA			NA			**0.87**			NA		
Nickel	NA			0.02	B		NA			NA			0.033	B		NA		
Potassium	NA			64.2			NA			NA			139			NA		
Sodium	NA			11,200			NA			NA			24,000			NA		
Vanadium	NA			0.0041	U		NA			NA			0.0082	U		NA		
Zinc	NA			0.014	U		NA			NA			0.027	U		NA		
General Chemistry	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	7.17			NA			NA			5.14			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**65,300**			NA			NA			**60,600**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NA			NA			2.1			NA			NA			0.31	J	

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW75A			AOCU-GW75A			AOCU-GW75A			AOCU-GW77			AOCU-GW77			AOCU-GW77			AOCU-GW78			AOCU-GW78			AOCU-GW78		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103021604			21103021620			680-66093-2			21103021601			21103021621			680-66093-3			21103021602			21103021622			680-66093-4		
Date Sampled:					2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			0.425	J		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	44.2	U		NA			NA			44.5	J		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.054**	B		NA			NA			**0.023**	B		NA			NA			**0.022**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.045**	B		NA			NA			**0.024**	B		NA			NA			**0.03**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA			NA			0.00055	U		NA			NA			0.005	B	J	NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			765			NA			NA			641			NA			NA			629			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.015	B		NA			NA			0.011	B		NA			NA			0.016	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.0084	B		NA			NA			0.002	U		NA			NA			0.002	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.018	B		NA			NA			0.032	B		NA			NA			0.048	B		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			4,370			NA			NA			2,540			NA			NA			1,950			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.94**			NA			NA			0.0062	U		NA			NA			0.011	B		NA		
Nickel	0.2	NV	15.9	15.89	NA			0.038	B		NA			NA			0.02	B		NA			NA			0.016	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			157			NA			NA			71.8			NA			NA			66.3			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			26,500			NA			NA			13,500			NA			NA			11,200			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U		NA			NA			0.0041	U		NA			NA			0.0041	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.027	U		NA			NA			0.014	U		NA			NA			0.051	B		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	4.97			NA			NA			5.12			NA			NA			5.31			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**66,600**			NA			NA			**44,400**			NA			NA			**39,600**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			0.3	J		NA			NA			1.1			NA			NA			0.18	J	

Notes:

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mg/L = Milligrams per liter
NV = No Value
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RDL = Reporting Detection Limit
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[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)
LOST RIVER BASIN

Client Sample Identification: / Lab Sample Identification: / Date Sampled: / Analyte	Groundwater Screening Levels: NMWQCC[1]	Groundwater Screening Levels: USEPA MCL[2]	Basewide Background: NMED Approved Background Levels[3]	Basewide Background: Dissolved Metals in Groundwater UTL[4]
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L
Acetone	NV	NV	NV	NV
Benzene	0.1	0.005	NV	NV
Bromomethane	NV	NV	NV	NV
Chloromethane	NV	NV	NV	NV
Naphthalene	0.03	NV	NV	NV
Toluene	0.75	1.0	NV	NV
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L
Benzyl Alcohol	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV
Di-n-butyl phthalate	NV	NV	NV	NV
Fluorene	NV	NV	NV	NV
Phenanthrene	NV	NV	NV	NV
Pyrene	NV	NV	NV	NV
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L
Antimony	NV	0.006	6	10.00
Arsenic	0.1	0.01	10	28.53
Barium	1.0	2.0	30.2	30.13
Calcium	NV	NV	1,151,302	1,151,301.20
Chromium	0.05	0.1	2.5	2.50
Cobalt	0.05	NV	2.6	2.60
Copper	1.0	1.3	22	57.46
Magnesium	NV	NV	3,630,927	3,630,926.70
Manganese	0.2	0.05[7]	50	118.65
Nickel	0.2	NV	15.9	15.89
Potassium	NV	NV	120,480	120,479.98
Sodium	NV	NV	19,972,499	19,972,499.00
Vanadium	NV	NV	73.8	73.73
Zinc	10	5.0[7]	23	56.28
General Chemistry	mg/L	mg/L	mg/L	mg/L
Nitrate (USEPA 353.2)	10	10	NV	NV
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L
Perchlorate	NV	15[8]	NV	NV

Client Sample Identification:	AOCU-GW80			AOCU-GW80			AOCU-GW80		
Lab Sample Identification:	21103021107			21103021623			680-66093-5		
Date Sampled:	2/28/2011			2/28/2011			2/28/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	58.2	J		NA			NA		
Oil Range Organics (>C22-C36)	84.7	J		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.027**	B		NA		
Arsenic	NA			**0.028**	B		NA		
Barium	NA			0.00055	U		NA		
Calcium	NA			613			NA		
Chromium	NA			0.01	B		NA		
Cobalt	NA			0.002	U		NA		
Copper	NA			0.0069	U		NA		
Magnesium	NA			3,200			NA		
Manganese	NA			**0.054**	B		NA		
Nickel	NA			0.021	B		NA		
Potassium	NA			154			NA		
Sodium	NA			18,400			NA		
Vanadium	NA			0.0041	U		NA		
Zinc	NA			0.014	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	5.74			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**51,400**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.43	J	

Client Sample Identification:	AOCU-GW82			AOCU-GW82			AOCU-GW82		
Lab Sample Identification:	21103021104			21103021624			680-66093-6		
Date Sampled:	2/28/2011			2/28/2011			2/28/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	0.322	U		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.023**	B		NA		
Arsenic	NA			**0.02**	B		NA		
Barium	NA			0.00055	U		NA		
Calcium	NA			629			NA		
Chromium	NA			0.014	B		NA		
Cobalt	NA			0.002	U		NA		
Copper	NA			0.074			NA		
Magnesium	NA			989			NA		
Manganese	NA			0.0076	B		NA		
Nickel	NA			0.011	B		NA		
Potassium	NA			23.7			NA		
Sodium	NA			4,930			NA		
Vanadium	NA			0.0041	U		NA		
Zinc	NA			0.014	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	8.01			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**21,200**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			1.0		

Client Sample Identification:	AOCU-GW83			AOCU-GW83			AOCU-GW83		
Lab Sample Identification:	21103021105			21103021625			680-66093-7		
Date Sampled:	2/28/2011			2/28/2011			2/28/2011		
Analyte	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	µg/L			µg/L			µg/L		
Acetone	5.59	J		NA			NA		
Benzene	0.049	U		NA			NA		
Bromomethane	0.276	U		NA			NA		
Chloromethane	0.076	U		NA			NA		
Naphthalene	0.175	U		NA			NA		
Toluene	0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	µg/L			µg/L			µg/L		
Benzyl Alcohol	0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	0.191	U		NA			NA		
Di-n-butyl phthalate	0.189	U		NA			NA		
Fluorene	0.288	U		NA			NA		
Phenanthrene	0.304	U		NA			NA		
Pyrene	0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	13	U		NA			NA		
Diesel Range Organics (C10-C22)	44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L			mg/L			mg/L		
Antimony	NA			**0.027**	B		NA		
Arsenic	NA			**0.039**	B		NA		
Barium	NA			0.00055	U		NA		
Calcium	NA			650			NA		
Chromium	NA			0.0098	B		NA		
Cobalt	NA			0.0033	B		NA		
Copper	NA			0.0069	U		NA		
Magnesium	NA			2,860			NA		
Manganese	NA			**0.25**			NA		
Nickel	NA			0.019	B		NA		
Potassium	NA			83.1			NA		
Sodium	NA			14,200			NA		
Vanadium	NA			0.0041	U		NA		
Zinc	NA			0.014	U		NA		
General Chemistry	mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	0.11			NA			NA		
Solids, Total Dissolved (SM 2540 C)	**47,200**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L			µg/L			µg/L		
Perchlorate	NA			NA			0.2	U	

Notes:
NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified

Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater, *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)
LOST RIVER BASIN

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW84			AOCU-GW84			AOCU-GW84			AOCU-GW86			AOCU-GW86			AOCU-GW86			AOCU-GW89			AOCU-GW89			AOCU-GW89		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103021617			21103021632			680-66162-7			21103021616			21103021633			680-66162-8			21103021613			21103021634			680-66162-9		
Date Sampled:					3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011			3/1/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			0.322	U		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.643	J		NA			NA			1.04	J		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			0.191	U		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			0.189	U		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			0.288	U		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			0.304	U		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			0.486	U		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA			44.2	U		NA			NA			44.2	U		NA			NA		
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.031**	B		NA			NA			0.02	U		NA			NA			**0.043**	B		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.027**	B		NA			NA			**0.043**	B		NA			NA			0.025	U		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.00055	U		NA			NA			0.00055	U		NA			NA			0.0011	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			801			NA			NA			611			NA			NA			665			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.01	B	J	NA			NA			0.0047	B	J	NA			NA			0.011	B	J	NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.002	U		NA			NA			0.002	U		NA			NA			0.004	U		NA		
Copper	1.0	1.3	22	57.46	NA			0.032	B		NA			NA			0.0069	B		NA			NA			0.014	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			1,690			NA			NA			2,230			NA			NA			6,210			NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			**0.39**			NA			NA			0.011	B	J	NA			NA			0.025	B		NA		
Nickel	0.2	NV	15.9	15.89	NA			0.018	B		NA			NA			0.019	B		NA			NA			0.052	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			73.6			NA			NA			56.1			NA			NA			177			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			13,500			NA			NA			10,200			NA			NA			29,000			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U		NA			NA			0.0041	U		NA			NA			0.0082	U		NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.014	U		NA			NA			0.014	U		NA			NA			0.027	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**13.5**			NA			NA			3.53			NA			NA			2.72			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**42,400**			NA			NA			**45,200**			NA			NA			**70,200**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			13			NA			NA			0.67			NA			NA			3.6		

Notes:

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µg/L = Micrograms per liter
mg/L = Milligrams per liter
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MDL = Method Detection Limit
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Q = Laboratory Qualifier
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Qualifiers
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B = Indicates the result is between the RDL and the MDL
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Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
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[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
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[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW91			AOCU-GW91			AOCU-GW91			AOCU-GW91-R			AOCU-GW93			AOCU-GW93			AOCU-GW93			AOCU-GW96			AOCU-GW96			AOCU-GW96		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103021614			21103021635			680-66162-10			21107150501			21103021108			21103021626			680-66093-8			21103021101			21103021627			680-66093-9		
Date Sampled:					3/1/2011			3/1/2011			3/1/2011			7/13/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			NA			0.322	U		NA			NA			4.6	J		NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			NA			0.049	U		NA			NA			0.049	U		NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			NA			0.276	U		NA			NA			0.276	U		NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			NA			0.076	U		NA			NA			0.076	U		NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			NA			0.175	U		NA			NA			0.175	U		NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			NA			0.078	U		NA			NA			0.078	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			NA			0.355	U		NA			NA			0.355	U		NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			NA			0.191	U		NA			NA			3.94	J		NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			NA			0.189	U		NA			NA			0.303	J		NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			NA			0.288	U		NA			NA			0.642	J		NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			NA			0.304	U		NA			NA			1.14	J		NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			NA			0.486	U		NA			NA			0.563	J		NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5[6]	NV	NV	NV	13	U		NA			NA			NA			13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	18.5[6]	NV	NV	NV	44.2	U		NA			NA			NA			49.7	J		NA			NA			107	J		NA			NA		
Oil Range Organics (>C22-C36)	18.5[6]	NV	NV	NV	45.7	U		NA			NA			NA			45.7	U		NA			NA			45.7	U		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.049**	B		NA			NA			NA			0.02	U		NA			NA			0.02	U		NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.083**	B		NA			NA			NA			**0.037**	B		NA			NA			**0.032**	B		NA		
Barium	1.0	2.0	30.2	30.13	NA			0.0011	U		NA			NA			NA			0.00055	U		NA			NA			0.00055	U		NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			554			NA			NA			NA			726			NA			NA			840			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.0034	U		NA			NA			NA			0.0029	B		NA			NA			0.0097	B		NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.004	U		NA			NA			NA			0.0043	B		NA			NA			0.0023	B		NA		
Copper	1.0	1.3	22	57.46	NA			0.014	U		NA			NA			NA			0.0069	U		NA			NA			0.0069	U		NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			8,110			NA			NA			NA			3,860			NA			NA			3,340			NA		
Manganese	0.2	0.05[7]	50	118.65	NA			**0.18**			NA			NA			NA			0.0062	U		NA			NA			0.047	B		NA		
Nickel	0.2	NV	15.9	15.89	NA			0.051	B		NA			NA			NA			0.024	B		NA			NA			0.023	B		NA		
Potassium	NV	NV	120,480	120,479.98	NA			278			NA			NA			NA			155			NA			NA			145			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			39,100			NA			NA			NA			22,700			NA			NA			18,900			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0082	U		NA			NA			NA			0.0041	U		NA			NA			0.0041	U		NA		
Zinc	10	5.0[7]	23	56.28	NA			0.027	U		NA			NA			NA			0.014	U		NA			NA			0.014	U		NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	**605**[10]			NA			NA			7.92			1.89			NA			NA			0.207			NA			NA		
Solids, Total Dissolved (SM 2540 C)	1,000	500[7]	NV	65,956.58[9]	**91,000**			NA			NA			NA			**65,000**			NA			NA			**53,600**			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15[8]	NV	NV	NA			NA			**42**			**52.9**	N		NA			NA			2.8			NA			NA			0.14	J	

Notes:
NMWQCC = New Mexico Water Quality Control Commission
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UTL = Upper Tolerance Limit
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mg/L = Milligrams per liter
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N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified
Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
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[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
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[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
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[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[10] The nitrate result from AOCU-91, collected on 3/1/2011, is considered a false positive due to sampling error and comparison with the resampling results in July 2011.

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
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Table C.13.1
AOC-U Groundwater Analytical Results (February – July 2011)

Client Sample Identification:	Groundwater Screening Levels		Basewide Background		AOCU-GW98			AOCU-GW98			AOCU-GW98			AOCU-GW100			AOCU-GW100			AOCU-GW100			AOCU-SA03		
Lab Sample Identification:	NMWQCC[1]	USEPA MCL[2]	NMED Approved Background Levels[3]	Dissolved Metals in Groundwater UTL[4]	21103021607			21103021628			680-66093-10			21103021102			21103021631			680-66093-11			21107150505		
Date Sampled:					2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			2/28/2011			7/14/2011		
Analyte					Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1	Result[5]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Acetone	NV	NV	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA			NA		
Benzene	0.1	0.005	NV	NV	0.049	U		NA			NA			0.049	U		NA			NA			NA		
Bromomethane	NV	NV	NV	NV	0.276	U		NA			NA			0.276	U		NA			NA			NA		
Chloromethane	NV	NV	NV	NV	0.076	U		NA			NA			0.076	U		NA			NA			NA		
Naphthalene	0.03	NV	NV	NV	0.175	U		NA			NA			0.175	U		NA			NA			NA		
Toluene	0.75	1.0	NV	NV	0.078	U		NA			NA			0.078	U		NA			NA			NA		
Semi-Volatile Organic Compounds (8270C)	mg/L	mg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Benzyl Alcohol	NV	NV	NV	NV	0.355	U		NA			NA			0.355	U		NA			NA			NA		
bis(2-Ethylhexyl)phthalate	NV	NV	NV	NV	0.191	U		NA			NA			0.191	U		NA			NA			NA		
Di-n-butyl phthalate	NV	NV	NV	NV	0.189	U		NA			NA			0.189	U		NA			NA			NA		
Fluorene	NV	NV	NV	NV	0.288	U		NA			NA			0.288	U		NA			NA			NA		
Phenanthrene	NV	NV	NV	NV	0.304	U		NA			NA			0.304	U		NA			NA			NA		
Pyrene	NV	NV	NV	NV	0.486	U		NA			NA			0.486	U		NA			NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	mg/L	mg/L	mg/L	mg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Gasoline Range Organics (C6-C10)	18.5 [6]	NV	NV	NV	13	U		NA			NA			13	U		NA			NA			NA		
Diesel Range Organics (C10-C22)	18.5 [6]	NV	NV	NV	44.2	U		NA			NA			44.2	U		NA			NA			NA		
Oil Range Organics (>C22-C36)	18.5 [6]	NV	NV	NV	45.7	U		NA			NA			45.7	U		NA			NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	mg/L	mg/L	µg/L	µg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Antimony	NV	0.006	6	10.00	NA			**0.022**	B		NA			NA			0.02	U		NA			NA		
Arsenic	0.1	0.01	10	28.53	NA			**0.025**	B		NA			NA			0.013	U		NA			NA		
Barium	1.0	2.0	30.2	30.13	NA			0.00055	U		NA			NA			0.00055	U		NA			NA		
Calcium	NV	NV	1,151,302	1,151,301.20	NA			638			NA			NA			828			NA			NA		
Chromium	0.05	0.1	2.5	2.50	NA			0.0092	B		NA			NA			0.013	B		NA			NA		
Cobalt	0.05	NV	2.6	2.60	NA			0.002	U		NA			NA			0.0021	B		NA			NA		
Copper	1.0	1.3	22	57.46	NA			0.017	B		NA			NA			0.069			NA			NA		
Magnesium	NV	NV	3,630,927	3,630,926.70	NA			1,820			NA			NA			1,020			NA			NA		
Manganese	0.2	0.05 [7]	50	118.65	NA			0.017	B		NA			NA			**0.28**			NA			NA		
Nickel	0.2	NV	15.9	15.89	NA			0.016	B		NA			NA			0.01	B		NA			NA		
Potassium	NV	NV	120,480	120,479.98	NA			31.2			NA			NA			29.5			NA			NA		
Sodium	NV	NV	19,972,499	19,972,499.00	NA			7,890			NA			NA			4,800			NA			NA		
Vanadium	NV	NV	73.8	73.73	NA			0.0041	U		NA			NA			0.0041	U		NA			NA		
Zinc	10	5.0 [7]	23	56.28	NA			0.014	U		NA			NA			0.014	U		NA			NA		
General Chemistry	mg/L	mg/L	mg/L	mg/L	mg/L			mg/L			mg/L			mg/L			mg/L			mg/L			mg/L		
Nitrate (USEPA 353.2)	10	10	NV	NV	5.66			NA			NA			2.63			NA			NA			0.003	U	
Solids, Total Dissolved (SM 2540 C)	1,000	500 [7]	NV	65,956.58 [9]	**30,200**			NA			NA			**21,000**			NA			NA			NA		
Perchlorate (USEPA SW846 6860)	µg/L	µg/L	µg/L	µg/L	µg/L			µg/L			µg/L			µg/L			µg/L			µg/L			µg/L		
Perchlorate	NV	15 [8]	NV	NV	NA			NA			0.78			NA			NA			0.15	J		NA		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers

U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature

AOCU = Lost River Basin (Area of Concern U)
GW = Groundwater Sample
A = Denotes a field duplicate sample
SA = Source Area [Suspected] (grab water)

[1] Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] USEPA National Primary Drinking Water Regulations MCLs (816-F-09-004, May 2009)
[3] Table 3, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[4] Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)
[5] If results are not detected (U) then the value is set at the MDL
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Concentration in Groundwater. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[7] USEPA Secondary Drinking Water Standard (816-F-09-004, May 2009)
[8] USEPA, Interim Drinking Water Health Advisory, for exposure to Perchlorate in water (December 2008)
[9] Total Groundwater UTL, Table 5-18, *Basewide Background Study Report, Holloman Air Force Base, New Mexico* (NationView/Bhate JV III, July 2011)

Bold value indicates analytes above the New Mexico Groundwater Quality Standards, the USEPA MCLs, or the NMED TPH Screening Guidelines
Indicates combined TPH-GRO/DRO/ORO analytical results above the NMED TPH Screening Guideline for Kerosene and Jet Fuel, Concentration in Groundwater, Table 6-3
Indicates analytical results above the New Mexico Groundwater Quality Standard, or USEPA MCL, but below the NMED Approved Background Levels
Indicates analytical results above the NMED Approved Background Levels, but below the New Mexico Groundwater Quality Standard, or USEPA MCL
Indicates analytical results above the NMED Approved Background Levels, but without established New Mexico Groundwater Quality Standard or USEPA MCL

Table C.13.2
AOC-U Surface Water Analytical Results (March 2011)

Client Sample Identification:	Surface Water Screening Levels		AOCU-SW01			AOCU-SW01			AOCU-SW01			AOCU-SW02			AOCU-SW02			AOCU-SW02		
Lab Sample Identification:	NMWQCC[1]	USEPA NRWQC[2]	21103080923			21103080936			680-66263-16			21103080924			21103080937			680-66263-17		
Date Sampled:			3/6/2011			3/6/2011			3/6/2011			3/6/2011			3/6/2011			3/6/2011		
Analyte			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Acetone	NV	NV	0.322	U		NA			NA			5.38	J		NA			NA		
Semi-Volatile Organic Compounds (8270C)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
All SVOCs	NV	NV	ND			NA			NA			ND			NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	**mg/L**	**mg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Gasoline Range Organics (C6-C10)	NV	NV	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	NV	NV	44.2	U		NA			NA			680			NA			NA		
Oil Range Organics (>C22-C36)	NV	NV	50.5	J		NA			NA			1,150			NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	**µg/L**	**µg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Antimony	5.6	5.6	NA			**0.03**	B		NA			NA			**0.027**	B		NA		
Calcium	NV	NV	NA			1,160			NA			NA			951			NA		
Chromium	100	NV	NA			0.013	B		NA			NA			0.012	B		NA		
Copper	1,300	1,300	NA			0.033	B		NA			NA			0.039	B		NA		
Magnesium	NV	NV	NA			3,050		J	NA			NA			2,850		J	NA		
Manganese	NV	50	NA			0.0062	U		NA			NA			**0.16**			NA		
Nickel	100	610	NA			0.03	B		NA			NA			0.029	B		NA		
Potassium	NV	NV	NA			80.8			NA			NA			95.3			NA		
Sodium	NV	NV	NA			14,500			NA			NA			16,100			NA		
Vanadium	100[4]	NV	NA			0.0041	U	UJ	NA			NA			0.0041	U	UJ	NA		
Zinc	7,400	7400	NA			0.014	U		NA			NA			0.014	U		NA		
General Chemistry	**mg/L**	**mg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Nitrate (USEPA 353.2)	10	10	6.59			NA			NA			0.628			NA			NA		
Calcium (SM 2340 B)	NV	NV	1,150			NA			NA			969			NA			NA		
Hardness (SM 2340 B)	NV	NV	15,100			NA			NA			14,300			NA			NA		
Magnesium (SM 2340 B)	NV	NV	2,980			NA			NA			2,880			NA			NA		
Solids, Total Dissolved (SM 2540 C)	NV	250	**50,000**			NA			NA			**57,600**			NA			NA		
pH (SM 4500 H^{+}B/SW846 9040A)	NV	5 to 9	8.19			NA			NA			8.3			NA			NA		
Perchlorate (SW846 6860)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Perchlorate	NV	15[5]	NA			NA			10			NA			NA			0.32	J	

Client Sample Identification:	Surface Water Screening Levels		AOCU-SW03			AOCU-SW03			AOCU-SW03			AOCU-SW03-A			AOCU-SW03-A			AOCU-SW03-A		
Lab Sample Identification:	NMWQCC[1]	USEPA NRWQC[2]	21103080916			21103080938			680-66263-18			21103080917			21103080939			680-66263-19		
Date Sampled:			3/6/2011			3/6/2011			3/6/2011			3/6/2011			3/6/2011			3/6/2011		
Analyte			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
Volatile Organic Compounds (SW846 8260B)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Acetone	NV	NV	0.322	U		NA			NA			0.322	U		NA			NA		
Semi-Volatile Organic Compounds (8270C)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
All SVOCs	NV	NV	ND			NA			NA			ND			NA			NA		
Total Petroleum Hydrocarbons (SW846 8015B)	**mg/L**	**mg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Gasoline Range Organics (C6-C10)	NV	NV	13	U		NA			NA			13	U		NA			NA		
Diesel Range Organics (C10-C22)	NV	NV	44.2	U		NA			NA			50.8	J		NA			NA		
Oil Range Organics (>C22-C36)	NV	NV	45.7	U		NA			NA			57.4	J		NA			NA		
TAL Metals Analysis (SW846 6010B/7470A)	**µg/L**	**µg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Antimony	5.6	5.6	NA			**0.028**	B		NA			NA			**0.033**	B		NA		
Calcium	NV	NV	NA			842			NA			NA			874			NA		
Chromium	100	NV	NA			0.0075	B	J	NA			NA			0.015	B	J	NA		
Copper	1,300	1,300	NA			0.14		J	NA			NA			0.085		J	NA		
Magnesium	NV	NV	NA			1,300		J	NA			NA			1,510		J	NA		
Manganese	NV	50	NA			**0.08**		J	NA			NA			0.045	B	J	NA		
Nickel	100	610	NA			0.047	B	J	NA			NA			0.019	B	J	NA		
Potassium	NV	NV	NA			49.5			NA			NA			55.1			NA		
Sodium	NV	NV	NA			6,510			NA			NA			7,240			NA		
Vanadium	100[4]	NV	NA			0.0041	U	UJ	NA			NA			0.042	B	J	NA		
Zinc	7,400	7400	NA			0.059	B		NA			NA			0.014	U		NA		
General Chemistry	**mg/L**	**mg/L**	**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**			**mg/L**		
Nitrate (USEPA 353.2)	10	10	0.938			NA			NA			0.966			NA			NA		
Calcium (SM 2340 B)	NV	NV	879			NA			NA			829			NA			NA		
Hardness (SM 2340 B)	NV	NV	8,030			NA			NA			8,070			NA			NA		
Magnesium (SM 2340 B)	NV	NV	1,420			NA			NA			1,460			NA			NA		
Solids, Total Dissolved (SM 2540 C)	NV	250	**20,400**			NA			NA			**22,000**			NA			NA		
pH (SM 4500 H^{+}B/SW846 9040A)	NV	5 to 9	7.66			NA			NA			7.74			NA			NA		
Perchlorate (SW846 6860)	**µg/L**	**µg/L**	**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**			**µg/L**		
Perchlorate	NV	15[5]	NA			NA			0.31			NA			NA			0.29		

Notes:

NMWQCC = New Mexico Water Quality Control Commission
USEPA = United States Environmental Protection Agency
NRWQC = National Recommended Water Quality Criteria
UTL = Upper Tolerance Limit
TAL = Target Analyte List
µg/L = Micrograms per liter
mg/L = Milligrams per liter
SVOCs = Semi-volatile Organic Compounds
ND = All SVOCs not detected
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
NMED = New Mexico Environment Department
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier

Qualifiers
U = Not detected
J = Indicates an estimated value
B = Indicates the result is between the RDL and the MDL
M = Manual integrated compound

Client Sample Nomenclature
AOCU = Lost River Basin (Area of Concern U)
SW = Surface water sample
A = Denotes a field duplicate sample

[1] Water quaility numeric criteria for surface water, domestic water supply, New Mexico Administrative Code 20.6.4.900
[2] USEPA NRWQC for Priority Polutants, Human Health for the consumption of Water + Organism (http://water.epa.gov/scitech/swguidance/standards/current/index.cfm)
[3] If results are not detected (U) then the value is set at the MDL
[4] Water quality numeric criteria for surface water, Irrigation/Livestock Watering (no value established for Domestic Water Supply), New Mexico Administrative Code 20.6.4.900.
[5] USEPA Interim Drinking Water Health Advisory for exposure to Perchlorate in water (December 2008)
Bold value indicates analytes above the NMWQCC numeric criteria for surface water or the USEPA NRWQC

Table C.13.3
AOC-U Subsurface and Surface Soil Analytical Results (July 2011)

Client Sample Identification:	Soil Screening Levels	Basewide Background	AOCU-HA12-2			AOCU-HA20-2			AOCU-HA22-2			AOCU-HA22-2-A			AOCU-HA24-1			AOCU-HA26-1.5			AOCU-HA28-2			AOCU-HA35-3			AOCU-HA41-3		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	21107131601			21107121301			21107121303			21107121304			21107121305			21107121308			21107121309			21107131602			21107121310		
Date Sampled:			7/11/2011			7/11/2011			7/11/2011			7/11/2011			7/11/2011			7/11/2011			7/11/2011			7/11/2011			7/11/2011		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
General Chemistry (SM 2540G)	%	%	%			%			%			%			%			%			%			%			%		
Total Moisture	NV	NV	34.3			27.4			27.5			28.5			31.3			28.8			37.1			28.2			29.4		
Nitrate (USEPA 353.2)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Nitrate	125,000	NV	3.28			35.7			17			20.5			43.2			35.6			0.041	U		0.036	U		0.037	U	
Perchlorate (USEPA SW846 6860)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Perchlorate	54.8	NV	0.00147	NU		0.00827	N		0.0141	N		0.0107	N		0.0482	N		0.0129	N		0.00150	NU		0.00143	NU		0.00154	NU	
TAL Metals Analysis (USEPA SW846 6010B/7471B)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Aluminum	78,000	13,722	2,820			4,110			8,140		J	3,900		J	13,500			10,700			14,400			7,830			4,250		
Antimony	31.3	1.6	1.22	B		0.4	B		0.96	B		0.33	U		0.34	U		0.33	U		0.19	U		0.64	B		0.33	U	
Arsenic	3.9	3.7	1.05	B		1.94	B		2.83	B		2.26	B		3.58	B		3.83	B		**5.06**			2.77	B		3.08	B	
Barium	15,600	169.3	31.8			39.9			67.5		J	35.5		J	105			87.6			134			65.1			40.5		
Beryllium	156	1.6	0.041	B	J	0.19	B		0.66		J	0.17	B	J	1.26			0.93			1.69			0.31	B	J	0.17	B	
Cadmium	70.3	0.3	0.6	B	J	0.52	B	J	0.45	B	J	0.37	B	J	0.4	B	J	0.42	B	J	0.86			0.53	B	J	0.38	B	J
Calcium	NV[5]	317,332	252,000			197,000			179,000			182,000			131,000			145,000			97,500			158,000			175,000		
Chromium (Total)	NV[5]	25	2.69	B	J	3.87			10.5		J	3.92		J	17.5			14.2			21.1			6.66			3.9		
Cobalt	23[4]	7.7	0.79	B	J	1.51			4.02		J	1.39		J	7.13			5.8			11.8			2.24			1.99		
Copper	3,130	13	7.33			5.54			9.99		J	4.55		J	14.3			11.5			17.6			6.61			7.03		
Iron	54,800	23,049	1,960			3,960			10,400		J	3,610		J	17,700			14,600			21,200			6,300			4,980		
Lead	400	10.9	1.4	B		3.18			8.66		J	1.21	B	J	13.2			10.3			14.8			3.24			3.02		
Magnesium	NV[5]	16,991	20,400			19,800			19,000			20,900			15,900			18,700			13,300			36,000			27,300		
Manganese	1,860	393	59.4			131			207			159			315			293			327			187			179		
Nickel	1,560	17.4	1.29	B	J	3.35	B	J	9.69		J	3.11	B	J	17.5			14.3			23.2			5.11			3.33	B	J
Potassium	NV[5]	5,077	1100			1,560			2,580		J	1,240		J	3,900			2,970			4,460			2,140			1,270		
Selenium	391	1.4	1.46	U		0.58	B		0.53	U		0.97	B		0.56	U		0.88	B		1.05	B		0.53	U		1.21	B	
Silver	391	1.1	0.28	B	J	0.25	B	J	0.096	U		0.11	B	J	0.1	U		0.098	U		0.055	U		0.096	U		0.14	B	J
Sodium	NV[5]	5,196	17,100			17,700			15,900			12,700			21,300			20,800			16,600			14,200			14,000		
Thallium	0.782	1.3	0.76	U		0.27	U		0.27	U		0.61	B	J	0.29	U		1.12	B	J	0.36	B	J	0.27	U		0.45	B	J
Vanadium	391	42.6	16.4			8.14			19.5		J	8.21		J	31.4			27			40.1			12.5			11.7		
Zinc	23,500	54.6	6.8			15.4			38.1		J	12.3		J	59			47.8			77.5			21.6			16.9		
Mercury	15.6	10.8	0.016	B		0.0053	B		0.0061	B		0.0047	U		0.011	B		0.0077	B		0.014	B		0.018			0.0048	U	
Total Petroleum Hydrocarbons (USEPA SW846 8015B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
Diesel Range Organics (C10-C22)	1,000[6]	NV	1,930	U		2,500	J		1,780	U		1,800	U		1,850	U		1,800	U		2,020	U		1,780	U		1,830	U	
Oil Range Organics (>C22-C36)	1,000[6]	NV	4,100	J		2,630	U		2,630	U		2,670	U		2,730	U		4,340	J		2,980	U		3,120	J		2,700	U	
Gasoline Range Organics (C6-C10)	1,000[6]	NV	902	U		775	U		593	U		822	U		763	U		972	J		880	U		795	U		772	U	
Volatile Organic Compounds (USEPA SW846 8260B)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,2,4-Trimethylbenzene	62[4]	NV	0.143	U		0.149	U		0.151	U		0.135	U		0.135	U		0.166	U		0.184	U		0.128	U		0.14	U	
2-Butanone (MEK)	37,100	NV	3.83	J		6.51			6.34	J		6.45			6.12			6.17	J		21.4			26.6		J	16.6		
Acetone	66,600	NV	14.4	J		30.7	J		22.7	J		19	J		14.3	J		19.7	J		60.9			101			66.4		
Benzene	15.4	NV	1.27	J		3.03	J		4.37	J		4.92	J		5.24	J		6.24	J		6.42	J		2.14	J		1.87	J	
Chloroform	5.86	NV	0.878	J	J	0.969	J	J	1.2	J	J	1.00	J	J	1.14	J	J	0.958	J	J	1.39	J	J	0.906	J	J	0.98	J	J
Toluene	5,270	NV	0.977	J		2.65	J		2.92	J		3.72	J		3.99	J		4.92	J		4.48	J		1.53	J		1.52	J	
m,p-Xylene	NV[5]	NV	0.425	U		0.444	U		0.452	U		0.572	J		0.807	J		0.655	J		0.549	U		0.382	U		0.418	U	
n-Hexane	938	NV	1.18	J		1.49	J		2.16	J		2.42	J		3.07	J		2.63	J		4.93	J		2.1	J	J	1.52	J	
o-Xylene	898	NV	0.962	J		1.14	J		1.2	J		1.25	J		1.28	J		1.55	J		1.56	J		0.919	J	J	0.959	J	
Semi-Volatile Organic Compounds (USEPA SW846 8270C)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
bis(2-Ethylhexyl)phthalate	347	NV	29.7	U		27	U		26.9	U		110	J		28.5	U		117	J		31	U		26.8	U		27.8	U	
Pentachlorophenol	8.94	NV	218	J		174	U		173	U		174	U		184	U		177	U		200	U		173	U		178	U	

Notes:
NMED = New Mexico Environment Department
USEPA = U.S. Environmental Protection Agency
SM = Standard Method
TAL = Target Analyte List
µg/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram
% = Percent
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers:
U = Not detected
J = Indicates an estimated value
B = (Organics) Indicates the analyte was detected in the associated Method Blank
B = (Inorganics) Indicates the result is between the RDL and the MDL
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified
Client Sample Nomenclature:
AOCU = Area of Concern U (Lost River Basin)
HA = Hand Auger Sample (subsurface soil)
Final digit(s) = Ending depth of the sample interval (feet below ground surface)
SA = Source Area [Suspected] (surface soil)

[1] Table A-1, NMED Soil Screening Levels. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012)
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
[4] USEPA Region 3, 6, and 9 Regional Screening Levels (RSLs) (November 2012)
[5] No Value established for NMED Residential SSL (June 2012) and USEPA RSL (November 2012)
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Residential Direct Exposure. Risk Assessment Guidance for Site Investigations and Remediation (NMED, June 2012)

Bold value indicates analytes above NMED SSLs (June, 2012) or TPH results above NMED TPH Screening Guidelines (June, 2012)
Indicates that the combined TPH-GRO/DRO/ORO results exceed the NMED TPH Screening Guidelines (Kerosene and Jet Fuel, Residential Direct Exposure, Table 6-3)
Indicates analytical results above the NMED Residential SSL, but below the NMED Approved Background Level
Indicates analytical results above the NMED Approved Background Level, but below the NMED Residential SSL or USEPA RSL
Indicates analytical results above the NMED Approved Background Level, but without established NMED Residential SSL or USEPA RSL

Table C.13.3
AOC-U Subsurface and Surface Soil Analytical Results (July 2011)

Client Sample Identification:	Soil Screening Levels	Basewide Background	AOCU-HA43-2			AOCU-HA45-1.5			AOCU-HA45-1.5-A			AOCU-HA47-2			AOCU-HA50-2		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	21107131603			21107131604			21107131605			21107131606			21107131607		
Date Sampled:			7/12/2011			7/12/2011			7/12/2011			7/12/2011			7/12/2011		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
General Chemistry (SM 2540G)	%	%	%			%			%			%			%		
Total Moisture	NV	NV	30.1			29.7			30.2			29.2			32.5		
Nitrate (USEPA 353.2)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Nitrate	125,000	NV	0.037	U		11.9			10.1			4.29			13.5		
Perchlorate (USEPA SW846 6860)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Perchlorate	54.8	NV	0.00140	NU		0.00148	NU		0.00141	NU		0.00140	NU		0.00150	NU	
TAL Metals Analysis (USEPA SW846 6010B/7471B)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Aluminum	78,000	13,722	13,200			10,700			14,900			6,440			2,210		
Antimony	31.3	1.6	0.17	U		0.34	U		0.17	U		0.33	U		0.54	B	
Arsenic	3.9	3.7	2.92			3.61	B		3.65			2	B		0.78	B	
Barium	15,600	169.3	118			94.2			108			53.3			22.7		
Beryllium	156	1.6	1.43			0.96			1.2			0.46	B	J	0.041	B	J
Cadmium	70.3	0.3	0.44			0.28	B	J	0.44			0.34	B	J	0.15	B	J
Calcium	NV[5]	317,332	95,000			120,000			97,000			181,000			163,000		
Chromium (Total)	NV[5]	25	17.3			13.8			17.9			7.85			2.4		
Cobalt	23[4]	7.7	8.14			5.62			7.26			2.97			0.78	B	J
Copper	3,130	13	13.9			13.1			12.7			7.28			3.23		
Iron	54,800	23,049	16,700			13,400			16,700			6,920			2,200		
Lead	400	10.9	12.9			10.3			11.3			5.5			1.97		
Magnesium	NV[5]	16,991	17,000			15,100			16,700			10,600			5,740		
Manganese	1,860	393	255			185		J	327		J	141			46.2		
Nickel	1,560	17.4	18.8			14			18			7.25			1.37	B	J
Potassium	NV[5]	5,077	3,970			3,040			4,150			2,040			851		
Selenium	391	1.4	0.53	B		0.55	U		0.31	B		0.54	U		0.57	U	
Silver	391	1.1	0.05	U		0.099	U		0.05	U		0.099	U		0.1	U	
Sodium	NV[5]	5,196	18,100			16,600			16,400			17,100			5,850		
Thallium	0.782	1.3	0.3	B	J	0.29	B	J	0.35	B	J	0.28	U		0.29	U	
Vanadium	391	42.6	31.7			25.7			28.3			14.7			7.7		
Zinc	23,500	54.6	63.8			46.8			58.1			26			7.95		
Mercury	15.6	10.8	0.034			0.029			0.029			0.022			0.017	B	
Total Petroleum Hydrocarbons (USEPA SW846 8015B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
Diesel Range Organics (C10-C22)	1,000[6]	NV	1,820	U		2,780	J		1,820	U		1,810	U		1,910	U	
Oil Range Organics (>C22-C36)	1,000[6]	NV	7,430	J		4,750	J		3,040	J		2,940	J		2,830	U	
Gasoline Range Organics (C6-C10)	1,000[6]	NV	750	U		902	U		790	U		731	U		1,030	U	
Volatile Organic Compounds (USEPA SW846 8260B)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,2,4-Trimethylbenzene	62[4]	NV	0.189	J		0.184	J		0.135	J		0.128	U		0.132	U	
2-Butanone (MEK)	37,100	NV	11.8		J	6.03		J	6.63		J	8.96		J	6.01		J
Acetone	66,600	NV	30.3			12.8	J	J	10.6	J	J	23.6	J		12.7	J	J
Benzene	15.4	NV	6.45			6.46			6.78			3.07	J		2.07	J	
Chloroform	5.86	NV	0.712	J	J	0.776	J	J	0.804	J	J	0.743	J	J	0.785	J	J
Toluene	5,270	NV	5.25	J		4.82	J		5.08	J		2.63	J		1.67	J	
m,p-Xylene	NV[5]	NV	0.987	J		1.1	J		1.01	J		0.381	U		0.394	U	
n-Hexane	938	NV	3.53	J		3.69	J		4.13	J		2.22	J	J	1.17	J	J
o-Xylene	898	NV	1.39	J	J	1.38	J	J	1.43	J	J	1.1	J	J	0.979	J	J
Semi-Volatile Organic Compounds (USEPA SW846 8270C)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
bis(2-Ethylhexyl)phthalate	347	NV	27.9	U		27.9	U		28	U		27.6	U		28.5	U	
Pentachlorophenol	8.94	NV	179	U		179	U		180	U		177	U		183	U	

Client Sample Identification:	AOCU-HA56-1			AOCU-HA57-1			AOCU-HA64-2			AOCU-HA66-2		
Lab Sample Identification:	21107131608			21107131609			21107141202			21107141203		
Date Sampled:	7/12/2011			7/12/2011			7/12/2011			7/12/2011		
Analyte (Method)	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
General Chemistry (SM 2540G)	%			%			%			%		
Total Moisture	32.6			26.3			29.4			26.2		
Nitrate (USEPA 353.2)	mg/kg			mg/kg			mg/kg			mg/kg		
Nitrate	43			20.2			7.98			12.5		
Perchlorate (USEPA SW846 6860)	mg/kg			mg/kg			mg/kg			mg/kg		
Perchlorate	0.00587	JN		0.00137	NU		0.00154	NU		0.00146	NU	
TAL Metals Analysis (USEPA SW846 6010B/7471B)	mg/kg			mg/kg			mg/kg			mg/kg		
Aluminum	1,420			3,490			2,400			1,970		
Antimony	0.74	B		0.32	U		0.51	B		0.59	B	
Arsenic	0.26	U		0.82	B		1.02	B	J	0.92	B	J
Barium	18.4			33.6			24.1			17.1		
Beryllium	0.025	B	J	0.13	B	J	0.12	B	J	0.14	B	J
Cadmium	0.29	B	J	0.2	B	J	0.21	B	J	0.2	B	J
Calcium	191,000			135,000			95,700			129,000		
Chromium (Total)	1.29			3.23			2.44			2.43		
Cobalt	0.64	B	J	1.11			0.86	B	J	0.93	B	J
Copper	2.43			4.09			3.41			3.13		
Iron	1,290			3,240			2,150			2,100		
Lead	0.96	B		2.53			1.22	B		1.47	B	
Magnesium	5,800			12,400			9,610			4,750		
Manganese	33.8			83.6			57.3			41.4		
Nickel	0.84	B	J	2.42	B	J	2.04	B	J	2.18	B	J
Potassium	592			1,050			617			517		
Selenium	0.57	U		0.52	U		0.54	U		0.58	B	
Silver	0.1	U		0.095	U		0.098	U		0.095	U	
Sodium	8,560			10,900			5,820			5,630		
Thallium	0.29	U		0.27	U		0.28	U		0.51	B	J
Vanadium	3.85			8.31			7.45			5.74		
Zinc	4.48			13.3			7.58			7.68		
Mercury	0.016	B		0.014	B		0.0048	U		0.0072	B	
Total Petroleum Hydrocarbons (USEPA SW846 8015B)	µg/kg			µg/kg			µg/kg			µg/kg		
Diesel Range Organics (C10-C22)	1,880	U		1,750	U		1,800	U		1,750	U	
Oil Range Organics (>C22-C36)	3,930	J		3,290	J		2,660	U		2,590	U	
Gasoline Range Organics (C6-C10)	811	U		807	U		1,030	U		817	U	
Volatile Organic Compounds (USEPA SW846 8260B)	µg/kg			µg/kg			µg/kg			µg/kg		
1,2,4-Trimethylbenzene	0.169	U		0.142	U		0.154	U		0.148	U	
2-Butanone (MEK)	7.9		J	9.94		J	6.74		J	9.18		J
Acetone	18.7	J		38.7	J		17.8	J		26.6	J	
Benzene	0.828	J	J	1.02	J		3.91	J		4.16	J	
Chloroform	0.888	J	J	0.861	J	J	0.851	J	J	0.935	J	J
Toluene	0.49	J	J	1.04	J		3.17	J		2.81	J	
m,p-Xylene	0.504	U		0.425	U		0.459	U		0.441	U	
n-Hexane	0.491	J	J	1.18	J	J	1.97	J	J	2.36	J	J
o-Xylene	1.06	J	J	0.964	J	J	1.22	J	J	1.23	J	J
Semi-Volatile Organic Compounds (USEPA SW846 8270C)	µg/kg			µg/kg			µg/kg			µg/kg		
bis(2-Ethylhexyl)phthalate	29	U		26.6	U		27.8	U		26.6	U	
Pentachlorophenol	186	U		171	U		178	U		171	U	

Notes:

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USEPA = U.S. Environmental Protection Agency
SM = Standard Method
TAL = Target Analyte List
µg/kg = Micrograms per kilogram
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Qualifiers:
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J = Indicates an estimated value
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Client Sample Nomenclature:
AOCU = Area of Concern U (Lost River Basin)
HA = Hand Auger Sample (subsurface soil)
Final digit(s) = Ending depth of the sample interval (feet below ground surface)
SA = Source Area [Suspected] (surface soil)

[1] Table A-1, NMED Soil Screening Levels. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012).
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
[4] USEPA Region 3, 6, and 9 Regional Screening Levels (RSLs) (November 2012)
[5] No Value established for NMED Residential SSL (June 2012) and USEPA RSL (November 2012)
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Residential Direct Exposure. Risk Assessment Guidance for Site Investigations and Remediation (NMED, June 2012).

Bold value indicates analytes above NMED SSLs (June, 2012) or TPH results above NMED TPH Screening Guidelines (June, 2012)
Indicates that the combined TPH-GRO/DRO/ORO results exceed the NMED TPH Screening Guidelines (Kerosene and Jet Fuel, Residential Direct Exposure, Table 6-3)
Indicates analytical results above the NMED Residential SSL, but below the NMED Approved Background Level
Indicates analytical results above the NMED Approved Background Level, but below the NMED Residential SSL or USEPA RSL
Indicates analytical results above the NMED Approved Background Level, but without established NMED Residential SSL or USEPA RSL

Table C.13.3
AOC-U Subsurface and Surface Soil Analytical Results (July 2011)

Client Sample Identification:	Soil Screening Levels	Basewide Background	AOCU-HA68-2			AOCU-HA69-2			AOCU-HA69-2-A			AOCU-HA71-2			AOCU-HA84-10			AOCU-HA91-2			AOCU-SA01			AOCU-SA02		
Lab Sample Identification:	NMED Residential[1]	NMED Approved Background Level[2]	21107141206			21107141207			21107141208			21107141209			21107141210			21107141211			21107150503			21107150504		
Date Sampled:			7/13/2011			7/13/2011			7/13/2011			7/13/2011			7/13/2011			7/13/2011			7/14/2011			7/14/2011		
Analyte (Method)			Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1	Result[3]	Q	Q1
General Chemistry (SM 2540G)	%	%	%			%			%			%			%			%			%			%		
Total Moisture	NV	NV	23			24.5			31.7			28.9			23.3			21.2			27.4			47.9		
Nitrate (USEPA 353.2)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Nitrate	125,000	NV	9.73			12			12.9			9.33			24.9			1.63			223			477		
Perchlorate (USEPA SW846 6860)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Perchlorate	54.8	NV	0.00149	NU		0.00749	JN	J	0.0137	N	J	0.00738	N		0.00134	NU		0.00128	NU		0.0656	N		42.3	N	
TAL Metals Analysis (USEPA SW846 6010B/7471B)	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg		
Aluminum	78,000	13,722	699			2,290			1,860			1,410			7,410			3,330			NA			NA		
Antimony	31.3	1.6	0.38	B		0.31	U		0.35	U		0.33	U		0.31	B		0.76	B		NA			NA		
Arsenic	3.9	3.7	0.75	B	J	1.4	B	J	0.84	B	J	0.25	U		2.31	B	J	0.99	B	J	NA			NA		
Barium	15,600	169.3	11.3			20.6			19.8			25.3			66.3			38			NA			NA		
Beryllium	156	1.6	0.031	B	J	0.11	B	J	0.11	B	J	0.074	B	J	0.66			0.17	B	J	NA			NA		
Cadmium	70.3	0.3	0.15	B	J	0.24	B	J	0.24	B	J	0.27	B	J	0.38	B	J	0.21	B	J	NA			NA		
Calcium	NV[5]	317,332	96,100			144,000			155,000			129,000			119,000			118,000			NA			NA		
Chromium (Total)	NV[5]	25	0.92	B		2.51			2.02			1.63			9.74			3.82			NA			NA		
Cobalt	23[4]	7.7	0.31	B	J	0.89	B	J	0.69	B	J	0.61	B	J	4.3			1.55			NA			NA		
Copper	3,130	13	2.25			4.03			2.94			1.84			7.67			3.29			NA			NA		
Iron	54,800	23,049	675			2,220			1,680			1,350			9,590			3,500			NA			NA		
Lead	400	10.9	0.29	B		1.65		J	0.54	B	J	0.34	B		6.54			1.97			NA			NA		
Magnesium	NV[5]	16,991	3,460			11,300		J	6,230		J	3,660			6,180			5,060			NA			NA		
Manganese	1,860	393	20			59.7			42.6			24.5			233			80.1			NA			NA		
Nickel	1,560	17.4	0.61	B	J	2.08	B	J	1.56	B	J	1.21	B	J	10.5			3.46	B	J	NA			NA		
Potassium	NV[5]	5,077	228			663			517			383			1,830			968			NA			NA		
Selenium	391	1.4	0.5	U		0.51	U		0.56	U		0.54	U		0.51	B		0.49	U		NA			NA		
Silver	391	1.1	0.091	U		0.092	U		0.1	U		0.098	U		0.09	U		0.089	U		NA			NA		
Sodium	NV[5]	5,196	2,760			11,700		J	3,770		J	2,540			4,490			7,620			NA			NA		
Thallium	0.782	1.3	0.26	U		0.26	U		0.29	U		0.28	U		0.37	B	J	0.25	U		NA			NA		
Vanadium	391	42.6	3.58			7.16			6.04			4.48			20.4			9.38			NA			NA		
Zinc	23,500	54.6	2.56			7.84			6.1			4.68			31			10.7			NA			NA		
Mercury	15.6	10.8	0.0044	U		0.0045	U		0.005	U		0.0047	U		0.0045	U		0.0043	U		NA			NA		
Total Petroleum Hydrocarbons (USEPA SW846 8015B)	mg/kg	mg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
Diesel Range Organics (C10-C22)	1,000[6]	NV	1,660	U		1,690	U		1,890	U		1,780	U		1,680	U		1,630	U		NA			NA		
Oil Range Organics (>C22-C36)	1,000[6]	NV	2,450	U		2,500	U		2,790	U		2,640	U		2,480	U		2,410	U		NA			NA		
Gasoline Range Organics (C6-C10)	1,000[6]	NV	757	U		825	U		985	U		780	U		803	U		665	U		NA			NA		
Volatile Organic Compounds (USEPA SW846 8260B)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
1,2,4-Trimethylbenzene	62[4]	NV	0.123	U		0.136	U		0.142	U		0.313	J		0.75	J		0.117	U		NA			NA		
2-Butanone (MEK)	37,100	NV	7.17		J	5.18	J	J	5.18	J	J	5.31	J	J	4.9	J	J	6.29		J	NA			NA		
Acetone	66,600	NV	16.6	J	J	9.1	J	J	10.9	J	J	8.28	J	J	4.47	J	J	16.9	J		NA			NA		
Benzene	15.4	NV	2.6	J		2.09	J		2.39	J		6.2			6.29			2.59	J		NA			NA		
Chloroform	5.86	NV	0.788	J	J	0.839	J	J	0.703	J	J	0.838	J	J	0.679	J	J	0.772	J	J	NA			NA		
Toluene	5,270	NV	2.6	J		1.79	J		2.27	J		6.7			6.61			2.44	J		NA			NA		
m,p-Xylene	NV[5]	NV	0.366	U		0.407	U		0.422	U		1.1	J		1.8	J		0.349	U		NA			NA		
n-Hexane	938	NV	1.77	J	J	1.46	J	J	1.81	J	J	3.04	J		3.42	J		1.46	J	J	NA			NA		
o-Xylene	898	NV	1.01	J	J	1.03	J	J	1.09	J	J	1.48	J	J	1.56	J	J	0.953	J	J	NA			NA		
Semi-Volatile Organic Compounds (USEPA SW846 8270C)	mg/kg	µg/kg	µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg			µg/kg		
bis(2-Ethylhexyl)phthalate	347	NV	25.4	U		26	U		28.7	U		27.5	U		25.6	U		24.5	U		NA			NA		
Pentachlorophenol	8.94	NV	163	U		167	U		184	U		177	U		164	U		157	U		NA			NA		

Notes:
NMED = New Mexico Environment Department
USEPA = U.S. Environmental Protection Agency
SM = Standard Method
TAL = Target Analyte List
µg/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram
% = Percent
NV = No Value
NA = Not Analyzed
MDL = Method Detection Limit
RDL = Reporting Detection Limit
Q = Laboratory Qualifier
Q1 = Validating Chemist Qualifier
Qualifiers:
U = Not detected
J = Indicates an estimated value
B = (Organics) Indicates the analyte was detected in the associated Method Blank
B = (Inorganics) Indicates the result is between the RDL and the MDL
N = Parameter is Environmental Laboratory Accreditation Program (ELAP) accredited but not National Environmental Laboratory Accreditation Conference (NELAC) certified
Client Sample Nomenclature:
AOCU = Area of Concern U (Lost River Basin)
HA = Hand Auger Sample (subsurface soil)
Final digit(s) = Ending depth of the sample interval (feet below ground surface)
SA = Source Area [Suspected] (surface soil)

[1] Table A-1, NMED Soil Screening Levels. *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, June 2012).
[2] Table 1, Conditional Approval Letter, Basewide Background Study Report, Holloman Air Force Base, New Mexico (NMED, December 2011)
[3] If results are not detected (U) then the value is set at the Method Detection Limit (MDL)
[4] USEPA Region 3, 6, and 9 Regional Screening Levels (RSLs) (November 2012)
[5] No Value established for NMED Residential SSL (June 2012) and USEPA RSL (November 2012)
[6] Table 6-3, TPH Screening Guidelines for Kerosene and Jet Fuel, Residential Direct Exposure. Risk Assessment Guidance for Site Investigations and Remediation (NMED, June 2012).
Bold value indicates analytes above NMED SSLs (June, 2012) or TPH results above NMED TPH Screening Guidelines (June, 2012)
Indicates that the combined TPH-GRO/DRO/ORO results exceed the NMED TPH Screening Guidelines (Kerosene and Jet Fuel, Residential Direct Exposure, Table 6-3)
Indicates analytical results above the NMED Residential SSL, but below the NMED Approved Background Level
Indicates analytical results above the NMED Approved Background Level, but below the NMED Residential SSL or USEPA RSL
Indicates analytical results above the NMED Approved Background Level, but without established NMED Residential SSL or USEPA RSL

Table C.13.4
AOC-U Soil Geotechnical Results (July 2011)

Sample Identification	Method	Unit	AOCU-HA12-2	AOCU-HA91-2	Average
Depth (ft bgs)			1-2	1-2	
Date sampled			7/11/2011	7/13/2011	
Parameter					
Bulk Density (Dry Basis)	ASTM D2937-94 M	g/mL	1.4	1.6	1.500
Fractional Organic Carbon	ASTM D2974-87	%	7.4	5.0	6.200
Moisture Content (Solids, Percent)	SM19 2540G	%	78.8	83.3	81.050
Specific Gravity	ASTM 1429		1.8	2.0	1.900

Notes:
ASTM - American Society for Testing and Materials
SM = Standard Method
ft bgs - Feet below ground surface
g/mL - grams per milliliter
% - percent
AOCU - Area of Concern U (Lost River Basin)
HA - Hand Auger Sample

Table C.14.1
AOC-838 - SS-72 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS72-DP01-5		SS72-DP02-5		SS72-DP03-5	
Lab Sample ID:	NMED	F48762-2		F48762-1		F48762-4	
Date Sampled:	Residential[1]	4/16/2007		4/16/2007		4/13/2007	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q
	µg/kg	µg/kg		µg/kg		µg/kg	
Volatile Organic Compounds							
Acetone	28,100,000	57	U	59	U	60	U
Acetonitrile	NV	57	U	59	U	60	U
Acrolein	206	28	U	30	U	30	U
Acrylonitrile	4,270	28	U	30	U	30	U
Allyl chloride	NV	28	U	30	U	30	U
Benzene	10,300	5.7	U	5.9	U	6.0	U
Benzyl Chloride	NV	5.7	U	5.9	U	6.0	U
Bromobenzene	37,000	5.7	U	5.9	U	6.0	U
Bromochloromethane	NV	5.7	U	5.9	U	6.0	U
Bromodichloromethane	14,400	5.7	U	5.9	U	6.0	U
Bromoform	621,000	5.7	U	5.9	U	6.0	U
n-Butylbenzene	62,100	5.7	U	5.9	U	6.0	U
sec-Butylbenzene	60,600	5.7	U	5.9	U	6.0	U
tert-Butylbenzene	106,000	5.7	U	5.9	U	6.0	U
Chlorobenzene	194,000	5.7	U	5.9	U	6.0	U
Chloroethane	63,300	5.7	U	5.9	U	6.0	U
Chloroform	4,000	5.7	U	5.9	U	6.0	U
1-Chlorohexane	NV	5.7	U	5.9	U	6.0	U
o-Chlorotoluene	202,000	5.7	U	5.9	U	6.0	U
p-Chlorotoluene	NV	5.7	U	5.9	U	6.0	U
2-Chloroethyl vinyl ether	NV	28	U	30	U	30	U
Carbon disulfide	460,000	5.7	U	5.9	U	6.0	U
Carbon tetrachloride	3,470	5.7	U	5.9	U	6.0	U
1,1-Dichloroethane	1,400,000	5.7	U	5.9	U	6.0	U
1,1-Dichloroethylene	206,000	5.7	U	5.9	U	6.0	U
1,1-Dichloropropene	NV	5.7	U	5.9	U	6.0	U
1,2-Dibromo-3-chloropropane	1,840	5.7	U	5.9	U	6.0	U
1,2-Dibromoethane	504	5.7	U	5.9	U	6.0	U
1,2-Dichloroethane	6,040	5.7	U	5.9	U	6.0	U
1,2-Dichloropropane	6,000	5.7	U	5.9	U	6.0	U
1,3-Dichloropropane	NV	5.7	U	5.9	U	6.0	U
2,2-Dichloropropane	NV	5.7	U	5.9	U	6.0	U
Dibromochloromethane	14,800	5.7	U	5.9	U	6.0	U
Dichlorodifluoromethane	161,000	5.7	U	5.9	U	6.0	U
cis-1,2-Dichloroethylene	76,500	5.7	U	5.9	U	6.0	U
cis-1,3-Dichloropropene	NV	5.7	U	5.9	U	6.0	U
cis-1,4-Dichloro-2-Butene	NV	28	U	30	U	30	U
m-Dichlorobenzene	32,600	5.7	U	5.9	U	6.0	U
o-Dichlorobenzene	37,400	5.7	U	5.9	U	6.0	U
p-Dichlorobenzene	39,500	5.7	U	5.9	U	6.0	U
trans-1,2-Dichloroethylene	112,000	5.7	U	5.9	U	6.0	U
trans-1,3-Dichloropropene	NV	5.7	U	5.9	U	6.0	U
Ethylbenzene	128,000	5.7	U	5.9	U	6.0	U
Ethyl methacrylate	52,700	28	U	30	U	30	U

Table C.14.1
AOC-838 - SS-72 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS72-DP01-5		SS72-DP02-5		SS72-DP03-5	
Lab Sample ID:	NMED	F48762-2		F48762-1		F48762-4	
Date Sampled:	Residential[1]	4/16/2007		4/16/2007		4/13/2007	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q
Freon 113	3,280,000	5.7	U	5.9	U	6.0	U
2-Hexanone	NV	28	U	30	U	30	U
Hexachlorobutadiene	12,200	5.7	U	5.9	U	6.0	U
Hexane	38,000	5.7	U	5.9	U	6.0	U
Isopropylbenzene	271,000	5.7	U	5.9	U	6.0	U
p-Isopropyltoluene	NV	5.7	U	5.9	U	6.0	U
4-Methyl-2-pentanone	NV	28	U	30	U	30	U
Methacrylonitrile	3,840	28	U	30	U	30	U
Methyl bromide	8,510	5.7	U	5.9	U	6.0	U
Methyl chloride	NV	5.7	U	5.9	U	6.0	U
Methyl iodide	NV	11	U	12	U	12	U
Methyl methacrylate	2,920,000	28	U	30	U	30	U
Methylene bromide	179,000	5.7	U	5.9	U	6.0	U
Methylene chloride	182,000	11	U	12	U	12	U
Methyl ethyl ketone	31,800,000	28	U	30	U	30	U
Methyl Tert Butyl Ether	388,000	5.7	U	5.9	U	6.0	U
Naphthalene	79,500	5.7	U	5.9	U	6.0	U
Pentachloroethane	NV	28	U	30	U	30	U
Propionitrile	NV	57	U	59	U	60	U
n-Propylbenzene	62,100	5.7	U	5.9	U	6.0	U
Styrene	100,000	5.7	U	5.9	U	6.0	U
1,1,1,2-Tetrachloroethane	43,200	5.7	U	5.9	U	6.0	U
1,1,1-Trichloroethane	563,000	5.7	U	5.9	U	6.0	U
1,1,2,2-Tetrachloroethane	5,550	5.7	U	5.9	U	6.0	U
1,1,2-Trichloroethane	11,900	5.7	U	5.9	U	6.0	U
1,2,3-Trichlorobenzene	NV	5.7	U	5.9	U	6.0	U
1,2,3-Trichloropropane	86	5.7	U	5.9	U	6.0	U
1,2,4-Trichlorobenzene	69,300	5.7	U	5.9	U	6.0	U
1,2,4-Trimethylbenzene	58,000	5.7	U	5.9	U	6.0	U
1,3,5-Trimethylbenzene	24,800	5.7	U	5.9	U	6.0	U
Tetrachloroethylene	12,500	5.7	U	5.9	U	6.0	U
Toluene	252,000	5.7	U	5.9	U	6.0	U
Trichloroethylene	638	5.7	U	5.9	U	6.0	U
Trichlorofluoromethane	588,000	5.7	U	5.9	U	6.0	U
Trans-1,4-Dichloro-2-Butene	NV	28	U	30	U	30	U
Vinyl chloride	2,250	5.7	U	5.9	U	6.0	U
Vinyl Acetate	1,070,000	28	U	30	U	30	U
m,p-Xylene	82,000	11	U	12	U	12	U
o-Xylene	99,500	5.7	U	5.9	U	6.0	U
Semi-Volatile Organic Compounds	µg/kg	µg/kg		µg/kg		µg/kg	
Benzoic acid	NV	1,000	U	1,100	U	1,100	U
2-Chlorophenol	166,000	210	U	230	U	220	U
4-Chloro-3-methyl phenol	NV	210	U	230	U	220	U
2,4-Dichlorophenol	183,000	210	U	230	U	220	U

Table C.14.1
AOC-838 - SS-72 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS72-DP01-5		SS72-DP02-5		SS72-DP03-5	
Lab Sample ID:	NMED	F48762-2		F48762-1		F48762-4	
Date Sampled:	Residential[1]	4/16/2007		4/16/2007		4/13/2007	
Analyte		Result[2]	Q	Result[2]	Q	Result[2]	Q
2,4-Dimethylphenol	1,220,000	210	U	230	U	220	U
2,4-Dinitrophenol	122,000	1,000	U	1,100	U	1,100	U
4,6-Dinitro-o-cresol	6,110	410	U	450	U	440	U
2-Methylphenol	NV	210	U	230	U	220	U
3&4-Methylphenol	NV	210	U	230	U	220	U
2-Nitrophenol	NV	210	U	230	U	220	U
4-Nitrophenol	NV	1,000	U	1,100	U	1,100	U
Pentachlorophenol	29,800	1,000	U	1,100	U	1,100	U
Phenol	18,300,000	210	U	230	U	220	U
2,4,5-Trichlorophenol	6,110,000	210	U	230	U	220	U
2,4,6-Trichlorophenol	6,110	210	U	230	U	220	U
Acenaphthene	3,730,000	210	U	230	U	220	U
Acenaphthylene	NV	210	U	230	U	220	U
Anthracene	22,000,000	210	U	230	U	220	U
Benzidine	21	2,100	U	2,300	U	2,200	U
Benzo(a)anthracene	6,210	210	U	230	U	220	U
Benzo(a)pyrene	621	210	U	230	U	220	U
Benzo(b)fluoranthene	6,210	210	U	230	U	220	U
Benzo(g,h,i)perylene	NV	210	U	230	U	220	U
Benzo(k)fluoranthene	62,100	210	U	230	U	220	U
4-Bromophenyl phenyl ether	NV	210	U	230	U	220	U
Butyl benzyl phthalate	NV	410	U	450	U	440	U
Benzyl Alcohol	NV	210	U	230	U	220	U
2-Chloronaphthalene	3,990,000	210	U	230	U	220	U
4-Chloroaniline	NV	410	U	450	U	440	U
Chrysene	615,000	210	U	230	U	220	U
bis(2-Chloroethoxy)methane	NV	210	U	230	U	220	U
bis(2-Chloroethyl)ether	2,440	210	U	230	U	220	U
bis(2-Chloroisopropyl)ether	38,700	210	U	230	U	220	U
4-Chlorophenyl phenyl ether	NV	210	U	230	U	220	U
1,2-Dichlorobenzene	37,400	210	U	230	U	220	U
1,3-Dichlorobenzene	32,600	210	U	230	U	220	U
1,4-Dichlorobenzene	39,500	210	U	230	U	220	U
2,4-Dinitrotoluene	122,000	210	U	230	U	220	U
2,6-Dinitrotoluene	NV	210	U	230	U	220	U
3,3'-Dichlorobenzidine	10,800	410	U	450	U	440	U
Dibenzo(a,h)anthracene	621	210	U	230	U	220	U
Dibenzofuran	142,000	210	U	230	U	220	U
Di-n-butyl phthalate	6,110,000	410	U	450	U	440	U
Di-n-octyl phthalate	NV	410	U	450	U	440	U
Diethyl phthalate	48,900,000	410	U	450	U	440	U
Dimethyl phthalate	100,000,000	410	U	450	U	440	U
bis(2-Ethylhexyl)phthalate	347,000	410	U	450	U	440	U
Fluoranthene	2,290,000	210	U	230	U	220	U
Fluorene	2,660,000	210	U	230	U	220	U
Hexachlorobenzene	3,040	210	U	230	U	220	U

Table C.14.1
AOC-838 - SS-72 Soil Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Soil Screening Levels	SS72-DP01-5		SS72-DP02-5		SS72-DP03-5	
Lab Sample ID:	NMED	F48762-2		F48762-1		F48762-4	
Date Sampled:	Residential[1]	4/16/2007		4/16/2007		4/13/2007	
Analyte		**Result[2]**	**Q**	**Result[2]**	**Q**	**Result[2]**	**Q**
Hexachlorobutadiene	12,200	210	U	230	U	220	U
Hexachlorocyclopentadiene	366,000	210	U	230	U	220	U
Hexachloroethane	61,100	210	U	230	U	220	U
Indeno(1,2,3-cd)pyrene	6,210	210	U	230	U	220	U
Isophorone	5,120,000	210	U	230	U	220	U
2-Methylnaphthalene	NV	210	U	230	U	220	U
2-Nitroaniline	NV	410	U	450	U	440	U
3-Nitroaniline	NV	410	U	450	U	440	U
4-Nitroaniline	NV	410	U	450	U	440	U
Naphthalene	79,500	210	U	230	U	220	U
Nitrobenzene	22,800	210	U	230	U	220	U
N-Nitroso-di-n-propylamine	NV	210	U	230	U	220	U
N-Nitrosodiphenylamine	993,000	210	U	230	U	220	U
Phenanthrene	1,830,000	210	U	230	U	220	U
Pyrene	2,290,000	210	U	230	U	220	U
1,2,4-Trichlorobenzene	69,300	210	U	230	U	220	U

Notes:
NA = Not Applicable (or not analyzed)
NMED = New Mexico Environment Department
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NV = No Value
Q = Qualifier
U = Not detected
J = Indicates an estimated value
[1]NMED, June 2006. Technical Background Document for Development of Soil Screening Levels, Revision 4.0.
[2] If results are not detected (U) then the value is set at the Reporting Limit (RL)
Bold value indicates analytes above NMED Soil Screening Levels (Rev 4.0, Jun 2006)

Table C.14.2
AOC-838 - SS-72 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS72-DP01		SS72-DP02		SS72-DP03	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48815-1		F48815-2		F48762-6	
Date Sampled:			4/16/2007		4/16/2007		4/15/2007	
Analyte			Result[2]	Q	Result[2]	Q	Result[2]	Q
Volatile Organic Compounds	µg/L	µg/L	µg/L		µg/L		µg/L	
Acetone	NV	NV	14.8	J	23.1	J	34.9	
Acetonitrile	NV	NV	20	U	20	U	20	U
Acrolein	NV	NV	20	U	20	U	20	U
Acrylonitrile	NV	NV	10	U	10	U	10	U
Allyl chloride	NV	NV	10	U	10	U	10	U
Benzene	10	5	1.0	U	1.0	U	1.0	U
Benzyl Chloride	NV	NV	1.0	U	1.0	U	1.0	U
Bromobenzene	NV	NV	1.0	U	1.0	U	1.0	U
Bromochloromethane	NV	NV	1.0	U	1.0	U	1.0	U
Bromodichloromethane	NV	NV	4.8		1.0	U	1.0	U
Bromoform	NV	NV	1.0	U	1.0	U	1.0	U
n-Butylbenzene	NV	NV	1.0	U	1.0	U	1.0	U
sec-Butylbenzene	NV	NV	1.0	U	1.0	U	1.0	U
tert-Butylbenzene	NV	NV	1.0	U	1.0	U	1.0	U
Chlorobenzene	NV	100	1.0	U	1.0	U	1.0	U
Chloroethane	NV	NV	2.0	U	2.0	U	2.0	U
Chloroform	100	NV	17.5		1.0	U	1.0	U
1-Chlorohexane	NV	NV	2.0	U	2.0	U	2.0	U
o-Chlorotoluene	NV	NV	1.0	U	1.0	U	1.0	U
p-Chlorotoluene	NV	NV	1.0	U	1.0	U	1.0	U
2-Chloroethyl vinyl ether	NV	NV	5.0	U	5.0	U	5.0	U
Carbon disulfide	NV	NV	2.0	U	2.0	U	2.0	U
Carbon tetrachloride	10	5	1.0	U	1.0	U	1.0	U
1,1-Dichloroethane	25	NV	1.0	U	1.0	U	1.0	U
1,1-Dichloroethylene	5	7	1.0	U	1.0	U	1.0	U
1,1-Dichloropropene	NV	NV	1.0	U	1.0	U	1.0	U
1,2-Dibromo-3-chloropropane	NV	0.2	2.0	U	2.0	U	2.0	U
1,2-Dibromoethane	0.1	0.05	1.0	U	1.0	U	1.0	U
1,2-Dichloroethane	10	5	1.0	U	1.0	U	1.0	U
1,2-Dichloropropane	NV	5	1.0	U	1.0	U	1.0	U
1,3-Dichloropropane	NV	NV	1.0	U	1.0	U	1.0	U
2,2-Dichloropropane	NV	NV	1.0	U	1.0	U	1.0	U
Dibromochloromethane	NV	NV	0.59	J	1.0	U	1.0	U
Dichlorodifluoromethane	NV	NV	1.0	U	1.0	U	1.0	U
cis-1,2-Dichloroethylene	NV	70	1.0	U	1.0	U	1.0	U
cis-1,3-Dichloropropene	NV	NV	1.0	U	1.0	U	1.0	U
cis-1,4-Dichloro-2-Butene	NV	NV	10	U	10	U	10	U
m-Dichlorobenzene	NV	NV	1.0	U	1.0	U	1.0	U
o-Dichlorobenzene	NV	600	1.0	U	1.0	U	1.0	U
p-Dichlorobenzene	NV	75	1.0	U	1.0	U	1.0	U
trans-1,2-Dichloroethylene	NV	100	1.0	U	1.0	U	1.0	U
trans-1,3-Dichloropropene	NV	NV	1.0	U	1.0	U	1.0	U
Ethylbenzene	750	700	1.0	U	1.0	U	1.0	U
Ethyl methacrylate	NV	NV	5.0	U	5.0	U	5.0	U

Table C.14.2
AOC-838 - SS-72 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS72-DP01		SS72-DP02		SS72-DP03	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48815-1		F48815-2		F48762-6	
Date Sampled:			4/16/2007		4/16/2007		4/15/2007	
Analyte			Result[2]	Q	Result[2]	Q	Result[2]	Q
Freon 113	NV	NV	1.0	U	1.0	U	1.0	U
2-Hexanone	NV	NV	5.0	U	5.0	U	5.0	U
Hexachlorobutadiene	NV	NV	2.0	U	2.0	U	2.0	U
Hexane	NV	NV	2.0	U	2.0	U	2.0	U
Isopropylbenzene	NV	NV	1.0	U	1.0	U	1.0	U
p-Isopropyltoluene	NV	NV	1.0	U	1.0	U	1.0	U
4-Methyl-2-pentanone	NV	NV	5.0	U	5.0	U	5.0	U
Methacrylonitrile	NV	NV	20	U	20	U	20	U
Methyl bromide	NV	NV	2.0	U	2.0	U	2.0	U
Methyl chloride	NV	NV	2.0	U	2.0	U	2.0	U
Methyl iodide	NV	NV	5.0	U	5.0	U	5.0	U
Methyl methacrylate	NV	NV	5.0	U	5.0	U	5.0	U
Methylene bromide	NV	NV	2.0	U	2.0	U	2.0	U
Methylene chloride	100	5	5.0	U	5.0	U	5.0	U
Methyl ethyl ketone	NV	NV	5.0	U	5.0	U	10.1	
Methyl Tert Butyl Ether	NV	NV	1.0	U	1.0	U	1.0	U
Naphthalene	30	NV	2.0	U	2.0	U	2.0	U
Pentachloroethane	NV	NV	10	U	10	U	10	U
Propionitrile	NV	NV	20	U	20	U	20	U
n-Propylbenzene	NV	NV	1.0	U	1.0	U	1.0	U
Styrene	NV	100	1.0	U	1.0	U	1.0	U
1,1,1,2-Tetrachloroethane	NV	NV	1.0	U	1.0	U	1.0	U
1,1,1-Trichloroethane	60	200	1.0	U	1.0	U	1.0	U
1,1,2,2-Tetrachloroethane	10	NV	1.0	U	1.0	U	1.0	U
1,1,2-Trichloroethane	10	5	1.0	U	1.0	U	1.0	U
1,2,3-Trichlorobenzene	NV	NV	1.0	U	1.0	U	1.0	U
1,2,3-Trichloropropane	NV	NV	2.0	U	2.0	U	2.0	U
1,2,4-Trichlorobenzene	NV	70	1.0	U	1.0	U	1.0	U
1,2,4-Trimethylbenzene	NV	NV	2.0	U	2.0	U	2.0	U
1,3,5-Trimethylbenzene	NV	NV	2.0	U	2.0	U	2.0	U
Tetrachloroethylene	20	5	1.0	U	1.0	U	1.0	U
Toluene	750	1,000	1.0	U	1.0	U	1.0	U
Trichloroethylene	100	5	1.0	U	0.80	J	1.0	U
Trichlorofluoromethane	NV	NV	2.0	U	2.0	U	2.0	U
Trans-1,4-Dichloro-2-Butene	NV	NV	10	U	10	U	10	U
Vinyl chloride	1	2	1.0	U	1.0	U	1.0	U
Vinyl Acetate	NV	NV	10	U	10	U	10	U
m,p-Xylene	620	10,000	2.0	U	2.0	U	2.0	U
o-Xylene	620	10,000	1.0	U	1.0	U	1.0	U

Table C.14.2
AOC-838 - SS-72 Groundwater Analytical Results
RFA Confirmatory Sampling Multiple Sites

Client Sample ID:	Groundwater Screening Levels		SS72-DP01		SS72-DP02		SS72-DP03	
Lab Sample ID:	NMWQCC[1]	EPA MCL	F48815-1		F48815-2		F48762-6	
Date Sampled:			4/16/2007		4/16/2007		4/15/2007	
Analyte			Result[2]	Q	Result[2]	Q	Result[2]	Q
General Chemistry	mg/L		mg/L		mg/L		mg/L	
Solids, Total Dissolved	1,000	NV	**2,580**		**3,080**		**3,990**	

Notes:
NA = Not Applicable (or not analyzed)
NMWQCC = New Mexico Water Quality Control Commission
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
UTL = Upper Tolerance Limit
µg/L = micrograms per liter
mg/L = milligrams per liter
NV = No Value
Q = Qualifier
U = Not detected
J = Indicates an estimated value
[1]Standards for Groundwater, if 10,000 mg/L TDS Concentration or Less, New Mexico Administrative Code 20.6.2.3103
[2] If results are not detected (U) then the value is set at the Reporting Limit (RL)
Bold value indicates analytes above New Mexico Groundwater Quality Standard

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NMED APPROVAL LETTERS

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SWMU Nos. 101 and 109 - LF-10 NMED Approval Letter, March 5, 2012

NEW MEXICO
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Hazardous Waste Bureau

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JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
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Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 5, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
SUPPLEMENTAL RCRA FACILITY INVESTIGATION REPORT ADDENDUM FOR LF-10 OLD MAIN BASE LANDFILL (SWMU 109) AND BUILDING 121 LANDFILL (SWMU 101), HOLLOMAN AFB, NOVEMBER 2011
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-11-014

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the *Supplemental RCRA Facility Investigation Report Addendum for LF-10 Old Main Base Landfill (SWMU 109) and Building 121 Landfill (SWMU 101), Holloman AFB, New Mexico, November 2011* which was received on December 1, 2011. The subject RCRA Facility Investigation Report Addendum is hereby approved.

NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) With Controls for LF-10 (SWMU 109 and 101). In this case, the presence of landfill wastes will restrict future land use. HAFB shall maintain the integrity and effectiveness of the cover, including making repairs to the cap as necessary to correct effects of settling, subsidence or erosion. HAFB shall not disturb the integrity of the cover without the prior approval of NMED

HAFB may initiate a Class 3 permit modification request for Corrective Action Complete for LF-10. The Class 3 Permit modification request includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that

SWMU Nos. 101 and 109 - LF-10 NMED Approval Letter, March 5, 2012 (cont.)

Mr. Budak
March 5, 2012
Page 2

corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the Permit modification request process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against HAFB, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

If you have any questions regarding this matter, please contact Brian Salem at (505) 222-9576.

Sincerely,

John E. Kieling
Acting Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
B. Salem, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
L. King, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-11-014

SWMU No. 113A - OT-20 NMED Approval Letter, June 27, 2012

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

**NEW MEXICO
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DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

CEA
CD AB 20120705

June 27, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

**RE: APPROVAL
ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT,
SITES SS-12 AND OT-20, APRIL 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-004**

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the *Accelerated Corrective Measures Completion Report, SS-12 (AOC-K) and OT-20 (SWMU 113A)* which was received on April 18, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for AOC-K and SWMU 113A.

HAFB may initiate a Class 3 permit modification request for CAC for AOC-K and SWMU 113A. The Class 3 Permit modification request includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the Permit modification request process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED

SWMU No. 113A - OT-20 NMED Approval Letter, June 27, 2012 (cont.)

Mr. Budak
June 27, 2012
Page 2

reserves all rights against HAFB, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-004

SWMU No. 114 - OT-03 NMED Approval Letter, August 13, 2012

NEW MEXICO
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DAVE MARTIN
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BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 13, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT,
SITES OT-03 AND OT-45, NOVEMBER 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-010

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *Accelerated Corrective Measures Completion Report, OT-03* (SWMU-114) *and OT-45* (AOC-O) which was received on December 18, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for SWMU-114 and AOC-O.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for these sites in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED

SWMU No. 114 - OT-03 NMED Approval Letter, August 13, 2012 (cont.)

Mr. Budak
August 13, 2012
Page 2

reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
B. Hunt, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-010

SWMU Nos. 118, 132, and AOC A - OT-16 NMED Approval Letter, May 24, 2012

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

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DAVE MARTIN
Secretary

Butch Tongate
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 24, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
APRIL 2009- JANUARY 2010 LONG-TERM MONITORING REPORT FOR OT-16 (SWMUS 118 AND 132 AND AOC-A), DP-30/SD-33 (SWMU 113B), AND SS-39 (SWMUS 165, 167, 177, 179 AND 181) HOLLOMAN AFB, NEW MEXICO, JUNE 2010
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-10-002

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the *April 2009-January 2010 Long-Term Monitoring Report for OT-16 (SWMUs 118 and 132 and AOC-A), DP-30/SD-33 (SWMU 113B), and SS-39 (SWMUs 165, 167, 177, 179 and 181) Holloman AFB, New Mexico, June 2010* which was received on July 6, 2010. The subject Long-Term Monitoring Report is hereby approved.

NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for OT-16 (SWMUs 118 and 132 and AOC-A).

HAFB may initiate a Class 3 permit modification request for Corrective Action Complete for OT-16. The Class 3 Permit modification request includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or

SWMU Nos. 118, 132, and AOC A - OT-16 NMED Approval Letter, May 24, 2012 (cont.)

Mr. Budak
May 24, 2012
Page 2

unknown conditions. As part of the Permit modification request process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against HAFB, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

If you have any questions regarding this matter, please contact Brian Salem at (505) 222-9576.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
B. Salem, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
L. King, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-10-002

SWMU 183 NMED Approval Letter, June 13, 2014

NEW MEXICO
ENVIRONMENT DEPARTMENT

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RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 13, 2014

Ms. DeAnna Rothhaupt
Chief, Holloman AFB Environmental
49 CES/CEIE
550 Tabosa Avenue
Holloman AFB, NM 88330-8261

RE: APPROVAL
RCRA FACILITY INVESTIGATION REPORT, SWMU 183 – BASEWIDE SEWER SYSTEM, MAY 2012
HOLLOMAN AIR FORCE BASE
EPA ID # NM6572124422
HWB-HAFB-12-010

Dear Ms. Rothhaupt:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) Resource Conservation and Recovery Act (RCRA) Facility Investigation Report for Solid Waste Management Unit (SWMU) 183, the Basewide Sewer System, dated May 2012 and received on May 21, 2012. The report is hereby approved.

The Permittee may submit a Class 3 permit modification request (PMR) to NMED to change the status of SWMU 183 from Corrective Action Required to Corrective Action Complete (CAC) in accordance with 20.4.1.900 NMAC incorporating 40 C.F.R. §270.42(c) and the facility's RCRA Permit at Part 4, Appendix 4-B, Section III, *Determination of No Further Action*. The process for a Class 3 PMR includes requirements for public notice and for providing opportunity for public comment that are mandatory. NMED's preliminary determination that corrective action is complete is subject to NMED's reservation of rights to require additional corrective action on the basis of new information, including information that may be provided to the NMED in public comment.

SWMU 183 NMED Approval Letter, June 13, 2014 (cont.)

Ms. Rothhaupt
June 13, 2014
Page 2 of 2

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Rizzuto, HAFB
C. Hendrickson, EPA-Region 6 (6PD-N)

File: HAFB 2014 and Reading
HAFB-12-010

AOC-1 - DP-64 NMED Approval Letter, October 8, 2013

**NEW MEXICO
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RYAN FLYNN
Cabinet Secretary-Designate

BUTCH TONGATE
Deputy Secretary

THOMAS BLAINE, PE
Director
Environmental Health Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 8, 2013

Ms. DeAnna Rothhaupt
Chief, Compliance and Restoration
49 CES/CEAN
550 Tabosa Avenue
Holloman AFB, NM 88330-8261

**RE: APPROVAL
RCRA FACILITY INVESTIGATION REPORT, CHEMICAL AGENT DISPOSAL SITE (DP-64), FEBRUARY 2012
HOLLOMAN AIR FORCE BASE
EPA ID # NM6572124422
HWB-HAFB-12-005**

Dear Ms. Rothhaupt:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) Resource Conservation and Recovery Act (RCRA) Facility Investigation Report for the Chemical Agent Disposal Site, DP-64 (AOC-I), dated February 2012 and received on February 15, 2012. The report is hereby approved and the data indicate that contaminants do not pose an unacceptable level of risk under a residential land use scenario.

The Permittee may submit a permit modification request (PMR) to NMED to change the status of AOC-I (DP-64) from Corrective Action Required to Corrective Action Complete (CAC) Without Controls in accordance with 20.4.1.900 NMAC incorporating 40 C.F.R. §270.42(c). The process for a Class 3 PMR includes requirements for public notice and for providing opportunity for public comment that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions.

AOC-1 - DP-64 NMED Approval Letter, October 8, 2013 (cont.)

Ms. Rothhaupt
October 8, 2013
Page 2 of 2

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
B. Salem, NMED HWB
C. Hendrickson, EPA-Region 6 (6PD-N)
L. King, EPA-Region 6 (6PD-N)

File: HAFB 2013 and Reading
HAFB-12-005

AOC-3 - DP-63 NMED Approval Letter, June 7, 2012

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 7, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
DP-63 ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT, JANUARY 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-001

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the *DP-63 (AOC-3) Accelerated Corrective Measures Completion Report* which was received on January 28, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for AOC-3.

HAFB may initiate a Class 3 permit modification request for Corrective Action Complete for AOC-3. The Class 3 Permit modification request includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the Permit modification request process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against HAFB, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

AOC-3 - DP-63 NMED Approval Letter, June 7, 2012 (cont.)

Mr. Budak
June 7, 2012
Page 2

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-001

AOC-4 - West POL Yard NMED Approval Letter, January 26, 2011

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Hazardous Waste Bureau

**2905 Rodeo Park Drive East, Building 1
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JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

RAJ SOLOMON, P.E.
Deputy Secretary

01-28-2011 09:04

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 26, 2011

CD | ADB 28 Jan 11
CEA | BH 28 JAN 11
CEAR | BH 28 JAN 11

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

**RE: APPROVAL: RESPONSE TO THE NOTICE OF DISAPPROVAL, FINAL WEST POL YARD ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT, HOLLOMAN AIR FORCE BASE, JUNE 2010
EPA ID #NM6572124422
HWB HAFB-08-008**

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the subject Accelerated Corrective Measures (ACM) Completion Report submitted by Holloman Air Force Base in response to the NMED's Notice of Disapproval dated May 14, 2009. The NMED hereby approves the subject ACM Completion Report and associated responses to the NOD.

AOC-4 - West POL Yard NMED Approval Letter, January 26, 2011 (cont.)

Mr. Budak
January 26, 2011
Page 2

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

Sincerely,

John E. Kieling
Program Manager
Permits Management Program
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
L. King, EPA, Region 6 (6PD-F)
File: HAFB 2011 and Reading
HWB HAFB-08-008

AOC-C - SS-66 NMED Approval Letter, June 18, 2012

NEW MEXICO
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JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 18, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
RCRA FACILITY ASSESSMENT CONFIRMATORY SAMPLING REPORT, MULTIPLE SITES (SS-66, SS-68, RW-70, SS-72 AND SS-73), MAY 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-006

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites, SS-66 (*AOC-C*), SS-68 (*AOC-F*), RW-70 (*AOC-M*), SS-72 (*AOC-838*) and SS-73 (*AOC-1088*)* which was received on June 27, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete Without Controls (CAC) for AOC-C, AOC-M, AOC-838 and AOC-1088. Please note that site AOC-F (SS-68) is currently in the process of being granted CAC status through a separate permit modification procedure.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for sites AOC-C, AOC-M, AOC-838 and AOC-1088 in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public

AOC-C - SS-66 NMED Approval Letter, June 18, 2012 (cont.)

Mr. Budak
July 18, 2012
Page 2

comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-006

AOC-K - SS-12 NMED Approval Letter, June 27, 2012

NEW MEXICO
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JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

CEA
CD AB 20120705

June 27, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT,
SITES SS-12 AND OT-20, APRIL 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-004

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed the *Accelerated Corrective Measures Completion Report, SS-12 (AOC-K) and OT-20 (SWMU 113A)* which was received on April 18, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for AOC-K and SWMU 113A.

HAFB may initiate a Class 3 permit modification request for CAC for AOC-K and SWMU 113A. The Class 3 Permit modification request includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the Permit modification request process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED

AOC-K - SS-12 NMED Approval Letter, June 27, 2012 (cont.)

Mr. Budak
June 27, 2012
Page 2

reserves all rights against HAFB, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-004

AOC-M - RW-70 NMED Approval Letter, July 18, 2012

NEW MEXICO
ENVIRONMENT DEPARTMENT

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DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 18, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
RCRA FACILITY ASSESSMENT CONFIRMATORY SAMPLING REPORT, MULTIPLE SITES (SS-66, SS-68, RW-70, SS-72 AND SS-73), MAY 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-006

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites, SS-66 (*AOC-C*), SS-68 (*AOC-F*), RW-70 (*AOC-M*), SS-72 (*AOC-838*) and SS-73 (*AOC-1088*)* which was received on June 27, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete Without Controls (CAC) for AOC-C, AOC-M, AOC-838 and AOC-1088. Please note that site AOC-F (SS-68) is currently in the process of being granted CAC status through a separate permit modification procedure.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for sites AOC-C, AOC-M, AOC-838 and AOC-1088 in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public

AOC-M - RW-70 NMED Approval Letter, July 18, 2012 (cont.)

Mr. Budak
July 18, 2012
Page 2

comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-006

AOC-O - OT-45 NMED Approval Letter, August 13, 2012

NEW MEXICO
ENVIRONMENT DEPARTMENT

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JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 13, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
ACCELERATED CORRECTIVE MEASURES COMPLETION REPORT,
SITES OT-03 AND OT-45, NOVEMBER 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-010

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *Accelerated Corrective Measures Completion Report, OT-03* (SWMU-114) *and OT-45* (AOC-O) which was received on December 18, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete (CAC) Without Controls for SWMU-114 and AOC-O.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for these sites in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED

AOC-O - OT-45 NMED Approval Letter, August 13, 2012 (cont.)

Mr. Budak
August 13, 2012
Page 2

reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
B. Hunt, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-010

AOC-U NMED Approval Letter, May 14, 2015

NEW MEXICO
ENVIRONMENT DEPARTMENT

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Lieutenant Governor

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RYAN FLYNN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 14, 2015

DeAnna Rothhaupt
Chief, Compliance and Restoration
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8261

RE: APPROVAL
RCRA FACILITY INVESTIGATION REPORT AOC-U, LOST RIVER BASIN, HOLLOMAN AIR FORCE BASE, NEW MEXICO, MARCH 2013
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-13-004

Dear Ms. Rothhaupt:

The New Mexico Environment Department (NMED) has reviewed the Holloman Air Force Base (Permittee) *RCRA Facility Investigation Report AOC-U, Lost River Basin, Holloman Air Force Base, New Mexico, March 2013*, received on May 8, 2013. The subject report is hereby approved.

The Permittee may request a Class 3 modification to the permit to change the status of AOC-U from Corrective Action Required to Corrective Action Complete in accordance with 40 C.F.R. §270.42(c). The Class 3 modification process includes requirements for public notice and for providing opportunity for public comment that are mandatory. NMED's preliminary determination that corrective action is complete is subject to NMED's reservation of rights if new information or unknown conditions indicate the existence of a potential threat to human health or the environment.

AOC-U, the Lost River Basin, receives surface runoff and groundwater migration from three sites around its perimeter: OT-37 (AOC-L); OT-38 (SWMU-137); and, SS-39 (SWMUs 165, 177, 179 and 181). Corrective action is still ongoing at these three sites. A determination of Corrective Action Complete for AOC-U does not preclude future

AOC-U NMED Approval Letter, May 14, 2015 (cont.)

Ms. Rothhaupt
May 14, 2015
Page 2

remedial activities at the sites referenced above. Should contamination from these sites impact AOC-U, or should other sites in the vicinity have the potential to contaminate soil, groundwater or surface water at AOC-U, future remedial activities may be required within the Lost River Basin (AOC-U).

As part of the permit modification process, new information may become available during the public comment period indicating that a given site is not protective of human health or the environment. NMED reserves all rights to withdraw its preliminary decision that corrective action is complete, if new information indicates that further corrective action is needed to protect human health or the environment.

If you have any questions regarding this matter, please contact Brian Salem of my staff at (505) 222-9576.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
W. Moats, NMED HWB
B. Salem, NMED HWB
D. Strasser, NMED HWB
D. Rizzuto, HAFB
L. King, EPA, Region 6 (6PD-F)
C. Hendrickson, EPA, Region 6 (6PD-F)

File: HAFB 2014 and Reading

AOC-838 - SS-72 NMED Approval Letter, July 18, 2012

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Hazardous Waste Bureau

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DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 18, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

**RE: APPROVAL
RCRA FACILITY ASSESSMENT CONFIRMATORY SAMPLING REPORT, MULTIPLE SITES (SS-66, SS-68, RW-70, SS-72 AND SS-73), MAY 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-006**

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites, SS-66 (*AOC-C*), SS-68 (*AOC-F*), RW-70 (*AOC-M*), SS-72 (*AOC-838*) and SS-73 (*AOC-1088*)* which was received on June 27, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete Without Controls (CAC) for AOC-C, AOC-M, AOC-838 and AOC-1088. Please note that site AOC-F (SS-68) is currently in the process of being granted CAC status through a separate permit modification procedure.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for sites AOC-C, AOC-M, AOC-838 and AOC-1088 in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public

AOC-838 - SS-72 NMED Approval Letter, July 18, 2012 (cont.)

Mr. Budak
July 18, 2012
Page 2

comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-006

AOC-1088 - SS-73 NMED Approval Letter, July 18, 2012

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

July 18, 2012

A. David Budak
Deputy Base Civil Engineer
49 CES/CEVR
550 Tabosa Avenue
Holloman AFB, NM 88330-8458

RE: APPROVAL
RCRA FACILITY ASSESSMENT CONFIRMATORY SAMPLING REPORT, MULTIPLE SITES (SS-66, SS-68, RW-70, SS-72 AND SS-73), MAY 2008
HOLLOMAN AIR FORCE BASE, EPA ID# NM6572124422
HWB-HAFB-08-006

Dear Mr. Budak:

The New Mexico Environment Department (NMED) has reviewed Holloman Air Force Base's (the Permittee's) *RCRA Facility Assessment Confirmatory Sampling Report, Multiple Sites, SS-66 (*AOC-C*), SS-68 (*AOC-F*), RW-70 (*AOC-M*), SS-72 (*AOC-838*) and SS-73 (*AOC-1088*)* which was received on June 27, 2008. The subject *Report* is hereby approved. NMED therefore issues a Certificate of Completion for Corrective Action Complete Without Controls (CAC) for AOC-C, AOC-M, AOC-838 and AOC-1088. Please note that site AOC-F (SS-68) is currently in the process of being granted CAC status through a separate permit modification procedure.

The Permittee may initiate a Class 3 Permit Modification Request (PMR) for CAC for sites AOC-C, AOC-M, AOC-838 and AOC-1088 in accordance with 40 C.F.R. §270.42(c). The Class 3 PMR includes requirements for public notice and for providing opportunity for public

AOC-1088 - SS-73 NMED Approval Letter, July 18, 2012 (cont.)

Mr. Budak
July 18, 2012
Page 2

comments that are mandatory. NMED's determination that corrective action is complete is subject to NMED's reservation of rights for new information or unknown conditions. As part of the PMR process, new information may become available during the public comment period that a previously issued Certificate of Completion for a given site is not protective of human health or the environment. NMED reserves all rights against the Permittee, and may withdraw a previously issued Certificate of Completion for any site where new information indicates that further corrective action is needed to protect human health and the environment.

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

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
D. Strasser, NMED HWB
D. Scruggs, HAFB
C. Hendrickson, EPA, Region 6 (6PD-F)
File: HAFB 2012 and Reading
HAFB-08-006

ATTACHMENTS

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APPENDIX 4-A

TABLE A
LIST OF SOLID WASTE MANAGEMENT UNITS / AREAS OF CONCERN

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

SERIAL NO.	SWMU/AOC	ERP SITE ID	UNIT NAME
1	4	OW-519	Building 131 Oil/Water Separator
2	8	OW-520	Building 231 Oil/Water Separator
3	19	SS-59	Building 638 Oil/Water Separator
4	20	SS-59	Building 639 Oil/Water Separator
5	82	SD-08	Building 131 Washrack
6	101	LF-10	Building 121 Landfill
7	104	LF-29	Former Army Landfill
8	109	LF-10	Old Main Base Landfill
9	111	RW-42	Radioactive Waste Disposal Area
10	113A	OT-20	Sludge Disposal Trenches near Lagoons
11	113B	DP-30/SD-33	Sludge Disposal Trenches Fire Train Area
12	114	OT-03	TEL Disposal Site
13	118	OT-16	Building 21 Pesticides Holding Tank
14	122	TU-521	Building 702 Waste Oil Tank
15	123	TU-521	Building 704 Waste Oil Tank
16	132	OT-16	Building 21 Entomology Leachfield
17	137	OT-38	Building 1166 Test Track Drain Field
18	141	SD-27	Pad 9 Drainage Pit
19	165	SS-39	Building 1176 Pond
20	177	SS-39	Building 1176 Sumps
21	179	SS-39	Discharge Box
22	181	SS-39	Building 1176 Drainage Trough
23	183	N/A	Base-Wide Sewer System
24	197	OT-14	Former Entomology Shop
25	229	SS-59	Test Cell Fuel Spill Site
26	AOC-1	DP-64	Chemical Agent Site
27	AOC-3	DP-63	Ammunition Yard Disposal Pit
28	AOC-4	N/A	West POL Fuel Spill Site
29	AOC-1001	SS-61	Building 1001 Fuel Spill Site
30	AOC-A	OT-16	Building 21 Pesticide Rinse-water Spill Area
31	AOC-B	SS-65	Building 807 Test Cell Surface Spill Area
32	AOC-C	SS-66	Building 835 Spills
33	AOC-E	SS-67	Buildings 903-909 Sand Blast Residues
34	AOC-H	SS-18	Chromic Acid Spill Area
35	AOC-I	SS-69	Fighter Wing Flight Line Spill
36	AOC-J	SS-13	Herbicide Sodium Arsenite Spill Area
37	AOC-K	SS-12	Northeast Fuel Line Spill Site # 1
38	AOC-L	OT-37	Early Missile Test Site
39	AOC-M	RW-70	Building 18 Product Storage Tank

SERIAL NO.	SWMU/AOC	ERP SITE ID	UNIT NAME
40	AOC-O	OT-45	Building 296 Old AGE Refueling Station
41	AOC-Q	SS-17	BX Gas Station Fuel Line Leaks
42	AOC-T	SS-02/05	POL Storage Tank Spill Sites 1 & 2
43	AOC-U	N/A	Lost River Basin
44	AOC-UST-221	TU/US-C503	Building 221 UST
45	AOC-UST-298	TU/US-C508	Building 298 UST
46	AOC-UST-300	TU/US-C500	Building 300 UST
47	AOC-UST-301	TU/US-C504	Building 301 UST
48	AOC-UST-684	TU/US-C516	Building 684 UST
49	AOC-UST-882	TU/US-C514	Building 882 UST
50	AOC-UST-889	TU/US-C515	Building 889 UST
51	AOC-UST-898	TU/US-C513	Building 898 UST
52	AOC-UST-901	TU/US-C506	Building 901 UST
53	AOC-UST-1097	TU/US-C505	Building 1097 UST
54	AOC-UST-1113	TU/US-C501	Building 1113 UST
55	AOC-UST-1272	TU/US-C507	Building 1272 UST
56	AOC-UST-2395	TU/US-C502	Building 2395 UST
57	AOC-UST-7003	TU/US-C518	National Radar Test Facility UST
58	AOC-838	SS-72	TCE Groundwater Contamination Upgradient of LF-21
59	AOC-1088	SS-73	TCE Groundwater Contamination Upgradient of SS-61

TOTAL OF CORRECTIVE ACTION SITES = 59 [i.e., 25 SWMUSs + 34 AOCs].

APPENDIX 4-A

TABLE B

LIST OF SOLID WASTE MANAGEMENT UNITS / AREAS OF CONCERN WITH CORRECTIVE ACTION COMPLETE WITHOUT CONTROLS

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 193 Oil/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	Building 810 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	Building 869 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
40	Building 1166 Oil/Water Separator	Site NFAd in February 2001
41	Building 1266 Oil/Water Separator	Site NFAd in February 2001
42	Building 1 Waste Accumulation Area	Site NFAd in February 2001

SWMU/AOC	DESCRIPTION	COMMENT
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	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	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	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	Building 901 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
67	Building 909 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
68	Building 910 Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.

SWMU/AOC	DESCRIPTION	COMMENT
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 1178A 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.

SWMU/AOC	DESCRIPTION	COMMENT
97	Building 1119 Wash rack	EPA listed the site in 1988 as a SWMU with no further action required.
98	Building 1166 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.
105	LF-19 Golf Course Landfill	Site CACd in March 2013
106	Main Base Landfill	Site NAFd in November 2005
107	Main Base Substation PCB Disposal Area	EPA listed the site in 1988 as a SWMU with no further action required.
108	LF-23 MOBSS Landfill Disposal Trench	Site CACd in March 2013
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.
115	LF-22 West Area Landfill #1 PCB Disposal Area	Site CACd in March 2013
116	LF-21 West Area Landfill #2	Site CACd in March 2013
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	Site CACd in March 2013
128	Building 1166 Waste Oil Tank	Site NFAd in February 2001
129	Building 1191 Waste Oil Tank	Site NFAd in February 2001
130	Taxiway 4 Tank 28 JP-4 Underground Waste Tank	Site CACd in March 2013
131	Waste Oil Bowsers	Site NFAd in February 2001
133	Building 703 Wash rack Discharge Pit	Site NFAd in February 2001
134	Buildings 902-924 Drainage Ditch	Site NFAd in February 2001
135	Building 1092 O/W Separator Drainage Pit (FT-31)	Site CACd in March 2013
136	Building 1119 Washrack Drainage Area	Site NFAd in November 2005
138	Building 1166 Oil/Water Sep Drainage Pit	Site NFAd in February 2001
139	SWMU 139 Lake Holloman	Site NFAd in November 2005
140	SWMU 140 Lake Stinky	Site NFAd in November 2005
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 and Wet Well	Site NFAd in February 2001
147	Splitter Box	Site NFAd in February 2001

SWMU/AOC	DESCRIPTION	COMMENT
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	DLADS Scrap Metal Storage Area	EPA called this site a SWMU in 1988, but did not require corrective action.
163	DLADS Wood Pile	EPA called this site a SWMU in 1988, but did not require corrective action.
164	Building 1080 Pond	Site NFAd in February 2001
165	Building 1176 Pond	Site NFAd in February 2001
166	SD-25 MOBSS Drainage Lagoon	Site NFAd in November 2005
167	Test Shed Launch Area Collection Basin	EPA listed the site in 1988 as a SWMU with no further action required.
169	Burn Kettle	EPA listed the site in 1988 as a SWMU with no further action required.
170	Fire Department Training Area 1 (FT-31)	Site CACd in March 2013
171	Fire Department Training Area 2 (FT-31)	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 322 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 282 Recycling Area	EPA identified this site as a SWMU in 1988.

SWMU/AOC	DESCRIPTION	COMMENT
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 listed the site in 1988 as a SWMU with no further action required.
AOC-2	Sewage Drainage Pit NE of Building 864	Site CACd in March 2013
AOC-BBMS	Bare Base Mobility Squadron Spill Area	EPA called this site a SWMU in 1988, but did not require corrective action .
AOC-D	SD-26 Building 882 Spills	EPA called this site a SWMU in 1988, but did not require corrective action .
AOC-F	Asphalt Tank Spill Area (SS-68)	Site CACd in March 2013
AOC-FST837	Building 837 Fuel Spill Site	Site NAFd November 2005
AOC-G	Atlas Substation PCB Spill	EPA called this site a SWMU in 1988, but did not require corrective action .
AOC-N	SS-48 Building 137 Military Gas Tank Leak	Site CACd March 2013
AOC-P	OT-44 Building 301 Fuel Tank Leak	Site CACd March 2013
AOC-R	JP-4 Fuel Line Spill Site (SS-06)	Site CACd March 2013
AOC-RD	DP-62 Rita's Draw Disposal Pit	Site NAFd November 2005
AOC-RR	Buried RR Cars.	EPA called this site a SWMU in 1988, but did not require corrective action.
AOC-S	Leaking Underground Storage Tank (BHUST)	Site CACd in March 2013
AOC-V	SS-57 Officer's Club	Site CACd in March 2013
AOC-PRI-A	Sewer Line from Primate Research Laboratory	EPA listed the site in 1988 as a SWMU with no further action required.
AOC-PRI-S	Primate Research Lab Borehole Disposal Site.	EPA called this site a SWMU in 1988, but did not require corrective action.
AOC-PRI-1	Primate Research Institute (PRI) Building 1264: Waste Accumulation Area	EPA listed the site in 1988 as a SWMU with no further action required.
AOC-PRI-2	PRI Building 1264 Solvent Burn Area (OT-35)	Site CACd in March 2013
AOC-PRI-3	PRI Building 1264 Biological Incinerator	EPA listed the site in 1988 as a SWMU with no further action required.
AOC-PRI-4	PRI Building 1264 Quarantine Area Incinerator	EPA listed the site in 1988 as a SWMU with no further action required.
AOC-PRI-5	PRI Building 1264 Solvent Burn Area (OT-35)	Site CACd in March 2013

OPERATING/CLOSED UNIT	DESCRIPTION	COMMENT
20,000-Pound Open Detonation (OD) Treatment Unit/SWMU # 168.	The OD Unit	Site undergoing closure.
Container Storage Unit/SWMU # 75	Hazardous Waste Management Unit	Site closed. NMED approved Closure on January 5, 2015..
300-Pound Open Burn (OB) Unit. This site was listed in the 1988 RFA Report as SWMU 172.	The OB Unit	The OB Unit was under Interim from 1965 to 1979. HAFB conducted risk-based closure as per approved Work Plan of 1997. NMED approved Closure of this site on February 3, 1997.

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APPENDIX 4-A

TABLE C

LIST OF SOLID WASTE MANAGEMENT UNITS / AOCS WITH CORRECTIVE ACTION COMPLETE WITH CONTROLS

The following is a list of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) with Corrective Action Complete with Controls.

SWMU/AOC	Control(s) Needed	Comment

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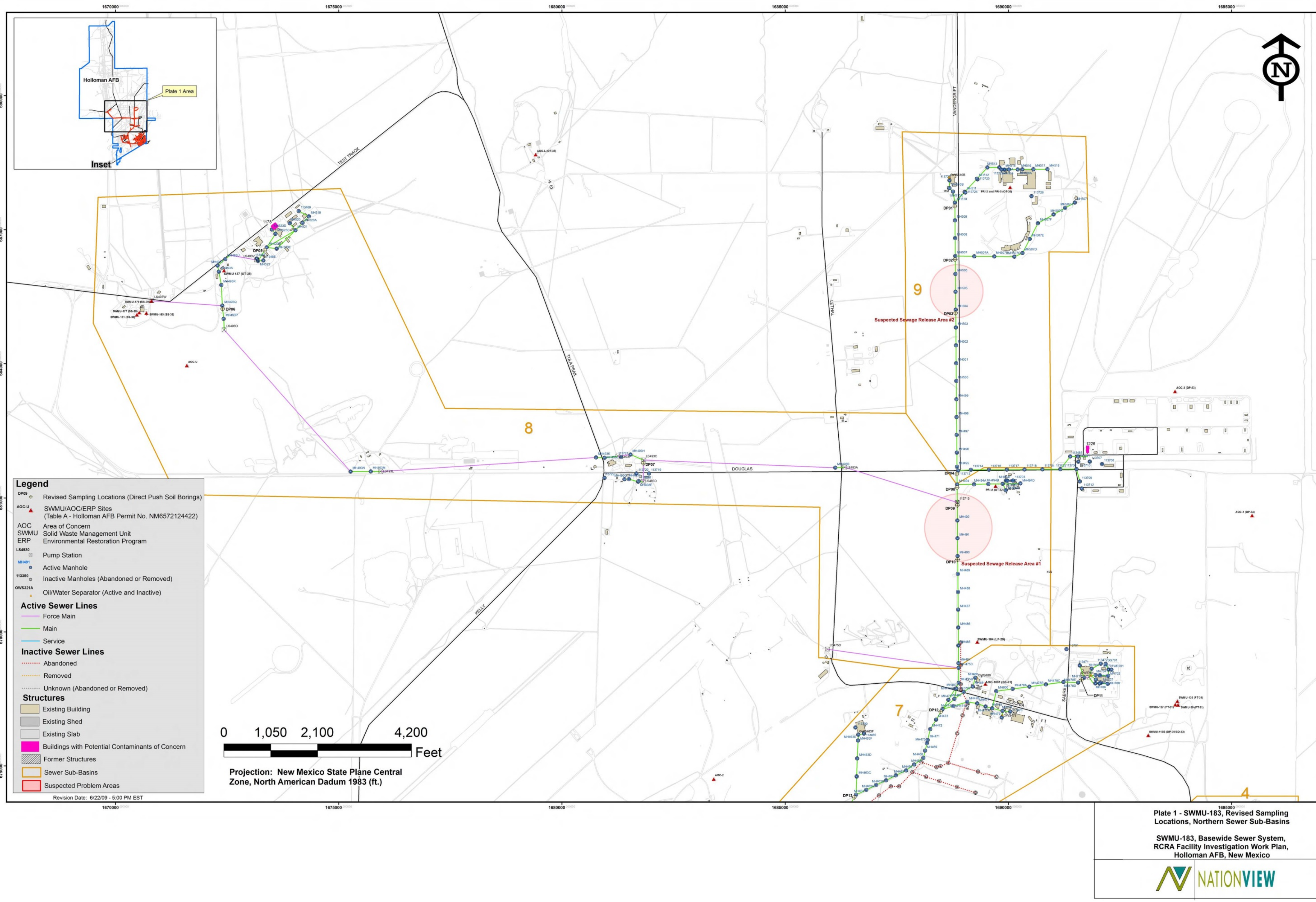

Plate 1 – SWMU-183, Revised Sampling Locations Northern Sewer Sub-Basins (NationView, 2012)

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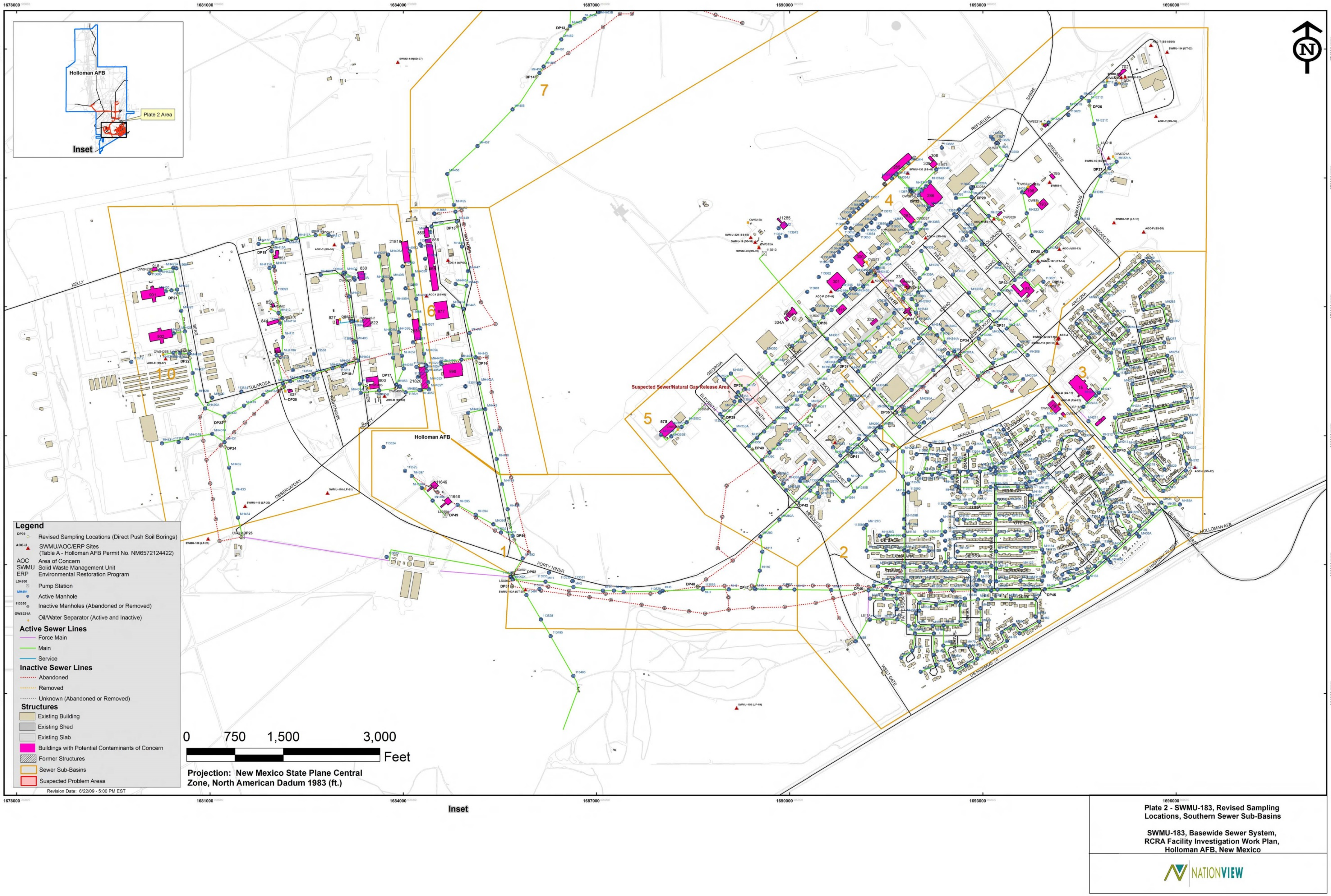

Plate 2 – SWMU-183, Revised Sampling Locations Southern Sewer Sub-Basins (NationView, 2012)