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

19 July 2016

ADAM M. KUSMAK, GS-13, USAF
Chief, Installation Management Flight (49 CES/CEI)
49th Civil Engineer Squadron (49 CES)
Holloman Air Force Base, NM

New Mexico Environment Department
Attn: Mr. John Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6063

Re: **Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141) Report, Holloman Air Force Base, New Mexico**
EPA ID# NM6572124422, HAFB-14-012
Holloman Air Force Base, Alamogordo, NM
Contract No. FA8903-13-C-0008

Dear Mr. Kieling,

Attached is the *Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141) Report*. This report is submitted as the next step under the Corrective Action Program for site SD-27. The report is on the enclosed CD, with native and PDF files.

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 regarding this submittal, please contact me at (575) 572-6675 or by email at adam.kusmak@us.af.mil.

Sincerely,

Digitally signed by KUSMAK.ADAM.M.1263331806
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USAF, cn=KUSMAK.ADAM.M.1263331806
Date: 2016.07.25 15:16:08 -06'00'

ADAM M. KUSMAK, GS-13, USAF

Attachment(s): *Final Risk Assessment for SD-27 Pad 9 Drainage Pit (SWMU 141) Report*. Hard copy and CD.

cc: Mr. Dave Strasser, NMED HWB (w/Atch, w/CD)
Mr. Cornelius Amindyas, NMED HWB (w/o Atch)
Mr. Brian Salem, NMED HWB (w/o Atch)
Mr. Chuck Hendrickson, USEPA (w/CD)
Ms. David Griffin, HAFB (w/Atch, w/CD)
Mr. Charles Schick, HAFB (w/Atch, w/CD)
Mr. Brian Renaghan, AFCEC (w/CD)
Mr. Wayne Bittner, Kirtland AFB (w/2-CD)

HOLLOMAN AIR FORCE BASE
NEW MEXICO

FINAL RISK ASSESSMENT
FOR SD-27 PAD 9 DRAINAGE PIT
(SWMU 141)

July 2016

Building 55
550 Tabosa Avenue
Holloman AFB, New Mexico 88330-8458

HOLLOMAN AIR FORCE BASE, NEW MEXICO

FINAL RISK ASSESSMENT
FOR
SD-27 PAD 9 DRAINAGE PIT (SWMU 141)
USEPA ID# NM6572124422

July 2016

Prepared for:

Air Force Civil Engineer Center
Department of the Air Force, 772nd ESS/PKB
3515 South General McMullen Drive, Suite 155
Joint Base San Antonio Lackland, Texas 78226-2018
Contract FA8903-13-C-0008

Prepared by:

URS Group, Inc. (now AECOM)
7720 North 16th Street, Suite 100
Phoenix, AZ 85020

In Association with:

FPM Remediations, Inc.
584 Phoenix Drive
Rome, NY 13441

URS Job No. 23446545

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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/m^3	micrograms per cubic meters of air
°C	degrees Celsius
°F	degrees Fahrenheit
AAF	Alamogordo Air Field
ACC	Air Combat Command
ACM	Accelerated Corrective Measures
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AMC	Air Materiel Command
atm-m^3/mol	atmosphere-cubic meter per mol
Bhate	Bhate Environmental Associates, Inc.
bgs	below ground surface
CAC	Corrective Action Complete
cm	centimeter
cm^2	square centimeter
COPC	contaminant of potential concern
COPEC	contaminant of potential ecological concern
DPT	direct push technology
DRO	diesel range organics
EFH	extractable fuel hydrocarbons
EM	exposure model
ERPIMS	Environmental Restoration Program Information Management System
EU	exposure unit
ft	foot/feet
ft^3	cubic feet
FPM	FPM Remediations Inc.
g/mol	grams per mol
GRO	gasoline range organics
HGL	HydroGeoLogic, Inc.
HI	hazard index
IELCR	incremental excess lifetime cancer risk
J&E	Johnson and Ettinger
kg	kilogram
LF	linear foot/feet
LTM	Long-Term Monitoring
MCL	maximum contaminant level
mg/cm^2	milligrams per square centimeter
mg/day	milligrams per day

mg/l	milligrams per liter
mg/kg	milligrams per kilogram
NFA	No Further Action
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NMWRRI	New Mexico Water Resources Research Institute
OSWER	Office of Solid Waste and Emergency Response
PA/SI	Preliminary Assessment/Site Investigation
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
PID	photoionization detector
Radian	Radian Corporation
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIC	Radioisotope Committee
RSL	Regional Screening Level
SCS	Soil Conservation Service
SL	screening level
SSL	Soil Screening Level
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TDS	total dissolved solids
Tetra Tech	Tetra Tech, Inc.
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
UCL	upper confidence limit of the mean
URS	URS Group, Inc.
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VI	vapor intrusion
VOC	volatile organic compound

EXECUTIVE SUMMARY

A risk assessment was performed for the SD-27 Pad 9 Discharge Pit (Solid Waste Management Unit [SWMU] 141) located at Holloman Air Force Base (AFB) Alamogordo, New Mexico. The SD-27 site is located east of Taxiway F near former Building T884, and was used for aircraft washing and maintenance in support of the Cloud Sampling Program prior to 1960. The risk assessment included: (1) review of relevant reports available for site SD-27, (2) compilation of available soil and groundwater data, (3) comparison of maximum soil and groundwater concentrations with the New Mexico Environment Department (NMED, 2015) screening levels to identify chemicals of potential concern (COPCs), (4) development of an exposure model, and (5) calculation of site-specific risk for potentially complete exposure pathways.

The potentially complete exposure pathways included direct soil contact and indoor vapor intrusion from soil and groundwater. The evaluation assumed unrestricted land use although the possibility of future residential development is remote. Available groundwater data indicate that the total dissolved solids concentrations in groundwater exceed 10,000 milligrams per liter. Therefore, per New Mexico Administrative Code 20.6.2.3101, groundwater at site SD-27 is not considered a protected resource for future human or agricultural use, and the potable water pathway was not evaluated. Further, the data indicate that the residual groundwater impacts of hydrocarbons are stable or decreasing.

Using generally conservative assumptions, cumulative site-specific risks and hazards were below the target cancer risk of 10^{-5} and target hazard index of 1.0, as specified in the Holloman AFB Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit No. NM6572124422. Based on the evaluation described above–conducted consistent with NMED (2015), U.S. Environmental Protection Agency guidance, and generally accepted practices–we request discontinuation of long-term groundwater monitoring at site SD-27 and that the site be granted Corrective Action Complete (CAC) *without* Controls status and moved from Table A to Table B of the Holloman AFB RCRA Permit.

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1.0 INTRODUCTION

This Risk Assessment Report was prepared by RAM Group of Gannett Fleming, Inc. in conjunction with URS Group, Inc. (URS) (now AECOM), who is the subcontractor to FPM Remediations, Inc. (FPM), on behalf of Holloman Air Force Base (AFB) for the SD-27 Pad 9 Drainage Pit site, Solid Waste Management Unit (SWMU) 141 at Holloman AFB, New Mexico, hereinafter referred to as the Site or SD-27. This risk assessment was prepared in accordance with the Performance-Based Remediation Contract for Cannon, Holloman, and Kirtland AFBs located in New Mexico, and Luke AFB located in Arizona under contract to the U.S. Air Force Civil Engineer Center (AFCEC), Contract No. FA8903-13-C-0008. An Accelerated Corrective Measures (ACM) Work Plan was submitted by Tetra Tech, Inc. (Tetra Tech) in 2009 which detailed additional site characterization activities and proposed a remedial action of excavation (Tetra Tech, 2009). The monitoring well installation and investigative sampling proposed in the 2009 ACM Work Plan was performed by Tetra Tech between November 2010 and March 2011 while the ACM Work Plan was under review by New Mexico Environmental Department (NMED). An addendum was submitted by Tetra Tech in January 2012, which provided investigative results obtained at the Site, an assessment of Site data with respect to then current risk-based criteria for the protection of human health and the environment, and a recommendation for Site closeout (Tetra Tech, 2012). URS used the 2012 ACM Work Plan Addendum submitted by Tetra Tech (2012), along with updated groundwater monitoring data, as a basis for this report. Applicable figures, tables, and appendices which were included and/or referenced in the 2012 ACM Work Plan Addendum are also included by reference in this Risk Assessment Report as support documentation. The organization of this report is outlined in Section 1.4.

This Risk Assessment Report presents a thorough summary of the applicable Site background information, analytical data, risk assessment methodology, results, and recommendations.

1.1 INSTALLATION BACKGROUND

1.1.1 Location

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County. The Base is located approximately 75 miles northeast of El Paso, Texas, and 7 miles west of Alamogordo, New Mexico. The Base occupies approximately 50,000 acres in the northeast quarter of section Township 17 South, Range 8 East. Additional land extending northward is occupied by the White Sands Missile Range testing facilities. An installation location map is provided in **Figure 1-1**.

1.1.2 History

Holloman AFB, formally Alamogordo Army Airfield, was initiated as a temporary facility during World War II, with construction commencing on February 6, 1942. Its status, mission, and Command have periodically changed over its 68-year history.

Prior to 1942, the property occupied by Holloman AFB was undeveloped rangeland. The Alamogordo Army Airfield was established in 1942 and was deactivated in 1945. The facility was reactivated in 1945 and was operated by the Air Materiel Command (AMC) until 1951. The AMC tested pilot-less aircraft, guided missiles, and other equipment. The facility mission remained largely unchanged until 1971. However, the facility identification changed several times during the 20-year span as follows:

- Air Force Missile Test Center (1951 to 1952),
- Holloman Air Development Center (1952 to 1957), and

- Air Force Missile Test Center (1957 to 1971).

The Tactical Air Command operated the facility from 1972 to 1992 and housed the 49th Tactical Fighter Wing, 479th Tactical Training Wing, 833rd Air Division, and 4449th Mobile Support Squadron. In 1992, Holloman AFB was realigned under the Air Combat Command (ACC). Currently, Holloman AFB continues operation under Command of the ACC.

1.2 SD-27 PAD 9 DRAINAGE PIT AREA

The following section details the location, site description, and contamination history of SD-27.

1.2.1 Location

The SD-27 Pad 9 Discharge Pit (SWMU 141) is located east of Taxiway F near former Building T884. The Site is located within the airfield, significantly limiting unauthorized access. The location of SD-27 with respect to Holloman AFB is shown on **Figure 1-2**. **Figure 1-3** shows the SD-27 Pad 9 Discharge Pit in detail, including its proximity to Building T884.

1.2.2 Site Description

As shown on **Figure 1-3**, SD-27 is an inactive wash rack area that consists of the following:

- A circular concrete pad, which was used as a wash rack, that is approximately 150 feet (ft) in diameter;
- A concrete constructed drainage gallery (sloped apron) that is approximately 75 ft long and 15 ft wide, which directs drainage to the sump located in its center;
- A concrete constructed sump that is approximately 4 ft wide, 7 ft long, and 1 to 1.5 ft deep located within the drainage gallery approximately 31 ft from the west edge of the concrete pad (wash rack);
- An associated concrete-lined drainage trough (gutter) that is 0.5 ft wide and 0.5 ft deep runs from the sump to the edge of the concrete pad (wash rack), approximately 67 ft long;
- A former unlined drainage pit that is approximately 50 ft in diameter and 12 ft deep; and
- A drainage pipe that runs between the pad (wash rack) and former unlined drainage pit that is approximately 160 linear feet (LF).

The drainage gallery/sump discharged accumulated wash water to the former unlined drainage pit, located approximately 140 ft south of the concrete pad via an underground drainage pipe as depicted on **Figure 1-3**. No petroleum or unusual stains were observed on the pad during Supplemental Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) field activities (HydroGeoLogic, Inc. [HGL], 2007). The concrete pad (wash rack) appeared to be in relatively good condition, with only a few fractures and cracks evident. The concrete pad is connected to Taxiway F by a partially degraded asphalt service road. The sump was constructed of concrete and covered with a thick steel grate. Prior to Supplemental RFI field activities, the sump and associated drainage gallery were nearly filled with accumulated sediments, grasses, and a cactus. Upon sampling and removal of the accumulated sediments, the base of the sump was determined to be in good condition. No soil staining, unusual solids or liquids, or unknown odors were noted in the sediment contained within the former sump and concrete trench (HGL, 2007).

A broken floor drain was present in the center of the sump floor. The floor drain was believed to connect the sump to the former drainage pit via an underground drainage pipe. The drain inlet was broken and

filled-in with sediments. The outlet of the drainage pipe, located in the former drainage pit, was not observed during the Supplemental RFI site inspection. The former drainage pit was described in previous reports as being unlined, approximately 50 ft in diameter by 12 ft deep. At the time of the Supplemental RFI site inspection, the drainage pit had been backfilled to within 2 to 3 ft of grade. The backfilled pit supported a thick concentration of shrubs, which were trimmed down prior to field sampling activities. No unusual stains or odors were noted on the surface soils within or around the former drainage pit. No surface expression of the only building formerly located on Site, Building T884, was observed during the Supplemental RFI field event (HGL, 2007).

The area immediately surrounding SD-27 is unpaved, undeveloped, and currently used as a safety buffer for Base runway operations. An active taxiway, Taxiway F, is located approximately 200 ft west of the SD-27.

1.2.3 Contamination History

The former wash rack (concrete pad) at SD-27 was used to wash down drones and manned aircraft in the 1940s and early 1950s. The planes washed at the Site were reportedly involved in the Cloud Sampling Program, a project studying fallout from nuclear explosions. Some of the aircraft in the program were used to collect air and particulate samples from clouds contaminated with fallout from above ground nuclear testing operations. Based on information provided to the U.S. Congress (Information Memorandum Package – Senator Glenn Hearing on Radioactive Waste, [Case, 1992]), Holloman AFB (formerly the Alamogordo Air Field [AAF]) would most likely not have serviced the actual nuclear blast cloud sampling aircraft that participated in the program, due to lack of proximity to the Nevada Test Site or Pacific Proving Grounds. Rather, other program support aircraft providing services such as weather reconnaissance, cloud tracking, bomb delivery, in-flight shock wave analysis, bomb damage assessment, and logistics and support were likely kept and maintained at the AAF (Case, 1992). Upon return from providing program support activities, the planes were washed down at Pad 9. Wash water would collect in the sump and discharge via the drainage pipe to the discharge pit. No information on the exact year when washrack activities ceased at SD-27 was obtained. According to former military personnel, no manned or drone aircraft maintenance activities have occurred at SD-27 since the cessation of the Cloud Sampling Program activities (Radian Corporation [Radian], 1993).

1.3 SCOPE AND OBJECTIVE

The purpose of this risk assessment is to compile, screen, and evaluate historical Site characterization data and to provide, as needed, a quantitative estimate of human health and ecological risk for current and future receptors at SD-27. Specific objectives include:

- Conduct risk screening and assessment in accordance with NMED guidance (NMED, 2015) and U.S. Environmental Protection Agency (USEPA) toxicity data and chemical properties (USEPA, 2015a);
- Evaluate hypothetical future indoor air vapor intrusion (VI) risks in accordance with current USEPA Guidance (USEPA, 2015b; USEPA, 2015c); and
- Estimate cumulative risk to human health and the environment.

The scope of this risk assessment includes consideration of the following:

- Site workers, hypothetical future construction workers, and hypothetical future residential receptors, including the child receptor;
- Non-radiological contaminants detected in shallow (upper 10 ft) of soils below and near the concrete pad and drainage pit areas of SD-27; and

- Non-radiological contaminants detected in groundwater since 2010 in any Site monitoring wells.

As described in Section 3, previous characterization studies have evaluated potential radiological contamination in soils and groundwater at SD-27 (Radian, 1993; Tetra Tech, 2012), with the conclusion that concentrations of radiological elements are not inconsistent with naturally occurring background levels. Any additional radiological characterization, evaluation, or remediation at SD-27 will be under the authority of the U.S. Nuclear Regulatory Commission as managed by the U.S. Air Force Radioisotope Committee (RIC).

1.4 REPORT ORGANIZATION

As described above, historical data compiled in the ACM Work Plan Addendum submitted by Tetra Tech (2012), along with updated groundwater sampling data as reported in the Environmental Restoration Program Information Management System (ERPIMS) were used as the basis for this risk assessment. Sections 2 and 3 are representative of the ACM Work Plan Addendum (Tetra Tech, 2012). Section 4 provides a detailed description of how the historical Site data were compiled for the purpose of risk screening and the quantitative risk assessment. This report is organized as follows:

- Section 1 is an introduction to Holloman AFB and SD-27, as well as report scope and objectives;
- Section 2 presents the site-specific environmental setting of the SD-27 Pad 9 Drainage Pit;
- Section 3 provides the history of previous site investigations;
- Section 4 presents the risk assessment methodology and findings; and
- Section 5 is overall conclusions and recommendations.

Tables provided in the ACM Work Plan Addendum (Tetra Tech, 2012) and used in this risk assessment are provided in **Appendix A**. Data from the tables in **Appendix A** that were reduced[1] in accordance with the methodologies described in Section 4 are provided in **Appendix B** (soils) and **Appendix C** (groundwater), and in the updated tables of this report.

Applicable figures from the ACM Work Plan Addendum (Tetra Tech, 2012) are also included in this risk assessment as support documentation. Analytical laboratory reports, original data tables, field logs, waste manifests, etc. are included by reference to the ACM Work Plan Addendum (Tetra Tech, 2012).

As a means of clarification, tables, figures, and appendices that are provided with this risk assessment report are referenced in **bold font** throughout the subsequent sections. Additional table and figure references are provided to assist the reader in locating data from previous reports that are contained in the Administrative Record for SD-27.

[1] The data in **Appendix B** and **Appendix C** originate from the tables provided in Tetra Tech 2012 (with the exception of updated long-term monitoring [LTM] groundwater data), which are provided in **Appendix A**. Data in **Appendix B** (**Tables B-1** and **B-3)** and **Appendix C** (**Tables C-1** and **C-3**) were reduced by removing outdated screening criteria, combining duplicate results, and treating data qualifiers, as described in Section 4.

2.0 SITE-SPECIFIC ENVIRONMENTAL SETTING

The environmental setting information in the following subsections is obtained from the 2012 ACM Work Plan Addendum prepared by Tetra Tech which was reproduced primarily from the Supplemental RFI Report prepared by HGL (2007) unless otherwise cited.

2.1 DEMOGRAPHICS

Alamogordo is the county seat of Otero County, New Mexico and the only town of appreciable size within 30 to 50 miles of the Base. The population of Alamogordo was 23,535 in 1975 and has since grown to approximately 31,500 (Tetra Tech, 2012). The economy of Alamogordo depends largely upon Holloman AFB and other military installations in the area. Approximately 5,500 people live at Holloman AFB.

2.2 CLIMATE

The climate in the Tularosa Basin is arid with low annual rainfall and low relative humidity. The surrounding mountain ranges greatly influence local weather. They modify approaching weather systems and provide orographic lifting which produces summer thunderstorms.

Holloman AFB receives most of its total annual rainfall from thunderstorm activity May through October. Winter is generally dry and is characterized by clear skies and erratic snowfall. The period from March through May is characterized by strong southerly wind flow and periods of blowing dust and sand. Mean annual precipitation is 7.9 inches. The mean annual lake evaporation rate, commonly used as an estimate of the mean annual evapotranspiration rate, is approximately 67 inches per year. As presented by Huff in the 49th Annual New Mexico Water Conference Proceedings (New Mexico Water Resources Research Institute [NMWRRI], 2005), approximately 30,000 acre-ft per year of groundwater left the Tularosa basin through evapotranspiration under 1995 conditions.

2.3 TOPOGRAPHY

SD-27 is located in a generally flat portion of Holloman AFB, although an overall southwestwardly dip is present. The drainage pit represents the lowest topographic feature on or near the SD-27 site. The base of the pit is extremely hummocky reflecting former backfilling activities.

2.4 SURFACE WATER

No surface water bodies or surface water drainage features are present within or adjacent to SD-27. No surface water was observed within the sump, drainage gallery, or former discharge pit. Precipitation falling onto the unpaved soil surrounding the Site most likely either evaporates or infiltrates into the subsurface soil. No visual evidence of overland flow was observed immediately surrounding the Site. Precipitation falling on the paved portion of SD-27 evaporates or infiltrates into the subsurface at the edges or along the few observed cracks and fractures. If a sufficient amount of precipitation falls on the concrete-paved area, it drains to the sump, drainage gallery, or surrounding unpaved areas (HGL, 2007).

2.5 SOILS

The native soils beneath SD-27 are classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) as belonging to the well-drained, sandy loam, and gypsum of the Holloman-Gypsum Land- Yesum complex (USDA, 1981). The soils of this association are formed from alluvial and eolian gypsiferous sediments. The Holloman unit makes up approximately 35% of the complex and is

described as being a light brown to pink, very fine, sandy loam with high gypsum content. The soil is moderately permeable, calcareous, and mildly to moderately alkaline. The Gypsum Land unit makes up approximately 30% of the complex and is described as being a soft to hard white gypsum, typically overlain by less than 1 inch of very fine, sandy loam. The Yesum unit, which makes up 20% of the complex, is light brown to pinkish-white, very fine sandy loam that is also high in gypsum. The Yesum unit is moderately calcareous and mildly alkaline (USDA, 1981).

2.6 OVERBURDEN GEOLOGY

Site-specific geologic information was obtained from soil borings completed during the Preliminary Assessment/Site Investigation (PA/SI) (Radian, 1993), Supplemental RFI (HGL, 2007), and SD-27 ACM field work (as described in the ACM Work Plan [Tetra Tech, 2012]). Field logs for soil borings completed for previous investigations can be obtained from the previous investigation reports.

Based on a review of boring logs, soil beneath SD-27 is very heterogeneous. No single lithologic unit was observed to be continuous across the Site (HGL, 2007). During the PA/SI, a 1- to 2-ft thick clay lens was encountered within the first 5 ft of soil beneath the eastern portion of SD-27 (Radian, 1993). However, this continuous unit was not observed in any of the Supplemental RFI borings (HGL, 2007). Supplemental RFI borings completed through or in the immediate vicinity of the concrete pad encountered soil composed primarily of silty, very fine- to medium-grained sand. Additionally, these borings encountered refusal between 8.5 and 13 ft below ground surface (bgs). No subsurface obstructions were observed that would result in borehole refusal. South of the concrete pad, subsurface soils were primarily sandy, silty, and sandy clay. Borings completed south of the pad were advanced to a maximum depth of 20 ft bgs without encountering refusal.

ACM borings completed within and adjacent to the former drainage pit provide further evidence of the heterogeneity of the overburden at SD-27. The ACM borings were advanced using direct push technology utilizing a Geoprobe 7822 equipped with 2.25-inch rods and were advanced in November 2010 and March 2011. According to boring logs, overburden within and adjacent to the former drainage pit is composed primarily of silty sand and sandy silt. Within and to the south of the former drainage pit, refusal on a hard layer composed of gypsiferous material, was encountered at depths from 9.5 to 22.5 ft bgs. This hard layer is present at shallow depths (9.5 to 10 ft bgs) primarily within the area of the former discharge pit. South and southeast of the former drainage pit, the hard layer was encountered much deeper at depths of 19 to 22.5 ft bgs. Discontinuous lenses of sand, silty clay, and clay are present in this area at various depths southwest of the former drainage pit.

2.7 HYDROGEOLOGY

As part of SD-27 ACM activities, five flush-mounted groundwater monitoring wells were installed in November 2010 (see **Figure 2-1)**. Details of the well completions are summarized in **Appendix A**, **Table A-1**. One upgradient monitoring well (MW27-01) was installed north of the concrete pad. Four monitoring wells (MW27-02 through MW27-05) were installed in the vicinity of the former drainage pit to assess the extent of impacts from historical activities on groundwater. Historical groundwater elevation measurements have been collected at SD-27 between November 2010 and August 2013. Based on these measurements, groundwater in the vicinity of the former drainage pit ranges from 8.50 to 11.5 ft bgs. The groundwater gradient has ranged from 0.001 ft/ft (April 2011) to 0.007 ft/ft (January 2011) for an average of 0.004 ft/ft. As indicated on **Figure 2-1**, groundwater flow appears to be in a slightly southwestern direction across the Site.

In April 2011, several recharge tests were conducted by Tetra Tech at SD-27 for monitoring wells MW27-02, -03, and -04. Two tests were conducted at each monitoring well and the hydraulic conductivities calculated from these tests are:

- MW27-02
    - Test 1 – 0.16 ft/day
    - Test 2 – 0.18 ft/day
- MW27-03
    - Test 1 – 0.16 ft/day
    - Test 2 – 0.19 ft/day
- MW27-04
    - Test 1 – 0.27 ft/day
    - Test 2 – 0.14 ft/day

Using an average hydraulic conductivity of 0.183 ft/day, hydraulic gradient of 0.004 ft/ft, and estimated porosity of 30%, the linear groundwater flow velocity across SD-27 is estimated to be 0.002 ft/day, or approximately 1 foot/year (Tetra Tech, 2012).

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3.0 PREVIOUS SITE INVESTIGATIONS

Investigations and field activities previously performed at SD-27 include:

1. Radiation Site Screening (1976),
2. PA/SI (1993),
3. Phase II Remedial Investigation (RI) (1998),
4. Supplemental RFI Activities (2006),
5. ACM Work Plan Field Activities (2011), and
6. Groundwater Monitoring under the Long-Term Monitoring (LTM) Program (2010 through 2013).

Sediment and soil analytical results from previous investigations are provided in chronological order in **Appendix A, Tables A-2** through **A-13**. Historical soil results shown in **Appendix A**, **Tables A-2** through **A-9** were taken from the previous investigation and field activities listed above and formatted (see table footnotes) to show exceedances of NMED Soil Screening Levels (SSLs) for residential, commercial/industrial, and construction worker exposure scenarios based on then-current NMED guidance (Table A-1 of NMED [2009]). The same sediment and soil results were re-presented in **Appendix A**, **Tables A-6** through **A-9**, and were formatted to show exceedances of site specific VI screening levels calculated for the VI exposure pathway. VI screening criteria were only provided for contaminants with sufficient volatility for vapor intrusion.

Soil and groundwater analytical data used for the current risk assessment were obtained from the previous reports and tables listed above, most of which were compiled into the ACM Work Plan Addendum (Tetra Tech, 2012). The reduced set of comprehensive soil sampling data and groundwater monitoring data (including 2013 LTM data contained in ERPIMS) are provided in **Appendix B** and **Appendix C**. The reduced data in **Appendix B** and **Appendix C** were compiled in accordance with the methodology described in Section 4, and do not include previously used risk or background screening values.

Historical groundwater analytical results from previous investigations (temporary wells) are provided in **Appendix A**, **Table A-10**. Groundwater analytical data from the six permanent Site monitoring wells were obtained from the ACM Work Plan Addendum (Tetra Tech, 2012) and ERPIMS database. The comprehensive reduced set of groundwater monitoring data is provided in **Appendix C**. The reduced data in **Appendix C** were compiled in accordance with the methodology described in Section 4, and do not include previously used risk or background screening values.

Locations of historical soil samples are shown on **Figure 3-1**. The SD-27 ACM investigation soil sample and monitoring well locations are also shown on **Figure 3-1** for completeness. As shown in the figure legend, timing of the sampling event is noted by the sample location symbol on the figure.

Locations of historical groundwater samples from non-well sample locations (e.g., borehole or direct push technology [DPT] samples) and new monitoring well locations installed during the SD-27 ACM investigation are shown on **Figure 3-2**.

A general discussion of the previous investigations is presented in Sections 3.1 through 3.5.

3.1 RADIATION SITE SCREENING

In May 1976, a radiation site screening investigation was conducted within the former drainage pit at SD-27. No information regarding this investigation was obtained from the Base Administrative Record. However, results of the investigation were summarized in the 1993 PA/SI Report (Radian, 1993). As

presented in the PA/SI Report, soil samples were collected from the bottom of the former drainage pit and submitted for analysis. Information presented in the PA/SI Report indicates that analytical results for samples collected within the former drainage pit did not contain radiation above normal background. However, the PA/SI Report did not provide information regarding the number or locations of samples collected, radiological analyses performed, or radiological analytical results. After the sampling event, the drainage pit was backfilled to grade (Radian, 1993).

3.2 PRELIMINARY ASSESSMENT/SITE INVESTIGATION

In 1993, a PA/SI was conducted at SD-27 by Radian that focused on three areas of possible contamination, including:

- The former drainage pit;
- A fenced transformer area, where stained soil was observed; and
- A location south of the concrete pad (wash rack) near the former drainage pipe.

As shown on **Figure 3-1**, five soil samples (BH27-01 through BH27-05) were collected from the areas listed above and selectively analyzed for organic constituents, radioactivity, and polychlorinated biphenyls (PCBs). The PA/SI analytical sampling results are summarized in **Appendix A**, **Table A-2** and **Table A-6**.

Three soil samples (BH27-01, -02, -03) were collected at SD-27 and analyzed for gross alpha and gross beta. Additionally, a background sample (BH27-05) was collected approximately 500 ft north of SD-27 and analyzed for gross alpha and gross beta. As indicated in **Appendix A**, **Table A-2**, Site concentrations of gross alpha ranged from 8.95 to 19.29 picocuries per gram (pCi/g) and gross beta ranged from 12.15 to 16.69 pCi/g. It was determined that radioactivity was consistent with background levels and not attributable to anthropogenic sources.

Based on the results presented in **Appendix A**, **Table A-2**, soil sample BH27-03 was collected within the former drainage pit and selectively analyzed for extractable fuel hydrocarbons (EFH) and purgeable fuel hydrocarbons in addition to gross alpha and gross beta. During advancement of soil borings, stained soil with a fuel odor was encountered at the base of the former drainage pit, below the water table. No evidence of staining or contamination was observed above the water table. Stained soil was observed in all of the soil borings from approximately 8 to 16 ft bgs. Soil sample BH27-03 was collected within the stained soil (8 to 10 ft bgs). Analytical results from the sample collected from BH27-03 for EFH and purgeable fuel hydrocarbons indicated concentrations are well below NMED residential SSLs. **Appendix A**, **Table A-2** summarizes the analytical results.

One soil sample (BH27-04) was collected within the fenced transformer area and analyzed for PCBs. Aroclor-1254 was detected at a concentration of 200 micrograms per kilogram (µg/kg) which was below the NMED residential SSL of 1,120 µg/kg. **Appendix A**, **Table A-2** summarizes the analytical results of soil borings BH27-01 through BH27-05.

A qualitative risk assessment was conducted as part of the PA/SI. The assessment identified possible contaminant migration and exposure pathways for both human and ecological receptors. As described in Tetra Tech (2012), these pathways included:

- Volatilization – determined to be minimal due to the semivolatile nature of PCBs and that hydrocarbon contamination is buried at the base of the former drainage pit.

- Fugitive dust generation – determined to be minimal due to radioactivity being present at levels comparable to background, the surface area of PCB contamination being very small (3-ft by 5-ft), and the hydrocarbons detected are buried.
- Surface water runoff – determined to be minimal due to the fact that there are no known areas where surface water from the Site collects.
- Infiltration and percolation – determined to be the most likely modes of contaminant transport due to the presence of hydrocarbons at and below the water table.

The risk assessment determined that off-Base residents are not expected to be affected by the Site. The assessment stated that ecological receptors may be exposed to PCBs in surface soils via dermal contact or ingestion and to fuel hydrocarbons through uptake by plants from soil. A site-specific human health-based concentration was calculated for PCBs to evaluate whether a potential risk could exist, under existing and potential future exposure scenarios. The risk-based concentration was calculated to be 987 µg/kg based on dermal exposure for an adult worker. The maximum concentration of Aroclor-1254 was 200 µg/kg, lower than the risk-based exposure concentration.

3.3 PHASE II REMEDIAL INVESTIGATION

After reviewing the PA/SI Report, NMED requested additional investigation to further delineate the vertical extent of contamination in the former drainage pit. In 1994, Radian conducted a Phase II RI to comply with NMED's request. During the RI, one soil boring (94-27-B01R) was advanced through the former drainage pit to a depth of 16 ft bgs (see **Figure 3-1**). During drilling activities, visible staining and a petroleum odor were observed at a depth of approximately 10 to 16 ft bgs. Three soil samples were collected from the boring and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and total recoverable petroleum hydrocarbons (TRPH) (Foster Wheeler and Radian, 1996). One sample was collected from each of three depth intervals (10 to 12 ft bgs, 12 to 14 ft bgs, and 14 to 15 ft bgs). The three soil samples were collected below the top of the underlying water bearing unit. The Phase II RI results are summarized in **Appendix A**, **Tables A-3** and **A-7**.

As shown in **Appendix A**, **Table A-3**, five VOCs, seven SVOCs, and TRPH were detected in the Phase II RI soil samples. Ethylbenzene and TRPH were detected at concentrations exceeding the NMED residential SSL in the 10 to 12 ft bgs soil interval. No other chemical concentrations exceeded NMED residential SSLs. Most of the analytes maximum concentrations were detected primarily in the 10 to 12 ft bgs soil interval while the lowest concentrations were detected in the 12 to 14 ft bgs soil interval.

Based on the results of the PA/SI and Phase II RI, Holloman AFB submitted a No Further Action (NFA) and Site Close Out Petition letter for SD-27 (SWMU 141) in December 2001. In a March 5, 2002 letter, NMED responded to the NFA petition by requesting additional soil and groundwater characterization data. The following data gaps were identified by NMED (Bhate Environmental Associates, Inc. [Bhate], 2003):

- The condition of the drainage gallery,
- The lack of soil and groundwater quality data beneath the drainage gallery to determine the presence or absence of hazardous materials, and
- The lack of soil and groundwater quality data beneath the drainage pit to determine if any hazardous constituents are present in the subsurface directly below the pit.

3.4 SUPPLEMENTAL RFI ACTIVITIES

To address NMED comments on the Site Closeout Petition, a Supplemental RFI was conducted during May and June 2006. The Supplemental RFI included sediment sampling, removal of sediment within the drainage gallery, collection of seven soil samples, and collection of four groundwater samples.

3.4.1 Drainage Gallery Assessment and Sediment Sampling

During the PA/SI performed in 1993, it was noted that the sump within the drainage gallery was filled with soil (i.e., sediment). Therefore, the sediment was removed during Supplemental RFI activities. During the removal, one composite sample (SD27-01) was collected and analyzed for RCRA metals, SVOCs, VOCs, total petroleum hydrocarbons (TPH)-diesel range organics (DRO)[2], TPH-gasoline range organics (GRO), and radionuclides. These constituents were screened against (then current) applicable NMED SSLs, with the exception of radionuclides, which were screened against USEPA radiological Preliminary Remediation Goals (PRGs), using the most conservative (lowest) PRG from those provided for soil ingestion, inhalation of fugitive dusts, and external radiation exposure. The sediment sample analytical results are summarized in **Appendix A**, **Tables A-4** and **A-8**.

As shown in **Appendix A**, **Table A-4**, 6 RCRA metals, 17 SVOCs, 8 VOCs, TPH-DRO, 9 radionuclides, gross alpha, and gross beta were detected in the sediment sample. Of the analytes detected, only benzo(a)pyrene, dibenzo(a,h)anthracene, total chromium, and lead were detected at concentrations exceeding NMED SSLs. Benzo(a)pyrene and lead were detected at concentrations exceeding NMED residential and industrial SSLs. Lead also exceeded the NMED SSL for construction workers. Dibenzo(a,h)anthracene and chromium were detected at concentrations exceeding NMED residential SSLs. Additionally, the radionuclides lead-210, radium-226, and radium-228 were detected above USEPA radiological SSLs for direct ingestion of Site soils.

After removal of accumulated sediment, the sump was determined to be approximately 7 ft long, 4 ft wide, and from 1.0 to 1.5 ft deep below the grade of the pad. The metal grate covering the sump was in good condition. The sump was observed to be constructed of concrete sidewalls and a concrete floor sloped inward from the sidewalls to the center of the sump. The concrete appeared to be in good condition with no cracks or fractures observed. Additionally, no concrete staining was observed. A floor drain with a broken cover was present in the center of the sump and filled with sediment (HGL, 2007).

The concrete-lined drainage trough (gutter) extended from the south end of the concrete slab, sloping towards the southern edge of the sump to promote drainage to the sump. The trench was approximately 0.5 ft wide and 0.5 ft deep. A small amount of sediment had accumulated on the floor of the trench. No staining of the trench sidewalls or floor and no sediment were observed. No unusual odors were noted. Radiation field screening did not detect radiation above background in the trench (HGL, 2007).

Sediment within the former sump was removed and stockpiled in plastic pending analytical results. Based on the analytical results, the sediment was transported off Base on September 12, 2006 and disposed as non-hazardous material (HGL, 2007).

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[2] Throughout this report, names of petroleum hydrocarbon mixtures are adopted directly from the source reports as referenced. The terms G-TPH and TPH-GRO (C6-C10) represent total petroleum hydrocarbons in the gasoline range, for which no soil screening level is defined (NMED, 2015). The terms D-TPH and TPH (C10-C28) are assumed to represent diesel, fuel oil and/or kerosene related mixtures, comprising 30% to 70% in the C11-C22 aromatic hydrocarbon range and 30% to 70% in the C9-C18 aliphatic hydrocarbon range, with a soil screening value of 1,000 mg/kg (NMED, 2015).

3.4.2 Subsurface Soil and Groundwater Sampling

Eight soil borings, designated as SB27-01 through SB27-08 (see **Figure 3-1**), were advanced within the concrete pad (wash rack), within the former drainage pit, and in the vicinity of the former discharge pipe. Initially, only three soil borings were proposed for assessing soil and groundwater quality in the vicinity of the former drainage pit and discharge pipe. Soil and groundwater samples were anticipated from these three borings as well as boring SB27-01 completed as part of the drainage gallery assessment. However, borehole refusal was encountered in two of the borings (SB27-01 at 8.5 ft bgs and SB27-04 at 10.5 ft bgs) prior to reaching the underlying water table. Consequently, additional borings SB27-05 through SB27-08 were completed at the Site. Borehole refusal was experienced in both SB27-05 (13 ft bgs) and SB27-06 (11.5 ft bgs) prior to reaching the underlying water table. SB27-07 was completed to 22.5 ft bgs near the former drainage pipeline by abandoning soil sampling activities and hydraulically hammering a sampler to the underlying water table. The remaining boring, SB27-08, was completed in an inferred hydraulically upgradient location in an effort to assess background metals and radionuclide concentrations in groundwater. Locations of Supplemental RFI soil borings are depicted on **Figure 3-1**.

Continuous soil sampling was conducted for borings SB27-01 through SB27-05. Soil sampling was not performed during the advancement of borings SB27-06 through SB27-08 since the goal of these boreholes was to obtain groundwater samples. Elevated photoionization detector (PID) readings and stained soils were observed below 6 ft bgs in borings SB27-02 and SB27-03. Consequently, two soil samples from borings SB27-02 and SB27-03 were analyzed for VOCs, SVOCs, RCRA metals, and radionuclides. Shallower soil samples were collected from a soil interval above the water table, which reflected the greatest potential for contamination based on field screening results and visual observations. Deeper soil samples were collected at or below the water table interface in accordance with the Bhate work plan (Bhate, 2003). These samples were collected to evaluate soil quality beneath the water table, a soil zone previously sampled and determined to contain elevated concentrations of TRPH. With respect to borings SB27-01, SB27-04, and SB27-05, refusal was encountered prior to reaching the underlying water table. Because field screening and visual observations did not indicate a preferential contaminated soil interval in the shallow subsurface, samples were collected from the soil interval immediately above where refusal was encountered analyzed for VOCs, SVOCs, RCRA metals, and radionuclides. Soil analytical results are summarized in **Appendix A**, **Tables A-5** and **A-9**.

After soil sampling activities were completed, soil borings SB27-02, SB27-03, SB27-07, and SB27-08 (see **Figure 3-2**) were converted into 1-inch diameter, 10-foot long screen, temporary groundwater wells. Groundwater samples were analyzed for VOCs, SVOCs, RCRA metals (total and dissolved), and radionuclides (total and dissolved). Dissolved RCRA metals and radionuclides were filtered in the field using a 0.4 micron in-line filter during the sample collection process. Sixteen VOCs, eight SVOCs, TPH-GRO, TPH-DRO, metals, and radionuclides were detected in the groundwater underlying SD-27 at concentrations exceeding the site-specific background groundwater sample collected from boring SB27-08. A summary of the groundwater analytical results is included in **Appendix A**, **Table A-10**.

Based on the Supplemental RFI data, further investigation of SD-27 was recommended to determine appropriate remedial actions, if necessary. Field activities recommended included: (1) sampling and potential removal of sediment within the wash rack concrete-lined drainage trough that terminates at the concrete sump; (2) subsurface soil investigation to delineate the extent of impacted soils in the vicinity of the discharge pit targeting VOCs, TPH-GRO, TPH-DRO, metals, and radionuclides; (3) installation of five permanent groundwater monitoring wells (i.e., one upgradient, one downgradient of the concrete pad [wash rack], and three downgradient); and (4) at least one round of groundwater sampling to assess VOCs, SVOCs, TPH-DRO, metals (total and dissolved), gross alpha and gross beta emitters (total and dissolved), and total dissolved solids (TDS) concentrations in the underlying groundwater.

3.5 ACCELERATED CORRECTIVE MEASURES WORK PLAN ADDENDUM ACTIVITIES

The following sections present a summary of results from the 2010-2011 ACM site investigation as reported in the ACM Work Plan Addendum (Tetra Tech, 2012).

3.5.1 Soil and Sediment Evaluation

As described in the ACM Work Plan (Tetra Tech, 2009) and summarized in the ACM Work Plan Addendum (Tetra Tech, 2012), soil field screening and sampling were conducted at 31 locations during the 2010-2011 ACM site investigation. Based on NMED recommendations from previous investigation work, the investigation focused on soils in and around the former drainage pit located south of the concrete pad (wash rack). Soil samples were collected at multiple depths at each location. Results for chemicals detected in the 2010-2011 soil samples are presented in **Appendix A**, **Tables A-11** and **A-12**. These results, in reduced and compiled form, are provided in **Appendix B**. It is noted that **Appendix A**, **Tables A-11 and A-12** were formatted to show exceedances of the (then current) direct contact NMED SSLs. Similarly, **Appendix A**, **Table A-13** was formatted to show exceedances of the (then current) NMED VI SSLs for detected contaminants with sufficient volatility.

It is noted that analytical results from 1993, 1994, and 2006 historical soil samples collected in the former drainage pit area (see **Figure 3-1** and **Appendix A, Tables A-2** through **A-9** were consistent with the 2010-2011 ACM sample results. As previously described, historical soil samples located in and near the concrete pad (wash rack) did not show exceedances of applicable screening levels (with the exception of sediment within the sump). The focus of the 2010-2011 soil evaluation was the former drainage pit area; however, sediment that had accumulated in the washrack sump (**Appendix A**, **Tables A-4** and **A-8** had exceedances of the NMED SSLs (sample SD27-01) and was addressed by a removal action.

3.5.2 Groundwater Evaluation

As described in the ACM Work Plan and summarized in the ACM Work Plan Addendum (Tetra Tech, 2012), five new groundwater monitoring wells were installed during the 2010 ACM site investigation. Subsequently, monitoring wells MW-01 through MW-05 were sampled in November 2010 and in January, April, and July 2011 as part of the ongoing LTM program at Holloman AFB that was completed prior to the ACM Work Plan Addendum (Tetra Tech, 2012). Results for chemicals detected in groundwater for the 2010 and 2011 LTM sample events are presented in **Appendix A**, **Table A-14**. These groundwater data were formatted to show exceedances of the (then current) NMED groundwater SSLs for residential tap water (or USEPA maximum contaminant levels [MCLs]) and exceedances of the vapor intrusion from groundwater to indoor air exposure pathway (per USEPA 2002 default criteria).

3.5.3 Radionuclides in Sediment, Soil, and Groundwater

Exceedances of then current USEPA PRGs and NMED Tap Water screening levels for radiological contaminants in soil, sediment and groundwater are shown in **Appendix A**, **Tables A-4**, **A-5 and A-10**. Groundwater results for gross alpha and gross beta in **Appendix A**, **Table A-14** were rejected due to high levels of dissolved solids in the samples. To determine if the screening values and underlying assumptions should be used as cleanup levels for radionuclides at SD-27, the data were reviewed by Tetra Tech's radiological specialist, Dr. Bob Meyer, PhD. Dr. Meyer's review of the soil radiological sample results provided in Section 3 (historical) and Section 4 (ACM) data tables (Tetra Tech, 2012) and his consideration of the SD-27 Radiation Protection Program and Baseline Gamma Survey Summary Report (Tetra Tech, 2010) led to his conclusions regarding the source, potential risk, and soil management at SD-27, as quoted below:

> *As can be seen in the (analytical results) tables, most of the radionuclide soil concentration data of potential interest in the light of the Office of Soil Waste and Emergency Response (OSWER) comparison values represent naturally occurring radionuclides, at concentrations typical for natural, uncontaminated soils. These nuclides are present in many types of soil throughout the world, and are not associated with detonations of fission weapons. A few of these values fall outside the single-value comparison concentrations from OSWER, but those values all fall well within the normal range of variation of these nuclides in the natural environment, and do not represent concentrations of concern, or concentrations suggesting the need for further study. Very low residual concentrations as found here (reference SD-27), the result of fallout atmospheric plumes and rainfall washout into soils well downwind of the test site and across the entire U.S., do not represent concentrations of concern, or concentrations suggesting the need for further study. The subject site's soils, as represented by the measured radionuclide concentrations, are not of concern in terms of human or environmental risk. If excavated, the soil represented by these radionuclide measurements may be disposed of as though it were ordinary soil, uncontaminated by radionuclides. The soil results do not indicate any potential for groundwater contamination.*

It was concluded from Dr. Meyer's evaluation that the USEPA radiological screening guidelines for soil are not applicable cleanup criteria for SD-27 because concentrations detected at the Site represent background conditions and Site soil and groundwater concentrations do not represent a potential human health or environmental risk. Further discussion or evaluation of soil and groundwater for radionuclides is not included in this risk assessment. The referenced gamma survey summary report for SD-27 (Tetra Tech, 2010) and Dr. Meyer's biography are provided in the ACM Work Plan Addendum (Tetra Tech, 2012).

3.5.4 Risk Conclusions and Planned Activities

Based on the risk screening conducted and presented in the ACM Work Plan Addendum (Tetra Tech, 2012), it was determined that contamination in soil at the Site posed unacceptable risks to hypothetical future residential receptors (vapor intrusion pathway) and construction workers (direct contact pathway). It was further concluded that contamination in groundwater also posed unacceptable risks to hypothetical future residential receptors based on the vapor intrusion pathway.

For potential ecological exposures, it was concluded that due to the depth of impacted soils and the lack of surface water bodies in the area, there are no viable pathways for exposure of ecological receptors to contaminants in soil or groundwater at the Site (Tetra Tech, 2012).

Based on the screening level risk evaluation described above, it was determined that approximately 18,300 cubic feet (ft^3) (under an area of 0.4 acre, at depths below 6 ft bgs) should be excavated and removed (Tetra Tech, 2012).

Differences in the findings of the current risk assessment and the screening level risk evaluation presented in the ACM Work Plan Addendum (Tetra Tech, 2012) are further described in Section 5.

3.6 GROUNDWATER MONITORING UNDER THE LONG-TERM MONITORING PROGRAM

Monitoring wells MW-01 through MW-05 were sampled in December 2012 and March, June, and August 2013, under the quarterly long-term monitoring program (Tetra Tech, 2013). Groundwater data results for

these sampling events were compiled from ERPIMS. These data, provided in reduced form and compiled in accordance with methods described in Section 4, are provided in **Appendix C**.

The data show that impacts to groundwater are greatest within and downgradient (southwest) of the former drainage pit. Impacts at well MW-05 suggest that ponding and periods of higher hydraulic head in the pit likely acted to distribute some groundwater contamination upgradient of the pit, or that a release occurred from the pipeline in that area. Overall, the data indicate that a plume of groundwater contamination extends in an elongated pattern running northeast to southwest through the former drainage pit.

4.0 RISK ASSESSMENT

This section presents the methodology used to calculate risk for SD-27. The purpose of this evaluation is to estimate the risks and hazards based on current conditions and a future unrestricted land use scenario to determine if remedial action is warranted or if the site is suitable for CAC *without controls*.

The methodology includes the following:

1. Compilation of soil and groundwater data (Section 4.1);
2. Identification of chemicals of potential concern (COPCs) (Section 4.2);
3. Development of a human health exposure model (EM) (Section 4.3);
4. Data used for human health risk calculations (Section 4.4);
5. Calculated human health risk (Section 4.5);
6. Consideration of TPHs for human health (Section 4.6);
7. Uncertainty analysis for the human health risk methodology (refer to Section 4.7); and
8. Ecological Risk (Section 4.8)

Each of the above is described in detail in the sections below. Conclusions and recommendations resulting from the risk assessment are presented in Section 5.

4.1 COMPILATION SOIL AND GROUNDWATER DATA

Available soil and groundwater data were compiled based on the data included in ACM Work Plan Addendum (Tetra Tech, 2012), and more recent groundwater data (2011 through 2013) from ERPIMS. The compilation of the data is briefly described below.

4.1.1 Soil Data

Soil data were compiled and screened in accordance with the following:

1. **Appendix B, Table B-1** presents the available soil data collected in 2010 and 2011. Including duplicates, 88 soil samples were collected from 31 borings as shown in **Figure 3-1**. Most of the samples were analyzed for TPH, metals, VOCs, and SVOCs (see **Appendix B**, **Table B-2**). Naphthalene was analyzed by two different methods and is included as a VOC and SVOC. The data indicate that:
    i. The shallowest depth at which samples were collected was 5 to 7 ft, because field observations, including PID readings indicated the absence of any impacts from ground surface to a depth of approximately 7 ft. The deepest sample was collected at 23 to 25 ft bgs.
    ii. The entire drainage pit (approximately 50 ft in diameter and 10 ft deep) was backfilled to within a few feet of grade following a 1976 site radiation screening (Tetra Tech, 2012).
2. **Appendix B**, **Table B-3** presents the available soil data collected in 2006 for nine samples from five soil borings. No soil samples were collected from SB-27-6 to SB-27-8 (**Figure 3-1**).

3. In addition to the above data, one soil sample was collected from BH-27-03 in 1993 and analyzed for TPH kerosene, ethylbenzene, toluene, and xylenes. Data from BH-27-03 were not used since more recent data are available from proximate boring SD27-DPT-03[3].
4. Soil data collected for radioactivity were not used because the focus of this risk assessment is on organic and inorganic chemicals.

For the purposes of risk assessment, the comprehensive data set was evaluated as follows:

- Sample SD27-01 (from 0 to 2 ft bgs) was not included because per Tetra Tech (2012), the sediments were removed from the concrete sump during the May-June 2006 Supplemental RFI.
- Data from boring SB27-02 collected in 2006 was not used because more recent (2011) soil data are available from proximate boring SD-27-DPT-06.
- Soil data below 10 ft (the depth of soil that residents or construction workers may come in contact with per NMED [2015]) were not considered.
- Data qualified as UJ were treated as data reported below the reporting limit.
- Any chemical for which all the data were below the reporting limit was eliminated. See Section 4.7.1 for additional discussion on screening of non-detected chemicals by maximum detection limits.
- The naphthalene concentration was the average of the concentrations reported as a VOC and as an SVOC for a given sample location and depth.
- The Site was divided into two exposure units (EUs), the North EU and South EU, as shown in **Figure 4-1** (adapted from Tetra Tech, 2012). The North EU includes former Building T884, the Pad 9 wash rack, and drainage gallery. The South EU includes the former drainage pit and surrounding area.
- Data with an R qualifier were not considered.
- Duplicate samples were averaged as follows:
  - If both samples had detected concentrations, the average of the two samples was taken and considered as a detected concentration;
  - If one of the samples contained a detected concentration without a qualifier and the other concentration was below the reporting limit (i.e., had a U or UJ qualifier), the result below the reporting limit was replaced with half the reporting limit and the average of the two was taken and considered as detected without a qualifier;
  - If one of the samples contained a detected concentration with a J qualifier and the other concentration was below the reporting limit (i.e., had a U or UJ qualifier), the result below the reporting limit was replaced with half the reporting limit and the average of the two were taken and considered as detected with a J qualifier; and
  - If both samples had concentrations below the reporting limits (i.e., were U or UJ qualified), the average of the two reporting limits was taken and the sample was considered as not detected with a U qualifier.

[3] Note – of the 1993 soil samples, BH-27-01 through BH-27-05, samples BH-27-01 and BH-27-02 were only analyzed for radiological chemicals, sample BH-27-04 was analyzed for PCBs, and BH-27-05 was intended as a local background sample (nearby, off-site) for radiological impacts. Only sample BH-27-03 was relevant to the current risk assessment, having evaluated for kerosene and selected BTEX components. Sample SD-27-DPT03 was taken in 2010 from the same location as BH-27-03, and so was used in its place.

With the above adjustments incorporated, **Table 4-1 and 4-2** present the data used for the risk assessment for North EU and South EU, respectively. Note, these tables also present the maximum detected concentration for each chemical.

4.1.2 Groundwater Data

The groundwater data were compiled in the following tables:

- **Table 4-3** presents construction details for the five wells (MW27-01 to MW27-05). The screen length varies from 7.5 to 10 ft and total depth of wells varies from approximately 17 to 20 ft bgs.
- **Appendix C, Table C-1** presents the groundwater data collected from the five permanent wells. Data are available for eight monitoring events from November 2010 to August 2013. The samples were analyzed for TDS, TPH, dissolved and total metals, VOCs, and SVOCs (**Appendix C, Table C-2**). Additionally, samples were analyzed for general chemistry data which were not compiled as they are not relevant to the risk evaluation.
- Groundwater data were also collected from four temporary borings in 2006. These data are presented in **Appendix C, Table C-3**. Except for TDS, samples from temporary borings were analyzed for the same parameters as the samples from permanent wells.
- **Table 4-4** presents a summary of the gauging data. The average depth to groundwater is approximately 10 ft bgs. The Site wide variation in depth is from approximately 8.5 to 14 ft bgs. No clear seasonal pattern was obvious.
- The maximum groundwater depth of 14.42 ft bgs was observed in MW-02 at the time of well installation in November 2010. Seven subsequent water level measurements are in the range of 9 to 11 ft bgs.

For purposes of risk assessment, the data were evaluated as follows:

- Data qualified as UJ were treated as data reported below the reporting limit.
- Any chemical for which all the data were below the reporting limit was eliminated.
- Data from 2010 were not used as data were available from 2012 and 2013 that are more representative of current conditions.
- The naphthalene concentration was the average of the concentrations reported as a VOC and as an SVOC for a given groundwater sample location and date.
- All duplicate samples were averaged as follows:
    - If both samples had detected concentrations, the average of the two samples was taken and considered as a detected concentration;
    - If one of the samples contained a detected concentration without a qualifier and the other concentration was below the reporting limit (i.e., had a U or UJ qualifier), the result below the reporting limit was replaced with half the reporting limit and the average of the two were taken and considered as detected without a qualifier;
    - If one of the samples contained a detected concentration with a J qualifier and the other concentration was below the reporting limit (i.e., had a U or UJ qualifier), the result below the reporting limit was replaced with half the reporting limit and the average of the two were taken and considered as detected with a J qualifier; and

- If both samples had concentrations below the reporting limits (i.e., were U or UJ qualified), the average of the two reporting limits was taken and the sample was considered as not detected with a U qualifier.

With the above adjustments incorporated, **Tables 4-5** and **4-6** present the data used for the risk assessment for the North EU and South EU, respectively. Note, these tables also present the maximum detected concentration for each chemical. The groundwater data for the North EU includes data from one permanent well (SD-MW27-01) and two temporary wells (GW27-07 and GW 27-08). Groundwater data for the South EU include those for permanent wells SD27-MW02, SD27-MW03, SD27-MW04 and SD27-MW05.

4.2 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

To identify COPCs, the maximum detected concentration of each chemical was compared with the corresponding screening levels, as described below.

4.2.1 Chemicals of Potential Concern in Soil

The SSLs (hereafter referred to as applicable SSLs) were obtained from the following two sources:

- NMED SSLs for residential land use (NMED 2015);
- NMED SSLs for construction workers (NMED 2015); and
- USEPA regional screening levels (RSLs) for residential land use (USEPA, 2015a) for chemicals for which NMED SSLs are not available. Note, USEPA (2015a) residential land use RSLs were adjusted to reflect a cancer risk of 10^{-5}, which is consistent with NMED 2015. Additionally, USEPA (2015a) does not have RSLs for construction workers.

The NMED residential and construction worker SSLs are protective of incidental ingestion of soil, dermal contact with soil, and outdoor inhalation of vapors and particulates. Since groundwater is not potable (see Section 4.2.3), the applicable SSLs and/or USEPA RSLs protective of groundwater are not directly applicable.

Table 4-7(a) and **Table 4-7(b)** present comparisons of maximum detected concentrations with applicable SSLs for the North EU and South EU, respectively. Chemicals with maximum detected concentrations greater than the applicable SSLs were considered COPCs. Additional discussion on selection of COPCs is provided in Section 4.7.1.

For the North EU, none of the chemicals exceeded the residential and construction worker screening levels.

For the South EU, chromium exceeded both residential and construction worker scenarios; and TPH (C10-C28) mixture exceeded the residential screening level.

Applicable SSLs for cymene were not available in either of the two sources (NMED [2015] and USEPA [2015a]). Further, quantitative toxicity values for p-cymene were not available, and therefore, a screening level could not be developed and this chemical was not considered further. The risk due to TPH mixtures is described in Section 4.6. Note, cymene is a naturally occurring aromatic organic compound and is a constituent of several essential oils (e.g., oil of cumin and thyme).

Table 4-8 presents the location and depth of samples that exceed screening levels for the South EU.

4.2.2 Chemicals of Potential Concern in Soil Indoor Inhalation

Applicable SSLs presented in **Table 4-7(a)** and **Table 4-7(b)** do not consider indoor inhalation of vapors from soil. Therefore, a site-specific risk evaluation was conducted for the indoor inhalation pathway for volatile chemicals detected in soil. Specifically, per NMED (2015), a chemical is considered volatile if its molecular weight is less than 200 grams per mol (g/mol) and Henry's constant is greater than 1 x 10^{-5} atmosphere-cubic meter per mol (atm-m^3/mol). Based on these criteria, **Table 4-9(a)** and **Table 4-9(b)** identify the volatile chemicals detected in soil at the Site. Specifically, 7 and 19 chemicals were identified as volatile in the North EU and South EU, respectively[4].

4.2.3 Chemicals of Potential Concern in Groundwater

Per New Mexico Administrative Code (NMAC) Title 20 Chapter 6 Section 20, (NMAC 20.6.20.3103) groundwater with a TDS concentration of less than 10,000 milligrams per liter (mg/l) is to be considered as a potential future source for use as domestic and agricultural water supply. Based on available data, the minimum TDS concentration from Site wells is 11,100 mg/l. Therefore, groundwater at the Site is not a drinking water source, and the tap water screening levels, New Mexico Water Quality Control Commission (NMWQCC) standards, and USEPA MCLs are not reasonable screening levels for groundwater at the Site.

As described in Section 4.3, the only potential route of exposure for groundwater is potential future indoor vapor intrusion. This pathway is applicable only for volatile chemicals as defined in Section 4.2.2.

Table 4-10(a) and **Table 4-10(b)** compare maximum detected groundwater concentrations with NMED (2015) residential VI SSLs. For the North EU, none of the volatile chemicals exceeded the vapor intrusion screening levels. For the South EU, benzene and ethylbenzene exceeded the screening values and were used for site-specific evaluation of the vapor intrusion pathway.

4.3 DEVELOPMENT OF AN EXPOSURE MODEL

This section presents the EM for SD-27. The EM assumes unrestricted future land use for both the EUs and identifies potential receptors and exposure pathways under current and hypothetical future conditions.

4.3.1 Receptors

Currently, the Site has restricted access and there are no indoor structures. An occasional maintenance worker may visit the Site and potentially be exposed to the residual chemicals on Site. However, their exposure frequency and exposure duration would be very small relative to the exposure frequency and duration of a hypothetical future residential receptor. Therefore, the exposure and risk would be less than that of hypothetical future residents evaluated in this risk assessment.

Although Holloman AFB has no plans to develop this property, it was conservatively assumed that the future land use will be residential. Therefore, the resident is considered a receptor of concern under hypothetical future conditions. Additionally, construction activities may occur in the future, and therefore, hypothetical future construction worker is also considered a receptor of concern. Note, per NMED (2015),

[4] Note – per USEPA (2015a), a chemical is considered volatile if its vapor pressure is greater than 1 mm Hg **or** its Henry's Law constant is greater than 10^{-5} atm-m^3 mol^{-1}. Using this definition results in the same set of VOCs as shown in Tables 4-9(a) and 4-9(b). See supplemental Table D-4(a) and Table D-4(b), Appendix D.

the risk to a resident requires consideration of risk to a child, adult, or age-adjusted receptor. The latter is a person who spends both childhood and adult life at the Site.

Per NMED (2015), direct exposure to soil is considered up to a depth of 10 ft bgs for the residential scenario.

4.3.2 Exposure Pathways

Figure 4-2 is human health conceptual site model that is a graphical representation of three-dimensional Site conditions that conveys what is known or suspected, at a discrete point in time, about the site-specific sources, releases, release mechanisms, contaminant fate and transport, exposure routes, and potential receptors (NMED, 2015). **Table 4-11** presents the EM for the potential future resident. As shown in this table, the following pathways will be evaluated:

- Ingestion, dermal contact, and outdoor inhalation of vapors and particulates from soil up to 10 ft bgs;
- Indoor inhalation of vapors from subsurface soil; and
- Indoor inhalation of vapors from groundwater.

Exposure and risk to a hypothetical future construction worker will not be evaluated because the risk to a resident is expected to exceed the risk to a construction worker for chromium in soil based on comparison of the residential and construction worker NMED SSLs.

4.4 DATA USED FOR RISK CALCULATIONS

This section described the data used to calculate risk for each complete exposure pathway identified in Section 4.3.

4.4.1 Direct Contact with Soil

Direct contact with soil includes incidental ingestion of soil, outdoor inhalation of vapors and particulates, and dermal contact with soil. The only COPCs are chromium and TPH (C10-C28) in the South EU (Section 4.2.1). The screening level evaluation considers the screening value for total chromium, per NMED (2015). For the detailed evaluation, total chromium was considered to consist of both chromium VI and chromium III in the recommended ratio of 1:6 (NMED, 2015). Consideration of TPH (C10-C28) contamination is further described in Section 4.6.

The following data are required for human health risk calculations:

- Toxicity values for the COPCs,
- Physical chemical properties for the COPCs,
- Exposure factors for the receptors,
- Media-specific factors (fate and transport parameters),
- Equations and models for the calculation of risk, and
- Representative concentrations for each COPC

Each of these inputs is discussed below.

4.4.1.1 Toxicity Values

The toxicity of chemicals with carcinogenic adverse health effects is quantified using slope factors for oral and dermal exposures and unit risk factors for inhalation exposure. For non-carcinogenic adverse health effects, the reference dose is used for oral and dermal exposures and reference concentrations for inhalation exposure. Toxicity values used in the risk assessment are presented in **Table 4-12** and were obtained from USEPA (2015a).

4.4.1.2 Physical and Chemical Properties

The physical and chemical properties for COPCs are presented in **Table 4-13** and were obtained from USEPA (2015a).

4.4.1.3 Exposure Factors

Exposure factors were obtained from NMED (2015) and USEPA (2014a) and are presented in **Table 4-14**.

Body Weight: Per NMED (2015), body weights of 15 kilograms (kg) for a child and 80 kg for an adult were used.

Skin Surface Area: This parameter represents the area of the skin that is assumed to be completely covered with soil. Chemicals in soil may penetrate the skin and cause dermal exposure. Per USEPA (2014a), the skin surface area for a child of 2,373 square centimeters (cm^2) was used and represents the area of head, arms, lower legs and feet. For an adult, an area of 6,032 cm^2 was used. Note, this differs from the value presented in NMED (2015); however, the value used is based on a review of the above original references cited in NMED (2015).

Exposure Duration: This parameter represents the number of years a resident will stay continuously at the hypothetical future homes and be potentially exposed to soil. Per NMED (2015), a conservative value of 6 years for a child and 20 years for an adult were used.

Exposure Frequency: This parameter represents the number of days in a year the receptor will be exposed to soil by incidental ingestion, outdoor inhalation of vapors and particulates, and dermal contact. Per NMED (2015), a value of 350 days was used.

Exposure Time for Outdoor Inhalation: Per USEPA (2011) Table 16-20, a typical resident spends 137.6 minutes/day (2.28 hours/day) outside in their yard or near their home. Therefore, 3 hours/day was considered for outdoor activities.

Soil Ingestion Rate: Per NMED (2015), an ingestion rate of 200 milligrams per day (mg/day) for a child and 100 mg/day for an adult were used.

Soil to skin adherence factor: Per NMED (2015), soil adherence factors of 0.2 milligrams per square centimeter (mg/cm^2) for child and 0.07 mg/cm^2 for adult were used.

4.4.1.4 Media Specific Factors

Per the ACM Work Plan Addendum (Tetra Tech, 2012), the vadose zone soil type is silty sand and sandy silt. The most similar soil type, per the default SCS soil type listed in USEPA (2004) guidance is loam. These parameters, also referred to as geotechnical parameters, were obtained for loam from USEPA

(2004) and are presented in **Table 4-15**. The exception to this is that the organic carbon content value was obtained from NMED (2015).

4.4.1.5 Equations for Calculation of Risk

Appendix E presents the equations and models used to estimate risk due to direct contact with soil. These equations were obtained from NMED (2015).

4.4.1.6 Representative Concentrations

The representative concentrations for soil were estimated for the South EU as follows:

South EU: Since sufficient number of samples were available, the 95% upper confidence limit of the mean (UCL) was calculated using ProUCL software, version 5.0 (USEPA, 2013). The representative concentrations are shown in **Table 4-16**.

4.4.2 Indoor Inhalation of Vapors from Soil and Groundwater

This section describes the input parameters used to calculate risk for indoor inhalation of vapors from soil and groundwater. This calculation of risk requires the following:

- Toxicity values for COPCs,
- Physical and chemical properties for COPCs,
- Exposure factors for the receptors,
- Source parameters,
- Geotechnical parameters,
- Building parameters,
- Models and equations, and
- Representative concentrations.

For the North EU, indoor inhalation risk was calculated for 7 chemicals in soil. For South EU indoor inhalation risk was calculated from 19 chemicals in soil and 2 chemicals in groundwater.

Each of these is described below.

4.4.2.1 Toxicity Values

The toxicity of chemicals with carcinogenic and non-carcinogenic adverse health effects is quantified using unit risk factor and reference concentration, respectively. Inhalation toxicity values for the volatile COPCs are presented in **Table 4-17** and were obtained from USEPA (2015a).

4.4.2.2 Physical and Chemical Properties

Physical and chemical properties are presented in **Table 4-17** and were obtained from USEPA (2004 and 2015a) and *BioVapor, 1-D Vapor Intrusion Model, Version 2.1, API, November 2012*. When available, default values of first order degradation rate were used for the COPCs. This included 9 of the 19 chemicals (**Table 4-17**). The remaining chemicals were assigned a very low degradation rate of 7.9×10^{-6}

per hour (i.e., a half-life of 10 years). This included petroleum hydrocarbons (e.g., butylbenzene) that may have much higher degradation rates.

4.4.2.3 Exposure Factors

Exposure factors for indoor inhalation of vapors from soil and groundwater are presented in **Table 4-18**. Typically, conservative values as recommended by USEPA (2014a) and NMED (2015) were used.

Exposure time: Per Table 16-16 of USEPA (2011), a resident spends 1001.4 minutes (16.66 hours) indoors per day. These data are based on activity pattern studies. Therefore, an exposure time of 17 hours was used.[5]

Exposure Duration: Conservatively, the NMED (2015) default exposure duration of 6 years for a child and 26 years for age-adjusted resident were used. This implies that the future resident will stay in the same home for 26 years.

Exposure Frequency: Conservatively, the NMED (2015) default exposure frequency of 350 days per year was used. This implies that the resident is on site for 350 days in a year and is on travel or outside the area of the property for 15 days in a year.

4.4.2.4 Source Parameters

The following source parameters are required for calculation of risk and presented in **Table 4-19**:

Average Groundwater Temperature: Per USEPA (2004), the average temperature of shallow groundwater in south central New Mexico is 62 degrees Fahrenheit (°F) (16.6 degrees Celsius [°C]).

Average Soil Temperature: The soil temperature was assumed to be the same as the groundwater temperature.

Depth Below Grade to Water Table: Based on groundwater gauging data, the shallowest depth to groundwater for the period 2010 through 2013 was 8.51 ft bgs (259.4 centimeters [cm]). This depth was used for the depth below grade to the water table.

Depth Below Grade to Top of Contamination: Based on available soil data for each EU, the depth to top of contamination is as follows:

North EU: The shallowest contamination was observed at SB27-01 from 6 to 8 ft bgs. Therefore, conservatively a depth of 6 ft bgs (182.8 cm) was used.

South EU: The shallowest contamination was observed from 6.5 to 8 ft bgs at several borings. Therefore, conservatively a depth of 6.5 ft bgs (198.12 cm) was used.

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[5] Indoor and outdoor exposure times of 17 hours and 3 hours, respectively, are based on the mean statistical values for "all" populations as provided in the Exposure Factors Handbook (USEPA, 2011). Using these "best estimates" for exposure time parameters (each rounded up to the nearest hour), implicitly assumes that the future resident will be away from the home and yard for an average of 4 hours per day over the typical exposure period. This represents the most accurate estimate for these parameters and is therefore un-biased with regard to total risk or hazard calculations.

4.4.2.5 Geotechnical Parameters

Geotechnical parameters for loam referenced in Section 4.4.1.4 were used. For the capillary fringe zone, it was assumed that the total porosity was the same as for the vadose zone and 90% of the total porosity was filled with water. The thickness of capillary fringe of 37.5 cm representative of loam (USEPA, 2004) was used.

4.4.2.6 Building Parameters

The BioVapor model requires dimensions of the hypothetical future residential building. In the absence of specific building plans, the default values used in Version 3.1 of the Johnson and Ettinger (J&E) model (USEPA, 2004) were used. A schematic of the required dimensions are presented in **Figures 4-3(a), (b), and (c)**. These values are tabulated in **Table 4-19** and include:

- Depth below grade to bottom of enclosed space floor,
- Enclosed space floor thickness,
- Enclosed space floor length,
- Enclosed space floor width,
- Enclosed space height,
- Floor-wall seam crack width,
- Indoor air exchange rate, and
- Average vapor flow rate into building.

The building parameter values and sources used are presented in **Table 4-19**.

4.4.2.7 Models and Equations

The risks were calculated using the BioVapor model (API, 2012), as described in the *Technical Guide for Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites* (USEPA, 2015b). For additional details of the model, refer to the API BioVapor website – http://www.api.org/environment-health-and-safety/clean-water/ground-water/vapor-intrusion/biovapor-form. This approach is consistent with the *OSWER Technical guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (USEPA, 2015c), which acknowledges that the former guidance (USEPA, 2015b) should be used to inform decisions about vapor intrusion and petroleum hydrocarbons at non-underground storage tank (UST) sites that are similar in size to a typical Subtitle I UST release site. Further, the use of the BioVapor model is appropriate for evaluation of potential future vapor intrusion risk at SD-27, because, as stated in the updated OSWER guidance (USEPA, 2015c):

> *Many petroleum hydrocarbons may naturally biodegrade in the vadose zone through the actions of microorganisms found naturally in soil. When oxygen supply from the atmosphere is sufficient, biodegradation of petroleum hydrocarbons can occur relatively quickly, will generally produce less harmful compounds (i.e., biodegradation products), and can result in substantial attenuation of petroleum hydrocarbon vapors over relatively short distances in the vadose zone.*

To calculate risk from volatile chemicals in soil, BioVapor requires soil vapor or groundwater concentration as the input. For consideration of impacts above the water table, representative concentrations in soil were used to calculate the soil vapor concentrations by using the equilibrium

partitioning equation between soil (or adsorbed-phase) concentrations and vapor phase concentrations. This approach may result in the source term being biased low, but likely would have minimal impact at this site (see discussion in Section 4.7.1). The partitioning equation is included in the J&E Model (USEPA, 2004).

4.4.2.8 Representative Concentrations

The following representative concentrations were used:

Soil for North EU: The maximum concentration from SB27-01, SB27-04, and SB27-05 was used as the representative concentration because a 95% UCL could not be calculated since less than eight samples were available (see **Table 4-20[a]**).

Groundwater for North EU: None of the chemicals in groundwater exceeded the vapor intrusion SLs, and therefore, representative concentrations are not required.

Soil for South EU: The 95% UCLs were used as the representative concentrations. The results are presented in **Table 4-20(b)**.

Groundwater for South EU: Groundwater data collected from 2011 through 2013 were used since these data are most representative of current conditions. For each well, the average concentration from multiple sampling events was calculated and referred to as the representative well concentration. The average of the representative well concentrations was used to calculate risk (see **Table 4-20[c]**).

4.5 CALCULATED RISKS

Risk was calculated for each COPC (Section 4.2), complete exposure pathway (Section 4.3.2), and receptor combination. The calculated risks are compared with the target cumulative risk level of 1×10^{-5} and target cumulative hazard index (HI) of 1.0.

North EU: The carcinogenic and non-carcinogenic risk for indoor inhalation of vapors from soil is presented in **Table 4-21(a)**.

HI for indoor inhalation of vapors from subsurface soil is 0.0004, which is below the target cumulative HI level of 1.0 and incremental excess lifetime cancer risk (IELCR) is less than 1×10^{-10}, which is below the target cumulative risk level of 1×10^{-5}. Note, this represents the cumulative risk because the direct pathway was screened out.

South EU: The carcinogenic and non-carcinogenic risk for direct contact with soil, indoor inhalation from soil, and indoor inhalation from groundwater are presented in **Tables 4-21(b)** and **Table 4-21(c)**. Following are the key observations and conclusion:

- HI for direct contact with soil is 0.05, which is below the target cumulative HI of 1.0 and IELCR is 8×10^{-6}, which is below the target cumulative risk level of 1×10^{-5}.
- HI for indoor inhalation of vapors from soil is 0.8, which is below the target cumulative HI of 1.0 and IELCR is 6×10^{-9}, which is below the target cumulative risk level of 1×10^{-5}.
- HI for indoor inhalation of vapors from groundwater is 8×10^{-18}, which is below the target cumulative HI of 1.0 and IELCR is 9×10^{-22}, which is less than the target cumulative risk level of 1×10^{-5}.

A summary of risks for pathways and EUs is presented in **Table 4-21(d)**. **Appendix F** provides the BioVapor model input and results screens for the VI risk from soils in the South EU. Cumulative risks in the North EU and South EU are below target levels.

4.6 CONSIDERATION OF TPH

Risk to each of the chemicals identified as COPCs is presented in Section 4.5. This section described the risk due to TPH measured in the South EU. Note, the maximum TPH concentrations measured in the North EU did not exceed NMED screening levels (see **Table 4-7[a]**).

Table 4-8 presents the locations where soil TPH concentrations exceeded the NMED SSLs. TPH is a mixture of several constituents whose toxicity depends on the specific constituents. Further, the composition of TPH varies in time as the process of weathering occurs. Specifically, the lighter and more toxic fractions volatilize and naturally attenuate. The NMED SSLs are based on several assumptions related to the composition of TPH which may or may not be valid for this site. Since the Site has been well delineated for a wide range of individual petroleum-related contaminants in soil and groundwater (volatile and semivolatile chemicals), these data have been used to quantitatively evaluate risk, as recommended by NMED (2015). Risk associated with these constituents is well below the target levels; therefore, it is not necessary to perform additional site-specific evaluation of residual TPH concentrations.

4.7 UNCERTAINTY ANALYSIS

In risk assessment, the estimated carcinogenic and non-carcinogenic risks contain several sources of uncertainties. However, the general approach used in this risk assessment has been to use conservative assumptions regarding exposure estimates, so that the estimated carcinogenic and non-carcinogenic risks represent an upper bound estimate of risk. The following sections present the inherent sources of uncertainty and conservative assumptions used in this risk assessment.

4.7.1 Inherent Sources of Uncertainty

The risk assessment process is designed to provide a conservative estimate or evaluation of risks to human health. However, some degree of uncertainty is inherent to the process. Sources of uncertainty typically relate to six areas:

1. Site characterization,
2. Selection of COPCs and Representative concentrations,
3. Exposure evaluation,
4. Toxicity values,
5. Physical and chemical properties, and
6. Fate and transport parameters and models.

Inherent sources of uncertainty relating to site characterization include:

- Field sampling location bias (sample locations were biased toward areas of highest contamination) and likely overestimation of risks.

Inherent sources of uncertainty relating to selection of COPCs and representative concentrations include:

- COPCs were identified in accordance with NMED (2015) Section 2.7.6 *Compare COPC Maximum Concentrations with SSLs*. Per this section, chemicals exhibiting concentrations in excess of the SSLs

represent the COPC list. As a check, carcinogenic and non-carcinogenic risks were estimated (using NMED and/or EPA screening levels) for all chemicals that were detected, but screened out. Cumulative risks were below the target risk level of 10-5 and target hazard index of 1.

To evaluate the potential impact of non-detected chemicals, comparisons of screening levels to maximum detection limits for all soil and groundwater samples in the North and South EUs are provided in Appendix D, Tables D-1(a), D-1(b), D-2(a), and D-2(b). None of the detection limits in soil or groundwater for the North EU exceeded applicable screening levels. In the South EU, maximum detection limits exceeded screening levels in soil samples for selenium and acrolein. For selenium, in a single sample there was an outlier detection limit of 6,000 mg/kg. The second highest detection limit for selenium in the dataset was 2.7 mg/kg, which is below the screening level. Based on this information selenium was not retained as a COPC. Acrolein also was not retained as a COPC for the following reasons: 1) acrolein is used as a biocide and/or produced in the burning of fats or other organics, and is not suspected of being used at SD-27; 2) if present, acrolein readily undergoes aerobic or anaerobic degradation; 3) it has a low organic carbon/water partition coefficient and high water solubility, thus "acrolein is not expected to significantly adsorb to suspended solids or sediments, nor are soils or sediments expected to significantly absorb acrolein from water." (WHO, 2002); and 4) it was analyzed in numerous groundwater samples from all five site wells through 2013 without any detections at the 5 ug/L detection limit.

- Use of current concentrations for hypothetical future resident and hypothetical future construction worker. This would overestimate future risks since the concentrations would decrease over time due to natural attenuation processes. This is particularly valid for petroleum hydrocarbons.
- Average groundwater plume concentrations were used, for the VOCs that exceeded NMED VISLs, to evaluate the vapor intrusion pathway in the South EU. Other approaches in the literature include using data from "a minimum of 3 wells in the core of the plume" (USEPA, 2014b). The three wells nearest any discernable "plume core" at SD-27 would be MW-05, MW-04 and MW-02. Using averages from these three wells (whether arithmetic or 95% UCLs) would have minimal impact on the groundwater exposure point concentrations. Furthermore, the calculated risk from the groundwater-to-indoor air pathway was essentially zero ($< 10^{-15}$) so even a several fold increase in exposure concentrations would not alter the conclusions of the analysis. In general, assuming the 2011 through 2013 average groundwater concentrations will persist at the site for a 26-year period, given the nature (degradable petroleum hydrocarbons) and age of contamination (on the order of 50 years), is protective and reasonable.
- Per NMED 2015, use of the ProUCL software for estimates of 95% UCLs is unreliable with datasets of low detection frequency. NMED (2015) recommends the number of detected samples at greater than 5. USEPA (2013) states: "Statistics (e.g., UCL95) computed based upon only a few detected values (e.g., < 4) cannot be considered reliable enough to estimate the EPC terms having potential impact on human health and the environment." EPCs were calculated for soil concentrations using the recommendations provided in the ProUCL output, which optimally accounts for non-detected sample results. In the North EU, there were three samples collected (n=3) for each of eight organic chemicals; therefore, due to the low sample number the maximum concentrations were used for EPCs for all eight chemicals. In the South EU, ProUCL was used to calculate 95% UCLs for 21 different chemicals. Four of these chemicals had less than 5 detections, and were detected with the following frequencies: acetone (3 of 22 samples); hexane (4 of 27 samples); methylene chloride (2 of 27 samples) and tert-butyl benzene (2 of 27 samples).

  For these four chemicals, the ProUCL output recommendations were used. Specifically, for methylene chloride, the maximum detected value was used. For the three other chemicals, each of which had 27 samples, the ProUCL calculated 95% UCLs were used. Note, the EPC for tert-butyl benzene had no impact, since it does not have toxicity data. Use of the Pro-UCL recommended values

for these three chemicals was shown to have no impact on the risk results. See supplemental Tables D-3(a) and D-3(b), Appendix D.

- Groundwater contaminants were screened using the NMED (2015) Vapor Intrusion Screening Levels (VISL), as shown in Table 4-10(b). One chemical, 1,2,4-Trimethylbenzene, does not have an established NMED VISL but does have a listed EPA VISL. Therefore, by using only the NMED groundwater screening data, this single chemical was omitted from additional analysis using the BioVapor model. This omission likely has a negligible impact on the overall findings, since the BioVapor model demonstrated high levels of attenuation of petroleum hydrocarbons and the combined modeled risk for the groundwater-to-indoor air pathway in the South EU was on the order of 10^{-18} (hazard) and 10^{-22} (cancer risk). It is noted, however, that 1,2,4-Trimethylbenze was accounted for in the soil-to-indoor air analysis, and found to contribute a hazard quotient of the order 10^{-15}.

Inherent sources of uncertainty relating to exposure evaluation include:

- Assumption of frequent or routine exposure over prolonged durations. For example, the assumption that a resident stays at the same location for 26 years. This would likely overestimate risk.
- Assumption that some pathways are negligible in comparison to others (e.g., outdoor inhalation of vapors from groundwater by hypothetical future residents were not quantitatively evaluated since indoor inhalation of vapors from groundwater was evaluated). This would slightly underestimate cumulative risk.

Inherent sources of uncertainty relating to toxicity values include:

- Procedures to develop cancer and non-cancer toxicity values incorporate conservative assumptions and uncertainty factors, respectively, and may overestimate risk or hazard.
- Chemicals without toxicity values. For example, risk from p-cymene (in soils) was not evaluated because a quantitative toxicity value is not available. To the extent these chemicals are toxic, the overall risks have been underestimated. Toxicity data were also lacking for selected VOCs that were detected in soils or groundwater, including: 1-methylnaphthalene; 2-methylnaphthalene; 1,3,5-trimethylbenzene; n-butylbenzene; sec-butylbenzene and tert-butylbenzene. It is noted that these chemicals are attributable to fuels-related contamination at the site, and are therefore recognized to be amenable to biological attenuation in the vadose zone.
- The cumulative risk calculation (i.e., sum of risks for different pathways and chemicals) assumes each chemical impacts a common target organ based on a similar mechanism. This is conservative because different chemicals may affect different organs. Since the cumulative calculated HI did not exceed one, no additional target organ/system analysis was performed. On the contrary, to the extent that there may be some synergistic effects between the chemicals, risk may be underestimated.

Inherent sources of uncertainty relating to physical and chemical properties and fate and transport parameters and models include:

- Use of physical and chemical properties based on a single chemical which does not consider effects of the presence of multiple chemicals (i.e., consideration of Raoult's Law for partitioning of chemicals within mixtures, Cline et al., 1991). This would overestimate risks because the presence of multiple chemicals reduces volatility and solubility.
- The choice of using the BioVapor model to assess risks related to vapor intrusion introduces uncertainty in evaluation of vapor intrusion risk to future residential receptors. Current guidance favors the use of soil gas measurements over modeling and other screening approaches for evaluation of the vapor intrusion pathway. Ideally, direct soil vapor samples are collected near the source and

near the building (sub-slab) to allow for site-specific evaluation of the attenuation factor (USEPA, 2015b). However, lacking a current building (receptor) at the site, a reasonable approach is to model soil vapor transport (and attenuation) using one of the available and recommended tools. This approach is consistent with the OSWER Technical guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (USEPA, 2015c), which acknowledges that the EPA LUST guidance (USEPA, 2015b) should be used to inform decisions about vapor intrusion and petroleum hydrocarbons at non-underground storage tank (UST) sites that are similar in size to a typical Subtitle I UST release site. Further, the use of the BioVapor model is appropriate for evaluation of potential future vapor intrusion risk at SD-27, because, as stated in the updated OSWER guidance (USEPA, 2015c):

> "*Many petroleum hydrocarbons may naturally biodegrade in the vadose zone through the actions of microorganisms found naturally in soil. When oxygen supply from the atmosphere is sufficient, biodegradation of petroleum hydrocarbons can occur relatively quickly, will generally produce less harmful compounds (i.e., biodegradation products), and can result in substantial attenuation of petroleum hydrocarbon vapors over relatively short distances in the vadose zone."*

- Use of equilibrium partitioning to estimate vapor phase source concentrations based on soil concentrations has the potential to bias the source term used in the vapor transport model. The concentration of COCs in soil generally ranges from 1 to 500 mg/kg. At these concentrations, any losses during sample collection would be expected to be quite small (e.g., <10%, which is much less than the sampling and analytical variability). Therefore, losses during the brief sample collection process are likely to be insignificant. Furthermore, the soils impacted by hydrocarbon VOCs are those with the lower sampling depth interval ranging from 8.5 to 10 feet bgs, near the water table. The soil layers at the highest impacted borehole locations, where maximum VOC soil concentrations were detected, were characterized as being in the range from "moist" to "wet" to "saturated", due to proximity to the water table (see Appendix A, Field Logs, Tetra Tech, 2012). The presence of a 'wet sample' further reduces the likelihood of losses during the sample collection process. Further the age of the release (> 50 + years) also indicates a lower potential for vapor intrusion (USEPA, 2015b). Per UESPA (2015b), vapor intrusion from petroleum hydrocarbons is not likely to be a concern if vertical separation distances exceed six feet (i.e., from the building floor to the impacted groundwater or soil), assuming that no LNAPL source exists (note, the threshold for lack of LNAPL is groundwater benzene concentration below 1 mg/L, which is the case for groundwater at SD-27). Due to these factors, the use of equilibrium partitioning in lieu of available soil vapor data at SD-27 is believed to conservative.
- Additional limitations that apply to use of the BioVapor model for evaluation of indoor vapor intrusion includes the following (BioVapor User's Manual, 2012):
  - The model is 1-dimensional and assumes steady state, therefore, changes in time and/or space of contaminant source concentrations or any other assumptions (ventilation rates, temperatures, etc.) are not captured, resulting in a potential lack of accuracy;
  - Subsurface oxygen concentrations and site-specific respiration rates were unknown in the current analysis. As such, sensitivity analyses were conducted (additional discussion below).
  - The model only evaluates risks based on vapor intrusion at the exclusion of all other exposure routes; therefore, other routes must be evaluated separately, as was done for the current risk assessment.
- One of the key input parameters in the BioVapor model is the biodegradation rate of petroleum hydrocarbon vapors. Although the biodegradation of vapors has been demonstrated in numerous studies and acknowledged by various regulatory agencies including USEPA (2015b), considerable

variability exists in the specific value of the biodegradation rate. This parameter can vary based on several factors such as the availability of oxygen and nature of microbes present in the soil.

- Another important input parameter for indoor air exposure modeling is the building air exchange rate. In the current study, an air exchange rate 0.5/hr was used, as provided in Table 9 of USEPA (2004), which is listed as the "typical or mean value" for building air exchange rate. There is considerable variability of the air exchange rate value in the literature. The Johnson and Ettinger Model Guidance documentation (USEPA, 1997) states a default value of 0.45 per hour, consistent with the mean and median for houses in all U.S. regions. The 2002 Subsurface Vapor Intrusion Guidance (USEPA, 2002) states a 'default value of 0.25 per hour, but also refers to that value as the upper end of the ranges that are "very small" and "very low". Abreau et al. (2009) used an air exchange rate of 0.5 per hour. EPA's Vapor Intrusion Screening Level (VISL) Calculator (2012) uses 0.5 per hour as the 'baseline value'; and values of 0.25 and 1.0 per hour as "alternative values". Another EPA report "Estimation of Distributions for Residential Air Exchange Rates" (USEPA, 1995) states "a value of 0.45 ACH [air changes per hour] would be appropriate when a typical air exchange rate is desired for modeling inhalation", with a reported weighted mean for the "West Region" (which includes New Mexico) of 0.66 ACH. Use of the air exchange rate of 0.5 is reasonable to assess future indoor vapor risk as this site based on the range described in the literature. Use of a "typical or mean" value provides the best accuracy.
- As described in Section 4.4.2.7, the BioVapor model allows for biodegradation of VOC contaminants in the vadose zone between the source and receptor, presumed to be in an indoor structure located over or adjacent to the source area. The depth of the aerobic zone in the model (and its capacity to attenuate contamination) is determined based on oxygen demand for respiration of the organic mass (contamination). Therefore, another source of uncertainty in the BioVapor model is the amount of mass loading (or oxygen demand) assumed, which in turn affects the amount of contaminant attenuation that can be realized along the pathway between the source and structure being modeled.

Results presented in Section 4.5 were based on default factors included in the BioVapor model. To account for variability/uncertainty, risk was calculated using the BioVapor model by reducing the biodegradation rate by a factor of 10. These results are presented in **Table 4-22(a)** and **Table 4-22(b)** for North EU and South EU, respectively, and indicate that risks are below the target cumulative risk by several orders of magnitude.

To test for potential effects of oxygen depletion in the aerobic portion of the vadose zone, an additional BioVapor modeling run was conducted where the total amount of aliphatic, gas-ranged hydrocarbons in soil were included by using the 95% UCL of TPH-GRO (575 milligrams per kilogram [mg/kg], **Table 4-20[b]**) in the South EU, which was the limiting case for indoor vapor risk (HI = 7.9×10^{-1}) as described in **Table 4-21(d)**. The vapor phase concentration for TPH-GRO (3.92×10^{8} micrograms per cubic meter of air [$\mu g/m^3$]) was estimated based on the chemical and physical properties as listed for C5-C8 aliphatic hydrocarbons (Brewer et al., 2013). Toluene was used as a surrogate for physical properties (**Table 4-17**) to estimate the Henry's constant for TPH-GRO adjusted for temperature. The resulting HI, as calculated by the BioVapor model for the 18 VOCs with the TPH-GRO contamination included, remained under the threshold value of 1.0, and the IELCR remained well under 1×10^{-5}. It is concluded that due to the overall low levels of contaminant present, vadose zone oxygen levels are not a limiting factor for bio-attenuation of vapor phase VOC contamination in the BioVapor modeling scenario for SD-27.

4.7.2 Overall Impact of Uncertainties

As described above, there are numerous sources of uncertainty in the parameters used to calculate potential risks. Risks have been estimated using generally conservative assumptions for most sources of uncertainty, which would result in an overestimation of overall risk.

4.8 ECOLOGICAL RISK

The results of a Holloman AFB site-wide ecological risk assessment prepared by Sirrine Environmental Consultants were included in the Risk Assessment Report for the Remedial Investigation, Volume IV of the RI Report (Radian, 1992). In the Phase I RCRA Facility Investigation Report, Volume II (Radian, 1994), the ecological risk assessment was updated. However, potential ecological risks at SD-27 were not specifically addressed in either of these reports.

The following information was compiled in consideration of an ecological scoping assessment for SD-27 (Tetra Tech, 2012), and has been updated to include the current data evaluation reported in Section 4:

- Basic Site Information – Sections 1 and 2 provide the Site history and Site/locality environmental setting.
- Site Visits – Site visits to identify community level habitat and ecological receptor observations are not known to have been conducted or have not been documented for SD-27. Threatened and endangered species and sensitive habitats are known to exist within Holloman AFB.
- Identify Preliminary Contaminants of Potential Ecological Concern (COPECs) – **Tables 4-1** and **4-2** and **Tables 4-5** and **4-6** provide lists of chemicals that have been detected at the Site in soil and groundwater, respectively. Contaminated sediment within the sump has been removed. It is noted that the data show that contaminants were released to a former drainage pit and that subsurface soil and groundwater have been impacted. The pit area was previously reclaimed by covering with clean soil to the approximate surrounding contour (Radian, 1992). The soil investigations (see Section 3) showed that only subsurface soils below a depth of approximately 6.5 ft bgs are impacted by COPCs (Section 4.2.1).
- Develop a Preliminary Conceptual Site Ecological EM – As indicated above, contaminated soil lies at a depth of 6.5 ft bgs or greater. The local water table has been observed to fluctuate between approximately 8 to 14.5 ft bgs. There are no deep drainages or nearby surface water bodies where groundwater from the Site may be accessed by ecological receptors. Because contaminated soil and groundwater lie at depths of approximately 6.5 ft bgs or greater, there are no completed exposure pathways for ecological receptors at or near the Site.

The data presented in this risk assessment indicate that the depth of soil and groundwater residual contamination at SD-27 results in no completed ecological exposure pathways. Due to lack of exposure pathways, it is concluded that residual contaminants in soil and groundwater at SD-27 do not pose an unacceptable risk to ecological receptors at Holloman AFB.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the risk assessment results presented above, SD-27 is suitable for CAC *without controls*, and it is recommended that no further corrective action be required. Therefore, discontinuation of the Groundwater Monitoring Program and a Class 3 modification to the Holloman RCRA Hazardous Waste Permit pursuant to 40 CFR 270.42(c) are warranted for Corrective Action Complete (CAC) of SD-27 (SWMU 141).

5.1 GROUNDWATER MONITORING – SD-27

Pursuant to the letter *Approval with Modification Long-Term Monitoring Report 2012-2013 For SD-27, PAD 9 Drainage Pit (SWMU 141)*, dated July 11, 2014, NMED required Holloman AFB to continue quarterly groundwater sampling and analysis at SD-27, "while contaminated soil at the site is remediated pursuant to the plan: *Accelerated Corrective Measures Work Plan Addendum for SD-27 Pad 9 Drainage Pit (SWMU 141)*, which was approved by NMED on March 2, 2012" (NMED, 2014).

An updated Final *Interim Measures Work Plan for Site SD-27, PAD 9 Drainage Pit (SWMU 141)* (URS, 2014) was submitted to NMED on October 31, 2014. NMED responded with the letter *Approval – Final Interim Measures Work Plan for SD-27, PAD 9 Drainage Pit (SMWU 141)*, dated February 26, 2015. Within this letter approval, NMED reiterated that "The Permittee shall continue quarterly groundwater sampling and analysis at SD-27, if concentrations detected in confirmation groundwater samples have not been reduced to levels that meet applicable regulatory standards pursuant to the Permittee's *Accelerated Corrective Measures Work Plan Addendum for SD-27 Pad 9 Drainage Pit (SWMU 141)*, which was approved by NMED on March 2, 2012."

Based on findings of the current risk assessment, additional corrective measures are no longer warranted, and it is recommended that the LTM program be terminated as there are no unacceptable risks based on residual chemicals in groundwater at the Site.

5.2 BASIS OF RECOMMENDATION – SD-27

SD-27 (SWMU 141) is proposed for CAC w*ithout* Controls based upon Criterion #5 listed in Appendix 4-B of the Holloman AFB RCRA Hazardous Waste Permit (NMED, 2004) 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.*

This criterion was accomplished in part by conducting limited removal actions and extensive investigation activities including:

- Radiation Site Screening (1976);
- Preliminary Assessment/Site Investigation (PA/SI) (1993);
- Phase II Remedial Investigation (RI) (1998);
- Supplemental RFI Activities (including sediment removal from the concrete sump) (2006);
- ACM Work Plan Field Activities (2011); and
- Groundwater monitoring (2010 – 2013).

A quantitative risk assessment has been conducted using applicable Site data and updated (2015) guidance from NMED and USEPA, and conditions at the Site have been determined to pose no unacceptable risks to current or future human or ecological receptors.

5.3 DISCUSSION OF RISK ASSESSMENT FINDINGS

As noted in Section 3.5, the ACM Work Plan Addendum (Tetra Tech, 2012) included a screening level risk evaluation and concluded that residual contaminants in soil and groundwater at SD-27 warranted additional investigation and remedial action. This section briefly describes the differences in methodology and rationale that have led to the updated conclusion that CAC *without* Controls is appropriate for SD-27.

The ACM Work Plan Addendum (Tetra Tech, 2012), recommended the following:

1. Excavation of approximately 18,300 ft^3 of soil.
2. No groundwater remediation based on the assumption that the soil excavation would also address groundwater impacts.
3. Collection of additional soil and groundwater samples to define the lateral extent of soil and groundwater impacts near the northern portion of the impacted soil area. Based on the results, Tetra Tech indicated that additional excavation may be needed.

The current risk assessment, that included a site-specific human health risk assessment, concluded that residual chemicals do not present an unacceptable risk. Therefore, site closure without any restrictions is reasonable and no remedial activities are recommended.

The differences in the conclusions and recommendations between Tetra Tech (2012) and the current risk Assessment Report are attributable, in differing degrees, to the following considerations:

1. Tetra Tech (2012) did not include a site-specific human health risk assessment; instead it provided only a screening level evaluation.
2. The screening evaluation provided in Tetra Tech (2012) used then current NMED (2009) guidance, while the current assessment uses the most current guidance, specifically NMED (2015) and USEPA (2015a, 2015b).
3. Soil samples were collected in 1993, 1994, 2006, 2010, and 2011. Refer to Section 3 and Section 4.1.1 for more details. The screening evaluation provided in Tetra Tech (2012) used all the historical soil data. The current assessment did not use the outdated (1993 and 1994) data and instead used the recent data that were available in close proximity to the older sample locations because recent data are more representative of current conditions. Specifically, Tetra Tech (2012) included soil samples collected in 1993 (BH-27-01 through BH-27-05) and 1994 (94-27-B01R) in their screening evaluation, while the current assessment did not use these samples. Instead, more recent data (from 2006, 2010, and 2011) collected close to the relevant 1993 and 1994 soil sample locations (BH-27-03 and 94-27-B01R) were used.
4. The current assessment had access to more recent groundwater sampling data (four additional sampling events in 2012 and 2013), which generally show decreasing trends of VOC concentrations.
5. The screening evaluation provided in Tetra Tech (2012) included sample SD27-01 (0 to 2 ft bgs) collected in 2006. This sample was collected before the removal of sediments within the drainage sump. These data were not used in the current assessment because the sediments were removed following the 2006 sample collection.

6. In the screening level evaluation (Tetra Tech, 2012), soil samples with depth ranging from 0 to 25 ft bgs were considered. The quantitative portion of the current assessment used the soil data collected between 0 to 10 ft bgs (except SD27-01 [0 to 2 ft bgs] as described above). This maximum depth of 10 ft is consistent with NMED (2015) that recommends the use of 0 to 10 ft bgs as the soil exposure interval for residential receptors.
7. For evaluation of the vapor intrusion pathway, the screening evaluation provided in Tetra Tech (2012) included soil samples up to the depth of 25 ft bgs. This is not reasonable on a physical basis as the average depth to groundwater is 10 ft bgs and residual soil contamination below the groundwater table does not volatilize nor contribute to vapor intrusion. Therefore, the current assessment used soil data above the water table—located at approximately 10 ft bgs—and the groundwater volatilization to indoor air pathway to assess any mechanisms potentially leading to risk from impacts below the water surface.
8. The Tetra Tech (2012) screening level risk evaluation for the vapor intrusion pathway used the J&E model (USEPA 2004) to back calculate screening levels. The current assessment used the BioVapor model to account for first order degradation and to calculate indoor vapor intrusion risk from soil and groundwater; and the calculated risk was below target levels. Use of the BioVapor model is consistent with the most recent guidance (USEPA, 2015b; 2015c) while use of the J&E model is now recognized to overestimate indoor air concentrations (by up to several orders of magnitude) under conditions where biodegradation of petroleum hydrocarbon contamination occurs (USEPA, 2015b).
9. The screening evaluation provided in Tetra Tech (2012) compared Site concentrations of total chromium to hexavalent chromium NMED SSLs, while the quantitative portion of the current assessment calculated direct contact risks assuming that total chromium concentrations were comprised of a mixture of chromium VI and chromium III, which were considered in the recommended ratio of 1:6 (NMED, 2015).

In summary, the risk assessment presented in this report is based on current NMED and USEPA documents, data and methods, and updated site-specific (groundwater sampling) information. Therefore, the conclusions of this report are tenable and consistent with current methodology and practices.

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TABLES

Table 4-1
Soil Data Used for Risk Assessment in North EU
Site SD-27, Holloman AFB

Sample	**SB27-01**		**SB27-04**		**SB27-05**		**Max Detected Concentration**
Depth (ft bgs)	6-8		8-10		7-8		
Date	5/16/2006		5/16/2006		5/18/2006		
TPH							
G-TPH	**309**		0.121	U	0.121	U	**309**
D-TPH	**124**		7.28	U	7.28	U	**124**
Metals							
Barium	**7.34**		**11.0**		**8.84**		**11**
Chromium, total	**1.31**		**1.51**		**0.456**	J	**1.51**
Lead	0.367	U	**0.886**	J	0.65	U	**0.866**
Silver	0.0044	U	0.0044	U	**0.565**		**0.565**
SVOCs							
Fluoranthene	0.0456	U	0.0456	U	**0.0853**	J	**0.0853**
VOCs							
1,2,4-Trimethylbenzene	**0.00595**	J	**0.00416**	J	0.0000535	U	**0.00595**
Isopropylbenzene	**0.00235**	J	0.000105	U	0.00013	U	**0.00235**
m, p-Xylene (sum of isomers)	**0.00312**	J	**0.00243**	J	0.0000714	U	**0.00243**
n-Butylbenzene	0.000116	U	**0.00183**	J	0.0000979	U	**0.00183**
Naphthalene	**0.0141**	J	**0.00871**	J	0.000441	U	**0.0141**
o-Xylene	**0.00162**	J	**0.00176**	J	0.0000679	U	**0.00176**
p-Cymene (p-Isopropyltoluene)	0.000105	U	**0.00148**	J	0.0000679	U	**0.00148**
Sec-Butylbenzene	**0.031**		0.01	U	0.0000632	U	**0.031**

Notes:
All units are in milligrams per kilograms (mg/kg)
Values in bold font are detected values.
ft bgs = feet below ground surface
G-TPH = total petroleum hydrocarbons - gasoline range
D-TPH = total petroleum hydrocarbons - diesel range

Table 4-2
Soil Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-01		SD27-DPT-02		SD27-DPT-03		SD27-DPT-04		SD27-DPT-05		SD27-DPT-06		SD27-DPT-07	
Depth (ft bgs)	6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5	
Date	11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010	
TPH														
TPH-GRO (C6-C10)	2.5	U	**112**		**2940**	J	**1590**		2.3	U	2.5	U	2.4	U
TPH (C10-C28)	4.6	U	12		**469**		**606**		4.6	U	4.15	U	4.5	U
Metals, Total														
Arsenic	**1.4**		**2.5**		**1.3**		**1.1**		**1.6**		**1.55**		**0.52**	J
Barium	**27.3**		**19.7**		**30.8**		**46.4**		**24.5**		**43.8**	J	**19**	
Cadmium	0.061	U	**0.16**	J	**0.28**		**0.22**	J	0.052	U	**0.049**	J	0.065	U
Chromium	**4.4**	J	**262**		**35.3**		**28.7**		**2.5**	J	**10.95**	J	**6.5**	
Lead	**1.3**		**3.1**		**3.7**		**3.6**		**1.2**		**1.6**		**0.9**	J
Mercury	**0.011**	J	0.012	U	0.011	U	0.011	U	0.01	U	0.00965	U	0.0099	U
SVOCs														
1-Methylnaphthalene	0.023	U	0.023	U	**1.06**		**1.04**		0.022	U	0.0205	U	0.022	U
2-Methylnaphthalene	0.023	U	0.023	U	**0.92**		**0.575**	J	0.022	U	0.0205	U	0.022	U
Naphthalene	25.00075	U	0.094	U	**2.952**		**3.054**		0.0187	U	0.017375	U	0.01835	U
VOCs														
1,2,4-Trimethylbenzene	0.00083	U	**2.12**		**40.1**		**41.3**		0.00079	U	0.00095	U	0.00092	U
1,3,5-Trimethylbenzene	0.00099	U	0.095	U	**16.8**		**16.9**		0.00094	U	0.0011	U	0.0011	U
n-Butylbenzene	0.00099	U	**0.12**	J	**5.16**		**1.64**		0.00094	U	0.0011	U	0.0011	U
Acetone	0.015	R	1.5	R	4.7	R	5.8	R	0.014	R	**0.024**	J	**0.0173**	J
Benzene	0.0011	U	**0.232**	J	**5.05**		**12.6**		0.0011	U	**0.0061**	J	**0.0054**	
Carbon disulfide	0.0015	U	0.15	U	**0.96**	J	0.58	U	0.0014	U	**0.0023**	J	0.0017	U
Cymene	0.00091	U	**0.144**	J	**5.17**		**4.12**		0.00087	U	0.00105	U	0.001	U
Ethylbenzene	0.00076	U	**0.474**		**15**		**13.2**		0.00072	U	**0.0010**	J	0.00084	U
Hexane	0.0014	UJ	0.14	UJ	**5.82**	J	**2.62**	J	0.0014	UJ	0.00165	UJ	0.0016	UJ
Isopropylbenzene	0.00083	U	**0.341**	J	**5.87**		**3.49**		0.00079	U	**0.0007825**	J	**0.0047**	
m,p-Xylene	0.0017	U	**0.626**	J	**46.3**		**46.9**		0.0016	U	0.0019	U	0.0018	U
Methylene chloride	0.0076	U	0.73	U	2.3	U	5.63	U	0.0072	U	0.0086	U	0.0084	U
n-Propylbenzene	0.0011	U	**0.388**		**6.53**		**2.15**		0.001	U	0.0012	U	**0.003**	J
o-Xylene	0.00076	U	**0.0902**	J	**17.1**		**18.8**		0.00072	U	0.00086	U	0.00084	U
Sec-Butylbenzene	0.0012	U	**0.186**	J	**5.95**		**3.23**		0.0012	U	0.0014	U	**0.0018**	J
Tert-butyl benzene	0.00091	U	0.088	U	0.28	U	**0.47**	J	0.00087	U	0.00105	U	0.001	U
Toluene	0.00091	U	0.088	U	**18.1**		**36.6**		0.00087	U	0.00105	U	0.001	U

Notes:
All units are in milligrams per kilograms (mg/kg).
Values in bold font are detected values.
NA: not analyzed
ft bgs = feet below ground surface
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-2
Soil Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-08	SD27-DPT-09	SD27-DPT-10	SD27-DPT-11	SD27-DPT-12	SD27-DPT-13	SD27-DPT-14
Depth (ft bgs)	6.5 - 8.5	7-9	8 - 10	6.5 - 8.5	6.5 - 8.5	6.5-8.5	5-7
Date	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/5/2010	3/22/2011
	TPH						
TPH-GRO (C6-C10)	**643**	**1480**	2.4 U	2.55 U	2.6 U	NA	6.3 U
TPH (C10-C28)	**1360**	**760**	**1970**	4 U	4.4 U	3.8 U	**4.06** J
	Metals, Total						
Arsenic	**0.86**	**0.51**	**0.52** J	**0.58**	**1.3**	**0.81**	0.88 U
Barium	**20.1**	**24.3**	**18.9**	**22.55**	**24.7**	**21.3** J	**15** J
Cadmium	**0.88**	0.045 U	**0.06** J	**0.365**	0.061 U	**0.27**	0.44 U
Chromium	**228**	**29**	**2.1** J	**15.55** J	**3.2** J	**2.8** J	**1.6** J
Lead	**4.9**	**1**	**1** J	**0.61** J	**1** J	**1.1**	**0.91** J
Mercury	0.011 U	0.01 U	0.01 U	0.0099 U	0.011 U	0.0097 U	0.01 U
	SVOCs						
1-Methylnaphthalene	**2.66**	**1.34**	**2.93**	0.0205 U	0.023 U	0.019 U	0.2 U
2-Methylnaphthalene	**1.25** J	**0.0872** J	0.11 U	0.0205 U	0.023 U	0.019 U	0.2 U
Naphthalene	**1.71**	**4.2625**	0.08575 U	0.0173 U	0.01875 U	0.031 U	0.1023 U
	VOCs						
1,2,4-Trimethylbenzene	**13.8**	**57.6**	**0.0379**	0.000895 U	0.00085 U	NA	0.0046 UJ
1,3,5-Trimethylbenzene	**9.2**	**24.2**	**0.0219**	0.001045 U	0.001 U	NA	0.0046 UJ
n-Butylbenzene	**0.291** J	**5.71**	**0.00098** J	0.001045 U	0.001 U	NA	0.0046 UJ
Acetone	2.1 U	9.8 U	0.015 U	0.016 U	0.015 U	NA	0.046 UJ
Benzene	**1.2**	**2.91**	**0.0109**	0.0012 U	0.0012 U	NA	0.0046 UJ
Carbon disulfide	**0.225** J	0.98 U	**0.0024** J	0.0016 U	0.0015 U	NA	0.0046 UJ
Cymene	**2.26**	**8.4**	**0.004**	0.000955 U	0.00092 U	NA	0.0046 UJ
Ethylbenzene	**5.4**	**36.4**	**0.0029** J	0.000815 U	0.00077 U	NA	0.0046 UJ
Hexane	**0.436** J	**0.931** J	0.0014 U	0.00155 U	0.0015 U	NA	0.0046 UJ
Isopropylbenzene	**1.05**	**9.58**	**0.0075**	0.000895 U	0.00085 U	NA	0.0046 UJ
m,p-Xylene	**17.3**	**69.2**	**0.0085**	0.0018 U	0.0017 U	NA	0.0093 UJ
Methylene chloride	0.48 U	2.3 U	0.0103 U	0.00375 U	0.0088 U	NA	0.0093 UJ
n-Propylbenzene	**0.49** J	**12.2**	**0.0059**	0.00115 U	0.0011 U	NA	0.0046 UJ
o-Xylene	**7.95**	**34.4**	0.00075 U	0.000815 U	0.00077 U	NA	0.0046 UJ
Sec-Butylbenzene	**1.33**	**6.84**	**0.0057**	0.0013 U	0.0012 U	NA	0.0046 UJ
Tert-butyl benzene	0.13 U	**0.614** J	0.0009 U	0.000955 U	0.00092 U	NA	0.0046 UJ
Toluene	**6.95**	**37**	0.0009 U	0.000955 U	0.00092 U	NA	0.0046 UJ

Notes:
All units are in milligrams per kilograms (mg/kg).
Values in bold font are detected values.
NA: not analyzed
ft bgs = feet below ground surface
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-2
Soil Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-15		SD27-DPT-16		SD27-DPT-17		SD27-DPT-18		SD27-DPT-19		SD27-DPT-20		SD27-DPT-21	
Depth (ft bgs)	5-7		8-10		8-10		8-10		8-10		7-9		8-10	
Date	3/22/2011		3/22/2011		3/22/2011		3/22/2011		3/22/2011		3/23/2011		3/23/2011	
	TPH													
TPH-GRO (C6-C10)	4.8	U	4.6	U	5.2	U	**61.9**	J	**231**	J	4	U	5.5	U
TPH (C10-C28)	10	U	10	U	10	U	10	U	**332**		9.4	U	9.8	U
	Metals, Total													
Arsenic	1	U	0.75	U	0.96	U	**1.4**	J	0.84	U	0.89	U	**1.1**	J
Barium	**12.8**	J	**27.7**	J	**20.2**	J	**18.7**	J	**24.1**	J	**12**	J	**20.9**	J
Cadmium	0.51	U	0.37	U	0.48	U	0.53	U	0.42	U	0.45	U	0.44	U
Chromium	**1.4**	J	**3**	J	**2.7**	J	**2.3**	J	**1.6**	J	**1.7**	J	**2.2**	J
Lead	0.51	U	**1.6**	J	**1.2**	J	**1**	J	**0.44**	J	0.45	U	**0.94**	J
Mercury	0.01	U	0.0096	U	0.0096	U	0.0088	U	0.0096	U	0.0096	U	0.0094	U
	SVOCs													
1-Methylnaphthalene	0.2	U	0.2	U	0.21	U	0.2	U	**1.78**		0.19	U	0.19	U
2-Methylnaphthalene	0.2	U	0.2	U	0.21	U	0.2	U	**1.62**		0.19	U	0.19	U
Naphthalene	0.10195	U	0.102	U	0.10695	U	0.23	U	**0.283**		0.09715	U	0.09705	U
	VOCs													
1,2,4-Trimethylbenzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.271**	J	**2.17**	J	0.0043	UJ	0.0041	U
1,3,5-Trimethylbenzene	0.0039	UJ	**0.0042**	J	0.0039	UJ	**0.22**	J	**1.09**	J	0.0043	UJ	0.0041	U
n-Butylbenzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.0721**	J	**0.264**	J	0.0043	UJ	0.0041	U
Acetone	0.039	UJ	0.04	UJ	0.039	UJ	2.6	UJ	2.5	UJ	0.043	UJ	0.041	U
Benzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.109**	J	0.25	UJ	0.0043	UJ	0.0041	U
Carbon disulfide	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	U
Cymene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.116**	J	**0.298**	J	0.0043	UJ	0.0041	U
Ethylbenzene	0.0039	UJ	**0.0028**	J	0.0039	UJ	**0.081**	J	**0.232**	J	0.0043	UJ	0.0041	U
Hexane	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	UJ
Isopropylbenzene	0.0039	UJ	**0.003**	J	0.0039	UJ	0.26	UJ	**0.373**	J	0.0043	UJ	0.0041	U
m,p-Xylene	0.0078	UJ	0.008	UJ	0.0077	UJ	0.52	UJ	**1.19**	J	0.0087	UJ	0.0082	U
Methylene chloride	0.0078	UJ	0.008	UJ	0.0077	UJ	0.52	UJ	0.5	UJ	0.0087	UJ	0.0082	U
n-Propylbenzene	0.0039	UJ	**0.0011**	J	0.0039	UJ	0.26	UJ	**0.419**	J	0.0043	UJ	0.0041	U
o-Xylene	0.0039	UJ	**0.00087**	J	0.0039	UJ	**0.0929**	J	**0.903**	J	0.0043	UJ	0.0041	U
Sec-Butylbenzene	0.0039	UJ	**0.0018**	J	0.0039	UJ	0.26	UJ	**0.328**	J	0.0043	UJ	0.0041	U
Tert-butyl benzene	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	U
Toluene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.0697**	J	0.25	UJ	0.0043	UJ	0.0041	U

Notes:
All units are in milligrams per kilograms (mg/kg).
Values in bold font are detected values.
NA: not analyzed
ft bgs = feet below ground surface
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-2
Soil Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-22		SD27-DPT-23		SD27-DPT-24		SD27-DPT-25		SD27-DPT-26		SD27-DPT-27		SD27-DPT-28		**Max Detected Concentration**
Depth (ft bgs)	8-10		8-10		8-10		8-10		8-10		8-10		8-10		
Date	3/23/2011		3/23/2011		3/23/2011		3/23/2011		3/23/2011		3/23/2011		3/23/2011		
	TPH														
TPH-GRO (C6-C10)	**308**		4.9	U	5.3	U	**1450**		4.5	U	4.4	U	4.45	U	**2940**
TPH (C10-C28)	9.9	U	9.4	U	9.4	U	**449**		9.6	U	9.6	U	9.9	U	**1970**
	Metals, Total														
Arsenic	0.97	U	0.75	U	0.74	U	0.77	U	0.92	U	0.99	U	4.8	U	**2.5**
Barium	**15.9**	J	**16.7**	J	**21.4**	J	**18**	J	**19.5**	J	**23.2**	J	**26.85**	J	**46.4**
Cadmium	0.48	U	0.37	U	0.37	U	0.38	U	0.46	U	0.49	U	0.48	U	**0.88**
Chromium	**2**	J	**1.9**	J	**1.8**	J	**2**	J	**2.3**	J	**2.6**	J	**2.8**	J	**262**
Lead	**1.3**	J	**1.1**	J	7.4	U	7.7	U	9.2	U	9.9	U	9.65	U	**4.9**
Mercury	0.0096	U	0.0089	U	0.009	R	0.0093	R	0.0095	R	0.0088	R	0.0096	U	**0.011**
	SVOCs														
1-Methylnaphthalene	0.19	U	0.19	U	0.19	U	**2.56**		0.19	U	0.2	U	0.2	U	**2.93**
2-Methylnaphthalene	0.19	U	0.19	U	0.19	U	**2.49**		0.19	U	0.2	U	0.2	U	**2.49**
Naphthalene	0.0968	U	0.0969	U	0.09775	U	**2.0365**		0.09725	U	0.1019	U	0.101875	U	**4.263**
	VOCs														
1,2,4-Trimethylbenzene	**0.0972**		0.0038	U	0.0039	U	**20.9**		0.0045	U	0.0038	U	0.00375	U	**57.6**
1,3,5-Trimethylbenzene	**0.0376**		0.0038	U	0.0039	U	**7.54**		0.0045	U	0.0038	U	0.00375	U	**24.2**
n-Butylbenzene	**0.0037**		0.0038	U	0.0039	U	**1.53**		0.0045	U	0.0038	U	**0.0013**	J	**5.71**
Acetone	0.036	U	0.038	U	0.039	U	2.4	U	0.045	U	0.038	U	**0.0552**	J	**0.055**
Benzene	0.0036	U	0.0038	U	0.0039	U	0.24	U	0.0045	U	0.0038	U	0.00375	U	**12.6**
Carbon disulfide	**0.0066**		0.0038	U	0.0039	U	0.24	U	0.0045	U	0.0038	U	0.00375	U	**0.96**
Cymene	**0.0158**		0.0038	U	0.0039	U	**2.8**		0.0045	U	0.0038	U	0.00375	U	**8.4**
Ethylbenzene	**0.0251**		0.0038	U	0.0039	U	**4.2**		0.0045	U	0.0038	U	**0.010**		**36.4**
Hexane	0.0036	UJ	0.0038	UJ	0.0039	UJ	0.24	UJ	0.0045	U	0.0038	U	0.00375	U	**5.82**
Isopropylbenzene	**0.0232**		0.0038	U	0.0039	U	**2.6**		0.0045	U	0.0038	U	**0.0291**		**9.58**
m,p-Xylene	**0.0189**		0.0076	U	0.0079	U	**9.28**		0.0091	U	0.0076	U	0.0074	U	**69.2**
Methylene chloride	0.0072	U	0.0076	U	0.0079	U	0.47	U	0.0091	U	**0.0052**	J	**0.004125**	J	**0.0052**
n-Propylbenzene	**0.0257**		0.0038	U	0.0039	U	**2.83**		0.0045	U	0.0038	U	**0.00635**		**12.2**
o-Xylene	**0.0083**		0.0038	U	0.0039	U	**6.64**		0.0045	U	0.0038	U	0.00375	U	**34.4**
Sec-Butylbenzene	**0.0206**		0.0038	U	0.0039	U	**2.48**		0.0045	U	0.0038	U	**0.00835**		**6.84**
Tert-butyl benzene	0.0036	U	0.0038	U	0.0039	U	0.24	U	0.0045	U	0.0038	U	0.00375	U	**0.614**
Toluene	0.0036	U	0.0038	U	0.0039	U	**1.35**		0.0045	U	0.0038	U	0.00375	U	**37**

Notes:
All units are in milligrams per kilograms (mg/kg).
Values in bold font are detected values.
NA: not analyzed
ft bgs = feet below ground surface
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-3
Monitoring Well Construction Details for SD-27
Site SD-27, Holloman AFB, New Mexico

Well ID	Installation Date	Survey Data		Borehole Depth (ft bgs)	Well Construction Information				
		Elevation (ft msl)			Total Well Depth (ft bgs)	Length of Riser Pipe (ft)	Length of Screen (ft)	Screened Interval (ft bgs)	
		Top of Casing	Ground					Top	Bottom
SD-27 - Pad 9 Washrack Area									
MW27-01	11/10/2010	4063.93	4063.84	18.03	17.99	8.08	10.0	7.99	17.69
MW27-02	11/6/2010	4063.20	4063.33	17.33	17.29	7.16	10.0	7.29	16.99
MW27-03	11/5/2010	4063.08	4063.24	15.28	15.24	7.58	7.5	7.74	14.94
MW27-04	11/6/2010	4063.43	4063.52	17.44	17.43	7.34	10.0	7.43	17.13
MW27-05	11/9/2010	4063.58	4063.59	19.95	19.91	9.90	10.0	9.91	19.61

Notes:
Data obtained from Table 2-1 of *Final Accelerated Corrective Measures Work Plan Addendum for SD-27 PAD 9 Drainage Pit (SWMU 141), 2012.*
All bores were 3.25" diameter wells, PVC 2" diameters and screen slot size of 0.01".
ft = feet
ft bgs = feet below ground surface
ft msl = feet above mean sea level

Table 4-4
Groundwater Gauging Data from Permanent Wells
Site SD-27, Holloman AFB, New Mexico

MW ID	Date	Top of Casing Elevation (ft msl)	Groundwater Level (ft btoc)	Groundwater Elevation (ft msl)
MW-01	11/11/10	4063.93	10.17	4053.76
	1/25/11		8.58	4055.35
	4/7/11		8.59	4055.34
	7/11/11		9.14	4054.79
	12/13/12		9.76	4054.17
	3/6/13		9.83	4054.1
	6/26/13		10.14	4053.79
	8/28/13		9.21	4054.72
Min			**8.58**	**4053.76**
Max			**10.17**	**4055.35**
Average			**9.43**	**4054.50**
MW-02	11/11/10	4063.2	14.42	4048.78
	1/25/11		8.94	4054.26
	4/7/11		9.52	4053.68
	7/11/11		9.78	4053.42
	12/13/12		10.29	4052.91
	3/6/13		10.37	4052.83
	6/26/13		10.76	4052.44
	8/28/13		9.96	4053.24
Min			**8.94**	**4048.78**
Max			**14.42**	**4054.26**
Average			**10.51**	**4052.70**
MW-03	11/10/10	4063.08	11.47	4051.61
	1/25/11		8.88	4054.2
	4/6/11		8.97	4054.11
	7/12/11		9.63	4053.45
	12/13/12		10.11	4052.97
	3/7/13		10.22	4052.86
	6/26/13		10.47	4052.61
	8/28/13		9.77	4053.31
Min			**8.88**	**4051.61**
Max			**11.47**	**4054.2**
Average			**9.94**	**4053.14**
MW-04	11/10/10	4063.43	12.25	4051.18
	1/25/11		8.95	4054.48
	4/6/11		9.1	4054.33
	7/11/11		9.78	4053.65
	12/12/12		10.22	4053.21
	3/7/13		10.27	4053.16
	6/26/13		10.57	4052.86
	8/28/13		9.75	4053.68
Min			**8.95**	**4051.18**
Max			**12.25**	**4054.48**
Average			**10.11**	**4053.32**
MW-05	11/11/10	4063.58	8.65	4054.93
	1/25/11		8.51	4055.07
	4/7/11		8.87	4054.71
	7/11/11		9.47	4054.11
	12/11/12		9.93	4053.65
	3/7/13		10.07	4053.51
	6/26/13		10.36	4053.22
	8/28/13		9.58	4054
Min			**8.51**	**4053.22**
Max			**10.36**	**4055.07**
Average			**9.43**	**4054.15**
Min of all			**8.51**	**4048.78**
Max of all			**14.42**	**4055.35**
Average of all			**9.88**	**4053.56**

Notes:
btoc: below top of casing
msl: above mean sea level

Table 4-5
Groundwater Data Used for Risk Assessment in North EU
Site SD-27, Holloman AFB

Parameter	SD27-MW01														GW27-07		GW27-08		Max Detected Concentration
	1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		6/16/06		6/16/06		
Metals, Dissolved (µg/L)																			
Arsenic	2	U	**12**		**4.8**	B	NA		NA		NA		NA		NA		NA		**12**
Barium	**27.1**	J	**23**	B	**23.7**	B	NA		NA		NA		NA		**39**		**29**		**39**
Mercury	0.05	U	0.05	U	**0.17**	B	NA		NA		NA		NA		NA		NA		**0.17**
Selenium	10	U	**9.6**	B	8	U	NA		NA		NA		NA		**7**	J	**10**		**10**
Silver	NA		NA		NA		NA		NA		NA		NA		**11**		0.2	U	**11**
Metals, Total (µg/L)																			
Arsenic	**6.5**	J	**14**		**6.4**	B	NA		NA		NA		NA		NA		NA		**14**
Barium	**25.2**	J	**24.9**	B	**22.2**	B	NA		NA		NA		NA		**345**		**52**		**345**
Chromium	5	U	4	U	4	U	NA		NA		NA		NA		**48**		1.4	U	**48**
Lead	5	U	4	U	4	U	NA		NA		NA		NA		**17**		1.6	U	**17**
Selenium	10	U	**10.2**	B	8	U	NA		NA		NA		NA		NA		NA		**10.2**
Silver	NA		NA		NA		NA		NA		NA		NA		**13**		**11**		**13**
VOCs (µg/L)																			
Methylene chloride	2	U	2	U	2	U	**4**	J	2	U	2	U	2	U	NA	NA			**4**
Trichloroethene	0.26	U	0.26	U	0.26	U	0.31	U	0.31	U	0.31	U	0.31	U	**0.22**	J	**0.17**	J	**0.22**

Notes:
Values in bold font are detected values.
NA: not analyzed
µg/L = micrograms per liter

Table 4-6
Groundwater Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Parameter	SD 27-MW02							SD27-MW03	
	1/25/2011	4/7/2011	7/11/2011	12/12/2012	3/6/2013	6/26/2013	8/28/2013	1/25/2011	4/6/2011
TPH (µg/L)									
TPH (C10-C28)	**597**	**549**	**446**	NA	NA	NA	NA	**226** J	**190** J
TPH-GRO (C6-C10)	**1200**	**759**	**770**	NA	NA	NA	NA	**82.1** J	50 U
Metals, Dissolved (µg/L)									
Arsenic	2.0 U	**7.4** B	2 U	NA	NA	NA	NA	2 U	**3.8** B
Barium	**23.9** J	**22.4** B	**22** B	NA	NA	NA	NA	**35.7** J	**31.3** B
Metals, Total (µg/L)									
Arsenic	**2**	**6.0** B	**2**	NA	NA	NA	NA	**3.3** J	**7** B
Barium	**24** J	**22.1** B	**21** B	NA	NA	NA	NA	**35.8** J	**32.6** B
Chromium	5 U	4.0 U	4 U	NA	NA	NA	NA	5 U	4 U
Lead	5 U	4.0 U	4 U	NA	NA	NA	NA	5 U	4 U
Mercury	0.05 U	0.1 U	**0.06** B	NA	NA	NA	NA	0.05 U	0.05 U
Selenium	10 U	8.0 U	8 U	NA	NA	NA	NA	10 U	**8.8** B
SVOCs (µg/L)									
1-Methylnaphthalene	**13.5**	**10.5**	**12**	NA	NA	NA	NA	**1.7** J	**2.7** J
2,4-Dimethylphenol	1.1 U			NA	NA	NA	NA	1.1 U	NA
2-Methylnaphthalene	**0.7** J	0.5 U	1 U	NA	NA	NA	NA	0.56 U	0.54 U
4-Methylphenol	0.5 U			NA	NA	NA	NA	0.53 U	NA
Di-n-butyl phthalate	0.8 U			NA	NA	NA	NA	0.85 U	NA
m,p-Cresol	1.1 U			NA	NA	NA	NA	1.1 U	NA
Naphthalene	**1.7** J	1.4 U	1 U	1	1 U	1 U	1 U	0.89 U	0.88 U
Phenol	0.5 U			NA	NA	NA	NA	0.49 U	NA
VOCs (µg/L)									
1,2,4-Trimethylbenzene	**99.0**	**80.6**	**88**	0.2 U	0.2 U	**1.5** J	**1.5** J	0.27 U	0.27 U
1,3,5-Trimethylbenzene	**40.6**	**22.5**	**31**	**5.00**	**4.4**	**5**	**5.3**	**2.1**	**3.9**
Benzene	**9.3**	**7.3**	**11**	**3.7**	**4.5**	**5.9**	**3.7**	**0.88** J	**1.4**
Chloroform	0.4 U	0.4 U	**0.53** J	0.26 U	**0.41** J	**0.47** J	**0.45** J	0.22 U	0.22 U
Cymene	**15.5**	**8.7**	**8**	**0.39** J	**0.3** J	**1**	**1.1**	0.21 U	0.21 U
Ethylbenzene	**126.0**	**115.5**	**92**	**0.2725** J	0.29 U	**1.5**	**4.6**	0.2 U	0.2 U
Isopropylbenzene	**31.5**	**22.9**	**30** J	**11.45**	**9**	**12.2**	**10.6**	**5.8**	**5.1**
m,p-Xylene	**22.4**	**1.0** J	**5**	0.3 U	0.3 U	**0.38** J	**1.2** J	0.32 U	0.32 U
Methyl methacrylate	2.0 U	2.0 U	**1.6** J	0.5 U	0.5 U	0.5 U	0.5 U	1 U	1 U
Methylene chloride	4.0 U	**7.2** J	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	**2.3**	**1.7** J	**2**	**0.1755**	0.2 U	0.2 U	**0.24** J	0.26 U	0.26 U
n-Propylbenzene	**35.8**	**23.9**	**33**	**14.8**	**12.7**	**16**	**14.6**	**2.8**	**3.6**
o-Xylene	**7.0**	**3.5**	**13**	0.2 U	0.2 U	0.2 U	**0.53** J	0.2 U	0.2 U
Sec-Butylbenzene	**11.4**	**7.5**	**11**	**4.85**	**3.9**	**6.2**	**4.9**	**2.5**	**1.8**
Tert-butyl benzene	**0.9** J	**0.4** J	**1** J	**0.3275**	**0.3** J	**0.59** J	**0.42** J	**0.44** J	0.27 U
Toluene	0.4 U	0.4 U	**1** J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	0.5 U	0.5 U	**1.85**	0.31 U	0.31 U	0.31 U	0.31 U	0.26 U	0.26 U

Notes:
Values in bold font are detected values.
NA: not analyzed
µg/L = micrograms per liter
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range

TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-6
Groundwater Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Parameter	SD27-MW03					SD27-MW04					
	7/12/2011	12/13/2012	3/7/2013	6/26/2013	8/28/2013	1/25/2011	4/6/2011	7/11/2011	12/12/2012	3/7/2013	6/26/2013
TPH (µg/L)											
TPH (C10-C28)	**170** J	NA	NA	NA	NA	**149** J	**104** J	**107** J	NA	NA	NA
TPH-GRO (C6-C10)	50 U	NA	NA	NA	NA	**128**	50 U	**98** J	NA	NA	NA
Metals, Dissolved (µg/L)											
Arsenic	NA	NA	NA	NA	NA	2 U	**14.3**	8 U	NA	NA	NA
Barium	NA	NA	NA	NA	NA	**20.5** J	**19.3** B	**18.4** B	NA	NA	NA
Metals, Total (µg/L)											
Arsenic	2 U	NA	NA	NA	NA	**7.8** J	**15.2**	8 U	NA	NA	NA
Barium	**30.9** B	NA	NA	NA	NA	**21.4** J	**21.5** B	**18.8** B	NA	NA	NA
Chromium	4 U	NA	NA	NA	NA	5 U	4 U	**7.4** B	NA	NA	NA
Lead	4 U	NA	NA	NA	NA	5 U	4 U	**14.2** B	NA	NA	NA
Mercury	0.05 U	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	NA	NA	NA
Selenium	8 U	NA	NA	NA	NA	10 U	8 U	8 U	NA	NA	NA
SVOCs (µg/L)											
1-Methylnaphthalene	0.48 U	NA	NA	NA	NA	**2.2** J	0.49 U	**2** J	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA	NA
2-Methylnaphthalene	0.55 U	NA	NA	NA	NA	0.55 U	0.55 U	0.56 U	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	0.52 U	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	0.84 U	NA	NA	NA	NA	NA
m,p-Cresol	NA	NA	NA	NA	NA	1.1 U	NA	NA	NA	NA	NA
Naphthalene	0.885 U	1 U	1 U	1 U	1 U	0.89 U	0.89 U	0.89 U	1 U	1 U	1 U
Phenol	NA	NA	NA	NA	NA	0.49 U	NA	NA	NA	NA	NA
VOCs (µg/L)											
1,2,4-Trimethylbenzene	0.27 U	0.2 U	0.2 U	0.2 U	0.2 U	**2.8**	**0.33** J	**2.9**	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene	**1.5** J	0.2 U	**0.28** J	0.2 U	0.2 U	**0.97** J	0.21 U	**0.83** J	0.2 U	0.2 U	0.2 U
Benzene	0.2 U	0.21 U	0.21 U	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.21 U
Chloroform	0.22 U	0.26 U	0.26 U	0.26 U	0.26 U	0.22 U	0.22 U	0.22 U	0.26 U	0.26 U	0.26 U
Cymene	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.3** J	0.21 U	**0.29** J	0.2 U	0.2 U	0.2 U
Ethylbenzene	0.2 U	0.29 U	0.29 U	0.29 U	0.29 U	**1.5**	0.2 U	**2.5**	**1.6**	0.29 U	**0.39** J
Isopropylbenzene	**0.69** J	**0.28** J	**0.33** J	0.2 U	**0.28** J	**4.1**	**0.5** J	**11.5** J	**11.2**	**3.6**	**4**
m,p-Xylene	0.32 U	0.3 U	0.3 U	0.3 U	0.3 U	0.32 U	0.32 U	0.32 U	0.3 U	0.3 U	0.3 U
Methyl methacrylate	1 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	1 U	**1** J	0.5 U	0.5 U	0.5 U
Methylene chloride	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	0.26 U	0.2 U	0.2 U	0.2 U	0.2 U	0.26 U	0.26 U	0.26 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene	0.2 U	0.23 U	**0.27** J	0.23 U	0.23 U	**2.3**	**0.25** J	**6.9**	**12.1**	**3.7**	**3.9**
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.22** J	0.2 U	0.2 U
Sec-Butylbenzene	**0.31** J	0.21 U	0.21 U	0.21 U	0.21 U	**2.5**	**0.35** J	**5.2**	**7.9**	**3.1**	**3**
Tert-butyl benzene	0.27 U	0.29 U	0.29 U	0.29 U	0.29 U	**0.28** J	0.27 U	**0.44** J	**0.63** J	**0.41** J	**0.32** J
Toluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	0.26 U	0.31 U	0.31 U	0.31 U	0.31 U	0.26 U	0.26 U	0.26 U	0.31 U	0.31 U	0.31 U

Notes:
Values in bold font are
detected values.
NA: not analyzed
µg/L = micrograms per liter
TPH-GRO (C6-C10) = total petroleum
hydrocarbons - gasoline range

TPH (C10-C28) = total petroleum hydrocarbons -
diesel range, fuel oil and/or kerosene range

Table 4-6
Groundwater Data Used for Risk Assessment in South EU
Site SD-27, Holloman AFB

Parameter	SD27-MW04	SD27-MW05							Max Detected Concentration
	8/28/2013	1/25/2011	4/7/2011	7/11/2011	12/11/2012	3/7/2013	6/26/2013	8/28/2013	
TPH (µg/L)									
TPH (C10-C28)	NA	**1160**	**1230**	**470**	NA	NA	NA	NA	**1230**
TPH-GRO (C6-C10)	NA	**4380**	**3310**	**1100**	NA	NA	NA	NA	**4380**
Metals, Dissolved (µg/L)									
Arsenic	NA	2 U	**6.2** B	2 U	NA	NA	NA	NA	**14.3**
Barium	NA	**27.5** J	**25.1** B	**23.4** B	NA	NA	NA	NA	**35.7**
Metals, Total (µg/L)									
Arsenic	NA	**9.3** J	**8** B	2 U	NA	NA	NA	NA	**15.2**
Barium	NA	**30.6** J	**25.8** B	**24.1** B	NA	NA	NA	NA	**35.8**
Chromium	NA	**6.4** J	**25** B	4 U	NA	NA	NA	NA	**25**
Lead	NA	5 U	4 U	4 U	NA	NA	NA	NA	**14.2**
Mercury	NA	**0.055** J	0.05 U	0.05 U	NA	NA	NA	NA	**0.06**
Selenium	NA	10 U	8 U	8 U	NA	NA	NA	NA	**8.8**
SVOCs (µg/L)									
1-Methylnaphthalene	NA	**14.1**	**14**	**11.3**	NA	NA	NA	NA	**14.1**
2,4-Dimethylphenol	NA	**7.2**	NA	NA	NA	NA	NA	NA	**7.2**
2-Methylnaphthalene	NA	**13.9**	**13**	**10.7**	NA	NA	NA	NA	**13.9**
4-Methylphenol	NA	**5.6**	NA	NA	NA	NA	NA	NA	**5.6**
Di-n-butyl phthalate	NA	**0.84** J	NA	NA	NA	NA	NA	NA	**0.84**
m,p-Cresol	NA	**7.1**	NA	NA	NA	NA	NA	NA	**7.1**
Naphthalene	1 U	**37.75** J	**28.25** J	**18.85** J	**5.8**	**23.8** J	**28.0** J	**10.4** J	**38**
Phenol	NA	**18.1**	NA	NA	NA	NA	NA	NA	**18.1**
VOCs (µg/L)									
1,2,4-Trimethylbenzene	0.2 U	**255**	**227**	**87.5**	**40.8**	**243.0**	**283.0**	**216.5**	**283**
1,3,5-Trimethylbenzene	0.2 U	**91.6**	**61.1**	**26.4**	**12.4**	**59.9**	**73.2**	**53.8**	**91.6**
Benzene	0.21 U	**776**	**550**	**217**	**152**	**471.0**	**636.5**	**452**	**776**
Chloroform	0.26 U	2.2 U	2.2 U	1.1 U	0.26 U	0.9 U	4.0 U	1.3 U	**0.525**
Cymene	0.2 U	**8.4** J	**6.6** J	**3.8** J	**1.4**	**5.7**	**7.2** J	**5.25**	**15.5**
Ethylbenzene	0.29 U	**41**	**15.1**	**107**	**105**	**524.0**	**775.5**	**484**	**775.5**
Isopropylbenzene	**1.1**	**9.1** J	2 U	**15.9** J	**10.7**	**48.4**	**61.5**	**50.1**	**61.5**
m,p-Xylene	0.3 U	**221**	**94.2**	**7.2** J	**6.7**	**44.6**	**84.9**	**55.25**	**221**
Methyl methacrylate	0.5 U	10 U	10 U	5 U	0.5 U	1.8 U	7.8 U	2.5 U	**1.6**
Methylene chloride	2 U	20 U	**27.6** J	**11.7** J	2 U	**36.8** J	30.0 U	10 U	**36.8**
n-Butylbenzene	0.2 U	2.6 U	2.6 U	1.3 U	0.2 U	**0.9** J	3.0 U	1 U	**2.3**
n-Propylbenzene	**0.72** J	**4.3** J	2 U	**10.8**	**9.2**	**50.9**	**67.9**	**53.55**	**67.9**
o-Xylene	0.2 U	**376**	**329**	**103**	**47.4**	**239.0**	**344.5**	**253.5**	**376**
Sec-Butylbenzene	**0.76** J	**3** J	2.2 U	**4.4** J	**2.4**	**8.8**	**12.6** J	**8.25**	**12.6**
Tert-butyl benzene	0.29 U	2.7 U	2.7 U	1.4 U	0.29 U	**0.9** J	4.4 U	1.5 U	**0.92**
Toluene	0.2 U	**104**	**104**	**33.9**	**28.1**	**100.4**	**226.0**	**189.5**	**226**
Trichloroethene	0.31 U	2.6 U	2.6 U	1.3 U	0.31 U	1.1 U	4.8 U	1.6 U	**1.85**

Notes:
Values in bold font are detected values.
NA: not analyzed
µg/L = micrograms per liter
TPH-GRO (C6-C10) = total petroleum hydrocarbons - gasoline range

TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range

Table 4-7(a)
Comparision of Maximum Detected Concentrations in Soil North EU with Screening Levels (Includes Construction Worker)
Site SD-27, Holloman AFB, New Mexico

Chemical	Maximum Detected Concentration (mg/kg)	Residential Soil SL** (mg/kg)	Exceeds?	Construction Worker SL** (mg/kg)	Exceeds?
TPH					
G-TPH	309	1,000	No	--	N/A
D-TPH	124	1,000	No	--	N/A
Metals					
Barium	11	15,600	No	4,390	No
Chromium, total	1.51	96.6	No	134	No
Lead	0.866	400	No	800	No
Silver	0.565	391	No	1,770	No
SVOCs					
Fluoranthene	0.0853	2,320	No	10,000	No
VOCs					
1,2,4-Trimethylbenzene	0.00595	**58**	No	NA	N/A
Isopropylbenzene	0.002	2,360	No	2,740	No
m, p-Xylene *	0.002	871	No	798	No
n-Butylbenzene	0.002	**3,900**	No	NA	N/A
Naphthalene	0.014	49.7	No	159	No
o-Xylene	0.002	805	No	736	No
p-Cymene	0.001	NA	N/A	NA	N/A
Sec-Butylbenzene	0.031	**7,800**	No	NA	N/A

Notes:
N/A: Not Applicable
* Values of Xylenes were used.
**Values in regular font are from NMED (2015).
**Values in bold are from USEPA (2015), adjusted for target risk of 10^{-5}.
Chemical is not listed in either the NMED (2015) or in the USEPA (2015)

Table 4-7(b)
Comparison of Maximum Detected Concentrations in Soil Collected in South EU with Screening Levels (Includes Construction Worker)
Site SD-27, Holloman AFB, New Mexico

Analyte	Maximum Detected Concentration (mg/kg)	Residential Soil SL*** (mg/kg)	Exceeds?	Construction Worker SL*** (mg/kg)	Exceeds?
TPH					
TPH-GRO (C6-C10)	2940	1,000	**Yes**	--	N/A
TPH (C10-C28)	1970	1,000	**Yes**	--	N/A
Metals					
Arsenic	2.5	4.25	No	57.4	No
Barium	46.4	15,600	No	4,390	No
Cadmium	0.88	70.5	No	72.1	No
Chromium	262	96.6	**Yes**	134	**Yes**
Lead	4.9	400	No	800	No
Mercury *	0.011	23.5	No	77.1	No
SVOCs					
1-Methylnaphthalene	2.93	**180**	No	NA	N/A
2-Methylnaphthalene	2.49	**240**	No	NA	N/A
Naphthalene	4.26	49.7	No	159	No
VOCs					
1,2,4-Trimethylbenzene	57.6	**58**	No	NA	N/A
1,3,5-Trimethylbenzene	24.2	**780**	No	NA	N/A
n-Butylbenzene	5.71	**3,900**	No	NA	N/A
Acetone	0.055	66,300	No	242,000	No
Benzene	12.6	17.8	No	142	No
Carbon disulfide	0.96	1,550	No	1,620	No
p-Cymene	8.4	NA	N/A	NA	N/A
Ethylbenzene	36.4	75.1	No	1,770	No
Hexane	5.82	615	No	603	No
Isopropylbenzene	9.58	2,360	No	2,740	No
m,p-Xylene **	69.2	871	No	798	No
Methylene chloride	0.0052	409	No	1,210	No
n-Propylbenzene	12.2	**3,800**	No	NA	N/A
o-Xylene	34.4	805	No	736	No
Sec-Butylbenzene	6.84	**7,800**	No	NA	N/A
Tert-butyl benzene	0.614	**7,800**	No	NA	N/A
Toluene	37	5,230	No	14,000	No

Notes:
N/A: Not Applicable
NA: Not Available
*Mercury (salts) values from NMED 2014 were used.
** Xylenes values from NMED 2015 were used.
***Values in regular font are from NMED (2015).
***Values in bold are from USEPA (2015), adjusted for target risk of 10^{5}.
Chemical is not listed in either the NMED (2015) or in the USEPA (2015)

Table 4-8
Chemicals in Soil that Exceeded the Residential Soil Screening Levels
Site SD-27, Holloman AFB, New Mexico

Chemical	Location*
North EU	
No Chemical of Concern	
South EU	
TPH (C10-C28)	DPT-08 (6.5-8.5) and DPT-10 (8-10)
Chromium	DPT-02 (6.5-8.5) and DPT-08 (6.5-8.5)

TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
* range provided parenthetically indicates sample depth interval below ground surface in feet

Table 4-9(a)
Selection of Volatile Detected Chemicals in Soil in North EU
Site SD-27, Holloman AFB, New Mexico

Chemical	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Volatile Yes/No?
SVOCs			
Fluoranthene	202.26	8.86E-06	No
VOCs			
1,2,4-Trimethylbenzene	*120.2*	*6.16E-03*	**Yes**
Isopropylbenzene	120.2	1.15E-02	**Yes**
m, p-Xylene*	106.17	5.18E-03	**Yes**
n-Butylbenzene	*134.22*	*1.59E-02*	**Yes**
Naphthalene	128.18	4.40E-04	**Yes**
o-Xylene	106.17	5.18E-03	**Yes**
p-Cymene	NA	NA	N/A
Sec-Butylbenzene	*134.22*	*1.76E-02*	**Yes**

Notes:
NA: Not Available N/A: Not Applicable
* Values of Xylenes were used.
A chemical is volatile if its molecular weight is less than 200 g/mol and Henry's constant is greater than 1E-5 atm-m^3/mol.
Values in regular font are from NMED (2015)
Values in italics are from USEPA (2015a).
g/mol = grams per mole
atm-m^3/mol = atmosphere meters cubed per mole
SVOC = semivolatile organic compound
VOC = volatile organic compound

NMED (2015): Risk Assessment Guidance for Site Investigations and Remediation, New Mexico Environment Department.
USEPA 2015a. Regional Tables, Regional Screening Levels. USEPA, June 2015.

Table 4-9(b)
Selection of Volatile Detected Chemicals in Soil in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Volatile Yes/No?
SVOCs			
1-Methylnaphthalene	*142.2*	*5.14E-04*	**Yes**
2-Methylnaphthalene	*142.2*	*5.18E-04*	**Yes**
VOCs			
1,2,4-Trimethylbenzene	*120.2*	*6.16E-03*	**Yes**
1,3,5-Trimethylbenzene	*120.2*	*8.77E-03*	**Yes**
Benzene	78.11	5.55E-03	**Yes**
Ethylbenzene	106.17	7.88E-03	**Yes**
Isopropylbenzene	120.2	1.15E-02	**Yes**
m, p-Xylene*	106.17	5.18E-03	**Yes**
Methylene chloride	84.93	3.25E-03	**Yes**
n-Butylbenzene	*134.22*	*1.59E-02*	**Yes**
n-Propylbenzene	*120.2*	*1.05E-02*	**Yes**
Naphthalene	128.18	4.40E-04	**Yes**
o-Xylene	106.17	5.18E-03	**Yes**
p-Cymene	NA	NA	N/A
Sec-Butylbenzene	*134.22*	*1.76E-02*	**Yes**
Toluene	92.14	6.64E-03	**Yes**
Acetone	58.08	3.50E-05	**Yes**
Carbon disulfide	76.13	1.44E-02	**Yes**
Hexane	86.18	1.80E+00	**Yes**
Tert-butyl benzene	*134.22*	*1.32E-02*	**Yes**

Notes:
NA: Not Available N/A: Not Applicable
* Values of Xylenes were used.
A chemical is volatile if its molecular weight is less than 200 g/mol and Henry's constant is greater than 1E-5 atm-m^3/mol.
Values in regular font are from NMED (2015)
Values in italics are from USEPA (2015a).
g/mol = grams per mole
atm-m^3/mol = atmosphere meters cubed per mole
SVOC = semivolatile organic compound
VOC = volatile organic compound

NMED (2015): Risk Assessment Guidance for Site Investigations and Remediation, New Mexico Environment Department.
USEPA 2015a. Regional Tables, Regional Screening Levels. USEPA, June 2015.

Table 4-10(a)
Comparison of Maximum Detected Concentration in Groundwater from North EU with Vapor Intrusion Screening Levels
Site SD-27, Holloman AFB, New Mexico

Analyte	Maximum Detected Concentration	New Mexico Environment Department Screening Levels (µg/L)	
		Residential Groundwater SL	Exceeds?
VOCs (µg/L)			
Methylene chloride	4	4700	No
Trichloroethene	0.22	5.16	No

Notes:
NMED (2015): Table A-3, NMED VISLs, Risk Assessment Guidance for Site Investigations and Remediation, New Mexico Environment Department.
µg/L = micrograms per liter
VOC = volatile organic compound

Table 4-10(b)
Comparison of Maximum Detected Concentrations in Groundwater from South EU with Vapor Intrusion Screening Levels
Site SD-27, Holloman AFB, New Mexico

Analyte	Maximum Detected Concentration	New Mexico Environment Department Screening Levels (µg/L)	
		Residential Groundwater SL	Exceeds?
SVOCs (µg/L)			
1-Methylnaphthalene	14.1	NA	N/A
2,4-Dimethylphenol	7.2	NA	N/A
2-Methylnaphthalene	13.9	NA	N/A
4-Methylphenol	5.6	NA	N/A
Di-n-butyl phthalate	0.84	NA	N/A
m,p-Cresol	7.1	NA	N/A
Naphthalene*	37.75	45.8	No
Phenol	18.1	NA	N/A
VOCs (µg/L)			
1,2,4-Trimethylbenzene	283	NA	N/A
1,3,5-Trimethylbenzene	91.6	NA	N/A
Benzene	776	15.8	**Yes**
Chloroform	0.525	8.11	No
Cymene ^	15.5	NA	N/A
Ethylbenzene	775.5	34.8	**Yes**
Isopropylbenzene	61.5	885	No
m,p-Xylene**	221	491	No
Methyl methacrylate	1.6	55800	No
Methylene chloride	36.8	4700	No
n-Butylbenzene	2.3	NA	N/A
n-Propylbenzene	67.9	NA	N/A
o-Xylene	376	491	No
Sec-Butylbenzene	12.6	NA	N/A
Tert-butyl benzene	0.92	NA	N/A
Toluene	226	19200	No
Trichloroethene	1.85	5.16	No

Notes:
NMED (2015): Table A-3, NMED VISLs, Risk Assessment Guidance for Site Investigations and Remediation, New Mexico Environment Department.
*: Avergae of VOC and SVOC concentration
** Xylenes values from NMED 2015 were used.
^ Chemical is not listed in either the NMED (2015) or in the USEPA (2015a)
NA: Not Available
N/A: Not Applicable
µg/L = micrograms per liter
VOC = volatile organic compound
SVOC = semivolatile organic compound

USEPA 2015a. Regional Tables, Regional Screening Levels. USEPA, June 2015.

Table 4-11
Exposure Model for Future Resident
Site SD-27, Holloman AFB, New Mexico

No.	Route of Exposure	C/NC	Justification
1	**Dermal contact with soil**	**C**	**Soil is impacted up to depth of 10 ft bgs per NMED (2015). Therefore, this pathway is complete.**
2	**Ingestion of soil**	**C**	
3	**Outdoor inhalation of vapors and particulates from soil**	**C**	
4	**Indoor inhalation of vapors from soil**	**C**	**Soil is impacted upto depth of water table (~ 10 ft bgs)**
5	**Indoor inhalation of vapors from groundwater**	**C**	**A residential building may be constructed over an area where impacted groundwater exists. Therefore, this pathway is complete.**
6	Outdoor inhalation of vapors from groundwater	C	Vapors from groundwater may migrate upwards through the capillary fringe, the vadose zone, and into the ambient air through the ground surface. Note this pathway is generally not the "risk driver" and contributes negligible additional risk (due to considerable mixing and dilution in ambient air) especially when indoor intrusion is considered.
7	Ingestion of groundwater due to domestic use of groundwater	NC	The TDS concentration exceeds 10,000 mg/kg. Therefore the water is not potable. Hence, pathway is incomplete.
8	Dermal contact with groundwater due to domestic use of groudnwater	NC	Since the groundwater is not potable due to high TDS, it is highly unlikely that domestic wells will be installed, which in all liklihood precludes dermal contact with groundwater.

Notes:
C = Complete
NC = Not complete
Pathways shown in bold will be quantitatively evaluated.
Subsurface soil is assumed to be soil between 0 ft bgs and the groundwater table (9.8 ft bgs).
Both exposure units (NEU and SEU) will be evaluated using this exposure model.

Table 4-12
Toxicity Parameters Used for Direct Pathway from Soil Exposure
Site SD-27, Holloman AFB, New Mexico

Chemicals of Concern	CAS #	Oral Slope Factor, SF_o	Inhalation Unit Risk, IUR	Oral Reference Dose, RfD_o	Inhalation Reference Concentration, RfC	Absorption Fraction	
						Dermal, ABS_d	Oral, ABS_{GI}
		[mg/kg-day]$^{-1}$	[ug/m^3]$^{-1}$	[mg/kg-day]	[mg/m^3]	[unitless]	[unitless]
Chromium VI	18540-29-9	5.0E-01	8.4E-02	3.0E-03	1.0E-04	NA	0.025
Chromium III	16065-83-1	NA	NA	1.5E+00	NA	NA	0.013

Notes:
Source: RSL Summary Table USEPA (2015a)
NA: Not available
mg/kg-day = milligrams per kilogram per day
ug/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
USEPA 2015a. Regional Tables, Regional Screening Levels. USEPA, June 2015.

Table 4-13
Physical and Chemical Properties for Direct Pathway from Soil Exposure
Site SD-27, Holloman AFB, New Mexico

Chemicals of Concern	CAS #	Molecular Weight, MW	Henry's Law Constant, H	Organic Carbon Adsorption Coefficient, K_{oc}	Soil-Water Partition Coefficient, K_d	Diffusion Coefficient in Air, D_a	Diffusion Coefficient in Water, D_w	Soil Saturation Csat
		(g/mol)	(L-water/L-air)	(cm^3/g)	(L/kg)	(cm^2/s)	(cm^2/s)	(mg/kg)
Chromium VI	18540-29-9	5.2E+01	NA	NA	19	NA	NA	NA
Chromium III	16065-83-1	5.2E+01	NA	NA	1,800,000	NA	NA	NA

Sources:
Regular font: RSL Chemical-Specific Parameters Supporting Table USEPA (2015a)
NA: Not available
g/mol = grams per mole
L = liter(s)
cm^3/g = cubic centimeters per gram
L/kg = liters per kilogram
cm^2/s = centimeters squared per second
mg/kg = milligrams per kilogram
USEPA 2015a. Regional Tables, Regional Screening Levels. USEPA, June 2015.

Table 4-14
Exposure Factors Used for Calculating Risk for Direct Pathway from Soil Exposure
Site SD-27, Holloman AFB, New Mexico

Exposure Parameter	Symbol	Units	Value Used	Source
Averaging Time - Carcinogen	AT_c	years	70	NMED (2015)
Averaging Time - Noncarcinogen (equals exposure duration):	AT_n	years	= ED	NMED (2015)
Body Weight				
Child	BW	kg	15	NMED (2015)
Adult	BW	kg	80	NMED (2015)
Exposure Duration				
Child	ED	years	6	NMED (2015)
Adult	ED	years	20	NMED (2015)
Exposure Frequency				
Child	EF	days/yr	350	Site-specific
Adult	EF	days/yr	350	Site-specific
Soil Ingestion/Dermal Rate				
Child	IR_{soil}	mg/day	200	NMED (2015)
Adult	IR_{soil}	mg/day	100	NMED (2015)
Exposure Time for Outdoor Inhalation				
Resident	ETout	hr/day	3	USEPA (2014)
Resident (Normalized)	ETout	--	0.125	Calculated
Particulate Emission Rate				
Residential	PEF	m^3/kg	6.61E+09	NMED (2015)
Soil to Skin Adherence Factor				
Child	AF_c	mg/cm^2	0.2	NMED (2015)
Adult	AF_a	mg/cm^2	0.07	NMED (2015)
Skin Surface Area for Dermal Contact				
Child	SA_c	cm^2/day	2373	USEPA (2014)
Adult	SA_a	cm^2/day	6032	USEPA (2014)

Notes:
NMED (2015). Risk Assessment Guidance for Investigations and Remediation. New Mexico Environment Dept.
USEPA (2014). Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors.
ED = exposure duration
kg = kilograms
yr = years
hr = hours
m^3 = cubic meters
cm^2 = square centimeters

Table 4-15
Fate and Transport Parameters for Direct Pathway from Soil Exposure
Site SD-27, Holloman AFB, New Mexico

Parameter	Symbol	Unit	Value Used	Source
Dry Soil Bulk Density in the Vadose Zone	r_s	g/cm^3	1.59	USEPA (2004)
Fractional Organic Carbon Content	f_{oc}	g-C/g-soil	0.0015	NMED (2015)
Total Soil Porosity in the Vadose Zone	n	cm^3/cm^3-soil	0.399	USEPA (2004)
Volumetric Water Content in the Vadose Zone	q_{ws}	cm^3/cm^3	0.15	USEPA (2004)
Volumetric Air Content in the Vadose Zone	q_{as}	cm^3/cm^3	0.25	Calculated
Inverse of mean cocnentration	Q/C_{vol}	g/m^2-s per kg/m^3	68.18	NMED (2015)

Notes:
NMED (2015). Risk Assessment Guidance for Investigations and Remediation, New Mexico Environment Department.
USEPA (2004). User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings.
g = grams
cm^3 = cubic centimeters
g-C = grams of organic carbon
g/m^2-s per kg/m^3 = grams per square meter seconds per kilogram per cubic meter

Table 4-16
Represe**ntative Concentration for Soil for Direct Pathway from Soil in South EU**
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-01	SD27-DPT-02	SD27-DPT-03	SD27-DPT-04	SD27-DPT-05	SD27-DPT-06	SD27-DPT-07
Depth (ft bgs)	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
Date	11/3/2010	11/3/2010	11/3/2010	11/3/2010	11/3/2010	11/3/2010	11/3/2010
Chromium	**4.4** J	**262**	**35.3**	**28.7**	**2.5** J	**10.95** J	**6.5**

Notes:
All units are in milligrams per kilogram.
Values in bold font are detected values.
ft bgs = feet below ground surface.
UCL = upper confidence limit.

Table 4-16
Represe**ntative Concentration for Soil for Direct Pathway from Soil in South EU**
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-08	SD27-DPT-09	SD27-DPT-10	SD27-DPT-11	SD27-DPT-12	SD27-DPT-13	SD27-DPT-14
Depth (ft bgs)	6.5 - 8.5	7-9	8 - 10	6.5 - 8.5	6.5 - 8.5	6.5-8.5	5-7
Date	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/5/2010	3/22/2011
Chromium	**228**	**29**	**2.1** J	**15.55** J	**3.2** J	**2.8** J	**1.6** J

Notes:
All units are in milligrams per kilogram.
Values in bold font are detected values.
ft bgs = feet below ground surface.
UCL = upper confidence limit.

Table 4-16
Represe**ntative Concentration for Soil for Direct Pathway from Soil in South EU**
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-15	SD27-DPT-16	SD27-DPT-17	SD27-DPT-18	SD27-DPT-19	SD27-DPT-20	SD27-DPT-21
Depth (ft bgs)	5-7	8-10	8-10	8-10	8-10	7-9	8-10
Date	3/22/2011	3/22/2011	3/22/2011	3/22/2011	3/22/2011	3/23/2011	3/23/2011
Chromium	**1.4** J	**3** J	**2.7** J	**2.3** J	**1.6** J	**1.7** J	**2.2** J

Notes:
All units are in milligrams per kilogram.
Values in bold font are detected values.
ft bgs = feet below ground surface.
UCL = upper confidence limit.

Table 4-16
Represe**ntative Concentration for Soil for Direct Pathway from Soil in South EU**
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-22	SD27-DPT-23	SD27-DPT-24	SD27-DPT-25	SD27-DPT-26	SD27-DPT-27	SD27-DPT-28	**Max Detected Concentration**	**95% UCL**	**Representative Concentration**
Depth (ft bgs)	8-10	8-10	8-10	8-10	8-10	8-10	8-10			
Date	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011			
Chromium	**2** J	**1.9** J	**1.8** J	**2** J	**2.3** J	**2.6** J	**2.8** J	**262**	**75.86**	**75.86**

Notes:
All units are in milligrams per kilogram.
Values in bold font are detected values.
ft bgs = feet below ground surface.
UCL = upper confidence limit.

Table 4-17
Toxicity and Physical and Chemical Parameters Used for Indoor Inhalation of Vapors
Site SD-27, Holloman AFB, New Mexico

Chemical	CAS #	Molecular Weight MW	Organic carbon partition coefficient K_{oc}	Diffusivity in air D_a	Diffusivity in water D_w	Pure component water solubility S	Henry's law constant H'	Henry's law constant at reference temperature H	Vapor Pressure Pv	Henry's law constant reference temperature T_R	Normal boiling point T_B	Critical temperature T_C	Enthalpy of vaporization at the normal boiling point $DH_{v,b}$	First Order Bio-degradation Kw	Inhalation Slope Factor SF_i	Reference concentration RfC
		(g/mol)	(cm^3/g)	(cm^2/s)	(cm^2/s)	(mg/L)	(unitless)	(atm-m^3/mol)	(mmHg)	(^oC)	(^oK)	(^oK)	(cal/mol)	(1/hr)	(mg/kg-day)-1	(mg/m^3)
1-Methylnaphthalene	90-12-0	1.4E+02	2.5E+03	5.3E-02	7.8E-06	2.6E+01	2.1E-02	5.1E-04	6.7E-02	NA	NA	NA	NA	**1,000**	NA	NA
2-Methylnaphthalene	91-57-6	1.4E+02	2.5E+03	5.2E-02	7.8E-06	2.5E+01	2.1E-02	5.2E-04	5.5E-02	2.50E+01	5.14E+02	7.61E+02	1.26E+04	**1,000**	NA	NA
1,2,4-Trimethylbenzene	95-63-6	1.2E+02	6.1E+02	6.1E-02	7.9E-06	5.7E+01	2.5E-01	6.2E-03	2.1E+00	2.50E+01	4.42E+02	6.49E+02	9.37E+03	*0.79*	NA	7.0E-03
1,3,5-Trimethylbenzene	108-67-8	1.2E+02	6.0E+02	6.0E-02	7.8E-06	4.8E+01	3.6E-01	8.8E-03	2.1E+00	2.50E+01	4.38E+02	6.37E+02	9.32E+03	*0.79*	NA	NA
Benzene	71-43-2	7.8E+01	1.5E+02	9.0E-02	1.0E-05	1.8E+03	2.3E-01	5.6E-03	9.5E+01	2.50E+01	3.53E+02	5.62E+02	7.34E+03	*0.79*	2.7E-02	3.0E-02
Ethylbenzene	100-41-4	1.1E+02	4.5E+02	6.8E-02	8.5E-06	1.7E+02	3.2E-01	7.9E-03	9.6E+00	2.50E+01	4.09E+02	6.17E+02	8.50E+03	*0.79*	8.8E-03	1.0E+00
Isopropylbenzene	98-82-8	1.2E+02	7.0E+02	6.0E-02	7.9E-06	6.1E+01	4.7E-01	1.2E-02	4.5E+00	2.50E+01	4.26E+02	6.31E+02	1.03E+04	**1,000**	NA	4.0E-01
m, p-Xylene*	108-38-3	1.1E+02	3.8E+02	6.8E-02	8.4E-06	1.6E+02	2.9E-01	7.2E-03	8.3E+00	2.50E+01	4.12E+02	6.17E+02	8.52E+03	*0.79*	NA	1.0E-01
Methylene chloride	75-09-2	8.5E+01	2.2E+01	1.0E-01	1.3E-05	1.3E+04	1.3E-01	3.3E-03	4.4E+02	2.50E+01	3.13E+02	5.10E+02	6.71E+03	**1,000**	3.5E-05	6.0E-01
n-Butylbenzene	104-51-8	1.3E+02	1.5E+03	5.3E-02	7.3E-06	1.2E+01	6.5E-01	1.6E-02	1.1E+00	2.50E+01	4.56E+02	6.61E+02	9.29E+03	**1,000**	NA	NA
n-Propylbenzene	103-65-1	1.2E+02	8.1E+02	6.0E-02	7.8E-06	5.2E+01	4.3E-01	1.1E-02	3.4E+00	2.50E+01	4.32E+02	6.30E+02	9.12E+03	**1,000**	NA	1.0E+00
Naphthalene	91-20-3	1.3E+02	1.5E+03	6.0E-02	8.4E-06	3.1E+01	1.8E-02	4.4E-04	8.5E-02	2.50E+01	4.91E+02	7.48E+02	1.04E+04	*0.46*	1.2E-01	3.0E-03
o-Xylene	95-47-6	1.1E+02	3.8E+02	6.9E-02	8.5E-06	1.8E+02	2.1E-01	5.2E-03	6.6E+00	2.50E+01	4.18E+02	6.30E+02	8.66E+03	*0.79*	NA	1.0E-01
Sec-Butylbenzene	135-98-8	1.3E+02	1.3E+03	5.3E-02	7.3E-06	1.8E+01	7.2E-01	1.8E-02	1.8E+00	2.50E+01	4.47E+02	6.79E+02	8.87E+04	**1,000**	NA	NA
Toluene	108-88-3	9.2E+01	2.3E+02	7.8E-02	9.2E-06	5.3E+02	2.7E-01	6.6E-03	2.8E+01	2.50E+01	3.84E+02	5.92E+02	7.93E+03	*0.79*	NA	5.0E+00
Acetone	67-64-1	5.8E+01	2.4E+00	1.1E-01	1.2E-05	1.0E+06	1.4E-03	3.5E-05	2.3E+02	2.50E+01	3.29E+02	5.08E+02	6.96E+03	**1,000**	NA	3.1E+01
Carbon disulfide	75-15-0	7.6E+01	2.2E+01	1.1E-01	1.3E-05	2.2E+03	5.9E-01	1.4E-02	3.6E+02	2.50E+01	3.19E+02	5.52E+02	6.39E+03	**1,000**	NA	7.0E-01
Hexane	110-54-3	8.6E+01	1.3E+02	7.3E-02	8.2E-06	9.5E+00	7.4E+01	1.8E+00	1.5E+02	2.50E+01	3.42E+02	5.08E+02	6.90E+03	*71.00*	NA	7.0E-01
Tert-butyl benzene	98-06-6	1.3E+02	1.0E+03	5.3E-02	7.4E-06	3.0E+01	5.4E-01	1.3E-02	2.2E+00	2.50E+01	4.42E+02	1.22E+03	8.98E+03	**1,000**	NA	NA

Notes:
NA = Not available
*:Information is for m-xylenes.
Value in normal font obtained from the Regional Screening Level (RSL) Summary Table, USEPA (2015)
Value underlined obtained from the User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings,USEPA (2004)
Values in italics are obtaibned from BioVapor, 1-D Vapor Intrusion Model, Version 2.1, API, November 2012.
Values in bold were assumed to be 1,000, as biodegradtion factors were notavailable for these chemicals.

The Biovapor model uses inhalation slope factor (SFi) as the toxicity factor for carcinogenic chemicals. The current practice is to use inhalation unit risk (IUR). So this necessitates the conversion of current IUR values to SFi . Such conversion requires the use of BW = 70 kg and inhalation rate of 20 m3/day. Note, the conversion was published by USEPA, although currently USEPA prefers not to use it. However, no alternative is available. This conversion is independent of the inhalation rate or BW, used to calculate the risk. Biovapor uses RfC for non-carcinogenic chemicals. Hence, no conversion was done. Per the NMED 2015 guidance, for non-carcinogenic ED for the child receptor is used (6 yrs) and for carcinogenic ED for age-adjusted, 26 yrs (20+6), is used.

Table 4-18
Exposure Factors for Indoor Inhalation of Vapors
Site SD-27, Holloman AFB, New Mexico

Parameter	Symbol	Unit	Values Used	Source
Body Weight- Child	BW_c	kg	15	NMED (2015)
Body Weight- Adult	BW_a	kg	80	NMED (2015)
Body Weight- Age-adjusted	Bw_{aa}	kg	65	Calculated
Exposure duration-Child	ED	years	6	NMED (2015)
Exposure duration-Age-adjusted	ED	years	26	NMED (2015)
Exposure frequency- Child and Age-adjusted	EF	days/year	350	NMED (2015)
Exposure time- - Child and Age-adjusted	ET	hours/day	17	USEPA (2014)
Indoor inhalation rate exposure adjustment	CF	--	0.7	Calculated

Notes:
NMED (2015). Risk Assessment Guidance for Site Investigations and Remediation. New Mexico Environment Dept.
USEPA (2014). Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors
Body Weight- Age-adjusted = [(6 yr x 15 kg) x (20 yr x 80 kg)]/(6 yr + 20 yr)
Indoor inhalation rate exposure adjustment = 17 hr/day x 1/24 day/hr = 0.7
kg = killograms
yr = years

Table 4-19
Media Specific Parameters Used for Calculating Target Levels of Indoor Inhalation of Vapors
Site SD-27, Holloman AFB, New Mexico

Parameter	Symbol	Unit	Value Used	Source
Source Parameters				
Average soil temperature	T_s	°C	16.6	USEPA (2004)
Depth below grade to water table	L_{WT}	cm	259.4	Site-specific
Depth below grade to top of contamination (North EU)	L_T	cm	183	Site-specific
Depth below grade to top of contamination (South EU)	L_T	cm	198	Site-specific
Thickness of capillary fringe zone	L_{cz}	cm	37.5	USEPA (2004)
Geotechnical Parameters				
Soil dry bulk density in the vadose zone and the capillary fringe zone	ρ_b	g/cm^3	1.59	USEPA (2004)
Total total porosity in the vadose zone and the capillary fringe zone	n	unitless	0.399	USEPA (2004)
Soil water-filled porosity in the vadose zone	θ_w	cm^3/cm^3	0.148	USEPA (2004)
Building Parameters for Future Resident				
Depth below grade to bottom of enclosed space floor	L_F	cm	15	USEPA (2004)
Enclosed space floor thickness	L_{crack}	cm	10	USEPA (2004)
Enclosed space floor length	L_B	cm	1000	USEPA (2004)
Enclosed space floor width	W_B	cm	1000	USEPA (2004)
Enclosed space height	H_B	cm	244	USEPA (2004)
Floor-wall seam crack width	w	cm	0.1	USEPA (2004)
Areal Fraction of Cracks in Foundation/Walls	η	cm^2/cm^2	0.00038	USEPA (2004)
Indoor air exchange rate	ER	1/hr	0.5	USEPA (2004)
Average vapor flow rate into building	Q_{soil}	L/min	5	USEPA (2004)

Notes:
USEPA (2004). User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings
°C = degrees centigrade
cm = centimeters
g = grams
hr = hour
min = minute

Table 4-20(a)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in North EU
Site SD-27, Holloman AFB

Sample	**SB27-01**		**SB27-04**		**SB27-05**		**Max Detected Concentration**	**95% UCL**	**Representative Concentration**
Depth	6-8		8-10		7-8				
Date	5/16/2006		5/16/2006		5/18/2006				
TPH									
D-TPH	**124**		7.28	U	7.28	U	124	NA	**124**
VOCs									
1,2,4-Trimethylbenzene	**0.00595**	J	**0.00416**	J	0.0000535	U	0.00595	NA	**0.00595**
Isopropylbenzene	**0.00235**	J	0.000105	U	0.00013	U	0.00235	NA	**0.00235**
m, p-Xylene	**0.00312**	J	**0.00243**	J	0.0000714	U	0.00243	NA	**0.00243**
n-Butylbenzene	0.000116	U	**0.00183**	J	0.0000979	U	0.00183	NA	**0.00183**
Naphthalene	**0.0141**	J	**0.00871**	J	0.000441	U	0.0141	NA	**0.0141**
o-Xylene	**0.00162**	J	**0.00176**	J	0.0000679	U	0.00176	NA	**0.00176**
Sec-Butylbenzene	**0.031**		0.01	U	0.0000632	U	0.031	NA	**0.031**

Notes:
All units are in milligrams per kilogram.
Values in bold font are detected values.
NA: Not applicable
U = undetected
J = estimated value
D-TPH = total petroleum hydrocarbons - diesel range
UCL = upper confidence limit

Table 4-20(b)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-01		SD27-DPT-02		SD27-DPT-03		SD27-DPT-04		SD27-DPT-05		SD27-DPT-06		SD27-DPT-07	
Depth (ft bgs)	6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5		6.5 - 8.5	
Date	11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010		11/3/2010	
TPH														
TPH (C10-C28)	4.6	U	12		**469**		**606**		4.6	U	4.15	U	4.5	U
SVOCs														
1-Methylnaphthalene	0.023	U	0.023	U	**1.06**		**1.04**		0.022	U	0.0205	U	0.022	U
2-Methylnaphthalene	0.023	U	0.023	U	**0.92**		**0.575**	J	0.022	U	0.0205	U	0.022	U
Naphthalene	25.00075	U	0.094	U	**2.952**		**3.054**		0.0187	U	0.017375	U	0.01835	U
VOCs														
1,2,4-Trimethylbenzene	0.00083	U	**2.12**		**40.1**		**41.3**		0.00079	U	0.00095	U	0.00092	U
1,3,5-Trimethylbenzene	0.00099	U	0.095	U	**16.8**		**16.9**		0.00094	U	0.0011	U	0.0011	U
n-Butylbenzene	0.00099	U	**0.12**	J	**5.16**		**1.64**		0.00094	U	0.0011	U	0.0011	U
Acetone	0.015	R	1.5	R	4.7	R	5.8	R	0.014	R	**0.024**	J	**0.0173**	J
Benzene	0.0011	U	**0.232**	J	**5.05**		**12.6**		0.0011	U	**0.0061**	J	**0.0054**	
Carbon disulfide	0.0015	U	0.15	U	**0.96**	J	0.58	U	0.0014	U	**0.0023**	J	0.0017	U
Ethylbenzene	0.00076	U	**0.474**		**15**		**13.2**		0.00072	U	**0.0010**	J	0.00084	U
Hexane	0.0014	UJ	0.14	UJ	**5.82**	J	**2.62**	J	0.0014	UJ	0.00165	UJ	0.0016	UJ
Isopropylbenzene	0.00083	U	**0.341**	J	**5.87**		**3.49**		0.00079	U	**0.0007825**	J	**0.0047**	
m,p-Xylene	0.0017	U	**0.626**	J	**46.3**		**46.9**		0.0016	U	0.0019	U	0.0018	U
Methylene chloride	0.0076	U	0.73	U	2.3	U	5.63	U	0.0072	U	0.0086	U	0.0084	U
n-Propylbenzene	0.0011	U	**0.388**		**6.53**		**2.15**		0.001	U	0.0012	U	**0.003**	J
o-Xylene	0.00076	U	**0.0902**	J	**17.1**		**18.8**		0.00072	U	0.00086	U	0.00084	U
Sec-Butylbenzene	0.0012	U	**0.186**	J	**5.95**		**3.23**		0.0012	U	0.0014	U	**0.0018**	J
Tert-butyl benzene	0.00091	U	0.088	U	0.28	U	**0.47**	J	0.00087	U	0.00105	U	0.001	U
Toluene	0.00091	U	0.088	U	**18.1**		**36.6**		0.00087	U	0.00105	U	0.001	U

Notes:
All units are in mg/kg.
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
R = uncertain result (not available for use in statistics)
UCL = upper confidence limit

Table 4-20(b)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-08	SD27-DPT-09	SD27-DPT-10	SD27-DPT-11	SD27-DPT-12	SD27-DPT-13	SD27-DPT-14
Depth (ft bgs)	6.5 - 8.5	7-9	8 - 10	6.5 - 8.5	6.5 - 8.5	6.5-8.5	5-7
Date	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/4/2010	11/5/2010	3/22/2011
	TPH						
TPH (C10-C28)	**1360**	**760**	**1970**	4 U	4.4 U	3.8 U	**4.06** J
	SVOCs						
1-Methylnaphthalene	**2.66**	**1.34**	**2.93**	0.0205 U	0.023 U	0.019 U	0.2 U
2-Methylnaphthalene	**1.25** J	**0.0872** J	0.11 U	0.0205 U	0.023 U	0.019 U	0.2 U
Naphthalene	**1.71**	**4.2625**	0.08575 U	0.0173 U	0.01875 U	0.031 U	0.1023 U
	VOCs						
1,2,4-Trimethylbenzene	**13.8**	**57.6**	**0.0379**	0.000895 U	0.00085 U	NA	0.0046 UJ
1,3,5-Trimethylbenzene	**9.2**	**24.2**	**0.0219**	0.001045 U	0.001 U	NA	0.0046 UJ
n-Butylbenzene	**0.291** J	**5.71**	**0.00098** J	0.001045 U	0.001 U	NA	0.0046 UJ
Acetone	2.1 U	9.8 U	0.015 U	0.016 U	0.015 U	NA	0.046 UJ
Benzene	**1.2**	**2.91**	**0.0109**	0.0012 U	0.0012 U	NA	0.0046 UJ
Carbon disulfide	**0.225** J	0.98 U	**0.0024** J	0.0016 U	0.0015 U	NA	0.0046 UJ
Ethylbenzene	**5.4**	**36.4**	**0.0029** J	0.000815 U	0.00077 U	NA	0.0046 UJ
Hexane	**0.436** J	**0.931** J	0.0014 U	0.00155 U	0.0015 U	NA	0.0046 UJ
Isopropylbenzene	**1.05**	**9.58**	**0.0075**	0.000895 U	0.00085 U	NA	0.0046 UJ
m,p-Xylene	**17.3**	**69.2**	**0.0085**	0.0018 U	0.0017 U	NA	0.0093 UJ
Methylene chloride	0.48 U	2.3 U	0.0103 U	0.00375 U	0.0088 U	NA	0.0093 UJ
n-Propylbenzene	**0.49** J	**12.2**	**0.0059**	0.00115 U	0.0011 U	NA	0.0046 UJ
o-Xylene	**7.95**	**34.4**	0.00075 U	0.000815 U	0.00077 U	NA	0.0046 UJ
Sec-Butylbenzene	**1.33**	**6.84**	**0.0057**	0.0013 U	0.0012 U	NA	0.0046 UJ
Tert-butyl benzene	0.13 U	**0.614** J	0.0009 U	0.000955 U	0.00092 U	NA	0.0046 UJ
Toluene	**6.95**	**37**	0.0009 U	0.000955 U	0.00092 U	NA	0.0046 UJ

Notes:
All units are in mg/kg.
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
R = uncertain result (not available for use in statistics)
UCL = upper confidence limit

Table 4-20(b)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-15		SD27-DPT-16		SD27-DPT-17		SD27-DPT-18		SD27-DPT-19		SD27-DPT-20		SD27-DPT-21	
Depth (ft bgs)	5-7		8-10		8-10		8-10		8-10		7-9		8-10	
Date	3/22/2011		3/22/2011		3/22/2011		3/22/2011		3/22/2011		3/23/2011		3/23/2011	
	TPH													
TPH (C10-C28)	10	U	10	U	10	U	10	U	**332**		9.4	U	9.8	U
	SVOCs													
1-Methylnaphthalene	0.2	U	0.2	U	0.21	U	0.2	U	**1.78**		0.19	U	0.19	U
2-Methylnaphthalene	0.2	U	0.2	U	0.21	U	0.2	U	**1.62**		0.19	U	0.19	U
Naphthalene	0.10195	U	0.102	U	0.10695	U	0.23	U	**0.283**		0.09715	U	0.09705	U
	VOCs													
1,2,4-Trimethylbenzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.271**	J	**2.17**	J	0.0043	UJ	0.0041	U
1,3,5-Trimethylbenzene	0.0039	UJ	**0.0042**	J	0.0039	UJ	**0.22**	J	**1.09**	J	0.0043	UJ	0.0041	U
n-Butylbenzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.0721**	J	**0.264**	J	0.0043	UJ	0.0041	U
Acetone	0.039	UJ	0.04	UJ	0.039	UJ	2.6	UJ	2.5	UJ	0.043	UJ	0.041	U
Benzene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.109**	J	0.25	UJ	0.0043	UJ	0.0041	U
Carbon disulfide	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	U
Ethylbenzene	0.0039	UJ	**0.0028**	J	0.0039	UJ	**0.081**	J	**0.232**	J	0.0043	UJ	0.0041	U
Hexane	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	UJ
Isopropylbenzene	0.0039	UJ	**0.003**	J	0.0039	UJ	0.26	UJ	**0.373**	J	0.0043	UJ	0.0041	U
m,p-Xylene	0.0078	UJ	0.008	UJ	0.0077	UJ	0.52	UJ	**1.19**	J	0.0087	UJ	0.0082	U
Methylene chloride	0.0078	UJ	0.008	UJ	0.0077	UJ	0.52	UJ	0.5	UJ	0.0087	UJ	0.0082	U
n-Propylbenzene	0.0039	UJ	**0.0011**	J	0.0039	UJ	0.26	UJ	**0.419**	J	0.0043	UJ	0.0041	U
o-Xylene	0.0039	UJ	**0.00087**	J	0.0039	UJ	**0.0929**	J	**0.903**	J	0.0043	UJ	0.0041	U
Sec-Butylbenzene	0.0039	UJ	**0.0018**	J	0.0039	UJ	0.26	UJ	**0.328**	J	0.0043	UJ	0.0041	U
Tert-butyl benzene	0.0039	UJ	0.004	UJ	0.0039	UJ	0.26	UJ	0.25	UJ	0.0043	UJ	0.0041	U
Toluene	0.0039	UJ	0.004	UJ	0.0039	UJ	**0.0697**	J	0.25	UJ	0.0043	UJ	0.0041	U

Notes:
All units are in mg/kg.
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
R = uncertain result (not available for use in statistics)
UCL = upper confidence limit

Table 4-20(b)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-22	SD27-DPT-23	SD27-DPT-24	SD27-DPT-25	SD27-DPT-26	SD27-DPT-27	SD27-DPT-28
Depth (ft bgs)	8-10	8-10	8-10	8-10	8-10	8-10	8-10
Date	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011	3/23/2011
	TPH						
TPH (C10-C28)	9.9 U	9.4 U	9.4 U	**449**	9.6 U	9.6 U	9.9 U
	SVOCs						
1-Methylnaphthalene	0.19 U	0.19 U	0.19 U	**2.56**	0.19 U	0.2 U	0.2 U
2-Methylnaphthalene	0.19 U	0.19 U	0.19 U	**2.49**	0.19 U	0.2 U	0.2 U
Naphthalene	0.0968 U	0.0969 U	0.09775 U	**2.0365**	0.09725 U	0.1019 U	0.101875 U
	VOCs						
1,2,4-Trimethylbenzene	**0.0972**	0.0038 U	0.0039 U	**20.9**	0.0045 U	0.0038 U	0.00375 U
1,3,5-Trimethylbenzene	**0.0376**	0.0038 U	0.0039 U	**7.54**	0.0045 U	0.0038 U	0.00375 U
n-Butylbenzene	**0.0037**	0.0038 U	0.0039 U	**1.53**	0.0045 U	0.0038 U	**0.0013** J
Acetone	0.036 U	0.038 U	0.039 U	2.4 U	0.045 U	0.038 U	**0.0552** J
Benzene	0.0036 U	0.0038 U	0.0039 U	0.24 U	0.0045 U	0.0038 U	0.00375 U
Carbon disulfide	**0.0066**	0.0038 U	0.0039 U	0.24 U	0.0045 U	0.0038 U	0.00375 U
Ethylbenzene	**0.0251**	0.0038 U	0.0039 U	**4.2**	0.0045 U	0.0038 U	**0.010**
Hexane	0.0036 UJ	0.0038 UJ	0.0039 UJ	0.24 UJ	0.0045 U	0.0038 U	0.00375 U
Isopropylbenzene	**0.0232**	0.0038 U	0.0039 U	**2.6**	0.0045 U	0.0038 U	**0.0291**
m,p-Xylene	**0.0189**	0.0076 U	0.0079 U	**9.28**	0.0091 U	0.0076 U	0.0074 U
Methylene chloride	0.0072 U	0.0076 U	0.0079 U	0.47 U	0.0091 U	**0.0052** J	**0.004125** J
n-Propylbenzene	**0.0257**	0.0038 U	0.0039 U	**2.83**	0.0045 U	0.0038 U	**0.00635**
o-Xylene	**0.0083**	0.0038 U	0.0039 U	**6.64**	0.0045 U	0.0038 U	0.00375 U
Sec-Butylbenzene	**0.0206**	0.0038 U	0.0039 U	**2.48**	0.0045 U	0.0038 U	**0.00835**
Tert-butyl benzene	0.0036 U	0.0038 U	0.0039 U	0.24 U	0.0045 U	0.0038 U	0.00375 U
Toluene	0.0036 U	0.0038 U	0.0039 U	**1.35**	0.0045 U	0.0038 U	0.00375 U

Notes:
All units are in mg/kg.
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
R = uncertain result (not available for use in statistics)
UCL = upper confidence limit

Table 4-20(b)
Representative Concentrations for Soil for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Sample ID Depth (ft bgs) Date	Max Detected Concentration	95% UCL	Representative Concentration
	TPH		
TPH (C10-C28)	1970	365	**365**
	SVOCs		
1-Methylnaphthalene	2.93	0.81	**0.81**
2-Methylnaphthalene	2.49	0.47	**0.47**
Naphthalene	4.263	0.95	**0.95**
	VOCs		
1,2,4-Trimethylbenzene	57.6	11.80	**11.80**
1,3,5-Trimethylbenzene	24.2	7.54	**7.54**
n-Butylbenzene	5.71	1.76	**1.76**
Acetone	0.055	0.02	**0.02**
Benzene	12.6	1.72	**1.72**
Carbon disulfide	0.96	0.12	**0.12**
Ethylbenzene	36.4	9.49	**9.49**
Hexane	5.82	0.82	**0.82**
Isopropylbenzene	9.58	2.57	**2.57**
m,p-Xylene	69.2	13.12	**13.12**
Methylene chloride	0.0052	0.01	**0.01**
n-Propylbenzene	12.2	3.27	**3.27**
o-Xylene	34.4	5.98	**5.98**
Sec-Butylbenzene	6.84	2.07	**2.07**
Tert-butyl benzene	0.614	0.11	**0.11**
Toluene	37	7.31	**7.31**

Notes:
All units are in mg/kg.
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
R = uncertain result (not available for use in statistics)
UCL = upper confidence limit

Table 4-20(c)
Representative Concentrations for Groundwater for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Parameter	SD 27-MW02							Average for SD27-MW-02	SD27-MW03	
	1/25/2011	4/7/2011	7/11/2011	12/12/2012	3/6/2013	6/26/2013	8/28/2013		1/25/2011	4/6/2011
TPH (µg/L)										
TPH (C10-C28)	**597**	**549**	**446**	NA	NA	NA	NA	**531**	**226** J	**190** J
VOCs (µg/L)										
Benzene	**9.3**	**7.3**	**11**	**3.7**	**4.5**	**5.9**	**3.7**	**6.4**	**0.88** J	**1.4**
Ethylbenzene	**126.0**	**115.5**	**92**	**0.2725** J	0.29 U	**1.5**	**4.6**	**48.6**	0.2 U	0.2 U

Notes:
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
UCL = upper confidence limit

Table 4-20(c)
Representative Concentrations for Groundwater for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Parameter	SD27-MW03					Average for SD27-MW-03	SD27-MW04				
	7/12/2011	12/13/2012	3/7/2013	6/26/2013	8/28/2013		1/25/2011	4/6/2011	7/11/2011	12/12/2012	3/7/2013
	TPH (µg/L)										
TPH (C10-C28)	**170** J	NA	NA	NA	NA	**195.3**	**149** J	**104** J	**107** J	NA	NA
	VOCs (µg/L)										
Benzene	0.2 U	0.21 U	0.21 U	0.21 U	0.21 U	**0.4**	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U
Ethylbenzene	0.2 U	0.29 U	0.29 U	0.29 U	0.29 U	**0.125**	**1.5**	0.2 U	**2.5**	**1.6**	0.29 U

Notes:
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
UCL = upper confidence limit

Table 4-20(c)
Representative Concentrations for Groundwater for Indoor Air Inhalation of Vapors in South EU
Site SD-27, Holloman AFB

Parameter	SD27-MW04		Average for SD27-MW-04	SD27-MW05							Average for SD27-MW-05	Average of all Wells
	6/26/2013	8/28/2013		1/25/2011	4/7/2011	7/11/2011	12/11/2012	3/7/2013	6/26/2013	8/28/2013		
TPH (µg/L)												
TPH (C10-C28)	NA	NA	**120.0**	**1160**	**1230**	**470**	NA	NA	NA	NA	**953**	**450**
VOCs (µg/L)												
Benzene	0.21 U	0.21 U	**0.10**	**776**	**550**	**217**	**152**	**471.0**	**636.5**	**452**	465	**118**
Ethylbenzene	**0.39** J	0.29 U	**0.91**	**41**	**15.1**	**107**	**105**	**524.0**	**775.5**	**484**	293	**86**

Notes:
Values in bold font are detected values.
NA: not analyzed
TPH (C10-C28) = total petroleum hydrocarbons - diesel range, fuel oil and/or kerosene range
U = undetected
J = estimated value
UCL = upper confidence limit

Table 4-21(a)
Risk from Indoor Inhalation of Vapors from Soil in North EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Representative Soil Concentration (mg/kg)	Soil Vapor Concentration* (ug/m^3)	Non-Carcinogenic	Carcinogenic
1,2,4-Trimethylbenzene	0.006	841	4.88E-23	NA
Isopropylbenzene	0.002	521	3.88E-04	NA
m, p-Xylene (sum of isomers)	0.002	650	7.39E-21	NA
n-Butylbenzene	0.002	290	NA	NA
Naphthalene	0.014	58	3.82E-59	1.56E-63
o-Xylene	0.002	335	2.07E-24	NA
Sec-Butylbenzene	0.031	57	NA	NA
		Cumulative	**3.9E-04**	**1.6E-63**

Notes:
NA: Not applicable as toxicity values not available.
*: Calculated using representative soil concentration and equilibrium equation.
mg/kg = milligrams per kilogram
ug/m^3 = micrograms per cubic meter

Table 4-21(b)
Risk from Direct Pathway from Soil in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Representative Concentrations (mg/kg)	Non Carcinogenic Risk from			HI	Carcinogenic Risk from			IELCR
		Ingestion	Inhalation of Vapors and particulates	Dermal Contact		Ingestion	Inhalation of Vapors and particulates	Dermal Contact	
Chromium VI	10.8	0.05	1.97E-06	NA	**4.6E-02**	7.80E-06	6.14E-09	NA	**7.81E-06**
Chromium III	65.0	0.001	NA	NA	**5.5E-04**	NA	NA	NA	**NA**
				Cummulative HI	**4.7E-02**			**Cummulative Risk**	**7.8E-06**

Notes:
NA: Not calculated due to lack of toxicity values.
HI: Hazard Index
IELCR: Individual Excess Lifetime Cancer Risk
Ratio of 1: 6 was used for Chromium VI: Chromium III per NMED (2015).
Representative concentration of chromium, total (75.86 mg/kg) was used to calculate chromium VI and chromium III salts.
mg/kg = milligrams per kilogram

Table 4-21(c)
Risk from Indoor Inhalation of Vapors from Soil and Groundwater in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Soil Representative Concentration (mg/kg)	Soil Vapor Concentration* (ug/m^3)	Non-Carcinogenic	Carcinogenic	Groundwater Representative Concentration (ug/L)	Non-Carcinogenic	Carcinogenic	HI	IELCR
1-Methylnaphthalene	0.81	N/A	NA	NA	NCOC	--		0.00E+00	0.00E+00
2-Methylnaphthalene	0.47	1.23E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Naphthalene	0.95	3.90E+03	1.74E-45	7.11E-50	NCOC	--		1.74E-45	7.11E-50
1,2,4-Trimethylbenzene	11.80	1.67E+06	9.53E-16	NA	NCOC	--		9.53E-16	0.00E+00
1,3,5-Trimethylbenzene	7.54	1.53E+06	NA	NA	NCOC	--		0.00E+00	0.00E+00
n-Butylbenzene	1.76	2.79E+05	NA	NA	NCOC	--		0.00E+00	0.00E+00
Acetone	0.02	2.59E+02	2.54E-06	NA	NCOC	--		2.54E-06	0.00E+00
Benzene	1.72	7.99E+05	3.66E-13	3.43E-17	118	7.78E-18	7.28E-22	3.66E-13	3.43E-17
Carbon disulfide	0.12	2.64E+05	1.75E-01	NA	NCOC			1.75E-01	0.00E+00
Ethylbenzene	9.49	2.41E+06	2.48E-14	2.48E-17	86	1.52E-19	1.52E-22	2.48E-14	2.48E-17
Hexane	0.82	5.02E+06	6.52E-08	NA	NCOC	--		6.52E-08	0.00E+00
Isopropylbenzene	2.57	5.71E+05	4.25E-01	NA	NCOC	--		4.25E-01	0.00E+00
m,p-Xylene	13.12	3.51E+06	7.23E-14	NA	NCOC	--		7.23E-14	0.00E+00
Methylene chloride	0.01	3.56E+03	2.61E-03	6.27E-09	NCOC	--		2.61E-03	6.27E-09
n-Propylbenzene	3.27	6.15E+05	1.83E-01	NA	NCOC	--		1.83E-01	0.00E+00
o-Xylene	5.98	1.14E+06	6.34E-17	NA	NCOC	--		6.34E-17	0.00E+00
Sec-Butylbenzene	2.07	3.83E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Tert-butyl benzene	0.11	2.26E+04	NA	NA	NCOC	--		0.00E+00	0.00E+00
Toluene	7.31	2.77E+06	6.26E-15	NA	NCOC	--		6.26E-15	0.00E+00
Cumulative			**7.9E-01**	**6.3E-09**		**7.9E-18**	**8.8E-22**	**7.9E-01**	**6.3E-09**

Notes:
NA: Not calculated due to lack of toxicity values.
NCOC: Not a chemical of concern
HI: Hazard Index
IELCR: Individual Excess Lifetime Cancer Risk
*: Calculated using representative soil concentration and equilibrium equation.
mg/kg = milligrams per kilogram
ug/m^3 = micrograms per cubic meter
ug/L = micrograms per liter

Table 4-21(d)
Summary of Risks in North and South EU
Site SD-27, Holloman AFB, New Mexico

Pathway	North EU		South EU	
	HI	IELCR	HI	IELCR
Direct Pathway[1]	--	--	4.7E-02	7.8E-06
Indoor Inhalation of Vapors from Soil[2]	3.9E-04	1.6E-63	7.9E-01	6.3E-09
Indoor Inhalation of Vapors from Groundwater[3]	--	--	7.9E-18	8.8E-22
Total	**3.9E-04**	**1.6E-63**	**8.3E-01**	**7.8E-06**

Notes:
1: Refer Table 4-21(b)
2: Refer Tables 4-21(a) and 4-21(c)
3: Refer Table 4-21(c)
HI: Hazard Index
IELCR: Individual Excess Lifetime Cancer Risk

Table 4-22(a)
Sensitivity Analysis-Risk from Indoor Inhalation of Vapors from Soil in North EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Representative Soil Concentration (mg/kg)	Soil Vapor Concentration* (ug/m^3)	Non-Carcinogenic (HI)	Carcinogenic (IELCR)
1,2,4-Trimethylbenzene	0.006	841	3.77E-08	NA
Isopropylbenzene	0.002	521	3.88E-04	NA
m, p-Xylene (sum of isomers)	0.002	650	2.48E-08	NA
n-Butylbenzene	0.002	290	NA	NA
Naphthalene	0.014	58	4.71E-20	1.92E-24
o-Xylene	0.002	335	1.23E-09	NA
Sec-Butylbenzene	0.031	57	NA	NA
		Cumulative	**3.88E-04**	**1.9E-24**

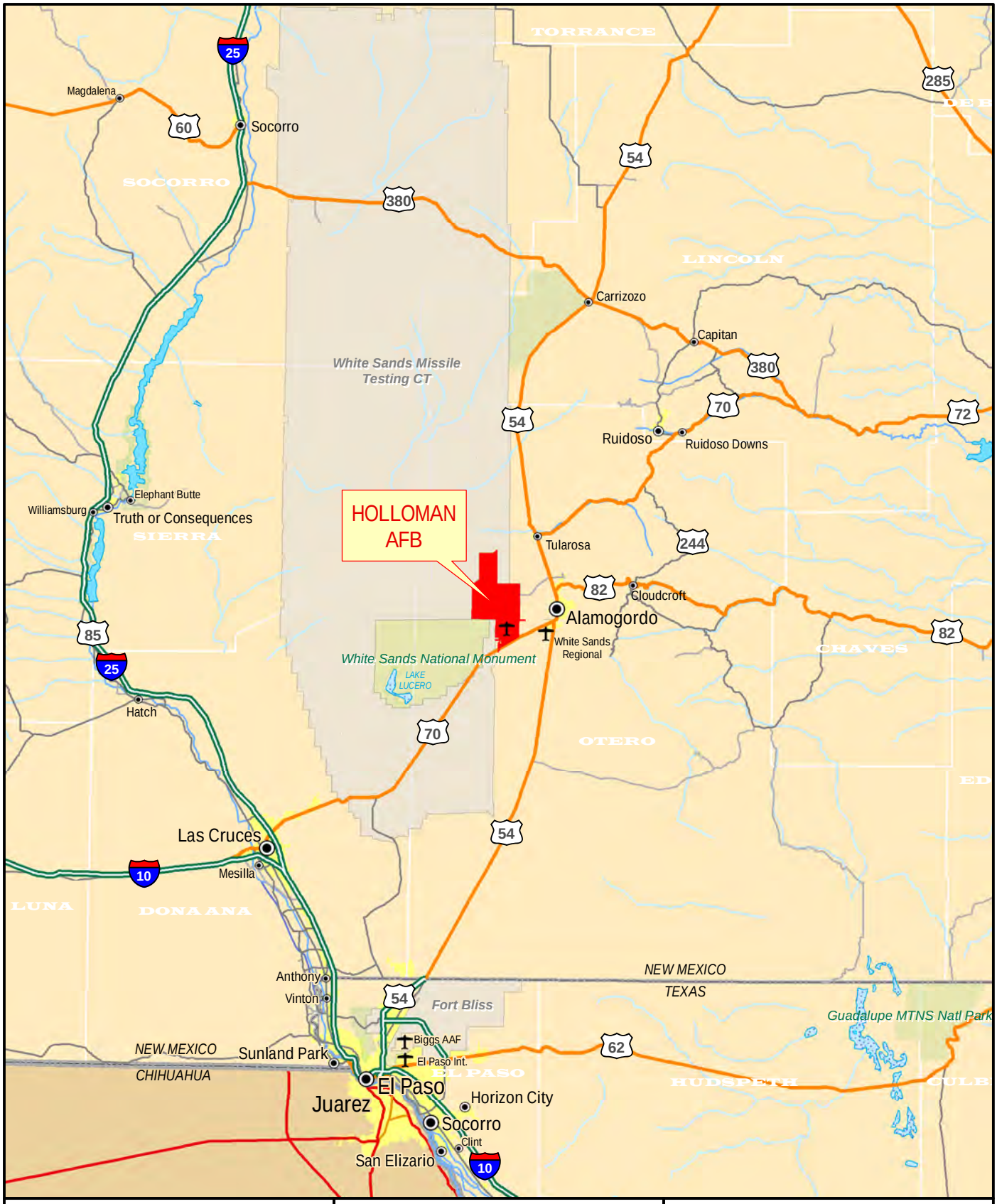
Notes:
NA: Not applicable as toxicity values not available.
*: Calculated using representative soil concentration and equilibrium equation.
For sensitivity analysis, risk was calculated by reducing the defualt biodegradation rate by a factor of 10.
ug/m^3 = micrograms per cubic meter
mg/kg = milligrams per kilogram
HI: Hazard Index
IELCR: Individual Excess Lifetime Cancer Risk

Table 4-22(b)
Sensitivity Analysis-Risk from Indoor Inhalation of Vapors from Soil and Groundwater in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Soil Representative Concentration (mg/kg)	Soil Vapor Concentration* (ug/m^3)	Non-Carcinogenic	Carcinogenic	Groundwater Representative Concentration (ug/L)	Non-Carcinogenic	Carcinogenic	HI	IELCR
1-Methylnaphthalene	0.81	N/A	NA	NA	NCOC	--		0.00E+00	0.00E+00
2-Methylnaphthalene	0.47	1.23E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Naphthalene	0.95	3.90E+03	1.11E-15	4.52E-20	NCOC	--		1.11E-15	4.52E-20
1,2,4-Trimethylbenzene	11.80	1.67E+06	3.99E-04	NA	NCOC	--		3.99E-04	0.00E+00
1,3,5-Trimethylbenzene	7.54	1.53E+06	NA	NA	NCOC	--		0.00E+00	0.00E+00
n-Butylbenzene	1.76	2.79E+05	NA	NA	NCOC	--		0.00E+00	0.00E+00
Acetone	0.02	2.59E+02	2.51E-06	NA	NCOC	--		2.51E-06	0.00E+00
Benzene	1.72	7.99E+05	7.61E-04	7.12E-08	118	5.26E-06	4.92E-10	7.66E-04	7.17E-08
Carbon disulfide	0.12	2.64E+05	1.75E-01	NA	NCOC			1.75E-01	0.00E+00
Ethylbenzene	9.49	2.41E+06	5.94E-05	5.94E-08	86	1.25E-07	1.25E-10	5.95E-05	5.95E-08
Hexane	0.82	5.02E+06	1.81E-02	NA	NCOC	--		1.81E-02	0.00E+00
Isopropylbenzene	2.57	5.71E+05	4.25E-01	NA	NCOC	--		4.25E-01	0.00E+00
m,p-Xylene	13.12	3.51E+06	5.00E-04	NA	NCOC	--		5.00E-04	0.00E+00
Methylene chloride	0.01	3.56E+03	2.61E-03	6.27E-09	NCOC	--		2.61E-03	6.27E-09
n-Propylbenzene	3.27	6.15E+05	1.83E-01	NA	NCOC	--		1.83E-01	0.00E+00
o-Xylene	5.98	1.14E+06	2.19E-05	NA	NCOC	--		2.19E-05	0.00E+00
Sec-Butylbenzene	2.07	3.83E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Tert-butyl benzene	0.11	2.26E+04	NA	NA	NCOC	--		0.00E+00	0.00E+00
Toluene	7.31	2.77E+06	1.44E-05	NA	NCOC	--		1.44E-05	0.00E+00
Cumulative			**8.1E-01**	**1.4E-07**		**5.4E-06**	**6.2E-10**	**8.1E-01**	**1.4E-07**

Notes:
NA: Not calculated due to lack of toxicity values.
NCOC: Not a chemical of concern
HI: Hazard Index
IELCR: Individual Excess Lifetime Cancer Risk
*: Calculated using representative soil concentration and equilibrium equation.
For sensitivity analysis, risk was calculated by reducing the defualt biodegradation rate by a factor of 10.
mg/kg = milligrams per kilogram
ug/m^3 = micrograms per cubic meter
ug/L = micrograms per liter

FIGURES



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Accelerated Corrective Measures Work Plan Addendum
Revised: 01/18/2012
Map Source: Holloman AFB
NAD83, State Plane - New Mexico Central, FIPS 3002, US Feet

TETRA TECH
OAK RIDGE, TN

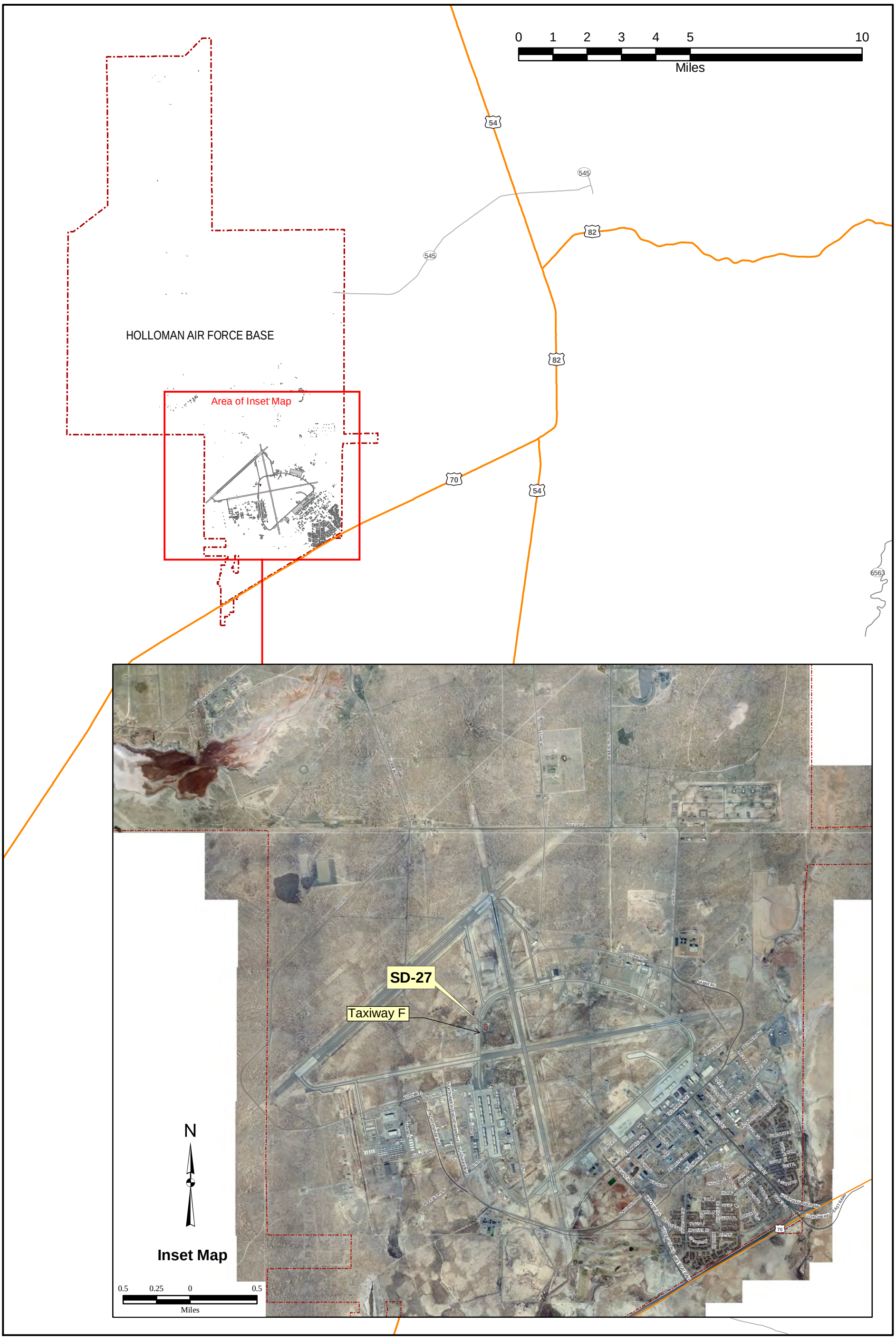
N

0 10 20 40
Miles

FIGURE 1-1

HOLLOMAN AIR FORCE BASE
INSTALLATION LOCATION
ALAMOGORDO, NEW MEXICO

Reference: (TetraTech, 2012)



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Accelerated Corrective Measures Work Plan Addendum
Revised: 01/18/2012
Map Source: Holloman AFB
NAD83, State Plane - New Mexico Central, FIPS 3002, US Feet

TETRA TECH
OAK RIDGE, TN

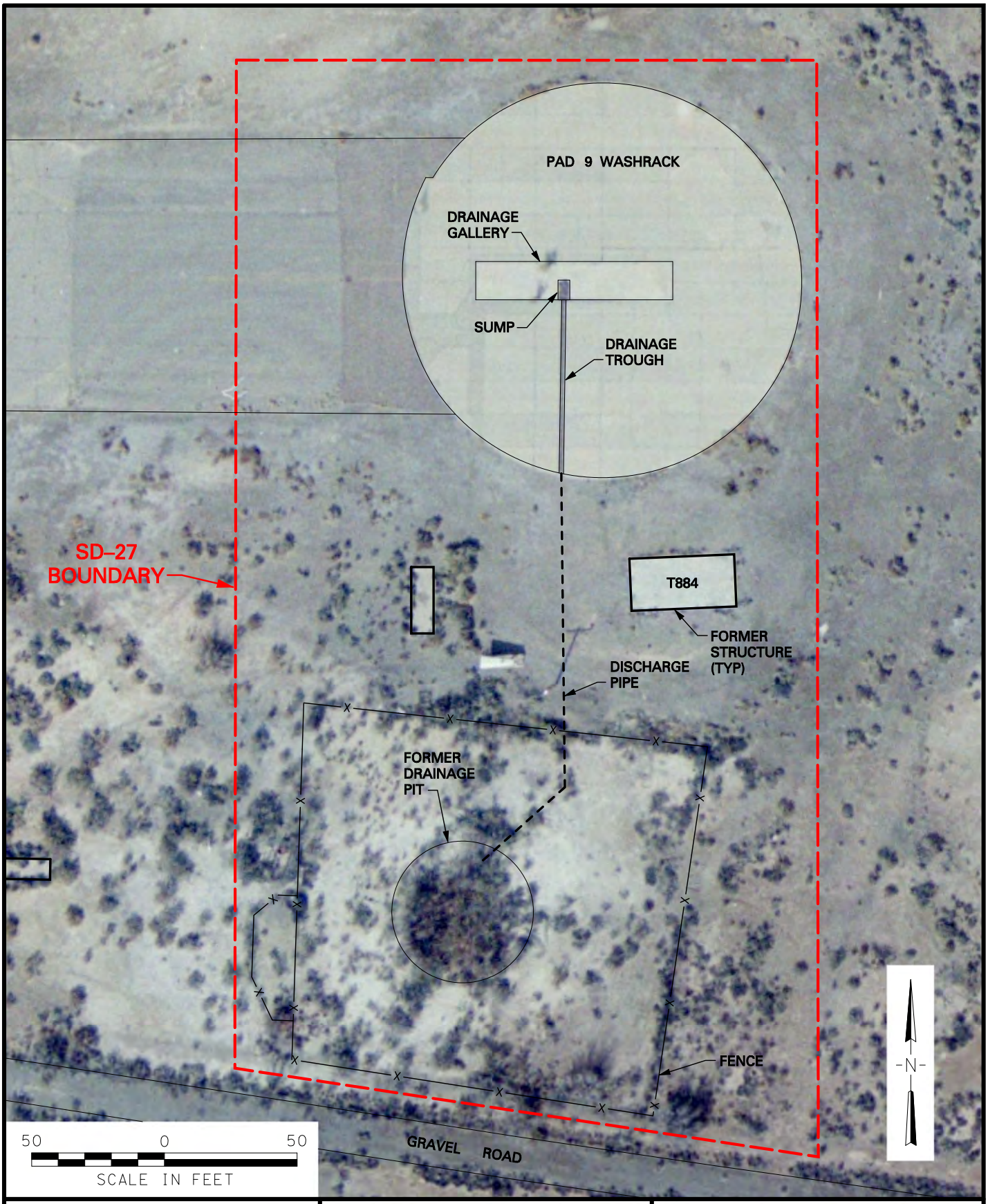
LEGEND

- HIGHWAY
- AIRFIELD
- BASE BOUNDARY
- SD-27 SITE

FIGURE 1-2

SD-27 LOCATION
AT HOLLOMAN AIR FORCE BASE

Reference: (TetraTech, 2012)



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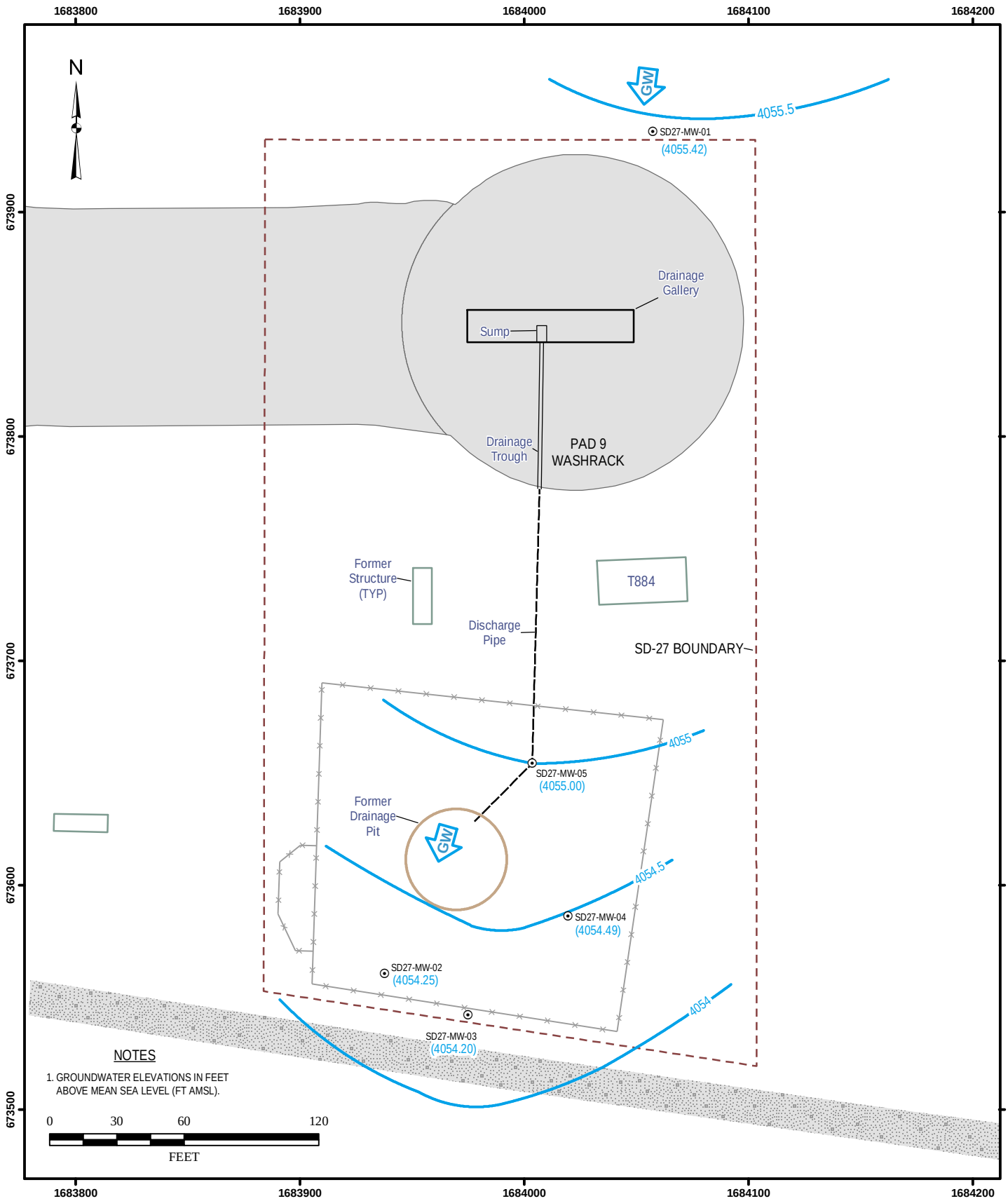
DATE: 1-19-2012
SOURCE: Holloman Air Force Base

ACCELERATED CORRECTIVE MEASURES WORK PLAN ADDENDUM
HOLLOMAN AIR FORCE BASE
ALAMOGORDO, NEW MEXICO

TETRA TECH

FIGURE 1-3
SD-27 SITE FEATURES

Reference: (TetraTech, 2012)



File: K:\GIS\Holloman\SD-27_ACM WorkPlan\ Fig2-1_SD-27 GW Potentio2011.mxd
Accelerated Corrective Measures Work Plan Addendum
Revised: 01/18/2012
Map Source: Holloman AFB
NAD83, State Plane - New Mexico Central, FIPS 3002, US Feet

TETRA TECH
OAK RIDGE, TN

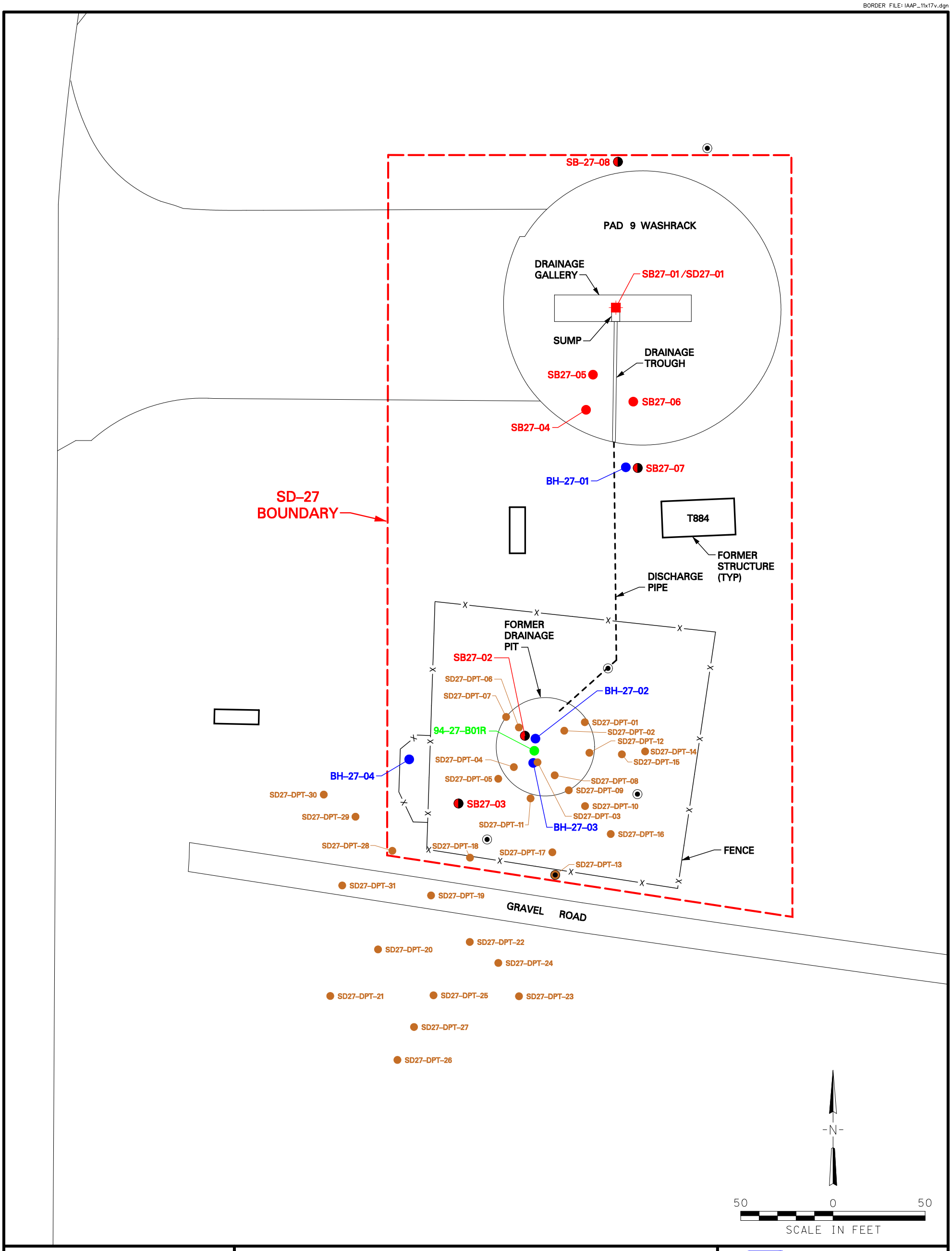
LEGEND

- MONITORING WELL
- GROUNDWATER CONTOUR
- CHAIN-LINK FENCE
- AIRFIELD SURFACE
- ROAD/PARKING (Gravel)

FIGURE 2-1
GROUNDWATER POTENTIOMETRIC SURFACE AT SD-27 (JANUARY, 2011)

Reference: (TetraTech, 2012)

BORDER FILE: IAAP_11x17v.dgn



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DATE: 1-19-2012
SOURCE: Holloman Air Force Base

ALL COORDINATES ARE ON THE NEW MEXICO STATE PLANE, CENTRAL ZONE IN FEET BASED ON NAD83 ADJUSTMENT OF 1996. THE VERTICAL CONTROL REFERENCE DATUM IS NAVD88.

ACCELERATED CORRECTIVE MEASURES WORK PLAN ADDENDUM
HOLLOMAN AIR FORCE BASE
ALAMOGORDO, NEW MEXICO

LEGEND

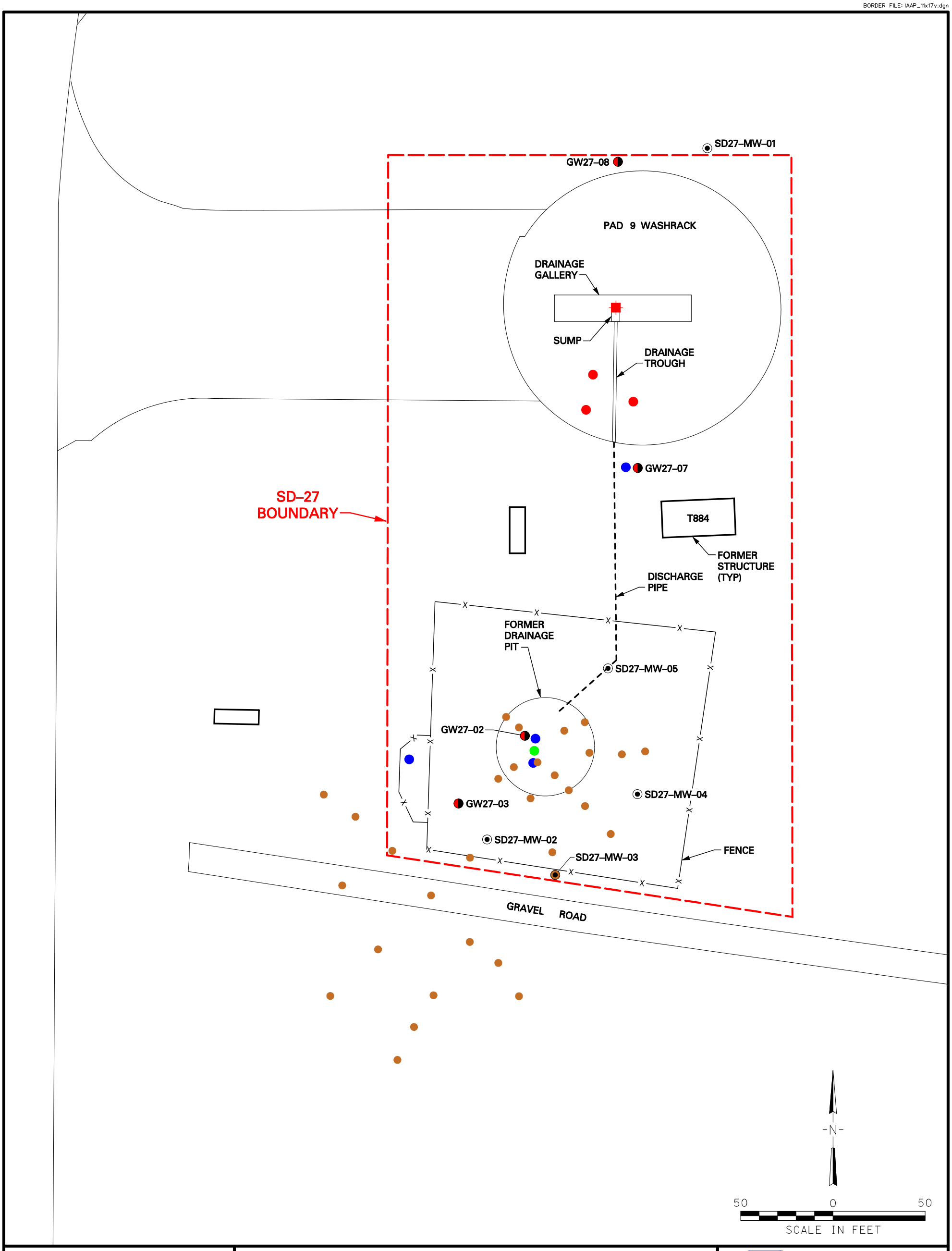
- PA/SI SOIL BORING (1993)
- PHASE II RI SOIL BORING (1994)
- SUPPLEMENTAL RFI SOIL BORING (2006)
- SUPPLEMENTAL RFI SOIL BORING WITH TEMPORARY GROUNDWATER SAMPLING POINT (2006)
- SUPPLEMENTAL RFI SEDIMENT/ SOIL BORING (2006)
- ACM DPT SOIL BORING (NOVEMBER 2010/MARCH 2011)
- ACM MONITORING WELL (NOVEMBER 2010)
- ACM DPT SOIL BORING/MONITORING WELL

TETRA TECH

FIGURE 3-1
SAMPLE LOCATIONS AT SD-27

Reference: (TetraTech, 2012)

BORDER FILE: IAAP_11x17v.dgn



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DATE: 1-19-2012
SOURCE: Holloman Air Force Base

ALL COORDINATES ARE ON THE NEW MEXICO STATE PLANE , CENTRAL ZONE IN FEET BASED ON NAD83 ADJUSTMENT OF 1996. THE VERTICAL CONTROL REFERENCE DATUM IS NAVD88.

ACCELERATED CORRECTIVE MEASURES WORK PLAN ADDENDUM
HOLLOMAN AIR FORCE BASE
ALAMOGORDO, NEW MEXICO

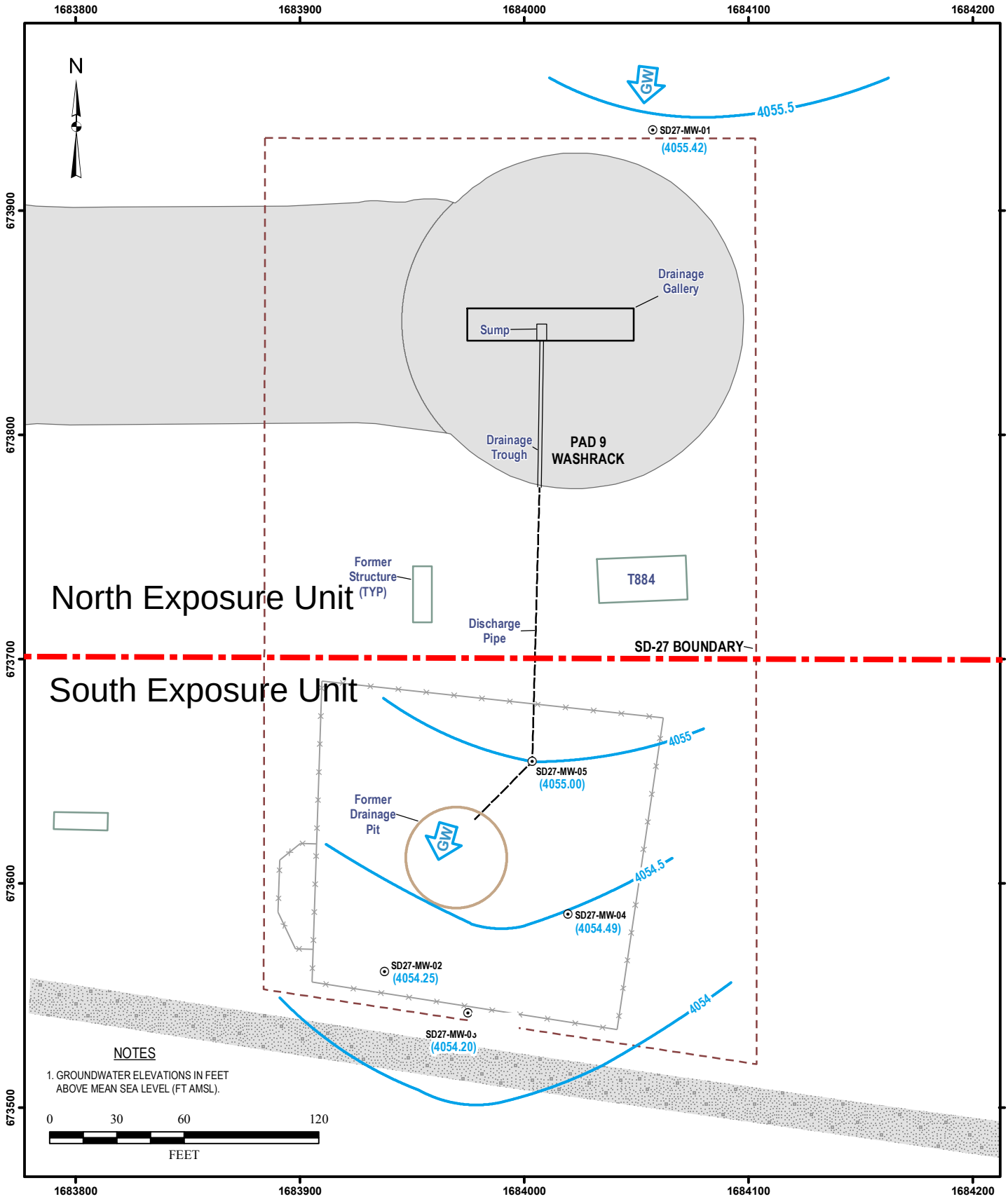
LEGEND

- PA/SI SOIL BORING
- PHASE II RI SOIL BORING
- SUPPLEMENTAL RFI SOIL BORING
- SUPPLEMENTAL RFI SOIL BORING WITH TEMPORARY GROUNDWATER SAMPLING POINT
- SUPPLEMENTAL RFI SEDIMENT/ SOIL BORING
- ACM DPT SOIL BORING (NOVEMBER 2010/MARCH 2011)
- ACM MONITORING WELL (NOVEMBER 2010)
- ACM DPT SOIL BORING/MONITORING WELL

TETRA TECH

FIGURE 3-2
GROUNDWATER SAMPLE LOCATIONS AT SD-27

Reference: (TetraTech, 2012)



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Accelerated Corrective Measures Work Plan Addendum
Revised: 01/18/2012
Map Source: Holloman AFB
NAD83, State Plane - New Mexico Central, FIPS 3002, US Feet

TETRA TECH
OAK RIDGE, TN

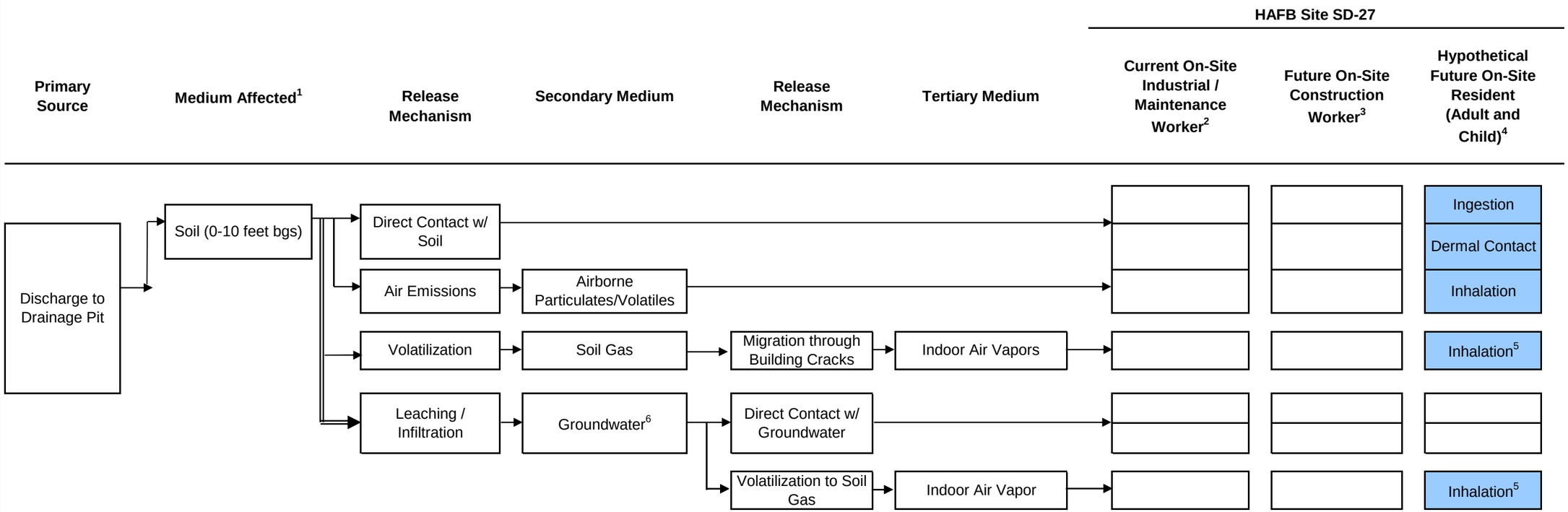
LEGEND

- MONITORING WELL
- GROUNDWATER CONTOUR
- CHAIN-LINK FENCE
- AIRFIELD SURFACE
- ROAD/PARKING (Gravel)

FIGURE 4-1
Exposure Units
Site SD-27, Holloman, AFB, New Mexico

ADAPTED FROM TETRA TECH 2012

FIGURE 4-2. Human Health Conceptual Site Model, HAFB Site SD-27



Legend:

Incomplete pathway or potentially complete but insignificant exposure pathway (not evalauted in the HHRA)

Complete Exposure Pathway- quantitatively evaluated in the risk assessment

[1] Soil exposure for residential receptors is 0 to 10 feet below ground surface per NMED (2015).

[2] Currently the site has restricted access and there are no indoor structures. Occasionally, a maintenance worker may visit the site. However, on-site workers are only exposed to surface soil (0-1 ft bgs) per NMED (2015) which is not impacted at the site. The on-site worker is not evaluted in the HHRA because soil exposure pathways are incomplete.

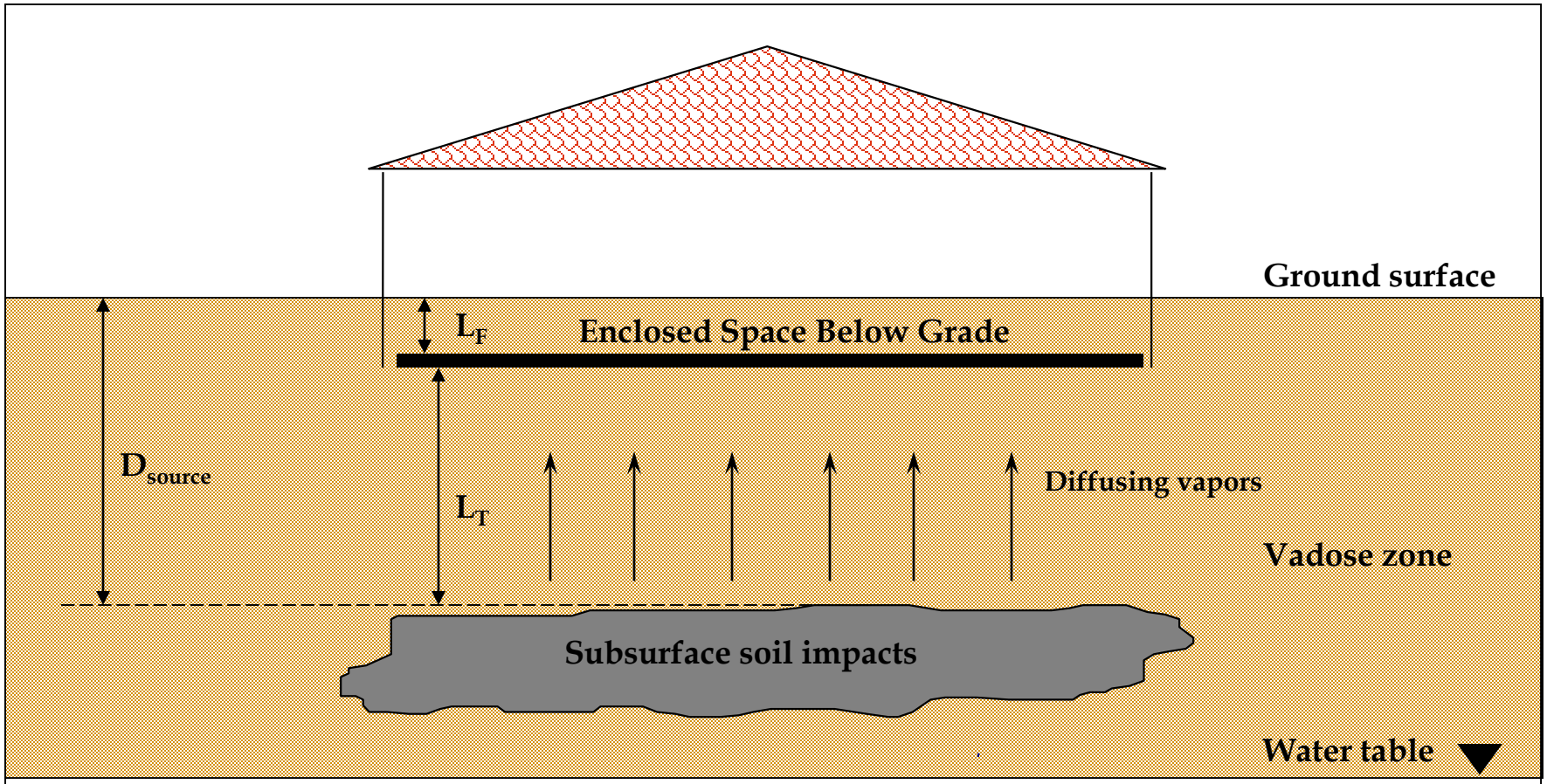
[3] In the future, an on-site construction worker may perform construction activities/excavation at the Site. The construction worker SSL for chromium was exceeded. However, because the residenital SSL for chromium is less than that for the construction worker, it is assumed that risk to the resident from chromium will exceed the risk to the construction worker from chromium. Consequently, the future construction worker is not evaluated in the HHRA because the exposure and risk to an on-site construction worker would be less than a residential receptor.

[4] Future development of the Site is not planned, but a hypothetical future residential scenario is conservatively evaluated. The hypothetical future resident is considered the maximally exposed receptor group for direct contact with soil and inhalation of indoor air vapors via soil and groundwater. The evaluation of the hypothetical future resident accounts for lesser use scenarios such as the on-site industrial/maintenance worker and future construction worker.

[5] A residential building may be constructed over an area where impacted groundwater exists, making inhalation of indoor air vapors a complete exposure pathway.

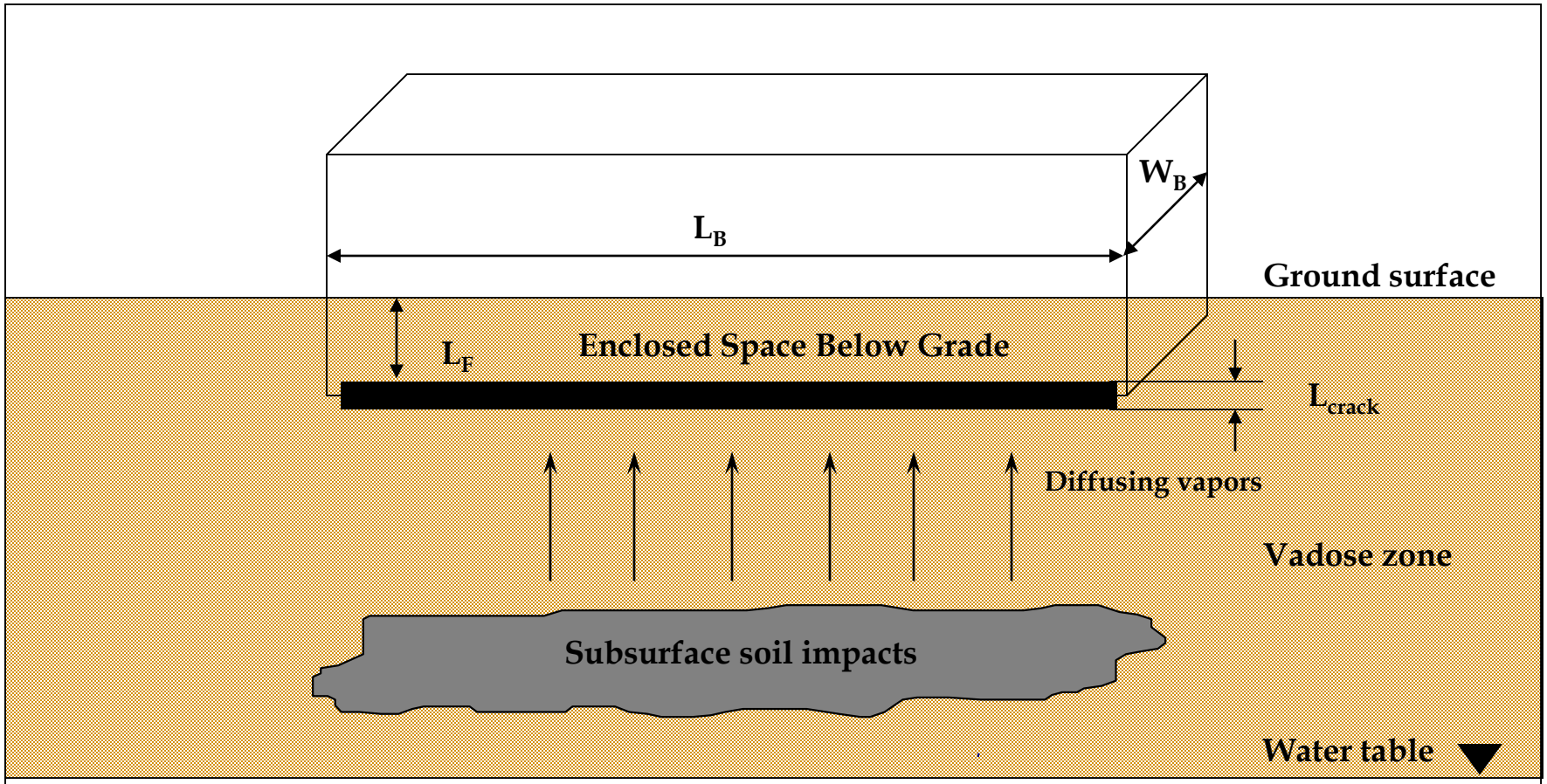
[6] Groundwater is not currently used as a potable water supply at the Site because Total Dissolved Soilds concentrations exceed 10,000 miiligram/liter. Consequently, the direct contact with groundwater evaluation is considered incomplete for the hypothetical future resident.

FIGURE 4-2
HUMAN HEALTH CONCEPTUAL SITE MODEL
SITE SD-27 HOLLOMAN AFB, NEW MEXICO



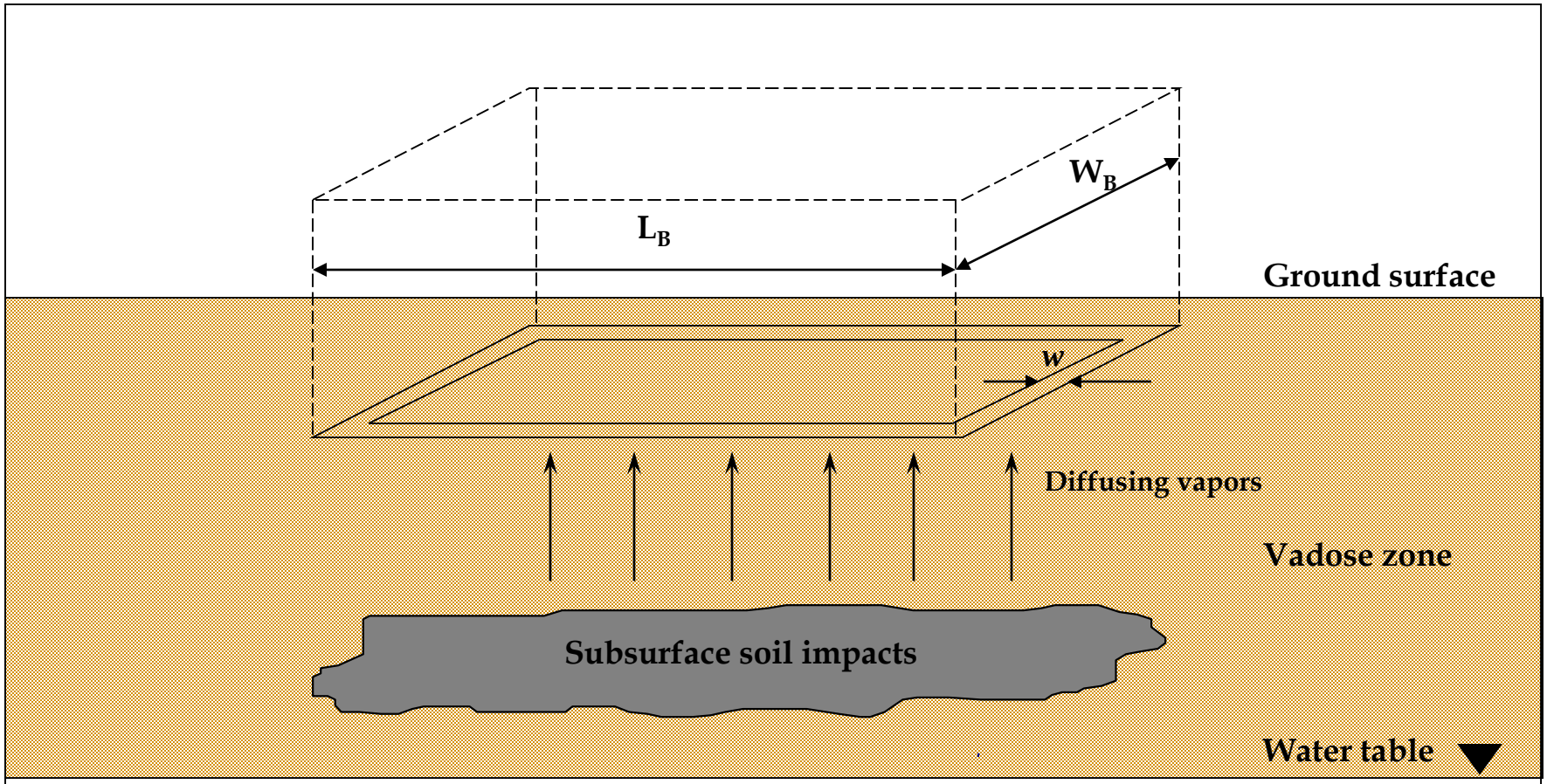
L_T	=	Source to building separation [cm]
D_{source}	=	Depth below grade to top of contamination [cm]
L_F	=	Depth below grade to bottom of enclosed space floor [cm]

Figure 4-3(a). Source to Building Separation



L_B	=	Length of building [cm]
W_B	=	Width of building [cm]
L_F	=	Depth below grade to bottom of enclosed space floor [cm]
L_{crack}	=	Slab thickness [cm]

Figure 4-3(b). Area of Enclosed Space Below Grade



L_B	=	Length of building [cm]
W_B	=	Width of building [cm]
w	=	Floor-wall seam gap [cm]

Figure 4-3(c). Area of Total Cracks

APPENDIX A

Comprehensive Data Tables from ACM Work Plan (Tetra Tech, 2012)

Table A-1
Monitoring Well Construction Details for SD-27
Holloman AFB, New Mexico

Well ID	Installation Date	Survey Data				Boring Information		Well Construction Information						
		Northing[1]	Easting[1]	Elevation (ft msl)		Borehole Depth (ft bgs)	Borehole diameter (in)	Total Well Depth (ft bgs)	PVC Diameter (in)	Length of Riser Pipe (ft)[3]	Screen Slot Size (in)	Length of Screen (ft)	Screened Interval (ft bgs)	
				Top of Casing[2]	Ground[2]								Top	Bottom
SD-27 - Pad 9 Washrack Area														
MW27-01	11/10/2010	673935.93	1684057.36	4063.93	4063.84	18.03	3.25	17.99	2	8.08	0.01	10.0	7.99	17.69
MW27-02	11/6/2010	673560.57	1683937.63	4063.20	4063.33	17.33	3.25	17.29	2	7.16	0.01	10.0	7.29	16.99
MW27-03	11/5/2010	673541.52	1683974.40	4063.08	4063.24	15.28	3.25	15.24	2	7.58	0.01	7.5	7.74	14.94
MW27-04	11/6/2010	673586.15	1684019.49	4063.43	4063.52	17.44	3.25	17.43	2	7.34	0.01	10.0	7.43	17.13
MW27-05	11/9/2010	673654.29	1684003.46	4063.58	4063.59	19.95	3.25	19.91	2	9.90	0.01	10.0	9.91	19.61

Notes:

[1] All locations are in NAD 83 State Plane New Mexico C Grid with the exception of well MW30&33-05R whose location is in US survey feet.

[2] NAVD 88, with the exception of wells at SD-27 and SS-39 which are in EMG96.

[3] Includes stickup

amsl - above mean sea level
bgs - below ground surface
EMG96 - Earth Gravitational Model 1996
ID - identification
in - inches; ft - feet
NAD 83 - North American Datum 1983
NAVD 88 - North American Vertical Datum 1988
PVC - polyvinyl chloride

Reference: (TetraTech, 2012)

Table A-2
Screening Preliminary Assessment/Visual Inspection Soil Analytical Results for Direct Contact Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	NMED Soil Screening Level (1)			BH-27-05	BH-27-01	BH-27-02	BH-27-03	BH-27-04
	Residential	Industrial	Construction Worker	Background 4-6	0-2	6-8	8-10	0-2
Extractable Fuel Hydrocarbons (µg/kg)								
Kerosene	760000	1810000	n/a	NA	NA	NA	430	NA
Purgeable Fuel Hydrocarbons (µg/kg)								
Ethylbenzene	69,663	384,570	6,625,408	NA	NA	NA	680	NA
Toluene	5,569,952	57,863,048	21,126,666	NA	NA	NA	51	NA
Xylenes	1,086,180	3,609,755	3,134,204	NA	NA	NA	2700	NA
Radioactivity (pCi/g)								
Gross alpha	n/a	n/a	n/a	7.35	8.95	19.29	13.5	NA
Gross beta	n/a	n/a	n/a	7.68	16.69	15.31	12.15	NA
PCBs (µg/kg)								
PCB-1254	1,120,000	8,260,000	4,360,000	NA	NA	NA	NA	200

Notes:

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009

(µg/kg) = micrograms per kilogram

(pCi/g) = picocuries per gram

NA = not analyzed

NMED = New Mexico Environment Department

PCB = polychlorinated biphenyl

n/a - not applicable

Red indicates > Residential SSLs for direct contact

Underline indicates > Commerical/Industrial SSLs for direct contact

Yellow shade indicates > Construction Worker SSLs for direct contact

Reference: (TetraTech, 2012)

Table A-3
Screening Phase II Remedial Investigation Soil Analytical Results for Direct Contact Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	NMED Soil Screening Level (1)			94-27-01R								
				10-12			12-14			14-16		
	Residential	Industrial	Construction Worker	Result	DL	Q	Result	DL	Q	Result	DL	Q
Volatile Organic Compounds (µg/kg)												
Acetone	67,455,916	850,852,227	262,713,781	<	2,360	U	4830	2,360		21700	2,360	
Benzene	15,493	85,381	471,147	3430	406		2550	406		12300	406	
Toluene	5,569,952	57,863,048	21,126,666	111000	663		20300	663		58500	663	
Ethylbenzene	69,663	384,570	6,625,408	**102000**	436		29600	436		51600	436	
Xylenes	1,086,180	3,609,755	3,134,204	242000	416		22500	416		134000	416	
Semivolatile Organic Compounds (µg/kg)												
Naphthalene	44,951	251,978	702,260	8800	5100		550	5100	J	2100	5100	J
2-Methylnaphthalene	310,000	4,100,000	n/a	7900	170		790	170		3200	170	
Dibenzofuran	78,000	1,000,000	n/a	340	170		40	170	J	80	170	J
Di-n-butylphthalate	n/a	n/a	n/a	30	170	J	60	170	J	<	170	U
Butyl benzyl phthalate	260,000	910,000	n/a	40	170	BJ	<	170	U	<	170	U
Bis(2-ethylhexyl)phthalate	n/a	n/a	n/a	160	170	BJ	210	170	BJ	110	170	BJ
Di-n-octyl phthalate	n/a	n/a	n/a	<	170	U	210	170		<	170	U
Total Recoverable Petroleum Hydrocarbons - (mg/kg)												
TRPH	760	1180	n/a	**6000**	25		150	25		240	25	

Notes:

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009

< = Not detected above the detection limit

B = positive detection considered to be attributable to laboratory blank contamination

J = positive detection result considered an estimate

U = non-detect value equal to reporting limit

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

DL = detection limit

Q = data qualifier

TRPH = total recoverable petroleum hydrocarbons

NA = not analyzed

n/a = not applicable

NMED = New Mexico Environment Department

Red indicates > Residential SSLs for direct contact

Underline indicates > Commerical/Industrial SSLs for direct contact

Yellow shade indicates > Construction Worker SSLs for direct contact

Reference: (TetraTech, 2012)

Table A-4
Screening Supplemental RFI Sediment Analytical Results for Direct Contact Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	Soil Screening Levels					SD27-01	
	HAFB Background	Residential(1)	Industrial(1)	Construction Worker(1)	EPA Radiological PRGs(4)	Val	Q
Volatile Organic Compounds (µg/kg)							
1,2,4-Trimethylbenzene	n/a	62,000	260,000	n/a	n/a	3.68	J
Benzene	n/a	15,493	85,381	471,147	n/a	5	J
Chloroform	n/a	5,718	31,941	670,634	n/a	0.58	J
m, p-Xylene (sum of isomers) (2)	n/a	8,290	27,200	23,800	n/a	4.78	J
n-Butylbenzene	n/a	3,900,000	51,000,000	n/a	n/a	2.1	J
Naphthalene	n/a	44,951	251,978	702,260	n/a	57	J
o-Xylene	n/a	9,547,753	31,511,172	27,483,017	n/a	2.28	J
p-Cymene (p-Isopropyltoluene)	n/a	n/a	n/a	n/a	n/a	1.66	J
Semi-Volatile Organic Compounds (µg/kg)							
4-Nitrophenol	n/a	n/a	n/a	n/a	n/a	53	J
Acenaphthene	n/a	3,440,511	36,670,255	18,581,818	n/a	124	J
Acenaphthylene	n/a	n/a	n/a	n/a	n/a	291	
Anthracene	n/a	17,202,556	183,351,274	66,841,073	n/a	2960	
Benzo(a)anthracene	n/a	6,214	23,442	212,877	n/a	2680	
Benzo(a)pyrene	n/a	621	2,344	21,288	n/a	3200	
Benzo(b)fluoranthene	n/a	6,214	23,442	212,877	n/a	4100	
Benzo(g,h,i)perylene	n/a	n/a	n/a	n/a	n/a	2710	
Benzo(k)fluoranthene	n/a	62,136	234,415	2,061,878	n/a	2320	
bis(2-Ethylhexyl)phthalate	n/a	n/a	n/a	n/a	n/a	5490	
Chrysene	n/a	621,362	2,344,150	20,618,784	n/a	3800	
Dibenz(a,h)anthracene	n/a	621	2,344	21,281	n/a	**1250**	
Dibenzofuran	n/a	78,000	1,000,000	n/a	n/a	352	
Fluoranthene	n/a	2,293,674	24,446,837	8,912,143	n/a	6670	
Indeno(1,2,3-c,d)pyrene	n/a	6,214	23,442	212,877	n/a	2020	
Phenanthrene	n/a	1,833,147	20,522,088	7,146,853	n/a	470	
Pyrene	n/a	1,720,256	18,335,127	6,684,107	n/a	5880	
Other Compounds (mg/kg)							
D-TPH	n/a	760	1,810	n/a	n/a	107	
Metals (mg/kg) (3)							
Arsenic	3.7	4	18	65	n/a	3.81	
Barium	169.3	15,596	223,980	4,353	n/a	13500	
Cadmium	0.3	78	1,124	309	n/a	21.6	
Chromium, total*	25	219	2922	449	n/a	**290**	
Lead	10.9	400	800	800	n/a	1900	
Mercury*	10.8	7.82	114	31	n/a	0.08	
Radiological Parameters (pCi/g) (4)							
Alpha, Gross	n/a	n/a	n/a	n/a	n/a	3.06	
Beta, Gross	n/a	n/a	n/a	n/a	n/a	16.6	
Bismuth-214	n/a	n/a	n/a	n/a	7950	0.528	
Cesium-137	n/a	n/a	n/a	n/a	4.02	1.01	
Lead-210	1.04	n/a	n/a	n/a	0.335	**3.62**	
Lead-214	n/a	n/a	n/a	n/a	44800	0.592	
Potassium-40	n/a	n/a	n/a	n/a	0.116	**11**	
Radium-226	1.35	n/a	n/a	n/a	0.199	**2.88**	
Radium-228	0.95	n/a	n/a	n/a	0.269	**0.53**	
Thallium-208	n/a	n/a	n/a	n/a	23100	0.148	
Thorium-228	1.35	n/a	n/a	n/a	23.4	0.533	

Notes:

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009

(2) m-Xylenes screening levels used as a surrogate for m,p-Xylenes

(3) NMED SSLs for hexavalent chromium and methylmercury used.

(4) Radiological screening criteria is the lowest of EPA PRGs for all residential pathways (ingestion of soil; inhalation of fugitive dusts; and external radiation exposure) (source: http://epa-prgs.ornl.gov/radionuclides/download.html).

NMED = New Mexico Environment Department
n/a = not applicable
(µg/kg) = micrograms per kilogram
mg/kg = milligrams per kilogram
pCi/g = picocuries per gram
ft = feet
Val = validated result
Q = data qualifier
J = estimated positive detection
SSL = soil screening level

Red indicates > Residential SSLs for direct contact
Underline indicates > Commerical/Industrial SSLs for direct contact
Yellow shade indicates > Construction Worker SSLs for direct contact
Green shade indicates > EPA Residential PRGs for radionuclides

Reference: (TetraTech, 2012)

Table A-5
Screening Supplemental RFI Soil Analytical Results for Direct Contact Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	Soil Screening Level					SB27-01 16-May-2006		SB27-02 16-May-2006						SB27-03 16-May-2006						SB27-04 16-May-2006		SB27-05 18-May-2006	
	HAFB Background	Residential[1]	Industrial[1]	Construction Worker[1]	EPA Radiological PRGs[5]	6.00-8.00 ft.		6.00-8.00 ft.		11.00-13.00 ft.				11.00-13.00 ft.				16.00-18.00 ft.		8.00-10.00 ft.		7.00-8.00 ft.	
						Val	Q	Val	Q	Val	Q	Val [2]	Q [2]	Val	Q	Val [2]	Q [2]	Val	Q	Val	Q	Val	Q
Volatile Organic Compounds (µg/kg)																							
1,2,4-Trimethylbenzene	n/a	62,000	260,000	n/a	n/a	6	J	0.148	U	53800		NA		5850	J	5950		2.67	J	4.16	J	0.0535	U
1,3,5-Trimethylbenzene	n/a	780	10,000	n/a	n/a	10	U	10	U	17000		NA		2310	J	1910		0.21	U	10	U	0.21	U
Benzene	n/a	15,493	85,381	471,147	n/a	0.236	U	0.236	U	6170		NA		34.4		42.8	J	0.0644	U	0.236	U	0.0644	U
Ethylbenzene	n/a	69,663	384,570	6,625,408	n/a	10	U	10	U	61000		NA		3490	J	2880		10	U	10	U	0.0376	U
Isopropylbenzene	n/a	3,211,290	14,877,923	10,289,467	n/a	2.35	J	2.62	J	14200		NA		1410		1080		0.13	U	0.105	U	0.13	U
m,p-Xylene (sum of isomers) [3]	n/a	8,290	27,200	23,800	n/a	3.12	J	7.29	J	74900		NA		5170	J	5340		0.0714	U	2.43	J	0.0714	U
Methylene chloride	n/a	199,476	1,085,484	10,561,087	n/a	50	U	50	U	0.315	U	NA		50	U	50.6	J	50	U	50	U	50	U
n-Butylbenzene	n/a	3,900,000	51,000,000	n/a	n/a	0.116	U	6.37	J	9680		NA		1210		932		10	U	1.83	J	0.0979	U
n-Propylbenzene	n/a	3,400,000	21,000,000	n/a	n/a	10	U	10	U	21600		NA		2450	J	1740		1.08	J	10	U	0.0421	U
Naphthalene	n/a	44,951	251,978	702,260	n/a	14.1	J	32.6	J	11500		NA		1050		1130		37.7	U	8.71	J	0.441	U
o-Xylene	n/a	9,547,753	31,511,172	27,483,017	n/a	1.62	J	4.44	J	33600		NA		2480	J	2320		0.0679	U	1.76	J	0.0679	U
p-Cymene (p-Isopropyltoluene)	n/a	n/a	n/a	n/a	n/a	0.105	U	3.92	J	6160		NA		1070		730		2.6	J	1.48	J	0.0679	U
Sec-Butylbenzene	n/a	n/a	n/a	n/a	n/a	30.5		10	U	7830		NA		1330		874		2.53	J	10	U	0.0632	U
Toluene	n/a	5,569,952	57,863,048	21,126,666	n/a	10	U	10	U	49900		NA		1500		1110		10	U	10	U	10	U
Semi-Volatile Organic Compounds (µg/kg)																							
1-Methylnaphthalene	n/a	22,000	99,000	n/a	n/a	47.5	U	47.5	U	15800		NA		1420		1580		47.5	U	47.5	U	47.5	U
2-Methylnaphthalene	n/a	310,000	4,100,000	n/a	n/a	41	U	41	U	16700		NA		1440		1600		41	U	41	U	41	U
Fluoranthene	n/a	2,293,674	24,446,837	8,912,143	n/a	45.6	U	45.6	U	45.6	U	NA		45.6	U	45.6	U	45.6	U	45.6	U	85.3	J
Other Compounds (mg/kg)																							
G-TPH	n/a	n/a [5]	n/a [5]	n/a [5]	n/a	309		0.121	U	4,790		NA		419		282		0.121	U	0.121	U	0.121	U
D-TPH	n/a	760	1,810	n/a [5]	n/a	124		7.28	U	3,480		NA		435		288		7.28	U	7.28	U	7.28	U
Metals (mg/kg)																							
Barium	169.3	15,596	223,980	4,353	n/a	7.34		11.5		9.5		NA		60.2		49.9		38.4		11		8.84	
Chromium, total [4]	25	219	2,922	449	n/a	1.31		47.7		5.6		NA		4.76		3.72		5.75		1.51		0.456	J
Lead	10.9	400	800	800	n/a	0.367	U	1		7.03		NA		6.26		4.46		7.8		0.886	J	0.65	U
Silver	1.1	391	5,678	1,548	n/a	0.0044	U	0.0044	U	0.0044	U	NA		0.0044	U	0.0044	U	0.0044	U	0.0044	U	0.565	
Radiological Parameters (pCi/g)[5]																							
Beta, Gross	n/a	n/a	n/a	n/a	n/a	2.1		3.97		5.11		5.72		3.66		NA		7.89		0.63	U	NA	
Bismuth-214	n/a	n/a	n/a	n/a	7950	0.129		0.351		0.371		0.351		0.251		NA		0.579		0.326		NA	
Lead-210	1.04	n/a	n/a	n/a	0.335	1.19		1.25	U	1.56		1.22	U	1.45	U	NA		1.66	U	1.68	U	NA	
Lead-214	n/a	n/a	n/a	n/a	44800	0.201		0.364		0.341		0.491		0.362		NA		0.505		0.354		NA	
Potassium-40	n/a	n/a	n/a	n/a	0.116	1.87		2.75		5.03		5.56		2.58		NA		10.6		2.2		NA	
Radium-226	1.35	n/a	n/a	n/a	0.199	1.45	U	2.58		1.68	U	1.41	U	1.53	U	NA		1.98	U	2.48	U	NA	
Radium-228	0.95	n/a	n/a	n/a	0.269	0.318	U	0.408	U	0.241	U	0.353		0.425	U	NA		0.332	U	0.404	U	NA	
Thallium-208	n/a	n/a	n/a	n/a	23100	0.055		0.072	U	0.084		0.115		0.108	U	NA		0.152		0.121	U	NA	
Thorium-228	1.35	n/a	n/a	n/a	23.4	0.097	U	0.126	U	0.27		0.33		0.194		NA		0.48		0.184		NA	
Uranium-235	0.08	n/a	n/a	n/a	0.192	0.344	U	0.174		0.102	U	0.401	U	0.418	U	NA		0.121	U	0.77	U	NA	

Notes:

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009

(2) duplicate

(3) NMED SSL for m-Xylenes used as a surrogate for m,p-Xylenes

(4) NMED SSL for hexavalent chromium used

(5) Radiological screening criteria is the lowest of EPA PRGs for all residential pathways (ingestion of soil; inhalation of fugitive dusts; and external radiation exposure) (source: http://epa-prgs.ornl.gov/radionuclides/download.html).

Q = data qualifier

NA = not analyzed

n/a = not applicable

Red indicates > Residential SSLs for direct contact

Underline indicates > Commerical/Industrial SSLs for direct contact

Yellow shade indicates > Construction Worker SSLs for direct contact

Green shade indicates > EPA Residential PRGs for radionuclides

NMED = New Mexico Environment Department

pCi/g = picocuries per gram

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

ft = feet

Val = validated result

J = estimated positive detection

SSL = soil screening level

Reference: (TetraTech, 2012)

Table A-6
Screening Preliminary Assessment/Visual Inspection Soil Analytical Results for Vapor Intrusion Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyses	Vaport Intrusion Screening Level (µg/kg) (1)		BH-27-05	BH-27-01	BH-27-02	BH-27-03	BH-27-04
	1e-6	1e-5	Background 4-6	0-2	6-8	8-10	0-2
Extractable Fuel Hydrocarbons (µg/kg)							
Kerosene	n/a	n/a	NA	NA	NA	430	NA
Purgeable Fuel Hydrocarbons (µg/kg)							
Ethylbenzene	21710	21710	NA	NA	NA	680	NA
Toluene	5073	5073	NA	NA	NA	51	NA
Xylenes (2)	2371	2371	NA	NA	NA	**2700**	NA
Radioactivity (pCi/g)							
Gross alpha	n/a	n/a	7.35	8.95	19.29	13.5	NA
Gross beta	n/a	n/a	7.68	16.69	15.31	12.15	NA
PCBs (µg/kg)							
PCB-1254	n/a	n/a	NA	NA	NA	N	200

Notes:

(1) Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings incorporated into Appendix G of of the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (November, 2002).

(2) p-Xylene criteria used for xylenes

Red indicates > 10-6 VI Risk.

Yellow shade indicates > 10-5 VI risk

(Mg/kg) = micrograms per kilogram

(pCi/g) = picocuries per gram

NA = not analyzed

NMED = New Mexico Environment Department

PCB = polychlorinated biphenyl

n/a = not applicable

Reference: (TetraTech, 2012)

Table A-7
Screening Phase II Remedial Investigation Soil Analytical Results for Vapor Intrusion Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	Vapor Intrusion Screening Level (µg/kg) [1]		94-27-01R								
			10-12			12-14			14-16		
	1e-6	1e-5	Result	DL	Qual	Result	DL	Qual	Result	DL	Qual
Volatile Organic Compounds (µg/kg)											
Acetone	61,057	61,057	<	2,360	U	4830	2,360		21700	2,360	
Benzene	2	18	**3430**	406		**2550**	406		**12300**	406	
Toluene	5,073	5,073	**111000**	663		**20300**	663		**58500**	663	
Ethylbenzene	21,710	21,710	**102000**	436		**29600**	436		**51600**	436	
Xylenes [2]	2,371	2,371	**242000**	416		**22500**	416		**134000**	416	
Semivolatile Organic Compounds (µg/kg)											
Naphthalene	6,576	6,576	**8800**	5100		550	5100	J	2100	5100	J
2-Methylnaphthalene	n/a	n/a	7900	170		790	170		3200	170	
Dibenzofuran	n/a	n/a	340	170		40	170	J	80	170	J
Di-n-butylphthalate	n/a	n/a	30	170	J	60	170	J	<	170	U
Butyl benzyl phthalate	n/a	n/a	40	170	BJ	<	170	U	<	170	U
Bis(2-ethylhexyl)phthalate	n/a	n/a	160	170	BJ	210	170	BJ	110	170	BJ
Di-n-octyl phthalate	n/a	n/a	<	170	U	210	170		<	170	U
Total Recoverable Petroleum Hydrocarbons - (mg/kg)											
TRPH	n/a	n/a	6000	25		150	25		240	25	

Notes:

(1) Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings incorporated into Appendix G of of the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (November, 2002).

[2] p-Xylene criteria used for xylenes

Red indicates > 10-6 VI Risk.

Yellow shade indicates > 10-5 VI risk

< = Not detected above the detection limit

B = positive detection considered to be attributable to laboratory blank contamination

J = positive detection result considered an estimate

U = non-detect value equal to reporting limit

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

DL = detection limit

Qual = qualifier

TRPH = total recoverable petroleum hydrocarbons

NA = not analyzed

n/a = not applicable

NMED = New Mexico Environment Department

Reference: (TetraTech, 2012)

Table A-8
Screening Supplemental RFI Sediment Analytical Results for Vapor Intrusion Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	Vapor Intrusion Screening Level (µg/kg) [1]		SD27-01 16-May-2006 0.00-2.00 ft	
	1e-6	1e-5	Val	Q
Volatile Organic Compounds (µg/kg)				
1,2,4-Trimethylbenzene	662	662	3.68	J
Benzene	1.75	17.52	**5.42**	J
Chloroform	0.63	6.31	0.58	J
m, p-Xylene (sum of isomers)[2]	2371	2371	4.78	J
n-Butylbenzene	6217	6217	2.1	J
Naphthalene	6576	6576	57	J
o-Xylene	3163	3163	2.28	J
p-Cymene (p-Isopropyltoluene)	n/a	n/a	1.66	J
Semi-Volatile Organic Compounds (µg/kg)				
4-Nitrophenol	n/a	n/a	53	J
Acenaphthene	n/a	n/a	124	J
Acenaphthylene	n/a	n/a	291	
Anthracene	n/a	n/a	2960	
Benzo(a)anthracene	n/a	n/a	2680	
Benzo(a)pyrene	n/a	n/a	3200	
Benzo(b)fluoranthene	n/a	n/a	4100	
Benzo(g,h,i)perylene	n/a	n/a	2710	
Benzo(k)fluoranthene	n/a	n/a	2320	
bis(2-Ethylhexyl)phthalate	n/a	n/a	5490	
Chrysene	n/a	n/a	3800	
Dibenz(a,h)anthracene	n/a	n/a	1250	
Dibenzofuran	n/a	n/a	352	
Fluoranthene	n/a	n/a	6670	
Indeno(1,2,3-c,d)pyrene	n/a	n/a	2020	
Phenanthrene	n/a	n/a	470	
Pyrene	n/a	n/a	5880	
Other Compounds (mg/kg)				
D-TPH	n/a	n/a	107	
Metals (mg/kg)				
Arsenic	n/a	n/a	3.81	
Barium	n/a	n/a	13500	
Cadmium	n/a	n/a	21.6	
Chromium, total	n/a	n/a	290	
Lead	n/a	n/a	1900	
Mercury	n/a	n/a	0.08	
Radiological Parameters (pCi/g)				
Alpha, Gross	n/a	n/a	3.06	
Beta, Gross	n/a	n/a	16.6	
Bismuth-214	n/a	n/a	0.528	
Cesium-137	n/a	n/a	1.01	
Lead-210	n/a	n/a	3.62	
Lead-214	n/a	n/a	0.592	
Potassium-40	n/a	n/a	11	
Radium-226	n/a	n/a	2.88	
Radium-228	n/a	n/a	0.53	
Thallium-208	n/a	n/a	0.148	
Thorium-228	n/a	n/a	0.533	

Notes:

(1) Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings incorporated into Appendix G of of the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (November, 2002).

[2] p-Xylene criteria used for m, p-Xylene (sum of isomers)

Red indicates > 10-6 VI Risk.

Yellow shade indicates > 10-5 VI risk

NMED = New Mexico Environment Department
mg/kg = milligrams per kilogram
pCi/g = picocuries per gram
ft = feet
Val = validated result
Q = data qualifier
n/a = not applicable
J = estimated positive detection
SSL = soil screening level

Reference: (TetraTech, 2012)

Table A-9
Screening Supplemental RFI Soil Analytical Results for Vapor Intrusion Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	Vapor Intrusion Screening Level (µg/kg) [1]		SB27-01 16-May-2006		SB27-02 16-May-2006						SB27-03 16-May-2006						SB27-04 16-May-2006		SB27-05 18-May-2006	
	1e-6	1e-5	6.00-8.00 ft.		6.00-8.00 ft.		11.00-13.00 ft.				11.00-13.00 ft.				16.00-18.00 ft.		8.00-10.00 ft.		7.00-8.00 ft.	
			Val	Q	Val	Q	Val	Q	Val [2]	Q [2]	Val	Q	Val [2]	Q [2]	Val	Q	Val	Q	Val	Q
Volatile Organic Compounds (µg/kg)																				
1,2,4-Trimethylbenzene	662	662	5.95	J	0.148	U	**53800**		NA		**5850**	**J**	**5950**		2.67	J	4.16	J	0.0535	U
1,3,5-Trimethylbenzene	694	694	10	U	10	U	**17000**		NA		**2310**	**J**	**1910**		0.21	U	10	U	0.21	U
Benzene	2	18	0.236	U	0.236	U	**6170**		NA		**34.4**		**42.8**	**J**	0.0644	U	0.236	U	0.0644	U
Ethylbenzene	21,710	21,710	10	U	10	U	**61000**		NA		3490	J	2880		10	U	10	U	0.0376	U
Isopropylbenzene	7,128	7,128	2.35	J	2.62	J	**14200**		NA		1410		1080		0.13	U	0.105	U	0.13	U
m, p-Xylene (sum of isomers) [3]	2,371	2,371	3.12	J	7.29	J	**74900**		NA		**5170**	**J**	**5340**		0.0714	U	2.43	J	0.0714	U
Methylene chloride	27	268	50	U	50	U	0.315	U	NA		50	U	**50.6**	**J**	50	U	50	U	50	U
n-Butylbenzene	6,217	6,217	0.116	U	6.37	J	**9680**		NA		1210		932		10	U	1.83	J	0.0979	U
n-Propylbenzene	3,820	3,820	10	U	10	U	**21600**		NA		2450	J	1740		1.08	J	10	U	0.0421	U
Naphthalene	6,576	6,576	14.1	J	32.6	J	**11500**		NA		1050		1130		37.7	U	8.71	J	0.441	U
o-Xylene	3,163	3,163	1.62	J	4.44	J	**33600**		NA		2480	J	2320		0.0679	U	1.76	J	0.0679	U
p-Cymene (p-Isopropyltoluene)	n/a	n/a	0.105	U	3.92	J	6160		NA		1070		730		2.6	J	1.48	J	0.0679	U
Sec-Butylbenzene	19,407	19,407	30.5		10	U	7830		NA		1330		874		2.53	J	10	U	0.0632	U
Toluene	5,073	5,073	10	U	10	U	**49900**		NA		1500		1110		10	U	10	U	10	U
Semi-Volatile Organic Compounds (µg/kg)																				
1-Methylnaphthalene	n/a	n/a	47.5	U	47.5	U	15800		NA		1420		1580		47.5	U	47.5	U	47.5	U
2-Methylnaphthalene	n/a	n/a	41	U	41	U	16700		NA		1440		1600		41	U	41	U	41	U
Fluoranthene	n/a	n/a	45.6	U	45.6	U	45.6	U	NA		45.6	U	45.6	U	45.6	U	45.6	U	85.3	J
Other Compounds (mg/kg)																				
G-TPH	n/a	n/a	309		0.121	U	4790		NA		419		282		0.121	U	0.121	U	0.121	U
D-TPH	n/a	n/a	124		7.28	U	3480		NA		435		288		7.28	U	7.28	U	7.28	U
Metals (mg/kg)																				
Barium	n/a	n/a	7.34		11.5		9.5		NA		60.2		49.9		38.4		11		8.84	
Chromium, total	n/a	n/a	1.31		47.7		5.6		NA		4.76		3.72		5.75		1.51		0.456	J
Lead	n/a	n/a	0.367	U	1		7.03		NA		6.26		4.46		7.8		0.886	J	0.65	U
Silver	n/a	n/a	0.0044	U	0.0044	U	0.0044	U	NA		0.0044	U	0.0044	U	0.0044	U	0.0044	U	0.565	
Radiological Parameters (pCi/g)																				
Beta, Gross	n/a	n/a	2.1		3.97		5.11		5.72		3.66		NA		7.89		0.63	U	NA	
Bismuth-214	n/a	n/a	0.129		0.351		0.371		0.351		0.251		NA		0.579		0.326		NA	
Lead-210	n/a	n/a	1.19		1.25	U	1.56		1.22	U	1.45	U	NA		1.66	U	1.68	U	NA	
Lead-214	n/a	n/a	0.201		0.364		0.341		0.491		0.362		NA		0.505		0.354		NA	
Potassium-40	n/a	n/a	1.87		2.75		5.03		5.56		2.58		NA		10.6		2.2		NA	
Radium-226	n/a	n/a	1.45	U	2.58		1.68	U	1.41	U	1.53	U	NA		1.98	U	2.48	U	NA	
Radium-228	n/a	n/a	0.318	U	0.408	U	0.241	U	0.353		0.425	U	NA		0.332	U	0.404	U	NA	
Thallium-208	n/a	n/a	0.055		0.072	U	0.084		0.115		0.108	U	NA		0.152		0.121	U	NA	
Thorium-228	n/a	n/a	0.097	U	0.126	U	0.27		0.33		0.194		NA		0.48		0.184		NA	
Uranium-235	n/a	n/a	0.344	U	0.174		0.102	U	0.401	U	0.418	U	NA		0.121	U	0.77	U	NA	

Notes:
[1] Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings incorporated into Appendix G of of the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (November, 2002).
[2] duplicate
[3] p-Xylene criteria used for m, p-Xylene (sum of isomers)
Red indicates > 10-6 VI Risk.
Yellow shade indicates > 10-5 VI risk
pCi/g = picocuries per gram
ft = feet
Val = validated result
Q = data qualifier

NMED = New Mexico Environment Department

µg/kg = micrograms per kilogram
NA = not analyzed
n/a = not applicable

Reference: (TetraTech, 2012)

Table A-10
Screening Supplemental RFI Groundwater Analytical Results for Tap Water and Vapor Intrusion Risk
SD-27 (SWMU 141) - Pad 9 Washrack Area Work Plan
Holloman AFB, New Mexico

Analyte	NMED Tap Water (1)	Vapor Intrusion 1e-5 (2)	GW27-02				GW27-03				GW27-07		GW27-08	
			05/16/06		05/20/06		05/16/06				06/16/06		06/16/06	
			Val	Q	Val	Q	Val	Q	Val (3)	Q (3)	Val	Q	Val	Q
Volatile Organic Compounds (µg/L)														
1,2-Dichloroethane	1.49	23	0.0557	U	NA		**52.4**	J	0.0557	U	0.0557	U	0.0557	U
1,2,4-Trimethylbenzene	n/a	24	412		NA		940		1460		1	U	1	U
1,3,5-Trimethylbenzene (mesitylene)	n/a	25	118		NA		266		427		1	U	1	U
Acetone	21800	220000	0.854	U	NA		0.854	U	850	J	0.854	U	0.854	U
Benzene	4.13	14	**7750**		NA		**2360**		**2800**		1.57	U	1	U
Ethylbenzene	14.8	700	**1030**		NA		**2330**		**3080**		1	U	1	U
Isopropylbenzene (cumene)	679	8.4	82	J	NA		230		374		1	U	1	U
m,p-Xylene (sum of isomers)	203	22000	**1430**		NA		**1460**		**1930**		1	U	1	U
n-Butylbenzene	n/a	260	33.2	J	NA		44.8	J	95.6	J	1	U	0.04	U
n-Propylbenzene	n/a	320	110		NA		264		443		1	U	1	U
Naphthalene	1.43	150	**133**	J	NA		**163**	J	**232**	J	0.4	U	0.4	U
o-Xylene	1430	33000	755		NA		1020		1390		1	U	1	U
p-Cymene (p-Isopropyltoluene)	n/a	n/a	20.2	J	NA		39.8	J	75.6	J	0.0513	U	1	U
Sec-Butylbenzene	n/a	250	28	J	NA		51.6	J	105		1	U	1	U
Toluene	2280	1500	**5690**		NA		1940		**2430**		1.14	U	1	U
Trichloroethene (TCE)	16.5	5	6.89	J	NA		0.0495	U	0.0495	U	0.22	J	0.17	J
Semi-Volatile Organic Compounds (µg/L)														
1-Methylnaphthalene	n/a	n/a	21.1		NA		23.2		29.8		0.5	U	0.5	U
2-Methylnaphthalene	n/a	3300	15.2		NA		15.3		21.1		0.4	U	0.4	U
2,4-Dimethylphenol	730	n/a	15.2		NA		0.9	U	0.9	U	0.9	U	0.9	U
Acetophenone	3650	800000	20		NA		17.8		22.8		0.6	U	0.6	U
Benzoic acid	n/a	n/a	106		NA		0.7	U	0.7	U	0.7	U	0.7	U
Cresols, m & p	n/a	n/a	53.8		NA		2.4	J	0.4	U	0.4	U	0.4	U
Diethyl phthalate	29200	n/a	10.9		NA		0.8	U	0.8	U	0.8	U	0.8	U
Total Cresols	n/a	n/a	13.3		NA		0.6	U	0.6	U	0.6	U	0.6	U
Other Compounds (mg/L)														
G-TPH	n/a	n/a	56.4		NA		24.2		23.6		0.0272	U	0.0272	U
D-TPH	n/a	n/a	4.17	J	NA		29.1		60.2		0.106	U	0.106	U
Metals (µg/L)														
Barium	7300	n/a	40		NA		22		36		345		52	
Chromium	100	n/a	3	J	NA		1.4	U	1.4	U	48		1.4	U
Lead	15	n/a	1.6	U	NA		1.6	U	1.6	U	**17**		1.6	U
Silver	183	n/a	0.2	U	NA		14		14		13		11	
Filtered Metals (µg/L)														
Barium (Filtered)	7300	n/a	NA		17		22		23		39		29	
Selenium (Filtered)	183	n/a	NA		**289**		97		81		7	J	10	
Silver (Filtered)	183	n/a	NA		0.2	U	0.2	U	0.2	U	11		0.2	U
Radiological Parameters (pCi/L)														
Beta, Gross	50	n/a	33.7	U	NA		37.4	U	33.6	U	44.5	U	**61.5**	
Bismuth-214	*214*	n/a	12.2		NA		12.5	U	10.6		25.5		15.6	
Lead-214	*154*	n/a	10	U	NA		9.51	U	9.45	U	17		12.4	
Radium-223	*0.222*	n/a	**6.35**		NA		**6.9**		**6.69**		5.79	U	**6.28**	
Radium-228	5	n/a	14.1	U	NA		13.3	U	**16.1**		**14.9**		-0.809	
Thallium-208	n/a	n/a	5.95	U	NA		5.39	U	6.45	U	6.22		5.39	
Uranium-235	20	n/a	18.1	U	NA		19.3		18.4		17.9	U	15	
Filtered Radiological Parameters (pCi/L)														
Bismuth-214	*214*	n/a	12.2		NA		12.537	U	15.647	U	NA		NA	
Radium-223	*0.222*	n/a	**9.68**		NA		**6.903**		6.694	U	NA		NA	
Radium-228	5	n/a	14.092	U	NA		13.338	U	**15.392**		NA		NA	
Uranium-235	20	n/a	18.084	U	NA		**22.63**		18.414	U	NA		NA	

Notes:
(1) NMED Tapwater Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009.
Underline indicates EPA MCL and italics indicates EPA PRG for radionuclides.
(2) EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) Table 2b November 2002
(3) Duplicate
Bold value indicates > NMED Tap Water SL or EPA MCL.
Highlighted value indicates > EPA OSWER Vapor Intrusion from Groundwater to Indoor Air Pathway 1e-

µg/L = micrograms per liter
mg/L = milligrams per liter
pCi/L = picocuries per liter
TDS = total dissolved solids
Val = analytical result
Q = data qualifier
J = positive detection, value between RL and the MDL
U = non-detect result
MDL = method detection limit
RL = reporting limit
G- TPH = gasoline-range total petroleum hydrocarbons
D- TPH = diesel-range total petroleum hydrocarbons
EPA = U.S. Environmental Protection Agency
MCL = Maximum Contaminant Level
n/a = not applicable

Reference: (TetraTech, 2012)

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

						Location:	SD27-DPT-01		SD27-DPT-01		SD27-DPT-02		SD27-DPT-03	
						Collection Date:	11/03/2010		11/03/2010		11/03/2010		11/03/2010	
						Depth (ft):	8.5		10.7		8.5		8.5	
						Depth Range (ft):	6.5 to 8.5		10 to 10.7		6.5 to 8.5		6.5 to 8.5	
						SampleID:	SD27-DPT-01A		SD27-DPT-01B		SD27-DPT-02A		SD27-DPT-03A	
						QCType:	N		N		N		N	
Test Group	Parameter	HAFB Background	NMED [1]			EPA Radiological PRGs[2]								
			Res Soil	Ind Soil	Const Soil		Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	n/a	22	99	n/a	n/a	0.023	U	0.0768	J	0.023	U	1.06	
	2-Methylnaphthalene	n/a	310	4100	n/a	n/a	0.023	U	0.021	U	0.023	U	0.92	
	Naphthalene	n/a	45	252	702	n/a	50	U	0.034	U	0.038	U	0.474	
Metals, Total	Arsenic	3.7	3.59	17.7	65.4	n/a	1.4		1.4		2.5		1.3	
	Barium	169.3	15600	224000	4350	n/a	27.3		39		19.7		30.8	
	Cadmium	0.3	77.9	1120	309	n/a	0.061	U	0.061	J	0.16	J	0.28	
	Chromium [3]	25	219	2922	449	n/a	4.4	J	3.8	J	**262**		35.3	
	Lead	10.9	400	800	800	n/a	1.3		1.6		3.1		3.7	
	Mercury [3]	10.8	7.82	114	31	n/a	0.011	J	0.01	U	0.012	U	0.011	U
	Selenium	1.4	391	5680	1550	n/a	6000	U	2.2	U	2	U	2.4	U
Radio-chemistry	Lead-210	1.04	n/a	n/a	n/a	0.335	0.4072	J	0.1751	U	0.1289	U	0.7175	J
	Plutonium-239	n/a	n/a	n/a	n/a	2.58	-0.0122	UJ	0.0380	UJ	0.0303	U	0.0281	U
	Radium-226	1.35	n/a	n/a	n/a	0.199	0.8639		0.5235	J	0.4401	J	0.6546	J
	Radium-228	0.95	n/a	n/a	n/a	0.269	0.6563	J	0.4328	U	0.2592	U	0.4410	U
	Strontium-90	n/a	n/a	n/a	n/a	0.344	0.2159	U	0.2279	U	0.0528	U	-0.2884	U
	Thorium-228	1.35	n/a	n/a	n/a	23.4	0.4378		0.3018	J	0.3635		0.4587	
	Thorium-230	1.55	n/a	n/a	n/a	3.46	0.4522		0.4799		0.3850		0.4460	
	Thorium-232	1.33	n/a	n/a	n/a	3.07	0.4317		0.2976	J	0.3628		0.3561	
	Uranium-234	1.43	n/a	n/a	n/a	4.02	0.5028		0.8308		0.7022		0.7126	
	Uranium-235	0.08	n/a	n/a	n/a	0.192	-0.005433	U	0.0182	U	0.08046	J	0.1033	J
	Uranium-238	0.75	n/a	n/a	n/a	4.48	0.3997		0.6313		0.5411		0.4988	

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-04 11/03/2010 8.5 6.5 to 8.5 SD27-DPT-04A N		SD27-DPT-05 11/03/2010 8.5 6.5 to 8.5 SD27-DPT-05A N		SD27-DPT-05 11/03/2010 12 10 to 12 SD27-DPT-05B N		SD27-DPT-06 11/03/2010 8.5 6.5 to 8.5 SD27-DPT-06A N		SD27-DPT-06 11/03/2010 8.5 6.5 to 8.5 SD27-DPT-DUP01 FD		SD27-DPT-07 11/03/2010 8.5 6.5 to 8.5 SD27-DPT-07A N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	1.04		0.022	U	0.187	J	0.022	U	0.019	U	0.022	U
	2-Methylnaphthalene	0.575	J	0.022	U	0.195	J	0.022	U	0.019	U	0.022	U
	Naphthalene	0.578	J	0.036	U	0.0931	J	0.035	U	0.031	U	0.035	U
Metals, Total	Arsenic	1.1		1.6		1.3		1.8		1.3		0.52	J
	Barium	46.4		24.5		25		29.7	J	57.9	J	19	
	Cadmium	0.22	J	0.052	U	0.13	J	0.069	J	0.058	U	0.065	U
	Chromium (3)	28.7		2.5	J	4.4	J	14.6	J	7.3	J	6.5	
	Lead	3.6		1.2		1.5		1.3		1.9		0.9	J
	Mercury (3)	0.011	U	0.01	U	0.01	U	0.01	U	0.0093	U	0.0099	U
	Selenium	2.7	U	2.1	U	2.1	U	2	U	2.3	U	2.6	U
Radio-chemistry	Lead-210	0.4848	J	-0.1957	U	0.2034	U	0.5111	J	0.2816	J	0.0369	U
	Plutonium-239	0.0157	U	0.0188	U	0.1073	UJ	0.0149	U	0.1854	J	-0.0505	U
	Radium-226	0.5826	J	0.7215	J	0.4547	J	0.4681	J	1.1950		0.5178	J
	Radium-228	0.8416	J	**1.0373**	J	**1.0534**	J	0.5513	J	**1.8481**	J	0.3548	U
	Strontium-90	0.4267	J	0.1159	U	0.2126	U	0.2047	U	0.0877	U	0.3438	J
	Thorium-228	0.4047		0.2962	J	0.2166		0.5134		0.3473		0.2132	J
	Thorium-230	0.6754		0.5895		0.4251		0.7070		0.5670		0.4127	
	Thorium-232	0.4669		0.3711		0.2997		0.2156		0.3328	J	0.2198	
	Uranium-234	0.4332		0.4060		0.7419		1.1050		0.7064		0.5503	
	Uranium-235	0.05144	U	0.02521	U	0.0435	U	0.06611	U	0.04919	U	0.02008	U
	Uranium-238	0.3209		0.2838		0.3188		0.5706		0.4742		0.4622	

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-08 11/04/2010 8.5 6.5 to 8.5 SD27-DPT-08A N		SD27-DPT-08 11/04/2010 15 10 to 15 SD27-DPT-08B N		SD27-DPT-08 11/04/2010 15 10 to 15 SD27-DPT-DUP02 FD		SD27-DPT-08 11/04/2010 18 16.5 to 18 SD27-DPT-08C N		SD27-DPT-08 11/04/2010 24 22 to 24 SD27-DPT-08D N		SD27-DPT-09 11/04/2010 9 7 to 9 SD27-DPT-09A N		SD27-DPT-09 11/04/2010 14 12 to 14 SD27-DPT-09B N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	2.66		6.21				0.306		0.02	U	1.34		10.9	
	2-Methylnaphthalene	1.25	J	6.64	J			0.277		0.02	U	0.0872	J	6.24	
	Naphthalene	1.64	J	3.01				0.0964	J	0.033	U	0.215	J	3.65	
Metals, Total	Arsenic	0.86		1.7				1.4		2.3		0.51		0.87	
	Barium	20.1		33.2	J			77.6		50.8		24.3		41.8	
	Cadmium	0.88		0.17	J			0.2	J	0.35		0.045	U	0.23	
	Chromium (3)	**228**		7.3				21.2		9.4		29		7.2	
	Lead	4.9		2.9	J			3		4.3		1		2.7	
	Mercury (3)	0.011	U	0.011	U			0.01	U	0.0099	U	0.01	U	0.01	U
	Selenium	2.1	U	2	U			2.2	U	2	U	1.8	U	2.2	U
Radio-chemistry	Lead-210	0.4451	J	0.4324	J	-0.0701	U	0.5727	J	0.4114	J	-0.0371	U	0.4369	J
	Plutonium-239	0.0362	U	-0.0140	U	0.0526	U	0.0115	U	-0.0134	U	0.0194	U	0.0000	U
	Radium-226	0.4818	J	0.4925	J	0.7344		0.5362		1.3270		0.6110		1.1650	
	Radium-228	**1.5693**	J	**1.7871**	J	0.8878	J	**1.7916**	J	**1.1224**	J	0.8043	J	**1.1049**	J
	Strontium-90	-0.2761	U	0.0762	U	0.3810	J	0.2016	U	0.2798	U	-0.2042	U	0.0191	U
	Thorium-228	0.2596	J	0.5191		0.3356		0.3749		0.6411		0.3448		0.6419	
	Thorium-230	0.3720		0.4325		0.6858		0.5229		1.2160		0.4641		0.6624	
	Thorium-232	0.3125		0.6720		0.5521		0.4234		0.7203		0.2720		0.3596	
	Uranium-234	1.3590		0.6566		0.5092		0.5353		0.9970		0.4073		0.5496	
	Uranium-235	0.1025	J	0	U	0.03052	U	0.01572	U	0.06907	U	0.04862	U	0.09013	J
	Uranium-238	0.8388		0.3473		0.5924		0.4250		1.0540		0.4404		0.6138	

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-09 11/04/2010 18 16 to 18 SD27-DPT-09C N		SD27-DPT-10 11/04/2010 10 8 to 10 SD27-DPT-10A N		SD27-DPT-10 11/04/2010 14.5 12.4 to 14.5 SD27-DPT-10B N		SD27-DPT-10 11/04/2010 19 17 to 19 SD27-DPT-10C N		SD27-DPT-11 11/04/2010 8.5 6.5 to 8.5 SD27-DPT-11A N		SD27-DPT-11 11/04/2010 8.5 6.5 to 8.5 SD27-DPT-DUP03 FD		SD27-DPT-11 11/04/2010 12 10 to 12 SD27-DPT-11B N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.02	U	2.93		4.34		0.019	U	0.021	U	0.02	U	0.491	
	2-Methylnaphthalene	0.02	U	0.11	U	3.28		0.019	U	0.021	U	0.02	U	0.347	
	Naphthalene	0.031	U	0.17	U	1.77		0.03	U	0.034	U	0.032	U	0.325	
Metals, Total	Arsenic	0.71		0.52	J	1.2		0.9		0.5	J	0.66		1.3	
	Barium	25.3		18.9		41.9		38.8		23.5		21.6		26.3	
	Cadmium	0.92		0.06	J	0.42		0.75		0.44		0.29		0.42	
	Chromium (3)	8.6		2.1	J	7.4		5.6		21.5	J	9.6	J	6	
	Lead	21.8		1	J	3	J	2.2	J	0.37	J	0.85	J	1.2	J
	Mercury (3)	0.0086	U	0.01	U	0.0095	U	0.0095	U	0.01	U	0.0098	U	0.011	U
	Selenium	2	U	2.2	U	1.9	U	1.7	U	2.2	U	1.6	U	1.9	U
Radio-chemistry	Lead-210	0.2458	J	0.1364	J	0.1497	J	0.1285	J	0.2095	J	0.5488		0.4647	J
	Plutonium-239	0.0447	U												
	Radium-226	0.8527		0.6588	J	0.8229		1.3080		-0.0045	U	0.5616	J	**1.9650**	
	Radium-228	0.6838	J	0.5902	J	**1.3131**	J	**1.6282**	J	0.8334	J	**1.1755**	J	0.7741	J
	Strontium-90	0.0000	U												
	Thorium-228	0.6315		0.3306	J	0.5369		0.4244		0.6682		0.5477		0.1910	J
	Thorium-230	1.0200		0.3273	J	0.8376		0.7094		0.6449		0.5566		0.4477	
	Thorium-232	0.5936		0.4357		0.5927		0.4165		0.7153		0.3930	J	0.2275	
	Uranium-234	0.4774		0.4411		0.7749		0.5335		0.5253		0.4721		0.5502	
	Uranium-235	0.02741	U	0.01094	U	0.0439	U	0.04505	U	0.05311	U	0.0887	J	0.005358	U
	Uranium-238	0.5479		0.2542		0.6140		0.5776		0.2908		0.2815		0.3607	

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-11 11/04/2010 19.7 18 to 19.7 SD27-DPT-11C N		SD27-DPT-12 11/04/2010 8.5 6.5 to 8.5 SD27-DPT-12A N		SD27-DPT-12 11/04/2010 13.5 11.5 to 13.5 SD27-DPT-12B N		SD27-DPT-12 11/04/2010 19 17 to 19 SD27-DPT-12C N		SD27-DPT-13 11/05/2010 8.5 6.5 to 8.5 SD27-DPT-13A N		SD27-DPT-13 11/05/2010 13.5 11.5 to 13.5 SD27-DPT-13B N		SD27-DPT-13 11/05/2010 18.5 16.5 to 18.5 SD27-DPT-13C N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.021	U	0.023	U	14		0.02	U	0.019	U	0.142		0.018	U
	2-Methylnaphthalene	0.021	U	0.023	U	13.2		0.02	U	0.019	U	0.02	U	0.018	U
	Naphthalene	0.034	U	0.036	U	8.91		0.033	U	0.031	U	0.032	U	0.03	U
Metals, Total	Arsenic	0.58		1.3		0.5		1		0.81		0.97		0.61	
	Barium	27		24.7		21.2		87		21.3	J	25.5	J	37.5	J
	Cadmium	0.47		0.061	U	0.3		0.95		0.27		0.25		0.086	J
	Chromium (3)	3	J	3.2	J	25.2		9		2.8	J	4.1	J	3.9	J
	Lead	1.8	J	1	J	0.92	J	3.4	J	1.1		1.2		1.2	
	Mercury (3)	0.01	U	0.011	U	0.0096	U	0.0089	U	0.0097	U	0.0098	U	0.013	J
	Selenium	1.8	U	2.5	U	1.8	U	2.1	U	1.5	U	1.9	U	1.6	U
Radio-chemistry	Lead-210	0.2372	J	0.1883	J	0.4673	J	0.0229	U	1.0147	J	0.6591	J	0.5856	J
	Plutonium-239														
	Radium-226	0.5138	J	0.7444		0.7021		0.6303		0.3494	J	0.4191	U	0.2155	U
	Radium-228	0.4535	U	0.8315	J	0.3707	U	0.9220	J	0.5987	J	0.5940	J	0.6913	J
	Strontium-90														
	Thorium-228	0.3470	J	0.3764		0.3382		0.6660		0.1914	J	0.3463		0.4171	
	Thorium-230	0.6175		0.6843		0.5646		0.5005		0.3713	J	0.6605		0.4901	
	Thorium-232	0.5656		0.3180		0.4119		0.5038		0.2481		0.3699		0.4292	
	Uranium-234	0.3749		0.5858		0.5099		0.4941		0.2810		0.6143		0.3418	
	Uranium-235	0.1027	J	0.09633	J	-0.009174	U	-0.01164	U	0.008497	U	0.0242	U	0.01304	U
	Uranium-238	0.4874		0.5030		0.3965		0.5751		0.1537	J	0.3102		0.2663	

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-14 03/22/2011 7 5 to 7 SD27-DPT-14A N		SD27-DPT-14 03/22/2011 12 10 to 12 SD27-DPT-14B N		SD27-DPT-14 03/22/2011 15 13 to 15 SD27-DPT-14C N		SD27-DPT-14 03/22/2011 22 20 to 22 SD27-DPT-14D N		SD27-DPT-15 03/22/2011 7 5 to 7 SD27-DPT-15A N		SD27-DPT-15 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-15B N		SD27-DPT-15 03/22/2011 20 18 to 20 SD27-DPT-15C N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.0379	J	0.19	U
	2-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U
	Naphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U
Metals, Total	Arsenic	0.88	U	1.1	U	0.99	J	1.1	U	1	U	1.1	U	1	U
	Barium	15	J	15.5	J	56.9	J	66.6	J	12.8	J	46.2	J	38.8	J
	Cadmium	0.44	U	0.53	U	0.39	U	0.54	U	0.51	U	0.53	U	0.51	U
	Chromium (3)	1.6	J	3.4	J	6.5		3.7	J	1.4	J	5.2	J	4.3	J
	Lead	0.91	J	1	J	3.5	J	2.3	J	0.51	U	2.6	J	2.2	J
	Mercury (3)	0.01	U	0.0089	U	0.0092	U	0.0096	U	0.01	U	0.0098	U	0.0092	U
	Selenium	1.8	U	2.1	U	1.5	U	2.2	U	2.1	U	2.1	U	2.3	J
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-16 03/22/2011 10 8 to 10 SD27-DPT-16A N		SD27-DPT-16 03/22/2011 15 13 to 15 SD27-DPT-16B N		SD27-DPT-16 03/22/2011 17.5 15.5 to 17.5 SD27-DPT-16C N		SD27-DPT-16 03/22/2011 22 20 to 22 SD27-DPT-16D N		SD27-DPT-17 03/22/2011 10 8 to 10 SD27-DPT-17A N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-17B N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP05 FD	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.19	U	0.21	U	0.232		0.283	
	2-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.19	U	0.21	U	0.18	U	0.18	U
	Naphthalene	0.2	U	0.19	U	0.19	U	0.19	U	0.21	U	0.18	U	0.18	U
Metals, Total	Arsenic	0.75	U	1.4	J	0.92	U	3.1	J	0.96	U	0.86	U	0.86	U
	Barium	27.7	J	53.6	J	62.5	J	28.1	J	20.2	J	17.8	J	15.8	J
	Cadmium	0.37	U	0.45	U	0.46	U	0.47	U	0.48	U	0.43	U	0.43	U
	Chromium (3)	3	J	8.1		6.8		6.4		2.7	J	3.5	J	4.1	J
	Lead	1.6	J	4.2	J	2.8	J	3.7	J	1.2	J	1.2	J	2.1	J
	Mercury (3)	0.0096	U	0.0091	U	0.0091	U	0.0094	U	0.0096	U	0.0089	U	0.0082	U
	Selenium	3	U	1.8	U	1.8	U	1.9	U	1.9	U	1.7	U	1.7	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-17 03/22/2011 17 15 to 17 SD27-DPT-17C N		SD27-DPT-17 03/22/2011 22 20 to 22 SD27-DPT-17D N		SD27-DPT-18 03/22/2011 10 8 to 10 SD27-DPT-18A N		SD27-DPT-18 03/22/2011 13 11 to 13 SD27-DPT-18B N		SD27-DPT-18 03/22/2011 17 15 to 17 SD27-DPT-18C N		SD27-DPT-18 03/22/2011 25 23 to 25 SD27-DPT-18D N		SD27-DPT-19 03/22/2011 10 8 to 10 SD27-DPT-19A N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.19	U	0.19	U	0.2	U	6.19		1.24		0.21	U	1.78	
	2-Methylnaphthalene	0.19	U	0.19	U	0.2	U	6.69		0.143	J	0.21	U	1.62	
	Naphthalene	0.19	U	0.19	U	0.2	U	3.29		0.77	U	0.21	U	0.307	J
Metals, Total	Arsenic	1.1	J	0.94	U	1.4	J	1.7	J	1.5	J	2.3	J	0.84	U
	Barium	26.6	J	18.8	J	18.7	J	24.2	J	28.7	J	50.1	J	24.1	J
	Cadmium	0.38	U	0.47	U	0.53	U	0.5	U	0.4	U	0.43	UJ	0.42	U
	Chromium (3)	2.5	J	2.7	J	2.3	J	2.8	J	4.9		10.4	J	1.6	J
	Lead	1.5	J	1.6	J	1	J	1.2	J	2.5	J	5.1	J	0.44	J
	Mercury (3)	0.0089	U	0.0088	U	0.0088	U	0.0083	U	0.0095	U	0.0091	U	0.0096	U
	Selenium	3	U	1.9	U	2.1	U	2	U	1.6	U	1.7	UJ	1.7	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-19B N		SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP06 FD		SD27-DPT-19 03/22/2011 20 18 to 20 SD27-DPT-19C N		SD27-DPT-19 03/22/2011 25 23 to 25 SD27-DPT-19D N		SD27-DPT-20 03/23/2011 9 7 to 9 SD27-DPT-20A N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-20B N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-DUP07 FD	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	1.22	J	2.21	J	0.19	U	0.18	U	0.19	U	0.0205	J	0.0947	J
	2-Methylnaphthalene	1.39	J	2.54	J	0.19	U	0.18	U	0.19	U	0.19	U	0.18	U
	Naphthalene	0.641	J	1.36	J	0.19	U	0.18	U	0.19	U	0.19	U	0.18	U
Metals, Total	Arsenic	0.92	U	0.97	U	**8.4**		1.3	J	0.89	U	0.92	U	0.9	U
	Barium	21.1	J	16.6	J	37.2	J	30.9	J	12	J	19.5	J	18.4	J
	Cadmium	0.46	U	0.48	U	0.48	U	0.38	U	0.45	U	0.46	U	0.45	U
	Chromium (3)	2.7	J	2.9	J	3.2	J	7.3		1.7	J	2.3	J	2.1	J
	Lead	1.4	J	1.2	J	1.8	J	4.3	J	0.45	U	0.91	J	1	J
	Mercury (3)	0.0089	U	0.009	U	0.0086	U	0.0088	U	0.0096	U	0.0089	U	0.0089	U
	Selenium	1.8	U	1.9	U	1.9	U	1.5	J	1.8	U	1.8	U	1.8	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-20 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-20C N		SD27-DPT-20 03/23/2011 25 23 to 25 SD27-DPT-20D N		SD27-DPT-21 03/23/2011 10 8 to 10 SD27-DPT-21A N		SD27-DPT-21 03/23/2011 14 12 to 14 SD27-DPT-21B N		SD27-DPT-21 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-21C N		SD27-DPT-22 03/23/2011 10 8 to 10 SD27-DPT-22A N		SD27-DPT-22 03/23/2011 14.5 12.5 to 14.5 SD27-DPT-22B N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.19	U	0.18	U	0.19	U	0.18	U	0.19	U	0.19	U	1.75	
	2-Methylnaphthalene	0.19	U	0.18	U	0.19	U	0.18	U	0.19	U	0.19	U	1.82	
	Naphthalene	0.19	U	0.18	U	0.19	U	0.18	U	0.19	U	0.19	U	0.84	
Metals, Total	Arsenic	2.9	J	2.1	J	1.1	J	2.1	J	1.2	U	0.97	U	1	U
	Barium	43.2	J	44.7	J	20.9	J	57.8	J	40.8	J	15.9	J	35.4	J
	Cadmium	0.49	U	0.42	U	0.44	U	0.55	U	0.58	U	0.48	U	0.5	U
	Chromium (3)	5.7		8.5		2.2	J	12.9		6.6		2	J	6.4	
	Lead	3.5	J	4.7	J	0.94	J	5.8	J	3.3	J	1.3	J	2.9	J
	Mercury (3)	0.0095	U	0.0079	U	0.0094	U	0.0088	U	0.0096	U	0.0096	U	0.0091	U
	Selenium	2	U	1.7	U	1.7	U	2.2	U	2.3	U	1.9	U	2	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-22 03/23/2011 17 15 to 17 SD27-DPT-22C N		SD27-DPT-23 03/23/2011 10 8 to 10 SD27-DPT-23A N		SD27-DPT-23 03/23/2011 15 12 to 15 SD27-DPT-23B N		SD27-DPT-24 03/23/2011 10 8 to 10 SD27-DPT-24A N		SD27-DPT-24 03/23/2011 12 10 to 12 SD27-DPT-24B N		SD27-DPT-24 03/23/2011 17 15 to 17 SD27-DPT-24C N		SD27-DPT-25 03/23/2011 10 8 to 10 SD27-DPT-25A N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.18	U	0.19	U	0.19	U	0.19	U	1.4		0.19	U	2.56	
	2-Methylnaphthalene	0.18	U	0.19	U	0.19	U	0.19	U	0.38	U	0.19	U	2.49	
	Naphthalene	0.18	U	0.19	U	0.19	U	0.19	U	0.38	U	0.19	U	0.803	
Metals, Total	Arsenic	0.96	U	0.75	U	0.8	U	0.74	U	0.72	U	0.9	U	0.77	U
	Barium	23.5	J	16.7	J	49.3	J	21.4	J	15.8	J	33.4	J	18	J
	Cadmium	0.48	U	0.37	U	0.4	U	0.37	U	0.36	U	0.45	U	0.38	U
	Chromium (3)	4.8		1.9	J	6.6		1.8	J	2.8	J	2.8	J	2	J
	Lead	2.6	J	1.1	J	3.4	J	7.4	U	7.2	U	9	U	7.7	U
	Mercury (3)	0.0093	U	0.0089	U	0.0088	U	0.009	R	0.0092	R	0.0087	R	0.0093	R
	Selenium	1.9	U	1.5	U	1.6	U	1.5	U	1.4	U	1.8	U	1.5	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-25 03/23/2011 15 12 to 15 SD27-DPT-25B N		SD27-DPT-26 03/23/2011 10 8 to 10 SD27-DPT-26A N		SD27-DPT-26 03/23/2011 15 12.5 to 15 SD27-DPT-26B N		SD27-DPT-27 03/23/2011 10 8 to 10 SD27-DPT-27A N		SD27-DPT-27 03/23/2011 15 12.5 to 15 SD27-DPT-27B N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-28A N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-DUP08 FD	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	2-Methylnaphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Naphthalene	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
Metals, Total	Arsenic	4.2	U	0.92	U	5	U	0.99	U	1.2	U	4.7	U	4.9	U
	Barium	54.7	J	19.5	J	58.3	J	23.2	J	64.9	J	27.4	J	26.3	J
	Cadmium	0.42	U	0.46	U	0.5	UJ	0.49	U	0.59	U	0.47	U	0.49	U
	Chromium (3)	8.6		2.3	J	6.8		2.6	J	10.8		2.7	J	2.9	J
	Lead	8.3	U	9.2	U	10	U	9.9	U	12	U	9.4	U	9.9	U
	Mercury (3)	0.0091	R	0.0095	R	0.009	R	0.0088	R	0.0092	R	0.0099	R	0.0096	U
	Selenium	1.8	J	1.8	U	2	UJ	2	U	2.4	U	1.9	U	2	U
Radio-chemistry	Lead-210														
	Plutonium-239														
	Radium-226														
	Radium-228														
	Strontium-90														
	Thorium-228														
	Thorium-230														
	Thorium-232														
	Uranium-234														
	Uranium-235														
	Uranium-238														

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

		SD27-DPT-28 03/23/2011 15 12.5 to 15 SD27-DPT-28B N		SD27-DPT-28 03/23/2011 20 18 to 20 SD27-DPT-28C N		SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-29A N		SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-DUP09 FD		SD27-DPT-29 03/23/2011 15 12.5 to 15 SD27-DPT-29B N		SD27-DPT-30 03/23/2011 12 10 to 12 SD27-DPT-30A N		SD27-DPT-31 03/23/2011 12 10 to 12 SD27-DPT-31A N		SD27-DPT-31 03/23/2011 15 13 to 15 SD27-DPT-31B N	
Test Group	Parameter	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q	Value	Q
SVOCs	1-Methylnaphthalene	0.34		0.19	U	1.62		1.43		0.19	U	0.18	U	0.0624	J	0.19	U
	2-Methylnaphthalene	0.19	U	0.19	U	1.72		1.37		0.19	U	0.18	U	0.19	U	0.19	U
	Naphthalene	0.19	U	0.19	U	0.845	J	0.289	J	0.19	U	0.18	U	0.19	U	0.19	U
Metals, Total	Arsenic	0.92	U	0.93	U	1.1	U	0.91	U	1.1	U	0.84	U	0.95	U	1.1	U
	Barium	17.2	J	46.4	J	17	J	22.8	J	41.9	J	25.6	J	22.2	J	69.1	J
	Cadmium	0.46	U	0.47	U	0.54	U	0.46	U	0.57	U	0.42	U	0.48	U	0.55	U
	Chromium (3)	2.9	J	4.3	J	3.8	J	5.6		8.5		3.5	J	2.8	J	8.7	
	Lead	9.2	U	9.3	U	11	U	9.1	U	11	U	17	U	9.5	U	11	U
	Mercury (3)	0.0095	R	0.0092	R	0.009	R	0.0096	U	0.0087	R	0.0088	U	0.0082	U	0.009	U
	Selenium	2.2	J	1.9	U	2.2	U	1.8	U	2.6	J	3.3	U	1.9	U	2.2	U
Radio-chemistry	Lead-210																
	Plutonium-239																
	Radium-226																
	Radium-228																
	Strontium-90																
	Thorium-228																
	Thorium-230																
	Thorium-232																
	Uranium-234																
	Uranium-235																
	Uranium-238																

Table A-11. Screening ACM Chemicals Detected in Soil for Direct Contact Risk
SVOCs, Metals, and Radionuclides
Site SD-27, Holloman AFB

Notes:
Units for metals and SVOCs are all milligram per kilogram (mg/kg); unist for radionuclides are picocuries per gram (pci/g).

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009. Underlined criteria taken from EPA June 2011 RSL table.

(2) Radiological screening criteria is the lowest of EPA PRGs for all residential pathways (ingestion of soil; inhalation of fugitive dusts; and external radiation exposure) (source: http://epa-prgs.ornl.gov/radionuclides/download.html).

(3) NMED SSLs for hexavalent chromium and methyl mercury used.

Blank 'value' cell indicates not analyzed.

Red indicates > Residential SSLs for direct contact for SVOCs and metals.

Underline indicates > Commerical/Industrial SSLs for direct contact for SVOCs and metals.

Yellow shade indicates > Construction Worker SSLs for direct contact for SVOCs and metals.

Green shade indicates > EPA Residential PRGs for radionuclides

Blank 'value' cell indicates not analyzed.

Reference: (TetraTech, 2012)

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

			Location:	SD27-DPT-01		SD27-DPT-01		SD27-DPT-02		SD27-DPT-03		SD27-DPT-04	
			Collection Date:	11/09/2010		11/09/2010		11/09/2010		11/09/2010		11/09/2010	
			Depth (ft):	8.5		10.7		8.5		8.5		8.5	
			Depth Range (ft):	6.5 to 8.5		10 to 10.7		6.5 to 8.5		6.5 to 8.5		6.5 to 8.5	
			SampleID:	SD27-DPT-01AV		SD27-DPT-01BV		SD27-DPT-02AV		SD27-DPT-03AV		SD27-DPT-04AV	
			QCType:	N		N		N		N		N	
Parameter	NMED [1]												
	Res Soil	Com/Ind Soil	Const Soil										
1,1-Dichloroethene	618	2216	1830	0.0011	U	0.065	U	0.1	U	0.33	U	0.41	U
1,2,4-Trimethylbenzene	62	260	n/a	0.00083	U	2.08		2.12		40.1		41.3	
1,3,5-Trimethylbenzene	780	10000	n/a	0.00099	U	0.732		0.095	U	16.8		16.9	
n-Butylbenzene	3900	51000	n/a	0.00099	U	0.173	J	0.12	J	5.16		1.64	
4-Methyl-2-pentanone	5949	73293	23100	0.0042	U	0.25	U	0.4	U	1.3	U	1.6	U
Acetone	67456	850852	262714	0.015	R	0.93	R	1.5	R	4.7	R	5.8	R
Acrolein	1	2	2	0.0083	UJ	0.51	UJ	0.8	UJ	2.6	UJ	3.2	U
Benzene	15	85	471	0.0011	U	0.142	J	0.232	J	5.05		12.6	
Benzyl Chloride	n/a	n/a	n/a	0.0011	U	0.069	U	0.11	U	0.35	U	0.44	U
Carbon disulfide	1935	7544	5890	0.0015	U	0.093	U	0.15	U	0.96	J	0.58	U
Chloroform	6	32	671	0.00091	U	0.056	U	0.088	U	0.28	U	0.35	U
Cymene	n/a	n/a	n/a	0.00091	U	2.63		0.144	J	5.17		4.12	
Ethylbenzene	70	385	6625	0.00076	U	0.657		0.474		15		13.2	
Hexane	1255	4989	3843	0.0014	UJ	0.088	UJ	0.14	UJ	5.82	J	2.62	J
Isopropylbenzene	3211	14878	10289	0.00083	U	0.356		0.341	J	5.87		3.49	
m,p-Xylene [2]	600	2600	n/a	0.0017	U	1.21		0.626	J	46.3		46.9	
Methylene chloride	199	1085	10561	0.0076	U	0.46	U	0.73	U	2.3	U	5.63	U
Naphthalene	45	252	702	0.0015	U	0.108	J	0.15	U	5.43		5.53	
n-Propylbenzene	3400	21000	n/a	0.0011	U	0.396		0.388		6.53		2.15	
o-Xylene	9548	31511	27483	0.00076	U	0.49		0.0902	J	17.1		18.8	
Sec-Butylbenzene	n/a	n/a	n/a	0.0012	U	0.25		0.186	J	5.95		3.23	
Tert-butyl benzene	n/a	n/a	n/a	0.00091	U	0.056	U	0.088	U	0.28	U	0.47	J
Toluene	5570	57863	21127	0.00091	U	0.166	J	0.088	U	18.1		36.6	
Trichloroethene	46	253	4598	0.00091	U	0.056	U	0.088	U	0.28	U	0.35	U
TPH-GRO (C6-C10)	n/a	n/a	n/a	2.5	U	179	J	112		2940	J	1590	
TPH (C10-C28)	760	1810	n/a	4.6	U	15.3		12		469		606	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-05 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-05AV N		SD27-DPT-05 11/09/2010 12 10 to 12 SD27-DPT-05BV N		SD27-DPT-06 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-06AV N		SD27-DPT-06 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-DUP01V FD		SD27-DPT-07 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-07AV N		SD27-DPT-08 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-08AV N	
Parameter												
1,1-Dichloroethene	0.001	U	0.14	U	0.0012	U	0.0012	U	0.0012	U	0.15	U
1,2,4-Trimethylbenzene	0.00079	U	9.33		0.00093	U	0.00097	U	0.00092	U	13.8	
1,3,5-Trimethylbenzene	0.00094	U	3.29		0.0011	U	0.0011	U	0.0011	U	9.2	
n-Butylbenzene	0.00094	U	0.704		0.0011	U	0.0011	U	0.0011	U	0.291	J
4-Methyl-2-pentanone	0.004	U	0.54	U	0.0046	U	0.0049	U	0.0046	U	0.58	U
Acetone	0.014	R	2	R	0.017	R	0.024	J	0.0173	J	2.1	U
Acrolein	0.0079	UJ	1.1	UJ	0.0093	U	0.0097	UJ	0.0092	UJ	1.2	U
Benzene	0.0011	U	4.8		0.0036	J	0.0086	J	0.0054		1.2	
Benzyl Chloride	0.0011	U	0.15	U	0.0013	U	0.0013	U	0.0013	U	0.16	U
Carbon disulfide	0.0014	U	0.2	U	0.0036	J	0.0018	U	0.0017	U	0.225	J
Chloroform	0.00087	U	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U
Cymene	0.00087	U	3.33		0.001	U	0.0011	U	0.001	U	2.26	
Ethylbenzene	0.00072	U	9.53		0.00088	J	0.0012	J	0.00084	U	5.4	
Hexane	0.0014	UJ	0.19	UJ	0.0016	UJ	0.0017	UJ	0.0016	UJ	0.436	J
Isopropylbenzene	0.00079	U	1.81		0.00093	U	0.0011	J	0.0047		1.05	
m,p-Xylene (2)	0.0016	U	9.69		0.0019	U	0.0019	U	0.0018	U	17.3	
Methylene chloride	0.0072	U	0.45	U	0.0084	U	0.0088	U	0.0084	U	0.48	U
Naphthalene	0.0014	U	1.3		0.0017	U	0.0018	U	0.0017	U	1.78	
n-Propylbenzene	0.001	U	2.12		0.0012	U	0.0012	U	0.003	J	0.49	J
o-Xylene	0.00072	U	5.87		0.00084	U	0.00088	U	0.00084	U	7.95	
Sec-Butylbenzene	0.0012	U	0.9		0.0014	U	0.0014	U	0.0018	J	1.33	
Tert-butyl benzene	0.00087	U	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U
Toluene	0.00087	U	6.67		0.001	U	0.0011	U	0.001	U	6.95	
Trichloroethene	0.00087	U	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U
TPH-GRO (C6-C10)	2.3	U	772	J	2.6	U	2.4	U	2.4	U	643	
TPH (C10-C28)	4.6	U	102		4.4	U	3.9	U	4.5	U	**1360**	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-08 11/10/2010 15 10 to 15 SD27-DPT-08BV N		SD27-DPT-08 11/10/2010 18 16.5 to 18 SD27-DPT-08CV N		SD27-DPT-08 11/10/2010 ?? 22 to ??? SD27-DPT-08DV N		SD27-DPT-09 11/10/2010 9 7 to 9 SD27-DPT-09AV N		SD27-DPT-09 11/10/2010 14 12 to 14 SD27-DPT-09BV N	
Parameter										
1,1-Dichloroethene	1.4	U	0.29	U	NA		0.69	U	0.69	U
1,2,4-Trimethylbenzene	**105**		15.2		NA		57.6		**87.2**	
1,3,5-Trimethylbenzene	33.9		5.09		NA		24.2		29.9	
n-Butylbenzene	17.2		1.84		NA		5.71		14.5	
4-Methyl-2-pentanone	5.5	U	1.1	U	NA		2.7	U	2.7	U
Acetone	20	UJ	4.1	U	NA		9.8	U	9.8	U
Acrolein	11	U	2.3	U	NA		5.4	U	5.4	U
Benzene	**23.7**		1.37		NA		2.91		2.97	
Benzyl Chloride	1.5	U	0.31	U	NA		0.74	U	1.6	J
Carbon disulfide	2	U	0.41	U	NA		0.98	U	0.98	U
Chloroform	1.2	U	0.25	U	NA		0.59	U	0.59	U
Cymene	12.1		1.85		NA		8.4		10.8	
Ethylbenzene	**107**	J	16.8		NA		36.4		**76.1**	
Hexane	22.7		1.07		NA		0.931	J	5.44	
Isopropylbenzene	25.4	J	3.73		NA		9.58		23.3	
m,p-Xylene (2)	132		17.3		NA		69.2		73.2	
Methylene chloride	4.6	U	0.95	U	NA		2.3	U	2.3	U
Naphthalene	20.1		2.63		NA		8.31		2.9	
n-Propylbenzene	37.3	J	5.67		NA		12.2		34.4	
o-Xylene	60.9	J	8.21		NA		34.4		39.4	
Sec-Butylbenzene	14.8		2.15		NA		6.84		14.1	
Tert-butyl benzene	1.2	U	0.25	U	NA		0.614	J	0.728	J
Toluene	93.9	J	9.46		NA		37		8.79	
Trichloroethene	1.2	U	0.25	U	NA		0.59	U	0.59	U
TPH-GRO (C6-C10)	4400	J	863	J	NA		1480		2540	J
TPH (C10-C28)	**1890**		146		4	U	760		**2870**	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-09 11/10/2010 18 16 to 18 SD27-DPT-09CV N		SD27-DPT-10 11/10/2010 10 8 to 10 SD27-DPT-10AV N		SD27-DPT-10 11/10/2010 14.5 12.4 to 14.5 SD27-DPT-10BV N		SD27-DPT-10 11/10/2010 19 17 to 19 SD27-DPT-10CV N		SD27-DPT-11 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-11AV N		SD27-DPT-11 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-DUP03V FD	
Parameter												
1,1-Dichloroethene	0.00097	U	0.0011	U	0.61	U	0.061	U	0.0011	U	0.0012	U
1,2,4-Trimethylbenzene	0.002	J	0.0379		33.6		4.46		0.00083	U	0.00096	U
1,3,5-Trimethylbenzene	0.00091	U	0.0219		11.7		1.58		0.00099	U	0.0011	U
n-Butylbenzene	0.00091	U	0.00098	J	3.73		0.493		0.00099	U	0.0011	U
4-Methyl-2-pentanone	0.0038	U	0.0041	U	2.4	U	0.24	U	0.0042	U	0.0048	U
Acetone	0.014	U	0.015	U	8.8	U	0.87	U	0.015	U	0.017	U
Acrolein	0.0077	U	0.0083	U	4.8	U	0.48	U	0.0083	U	0.0096	U
Benzene	0.0028	J	0.0109		0.66	U	0.065	U	0.0011	U	0.0013	U
Benzyl Chloride	0.001	U	0.0011	U	0.66	U	0.065	U	0.0011	U	0.0013	U
Carbon disulfide	0.0018	J	0.0024	J	0.88	U	0.087	U	0.0015	U	0.0017	U
Chloroform	0.00084	U	0.0009	U	0.53	U	0.052	U	0.00091	U	0.001	U
Cymene	0.00084	U	0.004		3.1		0.511		0.00091	U	0.001	U
Ethylbenzene	0.0042		0.0029	J	43.6		2.18		0.00076	U	0.00087	U
Hexane	0.0013	U	0.0014	U	1.88	J	0.0882	J	0.0014	U	0.0017	U
Isopropylbenzene	0.00077	U	0.0075		8.91		1.32		0.00083	U	0.00096	U
m,p-Xylene (2)	0.003	J	0.0085		60.2		1.1		0.0017	U	0.0019	U
Methylene chloride	0.009	U	0.0103	U	2	U	0.43	U	0.0035	U	0.004	U
Naphthalene	0.0014	U	0.0015	U	3.19		0.261		0.0015	U	0.0017	U
n-Propylbenzene	0.00097	U	0.0059		11.7		2		0.0011	U	0.0012	U
o-Xylene	0.002	J	0.00075	U	24.9		0.45		0.00076	U	0.00087	U
Sec-Butylbenzene	0.0011	U	0.0057		4.32		0.911		0.0012	U	0.0014	U
Tert-butyl benzene	0.00084	U	0.0009	U	0.53	U	0.052	U	0.00091	U	0.001	U
Toluene	0.0014	J	0.0009	U	10.2		0.293		0.00091	U	0.001	U
Trichloroethene	0.00084	U	0.0009	U	0.53	U	0.052	U	0.00091	U	0.001	U
TPH-GRO (C6-C10)	2.3	U	2.4	U	1970	J	418	J	2.3	U	2.8	U
TPH (C10-C28)	3.9	U	**1970**		**1150**		16.7		4.2	U	3.8	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-11 11/10/2010 12 10 to 12 SD27-DPT-11BV N		SD27-DPT-11 11/10/2010 19.7 18 to 19.7 SD27-DPT-11CV N		SD27-DPT-12 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-12AV N		SD27-DPT-12 11/10/2010 13.5 11.5 to 13.5 SD27-DPT-12BV N		SD27-DPT-12 11/10/2010 19 17 to 19 SD27-DPT-12CV N		SD27-DPT-13 11/05/2010 8.5 6.5 to 8.5 SD27-DPT-13A N	
Parameter												
1,1-Dichloroethene	1.4	U	0.056	U	0.0011	U	0.68	U	0.0011	U	NA	
1,2,4-Trimethylbenzene	**166**		4.73		0.00085	U	56.5		0.0118		NA	
1,3,5-Trimethylbenzene	56.8		1.82		0.001	U	19.6		0.0046		NA	
n-Butylbenzene	24.1		0.309		0.001	U	8.14		0.001	U	NA	
4-Methyl-2-pentanone	5.5	U	0.22	U	0.0042	U	2.7	U	0.0043	U	NA	
Acetone	20	U	0.8	U	0.015	U	9.8	U	0.016	U	NA	
Acrolein	11	UJ	0.44	U	0.0085	U	5.4	U	0.0086	U	NA	
Benzene	**60.6**		0.321		0.0012	U	4.22		0.0012	U	NA	
Benzyl Chloride	1.5	U	0.06	U	0.0012	U	0.73	U	0.0012	U	NA	
Carbon disulfide	2	U	0.08	U	0.0015	U	0.98	U	0.003	J	NA	
Chloroform	1.2	U	0.048	U	0.00092	U	0.59	U	0.00094	U	NA	
Cymene	17.7		0.474		0.00092	U	28.4		0.0036	J	NA	
Ethylbenzene	**190**		4.67		0.00077	U	**73.7**		0.0048		NA	
Hexane	69.2	J	0.163	J	0.0015	U	10		0.0043		NA	
Isopropylbenzene	44.6		1.45		0.00085	U	16.2		0.0034	J	NA	
m,p-Xylene (2)	257		0.512		0.0017	U	105		0.0042	J	NA	
Methylene chloride	4.6	U	0.4	U	0.0088	U	2.2	U	0.0085	U	NA	
Naphthalene	32.9		0.08	U	0.0015	U	8.45		0.0016	U	NA	
n-Propylbenzene	57.7		1.71		0.0011	U	21.1		0.0045		NA	
o-Xylene	129		0.248		0.00077	U	44.1		0.0017	J	NA	
Sec-Butylbenzene	23.2		0.775		0.0012	U	7.41		0.0037	J	NA	
Tert-butyl benzene	1.25	J	0.048	U	0.00092	U	0.59	U	0.00094	U	NA	
Toluene	152		0.256		0.00092	U	67.7		0.0018	J	NA	
Trichloroethene	1.2	U	0.048	U	0.00092	U	0.59	U	0.00094	U	NA	
TPH-GRO (C6-C10)	7040	J	437	J	2.6	U	3600	J	2.3	U	NA	
TPH (C10-C28)	586		4.3	U	4.4	U	**5690**		4.2	U	3.8	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-13 11/05/2010 13.5 11.5 to 13.5 SD27-DPT-13B N		SD27-DPT-13 11/05/2010 18.5 16.5 to 18.5 SD27-DPT-13C N		SD27-DPT-14 03/22/2011 7 5 to 7 SD27-DPT-14A N		SD27-DPT-14 03/22/2011 12 10 to 12 SD27-DPT-14B N		SD27-DPT-14 03/22/2011 15 13 to 15 SD27-DPT-14C N		SD27-DPT-14 03/22/2011 22 20 to 22 SD27-DPT-14D N	
Parameter												
1,1-Dichloroethene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
1,2,4-Trimethylbenzene	NA		NA		0.0046	UJ	0.0211	J	0.0017	J	0.0035	UJ
1,3,5-Trimethylbenzene	NA		NA		0.0046	UJ	0.0064	J	0.0041	UJ	0.0035	UJ
n-Butylbenzene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
4-Methyl-2-pentanone	NA		NA		0.023	UJ	0.023	UJ	0.02	UJ	0.018	UJ
Acetone	NA		NA		0.046	UJ	0.046	UJ	0.041	UJ	0.035	UJ
Acrolein	NA		NA		0.023	UJ	0.023	UJ	0.02	UJ	0.018	UJ
Benzene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Benzyl Chloride	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Carbon disulfide	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Chloroform	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Cymene	NA		NA		0.0046	UJ	0.0048	J	0.0041	UJ	0.0035	UJ
Ethylbenzene	NA		NA		0.0046	UJ	0.0237	J	0.0015	J	0.0018	J
Hexane	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Isopropylbenzene	NA		NA		0.0046	UJ	0.0063	J	0.0041	UJ	0.0035	UJ
m,p-Xylene [(2)]	NA		NA		0.0093	UJ	0.0092	UJ	0.0082	UJ	0.007	UJ
Methylene chloride	NA		NA		0.0093	UJ	0.0092	UJ	0.0082	UJ	0.007	UJ
Naphthalene	NA		NA		0.0046	UJ	0.0049	J	0.0041	UJ	0.0035	UJ
n-Propylbenzene	NA		NA		0.0046	UJ	0.0087	J	0.0041	UJ	0.0035	UJ
o-Xylene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Sec-Butylbenzene	NA		NA		0.0046	UJ	0.0042	J	0.0041	UJ	0.0035	UJ
Tert-butyl benzene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Toluene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
Trichloroethene	NA		NA		0.0046	UJ	0.0046	UJ	0.0041	UJ	0.0035	UJ
TPH-GRO (C6-C10)	NA		NA		6.3	U	5.3	U	5.8		5.2	U
TPH (C10-C28)	66.9		3.7	U	4.06	J	9.6	U	9.6	U	9.8	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-15 03/22/2011 7 5 to 7 SD27-DPT-15A N		SD27-DPT-15 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-15B N		SD27-DPT-15 03/22/2011 20 18 to 20 SD27-DPT-15C N		SD27-DPT-16 03/22/2011 10 8 to 10 SD27-DPT-16A N		SD27-DPT-16 03/22/2011 15 13 to 15 SD27-DPT-16B N		SD27-DPT-16 03/22/2011 17.5 15.5 to 17.5 SD27-DPT-16C N	
Parameter												
1,1-Dichloroethene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
1,2,4-Trimethylbenzene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
1,3,5-Trimethylbenzene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.0042	J	0.0035	UJ	0.0039	UJ
n-Butylbenzene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
4-Methyl-2-pentanone	0.019	UJ	0.024	UJ	0.018	UJ	0.02	UJ	0.017	UJ	0.019	UJ
Acetone	0.039	UJ	0.048	UJ	0.036	UJ	0.04	UJ	0.035	UJ	0.039	UJ
Acrolein	0.019	UJ	0.024	UJ	0.018	UJ	0.02	UJ	0.017	UJ	0.019	UJ
Benzene	0.0039	UJ	0.0109	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Benzyl Chloride	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Carbon disulfide	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Chloroform	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Cymene	0.0039	UJ	0.0017	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Ethylbenzene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.0028	J	0.0035	UJ	0.0039	UJ
Hexane	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Isopropylbenzene	0.0039	UJ	0.195	J	0.0036	UJ	0.003	J	0.0035	UJ	0.0039	UJ
m,p-Xylene (2)	0.0078	UJ	0.0096	UJ	0.0072	UJ	0.008	UJ	0.007	UJ	0.0078	UJ
Methylene chloride	0.0078	UJ	0.0096	UJ	0.0072	UJ	0.008	UJ	0.007	UJ	0.0078	UJ
Naphthalene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
n-Propylbenzene	0.0039	UJ	0.153	J	0.0036	UJ	0.0011	J	0.0035	UJ	0.0039	UJ
o-Xylene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.00087	J	0.0035	UJ	0.0039	UJ
Sec-Butylbenzene	0.0039	UJ	0.0701	J	0.0036	UJ	0.0018	J	0.0035	UJ	0.0039	UJ
Tert-butyl benzene	0.0039	UJ	0.005	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Toluene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Trichloroethene	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
TPH-GRO (C6-C10)	4.8	U	410		4.4	U	4.6	U	4.2	U	4.2	U
TPH (C10-C28)	10	U	30.7		9.4	U	10	U	9.4	U	9.4	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-16 03/22/2011 22 20 to 22 SD27-DPT-16D N		SD27-DPT-17 03/22/2011 10 8 to 10 SD27-DPT-17A N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-17B N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP05 FD		SD27-DPT-17 03/22/2011 17 15 to 17 SD27-DPT-17C N		SD27-DPT-17 03/22/2011 22 20 to 22 SD27-DPT-17D N	
Parameter												
1,1-Dichloroethene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
1,2,4-Trimethylbenzene	0.0041	UJ	0.0039	UJ	18.3	J	9.47	J	0.0016	J	0.0041	UJ
1,3,5-Trimethylbenzene	0.0041	UJ	0.0039	UJ	6.63	J	4.16	J	0.0041	UJ	0.0041	UJ
n-Butylbenzene	0.0041	UJ	0.0039	UJ	0.6	J	0.413	J	0.0041	UJ	0.0041	UJ
4-Methyl-2-pentanone	0.02	UJ	0.019	UJ	1.1	UJ	1.3	UJ	0.02	UJ	0.02	UJ
Acetone	0.041	UJ	0.039	UJ	2.21	J	2.6	UJ	0.041	UJ	0.041	UJ
Acrolein	0.02	UJ	0.019	UJ	1.1	UJ	1.3	UJ	0.02	UJ	0.02	UJ
Benzene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Benzyl Chloride	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Carbon disulfide	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Chloroform	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Cymene	0.0041	UJ	0.0039	UJ	6.56	J	4.37	J	0.0041	UJ	0.0041	UJ
Ethylbenzene	0.0041	UJ	0.0039	UJ	7.84	J	3.93	J	0.0041	UJ	0.0041	UJ
Hexane	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Isopropylbenzene	0.0041	UJ	0.0039	UJ	3.21	J	2.01	J	0.0041	UJ	0.0041	UJ
m,p-Xylene (2)	0.0081	UJ	0.0077	UJ	0.423	J	0.185	J	0.0081	UJ	0.0081	UJ
Methylene chloride	0.0081	UJ	0.0077	UJ	0.45	UJ	0.52	UJ	0.0081	UJ	0.0081	UJ
Naphthalene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
n-Propylbenzene	0.0041	UJ	0.0039	UJ	3.34	J	1.94	J	0.0041	UJ	0.0041	UJ
o-Xylene	0.0041	UJ	0.0039	UJ	0.37	J	0.17	J	0.0041	UJ	0.0041	UJ
Sec-Butylbenzene	0.0041	UJ	0.0039	UJ	1.36	J	0.836	J	0.0041	UJ	0.0041	UJ
Tert-butyl benzene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Toluene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
Trichloroethene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ
TPH-GRO (C6-C10)	4.6	U	5.2	U	1070		869		4.5	U	4.7	U
TPH (C10-C28)	9.3	U	10	U	29.8		26.3		9.5	U	9.5	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-18 03/22/2011 10 8 to 10 SD27-DPT-18A N		SD27-DPT-18 03/22/2011 13 11 to 13 SD27-DPT-18B N		SD27-DPT-18 03/22/2011 17 15 to 17 SD27-DPT-18C N		SD27-DPT-18 03/22/2011 25 23 to 25 SD27-DPT-18D N		SD27-DPT-19 03/22/2011 10 8 to 10 SD27-DPT-19A N		SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-19B N	
Parameter												
1,1-Dichloroethene	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
1,2,4-Trimethylbenzene	0.271	J	**71**	J	22.1	J	0.0057	UJ	2.17	J	58.8	J
1,3,5-Trimethylbenzene	0.22	J	24.3	J	9.43	J	0.0057	UJ	1.09	J	26.4	J
n-Butylbenzene	0.0721	J	12.2	J	1.79	J	0.0057	UJ	0.264	J	6.93	J
4-Methyl-2-pentanone	1.3	UJ	11	UJ	10	UJ	0.028	UJ	1.2	UJ	12	UJ
Acetone	2.6	UJ	22	UJ	40.4	J	0.057	UJ	2.5	UJ	23	UJ
Acrolein	1.3	UJ	11	UJ	10	UJ	0.028	UJ	1.2	UJ	12	UJ
Benzene	0.109	J	9.27	J	1.17	J	0.0057	UJ	0.25	UJ	2.3	UJ
Benzyl Chloride	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
Carbon disulfide	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
Chloroform	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
Cymene	0.116	J	8.21	J	23.1	J	0.0057	UJ	0.298	J	6.4	J
Ethylbenzene	0.081	J	**76**	J	0.578	J	0.0057	UJ	0.232	J	9.18	J
Hexane	0.26	UJ	21.8	J	2	UJ	0.0057	UJ	0.25	UJ	17	J
Isopropylbenzene	0.26	UJ	20.5	J	8.81	J	0.0057	UJ	0.373	J	12.4	J
m,p-Xylene [(2)]	0.52	UJ	111	J	4	UJ	0.011	UJ	1.19	J	52.2	J
Methylene chloride	0.52	UJ	4.4	UJ	4	UJ	0.011	UJ	0.5	UJ	4.7	UJ
Naphthalene	0.26	UJ	12.3	J	2	UJ	0.0057	UJ	0.259	J	6.59	J
n-Propylbenzene	0.26	UJ	26.7	J	13.5	J	0.0057	UJ	0.419	J	14.1	J
o-Xylene	0.0929	J	53.9	J	2	UJ	0.0057	UJ	0.903	J	30.1	J
Sec-Butylbenzene	0.26	UJ	10.6	J	14.8	J	0.0057	UJ	0.328	J	8.11	J
Tert-butyl benzene	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
Toluene	0.0697	J	52.9	J	2	UJ	0.0057	UJ	0.25	UJ	0.939	J
Trichloroethene	0.26	UJ	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ
TPH-GRO (C6-C10)	61.9	J	4680	J	479		6.8	U	231	J	4130	J
TPH (C10-C28)	10	U	**881**		376		9.5	U	332		132	J

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP06 FD		SD27-DPT-19 03/22/2011 20 18 to 20 SD27-DPT-19C N		SD27-DPT-19 03/22/2011 25 23 to 25 SD27-DPT-19D N		SD27-DPT-20 03/23/2011 9 7 to 9 SD27-DPT-20A N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-20B N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-DUP07 FD	
Parameter												
1,1-Dichloroethene	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
1,2,4-Trimethylbenzene	40	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.174	J	1.91	J
1,3,5-Trimethylbenzene	18.4	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.121	J	1.24	J
n-Butylbenzene	5.08	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0039	J	0.0065	J
4-Methyl-2-pentanone	5.6	UJ	0.02	UJ	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ
Acetone	11	UJ	0.04	UJ	0.04	UJ	0.043	UJ	0.041	UJ	0.038	UJ
Acrolein	5.6	UJ	0.02	UJ	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ
Benzene	1.1	UJ	0.006	J	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Benzyl Chloride	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Carbon disulfide	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0054	J	0.0096	J
Chloroform	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Cymene	4.96	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0388	J	0.05	J
Ethylbenzene	6.47	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0206	J	0.038	J
Hexane	6.02	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Isopropylbenzene	8.89	J	0.0037	J	0.0027	J	0.0043	UJ	0.0465	J	0.0644	J
m,p-Xylene (2)	36	J	0.008	UJ	0.008	UJ	0.0087	UJ	0.0082	UJ	0.0076	UJ
Methylene chloride	2.3	UJ	0.008	UJ	0.008	UJ	0.0087	UJ	0.0082	UJ	0.0076	UJ
Naphthalene	4.66	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
n-Propylbenzene	9.9	J	0.002	J	0.004	UJ	0.0043	UJ	0.0395	J	0.0519	J
o-Xylene	20.5	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0019	J	0.0047	J
Sec-Butylbenzene	5.82	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0336	J	0.045	J
Tert-butyl benzene	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Toluene	0.772	J	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
Trichloroethene	1.1	UJ	0.004	UJ	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ
TPH-GRO (C6-C10)	3830	J	4.5	U	4.7	U	4	U	651	J	206	J
TPH (C10-C28)	**883**	J	9.5	U	9.2	U	9.4	U	15.8		17.4	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-20 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-20C N		SD27-DPT-20 03/23/2011 25 23 to 25 SD27-DPT-20D N		SD27-DPT-21 03/23/2011 10 8 to 10 SD27-DPT-21A N		SD27-DPT-21 03/23/2011 14 12 to 14 SD27-DPT-21B N		SD27-DPT-21 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-21C N		SD27-DPT-22 03/23/2011 10 8 to 10 SD27-DPT-22A N	
Parameter												
1,1-Dichloroethene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
1,2,4-Trimethylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0972	
1,3,5-Trimethylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0376	
n-Butylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0037	
4-Methyl-2-pentanone	0.019	U	0.018	U	0.021	U	0.024	U	0.016	U	0.018	U
Acetone	0.038	U	0.037	U	0.041	U	0.048	U	0.032	U	0.036	U
Acrolein	0.019	UJ	0.018	UJ	0.021	UJ	0.024	UJ	0.016	UJ	0.018	UJ
Benzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
Benzyl Chloride	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
Carbon disulfide	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0066	
Chloroform	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
Cymene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0158	
Ethylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0251	
Hexane	0.0038	UJ	0.0037	UJ	0.0041	UJ	0.0048	UJ	0.0032	U	0.0036	UJ
Isopropylbenzene	0.0038	U	0.0026	J	0.0041	U	0.0048	U	0.0015	J	0.0232	
m,p-Xylene (2)	0.0076	U	0.0074	U	0.0082	U	0.0095	U	0.0063	U	0.0189	
Methylene chloride	0.0076	U	0.0074	U	0.0082	U	0.0095	U	0.0063	U	0.0072	U
Naphthalene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	UJ
n-Propylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0257	
o-Xylene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0083	
Sec-Butylbenzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0206	
Tert-butyl benzene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
Toluene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
Trichloroethene	0.0038	U	0.0037	U	0.0041	U	0.0048	U	0.0032	U	0.0036	U
TPH-GRO (C6-C10)	3.7	U	3.8	U	5.5	U	4.2	U	4.3	U	308	
TPH (C10-C28)	9.5	U	8.9	U	9.8	U	9.4	U	9.6	U	9.9	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-22 03/23/2011 14.5 12.5 to 14.5 SD27-DPT-22B N		SD27-DPT-22 03/23/2011 17 15 to 17 SD27-DPT-22C N		SD27-DPT-23 03/23/2011 10 8 to 10 SD27-DPT-23A N		SD27-DPT-23 03/23/2011 15 12 to 15 SD27-DPT-23B N		SD27-DPT-24 03/23/2011 10 8 to 10 SD27-DPT-24A N		SD27-DPT-24 03/23/2011 12 10 to 12 SD27-DPT-24B N	
Parameter												
1,1-Dichloroethene	0.22	U	0.0012	J	0.0038	U	0.0039	U	0.0039	U	0.24	U
1,2,4-Trimethylbenzene	**79.8**		0.0053	UJ	0.0038	U	0.0039	U	0.0039	U	7.63	
1,3,5-Trimethylbenzene	27		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	5.98	
n-Butylbenzene	10.9	J	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.861	
4-Methyl-2-pentanone	1.1	U	0.02	UJ	0.019	U	0.02	U	0.02	U	1.2	U
Acetone	2.2	U	0.04	UJ	0.038	U	0.039	U	0.039	U	2.4	U
Acrolein	1.1	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.02	U	1.2	U
Benzene	0.465		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Benzyl Chloride	0.22	U	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Carbon disulfide	0.22	U	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Chloroform	0.22	U	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Cymene	7.61	J	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	2.9	
Ethylbenzene	41.9		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Hexane	0.22	UJ	0.004	UJ	0.0038	UJ	0.0039	UJ	0.0039	UJ	0.24	UJ
Isopropylbenzene	15.6	J	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	3.48	
m,p-Xylene (2)	114		0.008	UJ	0.0076	U	0.0079	U	0.0079	U	0.47	U
Methylene chloride	0.44	U	0.008	UJ	0.0076	U	0.0079	U	0.0079	U	0.47	U
Naphthalene	0.603		0.004	UJ	0.0038	U	0.0039	U	0.0055	U	0.133	J
n-Propylbenzene	21		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	3.39	
o-Xylene	46.6		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Sec-Butylbenzene	10.3	J	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	4.03	
Tert-butyl benzene	0.22	U	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Toluene	26.9		0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
Trichloroethene	0.22	U	0.004	UJ	0.0038	U	0.0039	U	0.0039	U	0.24	U
TPH-GRO (C6-C10)	3290	J	4.6	U	4.9	U	4.1	U	5.3	U	2130	
TPH (C10-C28)	306		9.1	U	9.4	U	9.5	U	9.4	U	455	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-24 03/23/2011 17 15 to 17 SD27-DPT-24C N		SD27-DPT-25 03/23/2011 10 8 to 10 SD27-DPT-25A N		SD27-DPT-25 03/23/2011 15 12 to 15 SD27-DPT-25B N		SD27-DPT-26 03/23/2011 10 8 to 10 SD27-DPT-26A N		SD27-DPT-26 03/23/2011 15 12.5 to 15 SD27-DPT-26B N		SD27-DPT-27 03/23/2011 10 8 to 10 SD27-DPT-27A N	
Parameter												
1,1-Dichloroethene	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
1,2,4-Trimethylbenzene	0.0039	U	20.9		0.0045		0.0045	U	0.0037	U	0.0038	U
1,3,5-Trimethylbenzene	0.0039	U	7.54		0.0018	J	0.0045	U	0.0037	U	0.0038	U
n-Butylbenzene	0.0039	U	1.53		0.0038	U	0.0045	U	0.0037	U	0.0038	U
4-Methyl-2-pentanone	0.02	U	1.2	U	0.019	U	0.023	U	0.019	U	0.019	U
Acetone	0.039	U	2.4	U	0.038	U	0.045	U	0.037	UJ	0.038	U
Acrolein	0.02	UJ	1.2	UJ	0.019	UJ	0.023	U	0.019	UJ	0.019	U
Benzene	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
Benzyl Chloride	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	UJ	0.0038	U
Carbon disulfide	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
Chloroform	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
Cymene	0.0039	U	2.8		0.0038	U	0.0045	U	0.0037	U	0.0038	U
Ethylbenzene	0.0039	U	4.2		0.0015	J	0.0045	U	0.0037	U	0.0038	U
Hexane	0.0039	UJ	0.24	UJ	0.0038	U	0.0045	U	0.0037	UJ	0.0038	U
Isopropylbenzene	0.0039	U	2.6		0.0011	J	0.0045	U	0.0037	U	0.0038	U
m,p-Xylene (2)	0.0078	U	9.28		0.0047	J	0.0091	U	0.0075	U	0.0076	U
Methylene chloride	0.0078	U	0.47	U	0.0077	U	0.0091	U	0.0075	U	0.0052	J
Naphthalene	0.0039	U	3.27		0.0017	J	0.0045	U	0.0037	U	0.0038	U
n-Propylbenzene	0.0039	U	2.83		0.0038	U	0.0045	U	0.0037	U	0.0038	U
o-Xylene	0.0039	U	6.64		0.0023	J	0.0045	U	0.0037	U	0.0038	U
Sec-Butylbenzene	0.0039	U	2.48		0.0038	U	0.0045	U	0.0037	U	0.0038	U
Tert-butyl benzene	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
Toluene	0.0039	U	1.35		0.0038	U	0.0045	U	0.0037	U	0.0038	U
Trichloroethene	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U	0.0038	U
TPH-GRO (C6-C10)	4.9	U	1450		4.6	U	4.5	U	4.8	U	4.4	U
TPH (C10-C28)	9.9	U	449		9.9	U	9.6	U	9.6	U	9.6	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-27 03/23/2011 15 12.5 to 15 SD27-DPT-27B N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-28A N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-DUP08 FD		SD27-DPT-28 03/23/2011 15 12.5 to 15 SD27-DPT-28B N		SD27-DPT-28 03/23/2011 20 18 to 20 SD27-DPT-28C N		SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-29A N	
Parameter												
1,1-Dichloroethene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
1,2,4-Trimethylbenzene	0.004	U	0.0034	U	0.0041	U	5.43		0.0029	U	14.7	
1,3,5-Trimethylbenzene	0.004	U	0.0034	U	0.0041	U	2.35		0.0029	U	6.76	
n-Butylbenzene	0.004	U	0.0011	J	0.0014	J	0.238		0.0029	U	1.88	
4-Methyl-2-pentanone	0.02	U	0.017	U	0.02	U	0.97	U	0.014	U	5.4	UJ
Acetone	0.04	U	0.0716	J	0.0388	J	2.81		0.029	U	6.7	J
Acrolein	0.02	U	0.017	UJ	0.02	UJ	2.29		0.014	U	5.4	U
Benzene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Benzyl Chloride	0.004	U	0.0034	UJ	0.0041	UJ	0.19	U	0.0029	U	1.1	U
Carbon disulfide	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Chloroform	0.004	U	0.0034	U	0.0041	U	0.156	J	0.0029	U	0.335	J
Cymene	0.004	U	0.0034	U	0.0041	U	0.735		0.0029	U	2.35	
Ethylbenzene	0.004	U	0.0104		0.0093		2.65		0.0029	U	2.51	
Hexane	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Isopropylbenzene	0.004	U	0.0283	J	0.0299	J	1.53		0.0029	U	3.85	
m,p-Xylene (2)	0.008	U	0.0067	U	0.0081	U	1.22		0.0058	U	2.1	U
Methylene chloride	0.0053	J	0.0042	J	0.0081	U	0.39	U	0.0058	U	2.1	U
Naphthalene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.35	
n-Propylbenzene	0.004	U	0.0053		0.0074		1.61		0.0029	U	4.91	
o-Xylene	0.004	U	0.0034	U	0.0041	U	1.24		0.0029	U	1.2	
Sec-Butylbenzene	0.004	U	0.008		0.0087		0.807		0.0029	U	2.69	
Tert-butyl benzene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Toluene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Trichloroethene	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
TPH-GRO (C6-C10)	4.9	U	4.6	U	4.3	U	435	J	3.9	U	929	J
TPH (C10-C28)	10	U	9.9	U	9.9	U	87.9		9.5	U	314	

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact Risk VOCs and TPH Site SD-27, Holloman AFB

	SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-DUP09 FD		SD27-DPT-29 03/23/2011 15 12.5 to 15 SD27-DPT-29B N		SD27-DPT-30 03/23/2011 12 10 to 12 SD27-DPT-30A N		SD27-DPT-31 03/23/2011 12 10 to 12 SD27-DPT-31A N		SD27-DPT-31 03/23/2011 15 13 to 15 SD27-DPT-31B N	
Parameter										
1,1-Dichloroethene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
1,2,4-Trimethylbenzene	13.3		0.0034	U	0.0039	U	0.364		0.0036	U
1,3,5-Trimethylbenzene	5.54		0.0034	U	0.0039	U	0.152	J	0.0036	U
n-Butylbenzene	1.73		0.0034	U	0.0039	U	0.2	U	0.0036	U
4-Methyl-2-pentanone	14.8	J	0.017	U	0.02	U	1	U	0.018	U
Acetone	2.2	U	0.034	U	0.039	U	2	U	0.036	U
Acrolein	1.1	U	0.017	U	0.02	U	1	U	0.018	U
Benzene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Benzyl Chloride	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Carbon disulfide	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Chloroform	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Cymene	1.92		0.0034	U	0.0039	U	0.0671	J	0.0036	U
Ethylbenzene	1.86		0.0034	U	0.0039	U	0.102	J	0.0036	U
Hexane	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Isopropylbenzene	3.26		0.0034	U	0.0039	U	0.107	J	0.0036	U
m,p-Xylene [(2)]	0.44	U	0.0068	U	0.0078	U	0.41	U	0.0073	U
Methylene chloride	0.44	U	0.0068	U	0.0078	U	0.41	U	0.0073	U
Naphthalene	1.02		0.0034	U	0.0039	U	0.2	U	0.0036	U
n-Propylbenzene	4.37		0.0034	U	0.0039	U	0.141	J	0.0036	U
o-Xylene	0.889		0.0034	U	0.0039	U	0.2	U	0.0036	U
Sec-Butylbenzene	2.37		0.0034	U	0.0039	U	0.102	J	0.0036	U
Tert-butyl benzene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Toluene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Trichloroethene	0.22	U	0.0017	J	0.0039	U	0.2	U	0.0018	J
TPH-GRO (C6-C10)	832	J	4.2	U	4.1	U	75.8		4.7	U
TPH (C10-C28)	296		9.7	U	9.3	U	47.8		9.4	U

Table A-12. Screening ACM Chemicals Detected in Soil for Direct Contact
Risk VOCs and TPH
Site SD-27, Holloman AFB

All units are milligram per kilogram (mg/kg)

(1) NMED Soil Screening Levels: NEW MEXICO ENVIRONMENT DEPARTMENT Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Table A-1, TECHNICAL BACKGROUND DOCUMENT FOR DEVELOPMENT OF SOIL SCREENING LEVELS, REVISION 5.0, July 2009. Underlined criteria taken from EPA June 2011 RSL table.

(2) p-Xylene criteria used for m,p-xylenes

Red indicates > Residential SSLs for direct contact

Underline indicates > Commerical/Industrial SSLs for direct contact

Yellow shade indicates > Construction Worker SSLs for direct contact

n/a - not applicable

NA - not analyzled

Reference: (TetraTech, 2012)

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

		Location:	SD27-DPT-01		SD27-DPT-01		SD27-DPT-02		SD27-DPT-03		SD27-DPT-04		SD27-DPT-05	
		Collection Date:	11/09/2010		11/09/2010		11/09/2010		11/09/2010		11/09/2010		11/09/2010	
		Depth (ft):	8.5		10.7		8.5		8.5		8.5		8.5	
		Depth Range (ft):	6.5 to 8.5		10 to 10.7		6.5 to 8.5		6.5 to 8.5		6.5 to 8.5		6.5 to 8.5	
		SampleID:	SD27-DPT-01AV		SD27-DPT-01BV		SD27-DPT-02AV		SD27-DPT-03AV		SD27-DPT-04AV		SD27-DPT-05AV	
		QCType:	N		N		N		N		N		N	
Parameter	VI [1]													
	(10^{-6})	(10^{-5})												
1,1-Dichloroethene	0.295	0.295	0.0011	U	0.065	U	0.1	U	0.33	U	0.41	U	0.001	U
1,2,4-Trimethylbenzene	0.662	0.662	0.00083	U	**2.08**		**2.12**		**40.1**		**41.3**		0.00079	U
1,3,5-Trimethylbenzene	0.694	0.694	0.00099	U	**0.732**		0.095	U	**16.8**		**16.9**		0.00094	U
n-Butylbenzene	6.22	6.22	0.00099	U	0.173	J	0.12	J	5.16		1.64		0.00094	U
4-Methyl-2-pentanone	263	262.7	0.0042	U	0.25	U	0.4	U	1.3	U	1.6	U	0.004	U
Acetone	61.1	61.1	0.015	R	0.93	R	1.5	R	4.7	R	5.8	R	0.014	R
Acrolein	0.00128	0.0013	0.0083	UJ	0.51	UJ	0.8	UJ	2.6	UJ	3.2	U	0.0079	UJ
Benzene	0.00175	0.018	0.0011	U	**0.142**	J	**0.232**	J	**5.05**		**12.6**		0.0011	U
Benzyl Chloride	0.00417	0.042	0.0011	U	0.069	U	0.11	U	0.35	U	0.44	U	0.0011	U
Carbon disulfide	0.79	0.79	0.0015	U	0.093	U	0.15	U	**0.96**	J	0.58	U	0.0014	U
Chloroform	0.00063	0.0063	0.00091	U	0.056	U	0.088	U	0.28	U	0.35	U	0.00087	U
Cymene	n/a	n/a	0.00091	U	2.63		0.144	J	5.17		4.12		0.00087	U
Ethylbenzene	21.7	21.7	0.00076	U	0.657		0.474		15		13.2		0.00072	U
Hexane	0.068	0.068	0.0014	UJ	0.088	UJ	0.14	UJ	**5.82**	J	**2.62**	J	0.0014	UJ
Isopropylbenzene	7.13	7.13	0.00083	U	0.356		0.341	J	5.87		3.49		0.00079	U
m,p-Xylene [2]	2.37	2.37	0.0017	U	1.21		0.626	J	**46.3**		**46.9**		0.0016	U
Methylene chloride	0.027	0.27	0.0076	U	0.46	U	0.73	U	2.3	U	5.63	U	0.0072	U
Naphthalene	6.58	6.58	0.0015	U	0.108	J	0.15	U	5.43		5.53		0.0014	U
n-Propylbenzene	3.82	3.82	0.0011	U	0.396		0.388		**6.53**		2.15		0.001	U
o-Xylene	3.16	3.16	0.00076	U	0.49		0.0902	J	**17.1**		**18.8**		0.00072	U
Sec-Butylbenzene	19.4	19.4	0.0012	U	0.25		0.186	J	5.95		3.23		0.0012	U
Tert-butyl benzene	4.47	4.47	0.00091	U	0.056	U	0.088	U	0.28	U	0.47	J	0.00087	U
Toluene	5.07	5.07	0.00091	U	0.166	J	0.088	U	**18.1**		**36.6**		0.00087	U
Trichloroethene	0.00016	0.0016	0.00091	U	0.056	U	0.088	U	0.28	U	0.35	U	0.00087	U
TPH-GRO (C6-C10)	n/a	n/a	2.5	U	179	J	112		2940	J	1590		2.3	U
TPH (C10-C28)	n/a	n/a	4.6	U	15.3		12		469		606		4.6	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-05 11/09/2010 12 10 to 12 SD27-DPT-05BV N		SD27-DPT-06 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-06AV N		SD27-DPT-06 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-DUP01V FD		SD27-DPT-07 11/09/2010 8.5 6.5 to 8.5 SD27-DPT-07AV N		SD27-DPT-08 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-08AV N		SD27-DPT-08 11/10/2010 15 10 to 15 SD27-DPT-08BV N	
Parameter												
1,1-Dichloroethene	0.14	U	0.0012	U	0.0012	U	0.0012	U	0.15	U	1.4	U
1,2,4-Trimethylbenzene	**9.33**		0.00093	U	0.00097	U	0.00092	U	**13.8**		**105**	
1,3,5-Trimethylbenzene	**3.29**		0.0011	U	0.0011	U	0.0011	U	**9.2**		**33.9**	
n-Butylbenzene	0.704		0.0011	U	0.0011	U	0.0011	U	0.291	J	**17.2**	
4-Methyl-2-pentanone	0.54	U	0.0046	U	0.0049	U	0.0046	U	0.58	U	5.5	U
Acetone	2	R	0.017	R	0.024	J	0.0173	J	2.1	U	20	UJ
Acrolein	1.1	UJ	0.0093	U	0.0097	UJ	0.0092	UJ	1.2	U	11	U
Benzene	**4.8**		**0.0036**	J	**0.0086**	J	**0.0054**		**1.2**		**23.7**	
Benzyl Chloride	0.15	U	0.0013	U	0.0013	U	0.0013	U	0.16	U	1.5	U
Carbon disulfide	0.2	U	0.0036	J	0.0018	U	0.0017	U	0.225	J	2	U
Chloroform	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U	1.2	U
Cymene	3.33		0.001	U	0.0011	U	0.001	U	2.26		12.1	
Ethylbenzene	9.53		0.00088	J	0.0012	J	0.00084	U	5.4		**107**	J
Hexane	0.19	UJ	0.0016	UJ	0.0017	UJ	0.0016	UJ	**0.436**	J	**22.7**	
Isopropylbenzene	1.81		0.00093	U	0.0011	J	0.0047		1.05		**25.4**	J
m,p-Xylene [(2)]	**9.69**		0.0019	U	0.0019	U	0.0018	U	**17.3**		**132**	
Methylene chloride	0.45	U	0.0084	U	0.0088	U	0.0084	U	0.48	U	4.6	U
Naphthalene	1.3		0.0017	U	0.0018	U	0.0017	U	1.78		**20.1**	
n-Propylbenzene	2.12		0.0012	U	0.0012	U	0.003	J	0.49	J	**37.3**	J
o-Xylene	**5.87**		0.00084	U	0.00088	U	0.00084	U	**7.95**		**60.9**	J
Sec-Butylbenzene	0.9		0.0014	U	0.0014	U	0.0018	J	1.33		14.8	
Tert-butyl benzene	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U	1.2	U
Toluene	**6.67**		0.001	U	0.0011	U	0.001	U	**6.95**		**93.9**	J
Trichloroethene	0.12	U	0.001	U	0.0011	U	0.001	U	0.13	U	1.2	U
TPH-GRO (C6-C10)	772	J	2.6	U	2.4	U	2.4	U	643		4400	J
TPH (C10-C28)	102		4.4	U	3.9	U	4.5	U	1360		1890	

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-08 11/10/2010 18 16.5 to 18 SD27-DPT-08CV N		SD27-DPT-08 11/10/2010 ?? 22 to ??? SD27-DPT-08DV N		SD27-DPT-09 11/10/2010 9 7 to 9 SD27-DPT-09AV N		SD27-DPT-09 11/10/2010 14 12 to 14 SD27-DPT-09BV N		SD27-DPT-09 11/10/2010 18 16 to 18 SD27-DPT-09CV N		SD27-DPT-10 11/10/2010 10 8 to 10 SD27-DPT-10AV N		SD27-DPT-10 11/10/2010 14.5 12.4 to 14.5 SD27-DPT-10BV N	
Parameter														
1,1-Dichloroethene	0.29	U	NA		0.69	U	0.69	U	0.00097	U	0.0011	U	0.61	U
1,2,4-Trimethylbenzene	**15.2**		NA		**57.6**		**87.2**		0.002	J	0.0379		**33.6**	
1,3,5-Trimethylbenzene	**5.09**		NA		**24.2**		**29.9**		0.00091	U	0.0219		**11.7**	
n-Butylbenzene	1.84		NA		5.71		**14.5**		0.00091	U	0.00098	J	3.73	
4-Methyl-2-pentanone	1.1	U	NA		2.7	U	2.7	U	0.0038	U	0.0041	U	2.4	U
Acetone	4.1	U	NA		9.8	U	9.8	U	0.014	U	0.015	U	8.8	U
Acrolein	2.3	U	NA		5.4	U	5.4	U	0.0077	U	0.0083	U	4.8	U
Benzene	**1.37**		NA		**2.91**		**2.97**		**0.0028**	J	**0.0109**		0.66	U
Benzyl Chloride	0.31	U	NA		0.74	U	**1.6**	J	0.001	U	0.0011	U	0.66	U
Carbon disulfide	0.41	U	NA		0.98	U	0.98	U	0.0018	J	0.0024	J	0.88	U
Chloroform	0.25	U	NA		0.59	U	0.59	U	0.00084	U	0.0009	U	0.53	U
Cymene	1.85		NA		8.4		10.8		0.00084	U	0.004		3.1	
Ethylbenzene	16.8		NA		**36.4**		**76.1**		0.0042		0.0029	J	**43.6**	
Hexane	**1.07**		NA		**0.931**	J	**5.44**		0.0013	U	0.0014	U	**1.88**	J
Isopropylbenzene	3.73		NA		**9.58**		**23.3**		0.00077	U	0.0075		**8.91**	
m,p-Xylene [(2)]	**17.3**		NA		**69.2**		**73.2**		0.003	J	0.0085		**60.2**	
Methylene chloride	0.95	U	NA		2.3	U	2.3	U	0.009	U	0.0103	U	2	U
Naphthalene	2.63		NA		**8.31**		2.9		0.0014	U	0.0015	U	3.19	
n-Propylbenzene	**5.67**		NA		**12.2**		**34.4**		0.00097	U	0.0059		**11.7**	
o-Xylene	**8.21**		NA		**34.4**		**39.4**		0.002	J	0.00075	U	**24.9**	
Sec-Butylbenzene	2.15		NA		6.84		14.1		0.0011	U	0.0057		4.32	
Tert-butyl benzene	0.25	U	NA		0.614	J	0.728	J	0.00084	U	0.0009	U	0.53	U
Toluene	**9.46**		NA		**37**		**8.79**		0.0014	J	0.0009	U	**10.2**	
Trichloroethene	0.25	U	NA		0.59	U	0.59	U	0.00084	U	0.0009	U	0.53	U
TPH-GRO (C6-C10)	863	J	NA		1480		2540	J	2.3	U	2.4	U	1970	J
TPH (C10-C28)	146		4	U	760		2870		3.9	U	1970		1150	

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-10 11/10/2010 19 17 to 19 SD27-DPT-10CV N		SD27-DPT-11 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-11AV N		SD27-DPT-11 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-DUP03V FD		SD27-DPT-11 11/10/2010 12 10 to 12 SD27-DPT-11BV N		SD27-DPT-11 11/10/2010 19.7 18 to 19.7 SD27-DPT-11CV N		SD27-DPT-12 11/10/2010 8.5 6.5 to 8.5 SD27-DPT-12AV N		SD27-DPT-12 11/10/2010 13.5 11.5 to 13.5 SD27-DPT-12BV N	
Parameter														
1,1-Dichloroethene	0.061	U	0.0011	U	0.0012	U	1.4	U	0.056	U	0.0011	U	0.68	U
1,2,4-Trimethylbenzene	**4.46**		0.00083	U	0.00096	U	**166**		**4.73**		0.00085	U	**56.5**	
1,3,5-Trimethylbenzene	**1.58**		0.00099	U	0.0011	U	**56.8**		**1.82**		0.001	U	**19.6**	
n-Butylbenzene	0.493		0.00099	U	0.0011	U	**24.1**		0.309		0.001	U	**8.14**	
4-Methyl-2-pentanone	0.24	U	0.0042	U	0.0048	U	5.5	U	0.22	U	0.0042	U	2.7	U
Acetone	0.87	U	0.015	U	0.017	U	20	U	0.8	U	0.015	U	9.8	U
Acrolein	0.48	U	0.0083	U	0.0096	U	11	UJ	0.44	U	0.0085	U	5.4	U
Benzene	0.065	U	0.0011	U	0.0013	U	**60.6**		**0.321**		0.0012	U	**4.22**	
Benzyl Chloride	0.065	U	0.0011	U	0.0013	U	1.5	U	0.06	U	0.0012	U	0.73	U
Carbon disulfide	0.087	U	0.0015	U	0.0017	U	2	U	0.08	U	0.0015	U	0.98	U
Chloroform	0.052	U	0.00091	U	0.001	U	1.2	U	0.048	U	0.00092	U	0.59	U
Cymene	0.511		0.00091	U	0.001	U	17.7		0.474		0.00092	U	28.4	
Ethylbenzene	2.18		0.00076	U	0.00087	U	**190**		4.67		0.00077	U	**73.7**	
Hexane	**0.0882**	J	0.0014	U	0.0017	U	**69.2**	J	**0.163**	J	0.0015	U	**10**	
Isopropylbenzene	1.32		0.00083	U	0.00096	U	**44.6**		1.45		0.00085	U	**16.2**	
m,p-Xylene [(2)]	1.1		0.0017	U	0.0019	U	**257**		0.512		0.0017	U	**105**	
Methylene chloride	0.43	U	0.0035	U	0.004	U	4.6	U	0.4	U	0.0088	U	2.2	U
Naphthalene	0.261		0.0015	U	0.0017	U	**32.9**		0.08	U	0.0015	U	**8.45**	
n-Propylbenzene	2		0.0011	U	0.0012	U	**57.7**		1.71		0.0011	U	**21.1**	
o-Xylene	0.45		0.00076	U	0.00087	U	**129**		0.248		0.00077	U	**44.1**	
Sec-Butylbenzene	0.911		0.0012	U	0.0014	U	**23.2**		0.775		0.0012	U	7.41	
Tert-butyl benzene	0.052	U	0.00091	U	0.001	U	1.25	J	0.048	U	0.00092	U	0.59	U
Toluene	0.293		0.00091	U	0.001	U	**152**		0.256		0.00092	U	**67.7**	
Trichloroethene	0.052	U	0.00091	U	0.001	U	1.2	U	0.048	U	0.00092	U	0.59	U
TPH-GRO (C6-C10)	418	J	2.3	U	2.8	U	7040	J	437	J	2.6	U	3600	J
TPH (C10-C28)	16.7		4.2	U	3.8	U	586		4.3	U	4.4	U	5690	

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-12 11/10/2010 19 17 to 19 SD27-DPT-12CV N		SD27-DPT-13 11/05/2010 8.5 6.5 to 8.5 SD27-DPT-13A N		SD27-DPT-13 11/05/2010 13.5 11.5 to 13.5 SD27-DPT-13B N	SD27-DPT-13 11/05/2010 18.5 16.5 to 18.5 SD27-DPT-13C N		SD27-DPT-14 03/22/2011 7 5 to 7 SD27-DPT-14A N		SD27-DPT-14 03/22/2011 12 10 to 12 SD27-DPT-14B N		SD27-DPT-14 03/22/2011 15 13 to 15 SD27-DPT-14C N	
Parameter													
1,1-Dichloroethene	0.0011	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
1,2,4-Trimethylbenzene	0.0118		NA		NA	NA		0.0046	UJ	0.0211	J	0.0017	J
1,3,5-Trimethylbenzene	0.0046		NA		NA	NA		0.0046	UJ	0.0064	J	0.0041	UJ
n-Butylbenzene	0.001	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
4-Methyl-2-pentanone	0.0043	U	NA		NA	NA		0.023	UJ	0.023	UJ	0.02	UJ
Acetone	0.016	U	NA		NA	NA		0.046	UJ	0.046	UJ	0.041	UJ
Acrolein	0.0086	U	NA		NA	NA		0.023	UJ	0.023	UJ	0.02	UJ
Benzene	0.0012	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Benzyl Chloride	0.0012	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Carbon disulfide	0.003	J	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Chloroform	0.00094	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Cymene	0.0036	J	NA		NA	NA		0.0046	UJ	0.0048	J	0.0041	UJ
Ethylbenzene	0.0048		NA		NA	NA		0.0046	UJ	0.0237	J	0.0015	J
Hexane	0.0043		NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Isopropylbenzene	0.0034	J	NA		NA	NA		0.0046	UJ	0.0063	J	0.0041	UJ
m,p-Xylene [(2)]	0.0042	J	NA		NA	NA		0.0093	UJ	0.0092	UJ	0.0082	UJ
Methylene chloride	0.0085	U	NA		NA	NA		0.0093	UJ	0.0092	UJ	0.0082	UJ
Naphthalene	0.0016	U	NA		NA	NA		0.0046	UJ	0.0049	J	0.0041	UJ
n-Propylbenzene	0.0045		NA		NA	NA		0.0046	UJ	0.0087	J	0.0041	UJ
o-Xylene	0.0017	J	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Sec-Butylbenzene	0.0037	J	NA		NA	NA		0.0046	UJ	0.0042	J	0.0041	UJ
Tert-butyl benzene	0.00094	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Toluene	0.0018	J	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
Trichloroethene	0.00094	U	NA		NA	NA		0.0046	UJ	0.0046	UJ	0.0041	UJ
TPH-GRO (C6-C10)	2.3	U	NA		NA	NA		6.3	U	5.3	U	5.8	
TPH (C10-C28)	4.2	U	3.8	U	66.9	3.7	U	4.06	J	9.6	U	9.6	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-14 03/22/2011 22 20 to 22 SD27-DPT-14D N		SD27-DPT-15 03/22/2011 7 5 to 7 SD27-DPT-15A N		SD27-DPT-15 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-15B N		SD27-DPT-15 03/22/2011 20 18 to 20 SD27-DPT-15C N		SD27-DPT-16 03/22/2011 10 8 to 10 SD27-DPT-16A N		SD27-DPT-16 03/22/2011 15 13 to 15 SD27-DPT-16B N		SD27-DPT-16 03/22/2011 17.5 15.5 to 17.5 SD27-DPT-16C N	
Parameter														
1,1-Dichloroethene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
1,2,4-Trimethylbenzene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
1,3,5-Trimethylbenzene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.0042	J	0.0035	UJ	0.0039	UJ
n-Butylbenzene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
4-Methyl-2-pentanone	0.018	UJ	0.019	UJ	0.024	UJ	0.018	UJ	0.02	UJ	0.017	UJ	0.019	UJ
Acetone	0.035	UJ	0.039	UJ	0.048	UJ	0.036	UJ	0.04	UJ	0.035	UJ	0.039	UJ
Acrolein	0.018	UJ	0.019	UJ	0.024	UJ	0.018	UJ	0.02	UJ	0.017	UJ	0.019	UJ
Benzene	0.0035	UJ	0.0039	UJ	**0.0109**	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Benzyl Chloride	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Carbon disulfide	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Chloroform	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Cymene	0.0035	UJ	0.0039	UJ	0.0017	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Ethylbenzene	0.0018	J	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.0028	J	0.0035	UJ	0.0039	UJ
Hexane	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Isopropylbenzene	0.0035	UJ	0.0039	UJ	0.195	J	0.0036	UJ	0.003	J	0.0035	UJ	0.0039	UJ
m,p-Xylene [(2)]	0.007	UJ	0.0078	UJ	0.0096	UJ	0.0072	UJ	0.008	UJ	0.007	UJ	0.0078	UJ
Methylene chloride	0.007	UJ	0.0078	UJ	0.0096	UJ	0.0072	UJ	0.008	UJ	0.007	UJ	0.0078	UJ
Naphthalene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
n-Propylbenzene	0.0035	UJ	0.0039	UJ	0.153	J	0.0036	UJ	0.0011	J	0.0035	UJ	0.0039	UJ
o-Xylene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.00087	J	0.0035	UJ	0.0039	UJ
Sec-Butylbenzene	0.0035	UJ	0.0039	UJ	0.0701	J	0.0036	UJ	0.0018	J	0.0035	UJ	0.0039	UJ
Tert-butyl benzene	0.0035	UJ	0.0039	UJ	0.005	J	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Toluene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
Trichloroethene	0.0035	UJ	0.0039	UJ	0.0048	UJ	0.0036	UJ	0.004	UJ	0.0035	UJ	0.0039	UJ
TPH-GRO (C6-C10)	5.2	U	4.8	U	410		4.4	U	4.6	U	4.2	U	4.2	U
TPH (C10-C28)	9.8	U	10	U	30.7		9.4	U	10	U	9.4	U	9.4	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-16 03/22/2011 22 20 to 22 SD27-DPT-16D N		SD27-DPT-17 03/22/2011 10 8 to 10 SD27-DPT-17A N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-17B N		SD27-DPT-17 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP05 FD		SD27-DPT-17 03/22/2011 17 15 to 17 SD27-DPT-17C N		SD27-DPT-17 03/22/2011 22 20 to 22 SD27-DPT-17D N		SD27-DPT-18 03/22/2011 10 8 to 10 SD27-DPT-18A N	
Parameter														
1,1-Dichloroethene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
1,2,4-Trimethylbenzene	0.0041	UJ	0.0039	UJ	**18.3**	J	**9.47**	J	0.0016	J	0.0041	UJ	0.271	J
1,3,5-Trimethylbenzene	0.0041	UJ	0.0039	UJ	**6.63**	J	**4.16**	J	0.0041	UJ	0.0041	UJ	0.22	J
n-Butylbenzene	0.0041	UJ	0.0039	UJ	0.6	J	0.413	J	0.0041	UJ	0.0041	UJ	0.0721	J
4-Methyl-2-pentanone	0.02	UJ	0.019	UJ	1.1	UJ	1.3	UJ	0.02	UJ	0.02	UJ	1.3	UJ
Acetone	0.041	UJ	0.039	UJ	2.21	J	2.6	UJ	0.041	UJ	0.041	UJ	2.6	UJ
Acrolein	0.02	UJ	0.019	UJ	1.1	UJ	1.3	UJ	0.02	UJ	0.02	UJ	1.3	UJ
Benzene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	**0.109**	J
Benzyl Chloride	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
Carbon disulfide	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
Chloroform	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
Cymene	0.0041	UJ	0.0039	UJ	6.56	J	4.37	J	0.0041	UJ	0.0041	UJ	0.116	J
Ethylbenzene	0.0041	UJ	0.0039	UJ	7.84	J	3.93	J	0.0041	UJ	0.0041	UJ	0.081	J
Hexane	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
Isopropylbenzene	0.0041	UJ	0.0039	UJ	3.21	J	2.01	J	0.0041	UJ	0.0041	UJ	0.26	UJ
m,p-Xylene [(2)]	0.0081	UJ	0.0077	UJ	0.423	J	0.185	J	0.0081	UJ	0.0081	UJ	0.52	UJ
Methylene chloride	0.0081	UJ	0.0077	UJ	0.45	UJ	0.52	UJ	0.0081	UJ	0.0081	UJ	0.52	UJ
Naphthalene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
n-Propylbenzene	0.0041	UJ	0.0039	UJ	3.34	J	1.94	J	0.0041	UJ	0.0041	UJ	0.26	UJ
o-Xylene	0.0041	UJ	0.0039	UJ	0.37	J	0.17	J	0.0041	UJ	0.0041	UJ	0.0929	J
Sec-Butylbenzene	0.0041	UJ	0.0039	UJ	1.36	J	0.836	J	0.0041	UJ	0.0041	UJ	0.26	UJ
Tert-butyl benzene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
Toluene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.0697	J
Trichloroethene	0.0041	UJ	0.0039	UJ	0.23	UJ	0.26	UJ	0.0041	UJ	0.0041	UJ	0.26	UJ
TPH-GRO (C6-C10)	4.6	U	5.2	U	1070		869		4.5	U	4.7	U	61.9	J
TPH (C10-C28)	9.3	U	10	U	29.8		26.3		9.5	U	9.5	U	10	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-18 03/22/2011 13 11 to 13 SD27-DPT-18B N		SD27-DPT-18 03/22/2011 17 15 to 17 SD27-DPT-18C N		SD27-DPT-18 03/22/2011 25 23 to 25 SD27-DPT-18D N		SD27-DPT-19 03/22/2011 10 8 to 10 SD27-DPT-19A N		SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-19B N		SD27-DPT-19 03/22/2011 12.5 10.5 to 12.5 SD27-DPT-DUP06 FD		SD27-DPT-19 03/22/2011 20 18 to 20 SD27-DPT-19C N	
Parameter														
1,1-Dichloroethene	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
1,2,4-Trimethylbenzene	**71**	J	**22.1**	J	0.0057	UJ	**2.17**	J	**58.8**	J	**40**	J	0.004	UJ
1,3,5-Trimethylbenzene	**24.3**	J	**9.43**	J	0.0057	UJ	**1.09**	J	**26.4**	J	**18.4**	J	0.004	UJ
n-Butylbenzene	**12.2**	J	1.79	J	0.0057	UJ	0.264	J	**6.93**	J	5.08	J	0.004	UJ
4-Methyl-2-pentanone	11	UJ	10	UJ	0.028	UJ	1.2	UJ	12	UJ	5.6	UJ	0.02	UJ
Acetone	22	UJ	40.4	J	0.057	UJ	2.5	UJ	23	UJ	11	UJ	0.04	UJ
Acrolein	11	UJ	10	UJ	0.028	UJ	1.2	UJ	12	UJ	5.6	UJ	0.02	UJ
Benzene	**9.27**	J	**1.17**	J	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	**0.006**	J
Benzyl Chloride	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
Carbon disulfide	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
Chloroform	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
Cymene	8.21	J	23.1	J	0.0057	UJ	0.298	J	6.4	J	4.96	J	0.004	UJ
Ethylbenzene	**76**	J	0.578	J	0.0057	UJ	0.232	J	9.18	J	6.47	J	0.004	UJ
Hexane	**21.8**	J	2	UJ	0.0057	UJ	0.25	UJ	**17**	J	**6.02**	J	0.004	UJ
Isopropylbenzene	**20.5**	J	**8.81**	J	0.0057	UJ	0.373	J	**12.4**	J	**8.89**	J	0.0037	J
m,p-Xylene [(2)]	**111**	J	4	UJ	0.011	UJ	1.19	J	**52.2**	J	**36**	J	0.008	UJ
Methylene chloride	4.4	UJ	4	UJ	0.011	UJ	0.5	UJ	4.7	UJ	2.3	UJ	0.008	UJ
Naphthalene	**12.3**	J	2	UJ	0.0057	UJ	0.259	J	**6.59**	J	4.66	J	0.004	UJ
n-Propylbenzene	**26.7**	J	**13.5**	J	0.0057	UJ	0.419	J	**14.1**	J	**9.9**	J	0.002	J
o-Xylene	**53.9**	J	2	UJ	0.0057	UJ	0.903	J	**30.1**	J	**20.5**	J	0.004	UJ
Sec-Butylbenzene	10.6	J	14.8	J	0.0057	UJ	0.328	J	8.11	J	5.82	J	0.004	UJ
Tert-butyl benzene	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
Toluene	**52.9**	J	2	UJ	0.0057	UJ	0.25	UJ	0.939	J	0.772	J	0.004	UJ
Trichloroethene	2.2	UJ	2	UJ	0.0057	UJ	0.25	UJ	2.3	UJ	1.1	UJ	0.004	UJ
TPH-GRO (C6-C10)	4680	J	479		6.8	U	231	J	4130	J	3830	J	4.5	U
TPH (C10-C28)	881		376		9.5	U	332		132	J	883	J	9.5	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-19 03/22/2011 25 23 to 25 SD27-DPT-19D N		SD27-DPT-20 03/23/2011 9 7 to 9 SD27-DPT-20A N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-20B N		SD27-DPT-20 03/23/2011 12.5 10.5 to 12.5 SD27-DPT-DUP07 FD		SD27-DPT-20 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-20C N		SD27-DPT-20 03/23/2011 25 23 to 25 SD27-DPT-20D N		SD27-DPT-21 03/23/2011 10 8 to 10 SD27-DPT-21A N	
Parameter														
1,1-Dichloroethene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
1,2,4-Trimethylbenzene	0.004	UJ	0.0043	UJ	0.174	J	**1.91**	J	0.0038	U	0.0037	U	0.0041	U
1,3,5-Trimethylbenzene	0.004	UJ	0.0043	UJ	0.121	J	**1.24**	J	0.0038	U	0.0037	U	0.0041	U
n-Butylbenzene	0.004	UJ	0.0043	UJ	0.0039	J	0.0065	J	0.0038	U	0.0037	U	0.0041	U
4-Methyl-2-pentanone	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ	0.019	U	0.018	U	0.021	U
Acetone	0.04	UJ	0.043	UJ	0.041	UJ	0.038	UJ	0.038	U	0.037	U	0.041	U
Acrolein	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ	0.019	UJ	0.018	UJ	0.021	UJ
Benzene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
Benzyl Chloride	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
Carbon disulfide	0.004	UJ	0.0043	UJ	0.0054	J	0.0096	J	0.0038	U	0.0037	U	0.0041	U
Chloroform	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
Cymene	0.004	UJ	0.0043	UJ	0.0388	J	0.05	J	0.0038	U	0.0037	U	0.0041	U
Ethylbenzene	0.004	UJ	0.0043	UJ	0.0206	J	0.038	J	0.0038	U	0.0037	U	0.0041	U
Hexane	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	UJ	0.0037	UJ	0.0041	UJ
Isopropylbenzene	0.0027	J	0.0043	UJ	0.0465	J	0.0644	J	0.0038	U	0.0026	J	0.0041	U
m,p-Xylene [(2)]	0.008	UJ	0.0087	UJ	0.0082	UJ	0.0076	UJ	0.0076	U	0.0074	U	0.0082	U
Methylene chloride	0.008	UJ	0.0087	UJ	0.0082	UJ	0.0076	UJ	0.0076	U	0.0074	U	0.0082	U
Naphthalene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
n-Propylbenzene	0.004	UJ	0.0043	UJ	0.0395	J	0.0519	J	0.0038	U	0.0037	U	0.0041	U
o-Xylene	0.004	UJ	0.0043	UJ	0.0019	J	0.0047	J	0.0038	U	0.0037	U	0.0041	U
Sec-Butylbenzene	0.004	UJ	0.0043	UJ	0.0336	J	0.045	J	0.0038	U	0.0037	U	0.0041	U
Tert-butyl benzene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
Toluene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
Trichloroethene	0.004	UJ	0.0043	UJ	0.0041	UJ	0.0038	UJ	0.0038	U	0.0037	U	0.0041	U
TPH-GRO (C6-C10)	4.7	U	4	U	651	J	206	J	3.7	U	3.8	U	5.5	U
TPH (C10-C28)	9.2	U	9.4	U	15.8		17.4		9.5	U	8.9	U	9.8	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-21 03/23/2011 14 12 to 14 SD27-DPT-21B N		SD27-DPT-21 03/23/2011 17.5 15.5 to 17.5 SD27-DPT-21C N		SD27-DPT-22 03/23/2011 10 8 to 10 SD27-DPT-22A N		SD27-DPT-22 03/23/2011 14.5 12.5 to 14.5 SD27-DPT-22B N		SD27-DPT-22 03/23/2011 17 15 to 17 SD27-DPT-22C N		SD27-DPT-23 03/23/2011 10 8 to 10 SD27-DPT-23A N		SD27-DPT-23 03/23/2011 15 12 to 15 SD27-DPT-23B N	
Parameter														
1,1-Dichloroethene	0.0048	U	0.0032	U	0.0036	U	0.22	U	0.0012	J	0.0038	U	0.0039	U
1,2,4-Trimethylbenzene	0.0048	U	0.0032	U	0.0972		**79.8**		0.0053	UJ	0.0038	U	0.0039	U
1,3,5-Trimethylbenzene	0.0048	U	0.0032	U	0.0376		**27**		0.004	UJ	0.0038	U	0.0039	U
n-Butylbenzene	0.0048	U	0.0032	U	0.0037		**10.9**	J	0.004	UJ	0.0038	U	0.0039	U
4-Methyl-2-pentanone	0.024	U	0.016	U	0.018	U	1.1	U	0.02	UJ	0.019	U	0.02	U
Acetone	0.048	U	0.032	U	0.036	U	2.2	U	0.04	UJ	0.038	U	0.039	U
Acrolein	0.024	UJ	0.016	UJ	0.018	UJ	1.1	UJ	0.02	UJ	0.019	UJ	0.02	UJ
Benzene	0.0048	U	0.0032	U	0.0036	U	**0.465**		0.004	UJ	0.0038	U	0.0039	U
Benzyl Chloride	0.0048	U	0.0032	U	0.0036	U	0.22	U	0.004	UJ	0.0038	U	0.0039	U
Carbon disulfide	0.0048	U	0.0032	U	0.0066		0.22	U	0.004	UJ	0.0038	U	0.0039	U
Chloroform	0.0048	U	0.0032	U	0.0036	U	0.22	U	0.004	UJ	0.0038	U	0.0039	U
Cymene	0.0048	U	0.0032	U	0.0158		7.61	J	0.004	UJ	0.0038	U	0.0039	U
Ethylbenzene	0.0048	U	0.0032	U	0.0251		**41.9**		0.004	UJ	0.0038	U	0.0039	U
Hexane	0.0048	UJ	0.0032	U	0.0036	UJ	0.22	UJ	0.004	UJ	0.0038	UJ	0.0039	UJ
Isopropylbenzene	0.0048	U	0.0015	J	0.0232		**15.6**	J	0.004	UJ	0.0038	U	0.0039	U
m,p-Xylene [(2)]	0.0095	U	0.0063	U	0.0189		**114**		0.008	UJ	0.0076	U	0.0079	U
Methylene chloride	0.0095	U	0.0063	U	0.0072	U	0.44	U	0.008	UJ	0.0076	U	0.0079	U
Naphthalene	0.0048	U	0.0032	U	0.0036	UJ	0.603		0.004	UJ	0.0038	U	0.0039	U
n-Propylbenzene	0.0048	U	0.0032	U	0.0257		**21**		0.004	UJ	0.0038	U	0.0039	U
o-Xylene	0.0048	U	0.0032	U	0.0083		**46.6**		0.004	UJ	0.0038	U	0.0039	U
Sec-Butylbenzene	0.0048	U	0.0032	U	0.0206		10.3	J	0.004	UJ	0.0038	U	0.0039	U
Tert-butyl benzene	0.0048	U	0.0032	U	0.0036	U	0.22	U	0.004	UJ	0.0038	U	0.0039	U
Toluene	0.0048	U	0.0032	U	0.0036	U	**26.9**		0.004	UJ	0.0038	U	0.0039	U
Trichloroethene	0.0048	U	0.0032	U	0.0036	U	0.22	U	0.004	UJ	0.0038	U	0.0039	U
TPH-GRO (C6-C10)	4.2	U	4.3	U	308		3290	J	4.6	U	4.9	U	4.1	U
TPH (C10-C28)	9.4	U	9.6	U	9.9	U	306		9.1	U	9.4	U	9.5	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-24 03/23/2011 10 8 to 10 SD27-DPT-24A N		SD27-DPT-24 03/23/2011 12 10 to 12 SD27-DPT-24B N		SD27-DPT-24 03/23/2011 17 15 to 17 SD27-DPT-24C N		SD27-DPT-25 03/23/2011 10 8 to 10 SD27-DPT-25A N		SD27-DPT-25 03/23/2011 15 12 to 15 SD27-DPT-25B N		SD27-DPT-26 03/23/2011 10 8 to 10 SD27-DPT-26A N		SD27-DPT-26 03/23/2011 15 12.5 to 15 SD27-DPT-26B N	
Parameter														
1,1-Dichloroethene	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
1,2,4-Trimethylbenzene	0.0039	U	**7.63**		0.0039	U	**20.9**		0.0045		0.0045	U	0.0037	U
1,3,5-Trimethylbenzene	0.0039	U	**5.98**		0.0039	U	**7.54**		0.0018	J	0.0045	U	0.0037	U
n-Butylbenzene	0.0039	U	0.861		0.0039	U	1.53		0.0038	U	0.0045	U	0.0037	U
4-Methyl-2-pentanone	0.02	U	1.2	U	0.02	U	1.2	U	0.019	U	0.023	U	0.019	U
Acetone	0.039	U	2.4	U	0.039	U	2.4	U	0.038	U	0.045	U	0.037	UJ
Acrolein	0.02	U	1.2	U	0.02	UJ	1.2	UJ	0.019	UJ	0.023	U	0.019	UJ
Benzene	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
Benzyl Chloride	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	UJ
Carbon disulfide	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
Chloroform	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
Cymene	0.0039	U	2.9		0.0039	U	2.8		0.0038	U	0.0045	U	0.0037	U
Ethylbenzene	0.0039	U	0.24	U	0.0039	U	4.2		0.0015	J	0.0045	U	0.0037	U
Hexane	0.0039	UJ	0.24	UJ	0.0039	UJ	0.24	UJ	0.0038	U	0.0045	U	0.0037	UJ
Isopropylbenzene	0.0039	U	3.48		0.0039	U	2.6		0.0011	J	0.0045	U	0.0037	U
m,p-Xylene [(2)]	0.0079	U	0.47	U	0.0078	U	**9.28**		0.0047	J	0.0091	U	0.0075	U
Methylene chloride	0.0079	U	0.47	U	0.0078	U	0.47	U	0.0077	U	0.0091	U	0.0075	U
Naphthalene	0.0055	U	0.133	J	0.0039	U	3.27		0.0017	J	0.0045	U	0.0037	U
n-Propylbenzene	0.0039	U	3.39		0.0039	U	2.83		0.0038	U	0.0045	U	0.0037	U
o-Xylene	0.0039	U	0.24	U	0.0039	U	**6.64**		0.0023	J	0.0045	U	0.0037	U
Sec-Butylbenzene	0.0039	U	4.03		0.0039	U	2.48		0.0038	U	0.0045	U	0.0037	U
Tert-butyl benzene	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
Toluene	0.0039	U	0.24	U	0.0039	U	1.35		0.0038	U	0.0045	U	0.0037	U
Trichloroethene	0.0039	U	0.24	U	0.0039	U	0.24	U	0.0038	U	0.0045	U	0.0037	U
TPH-GRO (C6-C10)	5.3	U	2130		4.9	U	1450		4.6	U	4.5	U	4.8	U
TPH (C10-C28)	9.4	U	455		9.9	U	449		9.9	U	9.6	U	9.6	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-27 03/23/2011 10 8 to 10 SD27-DPT-27A N		SD27-DPT-27 03/23/2011 15 12.5 to 15 SD27-DPT-27B N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-28A N		SD27-DPT-28 03/23/2011 10 8 to 10 SD27-DPT-DUP08 FD		SD27-DPT-28 03/23/2011 15 12.5 to 15 SD27-DPT-28B N		SD27-DPT-28 03/23/2011 20 18 to 20 SD27-DPT-28C N		SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-29A N	
Parameter														
1,1-Dichloroethene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
1,2,4-Trimethylbenzene	0.0038	U	0.004	U	0.0034	U	0.0041	U	**5.43**		0.0029	U	**14.7**	
1,3,5-Trimethylbenzene	0.0038	U	0.004	U	0.0034	U	0.0041	U	**2.35**		0.0029	U	**6.76**	
n-Butylbenzene	0.0038	U	0.004	U	0.0011	J	0.0014	J	0.238		0.0029	U	1.88	
4-Methyl-2-pentanone	0.019	U	0.02	U	0.017	U	0.02	U	0.97	U	0.014	U	5.4	UJ
Acetone	0.038	U	0.04	U	0.0716	J	0.0388	J	2.81		0.029	U	6.7	J
Acrolein	0.019	U	0.02	U	0.017	UJ	0.02	UJ	**2.29**		0.014	U	5.4	U
Benzene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Benzyl Chloride	0.0038	U	0.004	U	0.0034	UJ	0.0041	UJ	0.19	U	0.0029	U	1.1	U
Carbon disulfide	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Chloroform	0.0038	U	0.004	U	0.0034	U	0.0041	U	**0.156**	J	0.0029	U	**0.335**	J
Cymene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.735		0.0029	U	2.35	
Ethylbenzene	0.0038	U	0.004	U	0.0104		0.0093		2.65		0.0029	U	2.51	
Hexane	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Isopropylbenzene	0.0038	U	0.004	U	0.0283	J	0.0299	J	1.53		0.0029	U	3.85	
m,p-Xylene [(2)]	0.0076	U	0.008	U	0.0067	U	0.0081	U	1.22		0.0058	U	2.1	U
Methylene chloride	0.0052	J	0.0053	J	0.0042	J	0.0081	U	0.39	U	0.0058	U	2.1	U
Naphthalene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.35	
n-Propylbenzene	0.0038	U	0.004	U	0.0053		0.0074		1.61		0.0029	U	**4.91**	
o-Xylene	0.0038	U	0.004	U	0.0034	U	0.0041	U	1.24		0.0029	U	1.2	
Sec-Butylbenzene	0.0038	U	0.004	U	0.008		0.0087		0.807		0.0029	U	2.69	
Tert-butyl benzene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Toluene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
Trichloroethene	0.0038	U	0.004	U	0.0034	U	0.0041	U	0.19	U	0.0029	U	1.1	U
TPH-GRO (C6-C10)	4.4	U	4.9	U	4.6	U	4.3	U	435	J	3.9	U	929	J
TPH (C10-C28)	9.6	U	10	U	9.9	U	9.9	U	87.9		9.5	U	314	

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion
Risk Site SD-27, Holloman AFB

	SD27-DPT-29 03/23/2011 12 10 to 12 SD27-DPT-DUP09 FD		SD27-DPT-29 03/23/2011 15 12.5 to 15 SD27-DPT-29B N		SD27-DPT-30 03/23/2011 12 10 to 12 SD27-DPT-30A N		SD27-DPT-31 03/23/2011 12 10 to 12 SD27-DPT-31A N		SD27-DPT-31 03/23/2011 15 13 to 15 SD27-DPT-31B N	
Parameter										
1,1-Dichloroethene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
1,2,4-Trimethylbenzene	**13.3**		0.0034	U	0.0039	U	0.364		0.0036	U
1,3,5-Trimethylbenzene	**5.54**		0.0034	U	0.0039	U	0.152	J	0.0036	U
n-Butylbenzene	1.73		0.0034	U	0.0039	U	0.2	U	0.0036	U
4-Methyl-2-pentanone	14.8	J	0.017	U	0.02	U	1	U	0.018	U
Acetone	2.2	U	0.034	U	0.039	U	2	U	0.036	U
Acrolein	1.1	U	0.017	U	0.02	U	1	U	0.018	U
Benzene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Benzyl Chloride	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Carbon disulfide	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Chloroform	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Cymene	1.92		0.0034	U	0.0039	U	0.0671	J	0.0036	U
Ethylbenzene	1.86		0.0034	U	0.0039	U	0.102	J	0.0036	U
Hexane	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Isopropylbenzene	3.26		0.0034	U	0.0039	U	0.107	J	0.0036	U
m,p-Xylene [(2)]	0.44	U	0.0068	U	0.0078	U	0.41	U	0.0073	U
Methylene chloride	0.44	U	0.0068	U	0.0078	U	0.41	U	0.0073	U
Naphthalene	1.02		0.0034	U	0.0039	U	0.2	U	0.0036	U
n-Propylbenzene	**4.37**		0.0034	U	0.0039	U	0.141	J	0.0036	U
o-Xylene	0.889		0.0034	U	0.0039	U	0.2	U	0.0036	U
Sec-Butylbenzene	2.37		0.0034	U	0.0039	U	0.102	J	0.0036	U
Tert-butyl benzene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Toluene	0.22	U	0.0034	U	0.0039	U	0.2	U	0.0036	U
Trichloroethene	0.22	U	**0.0017**	J	0.0039	U	0.2	U	**0.0018**	J
TPH-GRO (C6-C10)	832	J	4.2	U	4.1	U	75.8		4.7	U
TPH (C10-C28)	296		9.7	U	9.3	U	47.8		9.4	U

Table A-13. Screening ACM Chemicals Detected in Soil for Vapor Intrusion Risk Site SD-27, Holloman AFB

All units are milligram per kilogram (mg/kg)

(1) Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings incorporated into Appendix G of of the EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (November, 2002).

(2) p-Xylene criteria used for m,p-xylenes

Red indicates > 10-6 VI risk

Yellow shade indicates > 10-5 VI risk

n/a - not applicable

NA - not analyzled

Reference: (TetraTech, 2012)

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
Parameter	SV (1)	VI SV (2)																				
Dissolved Gases																						
Carbon dioxide	n/a	n/a					121000															
Methane	n/a	n/a					0.16	U														
General Chemistry																						
Alkalinity, total	387000	n/a					111000															
Nitrate	10000	n/a					**51400**	**J**														
Solids, total dissolved	1000	n/a	**21700**		**16500**	**J**	**12300**	**J**	**21200**										**16300**		**16700**	
Sulfate	17419000	n/a					2E+06															
Hydrocarbons																						
TPH (C10-C28)	550	18,500	129	J	95	U	96	U	96	U									**1380**		**1160**	
TPH-GRO (C6-C10)	550	18,500	50	U	50	U	50	U	50	U									**3310**		**3550**	
Metals, Dissolved																						
Arsenic	10	n/a	8	U	2	U	**12**		4.8	J									7.7	J	5.4	J
Barium	1000	n/a	48.9	J	27.1	J	23	J	23.7	J									29.2	J	25.6	J
Cadmium	5	n/a	4	U	1	U	1	U	1	U									1	U	1	U
Chromium	50	n/a	4	U	5	U	4	U	4	U									4	U	4	U
Lead	15	n/a	4	U	5	U	4	U	4	U									4	U	4	U
Mercury	2	0.68	0.05	U	0.05	U	0.05	U	0.17	J									0.056	J	0.051	J
Selenium	50	n/a	8	U	10	U	9.6	J	8	U									9.4	J	8	U
Silver	50	n/a	1	U	1	U	1	U	1	U									1	U	1	U
Metals, Total																						
Arsenic	10	n/a	**16.8**	**J**	6.5	J	**14**		6.4	J									8	U	8	U
Barium	1000	n/a	290	J	25.2	J	24.9	J	22.2	J									46.9	J	37.5	J
Cadmium	5	n/a	5	U	1	U	1	U	1	U									4	U	4	U
Chromium	50	n/a	23.2	J	5	U	4	U	4	U									7.6	J	4.2	J
Lead	15	n/a	11.9	J	5	U	4	U	4	U									4	U	4	U
Mercury	2	0.68	0.05	U	0.05	U	0.05	U	0.05	U									0.086	J	0.05	U
Selenium	50	n/a	10	U	10	U	10.2	J	8	U									8	U	8	U
Silver	50	n/a	1	U	1	U	1	U	1	U									1	U	1	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
Parameter	SV (1)	VI SV (2)																				
Dissolved Gases																						
Carbon dioxide	n/a	n/a					148000															
Methane	n/a	n/a					1.17		1.45													
General Chemistry																						
Alkalinity, total	387000	n/a					138000															
Nitrate	10000	n/a					**73100**		**71700**													
Solids, total dissolved	1000	n/a	**11100**		**13300**		**16700**		**13400**		**20700**		**17800**									
Sulfate	17419000	n/a					1E+06		2E+06													
Hydrocarbons																						
TPH (C10-C28)	550	18,500	**609**		**584**		524		**574**		377	J	515	J								
TPH-GRO (C6-C10)	550	18,500	**1150**		**1250**		**658**		**859**		**755**		**784**									
Metals, Dissolved																						
Arsenic	10	n/a	2	U	2	U	7.1	J	7.6	J	2	U	2	U								
Barium	1000	n/a	24.1	J	23.6	J	22.9	J	21.8	J	22.4	J	22.3	J								
Cadmium	5	n/a	1	U	1	U	1	U	1	U	1	U	1	U								
Chromium	50	n/a	5	U	5	U	4	U	4	U	4	U	4	U								
Lead	15	n/a	5	U	5	U	4	U	4	U	4	U	4	U								
Mercury	2	0.68	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U								
Selenium	50	n/a	10	U	10	U	8	U	8	U	8	U	8	U								
Silver	50	n/a	1	U	1	U	1	U	1	U	1	U	1	U								
Metals, Total																						
Arsenic	10	n/a	2.3	J	2	U	5.8	J	6.2	J	2.1	J	2	U								
Barium	1000	n/a	23.9	J	24.2	J	22.2	J	21.9	J	21.3	J	21.5	J								
Cadmium	5	n/a	1	U	1	U	1	U	1	U	1	U	1	U								
Chromium	50	n/a	5	U	5	U	4	U	4	U	4	U	4	U								
Lead	15	n/a	5	U	5	U	4	U	4	U	4	U	4	U								
Mercury	2	0.68	0.05	U	0.05	U	0.05	U	0.05	U	0.056	J	0.064	J								
Selenium	50	n/a	10	U	10	U	8	U	8	U	8	U	8	U								
Silver	50	n/a	1	U	1	U	1	U	1	U	1	U	1	U								

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
Parameter	SV (1)	VI SV (2)																				
Dissolved Gases																						
Carbon dioxide	n/a	n/a																				
Methane	n/a	n/a																				
General Chemistry																						
Alkalinity, total	387000	n/a																				
Nitrate	10000	n/a																				
Solids, total dissolved	1000	n/a			**28200**		**25800**		**19100**	**J**	**22700**										**29600**	
Sulfate	17419000	n/a																				
Hydrocarbons																						
TPH (C10-C28)	550	18,500			247		226	J	190	J	170	J									446	
TPH-GRO (C6-C10)	550	18,500			217		82.1	J	50	U	50	U									427	
Metals, Dissolved																						
Arsenic	10	n/a			2.5	J	2	U	3.8	J											6.9	J
Barium	1000	n/a			55.9	J	35.7	J	31.3	J											22.4	J
Cadmium	5	n/a			1	U	1	U	1	U											1	U
Chromium	50	n/a			4	U	5	U	4	U											4	U
Lead	15	n/a			4	U	5	U	4	U											4	U
Mercury	2	0.68			0.05	U	0.05	U	0.05	U											0.05	U
Selenium	50	n/a			8	U	10	U	8	U											8	U
Silver	50	n/a			1	U	1	U	1	U											1	U
Metals, Total																						
Arsenic	10	n/a			8	U	3.3	J	7	J	2	U									8	U
Barium	1000	n/a			67.9	J	35.8	J	32.6	J	30.9	J									24.9	J
Cadmium	5	n/a			4	U	1	U	1	U	1	U									4	U
Chromium	50	n/a			4	U	5	U	4	U	4	U									4	U
Lead	15	n/a			5	U	5	U	4	U	4	U									5	U
Mercury	2	0.68			0.05	U	0.05	U	0.05	U	0.05	U									0.05	U
Selenium	50	n/a			8	U	10	U	8.8	J	8	U									8	U
Silver	50	n/a			4	U	1	U	1	U	1	U									4	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
Parameter	SV (1)	VI SV (2)																		
Dissolved Gases																				
Carbon dioxide	n/a	n/a																		
Methane	n/a	n/a																		
General Chemistry																				
Alkalinity, total	387000	n/a																		
Nitrate	10000	n/a																		
Solids, total dissolved	1000	n/a	**28300**		**18300**	**J**	**30800**										**15300**		**14000**	
Sulfate	17419000	n/a																		
Hydrocarbons																				
TPH (C10-C28)	550	18,500	149	J	104	J	107	J									**1320**		**1160**	
TPH-GRO (C6-C10)	550	18,500	128		50	U	98	J									**6100**		**4380**	
Metals, Dissolved																				
Arsenic	10	n/a	2	U	**14.3**		8	U									6.4	J	2	U
Barium	1000	n/a	20.5	J	19.3	J	18.4	J									48.6	J	27.5	J
Cadmium	5	n/a	1	U	1	U	4	U									1	U	1	U
Chromium	50	n/a	5	U	4	U	4	U									4	U	5	U
Lead	15	n/a	5	U	4	U	10	U									4	U	5	U
Mercury	2	0.68	0.05	U	0.05	U	0.05	U									0.05	U	0.05	U
Selenium	50	n/a	10	U	8	U	8	U									8	U	10	U
Silver	50	n/a	1	U	1	U	4	U									1	U	1	U
Metals, Total																				
Arsenic	10	n/a	7.8	J	**15.2**		8	U									10	U	9.3	J
Barium	1000	n/a	21.4	J	21.5	J	18.8	J									69.4	J	30.6	J
Cadmium	5	n/a	1	U	1	U	4	U									5	U	1	U
Chromium	50	n/a	5	U	4	U	7.4	J									5	U	6.4	J
Lead	15	n/a	5	U	4	U	50	U									5	U	5	U
Mercury	2	0.68	0.05	U	0.05	U	0.05	U									0.05	U	0.055	J
Selenium	50	n/a	10	U	8	U	8	U									10	U	10	U
Silver	50	n/a	1	U	1	U	4	U									1	U	1	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
Parameter	SV (1)	VI SV (2)																		
Dissolved Gases																				
Carbon dioxide	n/a	n/a																		
Methane	n/a	n/a																		
General Chemistry																				
Alkalinity, total	387000	n/a																		
Nitrate	10000	n/a																		
Solids, total dissolved	1000	n/a	**16300**		**18500**															
Sulfate	17419000	n/a																		
Hydrocarbons																				
TPH (C10-C28)	550	18,500	**1230**		470															
TPH-GRO (C6-C10)	550	18,500	**3310**	**J**	**1100**															
Metals, Dissolved																				
Arsenic	10	n/a	6.2	J	2	U														
Barium	1000	n/a	25.1	J	23.4	J														
Cadmium	5	n/a	1	U	1	U														
Chromium	50	n/a	4	U	4	U														
Lead	15	n/a	4	U	4	U														
Mercury	2	0.68	0.05	U	0.05	U														
Selenium	50	n/a	8	U	8	U														
Silver	50	n/a	1	U	1	U														
Metals, Total																				
Arsenic	10	n/a	8	J	2	U														
Barium	1000	n/a	25.8	J	24.1	J														
Cadmium	5	n/a	1	U	1	U														
Chromium	50	n/a	25	J	4	U														
Lead	15	n/a	4	U	4	U														
Mercury	2	0.68	0.05	U	0.05	U														
Selenium	50	n/a	8	U	8	U														
Silver	50	n/a	1	U	1	U														

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
Radiochemistry																						
Alpha, gross	15	n/a	129.46	R															0	R	17.718	R
Beta, gross	50	n/a	117.55	R															35.148	R	24.581	R
SVOCs																						
1,2,4-Trichlorobenzene	70	3400	0.48	U	0.49	U													1.9	U	1.9	U
1,2-Dichlorobenzene	600	2600	0.95	U	0.98	U													3.8	U	3.8	U
1,2-Diphenylhydrazine	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
1,3-Dichlorobenzene	n/a	830	0.95	U	0.98	U													3.8	U	3.8	U
1,4-Dichlorobenzene	75	8200	0.95	U	0.98	U													3.8	U	3.8	U
1-Methylnaphthalene	30	n/a	0.48	U	0.49	U	0.49	U	0.48	U									**41**		**32.4**	
2,4,5-Trichlorophenol	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2,4,6-Trichlorophenol	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2,4-Dichlorophenol	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2,4-Dimethylphenol	n/a	n/a	1	U	1.1	U													4.2	U	4.2	U
2,4-Dinitrophenol	n/a	n/a	9.5	U	9.8	U													38	U	38	U
2,4-Dinitrotoluene	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2,6-Dinitrotoluene	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2-Chloronaphthalene	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2-Chlorophenol	n/a	1100	0.48	U	0.49	U													1.9	U	1.9	U
2-Methylnaphthalene	30	3300	0.54	U	0.56	U	0.56	U	0.55	U									11.3	J	9.8	J
2-Nitroaniline	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
2-Nitrophenol	n/a	n/a	0.51	U	0.53	U													2.1	U	2.1	U
3,3'-Dichlorobenzidine	n/a	n/a	0.95	U	0.98	U													3.8	U	3.8	U
3-Nitroaniline	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4,6-Dinitro-2-methylphenol	n/a	n/a	1.9	U	2	U													7.6	U	7.6	U
4-Bromophenyl phenyl ether	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4-Chloro-3-methylphenol	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4-Chloroaniline	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4-Chlorophenyl phenyl ether	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4-Methylphenol	n/a	n/a	0.51	U	0.53	U													2.1	U	2.1	U
4-Nitroaniline	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
4-Nitrophenol	n/a	n/a	4.8	U	4.9	U													19	U	19	U
Acenaphthene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Acenaphthylene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Aniline	n/a	n/a	0.5	U	0.51	U													2	U	2	U
Anthracene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
Radiochemistry																						
Alpha, gross	15	n/a																				
Beta, gross	50	n/a																				
SVOCs																						
1,2,4-Trichlorobenzene	70	3400	0.48	U	0.48	U																
1,2-Dichlorobenzene	600	2600	0.96	U	0.96	U																
1,2-Diphenylhydrazine	n/a	n/a	0.48	U	0.48	U																
1,3-Dichlorobenzene	n/a	830	0.96	U	0.96	U																
1,4-Dichlorobenzene	75	8200	0.96	U	0.96	U																
1-Methylnaphthalene	30	n/a	12.5		14.4		10.2		10.8		11.8		11.2									
2,4,5-Trichlorophenol	n/a	n/a	0.48	U	0.48	U																
2,4,6-Trichlorophenol	n/a	n/a	0.48	U	0.48	U																
2,4-Dichlorophenol	n/a	n/a	0.48	U	0.48	U																
2,4-Dimethylphenol	n/a	n/a	1.1	U	1.1	U																
2,4-Dinitrophenol	n/a	n/a	9.6	U	9.6	U																
2,4-Dinitrotoluene	n/a	n/a	0.48	U	0.48	U																
2,6-Dinitrotoluene	n/a	n/a	0.48	U	0.48	U																
2-Chloronaphthalene	n/a	n/a	0.48	U	0.48	U																
2-Chlorophenol	n/a	1100	0.48	U	0.48	U																
2-Methylnaphthalene	30	3300	0.69	J	0.74	J	0.55	U	0.54	U	0.55	U	0.55	U								
2-Nitroaniline	n/a	n/a	0.48	U	0.48	U																
2-Nitrophenol	n/a	n/a	0.52	U	0.52	U																
3,3'-Dichlorobenzidine	n/a	n/a	0.96	U	0.96	U																
3-Nitroaniline	n/a	n/a	0.48	U	0.48	U																
4,6-Dinitro-2-methylphenol	n/a	n/a	1.9	U	1.9	U																
4-Bromophenyl phenyl ether	n/a	n/a	0.48	U	0.48	U																
4-Chloro-3-methylphenol	n/a	n/a	0.48	U	0.48	U																
4-Chloroaniline	n/a	n/a	0.48	U	0.48	U																
4-Chlorophenyl phenyl ether	n/a	n/a	0.48	U	0.48	U																
4-Methylphenol	n/a	n/a	0.52	U	0.52	U																
4-Nitroaniline	n/a	n/a	0.48	U	0.48	U																
4-Nitrophenol	n/a	n/a	4.8	U	4.8	U																
Acenaphthene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Acenaphthylene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Aniline	n/a	n/a	0.5	U	0.5	U																
Anthracene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
Radiochemistry																						
Alpha, gross	15	n/a			-10.17	R															54.732	R
Beta, gross	50	n/a			50.1	R															-21.55	R
SVOCs																						
1,2,4-Trichlorobenzene	70	3400			0.48	U	0.49	U													0.48	U
1,2-Dichlorobenzene	600	2600			0.95	U	0.98	U													0.95	U
1,2-Diphenylhydrazine	n/a	n/a			0.48	U	0.49	U													0.48	U
1,3-Dichlorobenzene	n/a	830			0.95	U	0.98	U													0.95	U
1,4-Dichlorobenzene	75	8200			0.95	U	0.98	U													0.95	U
1-Methylnaphthalene	30	n/a			2	J	1.7	J	2.7	J	0.48	U									11	
2,4,5-Trichlorophenol	n/a	n/a			0.48	U	0.49	U													0.48	U
2,4,6-Trichlorophenol	n/a	n/a			0.48	U	0.49	U													0.48	U
2,4-Dichlorophenol	n/a	n/a			0.48	U	0.49	U													0.48	U
2,4-Dimethylphenol	n/a	n/a			1	U	1.1	U													1	U
2,4-Dinitrophenol	n/a	n/a			9.5	U	9.8	U													9.5	U
2,4-Dinitrotoluene	n/a	n/a			0.48	U	0.49	U													0.48	U
2,6-Dinitrotoluene	n/a	n/a			0.48	U	0.49	U													0.48	U
2-Chloronaphthalene	n/a	n/a			0.48	U	0.49	U													0.48	U
2-Chlorophenol	n/a	1100			0.48	U	0.49	U													0.48	U
2-Methylnaphthalene	30	3300			0.54	U	0.56	U	0.54	U	0.55	U									1.6	J
2-Nitroaniline	n/a	n/a			0.48	U	0.49	U													0.48	U
2-Nitrophenol	n/a	n/a			0.51	U	0.53	U													0.51	U
3,3'-Dichlorobenzidine	n/a	n/a			0.95	U	0.98	U													0.95	U
3-Nitroaniline	n/a	n/a			0.48	U	0.49	U													0.48	U
4,6-Dinitro-2-methylphenol	n/a	n/a			1.9	U	2	U													1.9	U
4-Bromophenyl phenyl ether	n/a	n/a			0.48	U	0.49	U													0.48	U
4-Chloro-3-methylphenol	n/a	n/a			0.48	U	0.49	U													0.48	U
4-Chloroaniline	n/a	n/a			0.48	U	0.49	U													0.48	U
4-Chlorophenyl phenyl ether	n/a	n/a			0.48	U	0.49	U													0.48	U
4-Methylphenol	n/a	n/a			0.51	U	0.53	U													0.51	U
4-Nitroaniline	n/a	n/a			0.48	U	0.49	U													0.48	U
4-Nitrophenol	n/a	n/a			4.8	U	4.9	U													4.8	U
Acenaphthene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Acenaphthylene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Aniline	n/a	n/a			0.5	U	0.51	U													0.5	U
Anthracene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
Radiochemistry																				
Alpha, gross	15	n/a															24.592	R		
Beta, gross	50	n/a															119.2	R		
SVOCs																				
1,2,4-Trichlorobenzene	70	3400	0.49	U													2	U	0.48	U
1,2-Dichlorobenzene	600	2600	0.97	U													4	U	0.95	U
1,2-Diphenylhydrazine	n/a	n/a	0.49	U													2	U	0.48	U
1,3-Dichlorobenzene	n/a	830	0.97	U													4	U	0.95	U
1,4-Dichlorobenzene	75	8200	0.97	U													4	U	0.95	U
1-Methylnaphthalene	30	n/a	2.2	J	0.49	U	2	J									24.7		14.1	
2,4,5-Trichlorophenol	n/a	n/a	0.49	U													2	U	0.48	U
2,4,6-Trichlorophenol	n/a	n/a	0.49	U													2	U	0.48	U
2,4-Dichlorophenol	n/a	n/a	0.49	U													2	U	0.48	U
2,4-Dimethylphenol	n/a	n/a	1.1	U													4.5	J	7.2	
2,4-Dinitrophenol	n/a	n/a	9.7	U													40	U	9.5	U
2,4-Dinitrotoluene	n/a	n/a	0.49	U													2	U	0.48	U
2,6-Dinitrotoluene	n/a	n/a	0.49	U													2	U	0.48	U
2-Chloronaphthalene	n/a	n/a	0.49	U													2	U	0.48	U
2-Chlorophenol	n/a	1100	0.49	U													2	U	0.48	U
2-Methylnaphthalene	30	3300	0.55	U	0.55	U	0.56	U									26.7		13.9	
2-Nitroaniline	n/a	n/a	0.49	U													2	U	0.48	U
2-Nitrophenol	n/a	n/a	0.52	U													2.2	U	0.51	U
3,3'-Dichlorobenzidine	n/a	n/a	0.97	U													4	U	0.95	U
3-Nitroaniline	n/a	n/a	0.49	U													2	U	0.48	U
4,6-Dinitro-2-methylphenol	n/a	n/a	1.9	U													8	U	1.9	U
4-Bromophenyl phenyl ether	n/a	n/a	0.49	U													2	U	0.48	U
4-Chloro-3-methylphenol	n/a	n/a	0.49	U													2	U	0.48	U
4-Chloroaniline	n/a	n/a	0.49	U													2	U	0.48	U
4-Chlorophenyl phenyl ether	n/a	n/a	0.49	U													2	U	0.48	U
4-Methylphenol	n/a	n/a	0.52	U													5.5	J	5.6	
4-Nitroaniline	n/a	n/a	0.49	U													2	U	0.48	U
4-Nitrophenol	n/a	n/a	4.9	U													20	U	4.8	U
Acenaphthene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Acenaphthylene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Aniline	n/a	n/a	0.5	U													2.1	U	0.5	U
Anthracene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
Radiochemistry																				
Alpha, gross	15	n/a																		
Beta, gross	50	n/a																		
SVOCs																				
1,2,4-Trichlorobenzene	70	3400																		
1,2-Dichlorobenzene	600	2600																		
1,2-Diphenylhydrazine	n/a	n/a																		
1,3-Dichlorobenzene	n/a	830																		
1,4-Dichlorobenzene	75	8200																		
1-Methylnaphthalene	30	n/a	14		11.3															
2,4,5-Trichlorophenol	n/a	n/a																		
2,4,6-Trichlorophenol	n/a	n/a																		
2,4-Dichlorophenol	n/a	n/a																		
2,4-Dimethylphenol	n/a	n/a																		
2,4-Dinitrophenol	n/a	n/a																		
2,4-Dinitrotoluene	n/a	n/a																		
2,6-Dinitrotoluene	n/a	n/a																		
2-Chloronaphthalene	n/a	n/a																		
2-Chlorophenol	n/a	1100																		
2-Methylnaphthalene	30	3300	13		10.7															
2-Nitroaniline	n/a	n/a																		
2-Nitrophenol	n/a	n/a																		
3,3'-Dichlorobenzidine	n/a	n/a																		
3-Nitroaniline	n/a	n/a																		
4,6-Dinitro-2-methylphenol	n/a	n/a																		
4-Bromophenyl phenyl ether	n/a	n/a																		
4-Chloro-3-methylphenol	n/a	n/a																		
4-Chloroaniline	n/a	n/a																		
4-Chlorophenyl phenyl ether	n/a	n/a																		
4-Methylphenol	n/a	n/a																		
4-Nitroaniline	n/a	n/a																		
4-Nitrophenol	n/a	n/a																		
Acenaphthene	n/a	n/a	0.5	U	0.48	U														
Acenaphthylene	n/a	n/a	0.5	U	0.48	U														
Aniline	n/a	n/a																		
Anthracene	n/a	n/a	0.5	U	0.48	U														

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
SVOCs																						
Benzidine	n/a	n/a	4.5	U	4.6	U													18	U	18	U
Benzo(a)anthracene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Benzo(a)pyrene	0.2	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Benzo(b)fluoranthene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Benzo(ghi)perylene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Benzo(k)fluoranthene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Benzoic acid	n/a	n/a	9.5	U	9.8	U													38	U	38	U
Benzyl alcohol	n/a	n/a	0.95	U	0.98	U													3.8	U	3.8	U
Bis(2-chloroethoxy)methane	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
Bis(2-chloroethyl)ether	n/a	100	0.51	U	0.53	U													2.1	U	2.1	U
Bis(2-chloroisopropyl)ether	n/a	510	0.51	U	0.53	U													2.1	U	2.1	U
Bis(2-ethylhexyl)phthalate	6	n/a	1	U	1.1	U													4.2	U	4.2	U
Butyl benzyl phthalate	n/a	n/a	1	U	1.1	U													4.2	U	4.2	U
Carbazole	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
Chrysene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Dibenz(a,h)anthracene	n/a	n/a	0.5	U	0.51	U	0.51	U	0.5	U									2	U	2	U
Dibenzofuran	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
Diethyl phthalate	n/a	n/a	1	U	1.1	U													4.2	U	4.2	U
Dimethyl phthalate	n/a	n/a	0.94	U	0.97	U													3.8	U	3.8	U
Di-n-butyl phthalate	n/a	n/a	1.9	J	0.85	U													3.3	U	3.3	U
Di-n-octyl phthalate	n/a	n/a	1	U	1.1	U													4.2	U	4.2	U
Fluoranthene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Fluorene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Hexachlorobenzene	1	1	0.53	U	0.55	U													2.1	U	2.1	U
Hexachlorobutadiene	n/a	3.3	0.95	U	0.98	U													3.8	U	3.8	U
Hexachlorocyclopentadiene	50	50	1.8	U	1.9	U													7.2	U	7.2	U
Hexachloroethane	n/a	38	0.95	U	0.98	U													3.8	U	3.8	U
Indeno(1,2,3-cd)pyrene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Isophorone	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
M,P-Cresol	n/a	n/a	1	U	1.1	U													4.2	U	4.2	U
Naphthalene	30	150	0.76	U	0.78	U	0.78	U	0.77	U									7.7	J	6.2	J
Nitrobenzene	n/a	2000	0.56	U	0.58	U													2.2	U	2.2	U
N-Nitrosodimethylamine	n/a	n/a	2.3	U	2.4	U													9.1	U	9.1	U
N-Nitroso-di-n-propylamine	n/a	n/a	0.48	U	0.49	U													1.9	U	1.9	U
N-Nitrosodiphenylamine	n/a	n/a	0.95	U	0.98	U													3.8	U	3.8	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
SVOCs																						
Benzidine	n/a	n/a	4.5	U	4.5	U																
Benzo(a)anthracene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Benzo(a)pyrene	0.2	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Benzo(b)fluoranthene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Benzo(ghi)perylene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Benzo(k)fluoranthene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Benzoic acid	n/a	n/a	9.6	U	9.6	U																
Benzyl alcohol	n/a	n/a	0.96	U	0.96	U																
Bis(2-chloroethoxy)methane	n/a	n/a	0.48	U	0.48	U																
Bis(2-chloroethyl)ether	n/a	100	0.52	U	0.52	U																
Bis(2-chloroisopropyl)ether	n/a	510	0.52	U	0.52	U																
Bis(2-ethylhexyl)phthalate	6	n/a	1.1	U	1.1	U																
Butyl benzyl phthalate	n/a	n/a	1.1	U	1.1	U																
Carbazole	n/a	n/a	0.48	U	0.48	U																
Chrysene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Dibenz(a,h)anthracene	n/a	n/a	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U								
Dibenzofuran	n/a	n/a	0.48	U	0.48	U																
Diethyl phthalate	n/a	n/a	1.1	U	1.1	U																
Dimethyl phthalate	n/a	n/a	0.95	U	0.95	U																
Di-n-butyl phthalate	n/a	n/a	0.84	U	0.84	U																
Di-n-octyl phthalate	n/a	n/a	1.1	U	1.1	U																
Fluoranthene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Fluorene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Hexachlorobenzene	1	1	0.54	U	0.54	U																
Hexachlorobutadiene	n/a	3.3	0.96	U	0.96	U																
Hexachlorocyclopentadiene	50	50	1.8	U	1.8	U																
Hexachloroethane	n/a	38	0.96	U	0.96	U																
Indeno(1,2,3-cd)pyrene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Isophorone	n/a	n/a	0.48	U	0.48	U																
M,P-Cresol	n/a	n/a	1.1	U	1.1	U																
Naphthalene	30	150	0.9	J	0.95	J	0.77	U	0.76	U	0.78	U	0.78	U								
Nitrobenzene	n/a	2000	0.57	U	0.57	U																
N-Nitrosodimethylamine	n/a	n/a	2.3	U	2.3	U																
N-Nitroso-di-n-propylamine	n/a	n/a	0.48	U	0.48	U																
N-Nitrosodiphenylamine	n/a	n/a	0.96	U	0.96	U																

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
SVOCs																						
Benzidine	n/a	n/a			4.5	U	4.6	U													4.5	U
Benzo(a)anthracene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Benzo(a)pyrene	0.2	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Benzo(b)fluoranthene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Benzo(ghi)perylene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Benzo(k)fluoranthene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Benzoic acid	n/a	n/a			9.5	U	9.8	U													9.5	U
Benzyl alcohol	n/a	n/a			0.95	U	0.98	U													0.95	U
Bis(2-chloroethoxy)methane	n/a	n/a			0.48	U	0.49	U													0.48	U
Bis(2-chloroethyl)ether	n/a	100			0.51	U	0.53	U													0.51	U
Bis(2-chloroisopropyl)ether	n/a	510			0.51	U	0.53	U													0.51	U
Bis(2-ethylhexyl)phthalate	6	n/a			1	U	1.1	U													1	U
Butyl benzyl phthalate	n/a	n/a			1	U	1.1	U													1	U
Carbazole	n/a	n/a			0.48	U	0.49	U													0.48	U
Chrysene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Dibenz(a,h)anthracene	n/a	n/a			0.5	U	0.51	U	0.5	U	0.5	U									0.5	U
Dibenzofuran	n/a	n/a			0.48	U	0.49	U													0.48	U
Diethyl phthalate	n/a	n/a			1	U	1.1	U													1	U
Dimethyl phthalate	n/a	n/a			0.94	U	0.97	U													0.94	U
Di-n-butyl phthalate	n/a	n/a			0.83	U	0.85	U													0.83	U
Di-n-octyl phthalate	n/a	n/a			1	U	1.1	U													1	U
Fluoranthene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Fluorene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Hexachlorobenzene	1	1			0.53	U	0.55	U													0.53	U
Hexachlorobutadiene	n/a	3.3			0.95	U	0.98	U													0.95	U
Hexachlorocyclopentadiene	50	50			1.8	U	1.9	U													1.8	U
Hexachloroethane	n/a	38			0.95	U	0.98	U													0.95	U
Indeno(1,2,3-cd)pyrene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Isophorone	n/a	n/a			0.48	U	0.49	U													0.48	U
M,P-Cresol	n/a	n/a			1	U	1.1	U													1	U
Naphthalene	30	150			0.76	U	0.78	U	0.76	U	0.77	U									0.76	U
Nitrobenzene	n/a	2000			0.56	U	0.58	U													0.56	U
N-Nitrosodimethylamine	n/a	n/a			2.3	U	2.4	U													2.3	U
N-Nitroso-di-n-propylamine	n/a	n/a			0.48	U	0.49	U													0.48	U
N-Nitrosodiphenylamine	n/a	n/a			0.95	U	0.98	U													0.95	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
SVOCs																				
Benzidine	n/a	n/a	4.6	U													19	U	4.5	U
Benzo(a)anthracene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Benzo(a)pyrene	0.2	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Benzo(b)fluoranthene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Benzo(ghi)perylene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Benzo(k)fluoranthene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Benzoic acid	n/a	n/a	9.7	U													40	U	9.5	U
Benzyl alcohol	n/a	n/a	0.97	U													4	U	0.95	U
Bis(2-chloroethoxy)methane	n/a	n/a	0.49	U													2	U	0.48	U
Bis(2-chloroethyl)ether	n/a	100	0.52	U													2.2	U	0.51	U
Bis(2-chloroisopropyl)ether	n/a	510	0.52	U													2.2	U	0.51	U
Bis(2-ethylhexyl)phthalate	6	n/a	1.1	U													4.4	U	1	U
Butyl benzyl phthalate	n/a	n/a	1.1	U													4.4	U	1	U
Carbazole	n/a	n/a	0.49	U													2	U	0.48	U
Chrysene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Dibenz(a,h)anthracene	n/a	n/a	0.5	U	0.5	U	0.51	U									2.1	U	0.5	U
Dibenzofuran	n/a	n/a	0.49	U													2	U	0.48	U
Diethyl phthalate	n/a	n/a	1.1	U													4.4	U	1	U
Dimethyl phthalate	n/a	n/a	0.96	U													4	U	0.94	U
Di-n-butyl phthalate	n/a	n/a	0.84	U													3.5	U	0.84	J
Di-n-octyl phthalate	n/a	n/a	1.1	U													4.4	U	1	U
Fluoranthene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Fluorene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Hexachlorobenzene	1	1	0.54	U													2.2	U	0.53	U
Hexachlorobutadiene	n/a	3.3	0.97	U													4	U	0.95	U
Hexachlorocyclopentadiene	50	50	1.8	U													7.6	U	1.8	U
Hexachloroethane	n/a	38	0.97	U													4	U	0.95	U
Indeno(1,2,3-cd)pyrene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Isophorone	n/a	n/a	0.49	U													2	U	0.48	U
M,P-Cresol	n/a	n/a	1.1	U													4.4	U	7.1	
Naphthalene	30	150	0.78	U	0.78	U	0.78	U									**60**		27	
Nitrobenzene	n/a	2000	0.57	U													2.4	U	0.56	U
N-Nitrosodimethylamine	n/a	n/a	2.3	U													9.6	U	2.3	U
N-Nitroso-di-n-propylamine	n/a	n/a	0.49	U													2	U	0.48	U
N-Nitrosodiphenylamine	n/a	n/a	0.97	U													4	U	0.95	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
SVOCs																				
Benzidine	n/a	n/a																		
Benzo(a)anthracene	n/a	n/a	0.5	U	0.48	U														
Benzo(a)pyrene	0.2	n/a	0.5	U	0.48	U														
Benzo(b)fluoranthene	n/a	n/a	0.5	U	0.48	U														
Benzo(ghi)perylene	n/a	n/a	0.5	U	0.48	U														
Benzo(k)fluoranthene	n/a	n/a	0.5	U	0.48	U														
Benzoic acid	n/a	n/a																		
Benzyl alcohol	n/a	n/a																		
Bis(2-chloroethoxy)methane	n/a	n/a																		
Bis(2-chloroethyl)ether	n/a	100																		
Bis(2-chloroisopropyl)ether	n/a	510																		
Bis(2-ethylhexyl)phthalate	6	n/a																		
Butyl benzyl phthalate	n/a	n/a																		
Carbazole	n/a	n/a																		
Chrysene	n/a	n/a	0.5	U	0.48	U														
Dibenz(a,h)anthracene	n/a	n/a	0.52	U	0.5	U														
Dibenzofuran	n/a	n/a																		
Diethyl phthalate	n/a	n/a																		
Dimethyl phthalate	n/a	n/a																		
Di-n-butyl phthalate	n/a	n/a																		
Di-n-octyl phthalate	n/a	n/a																		
Fluoranthene	n/a	n/a	0.5	U	0.48	U														
Fluorene	n/a	n/a	0.5	U	0.48	U														
Hexachlorobenzene	1	1																		
Hexachlorobutadiene	n/a	3.3																		
Hexachlorocyclopentadiene	50	50																		
Hexachloroethane	n/a	38																		
Indeno(1,2,3-cd)pyrene	n/a	n/a	0.5	U	0.48	U														
Isophorone	n/a	n/a																		
M,P-Cresol	n/a	n/a																		
Naphthalene	30	150	22.2		18.6															
Nitrobenzene	n/a	2000																		
N-Nitrosodimethylamine	n/a	n/a																		
N-Nitroso-di-n-propylamine	n/a	n/a																		
N-Nitrosodiphenylamine	n/a	n/a																		

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
SVOCs																						
Pentachlorophenol	1	n/a	5.1	U	5.3	U													21	U	21	U
Phenanthrene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Phenol	5	n/a	0.48	U	0.49	U													1.9	U	1.9	U
Pyrene	n/a	n/a	0.48	U	0.49	U	0.49	U	0.48	U									1.9	U	1.9	U
Pyridine	n/a	n/a	1.5	U	1.6	U													6.1	U	6.1	U
VOCs																						
1,1,1,2-Tetrachloroethane	n/a	33	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
1,1,1-Trichloroethane	60	3100	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
1,1,2,2-Tetrachloroethane	10	30	0.23	U	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.46	UJ	0.46	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	n/a	1500	0.47	U	0.47	U	0.47	U	0.47	U	1	U	1	U	1	U	1	U	0.94	UJ	0.94	UJ
1,1,2-Trichloroethane	5	41	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.44	UJ	0.44	UJ
1,1-Dichloroethane	25	2200	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
1,1-Dichloroethene	5	190	0.23	U	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.46	UJ	0.46	UJ
1,1-Dichloropropene	n/a	n/a	0.28	U	0.28	U	0.28	U	0.28	U	1	U	1	U	1	U	1	U	0.56	UJ	0.56	UJ
1,2,3-Trichlorobenzene	n/a	n/a	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ
1,2,3-Trichloropropane	n/a	290	0.3	U	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	0.6	UJ	0.6	UJ
1,2,4-Trichlorobenzene	70	3400	0.5	U	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	1	UJ	1	UJ
1,2,4-Trimethylbenzene	n/a	24	0.27	U	0.27	U	0.27	U	0.27	U	2	U	2	U	2	U	2	U	168	J	190	J
1,2-Dibromo-3-chloropropane	0.2	33	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	1	UJ	1	UJ
1,2-Dibromoethane	0.05	3.6	0.37	U	0.37	U	0.37	U	0.37	U	1	U	1	U	1	U	1	U	0.74	UJ	0.74	UJ
1,2-Dichlorobenzene	600	2600	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
1,2-Dichloroethane	5	23	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
1,2-Dichloropropane	5	35	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
1,3,5-Trimethylbenzene	n/a	25	0.21	U	0.21	U	0.21	U	0.21	U	2	U	2	U	2	U	2	U	50.6	J	56.7	J
1,3-Dichlorobenzene	n/a	830	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
1,3-Dichloropropane	n/a	n/a	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
1,4-Dichlorobenzene	75	8200	0.23	U	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.46	UJ	0.46	UJ
1-Chlorohexane	n/a	n/a	0.25	U	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	0.5	UJ	0.5	UJ
2,2-Dichloropropane	n/a	n/a	0.44	U	0.44	U	0.44	U	0.44	U	1	U	1	U	1	U	1	U	0.88	UJ	0.88	UJ
2-Butanone	n/a	440000	2	U	2	U	2	U	2	U	5	U	5	U	5	U	5	U	4	UJ	4	UJ
2-Chloroethyl vinyl ether	n/a	n/a	1.2	UJ	1.2	U	1.2	UJ	1.2	UJ	5	U	5	UJ	5	U	5	U	2.4	UJ	2.4	UJ
2-Chlorotoluene	n/a	n/a	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.44	UJ	0.44	UJ
2-Hexanone	n/a	n/a	4	U	4	U	4	U	4	U	10	U	10	U	10	U	10	U	8	UJ	8	UJ
4-Chlorotoluene	n/a	n/a	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
4-Methyl-2-pentanone	n/a	14000	2	U	2	U	2	U	2	U	5	U	5	U	5	U	5	U	4	UJ	4	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
SVOCs																						
Pentachlorophenol	1	n/a	5.2	U	5.2	U																
Phenanthrene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Phenol	5	n/a	0.48	U	0.48	U																
Pyrene	n/a	n/a	0.48	U	0.48	U	0.48	U	0.48	U	0.49	U	0.49	U								
Pyridine	n/a	n/a	1.5	U	1.5	U																
VOCs																						
1,1,1,2-Tetrachloroethane	n/a	33	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
1,1,1-Trichloroethane	60	3100	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	10	30	0.46	U	0.46	U	0.46	U	0.46	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U
1,1,2-Trichloro-1,2,2-trifluoroethane	n/a	1500	0.94	U	0.94	U	0.94	U	0.94	U	0.47	U	0.47	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	5	41	0.44	U	0.44	U	0.44	U	0.44	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	25	2200	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	5	190	0.46	U	0.46	U	0.46	U	0.46	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U
1,1-Dichloropropene	n/a	n/a	0.56	U	0.56	U	0.56	U	0.56	U	0.28	U	0.28	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	n/a	n/a	1	U	1	U	1	U	1	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U
1,2,3-Trichloropropane	n/a	290	0.6	U	0.6	U	0.6	U	0.6	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	70	3400	1	U	1	U	1	U	1	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U
1,2,4-Trimethylbenzene	n/a	24	101		97		81.8		79.3		87.1		89.4		2	U	2	U	2	U	1.5	J
1,2-Dibromo-3-chloropropane	0.2	33	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.05	3.6	0.74	U	0.74	U	0.74	U	0.74	U	0.37	U	0.37	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	600	2600	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	5	23	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	5	35	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
1,3,5-Trimethylbenzene	n/a	25	41		40.2		22.3		22.7		30.1		30.9		5.3		4.7		4.4		5	
1,3-Dichlorobenzene	n/a	830	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
1,3-Dichloropropane	n/a	n/a	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	75	8200	0.46	U	0.46	U	0.46	U	0.46	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U
1-Chlorohexane	n/a	n/a	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U
2,2-Dichloropropane	n/a	n/a	0.88	U	0.88	U	0.88	U	0.88	U	0.44	U	0.44	U	1	U	1	U	1	U	1	U
2-Butanone	n/a	440000	4	U	4	U	4	U	4	U	2	U	2	U	5	U	5	U	5	U	5	U
2-Chloroethyl vinyl ether	n/a	n/a	2.4	U	2.4	U	2.4	U	2.4	U	1.2	U	1.2	U	5	U	5	U	5	UJ	5	U
2-Chlorotoluene	n/a	n/a	0.44	U	0.44	U	0.44	U	0.44	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U
2-Hexanone	n/a	n/a	8	U	8	U	8	U	8	U	4	U	4	U	10	U	10	U	10	U	10	U
4-Chlorotoluene	n/a	n/a	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
4-Methyl-2-pentanone	n/a	14000	4	U	4	U	4	U	4	U	2	U	2	U	5	U	5	U	5	U	5	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
SVOCs																						
Pentachlorophenol	1	n/a			5.1	U	5.3	U													5.1	U
Phenanthrene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Phenol	5	n/a			0.48	U	0.49	U													0.48	U
Pyrene	n/a	n/a			0.48	U	0.49	U	0.48	U	0.48	U									0.48	U
Pyridine	n/a	n/a			1.5	U	1.6	U													1.5	U
VOCs																						
1,1,1,2-Tetrachloroethane	n/a	33	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
1,1,1-Trichloroethane	60	3100	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
1,1,2,2-Tetrachloroethane	10	30	1	U	0.23	UJ	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.23	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	n/a	1500	1	U	0.47	UJ	0.47	U	0.47	U	0.47	U	1	U	1	U	1	U	1	U	0.47	UJ
1,1,2-Trichloroethane	5	41	1	U	0.22	UJ	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.22	UJ
1,1-Dichloroethane	25	2200	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
1,1-Dichloroethene	5	190	1	U	0.23	UJ	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.23	UJ
1,1-Dichloropropene	n/a	n/a	1	U	0.28	UJ	0.28	U	0.28	U	0.28	U	1	U	1	U	1	U	1	U	0.28	UJ
1,2,3-Trichlorobenzene	n/a	n/a	1	U	0.5	UJ	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	0.5	UJ
1,2,3-Trichloropropane	n/a	290	2	U	0.3	UJ	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	0.3	UJ
1,2,4-Trichlorobenzene	70	3400	1	U	0.5	UJ	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	0.5	UJ
1,2,4-Trimethylbenzene	n/a	24	1.5	J	2	J	0.27	U	0.27	U	0.27	U	2	U	2	U	2	U	2	U	4.2	J
1,2-Dibromo-3-chloropropane	0.2	33	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	0.5	UJ
1,2-Dibromoethane	0.05	3.6	1	U	0.37	UJ	0.37	U	0.37	U	0.37	U	1	U	1	U	1	U	1	U	0.37	UJ
1,2-Dichlorobenzene	600	2600	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
1,2-Dichloroethane	5	23	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
1,2-Dichloropropane	5	35	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
1,3,5-Trimethylbenzene	n/a	25	5.3		3.5	J	2.1		3.9		1.5	J	2	U	0.28	J	2	U	2	U	1.1	J
1,3-Dichlorobenzene	n/a	830	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
1,3-Dichloropropane	n/a	n/a	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
1,4-Dichlorobenzene	75	8200	1	U	0.23	UJ	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	0.23	UJ
1-Chlorohexane	n/a	n/a	2	U	0.25	UJ	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	0.25	UJ
2,2-Dichloropropane	n/a	n/a	1	U	0.44	UJ	0.44	U	0.44	U	0.44	U	1	U	1	U	1	U	1	U	0.44	UJ
2-Butanone	n/a	440000	5	U	2	UJ	2	U	2	U	2	U	5	U	5	U	5	U	5	U	2	UJ
2-Chloroethyl vinyl ether	n/a	n/a	5	U	1.2	UJ	1.2	U	1.2	U	1.2	U	5	U	5	UJ	5	U	5	U	1.2	UJ
2-Chlorotoluene	n/a	n/a	1	U	0.22	UJ	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.22	UJ
2-Hexanone	n/a	n/a	10	U	4	UJ	4	U	4	U	4	U	10	U	10	U	10	U	10	U	4	UJ
4-Chlorotoluene	n/a	n/a	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
4-Methyl-2-pentanone	n/a	14000	5	U	2	UJ	2	U	2	U	2	U	5	U	5	U	5	U	5	U	2	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
SVOCs																				
Pentachlorophenol	1	n/a	5.2	U													22	U	5.1	U
Phenanthrene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Phenol	5	n/a	0.49	U													2	U	**18.1**	
Pyrene	n/a	n/a	0.49	U	0.49	U	0.49	U									2	U	0.48	U
Pyridine	n/a	n/a	1.6	U													6.4	U	1.5	U
VOCs																				
1,1,1,2-Tetrachloroethane	n/a	33	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
1,1,1-Trichloroethane	60	3100	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
1,1,2,2-Tetrachloroethane	10	30	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	2.3	UJ	2.3	U
1,1,2-Trichloro-1,2,2-trifluoroethane	n/a	1500	0.47	U	0.47	U	0.47	U	1	U	1	U	1	U	1	U	4.7	UJ	4.7	U
1,1,2-Trichloroethane	5	41	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	2.2	UJ	2.2	U
1,1-Dichloroethane	25	2200	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
1,1-Dichloroethene	5	190	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	2.3	UJ	2.3	U
1,1-Dichloropropene	n/a	n/a	0.28	U	0.28	U	0.28	U	1	U	1	U	1	U	1	U	2.8	UJ	2.8	U
1,2,3-Trichlorobenzene	n/a	n/a	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	5	UJ	5	U
1,2,3-Trichloropropane	n/a	290	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	3	UJ	3	U
1,2,4-Trichlorobenzene	70	3400	0.5	U	0.5	U	0.5	U	1	U	1	U	1	U	1	U	5	UJ	5	U
1,2,4-Trimethylbenzene	n/a	24	2.8		0.33	J	2.9		2	U	2	U	2	U	2	U	223	J	255	
1,2-Dibromo-3-chloropropane	0.2	33	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	5	UJ	5	U
1,2-Dibromoethane	0.05	3.6	0.37	U	0.37	U	0.37	U	1	U	1	U	1	U	1	U	3.7	UJ	3.7	U
1,2-Dichlorobenzene	600	2600	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
1,2-Dichloroethane	5	23	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
1,2-Dichloropropane	5	35	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
1,3,5-Trimethylbenzene	n/a	25	0.97	J	0.21	U	0.83	J	2	U	2	U	2	U	2	U	53.5	J	91.6	
1,3-Dichlorobenzene	n/a	830	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
1,3-Dichloropropane	n/a	n/a	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
1,4-Dichlorobenzene	75	8200	0.23	U	0.23	U	0.23	U	1	U	1	U	1	U	1	U	2.3	UJ	2.3	U
1-Chlorohexane	n/a	n/a	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	2.5	UJ	2.5	U
2,2-Dichloropropane	n/a	n/a	0.44	U	0.44	U	0.44	U	1	U	1	U	1	U	1	U	4.4	UJ	4.4	U
2-Butanone	n/a	440000	2	U	2	U	2	U	5	U	5	U	5	U	5	U	20	UJ	20	U
2-Chloroethyl vinyl ether	n/a	n/a	1.2	U	1.2	U	1.2	U	5	UJ	5	UJ	5	U	5	UJ	12	UJ	12	U
2-Chlorotoluene	n/a	n/a	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	2.2	UJ	2.2	U
2-Hexanone	n/a	n/a	4	U	4	U	4	U	10	U	10	U	10	U	10	U	40	UJ	40	U
4-Chlorotoluene	n/a	n/a	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
4-Methyl-2-pentanone	n/a	14000	2	U	2	U	2	U	5	U	5	U	5	U	5	U	20	UJ	20	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
SVOCs																				
Pentachlorophenol	1	n/a																		
Phenanthrene	n/a	n/a	0.5	U	0.48	U														
Phenol	5	n/a																		
Pyrene	n/a	n/a	0.5	U	0.48	U														
Pyridine	n/a	n/a																		
VOCs																				
1,1,1,2-Tetrachloroethane	n/a	33	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1,1-Trichloroethane	60	3100	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1,2,2-Tetrachloroethane	10	30	2.3	U	1.2	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1,2-Trichloro-1,2,2-trifluoroethane	n/a	1500	4.7	U	2.4	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1,2-Trichloroethane	5	41	2.2	U	1.1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1-Dichloroethane	25	2200	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1-Dichloroethene	5	190	2.3	U	1.2	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,1-Dichloropropene	n/a	n/a	2.8	U	1.4	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2,3-Trichlorobenzene	n/a	n/a	5	U	2.5	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2,3-Trichloropropane	n/a	290	3	U	1.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
1,2,4-Trichlorobenzene	70	3400	5	U	2.5	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2,4-Trimethylbenzene	n/a	24	227		87.5		40.8		244		242		194	J	372	J	213		220	
1,2-Dibromo-3-chloropropane	0.2	33	5	U	2.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
1,2-Dibromoethane	0.05	3.6	3.7	U	1.9	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2-Dichlorobenzene	600	2600	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2-Dichloroethane	5	23	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,2-Dichloropropane	5	35	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,3,5-Trimethylbenzene	n/a	25	61.1		26.4		12.4		64.2		55.6		51.5	J	94.9	J	52.8		54.8	
1,3-Dichlorobenzene	n/a	830	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,3-Dichloropropane	n/a	n/a	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1,4-Dichlorobenzene	75	8200	2.3	U	1.2	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
1-Chlorohexane	n/a	n/a	2.5	U	1.3	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
2,2-Dichloropropane	n/a	n/a	4.4	U	2.2	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
2-Butanone	n/a	440000	20	U	10	U	5	U	25	U	10	U	25	U	130	U	25	U	25	U
2-Chloroethyl vinyl ether	n/a	n/a	12	U	6	U	5	U	25	UJ	10	UJ	50	U	130	U	25	UJ	25	UJ
2-Chlorotoluene	n/a	n/a	2.2	U	1.1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
2-Hexanone	n/a	n/a	40	U	20	U	10	U	50	U	20	U	50	U	250	U	50	U	50	U
4-Chlorotoluene	n/a	n/a	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
4-Methyl-2-pentanone	n/a	14000	20	U	10	U	5	U	25	U	10	U	25	U	130	U	25	U	25	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
VOCs																						
Acetone	n/a	220000	10	UJ	10	U	10	U	10	U	25	U	25	U	25	U	25	U	24.6	J	25.8	J
Acetonitrile	n/a	42000	5	U	5	U	5	U	5	U	20	U	20	U	20	U	20	U	10	UJ	10	UJ
Acrolein	n/a	4	5	U	5	U	5	U	5	U	20	U	20	U	20	U	20	U	10	UJ	10	UJ
Acrylonitrile	n/a	85	3	U	3	U	3	U	3	U	10	U	10	U	10	U	10	U	6	UJ	6	UJ
Allyl chloride (3-Chloropopene)	n/a	n/a	0.3	U	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	0.6	UJ	0.6	UJ
Benzene	5	14	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	**6.4**	**J**	**6.7**	**J**
Benzyl Chloride	n/a	30	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	1	UJ	1	UJ
Bromobenzene	n/a	n/a	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
Bromochloromethane	n/a	n/a	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.44	UJ	0.44	UJ
Bromodichloromethane	81	21	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
Bromoform	81	0.083	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
Bromomethane	n/a	20	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	1	UJ	1	UJ
Carbon disulfide	n/a	560	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	1	UJ	1	UJ
Carbon tetrachloride	5	5	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
Chlorobenzene	100	390	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
Chloroethane	n/a	28000	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	1	UJ	1	UJ
Chloroform	81	80	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	3.1	J	3.4	J
Chloromethane	n/a	67	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	1	UJ	1	UJ
Cis-1,2-dichloroethene	70	210	0.26	U	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	0.52	UJ	0.52	UJ
Cis-1,3-dichloropropene	n/a	n/a	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
cis-1,4-Dichloro-2-butene	n/a	n/a	1	U	1	U	1	U	1	UJ	10	U	10	U	10	UJ	10	U	2	UJ	2	UJ
Cymene	n/a	n/a	0.21	U	0.21	U	0.21	U	0.21	U	1	U	1	U	1	U	1	U	30.7	J	32.5	J
Dibromochloromethane	82	32	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
Dibromomethane	n/a	990	0.25	U	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	0.5	UJ	0.5	UJ
Dichlorodifluoromethane	n/a	14	0.5	U	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	1	UJ	1	UJ
Ether, tert-butyl methyl	n/a	120000	0.34	U	0.34	U	0.34	U	0.34	U	1	U	1	U	1	U	1	U	0.68	UJ	0.68	UJ
Ethyl Methacrylate	n/a	9100	1	U	1	U	1	U	1	U	5	U	5	U	5	U	5	U	2	UJ	2	UJ
Ethylbenzene	700	700	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	168	J	140	J
Hexachlorobutadiene	n/a	3.3	0.8	U	0.8	U	0.8	U	0.8	U	2	U	2	U	2	U	2	U	1.6	UJ	1.6	UJ
Hexane	n/a	2.9	0.59	U	0.59	U	0.59	U	0.59	U	2	U	2	U	2	U	2	U	1.2	UJ	1.2	UJ
Iodomethane	n/a	n/a	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
Isopropylbenzene	n/a	8.4	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	48.7	J	53.2	J
m,p-Xylene	620	22000	0.32	U	0.32	U	0.32	U	0.32	U	2	U	2	U	2	U	2	U	147	J	182	J
Methacrylonitrile	n/a	69	5	U	5	U	5	U	5	U	20	U	20	U	20	U	20	U	10	UJ	10	UJ
Methyl methacrylate	n/a	51000	1	U	1	U	1	U	1	U	5	U	5	U	5	U	5	U	2	UJ	2	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
VOCs																						
Acetone	n/a	220000	20	U	20	U	20	U	20	U	10	U	10	U	25	U	25	U	25	U	25	U
Acetonitrile	n/a	42000	10	U	10	U	10	U	10	U	5	U	5	U	20	U	20	U	20	U	20	U
Acrolein	n/a	4	10	U	10	U	10	U	10	U	5	U	5	U	20	U	20	U	20	U	20	U
Acrylonitrile	n/a	85	6	U	6	U	6	U	6	U	3	U	3	U	10	U	10	U	10	U	10	U
Allyl chloride (3-Chloropopene)	n/a	n/a	0.6	U	0.6	U	0.6	U	0.6	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U
Benzene	5	14	**9.6**		**8.9**		**7.1**		**7.5**		**9.9**		**11.1**		3.8		3.6		4.5		**5.9**	
Benzyl Chloride	n/a	30	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U
Bromobenzene	n/a	n/a	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
Bromochloromethane	n/a	n/a	0.44	U	0.44	U	0.44	U	0.44	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U
Bromodichloromethane	81	21	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
Bromoform	81	0.083	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
Bromomethane	n/a	20	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U
Carbon disulfide	n/a	560	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U
Carbon tetrachloride	5	5	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
Chlorobenzene	100	390	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
Chloroethane	n/a	28000	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U
Chloroform	81	80	0.44	U	0.44	U	0.44	U	0.44	U	0.56	J	0.49	J	1	U	1	U	0.41	J	0.47	J
Chloromethane	n/a	67	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	UJ
Cis-1,2-dichloroethene	70	210	0.52	U	0.52	U	0.52	U	0.52	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U
Cis-1,3-dichloropropene	n/a	n/a	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
cis-1,4-Dichloro-2-butene	n/a	n/a	2	U	2	U	2	U	2	U	1	UJ	1	UJ	10	U	10	U	10	U	10	UJ
Cymene	n/a	n/a	15.8		15.2		8.6		8.7		7.7	J	7.9	J	0.4	J	0.38	J	0.3	J	1	
Dibromochloromethane	82	32	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
Dibromomethane	n/a	990	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U
Dichlorodifluoromethane	n/a	14	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	UJ
Ether, tert-butyl methyl	n/a	120000	0.68	U	0.68	U	0.68	U	0.68	U	0.34	U	0.34	U	1	U	1	U	1	U	1	U
Ethyl Methacrylate	n/a	9100	2	U	2	U	2	U	2	U	1	U	1	U	5	U	5	U	5	U	5	U
Ethylbenzene	700	700	122		130		117		114		92.9		91.9		0.4	J	1	U	1	U	1.5	
Hexachlorobutadiene	n/a	3.3	1.6	U	1.6	U	1.6	U	1.6	U	0.8	U	0.8	U	2	U	2	U	2	U	2	U
Hexane	n/a	2.9	1.2	U	1.2	U	1.2	U	1.2	U	0.59	U	0.59	U	2	U	2	U	2	U	2	U
Iodomethane	n/a	n/a	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
Isopropylbenzene	n/a	8.4	31.8		31.1		22.8		22.9		29	J	30	J	12.1		10.8		9		12.2	
m,p-Xylene	620	22000	23.8		21		1.1	J	0.97	J	5.2		4.5		2	U	2	U	2	U	0.38	J
Methacrylonitrile	n/a	69	10	U	10	U	10	U	10	U	5	U	5	U	20	U	20	U	20	U	20	U
Methyl methacrylate	n/a	51000	2	U	2	U	2	U	2	U	1.5	J	1.7	J	5	U	5	U	5	U	5	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
VOCs																						
Acetone	n/a	220000	25	U	43.6	J	10	U	10	U	10	U	25	U	25	U	25	U	25	U	10	UJ
Acetonitrile	n/a	42000	20	U	5	UJ	5	U	5	U	5	U	20	U	20	U	20	U	20	U	5	UJ
Acrolein	n/a	4	20	U	5	UJ	5	U	5	U	5	U	20	U	20	U	20	U	20	U	5	UJ
Acrylonitrile	n/a	85	10	U	3	UJ	3	U	3	U	3	U	10	U	10	U	10	U	10	U	3	UJ
Allyl chloride (3-Chloropopene)	n/a	n/a	2	U	0.3	UJ	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	0.3	UJ
Benzene	5	14	3.7		0.46	J	0.88	J	1.4		0.2	U	1	U	1	U	1	U	1	U	0.34	J
Benzyl Chloride	n/a	30	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	0.5	UJ
Bromobenzene	n/a	n/a	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
Bromochloromethane	n/a	n/a	1	U	0.22	UJ	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.22	UJ
Bromodichloromethane	81	21	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
Bromoform	81	0.083	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
Bromomethane	n/a	20	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	0.5	UJ
Carbon disulfide	n/a	560	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	0.5	UJ
Carbon tetrachloride	5	5	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
Chlorobenzene	100	390	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
Chloroethane	n/a	28000	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	0.5	UJ
Chloroform	81	80	0.45	J	0.22	UJ	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.22	UJ
Chloromethane	n/a	67	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	0.5	UJ
Cis-1,2-dichloroethene	70	210	1	U	0.26	UJ	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	0.26	UJ
Cis-1,3-dichloropropene	n/a	n/a	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
cis-1,4-Dichloro-2-butene	n/a	n/a	10	U	1	UJ	1	U	1	U	1	UJ	10	U	10	U	10	UJ	10	U	1	UJ
Cymene	n/a	n/a	1.1		0.79	J	0.21	U	0.21	U	0.21	U	1	U	1	U	1	U	1	U	0.6	J
Dibromochloromethane	82	32	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
Dibromomethane	n/a	990	2	U	0.25	UJ	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	0.25	UJ
Dichlorodifluoromethane	n/a	14	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	0.5	UJ
Ether, tert-butyl methyl	n/a	120000	1	U	0.34	UJ	0.34	U	0.34	U	0.34	U	1	U	1	U	1	U	1	U	0.34	UJ
Ethyl Methacrylate	n/a	9100	5	U	1	UJ	1	U	1	U	1	U	5	U	5	U	5	U	5	U	1	UJ
Ethylbenzene	700	700	4.6		0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2.7	J
Hexachlorobutadiene	n/a	3.3	2	U	0.8	UJ	0.8	U	0.8	U	0.8	U	2	U	2	U	2	U	2	U	0.8	UJ
Hexane	n/a	2.9	2	U	0.59	UJ	0.59	U	0.59	U	0.59	U	2	U	2	U	2	U	2	U	0.59	UJ
Iodomethane	n/a	n/a	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
Isopropylbenzene	n/a	8.4	10.6		2	J	5.8		5.1		0.69	J	0.28	J	0.33	J	1	U	0.28	J	15.1	J
m,p-Xylene	620	22000	1.2	J	0.32	UJ	0.32	U	0.32	U	0.32	U	2	U	2	U	2	U	2	U	0.32	UJ
Methacrylonitrile	n/a	69	20	U	5	UJ	5	U	5	U	5	U	20	U	20	U	20	U	20	U	5	UJ
Methyl methacrylate	n/a	51000	5	U	1	UJ	1	U	1	U	1	U	5	U	5	U	5	U	5	U	1	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
VOCs																				
Acetone	n/a	220000	10	U	10	U	10	U	25	U	25	U	25	U	25	U	100	UJ	100	U
Acetonitrile	n/a	42000	5	U	5	U	5	U	20	U	20	U	20	U	20	U	50	UJ	50	U
Acrolein	n/a	4	5	U	5	U	5	U	20	UJ	20	U	20	U	20	U	50	UJ	50	U
Acrylonitrile	n/a	85	3	U	3	U	3	U	10	U	10	U	10	U	10	U	30	UJ	30	U
Allyl chloride (3-Chloropopene)	n/a	n/a	0.3	U	0.3	U	0.3	U	2	U	2	U	2	U	2	U	3	UJ	3	U
Benzene	5	14	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	**371**	**J**	**776**	
Benzyl Chloride	n/a	30	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	5	UJ	5	U
Bromobenzene	n/a	n/a	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
Bromochloromethane	n/a	n/a	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	2.2	UJ	2.2	U
Bromodichloromethane	81	21	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
Bromoform	81	0.083	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
Bromomethane	n/a	20	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	5	UJ	5	U
Carbon disulfide	n/a	560	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	5	UJ	5	U
Carbon tetrachloride	5	5	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
Chlorobenzene	100	390	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
Chloroethane	n/a	28000	0.5	U	0.5	U	0.5	U	2	U	2	U	2	U	2	U	5	UJ	5	U
Chloroform	81	80	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	2.2	UJ	2.2	U
Chloromethane	n/a	67	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	5	UJ	5	U
Cis-1,2-dichloroethene	70	210	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	2.6	UJ	2.6	U
Cis-1,3-dichloropropene	n/a	n/a	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
cis-1,4-Dichloro-2-butene	n/a	n/a	1	U	1	U	1	UJ	10	U	10	U	10	UJ	10	UJ	10	UJ	10	U
Cymene	n/a	n/a	0.3	J	0.21	U	0.29	J	1	U	1	U	1	U	1	U	6.4	J	8.4	J
Dibromochloromethane	82	32	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
Dibromomethane	n/a	990	0.25	U	0.25	U	0.25	U	2	U	2	U	2	U	2	U	2.5	UJ	2.5	U
Dichlorodifluoromethane	n/a	14	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	5	UJ	5	U
Ether, tert-butyl methyl	n/a	120000	0.34	U	0.34	U	0.34	U	1	U	1	U	1	U	1	U	3.4	UJ	3.4	U
Ethyl Methacrylate	n/a	9100	1	U	1	U	1	U	5	U	5	U	5	U	5	U	10	UJ	10	U
Ethylbenzene	700	700	1.5		0.2	U	2.5		1.6		1	U	0.39	J	1	U	504	J	41	
Hexachlorobutadiene	n/a	3.3	0.8	U	0.8	U	0.8	U	2	U	2	U	2	U	2	U	8	UJ	8	U
Hexane	n/a	2.9	0.59	U	0.59	U	0.59	U	2	U	2	U	2	U	2	U	5.9	UJ	5.9	U
Iodomethane	n/a	n/a	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
Isopropylbenzene	n/a	8.4	4.1		0.5	J	11.5	J	11.2		3.6		4		1.1		51.8	J	9.1	J
m,p-Xylene	620	22000	0.32	U	0.32	U	0.32	U	2	U	2	U	2	U	2	U	145	J	221	
Methacrylonitrile	n/a	69	5	U	5	U	5	U	20	U	20	U	20	U	20	U	50	UJ	50	U
Methyl methacrylate	n/a	51000	1	U	1	U	1	J	5	U	5	U	5	U	5	U	10	UJ	10	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
VOCs																				
Acetone	n/a	220000	100	U	50	U	25	U	130	U	50	U	130	U	630	U	130	U	130	U
Acetonitrile	n/a	42000	50	U	25	U	20	U	100	U	40	U	100	U	500	U	100	U	100	U
Acrolein	n/a	4	50	U	25	U	20	U	100	U	40	U	100	U	500	U	100	U	100	U
Acrylonitrile	n/a	85	30	U	15	U	10	U	50	U	20	U	50	U	250	U	50	U	50	U
Allyl chloride (3-Chloropopene)	n/a	n/a	3	U	1.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Benzene	5	14	**550**		**217**		**152**		**426**		**516**		**537**	**J**	**736**	**J**	**461**		**443**	
Benzyl Chloride	n/a	30	5	U	2.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Bromobenzene	n/a	n/a	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Bromochloromethane	n/a	n/a	2.2	U	1.1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Bromodichloromethane	81	21	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Bromoform	81	0.083	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Bromomethane	n/a	20	5	U	2.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Carbon disulfide	n/a	560	5	U	2.5	U	1.4	J	10	U	1.3	J	10	U	50	U	2.9	J	2.5	J
Carbon tetrachloride	5	5	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Chlorobenzene	100	390	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Chloroethane	n/a	28000	5	U	2.5	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Chloroform	81	80	2.2	U	1.1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Chloromethane	n/a	67	5	U	2.5	U	2	U	10	U	4	U	10	UJ	50	UJ	10	U	10	U
Cis-1,2-dichloroethene	70	210	2.6	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Cis-1,3-dichloropropene	n/a	n/a	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
cis-1,4-Dichloro-2-butene	n/a	n/a	10	U	5	UJ	10	U	50	U	20	U	100	UJ	250	UJ	50	U	50	U
Cymene	n/a	n/a	6.6	J	3.8	J	1.4		5.8		5.5		5.3	J	9	J	5.3		5.2	
Dibromochloromethane	82	32	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Dibromomethane	n/a	990	2.5	U	1.3	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Dichlorodifluoromethane	n/a	14	5	U	2.5	U	2	U	10	U	4	U	10	UJ	50	UJ	10	U	10	U
Ether, tert-butyl methyl	n/a	120000	3.4	U	1.7	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Ethyl Methacrylate	n/a	9100	10	U	5	U	5	U	25	U	10	U	25	U	130	U	25	U	25	U
Ethylbenzene	700	700	15.1		107		105		480		568		656	J	**895**	**J**	499		469	
Hexachlorobutadiene	n/a	3.3	8	U	4	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Hexane	n/a	2.9	5.9	U	3	U	2	U	10	U	4	U	10	U	50	U	10	U	10	U
Iodomethane	n/a	n/a	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Isopropylbenzene	n/a	8.4	2	U	15.9	J	10.7		49.5		47.2		46.5	J	76.5	J	49.7		50.5	
m,p-Xylene	620	22000	94.2		7.2	J	6.7		47.1		42.1		69.8	J	100	J	54		56.5	
Methacrylonitrile	n/a	69	50	U	25	U	20	U	100	U	40	U	100	U	500	U	100	U	100	U
Methyl methacrylate	n/a	51000	10	U	5	U	5	U	25	U	10	U	25	U	130	U	25	U	25	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW01		SD27-MW02		SD27-MW02	
		Collection Date:	11/11/2010		1/25/2011		4/7/2011		7/11/2011		12/13/2012		3/6/2013		6/26/2013		8/28/2013		11/10/2010		11/10/2010	
		SampleID:	SD27-TTMW-01		MW27-01-012511		MW27-01-040711		MW27-01-071111		SD27-MW01-13122012		MW27-01-030613		MW27-01-062613		MW27-01-082013		SD27-TTMW-02		SD27-TTMW-02-FD	
		QCType:	N		N		N		N		N		N		N		N		N		FD	
VOCs																						
Methylene chloride	5	580	2	U	2	U	2	U	2	U	4	J	5	U	5	U	5	U	4	UJ	4	UJ
Naphthalene	30	150	1	U	1	U	1	U	1	U	5	U	5	U	5	U	5	U	5.4	J	6.6	J
n-Butylbenzene	n/a	260	0.26	UJ	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	3.9	J	4.2	J
n-Propylbenzene	n/a	320	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	57	J	64.2	J
o-Xylene	620	33000	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	74.5	J	90.4	J
Pentachloroethane	n/a	n/a	2	U	2	U	2	U	2	U	10	U	10	U	10	U	10	UJ	4	UJ	4	UJ
Propane Nitrile (Propionitrile)	n/a	n/a	5	U	5	U	5	U	5	U	20	U	20	U	20	U	20	U	10	UJ	10	UJ
sec-Butylbenzene	n/a	250	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	20	J	21	J
Styrene	100	8900	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
tert-Butylbenzene	n/a	290	0.27	U	0.27	U	0.27	U	0.27	U	1	U	1	U	1	U	1	U	0.54	UJ	0.54	UJ
Tetrachloroethene	5	11	0.25	U	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.5	UJ	0.5	UJ
Toluene	750	1500	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	4.5	J	5.8	J
Trans-1,2-dichloroethene	100	180	0.35	U	0.35	U	0.35	U	0.35	U	1	U	1	U	1	U	1	U	0.7	UJ	0.7	UJ
Trans-1,3-dichloropropene	n/a	n/a	0.2	U	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.4	UJ	0.4	UJ
trans-1,4-Dichloro-2-butene	n/a	n/a	2	U	2	U	2	U	2	U	10	U	10	U	10	UJ	10	U	4	UJ	4	UJ
Trichloroethene	5	5	0.26	U	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	0.52	UJ	0.52	UJ
Trichlorofluoromethane	n/a	180	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	1	UJ	1	UJ
Vinyl acetate	n/a	9600	2	U	2	U	2	U	2	U	10	U	10	UJ	10	U	10	U	4	UJ	4	UJ
Vinyl chloride	1	2.5	0.22	U	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.44	UJ	0.44	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02		SD27-MW02	
		Collection Date:	1/25/2011		1/25/2011		4/7/2011		4/7/2011		7/11/2011		7/11/2011		12/12/2012		12/12/2012		3/6/2013		6/26/2013	
		SampleID:	MW27-02-012511		MW27-DUP01-012511		MW27-02-040711		MW27-DUP01-040711		MW27-02-071111		MW27-DUP01-071111		SD27-MW02-12122012		SD27-MW02-DUP 01		MW27-02-030613		MW27-02-062613	
		QCType:	N		FD		N		FD		N		FD		N		FD		N		N	
VOCs																						
Methylene chloride	5	580	4	U	4	U	**7.1**	**J**	**7.2**	**J**	2	U	2	U	5	U	5	U	5	U	5	U
Naphthalene	30	150	2.3	J	2.6	J	2	U	2	U	1	U	1	U	5	U	5	U	5	U	5	U
n-Butylbenzene	n/a	260	2.4		2.1		1.7	J	1.7	J	1.6		1.5		0.25	J	1	U	1	U	1	U
n-Propylbenzene	n/a	320	36.4		35.2		23.6		24.1		32.1		33.9		15.5		14.1		12.7		16	
o-Xylene	620	33000	7.3		6.6		3.5		3.5		13.6		12		1	U	1	U	1	U	1	U
Pentachloroethane	n/a	n/a	4	U	4	U	4	U	4	U	2	U	2	U	10	U	10	U	10	U	10	U
Propane Nitrile (Propionitrile)	n/a	n/a	10	U	10	U	10	U	10	U	5	U	5	U	20	U	20	U	20	U	20	U
sec-Butylbenzene	n/a	250	11.8		11		7.4		7.5		10.6		11.3		5.2		4.5		3.9		6.2	
Styrene	100	8900	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
tert-Butylbenzene	n/a	290	0.86	J	0.98	J	0.54	U	0.55	J	0.87	J	0.84	J	0.51	J	1	U	0.3	J	0.59	J
Tetrachloroethene	5	11	0.5	U	0.5	U	0.5	U	0.5	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U
Toluene	750	1500	0.4	U	0.4	U	0.4	U	0.4	U	0.61	J	0.54	J	1	U	1	U	1	U	0.49	U
Trans-1,2-dichloroethene	100	180	0.7	U	0.7	U	0.7	U	0.7	U	0.35	U	0.35	U	1	U	1	U	1	U	1	U
Trans-1,3-dichloropropene	n/a	n/a	0.4	U	0.4	U	0.4	U	0.4	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U
trans-1,4-Dichloro-2-butene	n/a	n/a	4	U	4	U	4	U	4	U	2	U	2	U	10	U	10	U	10	U	10	UJ
Trichloroethene	5	5	0.52	U	0.52	U	0.52	U	0.52	U	1.9		1.8		1	U	1	U	1	U	1	U
Trichlorofluoromethane	n/a	180	1	U	1	U	1	U	1	U	0.5	U	0.5	U	2	U	2	U	2	U	2	UJ
Vinyl acetate	n/a	9600	4	U	4	U	4	U	4	U	2	U	2	U	10	U	10	U	10	UJ	10	U
Vinyl chloride	1	2.5	0.44	U	0.44	U	0.44	U	0.44	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW02		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW03		SD27-MW04	
		Collection Date:	8/28/2013		11/10/2010		1/25/2011		4/6/2011		7/12/2011		12/13/2012		3/7/2013		6/26/2013		8/28/2013		11/10/2010	
		SampleID:	MW27-02-082013		SD27-TTMW-03		MW27-03-012511		MW27-03-040611		MW27-03-071211		SD27-MW03-13122012		MW27-03-030713		MW27-03-062613		MW27-03-082013		SD27-TTMW-04	
		QCType:	N		N		N		N		N		N		N		N		N		N	
VOCs																						
Methylene chloride	5	580	5	U	2	UJ	2	U	2	U	2	U	5	U	5	U	5	U	5	U	2	UJ
Naphthalene	30	150	5	U	1	UJ	1	U	1	U	1	U	5	U	5	U	5	U	5	U	1	UJ
n-Butylbenzene	n/a	260	0.24	J	0.26	UJ	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	0.26	UJ
n-Propylbenzene	n/a	320	14.6		1.1	J	2.8		3.6		0.2	U	1	U	0.27	J	1	U	1	U	11.5	J
o-Xylene	620	33000	0.53	J	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.27	J
Pentachloroethane	n/a	n/a	10	UJ	2	UJ	2	U	2	U	2	U	10	U	10	U	10	U	10	UJ	2	UJ
Propane Nitrile (Propionitrile)	n/a	n/a	20	U	5	UJ	5	U	5	U	5	U	20	U	20	U	20	U	20	U	5	UJ
sec-Butylbenzene	n/a	250	4.9		2.1	J	2.5		1.8		0.31	J	1	U	1	U	1	U	1	U	6.8	J
Styrene	100	8900	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
tert-Butylbenzene	n/a	290	0.42	J	0.39	J	0.44	J	0.27	U	0.27	U	1	U	1	U	1	U	1	U	0.27	UJ
Tetrachloroethene	5	11	1	U	0.25	UJ	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	0.25	UJ
Toluene	750	1500	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	0.32	U	1	U	0.2	UJ
Trans-1,2-dichloroethene	100	180	1	U	0.35	UJ	0.35	U	0.35	U	0.35	U	1	U	1	U	1	U	1	U	0.35	UJ
Trans-1,3-dichloropropene	n/a	n/a	1	U	0.2	UJ	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	0.2	UJ
trans-1,4-Dichloro-2-butene	n/a	n/a	10	U	2	UJ	2	U	2	U	2	U	10	U	10	U	10	UJ	10	U	2	UJ
Trichloroethene	5	5	1	U	0.26	UJ	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	0.26	UJ
Trichlorofluoromethane	n/a	180	2	U	0.5	UJ	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	0.5	UJ
Vinyl acetate	n/a	9600	10	U	2	UJ	2	U	2	U	2	U	10	U	10	UJ	10	U	10	U	2	UJ
Vinyl chloride	1	2.5	1	U	0.22	UJ	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	0.22	UJ

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW04		SD27-MW05		SD27-MW05	
		Collection Date:	1/25/2011		4/6/2011		7/11/2011		12/12/2012		3/7/2013		6/26/2013		8/28/2013		11/11/2010		1/25/2011	
		SampleID:	MW27-04-012511		MW27-04-040611		MW27-04-071111		SD27-MW04-12122012		MW27-04-030713		MW27-04-062613		MW27-04-082013		SD27-TTMW-05		MW27-05-012511	
		QCType:	N		N		N		N		N		N		N		N		N	
VOCs																				
Methylene chloride	5	580	2	U	2	U	2	U	5	U	5	U	5	U	5	U	20	UJ	20	U
Naphthalene	30	150	1	U	1	U	1	U	5	U	5	U	5	U	5	U	**57.4**	**J**	**48.5**	**J**
n-Butylbenzene	n/a	260	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	2.6	UJ	2.6	U
n-Propylbenzene	n/a	320	2.3		0.25	J	6.9		12.1		3.7		3.9		0.72	J	50.1	J	4.3	J
o-Xylene	620	33000	0.2	U	0.2	U	0.2	U	0.22	J	1	U	1	U	1	U	332	J	376	
Pentachloroethane	n/a	n/a	2	U	2	U	2	U	10	U	10	U	10	U	10	UJ	20	UJ	20	U
Propane Nitrile (Propionitrile)	n/a	n/a	5	U	5	U	5	U	20	U	20	U	20	U	20	U	50	UJ	50	U
sec-Butylbenzene	n/a	250	2.5		0.35	J	5.2		7.9		3.1		3		0.76	J	7.8	J	3	J
Styrene	100	8900	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
tert-Butylbenzene	n/a	290	0.28	J	0.27	U	0.44	J	0.63	J	0.41	J	0.32	J	1	U	2.7	UJ	2.7	U
Tetrachloroethene	5	11	0.25	U	0.25	U	0.25	U	1	U	1	U	1	U	1	U	2.5	UJ	2.5	U
Toluene	750	1500	0.2	U	0.2	U	0.2	U	1	U	1	U	0.36	U	1	U	279	J	104	
Trans-1,2-dichloroethene	100	180	0.35	U	0.35	U	0.35	U	1	U	1	U	1	U	1	U	3.5	UJ	3.5	U
Trans-1,3-dichloropropene	n/a	n/a	0.2	U	0.2	U	0.2	U	1	U	1	U	1	U	1	U	2	UJ	2	U
trans-1,4-Dichloro-2-butene	n/a	n/a	2	U	2	U	2	U	10	U	10	U	10	UJ	10	UJ	20	UJ	20	U
Trichloroethene	5	5	0.26	U	0.26	U	0.26	U	1	U	1	U	1	U	1	U	2.6	UJ	2.6	U
Trichlorofluoromethane	n/a	180	0.5	U	0.5	U	0.5	U	2	U	2	U	2	UJ	2	U	5	UJ	5	U
Vinyl acetate	n/a	9600	2	U	2	U	2	U	10	U	10	UJ	10	U	10	U	20	UJ	20	U
Vinyl chloride	1	2.5	0.22	U	0.22	U	0.22	U	1	U	1	U	1	U	1	U	2.2	UJ	2.2	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

		Well:	SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05		SD27-MW05	
		Collection Date:	4/7/2011		7/11/2011		12/11/2012		3/7/2013		3/7/2013		6/26/2013		6/26/2013		8/28/2013		8/28/2013	
		SampleID:	MW27-05-040711		MW27-05-071111		SD27-MW05-11122012		MW27-05-030713		MW27-DUP01-030713		MW27-05-062613		MW27-DUP01-062613		MW27-05-082013		MW27-DUP01-082013	
		QCType:	N		N		N		N		FD		N		FD		N		FD	
VOCs																				
Methylene chloride	5	580	**27.6**	**J**	**11.7**	**J**	5	U	**61.3**	**J**	**12.2**	**J**	25	U	130	U	25	U	25	U
Naphthalene	30	150	**34.3**	**J**	19.1	J	5.8		21.9	J	25.6		17.9	J	**38**	**J**	9.8	J	11	J
n-Butylbenzene	n/a	260	2.6	U	1.3	U	1	U	1	J	0.74	J	5	U	25	U	5	U	5	U
n-Propylbenzene	n/a	320	2	U	10.8		9.2		52.4		49.3		45	J	90.7	J	52.8		54.3	
o-Xylene	620	33000	329		103		47.4		220		258		323		366		249		258	
Pentachloroethane	n/a	n/a	20	U	10	U	10	U	50	U	20	U	50	U	250	U	50	UJ	50	UJ
Propane Nitrile (Propionitrile)	n/a	n/a	50	U	25	U	20	U	100	U	40	U	100	U	500	U	100	U	100	U
sec-Butylbenzene	n/a	250	2.2	U	4.4	J	2.4		9.4		8.2		11.5	J	13.6	J	8.1		8.4	
Styrene	100	8900	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
tert-Butylbenzene	n/a	290	2.7	U	1.4	U	1	U	5	U	0.95	J	5	U	25	U	5	U	5	U
Tetrachloroethene	5	11	2.5	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Toluene	750	1500	104		33.9		28.1		102		98.8		160	J	292	J	189		190	
Trans-1,2-dichloroethene	100	180	3.5	U	1.8	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Trans-1,3-dichloropropene	n/a	n/a	2	U	1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
trans-1,4-Dichloro-2-butene	n/a	n/a	20	U	10	U	10	U	50	U	20	U	100	UJ	250	UJ	50	U	50	U
Trichloroethene	5	5	2.6	U	1.3	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U
Trichlorofluoromethane	n/a	180	5	U	2.5	U	2	U	10	U	4	U	10	UJ	50	UJ	10	U	10	U
Vinyl acetate	n/a	9600	20	U	10	U	10	U	50	UJ	20	UJ	50	U	250	U	50	U	50	U
Vinyl chloride	1	2.5	2.2	U	1.1	U	1	U	5	U	2	U	5	U	25	U	5	U	5	U

Table A-14. Analytical Results for Groundwater at SD-27 (2010 - 2013)
Holloman AFB, Alamogorodo, NM

Notes:
All units are microgram per liter, except: TDS is milligrams per liter, and Radiochemistry is picocuries per liter.

(1) Screening Value (SV) is the lower of the New Mexico Environment Department, Water Quality Control Commission (NMWQCC), STANDARDS FOR GROUND WATER (NMAC 20.6.2.3103) and EPA MCLs (April 2012). For inorganics, if HAFB Background (NMED, 2012a) is greater than NMWQCC and EPA criteria, then the background value is used as the SV. For TPH, the NMED GW-1 standard for Kerosene and Jet Fuel are used (NMED, 2012b).

(2) Vapor Intrusion (VI) SV for volatile chemicals is the $1e^{-5}$ risk level value listed in EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Table 2b, November 2002. For TPH, the NMED GW-2 standard for kerosene and jet fuel is used (NMED, 2012b).

Bold red indicates > SV

Highlighted indicates > VI SV

Not analyzed.

n/a = not applicable
U = Analyte not detected above reporting detection limit shown.
J = Estimated quantity.
B = (Inorganic parameters) Analyte detected between method detection limit and reporting limit; quantity estimated.
R = Rejected
NM - normal sample (parent), FD - field duplicate sample.

Reference: (TetraTech, 2013)

Table A-15
Areas and Volumes of Contaminated Media for Pathways of Concern
SD-27, Holloman Air Force Base

Media and Pathway of Concern	Sample Locations	Chemicals of Concern[a]	Area, Approximate (feet^2)[b]	Thickness, Range / Average (feet)	Contaminated Media Volume[c] (yd^3)
Soil, direct contact	DPTs: 02, 08, 09, 10, 11, 12, 18, 19, 22, 28; Soil Borings: SB27-02, SB27-03; 94-27-01R.	1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; acrolien; benzene; ethylbenzene; xylenes; TPH(C10-C28), arsenic, chromium	6,000	4 - 14 / 11	2,800
Soil, vapor intrusion	DPTs: 01, 02, 03, 04, 05, 08, 09, 10, 11, 12, 17, 18, 19, 20, 22, 24, 25, 28, 29, 31; Soil Borings: SB27-02, SB27-03; 94-27-01R.	1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; acrolein, benzene, carbon disulfide, chloroform, ethylbenzene, hexane, isopropylbenzene, m,p-xylene, n-butylbenzene, n-propylbenzene, naphthalene, o-xylene, toluene, and trichloroethane.	18,300	4 - 14 / 6	4,500
Groundwater, vapor intrusion	Wells: MW-02, -04, -05; Samples: GW27-02, GW27-03.	1,2-dichloroethane; 1,2,4-TMB; 1,3,5-TMB; benzene; ethylbenzene; isopropylbenzene; n-propylbenzene; toluene, and TCE	18,300	4 - 14 / 7	5,050
Estimated Totals, All Media			**18,300**	**4 - 14**	**5,050**

[a] Chemicals of concern exceed SSLs for soil and SLs for groundwater.

[b] Soil vapor intrusion contamination area overlaps and exceeds area of direct contact contamination by approximately 9,300 feet^2. Groundwater contamination area overlies and exceeds soil contamination area by approximately 3,000 feet^2.

[c] Includes 15 percent expansion; does not include clean overburden. Reference: (TetraTech, 2012)

APPENDIX B

Comprehensive and Reduced Soil Data Collected in 2006, 2010 and 2011

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-01		SD27-DPT-02	SD27-DPT-03	SD27-DPT-04	SD27-DPT-05		SD27-DPT-06		SD27-DPT-07
Depth (ft bgs)	6.5 - 8.5	10 - 10.7	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	10-12	6.5 - 8.5	6.5 - 8.5 (DUP)	6.5 - 8.5
Date	11/3/2010		11/3/2010	11/3/2010	11/3/2010	11/3/2010		11/3/2010		11/3/2010
TPH										
TPH-GRO (C6-C10)	2.5 U	**179** J	**112**	**2940** J	**1590**	2.3 U	**772** J	2.6 U	2.4 U	2.4 U
TPH (C10-C28)	4.6 U	**15.3**	12	**469**	**606**	4.6 U	102	4.4 U	3.9 U	4.5 U
Metals, Total										
Arsenic	**1.4**	**1.4**	**2.5**	**1.3**	**1.1**	**1.6**	**1.3**	**1.8**	**1.3**	**0.52** J
Barium	**27.3**	**39**	**19.7**	**30.8**	**46.4**	**24.5**	**25**	**29.7** J	**57.9** J	**19**
Cadmium	0.061 U	**0.061** J	**0.16** J	**0.28**	**0.22** J	0.052 U	**0.13** J	**0.069** J	0.058 U	0.065 U
Chromium	**4.4** J	**3.8** J	**262**	**35.3**	**28.7**	**2.5** J	**4.4** J	**14.6** J	**7.3** J	**6.5**
Lead	**1.3**	**1.6**	**3.1**	**3.7**	**3.6**	**1.2**	**1.5**	**1.3**	**1.9**	**0.9** J
Mercury	**0.011** J	0.01 U	0.012 U	0.011 U	0.011 U	0.01 U	0.01 U	0.01 U	0.0093 U	0.0099 U
Selenium	6000 U	2.2 U	2 U	2.4 U	2.7 U	2.1 U	2.1 U	2 U	2.3 U	2.6 U
Date	11/9/2010		11/9/2010	11/9/2010	11/9/2010	11/9/2010		11/9/2010		11/9/2010
SVOCs										
1-Methylnaphthalene	0.023 U	**0.0768** J	0.023 U	**1.06**	**1.04**	0.022 U	**0.187** J	0.022 U	0.019 U	0.022 U
2-Methylnaphthalene	0.023 U	0.021 U	0.023 U	**0.92**	**0.575** J	0.022 U	**0.195** J	0.022 U	0.019 U	0.022 U
Naphthalene	50 U	0.034 U	0.038 U	**0.474**	**0.578** J	0.036 U	**0.0931** J	0.035 U	0.031 U	0.035 U
VOCs										
1,1-Dichloroethene	0.0011 U	0.065 U	0.1 U	0.33 U	0.41 U	0.001 U	0.14 U	0.0012 U	0.0012 U	0.0012 U
1,2,4-Trimethylbenzene	0.00083 U	**2.08**	**2.12**	**40.1**	**41.3**	0.00079 U	**9.33**	0.00093 U	0.00097 U	0.00092 U
1,3,5-Trimethylbenzene	0.00099 U	**0.732**	0.095 U	**16.8**	**16.9**	0.00094 U	**3.29**	0.0011 U	0.0011 U	0.0011 U
n-Butylbenzene	0.00099 U	**0.173** J	**0.12** J	**5.16**	**1.64**	0.00094 U	**0.704**	0.0011 U	0.0011 U	0.0011 U
4-Methyl-2-pentanone	0.0042 U	0.25 U	0.4 U	1.3 U	1.6 U	0.004 U	0.54 U	0.0046 U	0.0049 U	0.0046 U
Acetone	**0.015** R	**0.93** R	**1.5** R	**4.7** R	**5.8** R	**0.014** R	**2** R	**0.017** R	**0.024** J	**0.0173** J
Acrolein	**0.0083** UJ	**0.51** UJ	**0.8** UJ	**2.6** UJ	3.2 U	**0.0079** UJ	**1.1** UJ	0.0093 U	**0.0097** UJ	**0.0092** UJ
Benzene	0.0011 U	**0.142**	**0.232** J	**5.05**	**12.6**	0.0011 U	**4.8**	**0.0036** J	**0.0086** J	**0.0054**
Benzyl Chloride	0.0011 U	0.069 U	0.11 U	0.35 U	0.44 U	0.0011 U	0.15 U	0.0013 U	0.0013 U	0.0013 U
Carbon disulfide	0.0015 U	0.093 U	0.15 U	**0.96** J	0.58 U	0.0014 U	0.2 U	**0.0036** J	0.0018 U	0.0017 U
Chloroform	0.00091 U	0.056 U	0.088 U	0.28 U	0.35 U	0.00087 U	0.12 U	0.001 U	0.0011 U	0.001 U
Cymene	0.00091 U	**2.63**	**0.144** J	**5.17**	**4.12**	0.00087 U	**3.33**	0.001 U	0.0011 U	0.001 U
Ethylbenzene	0.00076 U	**0.657**	**0.474**	**15**	**13.2**	0.00072 U	**9.53**	**0.00088** J	**0.0012** J	0.00084 U
Hexane	**0.0014** UJ	**0.088** UJ	**0.14** UJ	**5.82** J	**2.62** J	**0.0014** UJ	**0.19** UJ	**0.0016** UJ	**0.0017** UJ	**0.0016** UJ
Isopropylbenzene	0.00083 U	**0.356**	**0.341** J	**5.87**	**3.49**	0.00079 U	**1.81**	0.00093 U	**0.0011** J	**0.0047**
m,p-Xylene	0.0017 U	**1.21**	**0.626** J	**46.3**	**46.9**	0.0016 U	**9.69**	0.0019 U	0.0019 U	0.0018 U
Methylene chloride	0.0076 U	0.46 U	0.73 U	2.3 U	5.63 U	0.0072 U	0.45 U	0.0084 U	0.0088 U	0.0084 U
Naphthalene	0.0015 U	**0.108** J	0.15 U	**5.43**	**5.53**	0.0014 U	**1.3**	0.0017 U	0.0018 U	0.0017 U
n-Propylbenzene	0.0011 U	**0.396**	**0.388**	**6.53**	**2.15**	0.001 U	**2.12**	0.0012 U	0.0012 U	**0.003** J
o-Xylene	0.00076 U	**0.49**	**0.0902** J	**17.1**	**18.8**	0.00072 U	**5.87**	0.00084 U	0.00088 U	0.00084 U
Sec-Butylbenzene	0.0012 U	**0.25**	**0.186** J	**5.95**	**3.23**	0.0012 U	**0.9**	0.0014 U	0.0014 U	**0.0018** J
Tert-butyl benzene	0.00091 U	0.056 U	0.088 U	0.28 U	**0.47** J	0.00087 U	0.12 U	0.001 U	0.0011 U	0.001 U
Toluene	0.00091 U	**0.166** J	0.088 U	**18.1**	**36.6**	0.00087 U	**6.67**	0.001 U	0.0011 U	0.001 U
Trichloroethene	0.00091 U	0.056 U	0.088 U	0.28 U	0.35 U	0.00087 U	0.12 U	0.001 U	0.0011 U	0.001 U

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3 of Final Accelerated Corrective Measures Work Plan Addendum for SD-27 PAD 9 Drainage Pit (SWMU 141), 2012.
Values in bold font are detected values.
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-08					SD27-DPT-09			SD27-DPT-10		
Depth (ft bgs)	6.5 - 8.5	10-15	10-15 (DUP)	16.5-18	22-24	7-9	12-14	16-18	8 - 10	12.4 - 14.5	17 - 19
Date	11/4/2010					11/4/2010			11/4/2010		
	TPH										
TPH-GRO (C6-C10)	**643**	**4400** J	NA	NA	**863** J	NA	**1480**	**2540** J	2.3 U	2.4 U	**1970** J	**418** J
TPH (C10-C28)	**1360**	**1890**	NA	NA	**146**	4 U	**760**	**2870**	3.9 U	**1970**	**1150**	**16.7**
	Metals, Total										
Arsenic	**0.86**	**1.7**	NA		**1.4**	**2.3**	**0.51**	**0.87**	**0.71**	**0.52** J	**1.2**	**0.9**
Barium	**20.1**	**33.2** J	NA		**77.6**	**50.8**	**24.3**	**41.8**	**25.3**	**18.9**	**41.9**	**38.8**
Cadmium	**0.88**	**0.17** J	NA		**0.2** J	**0.35**	0.045 U	**0.23**	**0.92**	**0.06** J	**0.42**	**0.75**
Chromium	**228**	**7.3**	NA		**21.2**	**9.4**	**29**	**7.2**	**8.6**	**2.1** J	**7.4**	**5.6**
Lead	**4.9**	**2.9** J	NA		**3**	**4.3**	**1**	**2.7**	**21.8**	**1** J	**3** J	**2.2** J
Mercury	0.011 U	0.011 U	NA		0.01 U	0.0099 U	0.01 U	0.01 U	0.0086 U	0.01 U	0.0095 U	**0.0095**
Selenium	2.1 U	2 U	NA		2.2 U	2 U	1.8 U	2.2 U	2 U	2.2 U	1.9 U	1.7 U
Date	11/10/2010					11/10/2010			11/10/2010		
	SVOCs										
1-Methylnaphthalene	**2.66**	**6.21**	NA		**0.306**	0.02 U	**1.34**	**10.9**	0.02 U	**2.93**	**4.34**	0.019 U
2-Methylnaphthalene	**1.25** J	**6.64** J	NA		**0.277**	0.02 U	**0.0872** J	**6.24**	0.02 U	0.11 U	**3.28**	0.019 U
Naphthalene	**1.64** J	**3.01**	NA		**0.0964** J	0.033 U	**0.215** J	**3.65**	0.031 U	0.17 U	**1.77**	0.03 U
	VOCs										
1,1-Dichloroethene	0.15 U	1.4 U	NA	NA	0.29 U	NA	0.69 U	0.69 U	0.00097 U	0.0011 U	0.61 U	0.061 U
1,2,4-Trimethylbenzene	**13.8**	**105**	NA	NA	**15.2**	NA	**57.6**	**87.2**	**0.002** J	**0.0379**	**33.6**	**4.46**
1,3,5-Trimethylbenzene	**9.2**	**33.9**	NA	NA	**5.09**	NA	**24.2**	**29.9**	0.00091 U	**0.0219**	**11.7**	**1.58**
n-Butylbenzene	**0.291** J	**17.2**	NA	NA	**1.84**	NA	**5.71**	**14.5**	0.00091 U	**0.00098** J	**3.73**	**0.493**
4-Methyl-2-pentanone	0.58 U	5.5 U	NA	NA	1.1 U	NA	2.7 U	2.7 U	0.0038 U	0.0041 U	2.4 U	0.24 U
Acetone	2.1 U	**20** UJ	NA	NA	4.1 U	NA	9.8 U	9.8 U	0.014 U	0.015 U	8.8 U	0.87 U
Acrolein	1.2 U	11 U	NA	NA	2.3 U	NA	5.4 U	5.4 U	0.0077 U	0.0083 U	4.8 U	0.48 U
Benzene	**1.2**	**23.7**	NA	NA	**1.37**	NA	**2.91**	**2.97**	**0.0028** J	**0.0109**	0.66 U	0.065 U
Benzyl Chloride	0.16 U	1.5 U	NA	NA	0.31 U	NA	0.74 U	**1.6** J	0.001 U	0.0011 U	0.66 U	0.065 U
Carbon disulfide	**0.225** J	2 U	NA	NA	0.41 U	NA	0.98 U	0.98 U	**0.0018** J	**0.0024** J	0.88 U	0.087 U
Chloroform	0.13 U	1.2 U	NA	NA	0.25 U	NA	0.59 U	0.59 U	0.00084 U	0.0009 U	0.53 U	0.052 U
Cymene	**2.26**	**12.1**	NA	NA	**1.85**	NA	**8.4**	**10.8**	0.00084 U	**0.004**	**3.1**	**0.511**
Ethylbenzene	**5.4**	**107** J	NA	NA	**16.8**	NA	**36.4**	**76.1**	**0.0042**	**0.0029** J	**43.6**	**2.18**
Hexane	**0.436** J	**22.7**	NA	NA	**1.07**	NA	**0.931** J	**5.44**	0.0013 U	0.0014 U	**1.88** J	**0.0882** J
Isopropylbenzene	**1.05**	**25.4** J	NA	NA	**3.73**	NA	**9.58**	**23.3**	0.00077 U	**0.0075**	**8.91**	**1.32**
m,p-Xylene	**17.3**	**132**	NA	NA	**17.3**	NA	**69.2**	**73.2**	**0.003** J	**0.0085**	**60.2**	**1.1**
Methylene chloride	0.48 U	4.6 U	NA	NA	0.95 U	NA	2.3 U	2.3 U	0.009 U	0.0103 U	2 U	0.43 U
Naphthalene	**1.78**	**20.1**	NA	NA	**2.63**	NA	**8.31**	**2.9**	0.0014 U	0.0015 U	**3.19**	**0.261**
n-Propylbenzene	**0.49** J	**37.3** J	NA	NA	**5.67**	NA	**12.2**	**34.4**	0.00097 U	**0.0059**	**11.7**	**2**
o-Xylene	**7.95**	**60.9** J	NA	NA	**8.21**	NA	**34.4**	**39.4**	**0.002** J	0.00075 U	**24.9**	**0.45**
Sec-Butylbenzene	**1.33**	**14.8**	NA	NA	**2.15**	NA	**6.84**	**14.1**	0.0011 U	**0.0057**	**4.32**	**0.911**
Tert-butyl benzene	0.13 U	1.2 U	NA	NA	0.25 U	NA	**0.614** J	**0.728** J	0.00084 U	0.0009 U	0.53 U	0.052 U
Toluene	**6.95**	**93.9** J	NA	NA	**9.46**	NA	**37**	**8.79**	**0.0014** J	0.0009 U	**10.2**	**0.293**
Trichloroethene	0.13 U	1.2 U	NA	NA	0.25 U	NA	0.59 U	0.59 U	0.00084 U	0.0009 U	0.53 U	0.052 U

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-11				SD27-DPT-12			SD27-DPT-13		
Depth (ft bgs)	6.5 - 8.5	6.5 - 8.5 (DUP)	10-12	18-19.7	6.5 - 8.5	11.5-13.5	17-19	6.5-8.5	11.5-13.5	16.5-18.5
Date	11/4/2010				11/4/2010			11/5/2010		
	TPH									
TPH-GRO (C6-C10)	2.3 U	2.8 U	**7040** J	**437** J	2.6 U	**3600** J	2.3 U	NA	NA	NA
TPH (C10-C28)	4.2 U	3.8 U	**586**	4.3 U	4.4 U	**5690**	4.2 U	3.8 U	**66.9**	3.7 U
	Metals, Total									
Arsenic	**0.5** J	**0.66**	**1.3**	**0.58**	**1.3**	**0.5**	**1**	**0.81**	**0.97**	**0.61**
Barium	**23.5**	**21.6**	**26.3**	**27**	**24.7**	**21.2**	**87**	**21.3** J	**25.5** J	**37.5** J
Cadmium	**0.44**	**0.29**	**0.42**	**0.47**	0.061 U	**0.3**	**0.95**	**0.27**	**0.25**	**0.086** J
Chromium	**21.5** J	**9.6** J	**6**	**3** J	**3.2** J	**25.2**	**9**	**2.8** J	**4.1** J	**3.9** J
Lead	**0.37** J	**0.85** J	**1.2** J	**1.8** J	**1** J	**0.92** J	**3.4** J	**1.1**	**1.2**	**1.2**
Mercury	0.01 U	0.0098 U	0.011 U	0.01 U	0.011 U	0.0096 U	0.0089 U	0.0097 U	0.0098 U	**0.013** J
Selenium	2.2 U	1.6 U	1.9 U	1.8 U	2.5 U	1.8 U	2.1 U	1.5 U	1.9 U	1.6 U
Date	11/10/2010				11/10/2010			11/5/2010		
	SVOCs									
1-Methylnaphthalene	0.021 U	0.02 U	**0.491**	0.021 U	0.023 U	**14**	0.02 U	0.019 U	**0.142**	0.018 U
2-Methylnaphthalene	0.021 U	0.02 U	**0.347**	0.021 U	0.023 U	**13.2**	0.02 U	0.019 U	0.02 U	0.018 U
Naphthalene	0.034 U	0.032 U	**0.325**	0.034 U	0.036 U	**8.91**	0.033 U	0.031 U	0.032 U	0.03 U
	VOCs									
1,1-Dichloroethene	0.0011 U	0.0012 U	1.4 U	0.056 U	0.0011 U	0.68 U	0.0011 U	NA	NA	NA
1,2,4-Trimethylbenzene	0.00083 U	0.00096 U	**166**	**4.73**	0.00085 U	**56.5**	**0.0118**	NA	NA	NA
1,3,5-Trimethylbenzene	0.00099 U	0.0011 U	**56.8**	**1.82**	0.001 U	**19.6**	**0.0046**	NA	NA	NA
n-Butylbenzene	0.00099 U	0.0011 U	**24.1**	**0.309**	0.001 U	**8.14**	0.001 U	NA	NA	NA
4-Methyl-2-pentanone	0.0042 U	0.0048 U	5.5 U	0.22 U	0.0042 U	2.7 U	0.0043 U	NA	NA	NA
Acetone	0.015 U	0.017 U	20 U	0.8 U	0.015 U	9.8 U	0.016 U	NA	NA	NA
Acrolein	0.0083 U	0.0096 U	**11** UJ	0.44 U	0.0085 U	5.4 U	0.0086 U	NA	NA	NA
Benzene	0.0011 U	0.0013 U	**60.6**	**0.321**	0.0012 U	**4.22**	0.0012 U	NA	NA	NA
Benzyl Chloride	0.0011 U	0.0013 U	1.5 U	0.06 U	0.0012 U	0.73 U	0.0012 U	NA	NA	NA
Carbon disulfide	0.0015 U	0.0017 U	2 U	0.08 U	0.0015 U	0.98 U	**0.003** J	NA	NA	NA
Chloroform	0.00091 U	0.001 U	1.2 U	0.048 U	0.00092 U	0.59 U	0.00094 U	NA	NA	NA
Cymene	0.00091 U	0.001 U	**17.7**	**0.474**	0.00092 U	**28.4**	**0.0036** J	NA	NA	NA
Ethylbenzene	0.00076 U	0.00087 U	**190**	**4.67**	0.00077 U	**73.7**	**0.0048**	NA	NA	NA
Hexane	0.0014 U	0.0017 U	**69.2** J	**0.163** J	0.0015 U	**10**	**0.0043**	NA	NA	NA
Isopropylbenzene	0.00083 U	0.00096 U	**44.6**	**1.45**	0.00085 U	**16.2**	**0.0034** J	NA	NA	NA
m,p-Xylene	0.0017 U	0.0019 U	**257**	**0.512**	0.0017 U	**105**	**0.0042** J	NA	NA	NA
Methylene chloride	0.0035 U	0.004 U	4.6 U	0.4 U	0.0088 U	2.2 U	0.0085 U	NA	NA	NA
Naphthalene	0.0015 U	0.0017 U	**32.9**	0.08 U	0.0015 U	**8.45**	0.0016 U	NA	NA	NA
n-Propylbenzene	0.0011 U	0.0012 U	**57.7**	**1.71**	0.0011 U	**21.1**	**0.0045**	NA	NA	NA
o-Xylene	0.00076 U	0.00087 U	**129**	**0.248**	0.00077 U	**44.1**	**0.0017** J	NA	NA	NA
Sec-Butylbenzene	0.0012 U	0.0014 U	**23.2**	**0.775**	0.0012 U	**7.41**	**0.0037** J	NA	NA	NA
Tert-butyl benzene	0.00091 U	0.001 U	**1.25** J	0.048 U	0.00092 U	0.59 U	0.00094 U	NA	NA	NA
Toluene	0.00091 U	0.001 U	**152**	0.256	0.00092 U	**67.7**	**0.0018** J	NA	NA	NA
Trichloroethene	0.00091 U	0.001 U	1.2 U	0.048 U	0.00092 U	0.59 U	0.00094 U	NA	NA	NA

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-14				SD27-DPT-15			SD27-DPT-16			
Depth (ft bgs)	5-7	10-12	13-15	20-22	5-7	10.5-12.5	18-20	8-10	13-15	15.5-17.5	20-22
Date	3/22/2011				3/22/2011			3/22/2011			
	TPH										
TPH-GRO (C6-C10)	6.3 U	5.3 U	**5.8**	5.2 U	4.8 U	**410**	4.4 U	4.6 U	4.2 U	4.2 U	4.6 U
TPH (C10-C28)	**4.06** J	9.6 U	9.6 U	9.8 U	10 U	**30.7**	9.4 U	10 U	9.4 U	9.4 U	9.3 U
	Metals, Total										
Arsenic	0.88 U	1.1 U	**0.99** J	1.1 U	1 U	1.1 U	1 U	0.75 U	**1.4** J	0.92 U	**3.1** J
Barium	**15** J	**15.5** J	**56.9** J	**66.6** J	**12.8** J	**46.2** J	**38.8** J	**27.7** J	**53.6** J	**62.5** J	**28.1** J
Cadmium	0.44 U	0.53 U	0.39 U	0.54 U	0.51 U	0.53 U	0.51 U	0.37 U	0.45 U	0.46 U	0.47 U
Chromium	**1.6** J	**3.4** J	**6.5**	**3.7** J	**1.4** J	**5.2** J	**4.3** J	**3** J	**8.1**	**6.8**	**6.4**
Lead	**0.91** J	**1** J	**3.5** J	**2.3** J	0.51 U	**2.6** J	**2.2** J	**1.6** J	**4.2** J	**2.8** J	**3.7** J
Mercury	0.01 U	0.0089 U	0.0092 U	0.0096 U	0.01 U	0.0098 U	0.0092 U	0.0096 U	0.0091 U	0.0091 U	0.0094 U
Selenium	1.8 U	2.1 U	1.5 U	2.2 U	2.1 U	2.1 U	**2.3** J	3 U	1.8 U	1.8 U	1.9 U
Date	3/22/2011				3/22/2011			3/22/2011			
	SVOCs										
1-Methylnaphthalene	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	**0.0379** J	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
2-Methylnaphthalene	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
Naphthalene	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U
	VOCs										
1,1-Dichloroethene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
1,2,4-Trimethylbenzene	**0.0046** UJ	**0.0211** J	**0.0017** J	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
1,3,5-Trimethylbenzene	**0.0046** UJ	**0.0064** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.0042** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
n-Butylbenzene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
4-Methyl-2-pentanone	**0.023** UJ	**0.023** UJ	**0.02** UJ	**0.018** UJ	**0.019** UJ	**0.024** UJ	**0.018** UJ	**0.02** UJ	**0.017** UJ	**0.019** UJ	**0.02** UJ
Acetone	**0.046** UJ	**0.046** UJ	**0.041** UJ	**0.035** UJ	**0.039** UJ	**0.048** UJ	**0.036** UJ	**0.04** UJ	**0.035** UJ	**0.039** UJ	**0.041** UJ
Acrolein	**0.023** UJ	**0.023** UJ	**0.02** UJ	**0.018** UJ	**0.019** UJ	**0.024** UJ	**0.018** UJ	**0.02** UJ	**0.017** UJ	**0.019** UJ	**0.02** UJ
Benzene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0109** J	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Benzyl Chloride	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Carbon disulfide	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Chloroform	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Cymene	**0.0046** UJ	**0.0048** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0017** J	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Ethylbenzene	**0.0046** UJ	**0.0237** J	**0.0015** J	**0.0018** J	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.0028** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Hexane	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Isopropylbenzene	**0.0046** UJ	**0.0063** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.195** J	**0.0036** UJ	**0.003** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
m,p-Xylene	**0.0093** UJ	**0.0092** UJ	**0.0082** UJ	**0.007** UJ	**0.0078** UJ	**0.0096** UJ	**0.0072** UJ	**0.008** UJ	**0.007** UJ	**0.0078** UJ	**0.0081** UJ
Methylene chloride	**0.0093** UJ	**0.0092** UJ	**0.0082** UJ	**0.007** UJ	**0.0078** UJ	**0.0096** UJ	**0.0072** UJ	**0.008** UJ	**0.007** UJ	**0.0078** UJ	**0.0081** UJ
Naphthalene	**0.0046** UJ	**0.0049** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
n-Propylbenzene	**0.0046** UJ	**0.0087** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.153** J	**0.0036** UJ	**0.0011** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
o-Xylene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.00087** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Sec-Butylbenzene	**0.0046** UJ	**0.0042** J	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0701** J	**0.0036** UJ	**0.0018** J	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Tert-butyl benzene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.005** J	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Toluene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ
Trichloroethene	**0.0046** UJ	**0.0046** UJ	**0.0041** UJ	**0.0035** UJ	**0.0039** UJ	**0.0048** UJ	**0.0036** UJ	**0.004** UJ	**0.0035** UJ	**0.0039** UJ	**0.0041** UJ

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-17					SD27-DPT-18			
Depth (ft bgs)	8-10	10.5-12.5	10.5-12.5 (DUP)	15-17	20-22	8-10	11-13	15-17	23-25
Date	3/22/2011					3/22/2011			
	TPH								
TPH-GRO (C6-C10)	5.2 U	**1070**	**869**	4.5 U	4.7 U	**61.9** J	**4680** J	**479**	6.8 U
TPH (C10-C28)	10 U	**29.8**	**26.3**	9.5 U	9.5 U	10 U	**881**	**376**	9.5 U
	Metals, Total								
Arsenic	0.96 U	0.86 U	0.86 U	**1.1** J	0.94 U	**1.4** J	**1.7** J	**1.5** J	**2.3** J
Barium	**20.2** J	**17.8** J	**15.8** J	**26.6** J	**18.8** J	**18.7** J	**24.2** J	**28.7** J	**50.1** J
Cadmium	0.48 U	0.43 U	0.43 U	0.38 U	0.47 U	0.53 U	0.5 U	0.4 U	**0.43** UJ
Chromium	**2.7** J	**3.5** J	**4.1** J	**2.5** J	**2.7** J	**2.3** J	**2.8** J	**4.9**	**10.4** J
Lead	**1.2** J	**1.2** J	**2.1** J	**1.5** J	**1.6** J	**1** J	**1.2** J	**2.5** J	**5.1** J
Mercury	0.0096 U	0.0089 U	0.0082 U	0.0089 U	0.0088 U	0.0088 U	0.0083 U	0.0095 U	**0.0091** U
Selenium	1.9 U	1.7 U	1.7 U	3 U	1.9 U	2.1 U	2 U	1.6 U	**1.7** UJ
Date	3/22/2011					3/22/2011			
	SVOCs								
1-Methylnaphthalene	0.21 U	**0.232**	**0.283**	0.19 U	0.19 U	0.2 U	**6.19**	**1.24**	0.21 U
2-Methylnaphthalene	0.21 U	0.18 U	0.18 U	0.19 U	0.19 U	0.2 U	**6.69**	**0.143** J	0.21 U
Naphthalene	0.21 U	0.18 U	0.18 U	0.19 U	0.19 U	0.2 U	**3.29**	0.77 U	0.21 U
	VOCs								
1,1-Dichloroethene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ
1,2,4-Trimethylbenzene	**0.0039** UJ	**18.3** J	**9.47** J	**0.0016** J	**0.0041** UJ	**0.271** J	**71** J	**22.1** J	**0.0057** UJ
1,3,5-Trimethylbenzene	**0.0039** UJ	**6.63** J	**4.16** J	**0.0041** UJ	**0.0041** UJ	**0.22** J	**24.3** J	**9.43** J	**0.0057** UJ
n-Butylbenzene	**0.0039** UJ	**0.6** J	**0.413** J	**0.0041** UJ	**0.0041** UJ	**0.0721** J	**12.2** J	**1.79** J	**0.0057** UJ
4-Methyl-2-pentanone	**0.019** UJ	**1.1** UJ	**1.3** UJ	**0.02** UJ	**0.02** UJ	**1.3** UJ	**11** UJ	**10** UJ	**0.028** UJ
Acetone	**0.039** UJ	**2.21** J	**2.6** UJ	**0.041** UJ	**0.041** UJ	**2.6** UJ	**22** UJ	**40.4** J	**0.057** UJ
Acrolein	**0.019** UJ	**1.1** UJ	**1.3** UJ	**0.02** UJ	**0.02** UJ	**1.3** UJ	**11** UJ	**10** UJ	**0.028** UJ
Benzene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.109** J	**9.27** J	**1.17** J	**0.0057** UJ
Benzyl Chloride	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ
Carbon disulfide	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ
Chloroform	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ
Cymene	**0.0039** UJ	**6.56** J	**4.37** J	**0.0041** UJ	**0.0041** UJ	**0.116** J	**8.21** J	**23.1** J	**0.0057** UJ
Ethylbenzene	**0.0039** UJ	**7.84** J	**3.93** J	**0.0041** UJ	**0.0041** UJ	**0.081** J	**76** J	**0.578** J	**0.0057** UJ
Hexane	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**21.8** J	**2** UJ	**0.0057** UJ
Isopropylbenzene	**0.0039** UJ	**3.21** J	**2.01** J	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**20.5** J	**8.81** J	**0.0057** UJ
m,p-Xylene	**0.0077** UJ	**0.423** J	**0.185** J	**0.0081** UJ	**0.0081** UJ	**0.52** UJ	**111** J	**4** UJ	**0.011** UJ
Methylene chloride	**0.0077** UJ	**0.45** UJ	**0.52** UJ	**0.0081** UJ	**0.0081** UJ	**0.52** UJ	**4.4** UJ	**4** UJ	**0.011** UJ
Naphthalene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**12.3** J	**2** UJ	**0.0057** UJ
n-Propylbenzene	**0.0039** UJ	**3.34** J	**1.94** J	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**26.7** J	**13.5** J	**0.0057** UJ
o-Xylene	**0.0039** UJ	**0.37** J	**0.17** J	**0.0041** UJ	**0.0041** UJ	**0.0929** J	**53.9** J	**2** UJ	**0.0057** UJ
Sec-Butylbenzene	**0.0039** UJ	**1.36** J	**0.836** J	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**10.6** J	**14.8** J	**0.0057** UJ
Tert-butyl benzene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ
Toluene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.0697** J	**52.9** J	**2** UJ	**0.0057** UJ
Trichloroethene	**0.0039** UJ	**0.23** UJ	**0.26** UJ	**0.0041** UJ	**0.0041** UJ	**0.26** UJ	**2.2** UJ	**2** UJ	**0.0057** UJ

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3
Values in bold font are detected value
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-19					SD27-DPT-20				
Depth (ft bgs)	8-10	10.5-12.5	10.5-12.5 (DUP)	18-20	23-25	7-9	10.5-12.5	10.5-12.5 (DUP)	15.5-17.5	23-25
Date	3/22/2011					3/23/2011				
	TPH									
TPH-GRO (C6-C10)	**231** J	**4130** J	**3830** J	4.5 U	4.7 U	4 U	**651** J	**206** J	3.7 U	**3.8** UJ
TPH (C10-C28)	**332**	**132** J	**883** J	9.5 U	9.2 U	9.4 U	**15.8**	**17.4**	9.5 U	**8.9** UJ
	Metals, Total									
Arsenic	0.84 U	0.92 U	0.97 U	**8.4**	**1.3** J	0.89 U	0.92 U	0.9 U	**2.9** J	**2.1** J
Barium	**24.1** J	**21.1** J	**16.6** J	**37.2** J	**30.9** J	**12** J	**19.5** J	**18.4** J	**43.2** J	**44.7** J
Cadmium	0.42 U	0.46 U	**0.48**	0.48 U	0.38 U	0.45 U	0.46 U	0.45 U	0.49 U	0.42 U
Chromium	**1.6** J	**2.7** J	**2.9** J	**3.2** J	**7.3**	**1.7** J	**2.3** J	**2.1** J	**5.7**	**8.5**
Lead	**0.44** J	**1.4** J	**1.2** J	**1.8** J	**4.3** J	0.45 U	**0.91** J	**1** J	**3.5** J	**4.7** J
Mercury	0.0096 U	0.0089 U	0.009 U	0.0086 U	0.0088 U	0.0096 U	0.0089 U	0.0089 U	0.0095 U	0.0079 U
Selenium	1.7 U	1.8 U	1.9 U	1.9 U	**1.5** J	1.8 U	1.8 U	1.8 U	2 U	1.7 U
Date	3/22/2011					3/23/2011				
	SVOCs									
1-Methylnaphthalene	**1.78**	**1.22** J	**2.21** J	0.19 U	0.18 U	0.19 U	**0.0205** J	**0.0947** J	0.19 U	0.18 U
2-Methylnaphthalene	**1.62**	**1.39** J	**2.54** J	0.19 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U
Naphthalene	**0.307** J	**0.641** J	**1.36** J	0.19 U	0.18 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U
	VOCs									
1,1-Dichloroethene	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	0.0037 U
1,2,4-Trimethylbenzene	**2.17** J	**58.8** J	**40** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.174** J	**1.91** J	0.0038 U	0.0037 U
1,3,5-Trimethylbenzene	**1.09** J	**26.4** J	**18.4** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.121** J	**1.24** J	0.0038 U	0.0037 U
n-Butylbenzene	**0.264** J	**6.93** J	**5.08** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0039** J	**0.0065** J	0.0038 U	0.0037 U
4-Methyl-2-pentanone	**1.2** UJ	**12** UJ	**5.6** UJ	**0.02** UJ	**0.02** UJ	**0.022** UJ	**0.02** UJ	**0.019** UJ	0.019 U	0.018 U
Acetone	**2.5** UJ	**23** UJ	**11** UJ	**0.04** UJ	**0.04** UJ	**0.043** UJ	**0.041** UJ	**0.038** UJ	0.038 U	0.037 U
Acrolein	**1.2** UJ	**12** UJ	**5.6** UJ	**0.02** UJ	**0.02** UJ	**0.022** UJ	**0.02** UJ	**0.019** UJ	**0.019** UJ	**0.018** UJ
Benzene	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.006** J	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	**0.0038** UJ	**0.0037** UJ
Benzyl Chloride	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ
Carbon disulfide	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0054** J	**0.0096** J	0.0038 U	**0.0037** UJ
Chloroform	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ
Cymene	**0.298** J	**6.4** J	**4.96** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0388** J	**0.05** J	0.0038 U	**0.0037** UJ
Ethylbenzene	**0.232** J	**9.18** J	**6.47** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0206** J	**0.038** J	0.0038 U	**0.0037** UJ
Hexane	**0.25** UJ	**17** J	**6.02** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	**0.0038** UJ	**0.0037** UJ
Isopropylbenzene	**0.373** J	**12.4** J	**8.89** J	**0.0037** J	**0.0027** J	**0.0043** UJ	**0.0465** J	**0.0644** J	0.0038 U	**0.0026** J
m,p-Xylene	**1.19** J	**52.2** J	**36** J	**0.008** UJ	**0.008** UJ	**0.0087** UJ	**0.0082** UJ	**0.0076** UJ	0.0076 U	**0.0074** UJ
Methylene chloride	**0.5** UJ	**4.7** UJ	**2.3** UJ	**0.008** UJ	**0.008** UJ	**0.0087** UJ	**0.0082** UJ	**0.0076** UJ	0.0076 U	**0.0074** UJ
Naphthalene	**0.259** J	**6.59** J	**4.66** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ
n-Propylbenzene	**0.419** J	**14.1** J	**9.9** J	**0.002** J	**0.004** UJ	**0.0043** UJ	**0.0395** J	**0.0519** J	0.0038 U	**0.0037** UJ
o-Xylene	**0.903** J	**30.1** J	**20.5** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0019** J	**0.0047** J	0.0038 U	**0.0037** UJ
Sec-Butylbenzene	**0.328** J	**8.11** J	**5.82** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0336** J	**0.045** J	0.0038 U	**0.0037** UJ
Tert-butyl benzene	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ
Toluene	**0.25** UJ	**0.939** J	**0.772** J	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ
Trichloroethene	**0.25** UJ	**2.3** UJ	**1.1** UJ	**0.004** UJ	**0.004** UJ	**0.0043** UJ	**0.0041** UJ	**0.0038** UJ	0.0038 U	**0.0037** UJ

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-21			SD27-DPT-22			SD27-DPT-23		SD27-DPT-24		
Depth (ft bgs)	8-10	12-14	15.5-17.5	8-10	12.5-14.5	15-17	8-10	12-15	8-10	10-12	15-17
Date	3/23/2011			3/23/2011			3/23/2011		3/23/2011		
	TPH										
TPH-GRO (C6-C10)	5.5 U	4.2 U	4.3 U	**308**	**3290** J	4.6 U	4.9 U	4.1 U	5.3 U	**2130**	4.9 U
TPH (C10-C28)	9.8 U	9.4 U	9.6 U	9.9 U	**306**	9.1 U	9.4 U	9.5 U	9.4 U	**455**	9.9 U
	Metals, Total										
Arsenic	**1.1** J	2.1 J	1.2 U	0.97 U	1 U	0.96 U	0.75 U	0.8 U	0.74 U	0.72 U	0.9 U
Barium	**20.9** J	57.8 J	**40.8** J	**15.9** J	**35.4** J	**23.5** J	**16.7** J	**49.3** J	**21.4** J	**15.8** J	**33.4** J
Cadmium	0.44 U	0.55 U	0.58 U	0.48 U	0.5 U	0.48 U	0.37 U	0.4 U	0.37 U	0.36 U	0.45 U
Chromium	**2.2** J	**12.9**	**6.6**	**2** J	**6.4**	**4.8**	**1.9** J	**6.6**	**1.8** J	**2.8** J	**2.8** J
Lead	**0.94** J	5.8 J	**3.3** J	**1.3** J	**2.9** J	**2.6** J	**1.1** J	**3.4** J	7.4 U	7.2 U	9 U
Mercury	0.0094 U	0.0088 U	0.0096 U	0.0096 U	0.0091 U	0.0093 U	0.0089 U	0.0088 U	**0.009** R	**0.0092** R	**0.0087** R
Selenium	1.7 U	2.2 U	2.3 U	1.9 U	2 U	1.9 U	1.5 U	1.6 U	1.5 U	1.4 U	1.8 U
Date	3/23/2011			3/23/2011			3/23/2011		3/23/2011		
	SVOCs										
1-Methylnaphthalene	0.19 U	0.18 U	0.19 U	0.19 U	**1.75**	0.18 U	0.19 U	0.19 U	0.19 U	**1.4**	0.19 U
2-Methylnaphthalene	0.19 U	0.18 U	0.19 U	0.19 U	**1.82**	0.18 U	0.19 U	0.19 U	0.19 U	0.38 U	0.19 U
Naphthalene	0.19 U	0.18 U	0.19 U	0.19 U	**0.84**	0.18 U	0.19 U	0.19 U	0.19 U	0.38 U	0.19 U
	VOCs										
1,1-Dichloroethene	0.0041 U	0.0048 U	0.0032 U	0.0036 U	0.22 U	**0.0012** J	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
1,2,4-Trimethylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0972**	**79.8**	**0.0053** UJ	0.0038 U	0.0039 U	0.0039 U	**7.63**	0.0039 U
1,3,5-Trimethylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0376**	**27**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**5.98**	0.0039 U
n-Butylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0037**	**10.9** J	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**0.861**	0.0039 U
4-Methyl-2-pentanone	0.021 U	0.024 U	0.016 U	0.018 U	1.1 U	**0.02** UJ	0.019 U	0.02 U	0.02 U	1.2 U	0.02 U
Acetone	0.041 U	0.048 U	0.032 U	0.036 U	2.2 U	**0.04** UJ	0.038 U	0.039 U	0.039 U	2.4 U	0.039 U
Acrolein	**0.021** UJ	**0.024** UJ	**0.016** UJ	**0.018** UJ	**1.1** UJ	**0.02** UJ	**0.019** UJ	**0.02** UJ	0.02 U	1.2 U	**0.02** UJ
Benzene	0.0041 U	0.0048 U	0.0032 U	0.0036 U	**0.465**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Benzyl Chloride	0.0041 U	0.0048 U	0.0032 U	0.0036 U	0.22 U	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Carbon disulfide	0.0041 U	0.0048 U	0.0032 U	**0.0066**	0.22 U	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Chloroform	0.0041 U	0.0048 U	0.0032 U	0.0036 U	0.22 U	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Cymene	0.0041 U	0.0048 U	0.0032 U	**0.0158**	**7.61**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**2.9**	0.0039 U
Ethylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0251**	**41.9**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Hexane	**0.0041** UJ	**0.0048** UJ	0.0032 U	**0.0036** UJ	**0.22** UJ	**0.004** UJ	**0.0038** UJ	**0.0039** UJ	**0.0039** UJ	**0.24**	**0.0039** UJ
Isopropylbenzene	0.0041 U	0.0048 U	**0.0015** J	**0.0232**	**15.6** J	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**3.48**	0.0039 U
m,p-Xylene	0.0082 U	0.0095 U	0.0063 U	**0.0189**	**114**	**0.008** UJ	0.0076 U	0.0079 U	0.0079 U	0.47 U	0.0078 U
Methylene chloride	0.0082 U	0.0095 U	0.0063 U	0.0072 U	0.44 U	**0.008** UJ	0.0076 U	0.0079 U	0.0079 U	0.47 U	0.0078 U
Naphthalene	0.0041 U	0.0048 U	0.0032 U	**0.0036** UJ	**0.603**	**0.004** UJ	0.0038 U	0.0039 U	0.0055 U	**0.133**	0.0039 U
n-Propylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0257**	**21**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**3.39**	0.0039 U
o-Xylene	0.0041 U	0.0048 U	0.0032 U	**0.0083**	**46.6**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Sec-Butylbenzene	0.0041 U	0.0048 U	0.0032 U	**0.0206**	**10.3** J	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	**4.03**	0.0039 U
Tert-butyl benzene	0.0041 U	0.0048 U	0.0032 U	0.0036 U	0.22 U	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Toluene	0.0041 U	0.0048 U	0.0032 U	0.0036 U	**26.9**	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U
Trichloroethene	0.0041 U	0.0048 U	0.0032 U	0.0036 U	0.22 U	**0.004** UJ	0.0038 U	0.0039 U	0.0039 U	0.24 U	0.0039 U

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-25		SD27-DPT-26		SD27-DPT-27		SD27-DPT-28			
Depth (ft bgs)	8-10	12-15	8-10	12.5-15	8-10	12.5-15	8-10	8-10 (DUP)	12.5-15	18-20
Date	3/23/2011		3/23/2011		3/23/2011		3/23/2011			
	TPH									
TPH-GRO (C6-C10)	**1450**	4.6 U	4.5 U	4.8 U	4.4 U	4.9 U	4.6 U	4.3 U	**435** J	3.9 U
TPH (C10-C28)	**449**	9.9 U	9.6 U	9.6 U	9.6 U	10 U	9.9 U	9.9 U	**87.9**	9.5 U
	Metals, Total									
Arsenic	0.77 U	4.2 U	0.92 U	5 U	0.99 U	1.2 U	4.7 U	4.9 U	0.92 U	0.93 U
Barium	**18** J	**54.7** J	**19.5** J	**58.3** J	**23.2** J	**64.9** J	**27.4** J	**26.3** J	**17.2** J	**46.4** J
Cadmium	0.38 U	0.42 U	0.46 U	**0.5** UJ	0.49 U	0.59 U	0.47 U	0.49 U	0.46 U	0.47 U
Chromium	**2** J	**8.6**	**2.3** J	**6.8**	**2.6** J	**10.8**	**2.7** J	**2.9** J	**2.9** J	**4.3** J
Lead	7.7 U	8.3 U	9.2 U	10 U	9.9 U	12 U	9.4 U	9.9 U	9.2 U	9.3 U
Mercury	**0.0093** R	**0.0091** R	**0.0095** R	**0.009** R	**0.0088** R	**0.0092** R	**0.0099** R	0.0096 U	**0.0095** R	**0.0092** R
Selenium	4.5 U	**1.8** J	1.8 U	**2** UJ	2 U	2.4 U	1.9 U	2 U	**2.2** J	1.9 U
Date	3/23/2011		3/23/2011		3/23/2011		3/23/2011			
	SVOCs									
1-Methylnaphthalene	**2.56**	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.34**	0.19 U
2-Methylnaphthalene	**2.49**	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U	0.19 U	0.19 U
Naphthalene	**0.803**	0.2 U	0.19 U	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U	0.19 U	0.19 U
	VOCs									
1,1-Dichloroethene	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
1,2,4-Trimethylbenzene	**20.9**	**0.0045**	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	**5.43**	0.0029 U
1,3,5-Trimethylbenzene	**7.54**	**0.0018** J	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	**2.35**	0.0029 U
n-Butylbenzene	**1.53**	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	**0.0011** J	**0.0014** J	**0.238**	0.0029 U
4-Methyl-2-pentanone	1.2 U	0.019 U	0.023 U	0.019 U	0.019 U	0.02 U	0.017 U	0.02 U	0.97 U	0.014 U
Acetone	2.4 U	0.038 U	0.045 U	**0.037** UJ	0.038 U	0.04 U	**0.0716** J	**0.0388** J	**2.81**	0.029 U
Acrolein	**1.2** UJ	**0.019** UJ	0.023 U	**0.019** UJ	0.019 U	0.02 U	**0.017** UJ	**0.02** UJ	**2.29**	0.014 U
Benzene	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
Benzyl Chloride	0.24 U	0.0038 U	0.0045 U	**0.0037** UJ	0.0038 U	0.004 U	**0.0034** UJ	**0.0041** UJ	0.19 U	0.0029 U
Carbon disulfide	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
Chloroform	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	**0.156** J	0.0029 U
Cymene	**2.8**	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	**0.735**	0.0029 U
Ethylbenzene	**4.2**	**0.0015** J	0.0045 U	0.0037 U	0.0038 U	0.004 U	**0.0104**	**0.0093**	**2.65**	0.0029 U
Hexane	**0.24** UJ	0.0038 U	0.0045 U	**0.0037** UJ	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
Isopropylbenzene	**2.6**	**0.0011** J	0.0045 U	0.0037 U	0.0038 U	0.004 U	**0.0283** J	**0.0299** J	**1.53**	0.0029 U
m,p-Xylene	**9.28**	**0.0047** J	0.0091 U	0.0075 U	0.0076 U	0.008 U	0.0067 U	0.0081 U	**1.22**	0.0058 U
Methylene chloride	0.47 U	0.0077 U	0.0091 U	0.0075 U	**0.0052** J	**0.0053** J	**0.0042** J	0.0081 U	0.39 U	0.0058 U
Naphthalene	**3.27**	**0.0017** J	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
n-Propylbenzene	**2.83**	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	**0.0053**	**0.0074**	**1.61**	0.0029 U
o-Xylene	**6.64**	**0.0023** J	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	**1.24**	0.0029 U
Sec-Butylbenzene	**2.48**	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	**0.008**	**0.0087**	**0.807**	0.0029 U
Tert-butyl benzene	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
Toluene	**1.35**	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U
Trichloroethene	0.24 U	0.0038 U	0.0045 U	0.0037 U	0.0038 U	0.004 U	0.0034 U	0.0041 U	0.19 U	0.0029 U

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-
Values in bold font are detected valu
NA: not analyzed
DUP: Duplicate sample

Table B-1
Comprehensive Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB

Sample ID	SD27-DPT-29			SD27-DPT-30	SD27-DPT-31	
Depth (ft bgs)	10-12	10-12 (DUP)	12.5-15	10-12	10-12	13-15
Date	3/23/2011			3/23/2011	3/23/2011	
	TPH					
TPH-GRO (C6-C10)	**929** J	**832** J	4.2 U	4.1 U	**75.8**	4.7 U
TPH (C10-C28)	**314**	**296**	9.7 U	9.3 U	**47.8**	9.4 U
	Metals, Total					
Arsenic	1.1 U	0.91 U	1.1 U	0.84 U	0.95 U	1.1 U
Barium	**17** J	**22.8** J	**41.9** J	**25.6** J	**22.2** J	**69.1** J
Cadmium	0.54 U	0.46 U	0.57 U	0.42 U	0.48 U	0.55 U
Chromium	**3.8** J	**5.6**	**8.5**	**3.5** J	**2.8** J	**8.7**
Lead	11 U	9.1 U	11 U	17 U	9.5 U	11 U
Mercury	**0.009** R	0.0096 U	0.0087 U	0.0088 U	0.0082 U	0.009 U
Selenium	2.2 U	1.8 U	2.6 U	3.3 U	1.9 U	2.2 U
Date	3/23/2011			3/23/2011	3/23/2011	
	SVOCs					
1-Methylnaphthalene	**1.62**	**1.43**	0.19 U	0.18 U	**0.0624** J	0.19 U
2-Methylnaphthalene	**1.72**	**1.37**	0.19 U	0.18 U	0.19 U	0.19 U
Naphthalene	**0.845** J	**0.289** J	0.19 U	0.18 U	0.19 U	0.19 U
	VOCs					
1,1-Dichloroethene	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
1,2,4-Trimethylbenzene	**14.7**	**13.3**	0.0034 U	0.0039 U	**0.364**	0.0036 U
1,3,5-Trimethylbenzene	**6.76**	**5.54**	0.0034 U	0.0039 U	**0.152** J	0.0036 U
n-Butylbenzene	**1.88**	**1.73**	0.0034 U	0.0039 U	0.2 U	0.0036 U
4-Methyl-2-pentanone	**5.4** UJ	**14.8** J	0.017 U	0.02 U	1 U	0.018 U
Acetone	**6.7** J	2.2 U	0.034 U	0.039 U	2 U	0.036 U
Acrolein	5.4 U	1.1 U	0.017 U	0.02 U	1 U	0.018 U
Benzene	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Benzyl Chloride	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Carbon disulfide	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Chloroform	**0.335** J	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Cymene	**2.35**	**1.92**	0.0034 U	0.0039 U	**0.0671** J	0.0036 U
Ethylbenzene	**2.51**	**1.86**	0.0034 U	0.0039 U	**0.102** J	0.0036 U
Hexane	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Isopropylbenzene	**3.85**	**3.26**	0.0034 U	0.0039 U	**0.107** J	0.0036 U
m,p-Xylene	2.1 U	0.44 U	0.0068 U	0.0078 U	0.41 U	0.0073 U
Methylene chloride	2.1 U	0.44 U	0.0068 U	0.0078 U	0.41 U	0.0073 U
Naphthalene	**1.35**	**1.02**	0.0034 U	0.0039 U	0.2 U	0.0036 U
n-Propylbenzene	**4.91**	**4.37**	0.0034 U	0.0039 U	**0.141** J	0.0036 U
o-Xylene	**1.2**	**0.889**	0.0034 U	0.0039 U	0.2 U	0.0036 U
Sec-Butylbenzene	**2.69**	**2.37**	0.0034 U	0.0039 U	**0.102** J	0.0036 U
Tert-butyl benzene	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Toluene	1.1 U	0.22 U	0.0034 U	0.0039 U	0.2 U	0.0036 U
Trichloroethene	1.1 U	0.22 U	**0.0017** J	0.0039 U	0.2 U	**0.0018** J

Notes:
All units are in mg/kg.
Data obtained from Table 4-1 and 4-3
Values in bold font are detected value
NA: not analyzed
DUP: Duplicate sample

Table B-2
Summary of Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB, New Mexico

Soil Boring	Depths	Date	Analytes			
			TPH	Metals, Total	SVOCs	VOCs
2010 and 2011						
SD27-DPT-01	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
	10 - 10.7		Yes	Yes	Yes	Yes
SD27-DPT-02	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
SD27-DPT-03	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
SD27-DPT-04	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
SD27-DPT-05	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
	10-12		Yes	Yes	Yes	Yes
SD27-DPT-06	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
	6.5-8.5 (DUP)		Yes	Yes	Yes	Yes
SD27-DPT-07	6.5-8.5	11/3/2010	Yes	Yes	Yes	Yes
SD27-DPT-08	6.5-8.5	11/4/2010	Yes	Yes	Yes	Yes
	10-15		Yes	Yes	Yes	Yes
	10-15 (DUP)		**No**	**No**	**No**	**No**
	16.5-18		Yes	Yes	Yes	Yes
	22-24		Yes	Yes	Yes	No
SD27-DPT-09	7-9	11/4/2010	Yes	Yes	Yes	Yes
	12-14		Yes	Yes	Yes	Yes
	16-18		Yes	Yes	Yes	Yes
SD27-DPT-10	8-10	11/4/2010	Yes	Yes	Yes	Yes
	12.4-14.5		Yes	Yes	Yes	Yes
	17-19		Yes	Yes	Yes	Yes
SD27-DPT-11	6.5-8.5	11/4/2010	Yes	Yes	Yes	Yes
	6.5-8.5 (DUP)		Yes	Yes	Yes	Yes
	10-12		Yes	Yes	Yes	Yes
	18-19.7		Yes	Yes	Yes	Yes
SD27-DPT-12	6.5-8.5	11/4/2010	Yes	Yes	Yes	Yes
	11.5-13.5		Yes	Yes	Yes	Yes
	17-19		Yes	Yes	Yes	Yes
SD27-DPT-13	6.5-8.5	11/5/2010	Yes	Yes	Yes	**No**
	11.5-13.5		Yes	Yes	Yes	**No**
	16.5-18.5		Yes	Yes	Yes	**No**
SD27-DPT-14	5-7	3/22/2011	Yes	Yes	Yes	Yes
	10-12		Yes	Yes	Yes	Yes
	13-15		Yes	Yes	Yes	Yes
	20-22		Yes	Yes	Yes	Yes
SD27-DPT-15	5-7	3/22/2011	Yes	Yes	Yes	Yes
	10.5-12.5		Yes	Yes	Yes	Yes
	18-20		Yes	Yes	Yes	Yes
SD27-DPT-16	8-10	3/22/2011	Yes	Yes	Yes	Yes
	13-15		Yes	Yes	Yes	Yes
	15.5-17.5		Yes	Yes	Yes	Yes
	20-22		Yes	Yes	Yes	Yes
SD27-DPT-17	8-10	3/22/2011	Yes	Yes	Yes	Yes
	10.5-12.5		Yes	Yes	Yes	Yes
	10.5-12.5 (DUP)		Yes	Yes	Yes	Yes
	15-17		Yes	Yes	Yes	Yes
	20-22		Yes	Yes	Yes	Yes
SD27-DPT-18	8-10	3/22/2011	Yes	Yes	Yes	Yes
	11-13		Yes	Yes	Yes	Yes
	15-17		Yes	Yes	Yes	Yes
	23-25		Yes	Yes	Yes	Yes

Table B-2
Summary of Soil Data Collected in 2010 and 2011.
Site SD-27, Holloman AFB, New Mexico

Soil Boring	Depths	Date	Analytes			
			TPH	Metals, Total	SVOCs	VOCs
SD27-DPT-19	8-10	3/22/2011	Yes	Yes	Yes	Yes
	10.5-12.5		Yes	Yes	Yes	Yes
	10.5-12.5 (DUP)		Yes	Yes	Yes	Yes
	18-20		Yes	Yes	Yes	Yes
	23-25		Yes	Yes	Yes	Yes
SD27-DPT-20	7-9	3/23/2011	Yes	Yes	Yes	Yes
	10.5-12.5		Yes	Yes	Yes	Yes
	10.5-12.5 (DUP)		Yes	Yes	Yes	Yes
	15.5-17.5		Yes	Yes	Yes	Yes
	23-25		Yes	Yes	Yes	Yes
SD27-DPT-21	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12-14		Yes	Yes	Yes	Yes
	15.5-17.5		Yes	Yes	Yes	Yes
SD27-DPT-22	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12.5-14.5		Yes	Yes	Yes	Yes
	15-17		Yes	Yes	Yes	Yes
SD27-DPT-23	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12-15		Yes	Yes	Yes	Yes
SD27-DPT-24	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12-15		Yes	Yes	Yes	Yes
	15-17		Yes	Yes	Yes	Yes
SD27-DPT-25	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12-15		Yes	Yes	Yes	Yes
SD27-DPT-26	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12.5-15		Yes	Yes	Yes	Yes
SD27-DPT-27	8-10	3/23/2011	Yes	Yes	Yes	Yes
	12.5-15		Yes	Yes	Yes	Yes
SD27-DPT-28	8-10	3/23/2011	Yes	Yes	Yes	Yes
	8-10 (DUP)		Yes	Yes	Yes	Yes
	12.5-15		Yes	Yes	Yes	Yes
	18-20		Yes	Yes	Yes	Yes
SD27-DPT-29	10-12	3/23/2011	Yes	Yes	Yes	Yes
	10-12 (DUP)		Yes	Yes	Yes	Yes
	12.5-15		Yes	Yes	Yes	Yes
SD27-DPT-30	10-12	3/23/2011	Yes	Yes	Yes	Yes
SD27-DPT-31	10-12	3/23/2011	Yes	Yes	Yes	Yes
	13-15		Yes	Yes	Yes	Yes
2006						
SD27-01	0-2	5/16/2006	Yes	Yes	Yes	Yes
SB27-01	6-8	5/16/2006	Yes	Yes	Yes	Yes
SB27-02	6-8	5/16/2006	Yes	Yes	Yes	Yes
	11-13		Yes	Yes	Yes	Yes
SB27-03	11-13	5/16/2006	Yes	Yes	Yes	Yes
	11-13 (DUP)		Yes	Yes	Yes	Yes
	16-18		Yes	Yes	Yes	Yes
SB27-04	8-10	5/16/2006	Yes	Yes	Yes	Yes
SB27-05	7-8	5/18/2006	Yes	Yes	Yes	Yes

Note:
DUP: Duplicate sample

Table B-3
Comprehensive Soil Data Collected in 2006.
Site SD-27, Holloman AFB

Sample	**SD27-01**	**SB27-01**	**SB27-02**			**SB27-03**
Depth	0-2	6-8	6-8	11-13	11-13	11-13 (DUP)
Date	5/16/2006	5/16/2006	5/16/2006			5/16/2006
TPH						
G-TPH	NA	**309**	0.121 U	**4790**	**419**	**282**
D-TPH	**107**	**124**	7.28 U	**3480**	**435**	**288**
Metals						
Arsenic	**3.81**	NA	NA	NA	NA	NA
Barium	**13500**	**7.34**	**11.5**	**9.5**	**60.2**	**49.9**
Cadmium	**21.6**	NA	NA	NA	NA	NA
Chromium, total	**290**	**1.31**	**47.7**	**5.60**	**4.76**	**3.72**
Lead	**1900**	0.367 U	**1.0**	**7.03**	**6.26**	**4.46**
Silver	NA	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U
Mercury	**0.08**	NA	NA	NA	NA	NA
SVOCs						
1-Methylnaphthalene	NA	0.0475 U	0.0475 U	**15.8**	**1.42**	**1.58**
2-Methylnaphthalene	NA	0.041 U	0.041 U	**16.7**	**1.44**	**1.6**
4-Nitrophenol	**0.053** J	NA	NA	NA	NA	NA
Acenaphthene	**0.124** J	NA	NA	NA	NA	NA
Acenaphthylene	**0.291**	NA	NA	NA	NA	NA
Anthracene	**2.960**	NA	NA	NA	NA	NA
Benzo(a)anthracene	**2.680**	NA	NA	NA	NA	NA
Benzo(a)pyrene	**3.200**	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	**4.100**	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	**2.710**	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	**2.320**	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	**5.490**	NA	NA	NA	NA	NA
Chrysene	**3.800**	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	**1.250**	NA	NA	NA	NA	NA
Dibenzofuran	**0.352**	NA	NA	NA	NA	NA
Fluoranthene	**6.670**	0.0456 U	0.0456 U	0.0456 U	0.456 U	0.0456 U
Indeno(1,2,3-c,d)pyrene	**2.020**	NA	NA	NA	NA	NA
Phenanthrene	**0.470**	NA	NA	NA	NA	NA
Pyrene	**5.880**	NA	NA	NA	NA	NA
VOCs						
1,2,4-Trimethylbenzene	**0.00368** J	**0.00595** J	0.000148 U	**54**	**5.85** J	**5.950**
1,3,5-Trimethylbenzene	NA	0.01 U	0.01 U	**17**	**2.31** J	**1.91**
Benzene	**0.00542** J	0.000236 U	0.000236 U	**6**	**0.0**	**0.0428** J
Chloroform	**0.00058** J	NA	NA	NA	NA	NA
Ethylbenzene	NA	0.01 U	0.01 U	**61000**	**3.49** J	**2.88**
Isopropylbenzene	NA	**0.00235** J	**0.00262** J	**14**	**1**	**1.08**
m, p-Xylene (sum of isomers)	**0.00478** J	**0.00312** J	**0.00729** J	**75**	**5.17** J	**5.34**

Table B-3
Comprehensive Soil Data Collected in 2006.
Site SD-27, Holloman AFB

Methylene chloride	NA		0.05	U	0.05	U	0.315	U	0.05	U	**0.0506**	J
n-Butylbenzene	**0.0021**	J	0.000116	U	**0.00637**	J	**10**		**1**		**0.932**	
n-Propylbenzene	NA		0.01	U	0.01	U	**22**		**2.45**	J	**1.74**	
Naphthalene	**0.057**	J	**0.0141**	J	**0.0326**	J	**12**		**1**		**1.13**	
o-Xylene	**0.00228**	J	**0.00162**	J	**0.00444**	J	**34**		**2.48**	J	**2.32**	
p-Cymene (p-Isopropyltoluene)	**0.00166**	J	0.000105	U	**0.00392**	J	**6**		**1**		**0.73**	
Sec-Butylbenzene	NA		**0.0**		0.01	U	**8**		**1**		**0.874**	
Toluene	NA		0.01	U	0.01	U	**50**		**2**		**1.11**	

Notes:
All units are in mg/kg.
Data obtained from Table 3-8 of Final Accelerated Corrective Measures Work Plan Addendum for SD-27 PAD 9 Drainage Pit (SWMU 141), 2012.
Values in bold font are detected values.
NA: not analyzed
DUP: Duplicate sample

Table B-3
Comprehensive Soil Data Collected in 2006.
Site SD-27, Holloman AFB

Sample			**SB27-04**		**SB27-05**	
Depth	16-18		8-10		7-8	
Date			5/16/2006		5/18/2006	
G-TPH	0.121	U	0.121	U	0.121	U
D-TPH	7.28	U	7.28	U	7.28	U
Arsenic	NA		NA		NA	
Barium	**38.4**		**11.0**		**8.84**	
Cadmium	NA		NA		NA	
Chromium, total	**5.75**		**1.51**		**0.456**	J
Lead	**7.80**		**0.886**	J	0.65	U
Silver	0.0044	U	0.0044	U	**0.565**	
Mercury	NA		NA		NA	
1-Methylnaphthalene	0.0475	U	0.0475	U	0.0475	U
2-Methylnaphthalene	0.041	U	0.041	U	0.041	U
4-Nitrophenol	NA		NA		NA	
Acenaphthene	NA		NA		NA	
Acenaphthylene	NA		NA		NA	
Anthracene	NA		NA		NA	
Benzo(a)anthracene	NA		NA		NA	
Benzo(a)pyrene	NA		NA		NA	
Benzo(b)fluoranthene	NA		NA		NA	
Benzo(g,h,i)perylene	NA		NA		NA	
Benzo(k)fluoranthene	NA		NA		NA	
bis(2-Ethylhexyl)phthalate	NA		NA		NA	
Chrysene	NA		NA		NA	
Dibenz(a,h)anthracene	NA		NA		NA	
Dibenzofuran	NA		NA		NA	
Fluoranthene	0.0456	U	0.0456	U	**0.0853**	J
Indeno(1,2,3-c,d)pyrene	NA		NA		NA	
Phenanthrene	NA		NA		NA	
Pyrene	NA		NA		NA	
1,2,4-Trimethylbenzene	**0.00267**	J	**0.00416**	J	0.0000535	U
1,3,5-Trimethylbenzene	0.00021	U	0.01	U	0.00021	U
Benzene	0.0000644	U	0.000236	U	0.0000644	U
Chloroform	NA		NA		NA	
Ethylbenzene	0.01	U	0.01	U	0.0000376	U
Isopropylbenzene	0.00013	U	0.000105	U	0.00013	U
m, p-Xylene (sum of isomers)	0.0000714	U	**0.00243**	J	0.0000714	U

Table B-3
Comprehensive Soil Data Collected in 2006.
Site SD-27, Holloman AFB

Methylene chloride	0.05	U	0.05	U	0.05	U
n-Butylbenzene	0.01	U	**0.00183**	J	0.0000979	U
n-Propylbenzene	**0.00108**	J	0.01	U	0.0000421	U
Naphthalene	0.0377	U	**0.00871**	J	0.000441	U
o-Xylene	0.0000679	U	**0.00176**	J	0.0000679	U
p-Cymene (p-Isopropyltoluene)	**0.0026**	J	**0.00148**	J	0.0000679	U
Sec-Butylbenzene	**0.00253**	J	0.01	U	0.0000632	U
Toluene	0.01	U	0.01	U	0.01	U

Notes:
All units are in mg/kg.
Data obtained from Table 3-8 of Final A
Values in bold font are detected values.
NA: not analyzed
DUP: Duplicate sample

APPENDIX C

Comprehensive and Reduced Groundwater Data from Temporary and Permanent Wells

Table C-1
Comprehensive Groundwater Data from Permanent Wells.
Site SD-27, Holloman AFB

Parameter	SD27-MW01								SD27-MW02			
	11/11/2010	1/25/2011	4/7/2011	7/11/2011	12/13/2012	3/6/2013	6/26/2013	8/28/2013	11/10/2010	11/10/2010 (DUP)	1/25/2011	1/25/2011 (DUP)
TDS (mg/L)												
Total Dissolved Solids	**21700**	**16500** J	**12300**	**21200**	NA	NA	NA	NA	**16300**	**16700**	**11100**	**13300**
TPH (µg/L)												
TPH (C10-C28)	**129** J	95 U	96 U	96 U	NA	NA	NA	NA	**1380**	**1160**	**609**	**584**
TPH-GRO (C6-C10)	50 U	50 U	50 U	50 U	NA	NA	NA	NA	**3310**	**3550**	**1150**	**1250**
Metals, Dissolved (µg/L)												
Arsenic	8 U	2 U	**12**	**4.8** B	NA	NA	NA	NA	**7.7** J	**5.4** J	2 U	2 U
Barium	**48.9** J	**27.1** J	**23** B	**23.7** B	NA	NA	NA	NA	**29.2** J	**25.6** J	**24.1** J	**23.6** J
Chromium	4 U	5 U	4 U	4 U	NA	NA	NA	NA	4 U	4 U	5 U	5 U
Lead	4 U	5 U	4 U	4 U	NA	NA	NA	NA	4 U	4 U	5 U	5 U
Mercury	0.05 U	0.05 U	0.05 U	**0.17** B	NA	NA	NA	NA	**0.056** J	**0.051** J	0.05 U	0.05 U
Selenium	8 U	10 U	**9.6** B	8 U	NA	NA	NA	NA	**9.4** J	8 U	10 U	10 U
Metals, Total (µg/L)												
Arsenic	**16.8** J	**6.5** J	**14**	**6.4** B	NA	NA	NA	NA	8 U	8 U	**2.3** J	2 U
Barium	**290** J	**25.2** J	**24.9** B	**22.2** B	NA	NA	NA	NA	**46.9** J	**37.5** J	**23.9** J	**24.2** J
Chromium	**23.2** J	5 U	4 U	4 U	NA	NA	NA	NA	**7.6** J	**4.2** J	5 U	5 U
Lead	**11.9** J	5 U	4 U	4 U	NA	NA	NA	NA	4 U	4 U	5 U	5 U
Mercury	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	**0.086** J	0.05 U	0.05 U	0.05 U
Selenium	10 U	10 U	**10.2** B	8 U	NA	NA	NA	NA	8 U	8 U	10 U	10 U
SVOCs (µg/L)												
1-Methylnaphthalene	0.48 U	0.49 U	0.49 U	0.48 U	NA	NA	NA	NA	**41**	**32.4**	**12.5**	**14.4**
2,4-Dimethylphenol	1 U	1.1 U	NA	NA	NA	NA	NA	NA	4.2 U	4.2 U	1.1 U	1.1 U
2-Methylnaphthalene	0.54 U	0.56 U	0.56 U	0.55 U	NA	NA	NA	NA	**11.3** J	**9.8** J	**0.69** J	**0.74** J
4-Methylphenol	0.51 U	0.53 U	NA	NA	NA	NA	NA	NA	2.1 U	2.1 U	0.52 U	0.52 U
Di-n-butyl phthalate	**1.9** J	0.85 U	NA	NA	NA	NA	NA	NA	3.3 U	3.3 U	0.84 U	0.84 U
m,p-Cresol	1 U	1.1 U	NA	NA	NA	NA	NA	NA	4.2 U	4.2 U	1.1 U	1.1 U
Naphthalene	0.76 U	0.78 U	0.78 U	0.77 U	NA	NA	NA	NA	**7.7** J	**6.2** J	**0.9** J	**0.95** J
Phenol	0.48 U	0.49 U	NA	NA	NA	NA	NA	NA	1.9 U	1.9 U	0.48 U	0.48 U
VOCs (µg/L)												
1,2,4-Trimethylbenzene	0.27 U	0.27 U	0.27 U	0.27 U	2 U	0.2 U	0.2 U	0.2 U	**168** J	**190** J	**101**	**97**
1,3,5-Trimethylbenzene	0.21 U	0.21 U	0.21 U	0.21 U	2 U	0.2 U	0.2 U	0.2 U	**50.6** J	**56.7** J	**41**	**40.2**
Acetone	**10** UJ	10 U	10 U	10 U	25 U	10 U	10 U	10 U	**24.6** J	**25.8** J	20 U	20 U
Benzene	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.21 U	0.21 U	0.21 U	**6.4** J	**6.7** J	**9.6**	**8.9**
Chloroform	0.22 U	0.22 U	0.22 U	0.22 U	1 U	0.26 U	0.26 U	0.26 U	**3.1** J	**3.4** J	0.44 U	0.44 U
Cymene	0.21 U	0.21 U	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	**30.7** J	**32.5** J	**15.8**	**15.2**
Ethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.29 U	0.29 U	0.29 U	**168** J	**140** J	**122**	**130**
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 U	0.2 U	**48.7** J	**53.2** J	**31.8**	**31.1**
m,p-Xylene	0.32 U	0.32 U	0.32 U	0.32 U	2 U	0.3 U	0.3 U	0.3 U	**147** J	**182** J	**23.8**	**21**
Methyl methacrylate	1 U	1 U	1 U	1 U	5 U	0.5 U	0.5 U	0.5 U	**2** UJ	**2** UJ	2 U	2 U
Methylene chloride	2 U	2 U	2 U	2 U	**4** J	2 U	2 U	2 U	**4** UJ	**4** UJ	4 U	4 U
Naphthalene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**5.4** J	**6.6** J	**2.3** J	**2.6** J
n-Butylbenzene	**0.26** UJ	0.26 U	0.26 U	0.26 U	0.2 U	0.2 U	0.2 U	0.2 U	**3.9** J	**4.2** J	**2.4**	**2.1**
n-Propylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.23 U	0.23 U	0.23 U	0.23 U	**57** J	**64.2** J	**36.4**	**35.2**
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**74.5** J	**90.4** J	**7.3**	**6.6**
Sec-Butylbenzene	0.22 U	0.22 U	0.22 U	0.22 U	0.21 U	0.21 U	0.21 U	0.21 U	**20** J	**21** J	**11.8**	**11**
Tert-butyl benzene	0.27 U	0.27 U	0.27 U	0.27 U	0.29 U	0.29 U	0.29 U	0.29 U	**0.54** UJ	**0.54** UJ	**0.86** J	**0.98** J
Toluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**4.5** J	**5.8** J	0.4 U	0.4 U
Trichloroethene	0.26 U	0.26 U	0.26 U	0.26 U	0.31 U	0.31 U	0.31 U	0.31 U	**0.52** UJ	**0.52** UJ	0.52 U	0.52 U

Notes:
Data obtained from Table 4-4 of Final Accelerated Corrective Measures Work Plan Addendum for SD-27 PAD 9 Drainage Pit (SWMU 141), 2012.
Values in bold font are detected values.
NA: not analyzed

Table C-1
Comprehensive Groundwater Data from Permanent Wells.
Site SD-27, Holloman AFB

Parameter	SD 27-MW02									SD27-MW03				
	4/7/2011	4/7/2011 (DUP)	7/11/2011	7/11/2011 (DUP)	12/12/2012	12/12/2012 (DUP)	3/6/2013	6/26/2013	8/28/2013	11/10/2010	1/25/2011	4/6/2011	7/12/2011	12/13/2012
TDS (mg/L)														
Total Dissolved Solids	**16700**	**13400**	**20700**	**17800**	NA	NA	NA	NA	NA	**28200**	**25800**	**19100**	**22700**	NA
TPH (µg/L)														
TPH (C10-C28)	**524**	**574**	**377**	**515**	NA	NA	NA	NA	NA	**247**	**226** J	**190** J	**170** J	NA
TPH-GRO (C6-C10)	**658**	**859**	**755**	**784**	NA	NA	NA	NA	NA	**217**	**82.1** J	50 U	50 U	NA
Metals, Dissolved (µg/L)														
Arsenic	**7.1** B	**7.6** B	2 U	2 U	NA	NA	NA	NA	NA	**2.5** J	2 U	**3.8** B	NA	NA
Barium	**22.9** B	**21.8** B	**22.4** B	**22.3** B	NA	NA	NA	NA	NA	**55.9** J	**35.7** J	**31.3** B	NA	NA
Chromium	4 U	4 U	4 U	4 U	NA	NA	NA	NA	NA	4 U	5 U	4 U	NA	NA
Lead	4 U	4 U	4 U	4 U	NA	NA	NA	NA	NA	4 U	5 U	4 U	NA	NA
Mercury	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	NA	NA
Selenium	8 U	8 U	8 U	8 U	NA	NA	NA	NA	NA	8 U	10 U	8 U	NA	NA
Metals, Total (µg/L)														
Arsenic	**5.8** B	**6.2** B	**2.1** B	2 U	NA	NA	NA	NA	NA	8 U	**3.3** J	**7** B	2 U	NA
Barium	**22.2** B	**21.9** B	**21.3** B	**21.5** B	NA	NA	NA	NA	NA	**67.9** J	**35.8** J	**32.6** B	**30.9** B	NA
Chromium	4 U	4 U	4 U	4 U	NA	NA	NA	NA	NA	4 U	5 U	4 U	4 U	NA
Lead	4 U	4 U	4 U	4 U	NA	NA	NA	NA	NA	5 U	5 U	4 U	4 U	NA
Mercury	0.05 U	0.05 U	**0.056** B	**0.064** B	NA	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA
Selenium	8 U	8 U	8 U	8 U	NA	NA	NA	NA	NA	8 U	10 U	**8.8** B	8 U	NA
SVOCs (µg/L)														
1-Methylnaphthalene	**10.2**	**10.8**	**11.8**	**11.2**	NA	NA	NA	NA	NA	**2** J	**1.7** J	**2.7** J	0.48 U	NA
2,4-Dimethylphenol					NA	NA	NA	NA	NA	1 U	1.1 U	NA	NA	NA
2-Methylnaphthalene	0.55 U	0.54 U	0.55 U	0.55 U	NA	NA	NA	NA	NA	0.54 U	0.56 U	0.54 U	0.55 U	NA
4-Methylphenol					NA	NA	NA	NA	NA	0.51 U	0.53 U	NA	NA	NA
Di-n-butyl phthalate					NA	NA	NA	NA	NA	0.83 U	0.85 U	NA	NA	NA
m,p-Cresol					NA	NA	NA	NA	NA	1 U	1.1 U	NA	NA	NA
Naphthalene	0.77 U	0.76 U	0.78 U	0.78 U	NA	NA	NA	NA	NA	0.76 U	0.78 U	0.76 U	0.77 U	NA
Phenol					NA	NA	NA	NA	NA	0.48 U	0.49 U	NA	NA	NA
VOCs (µg/L)														
1,2,4-Trimethylbenzene	**81.8**	**79.3**	**87.1**	**89.4**	0.2 U	0.2 U	0.2 U	**1.5** J	**1.5** J	**2** J	0.27 U	0.27 U	0.27 U	0.2 U
1,3,5-Trimethylbenzene	**22.3**	**22.7**	**30.1**	**30.9**	**5.3**	**4.7**	**4.4**	**5**	**5.3**	**3.5** J	**2.1**	**3.9**	**1.5** J	0.2 U
Acetone	20 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**43.6** J	10 U	10 U	10 U	10 U
Benzene	**7.1**	**7.5**	**9.9**	**11.1**	**3.8**	**3.6**	**4.5**	**5.9**	**3.7**	**0.46** J	**0.88** J	**1.4**	0.2 U	0.21 U
Chloroform	0.44 U	0.44 U	**0.56** J	**0.49** J	0.26 U	0.26 U	**0.41** J	**0.47** J	**0.45** J	**0.22** UJ	0.22 U	0.22 U	0.22 U	0.26 U
Cymene	**8.6**	**8.7**	**7.7**	**7.9**	**0.4** J	**0.38** J	**0.3** J	**1**	**1.1**	**0.79** J	0.21 U	0.21 U	0.21 U	0.2 U
Ethylbenzene	**117**	**114**	**92.9**	**91.9**	**0.4** J	0.29 U	0.29 U	**1.5**	**4.6**	**0.2** UJ	0.2 U	0.2 U	0.2 U	0.29 U
Isopropylbenzene	**22.8**	**22.9**	**29** J	**30**	**12.1**	**10.8**	**9**	**12.2**	**10.6**	**2** J	**5.8**	**5.1**	**0.69** J	**0.28** J
m,p-Xylene	**1.1** J	**0.97** J	**5.2**	**4.5**	0.3 U	0.3 U	0.3 U	**0.38** J	**1.2** J	**0.32** UJ	0.32 U	0.32 U	0.32 U	0.3 U
Methyl methacrylate	2 U	2 U	**1.5** J	**1.7** J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1** UJ	1 U	1 U	1 U	0.5 U
Methylene chloride	**7.1** J	**7.2** J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	**2** UJ	2 U	2 U	2 U	2 U
Naphthalene	2 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**1** UJ	1 U	1 U	1 U	1 U
n-Butylbenzene	**1.7** J	**1.7** J	**1.6**	**1.5**	**0.25** J	0.2 U	0.2 U	0.2 U	**0.24** J	**0.26** UJ	0.26 U	0.26 U	0.26 U	0.2 U
n-Propylbenzene	**23.6**	**24.1**	**32.1**	**33.9**	**15.5**	**14.1**	**12.7**	**16**	**14.6**	**1.1** J	**2.8**	**3.6**	0.2 U	0.23 U
o-Xylene	**3.5**	**3.5**	**13.6**	**12**	0.2 U	0.2 U	0.2 U	0.2 U	**0.53** J	**0.2** UJ	0.2 U	0.2 U	0.2 U	0.2 U
Sec-Butylbenzene	**7.4**	**7.5**	**10.6**	**11.3**	**5.2**	**4.5**	**3.9**	**6.2**	**4.9**	**2.1** J	**2.5**	**1.8**	**0.31** J	0.21 U
Tert-butyl benzene	0.54 U	**0.55** J	0.87 J	**0.84** J	**0.51** J	0.29 U	**0.3** J	**0.59** J	**0.42** J	**0.39** J	**0.44** J	0.27 U	0.27 U	0.29 U
Toluene	0.4 U	0.4 U	0.61 J	**0.54** J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.2** J	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	0.52 U	0.52 U	**1.9**	**1.8**	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	**0.26** J	0.26 U	0.26 U	0.26 U	0.31 U

Notes:
Data obtained from Table 4
Values in bold font are dete
NA: not analyzed

Table C-1
Comprehensive Groundwater Data from Permanent Wells.
Site SD-27, Holloman AFB

Parameter	SD27-MW03			SD27-MW04								SD27-MW05				
	3/7/2013	6/26/2013	8/28/2013	11/10/2010	1/25/2011	4/6/2011	7/11/2011	12/12/2012	3/7/2013	6/26/2013	8/28/2013	11/11/2010	1/25/2011	4/7/2011	7/11/2011	12/11/2012
TDS (mg/L)																
Total Dissolved Solids	NA	NA	NA	**29600**	**28300**	**18300**	**30800**	NA	NA	NA	NA	**15300**	**14000**	**16300**	**18500**	NA
TPH (µg/L)																
TPH (C10-C28)	NA	NA	NA	**446**	**149** J	**104** J	**107** J	NA	NA	NA	NA	**1320**	**1160**	**1230**	**470**	NA
TPH-GRO (C6-C10)	NA	NA	NA	**427**	**128**	50 U	**98** J	NA	NA	NA	NA	**6100**	**4380**	**3310**	**1100**	NA
Metals, Dissolved (µg/L)																
Arsenic	NA	NA	NA	**6.9** J	2 U	**14.3**	8 U	NA	NA	NA	NA	**6.4** J	2 U	**6.2** B	2 U	NA
Barium	NA	NA	NA	**22.4** J	**20.5** J	**19.3** B	**18.4** B	NA	NA	NA	NA	**48.6** J	**27.5** J	**25.1** B	**23.4** B	NA
Chromium	NA	NA	NA	4 U	5 U	4 U	4 U	NA	NA	NA	NA	4 U	5 U	4 U	4 U	NA
Lead	NA	NA	NA	4 U	5 U	4 U	10 U	NA	NA	NA	NA	4 U	5 U	4 U	4 U	NA
Mercury	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA
Selenium	NA	NA	NA	8 U	10 U	8 U	8 U	NA	NA	NA	NA	8 U	10 U	8 U	8 U	NA
Metals, Total (µg/L)																
Arsenic	NA	NA	NA	8 U	**7.8** J	**15.2**	8 U	NA	NA	NA	NA	10 U	**9.3** J	**8** B	2 U	NA
Barium	NA	NA	NA	**24.9** J	**21.4** J	**21.5** B	**18.8** B	NA	NA	NA	NA	**69.4** J	**30.6** J	**25.8** B	**24.1** B	NA
Chromium	NA	NA	NA	4 U	5 U	4 U	**7.4** B	NA	NA	NA	NA	5 U	**6.4** J	**25** B	4 U	NA
Lead	NA	NA	NA	5 U	5 U	4 U	**14.2** B	NA	NA	NA	NA	5 U	5 U	4 U	4 U	NA
Mercury	NA	NA	NA	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA	NA	0.05 U	**0.055** J	0.05 U	0.05 U	NA
Selenium	NA	NA	NA	8 U	10 U	8 U	8 U	NA	NA	NA	NA	10 U	10 U	8 U	8 U	NA
SVOCs (µg/L)																
1-Methylnaphthalene	NA	NA	NA	**11**	**2.2** J	0.49 U	**2** J	NA	NA	NA	NA	**24.7**	**14.1**	**14**	**11.3**	NA
2,4-Dimethylphenol	NA	NA	NA	1 U	1.1 U	NA	NA	NA	NA	NA	NA	**4.5** J	**7.2**	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	**1.6** J	0.55 U	0.55 U	0.56 U	NA	NA	NA	NA	**26.7**	**13.9**	**13**	**10.7**	NA
4-Methylphenol	NA	NA	NA	0.51 U	0.52 U	NA	NA	NA	NA	NA	NA	**5.5** J	**5.6**	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	0.83 U	0.84 U	NA	NA	NA	NA	NA	NA	3.5 U	**0.84** J	NA	NA	NA
m,p-Cresol	NA	NA	NA	1 U	1.1 U	NA	NA	NA	NA	NA	NA	4.4 U	**7.1**	NA	NA	NA
Naphthalene	NA	NA	NA	0.76 U	0.78 U	0.78 U	0.78 U	NA	NA	NA	NA	**60**	**27**	**22.2**	**18.6**	NA
Phenol	NA	NA	NA	0.48 U	0.49 U	NA	NA	NA	NA	NA	NA	2 U	**18.1**	NA	NA	NA
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	**4.2** J	**2.8**	**0.33** J	**2.9**	0.2 U	0.2 U	0.2 U	0.2 U	**223** J	**255**	**227**	**87.5**	**40.8**
1,3,5-Trimethylbenzene	**0.28** J	0.2 U	0.2 U	**1.1** J	**0.97** J	0.21 U	**0.83** J	0.2 U	0.2 U	0.2 U	0.2 U	**53.5** J	**91.6**	**61.1**	**26.4**	**12.4**
Acetone	10 U	10 U	10 U	**10** UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**100** UJ	100 U	100 U	50 U	10 U
Benzene	0.21 U	0.21 U	0.21 U	**0.34** J	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.21 U	0.21 U	**371** J	**776**	**550**	**217**	**152**
Chloroform	0.26 U	0.26 U	0.26 U	**0.22** UJ	0.22 U	0.22 U	0.22 U	0.26 U	0.26 U	0.26 U	0.26 U	**2.2** UJ	2.2 U	2.2 U	1.1 U	0.26 U
Cymene	0.2 U	0.2 U	0.2 U	**0.6** J	**0.3** J	0.21 U	**0.29** J	0.2 U	0.2 U	0.2 U	0.2 U	**6.4** J	**8.4** J	**6.6** J	**3.8** J	**1.4**
Ethylbenzene	0.29 U	0.29 U	0.29 U	**2.7** J	**1.5**	0.2 U	**2.5**	**1.6**	0.29 U	**0.39** J	0.29 U	**504** J	**41**	**15.1**	**107**	**105**
Isopropylbenzene	**0.33** J	0.2 U	**0.28** J	**15.1** J	**4.1**	**0.5** J	**11.5** J	**11.2**	**3.6**	**4**	**1.1**	**51.8** J	**9.1** J	2 U	**15.9** J	**10.7**
m,p-Xylene	0.3 U	0.3 U	0.3 U	**0.32** UJ	0.32 U	0.32 U	0.32 U	0.3 U	0.3 U	0.3 U	0.3 U	**145** J	**221**	**94.2**	**7.2** J	**6.7**
Methyl methacrylate	0.5 U	0.5 U	0.5 U	**1** UJ	1 U	1 U	**1** J	0.5 U	0.5 U	0.5 U	0.5 U	**10** UJ	10 U	10 U	5 U	0.5 U
Methylene chloride	2 U	2 U	2 U	**2** UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	**20** UJ	20 U	**27.6** J	**11.7** J	2 U
Naphthalene	1 U	1 U	1 U	**1** UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**57.4** J	**48.5** J	**34.3** J	**19.1** J	**5.8**
n-Butylbenzene	0.2 U	0.2 U	0.2 U	**0.26** UJ	0.26 U	0.26 U	0.26 U	0.2 U	0.2 U	0.2 U	0.2 U	**2.6** UJ	2.6 U	2.6 U	1.3 U	0.2 U
n-Propylbenzene	**0.27** J	0.23 U	0.23 U	**11.5** J	**2.3**	**0.25** J	**6.9**	**12.1**	**3.7**	**3.9**	**0.72** J	**50.1** J	**4.3** J	2 U	**10.8**	**9.2**
o-Xylene	0.2 U	0.2 U	0.2 U	**0.27** J	0.2 U	0.2 U	0.2 U	**0.22** J	0.2 U	0.2 U	0.2 U	**332** J	**376**	**329**	**103**	**47.4**
Sec-Butylbenzene	0.21 U	0.21 U	0.21 U	**6.8** J	**2.5**	**0.35** J	**5.2**	**7.9**	**3.1**	**3**	**0.76** J	**7.8** J	**3** J	2.2 U	**4.4** J	**2.4**
Tert-butyl benzene	0.29 U	0.29 U	0.29 U	**0.27** UJ	**0.28** J	0.27 U	**0.44** J	**0.63** J	**0.41** J	**0.32** J	0.29 U	**2.7** UJ	2.7 U	2.7 U	1.4 U	0.29 U
Toluene	0.2 U	0.2 U	0.2 U	**0.2** UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**279** J	**104**	**104**	**33.9**	**28.1**
Trichloroethene	0.31 U	0.31 U	0.31 U	**0.26** UJ	0.26 U	0.26 U	0.26 U	0.31 U	0.31 U	0.31 U	0.31 U	**2.6** UJ	2.6 U	2.6 U	1.3 U	0.31 U

Notes:
Data obtained from Table 4
Values in bold font are dete
NA: not analyzed

Table C-1
Comprehensive Groundwater Data from Permanent Wells.
Site SD-27, Holloman AFB

Parameter	SD27-MW05					
	3/7/2013	3/7/2013 (DUP)	6/26/2013	6/26/2013 (DUP)	8/28/2013	8/28/2013 (DUP)
TDS (mg/L)						
Total Dissolved Solids	NA	NA	NA	NA	NA	NA
TPH (µg/L)						
TPH (C10-C28)	NA	NA	NA	NA	NA	NA
TPH-GRO (C6-C10)	NA	NA	NA	NA	NA	NA
Metals, Dissolved (µg/L)						
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Metals, Total (µg/L)						
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
SVOCs (µg/L)						
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA
m,p-Cresol	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
VOCs (µg/L)						
1,2,4-Trimethylbenzene	**244**	**242**	**194**	**372**	**213**	**220**
1,3,5-Trimethylbenzene	**64.2**	**55.6**	**51.5**	**94.9**	**52.8**	**54.8**
Acetone	50 U	20 U	50 U	250 U	50 U	50 U
Benzene	**426**	**516**	**537**	**736**	**461**	**443**
Chloroform	1.3 U	0.53 U	1.3 U	6.6 U	1.3 U	1.3 U
Cymene	**5.8**	**5.5**	**5.3**	**9** J	**5.3**	**5.2**
Ethylbenzene	**480**	**568**	**656**	**895**	**499**	**469**
Isopropylbenzene	**49.5**	**47.2**	**46.5**	**76.5**	**49.7**	**50.5**
m,p-Xylene	**47.1**	**42.1**	**69.8**	**100**	**54**	**56.5**
Methyl methacrylate	2.5 U	1 U	2.5 U	13 U	2.5 U	2.5 U
Methylene chloride	**61.3** J	**12.2** J	10 U	50 U	10 U	10 U
Naphthalene	**21.9** J	**25.6**	**17.9** J	**38** J	**9.8** J	**11** J
n-Butylbenzene	**1** J	**0.74** J	1 U	5 U	1 U	1 U
n-Propylbenzene	**52.4**	**49.3**	**45**	**90.7**	**52.8**	**54.3**
o-Xylene	**220**	**258**	**323**	**366**	**249**	**258**
Sec-Butylbenzene	**9.4**	**8.2**	**11.5**	**13.6** J	**8.1**	**8.4**
Tert-butyl benzene	1.5 U	**0.95** J	1.5 U	7.3 U	1.5 U	1.5 U
Toluene	**102**	**98.8**	**160**	**292**	**189**	**190**
Trichloroethene	1.6 U	0.63 U	1.6 U	7.9 U	1.6 U	1.6 U

Notes:
Data obtained from Table 4
Values in bold font are dete
NA: not analyzed

Table C-2
Summary of Groundwater Data from Permanent Wells.
Site SD-27, Holloman AFB, New Mexico

Well No.	Sampling Date	Analytes					
		VOC	SVOCs	TPH	TDS	Metals, Dissolved	Metals, Total
SD27-MW01	11/11/2010	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011	Yes	Yes	Yes	Yes	Yes	Yes
	4/7/2011	Yes	Yes	Yes	Yes	Yes	Yes
	7/11/2011	Yes	Yes	Yes	Yes	Yes	Yes
	12/13/2012	Yes	**No**	**No**	**No**	**No**	**No**
	3/6/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013	Yes	**No**	**No**	**No**	**No**	**No**
SD27-MW02	11/10/2010	Yes	Yes	Yes	Yes	Yes	Yes
	11/10/2010 (DUP)	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011 (DUP)	Yes	Yes	Yes	Yes	Yes	Yes
	4/7/2011	Yes	Yes	Yes	Yes	Yes	Yes
	4/7/2011 (DUP)	Yes	Yes	Yes	Yes	Yes	Yes
	7/11/2011	Yes	Yes	Yes	Yes	Yes	Yes
	7/11/2011 (DUP)	Yes	Yes	Yes	Yes	Yes	Yes
	12/12/2012	Yes	**No**	**No**	**No**	**No**	**No**
	12/12/2012 (DUP)	Yes	**No**	**No**	**No**	**No**	**No**
	3/6/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013	Yes	**No**	**No**	**No**	**No**	**No**
SD27-MW03	11/10/2010	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011	Yes	Yes	Yes	Yes	Yes	Yes
	4/6/2011	Yes	Yes	Yes	Yes	Yes	Yes
	7/12/2011	Yes	Yes	Yes	Yes	No	Yes
	12/13/2012	Yes	**No**	**No**	**No**	**No**	**No**
	3/7/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013	Yes	**No**	**No**	**No**	**No**	**No**
SD27-MW04	11/10/2010	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011	Yes	Yes	Yes	Yes	Yes	Yes
	4/6/2011	Yes	Yes	Yes	Yes	Yes	Yes
	7/11/2011	Yes	Yes	Yes	Yes	Yes	Yes
	12/12/2012	Yes	**No**	**No**	**No**	**No**	**No**
	3/7/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013	Yes	**No**	**No**	**No**	**No**	**No**
SD27-MW05	11/11/2010	Yes	Yes	Yes	Yes	Yes	Yes
	1/25/2011	Yes	Yes	Yes	Yes	Yes	Yes
	4/7/2011	Yes	Yes	Yes	Yes	Yes	Yes
	7/11/2011	Yes	Yes	Yes	Yes	Yes	Yes
	12/11/2012	Yes	**No**	**No**	**No**	**No**	**No**
	3/7/2013	Yes	**No**	**No**	**No**	**No**	**No**
	3/7/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013	Yes	**No**	**No**	**No**	**No**	**No**
	6/26/2013 (DUP)	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013	Yes	**No**	**No**	**No**	**No**	**No**
	8/28/2013 (DUP)	Yes	**No**	**No**	**No**	**No**	**No**

Notes:
DUP: Duplicate sample

Table C-3
Comprehensive Groundwater Data from Temporary Wells.
Site SD-27, Holloman AFB, New Mexico

Parameter	GW27-02		GW27-03		GW27-07		GW27-08	
	5/16/06	5/20/06	5/16/06		6/16/06		6/16/06	
TPH								
G-TPH	**56,400**	NA	**24,200**	**23,600**	27.2	U	27.2	U
D-TPH	**4,170** J	NA	**29,100**	**60,200**	106	U	106	U
Metals, Dissolved								
Barium	**NA**	**17**	**22**	**23**	**39**		**29**	
Selenium	**NA**	**289**	**97**	**81**	**7**	J	**10**	
Silver	**NA**	0.2 U	0.2 U	0.2 U	**11**		0.2	U
Metals, Total								
Barium	**40**	NA	**22**	**36**	**345**		**52**	
Chromium	**3** J	NA	1.4 U	1.4 U	**48**		1.4	U
Lead	1.6 U	NA	1.6 U	1.6 U	**17**		1.6	U
Silver	0.2 U	NA	**14**	**14**	**13**		**11**	
SVOCs								
1-Methylnaphthalene	**21.1**	NA	**23.2**	**29.8**	0.5	U	0.5	U
2-Methylnaphthalene	**15.2**	NA	**15.3**	**21.1**	0.4	U	0.4	U
2,4-Dimethylphenol	**15.2**	NA	0.9 U	0.9 U	0.9	U	0.9	U
Acetophenone	**20**	NA	**17.8**	**22.8**	0.6	U	0.6	U
Benzoic acid	**106**	NA	0.7 U	0.7 U	0.7	U	0.7	U
Cresols, m & p	**53.8**	NA	**2.4** J	0.4 U	0.4	U	0.4	U
Diethyl phthalate	**10.9**	NA	0.8 U	0.8 U	0.8	U	0.8	U
Total Cresols	**13.3**	NA	0.6 U	0.6 U	0.6	U	0.6	U
VOCs								
1,2-Dichloroethane	0.0557 U	NA	**52** J	0.0557 U	0.0557	U	0.0557	U
1,2,4-Trimethylbenzene	**412**	NA	**940**	**1460**	1	U	1	U
1,3,5-Trimethylbenzene	**118**	NA	**266**	**427**	1	U	1	U
(mesitylene) Acetone	0.854 U	NA	1 U	**850** J	1	U	1	U
Benzene	**7750**	NA	**2360**	**2800**	2	U	1	U
Ethylbenzene	**1030**	NA	**2330**	**3080**	1	U	1	U
Isopropylbenzene (cumene)	**82**	NA	**230**	**374**	1	U	1	U
m,p- Xylene (sum of isomers)	**1430**	NA	**1460**	**1930**	1	U	1	U
n- Butylbenzene	**33.2** J	NA	**44.8** J	**95.6** J	1	U	0.04	U
n-Propylbenzene	**110**	NA	**264**	**443**	1	U	1	U
Naphthalene	**133** J	NA	**163** J	**232** J	0.4	U	0.4	U
o-Xylene	**755**	NA	**1020**	**1390**	1	U	1	U
p-Cymene (p-Isopropyltoluene)	**20.2** J	NA	**39.8** J	**75.6** J	0.0513	U	1	U
Sec-Butylbenzene	**28** J	NA	**51.6**	**105**	1	U	1	U
Toluene	**5690**	NA	**1940**	**2430**	1.14	U	1	U
Trichloroethene (TCE)	**6.89**	NA	0.0495 U	0.0495 U	**0.22**	J	**0.17**	J

Notes:
All units are in µg/L.
Data obtained from Table 3-9 of Final Accelerated Corrective Measures Work Plan Addendum for SD-27 PAD 9 Drainage Pit (SWMU 141), 2012.
Values in bold font are detected values.
NA: not analyzed

APPENDIX D

Supplemental Data Tables

Table D-1(a)
Comparison of Maximum Soil Detection Limits for Chemicals Never Detected with Soil Screening Levels in North EU
Site SD-27, Holloman AFB

Chemical	Max Detection Limit (mg/kg)	Soil Screening Level (mg/kg)			
		Residential	Exceed?	Cons. Worker	Exceed?
1-Methylnaphthalene	0.0475	*180*	No	NA	No
2-Methylnaphthalene	0.041	*240*	No	NA	No
1,3,5-Trimethylbenzene	0.01	*780*	No	NA	No
Benzene	0.000236	17.8	No	142	No
Ethylbenzene	0.01	75.1	No	1,770	No
Methylene chloride	0.05	409	No	1,210	No
n-Propylbenzene	0.01	*3,800*	No	NA	No
Toluene	0.01	5,230	No	14,000	No

Notes:
Screening levels in normal font were obtained from "NMED Risk Assessment Guidance for Site Investigations and Remediation, 2015".
Screening levels in italic font were obtained from "USEPA Regional Screening Level Tables, November 2015, adjusted for taget risk 1E-05.
NA: Not available

Table D-1(b)
Comparison of Maximum Groundwater Detection Limits for Chemicals Never Detected with Groundwater Vapor Intrusion Screening Levels in North EU
Site SD-27, Holloman AFB

Chemical	Max Detection Limit	GW Vapor Intrusion Screening Level	Exceed?
	(µg/L)		
Chromium (dissolved)*	5	N/A	
Lead (dissolved)*	5	N/A	
Mercury (total)	0.05	0.669	No
1-Methylnaphthalene	0.5	NA	N/A
1,2-Dichloroethane	0.0557	22.3	No
2,4-Dimethylphenol	1.1	NA	N/A
2-Methylnaphthalene	0.56	NA	N/A
4-Methylphenol	0.53	NA	N/A
Di-n-butyl phthalate	0.85	NA	N/A
m,p-Cresol	1.1	NA	N/A
Naphthalene	0.78	45.8	No
Phenol	0.49	NA	N/A
Acetophenone	0.6	NA	N/A
Benzoic acid	0.7	NA	N/A
Diethyl phthalate	0.8	NA	N/A
Total Cresols	0.6	NA	N/A
1,2,4-Trimethylbenzene	2	NA	N/A
1,3,5-Trimethylbenzene	2	NA	N/A
Acetone	25	22,500,000	No
Benzene	1.57	15.8	No
Chloroform	1	8.11	No
Cymene	1	NA	N/A
Ethylbenzene	1	34.8	No
Isopropylbenzene	1	885	No
m,p-Xylene**	2	491	No
Methyl methacrylate	5	55,800	No
Naphthalene	1	45.8	No
n-Butylbenzene	1	NA	N/A
n-Propylbenzene	1	NA	N/A
o-Xylene	1	491	No
Sec-Butylbenzene	1	NA	N/A
Tert-butyl benzene	0.29	NA	N/A
Toluene	1.14	19,200	No

Notes:
*: Non-volatile chemical
**: Xylenes values from NMED (2015) were used.
NA: Screening level not available N/A: Not applicable
Screening levels were obtained from "*NMED Risk Assessment Guidance for Site Investigations and Remediation*, 2015".
For mercury, screening level for elemental mercury was used.

Table D-2(a)
Comparison of Maximum Soil Detection Limits for Chemicals Never Detected with Soil Screening Levels in South EU
Site SD-27, Holloman AFB

Chemical	Max Detection Limit (mg/kg)	Soil Screening Level (mg/kg)			
		Residential	Exceed?	Cons. Worker	Exceed?
Selenium	6,000 (2.7*)	391	**Yes**	1,750	**Yes**
1,1-Dichloroethene	0.69	440	No	424	No
4-Methyl-2-pentanone	2.7	*33,000*	No	NA	No
Acrolein	5.4	0.454	**Yes**	0.401	**Yes**
Benzyl Chloride	0.74	*11*	No	NA	No
Chloroform	0.59	5.9	No	134	No
Trichloroethene	0.59	6.77	No	6.9	No

Notes:
Screening levels in normal font were obtained from "NMED Risk Assessment Guidance for Site Investigations and Remediation, 2015".
Screening levels in italic font were obtained from "*USEPA Regional Screening Level Tables, November 2015* ", adjusted for cancer risk 1E-05.
NA: Not available
* One sample for Selenium had a detection limit of 6,000 mg/kg. This was anomolous for the dataset. The second highest DL for selenium was 2.7 mg/kg.

Table D-2(b)
Comparison of Maximum Groundwater Detection Limits for Chemicals Never Detected with Groundwater Vapor Intrusion Screening Levels in South EU
Site SD-27, Holloman AFB

Chemical	Max Detection Limit	Screening Level	Exceed?
	(µg/L)		
Chromium (dissolved)*	5	N/A	
Lead (dissolved)*	10		
Mercury (dissolved)*	0.05		
Selenium (dissolved)*	10		
Acetone	250	22,500,000	No

Notes:

*: Non-volatile chemical

N/A: Not applicable

Screening level was obtained from "NMED Risk Assessment Guidance for Site Investigations and Remediation, 2015".

Table D-3(a)
Summary of Samples used for 95% UCL
Site SD-27, Holloman AFB, New Mexico

Analyte	No.of Samples		
	Collected	Detetced	Non-Detect
Soil Direct Pathway (South EU)			
Chromium	28	28	0
Soil Indoor Inhalation Pathway (North EU)			
D-TPH	3	***1***	2
1,2,4-Trimethylbenzene	3	***2***	1
Isopropylbenzene	3	***1***	2
m, p-Xylene	3	***2***	1
n-Butylbenzene	3	***1***	2
Naphthalene	3	***2***	1
o-Xylene	3	***2***	1
Sec-Butylbenzene	3	***1***	2
Soil Indoor Inhalation Pathway (South EU)			
TPH (C10-C28)	28	9	19
1-Methylnaphthalene	28	7	21
2-Methylnaphthalene	28	6	22
Naphthalene	28	6	22
1,2,4-Trimethylbenzene	27	10	17
1,3,5-Trimethylbenzene	27	12	15
n-Butylbenzene	27	12	15
Acetone	22	**3**	19
Benzene	27	9	18
Carbon disulfide	27	6	21
Ethylbenzene	27	13	14
Hexane	27	**4**	23
Isopropylbenzene	27	13	14
m,p-Xylene	27	9	18
Methylene chloride	27	**2***	25
n-Propylbenzene	27	12	15
o-Xylene	27	10	17
Sec-Butylbenzene	27	12	15
Tert-butyl benzene	27	**2**	25
Toluene	27	6	21

bold values indicate less than 5 detected samples; used Pro-UCL recommendations for EPC.
bold italicized values indicate where maximum concentrations used for EPC.
* note - for Methylene Chloride, Pro-UCL recommended using the maximum value.

Table D-3(b)
Risk from Indoor Inhalation of Vapors from Soil and Groundwater in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical of Concern	Soil Representative Concentration (mg/kg)	Soil Vapor Concentration* (ug/m^3)	Non-Carcinogenic	Carcinogenic	Groundwater Representative Concentration (ug/L)	Non-Carcinogenic	Carcinogenic	HI	IELCR
1-Methylnaphthalene	0.81	N/A	NA	NA	NCOC	--		0.00E+00	0.00E+00
2-Methylnaphthalene	0.47	1.23E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Naphthalene	0.95	3.90E+03	3.44E-32	1.40E-36	NCOC	--		3.44E-32	1.40E-36
1,2,4-Trimethylbenzene	11.80	1.67E+06	7.75E-11	NA	NCOC	--		7.75E-11	0.00E+00
1,3,5-Trimethylbenzene	7.54	1.53E+06	NA	NA	NCOC	--		0.00E+00	0.00E+00
n-Butylbenzene	1.76	2.79E+05	NA	NA	NCOC	--		0.00E+00	0.00E+00
Acetone*	*0.06*	*5.73E+02*	*6.27E-06*	*NA*	NCOC	--		6.27E-06	0.00E+00
Benzene	1.72	7.99E+05	2.59E-09	2.42E-13	118	7.78E-18	7.28E-22	2.59E-09	2.42E-13
Carbon disulfide	0.12	2.64E+05	1.75E-01	NA	NCOC			1.75E-01	0.00E+00
Ethylbenzene	9.49	2.41E+06	1.90E-10	1.90E-13	86	1.52E-19	1.52E-22	1.90E-10	1.90E-13
Hexane*	*5.82*	*3.59E+07*	*6.06E-05*	*NA*	NCOC	--		6.06E-05	0.00E+00
Isopropylbenzene	2.57	5.71E+05	4.26E-01	NA	NCOC	--		4.26E-01	0.00E+00
m,p-Xylene	13.12	3.51E+06	8.97E-10	NA	NCOC	--		8.97E-10	0.00E+00
Methylene chloride**	*0.01*	*3.56E+03*	*2.62E-03*	*6.28E-09*	NCOC	--		2.62E-03	6.28E-09
n-Propylbenzene	3.27	6.15E+05	1.83E-01	NA	NCOC	--		1.83E-01	0.00E+00
o-Xylene	5.98	1.14E+06	4.68E-12	NA	NCOC	--		4.68E-12	0.00E+00
Sec-Butylbenzene	2.07	3.83E+03	NA	NA	NCOC	--		0.00E+00	0.00E+00
Tert-butyl benzene*	*0.61*	*1.30E+05*	*NA*	*NA*	NCOC	--		0.00E+00	0.00E+00
Toluene	7.31	2.77E+06	4.67E-11	NA	NCOC	--		4.67E-11	0.00E+00
Cumulative			**7.9E-01**	**6.3E-09**		**7.9E-18**	**8.8E-22**	**7.9E-01**	**6.3E-09**

Notes:
* Calculated using representative soil concentration and equilibrium equation.
HI = Hazard Index
IELCR = Individual Excess Lifetime Cancer Risk
mg/kg = milligrams per kilogram
NA = Not calculated due to lack of toxicity values.
NCOC = Not a chemical of concern
ug/m^3 = micrograms per cubic meter
ug/L = micrograms per liter
* italicized results for maximum chemcial concentrations instead of Pro-UCL recommended 95% UCL values. Comparison to Table 4-21(c) shows no change to risk results at reported level of significance.
** for methylene chloride Pro-UCL using the maximum concentration.

Table D-4(a)
Selection of Volatile Detected Chemicals in Soil in North EU
Site SD-27, Holloman AFB, New Mexico

Chemical	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Volatile Yes/No?
SVOCs			
Fluoranthene	202.26	8.86E-06	No
VOCs			
1,2,4-Trimethylbenzene	*120.2*	*6.16E-03*	**Yes**
Isopropylbenzene	120.2	1.15E-02	**Yes**
m, p-Xylene*	106.17	5.18E-03	**Yes**
n-Butylbenzene	*134.22*	*1.59E-02*	**Yes**
Naphthalene	128.18	4.40E-04	**Yes**
o-Xylene	106.17	5.18E-03	**Yes**
p-Cymene	NA	NA	N/A
Sec-Butylbenzene	*134.22*	*1.76E-02*	**Yes**

Notes:
* Values for Xylenes were used.
A chemical is volatile if its molecular weight is less than 200 g/mol and Henry's constant is greater than 1E-5 atm-m^3/mol.
Values in regular font are from NMED (2015).
Values in italics are from USEPA (2015a).
atm-m^3/mol = atmosphere meters cubed per mole
g/mol = grams per mole
N/A = Not Applicable
NA = Not Available
SVOC = semivolatile organic compound
VOC = volatile organic compound

New Mexico Environment Department (NMED), 2015. Risk Assessment Guidance for Site Investigations and Remediation.
U.S. Environmental Protection Agency (USEPA), 2015a. Regional Tables, Regional Screening Levels. June.

Table D-4(b)
Selection of Volatile Detected Chemicals in Soil in South EU
Site SD-27, Holloman AFB, New Mexico

Chemical	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Volatile Yes/No?
SVOCs			
1-Methylnaphthalene	*142.2*	*5.14E-04*	**Yes**
2-Methylnaphthalene	*142.2*	*5.18E-04*	**Yes**
VOCs			
1,2,4-Trimethylbenzene	*120.2*	*6.16E-03*	**Yes**
1,3,5-Trimethylbenzene	*120.2*	*8.77E-03*	**Yes**
Benzene	78.11	5.55E-03	**Yes**
Ethylbenzene	106.17	7.88E-03	**Yes**
Isopropylbenzene	120.2	1.15E-02	**Yes**
m, p-Xylene*	106.17	5.18E-03	**Yes**
Methylene chloride	84.93	3.25E-03	**Yes**
n-Butylbenzene	*134.22*	*1.59E-02*	**Yes**
n-Propylbenzene	*120.2*	*1.05E-02*	**Yes**
Naphthalene	128.18	4.40E-04	**Yes**
o-Xylene	106.17	5.18E-03	**Yes**
p-Cymene	NA	NA	N/A
Sec-Butylbenzene	*134.22*	*1.76E-02*	**Yes**
Toluene	92.14	6.64E-03	**Yes**
Acetone	58.08	3.50E-05	**Yes**
Carbon disulfide	76.13	1.44E-02	**Yes**
Hexane	86.18	1.80E+00	**Yes**
Tert-butyl benzene	*134.22*	*1.32E-02*	**Yes**

Notes:
* Values of Xylenes were used.
A chemical is volatile if its molecular weight is less than 200 g/mol and Henry's constant is greater than 1E-5 atm-m^3/mol.
Values in regular font are from NMED (2015).
Values in italics are from USEPA (2015a).
atm-m^3/mol = atmosphere meters cubed per mole
g/mol = grams per mole
N/A = Not Applicable
NA = Not Available
SVOC = semivolatile organic compound
VOC = volatile organic compound

New Mexico Environment Department (NMED), 2015. Risk Assessment Guidance for Site Investigations and Remediation.
U.S. Environmental Protection Agency (USEPA), 2015a. Regional Tables, Regional Screening Levels. June.

APPENDIX E

Equations for Direct Pathway – Soils

Non-Carcinogenic Risk Calculation from Ingestion, Dermal Contact, and Inhalation of Vapors and Particulates from Soil

Oral

$$HQ = \frac{C \times EF \times ED \times \left({}^{1}/_{RfD_o}\right) \times IRSc \times 10^{-6}}{AT_n \times BWc}$$

Outdoor Inhalation

$$HQ = \frac{C \times EF \times ED \times ET \times \left({}^{1}/_{RfC}\right) \times \left[\left({}^{1}/_{VF}\right) + \left({}^{1}/_{PEF}\right)\right]}{AT_n}$$

Dermal

$$HQ = \frac{C \times EF \times ED \times SA \times AF \times \left({}^{1}/_{(RfDo \times GIABS)}\right) \times ABSd \times 10^{-6}}{AT_n \times BWc}$$

HQ = Hazard quotient
ATn = Average time, non-carcinogenic (days)
BWc = Body weight, child (kg)
C = Contaminant concentration (mg/kg)
EF = Exposure frequency, resident (days/yr)
ED = Exposure duration, child (yrs)
ET = Exposure time [(hr/day) x (day/hr)]
IRSc = Soil ingestion rate, child (mg/day)
RfDo = Oral reference dose (mg/kg-day)
RfC = Inhalation reference concentration (mg/m^3)
SA = Dermal surface area, child (cm^2/day)
AF = Soil adherence factor, child (mg/cm^2)
GIABS = Fraction absorbed in gastrointestinal tract (unitless)
ABSd = Skin absorption factor (unitless)
VF = Volatilization factor (m^3/kg)
PEF = Particulate emission factor (m^3/kg)
10^{-6} = Unit conversion factor (kg/mg)

Source: Equation 1, NMED (2015)

Carcinogenic Risk Calculation from Inhalation, Dermal Contact, and Inhalation of Vapors and Particulates from Soil

Oral

$$R = \frac{C \times CSFo \times IFS_{adj} \times 10^{-6}}{AT_c}$$

Outdoor Inhalation

$$R = \frac{C \times EF \times ED \times ET \times IUR \times 1000 \times \left[\left({}^{1}/_{VF}\right) + \left({}^{1}/_{PEF}\right)\right]}{AT_c}$$

Dermal

$$R = \frac{C \times DFS_{adj} \times \left({}^{CSFo}/_{(GIABS)}\right) \times ABSd \times 10^{-6}}{AT_n \times BWc}$$

R = Cancer risk
AT = Average time, non-carcinogenic (days)
C = Contaminant concentration (mg/kg)
EF = Exposure frequency, resident (days/yr)
ED = Exposure duration, resident (yrs)
ET = Exposure time [(hr/day) x (day/hr)]
IRSadj = Age-adjusted soil ingestion rate (mg/kg)
DFSad = Age-adjusted dermal factor (mg/kg)
CFSo = Oral cancer slope factor $(mg/kg\text{-}day)^{-1}$
IUR = Inhalation unit risk $(ug/m3)^{-1}$
GIABS = Fraction absorbed in gastrointestinal tract (unitless)
ABSd = Skin absorption factor (unitless)
VF = Volatilization factor (m^3/kg)
PEF = Particulate emission factor (m^3/kg)
10^{-6} = Unit conversion factor (kg/mg)
1000 = Unit conversion factor (ug/mg)

Source: Equation 2, NMED (2015)

Calculation for Age-adjusted Soil Ingestion and Dermal Factor

$$IFS_{adj} = \frac{EF \times EDc \times IRSc}{BWc} + \frac{EF \times (EDr - EDc) \times IRSa}{BWa}$$

$$DFS_{adj} = \frac{EF \times EDc \times SAc \times AFc}{BWc} + \frac{EF \times (EDr - EDc) \times SAa \times AFa}{BWa}$$

IFSadj = Age adjusted soil ingestion rate for carcinogen (mg/kg)
DFSadj = Age adjusted dermal factor rate carcinogen (mg/kg)
EF = Exposure frequency (day/yr)
EDc = Exposure duration, child (yr)
EDr = Exposure duration, resident (yr)
IRSc = Soil ingestion rate, child (mg/day)
IRSa = Soil ingestion rate, adult (mg/day)
SAc = Dermal surface area, child (cm^2/day)
SAa = Dermal surface area, adult (cm^2/day)
AFc = Soil adherence factor, child (mg/cm^2)
AFa = Soil adherence factor, adult (mg/cm^2)
BWc = Body weight, child (kg)
BWa = Body weight, adult (kg)

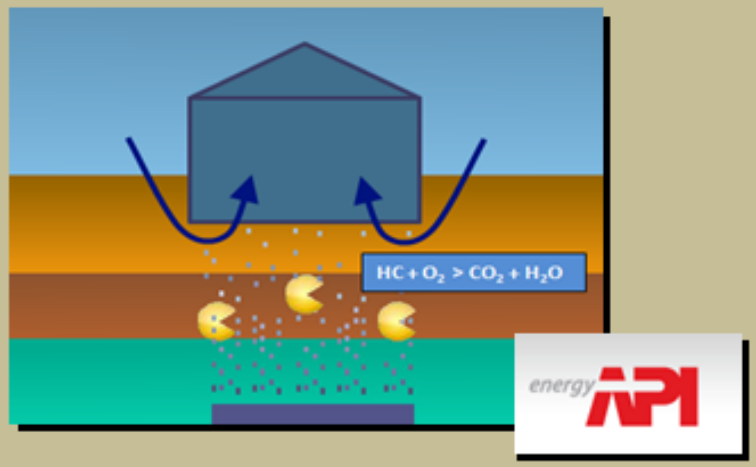
Source: Equations 3 and 4, NMED (2015)

APPENDIX F

Example BioVapor Model Input and Results – South EU Soils

BioVapor

A 1-D vapor intrusion Model:
with Oxygen-Limited Aerobic Biodegradation



1) PROJECT INFORMATION

Site ID #:	HAFB SD 27
Address:	HAFB, New Mexico
Completed by:	D. Vaidya
Date:	8-Feb-16
Job ID:	60425210

BioVapor Version 2.1 beta

2) INPUT SCREENS

1) Environmental Factors
2) Chemicals
3) Chemical Concentrations

Chemical Database

3) RESULTS SCREENS

1) VI Risk
2) Subsurface Profile
3) Detailed Results

Print Report

Model Input Screens

1 Environmental Factors | 2 Chemicals | 3 Chemical Concentrations | Chemical Database

1. Oxygen Surface Boundary Condition

Slab or Basement Foundation (e.g., Specify Airflow)

2. Indoor Target Criteria

- (●) Do not perform backward Calculation
- ( ) Based on Indoor Risk / Hazard Target
- ( ) Specified Indoor Air Concentration Target

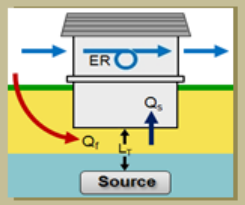
Note: Target indoor air concentrations can be edited on the "Chemical Database" screen

3. Exposure and Risk Factors

Target Hazard Quotient For Individual Chemicals	THQ	1.00	(-)
Target Excess Individual Lifetime Cancer Risk	TR	1.00E-05	(-)
Carcinogen Averaging Time	AT_c	70.00	yrs
Non-carcinogenic Averaging Time	AT_{nc}	6.00	yrs
Body Weight - Adult	BW	15.00	kg
Exposure Duration	ED	6.00	yrs
Exposure Frequency	EF	350.00	days/yr
Indoor Inhalation Rate Exposure Adjustment	CF	0.71	(-)

Legend

80.00	Calculated Value
80.00	User Input Value
80.00	Value Outside Normal Range



4. Building Parameters

Indoor Mixing Height	L_{mix}	244.00	cm
Air Exchange Rate	ER	12.00	1/day
Foundation Thickness	L_{crack}	10.00	cm
Foundation Area	A_b	#########	cm²
Foundation Crack Fraction	η	3.80E-04	cm²-cracks/cm²-total
Total Porosity (Soil-filled Cracks)	$\theta_{T\text{-}crack}$	0.40	cm³-void/cm³-soil
Water Filled Porosity (Soil-filled Cracks)	$\theta_{w\text{-}crack}$	0.15	cm³-void/cm³-soil
Airflow Through Basement Foundation	Q_s	83.33	cm³-air/sec
Building Envelope Resistance	L_{mix} * ER	0.03	cm/sec

5. Vadose Zone Parameters

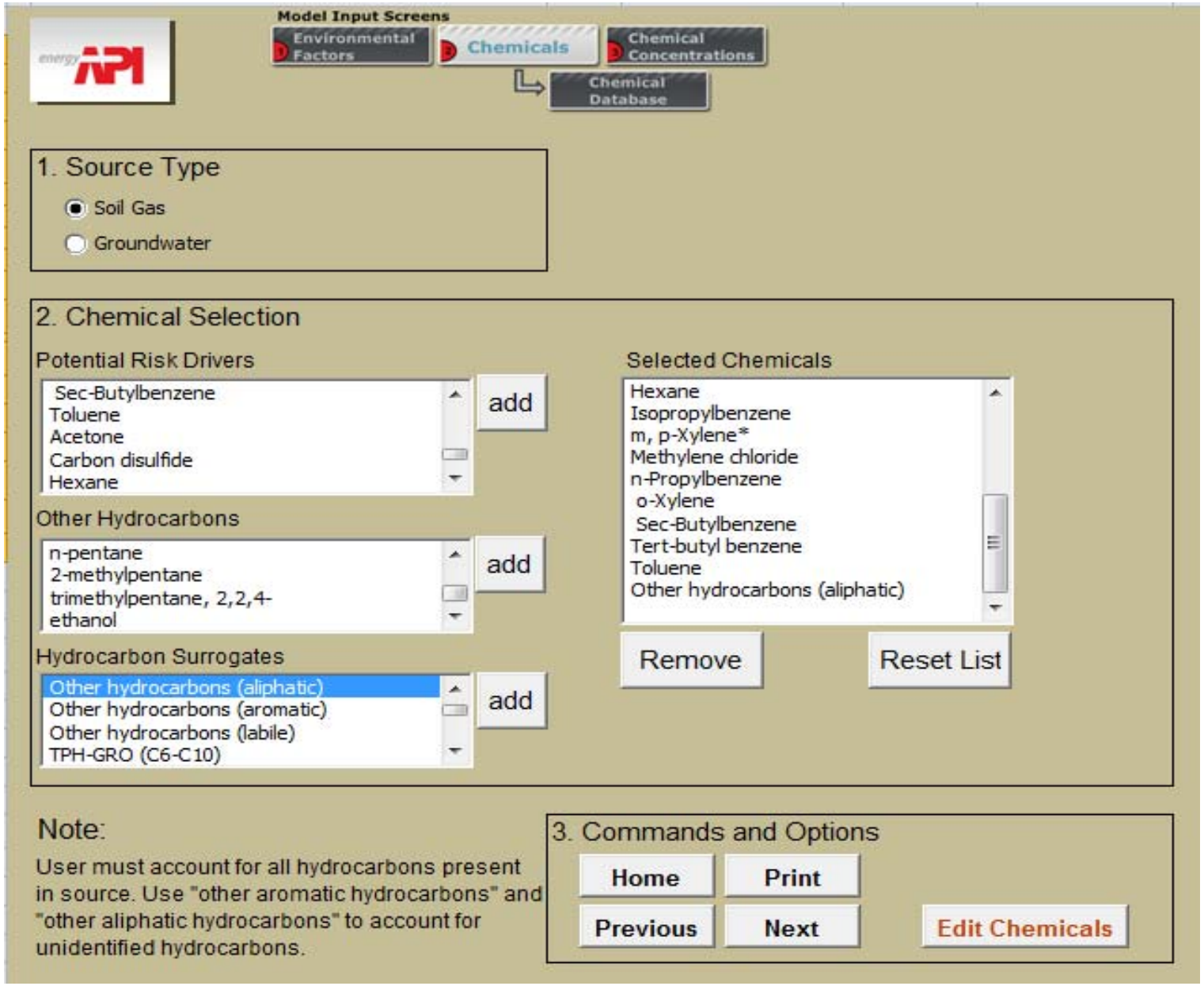
Soil Porosity	$\theta_{T\text{-}soil}$	0.40	cm³-void/cm³-soil
Soil Water Content	$\theta_{w\text{-}soil}$	0.15	cm³-water/cm³-soil
Soil Organic Carbon Fraction	f_{oc}	1.50E-03	g-oc/g-soil
Soil Density - Bulk	ρs	1.59	g-soil/cm³-soil
Airflow Under Foundation	Q_f	83.33	cm³-air/sec
Depth of Aerobic Zone Under Foundation	L_A	-	cm
O_2 Concentration Under Foundation	Co_2-e	-	%
Annual Median Soil Temperature	T	16.60	°C
Baseline Soil Oxygen Respiration Rate (Calculated from Foc)	Λ_{base}	2.934E-08	mg-O_2/g-soil - sec
Depth to Source (from bottom of foundation)	LT	206.00	cm
Minimum O_2 Conc. For Aerobic Biodegradation		10.00	%

6. Commands and Options

Default Values
- (●) Residential
- ( ) Commercial / Industrial

Paste

Home | Print | Reset | Next


Model Input Screens
Environmental Factors
Chemicals
Chemical Concentrations
Chemical Database
1. Source Type
Soil Gas
Groundwater
2. Chemical Selection
Potential Risk Drivers
Sec-Butylbenzene
Toluene
Acetone
Carbon disulfide
Hexane
add
Other Hydrocarbons
n-pentane
2-methylpentane
trimethylpentane, 2,2,4-
ethanol
add
Hydrocarbon Surrogates
Other hydrocarbons (aliphatic)
Other hydrocarbons (aromatic)
Other hydrocarbons (labile)
TPH-GRO (C6-C10)
add
Selected Chemicals
Hexane
Isopropylbenzene
m, p-Xylene*
Methylene chloride
n-Propylbenzene
o-Xylene
Sec-Butylbenzene
Tert-butyl benzene
Toluene
Other hydrocarbons (aliphatic)
Remove
Reset List
Note:
User must account for all hydrocarbons present in source. Use "other aromatic hydrocarbons" and "other aliphatic hydrocarbons" to account for unidentified hydrocarbons.
3. Commands and Options
Home
Print
Previous
Next
Edit Chemicals

Model Input Screens

Environmental Factors | Chemicals | Chemical Concentrations | Chemical Database

2. Commands and Options

Home | Print | Previous | Next :: Results

After Clicking "Next :: Results", see status bar in lower left corner for progress on calculations.

1. Soil Gas Source Chemical Concentrations

Chemical	ug/m^3
2-Methylnaphthalene	1.23E+03
Naphthalene	3.90E+03
1,2,4-Trimethylbenzene	1.67E+06
1,3,5-Trimethylbenzene	1.53E+06
n-Butylbenzene	2.79E+05
Acetone	2.59E+02
Benzene	7.99E+05
Carbon disulfide	2.64E+05
Ethylbenzene	2.41E+06
Hexane	5.02E+06
Isopropylbenzene	5.71E+05
m, p-Xylene*	3.51E+06
Methylene chloride	3.56E+03
n-Propylbenzene	6.15E+05
o-Xylene	1.14E+06
Sec-Butylbenzene	3.83E+03
Tert-butyl benzene	2.26E+04
Toluene	2.77E+06
Other hydrocarbons (aliphatic)	3.92E+08

4.13E+08 Total Entered Hydrocarbon Concentration (ug/m^3)

Note: The total hydrocarbon concentration should equal the total concentration of all hydrocarbons in the source area

Model Output Screens

VI Risk | Subsurface Profile | Detailed Results

Commands and Options

Home | Print | Previous | Next | Unprotect

Target Hazard Quotient	Target Risk Level
1	1.00E-05

Forward Risk Calculation

Chemical Name	Groundwater Source Concentration	Soil Gas Source Concentration	Soil Gas to Indoor Air Attenuation Factor	Target Indoor Air Concentration	Predicted Indoor Air Concentration	Hazard Quotient	Risk Level
	ug/L	ug/m³	(-)	ug/m³-air	ug/m³-air	(-)	(-)
2-Methylnaphthalene	-	1.23E+03	3.74E-04	0.00E+00	4.60E-01	-	-
Naphthalene	-	3.90E+03	1.62E-28	0.00E+00	6.32E-25	1.44E-25	5.86E-30
1,2,4-Trimethylbenzene	-	1.67E+06	1.43E-13	0.00E+00	2.38E-07	2.31E-08	-
1,3,5-Trimethylbenzene	-	1.53E+06	4.51E-12	0.00E+00	6.91E-06	-	-
n-Butylbenzene	-	2.79E+05	3.92E-04	0.00E+00	1.09E+02	-	-
Acetone	-	2.59E+02	5.33E-04	0.00E+00	1.38E-01	3.04E-06	-
Benzene	-	7.99E+05	1.27E-11	0.00E+00	1.01E-05	2.30E-07	2.15E-11
Carbon disulfide	-	2.64E+05	6.81E-04	0.00E+00	1.80E+02	1.75E-01	-
Ethylbenzene	-	2.41E+06	1.07E-11	0.00E+00	2.59E-05	1.76E-08	1.76E-11
Hexane	-	5.02E+06	2.13E-08	0.00E+00	1.07E-01	1.04E-04	-
Isopropylbenzene	-	5.71E+05	4.38E-04	0.00E+00	2.50E+02	4.26E-01	-
m, p-Xylene*	-	3.51E+06	4.42E-12	0.00E+00	1.55E-05	1.06E-07	-
Methylene chloride	-	3.56E+03	6.49E-04	0.00E+00	2.31E+00	2.62E-03	6.28E-09
n-Propylbenzene	-	6.15E+05	4.37E-04	0.00E+00	2.69E+02	1.83E-01	-
o-Xylene	-	1.14E+06	1.72E-13	0.00E+00	1.96E-07	1.33E-09	-
Sec-Butylbenzene	-	3.83E+03	3.54E-04	0.00E+00	1.36E+00	-	-
Tert-butyl benzene	-	2.26E+04	3.93E-04	0.00E+00	8.90E+00	-	-
Toluene	-	2.77E+06	1.13E-11	0.00E+00	3.14E-05	4.27E-09	-

NOTE A: "< 1E-100" means calculated attentuation factor is less than 1E-100

DETAILED RESULTS (1 of 3)

General Results - Forward Calculations

Depth from building foundation to aerobic/anaerobic interface	Depth from aerobic/anaerobic interface to source	Total Depth
cm	cm	cm
84.87	121.13	206.00

Chemical Specific Results - Forward Calculations

Chemical	Foundation Mass Transfer Resistance	Soil Resistance	Sub-slab to indoor air attenuation factor	Aerobic/anaerobic interface to sub-slab attenuation factor	Source to aerobic/anaerobic interface attenuation factor	Source to indoor air attenuation factor	Source to indoor air attenuation factor (if no biodegradation)
	cm/sec	cm/sec	(-)	(-)	(-)	(-)	(-)
2-Methylnaphthalene	8.35E-05	1.58E-05	2.46E-03	3.09E-01	4.93E-01	3.74E-04	3.91E-04
Naphthalene	8.35E-05	1.82E-05	2.46E-03	5.18E-24	1.27E-02	1.62E-28	4.41E-04
1,2,4-Trimethylbenzene	8.35E-05	1.82E-05	2.46E-03	1.78E-09	3.27E-02	1.43E-13	4.41E-04
1,3,5-Trimethylbenzene	8.35E-05	1.81E-05	2.46E-03	4.75E-08	3.86E-02	4.51E-12	4.38E-04
n-Butylbenzene	8.35E-05	1.58E-05	2.46E-03	3.15E-01	5.06E-01	3.92E-04	3.93E-04
Acetone	8.35E-05	3.24E-05	2.46E-03	4.35E-01	4.99E-01	5.33E-04	6.88E-04
Benzene	8.35E-05	2.69E-05	2.46E-03	1.27E-07	4.07E-02	1.27E-11	6.00E-04
Carbon disulfide	8.35E-05	3.19E-05	2.46E-03	4.82E-01	5.75E-01	6.81E-04	6.81E-04
Ethylbenzene	8.35E-05	2.05E-05	2.46E-03	1.08E-07	4.04E-02	1.07E-11	4.86E-04
Hexane	8.35E-05	2.19E-05	2.46E-03	1.26E-04	6.86E-02	2.13E-08	5.12E-04
Isopropylbenzene	8.35E-05	1.81E-05	2.46E-03	3.45E-01	5.16E-01	4.38E-04	4.39E-04
m, p-Xylene*	8.35E-05	2.05E-05	2.46E-03	4.66E-08	3.85E-02	4.42E-12	4.86E-04
Methylene chloride	8.35E-05	3.00E-05	2.46E-03	4.66E-01	5.67E-01	6.49E-04	6.51E-04
n-Propylbenzene	8.35E-05	1.80E-05	2.46E-03	3.44E-01	5.16E-01	4.37E-04	4.38E-04
o-Xylene	8.35E-05	2.07E-05	2.46E-03	2.12E-09	3.29E-02	1.72E-13	4.89E-04
Sec-Butylbenzene	8.35E-05	1.59E-05	2.46E-03	3.02E-01	4.77E-01	3.54E-04	3.95E-04
Tert-butyl benzene	8.35E-05	1.59E-05	2.46E-03	3.16E-01	5.06E-01	3.93E-04	3.94E-04
Toluene	8.35E-05	2.33E-05	2.46E-03	1.14E-07	4.05E-02	1.13E-11	5.38E-04
Other hydrocarbons (aliphatic	8.35E-05	2.10E-05	2.46E-03	1.02E-04	6.72E-02	1.68E-08	4.95E-04

DETAILED RESULTS (2 of 3)

Chemical	Concentration in indoor air	Concentration in sub-slab gas	Concentration at aerobic/anaerobic interface	Concentration at source	Concentration in indoor air (if no biodegradation)	Flux into enclosure	Flux from source
	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/sec	ug/sec
2-Methylnaphthalene	4.60E-01	1.87E+02	6.06E+02	1.23E+03	4.81E-01	1.56E-02	1.7E-02
Naphthalene	6.32E-25	2.57E-22	4.97E+01	3.90E+03	1.72E+00	2.14E-26	1.2E-01
1,2,4-Trimethylbenzene	2.38E-07	9.67E-05	5.45E+04	1.67E+06	7.35E+02	8.06E-09	5.0E+01
1,3,5-Trimethylbenzene	6.91E-06	2.81E-03	5.91E+04	1.53E+06	6.71E+02	2.34E-07	4.5E+01
n-Butylbenzene	1.09E+02	4.44E+04	1.41E+05	2.79E+05	1.09E+02	3.70E+00	3.7E+00
Acetone	1.38E-01	5.62E+01	1.29E+02	2.59E+02	1.78E-01	4.69E-03	7.2E-03
Benzene	1.01E-05	4.13E-03	3.26E+04	7.99E+05	4.79E+02	3.44E-07	3.5E+01
Carbon disulfide	1.80E+02	7.32E+04	1.52E+05	2.64E+05	1.80E+02	6.10E+00	6.1E+00
Ethylbenzene	2.59E-05	1.05E-02	9.75E+04	2.41E+06	1.17E+03	8.76E-07	8.1E+01
Hexane	1.07E-01	4.35E+01	3.45E+05	5.02E+06	2.57E+03	3.62E-03	1.7E+02
Isopropylbenzene	2.50E+02	1.02E+05	2.95E+05	5.71E+05	2.51E+02	8.48E+00	8.5E+00
m, p-Xylene*	1.55E-05	6.31E-03	1.35E+05	3.51E+06	1.71E+03	5.26E-07	1.2E+02
Methylene chloride	2.31E+00	9.38E+02	2.01E+03	3.56E+03	2.31E+00	7.82E-02	7.9E-02
n-Propylbenzene	2.69E+02	1.09E+05	3.17E+05	6.15E+05	2.69E+02	9.11E+00	9.1E+00
o-Xylene	1.96E-07	7.95E-05	3.75E+04	1.14E+06	5.57E+02	6.63E-09	3.9E+01
Sec-Butylbenzene	1.36E+00	5.51E+02	1.83E+03	3.83E+03	1.51E+00	4.59E-02	5.4E-02
Tert-butyl benzene	8.90E+00	3.62E+03	1.15E+04	2.26E+04	8.91E+00	3.02E-01	3.0E-01
Toluene	3.14E-05	1.28E-02	1.12E+05	2.77E+06	1.49E+03	1.06E-06	1.1E+02
Other hydrocarbons (aliphatic	6.59E+00	2.68E+03	2.63E+07	3.92E+08	1.94E+05	2.23E-01	1.3E+04
Totals	8.28E+02	3.37E+05	2.81E+07	4.13E+08	2.04E+05	2.81E+01	1.37E+04

DETAILED RESULTS (3 of 3)

Chemical	Oxygen Demand in Vadose Zone	Minimum O_2 Concentration at top of aerobic zone (i.e., below building foundation)	Oxygen mass flow at the top of aerobic zone
	% of total demand	%	ug/sec
2-Methylnaphthalene	0.00%		
Naphthalene	0.00%		
1,2,4-Trimethylbenzene	1.59%		
1,3,5-Trimethylbenzene	1.42%		
n-Butylbenzene	0.00%		
Acetone	0.00%		
Benzene	1.06%		
Carbon disulfide	0.00%		
Ethylbenzene	2.52%		
Hexane	5.76%		
Isopropylbenzene	0.00%		
m, p-Xylene*	3.67%		
Methylene chloride	0.00%		
n-Propylbenzene	0.00%		
o-Xylene	1.22%		
Sec-Butylbenzene	0.00%		
Tert-butyl benzene	0.00%		
Toluene	3.24%		
Other hydrocarbons (aliphatic	58.81%		
Demand	20.70%		
Totals	100.00%	15.58%	1.23E+04

Additional BioVapor Model Input Notes:

- In the residential scenario three receptors are evaluated, child, age-adjusted, and adult. For carcinogenic risk, age-adjusted has the highest risk and the risk is dependent on body weight, as it uses inhalation slope factor (mg/kg-d) as its toxicity, which is weight dependent. Bodyweight of 65 kg was used (age adjusted weighted average).
- For non-carcinogenic risk, the child receptor has the highest risk and the risk is not dependent on body weight, as it uses reference concentration (mg/m^3) as its toxicity.