KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO

FINAL CORRECTIVE ACTION COMPLETE PROPOSAL WITHOUT CONTROLS STATUS FOR EXPLOSIVE ORDNANCE DISPOSAL (EOD) HILL (CG-570) SITE AND MANZANO BASE GROUNDWATER (MBG) SITE (CG-105), KIRTLAND AIR FORCE BASE, NEW MEXICO

September 2021

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WITHOUT CONTROLS STATUS FOR EXPLOSIVE ORDNANCE DISPOSAL (EOD) HILL (CG-570) SITE AND MANZANO BASE GROUNDWATER (MBG) SITE (CG-105)

September 2021

Prepared for:

Air Force Civil Engineer Center
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Contract FA8903-13-C-0008

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NOTICE

This Corrective Action Complete Proposal – *without* controls Status for Explosive Ordnance Disposal (EOD) Hill (CG-570) and Manzano Base Groundwater (MBG) (CG-105) was prepared for the Air Force Civil Engineer Center by URS Group, Inc. in association with FPM Remediations, Inc. to aid in the implementation of site closure under the Environmental Restoration Program (ERP). As the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this report and the ongoing nature of the ERP, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this report, since subsequent facts may become known which may make this report premature or inaccurate.

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14. ABSTRACT
This Corrective Action Complete Proposal without controls status for the Explosive Ordnance Disposal (EOD) Hill (CG-570) Site and the Manzano Base Groundwater (MBG) Site (CG-105) at Kirtland Air Force Base, New Mexico, provides a description, history, and evaluation of relevant information leading to the Basis of Determination for corrective action complete without controls for both sites.

15. SUBJECT TERMS
Explosive Ordnance Disposal (EOD) Hill (CG-570), Manzano Base Groundwater (MBG), Basis of Determination, Perchlorate, Trichloroethene

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JASON F. VATTIONI, Colonel, USAF — Date
Commander, 377th Air Base Wing

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PREFACE

This Corrective Action Complete (CAC) Proposal documents the Basis of Determination for Sites CG-570 (Explosives Ordnance Hill) and CG-105 (Manzano Base Groundwater) for Corrective Action Complete *without* controls. A Resource Conservation and Recovery Act Facility Investigation was conducted at Site CG-570 and groundwater monitoring was conducted at Site CG-105, which have demonstrating that constituents present do not pose an unacceptable risk to human health or the environment at either site. Based on the results of the investigations, it is recommended that a Class 3 permit modification under 40 Code of Federal Regulation § 270.42(c) to terminate corrective action be submitted.

This work is being performed under the authority of the Air Force Civil Engineer Center – Contract No. FA8903-13-C-0008. The work under this contract will be performed between 20 September 2013 and 20 September 2023. Brian Renaghan, Air Force Civil Engineer Center/Environmental Restoration Division, has been appointed as the Primary Contracting Officer's Representative for this contract. This program is conducted under the Kirtland Air Force Base (AFB) Environmental Restoration Section Chief, Mr. Scott Clark, and the Kirtland AFB Project Manager, Ms. Suzanne Devergie. URS Group, Inc., as a subcontractor to FPM Remediations, Inc., has prepared this report as defined in the Performance Based Remediation Contract for Cannon, Holloman, and Kirtland AFBs located in New Mexico, and Luke AFB located in Arizona. Mr. Steve Geiger is the URS Group, Inc. Installation Manager for the Environmental Restoration Project Sites at Kirtland AFB.

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
µg/kg	micrograms per kilogram
ABW	Air Base Wing
AFB	Air Force Base
amsl	above mean sea level
AOC	Area of Concern
bgs	below ground surface
BH	borehole
btoc	below top of casing
CAC	Corrective Action Complete
CE2	CE2 Corporation
CFR	Code of Federal Regulations
D	dilution
DOE	Department of Energy
EB	equipment blank
EOD	Explosive Ordnance Disposal
EOD-BH	Explosive Ordnance Disposal Borehole
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
FB	field blank
FD	field duplicate
ID	Identification
IDP	Installation Development Plan
IRP	Installation Restoration Program
J	concentration is an estimated value
KAFB	Kirtland Air Force Base
MBG	Manzano Base Groundwater
MCL	Maximum Contaminant Level
MDL	minimum detection limit
NE	not established
NM	New Mexico
NMAC	New Mexico Administrative Code

NMED	New Mexico Environment Department
NMED HWB	New Mexico Environment Department Hazardous Waste Bureau
NMWQCC	New Mexico Water Quality Control Commission
NMOSE	New Mexico Office of the State Engineer
NPDWR	National Primary Drinking Water Regulation
Permit	Hazardous Waste Treatment Facility Operating Permit
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	reporting limit
Site	The EOD Hill Site
SNL	Sandia National Laboratory
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
U	not detected at the limit of detection
USAF	United States Air Force
VOCs	volatile organic compounds

1.0 INTRODUCTION AND FACILITY DESCRIPTION

The United States Air Force (USAF) and Kirtland Air Force Base (AFB) [Permittee] is requesting Corrective Action Complete (CAC) *without* controls Status for the Explosive Ordnance Disposal (EOD) Hill Site (CG-570) and Manzano Base Groundwater (MBG) Site[1] (CG-105), from the New Mexico Environment Department Hazardous Waste Bureau (NMED HWB). This request is being made in accordance with the New Mexico Hazardous Waste Act (Section 74-4-1 *et seq*., New Mexico Statutes Annotated 1978, as amended, 1992) and the New Mexico Hazardous Waste Management Regulations 20.4.1 New Mexico Administrative Code. This Area of Concern (AOC) is currently listed in the Permittee's Hazardous Waste Treatment Facility Operating Permit (Permit) (U.S. Environmental Protection Agency [EPA] ID No. NM9570024423).

If approved, the Permittee requests NMED HWB initiate a modification of Kirtland AFB's Permit. The proposed modification to the Permit would document *Granted No Further Action Status* for EOD Hill (CG-570) and MBG (CG-105). EOD Hill and MBG should then be moved from Table I-3 of the Resource Conservation and Recovery Act (RCRA) Permit *Solid Waste Management Unit (SWMUs) and AOCs Requiring Corrective Action* and listed in Table K-1 of the Permit *SWMUs and AOCs for which Corrective Action Complete without Controls*.

1.1 Facility Description

Kirtland AFB is located in Bernalillo County, southeast of the city of Albuquerque, New Mexico. The installation encompasses 51,585 acres with elevations that range from 5,200 to almost 8,000 feet above mean sea level (amsl). The Manzanita Mountains on its eastern boundary rise to over 10,000 feet (KAFB, 2018). The land within the installation is owned by a variety of entities (refer to **Table 1**). The U.S. Air Force controls 44,052 acres of the land within Kirtland AFB. The northwest portion of Kirtland AFB is developed. The remaining portion of the installation is relatively undeveloped and is used for training and testing missions.

Table 1. Kirtland AFB Land Ownership

Kirtland AFB Lands	Acres
U.S. Air Force Fee Owned	25,612
U.S. Forest Service withdrawn to the Department of Defense	15,891
Bureau of Land Management withdrawn to the Department of Defense	2,549
U.S. Air Force Total (U.S. Air Force Controlled Lands)	**44,052**
Department of Energy Fee Owned	2,938
U.S. Forest Service withdrawn to the Department of Energy	4,595
Department of Energy Total	**7,533**
Grand Total	**51,585**
Source: KAFB, 2012	

[1] The Manzano Base Groundwater Site (CG-105) was also formerly referred to as the trichloroethylene (TCE) component of Site ST-105 TCE and Nitrate Impacted Groundwater.

Surrounding land uses adjacent to Kirtland AFB include the U.S. Forest Service Cibola National Forest to the northeast and east, the Isleta Pueblo Reservation to the south, Bernalillo County developments to the southwest, residential and business areas of the city of Albuquerque to the west and north, and the Albuquerque International Sunport directly to the northwest.

Kirtland AFB was established in the late 1930s as a training installation for the U.S. Army Air Corps. At that time, the installation was known as the Albuquerque Army Air Base. The base grew rapidly with the involvement of the United States in World War II as a training site for air crews for many of the country's bomber aircraft. In February 1942, Albuquerque Army Air Base was renamed Kirtland Army Air Field in honor of Colonel Roy C. Kirtland, one of the Army's earliest aviation pioneers. During this same year, the U.S. Army Air Corps established a training base, later to be known as Sandia Base, just east of Kirtland Army Air Field. In 1947, the U.S. Army Air Corps became the U.S. Air Force, and Kirtland Army Air Field was renamed Kirtland AFB.

In 1949, the U.S. Air Force established its own Special Weapons Center and testing Laboratory at Kirtland Field near Sandia Base, which eventually became Phillips Laboratory and subsequently the Air Force Weapons Laboratory (now the Air Force Research Laboratory). A majority of the test and evaluation activities were conducted on a 46,000-acre tract in the Manzanita Mountains, referred to as the New Mexico Proving Ground, on the southern portion of the installation, which includes U.S. Forest Service lands withdrawn for Department of Defense and Department of Energy research, testing, and development activities. The establishment of these activities at Kirtland AFB was considered ideal due to its proximity to the Los Alamos Laboratory and Sandia Base. The late 1940s and 1950s were expansion years as both Kirtland AFB and the adjacent Sandia Army Base played increasing roles in the nation's defense efforts. New buildings, hangars, and the east-west runway, which is now owned by the city of Albuquerque, were constructed. During this period, air defense, weather, and atomic test squadrons operated from Kirtland AFB. In 1971, Kirtland AFB and its adjoining military neighbors to the east, Sandia and Manzano Army Bases, were merged to form what is known at Kirtland AFB.

Kirtland AFB is the sixth largest installation in the U.S. Air Force. It is operated by 377 Air Base Wing (ABW), a unit of Air Force Global Strike Command's 20th Air Force and the host unit of Kirtland AFB. Missions at Kirtland AFB fall into four major categories: research, development, and testing; readiness and training; munitions maintenance; and support to installation operations for more than 100 mission partners. The primary mission of 377 ABW is to execute nuclear, readiness, and support operations for American airpower. Kirtland AFB is a center for research, development, and testing of nonconventional weapons, space and missile technology, laser warfare, and much more. Organizations involved in these activities include Air Force Nuclear Weapons Center, Air Force Operational Test and Evaluation Center, Space and Missile Systems Center, Air Force Inspection Agency, Air Force Safety Center, Air Force Research Laboratory, Department of Energy (DOE), and Sandia National Laboratory. In addition, 377 ABW ensures readiness and training of airmen for worldwide duty and operates the airfield for present and future U.S. Air Force operations, prepares personnel to deploy worldwide on a moment's notice, and keeps the installation secure. Mission partners involved in these activities include the 58th Special Operations Wing, 150th Special Operations Wing (New Mexico Air National Guard), and the U.S. Air Force Pararescue School.

2.0 CG-570, EXPLOSIVES ORDNANCE DISPOSAL HILL

The Explosives Ordnance Disposal (EOD) Hill Site is listed in the Kirtland AFB RCRA Permit (NMED, 2010) and consisted of a single borehole (EOD Hill Borehole [EOD-BH]). Additional site features include eight 'pits' on the ground surface of the EOD Hill where additional soil sampling was conducted. The regulatory history, relevant environmental sampling history, recommendations and basis of determination are described below.

2.1 Regulatory History

Investigation and remediation of SWMUs and AOCs at Kirtland AFB are conducted under both the USAF Environmental Restoration Program (ERP) and the RCRA Corrective Action Program. The ERP, formerly called the Installation Restoration Program (IRP), was initiated in 1983. A RCRA Facility Assessment was conducted in 1987 that identified SWMUs and AOCs at Kirtland AFB to be included in the RCRA Corrective Action Program. A RCRA permit, as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), was originally issued to Kirtland AFB to operate as a hazardous waste disposal facility in October 1990. The EOD Hill Site was not listed in the original 1990 RCRA Permit.

The EOD-BH was initially identified for use as an environmental well in 1990 by Sandia National Laboratory (SNL). Based on its location, it was assumed that it would not be affected by sources of contamination and could be used as a background groundwater sampling location (Copland, 2005). The earliest identified groundwater samples from the EOD-BH were collected annually between 2001 and 2004 under the SNL Environmental Remediation program. In 2006 Kirtland AFB assumed responsibility for the EOD Hill site under its ERP. EOD Hill is listed on the Kirtland AFB Permit issued by the NMED in 2010 with both the SWMU name and IRP Site designation "EOD Hill" on Table I-3 (Solid Waste Management Units [SWMUs] and Areas of Concern [AOCs] Requiring Corrective Action). Additionally, KAFB Permit Section 6.4.1.3 (Areas with Groundwater Contamination) lists item number 9 as "EOD Hill – Perchlorate contamination".

2.2 Area of Concern Description

The EOD Hill covers approximately 13 acres in a remote area of Kirtland AFB. The hill is surrounded by vacant land and accessed by a rarely used, narrow, two-track dirt road. The EOD Hill is capped by a well-exposed sequence of Madera Group limestone. A small amount of test debris is scattered across the hill. No buildings have been constructed at the EOD Hill (Copland, 2005).

There are eight small craters located east of EOD-BH which were reportedly used for explosives testing at the locations shown in **Section 2.3** (Copland, 2005).

2.3 Location

The Kirtland AFB EOD Hill Site covers approximately 13 acres and is a 50-foot high limestone ridge located roughly one mile west of Kirtland AFB's EOD Range, and approximately 0.8 mile southeast of the intersection of Lovelace Road and the unpaved Coyote Springs Road. **Figure 1** shows the location of the Site at Kirtland AFB and **Figure 2** shows the Site features. Situated on top of the EOD Hill is a single borehole that is unofficially called the EOD Hill well but is referred to in the Kirtland AFB and regulatory agency databases as "EOD-BH."

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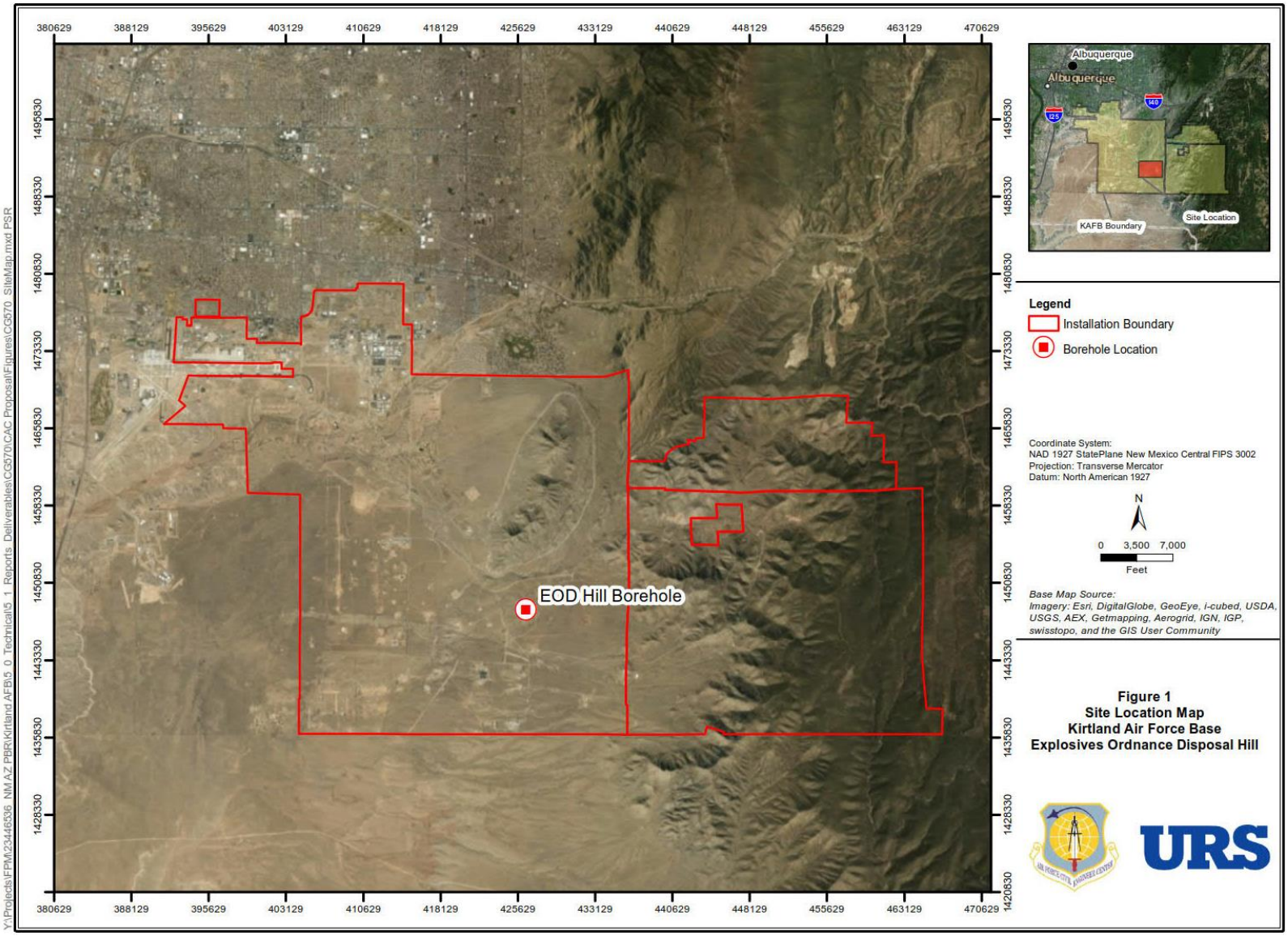

Figure 1. Site Location Map

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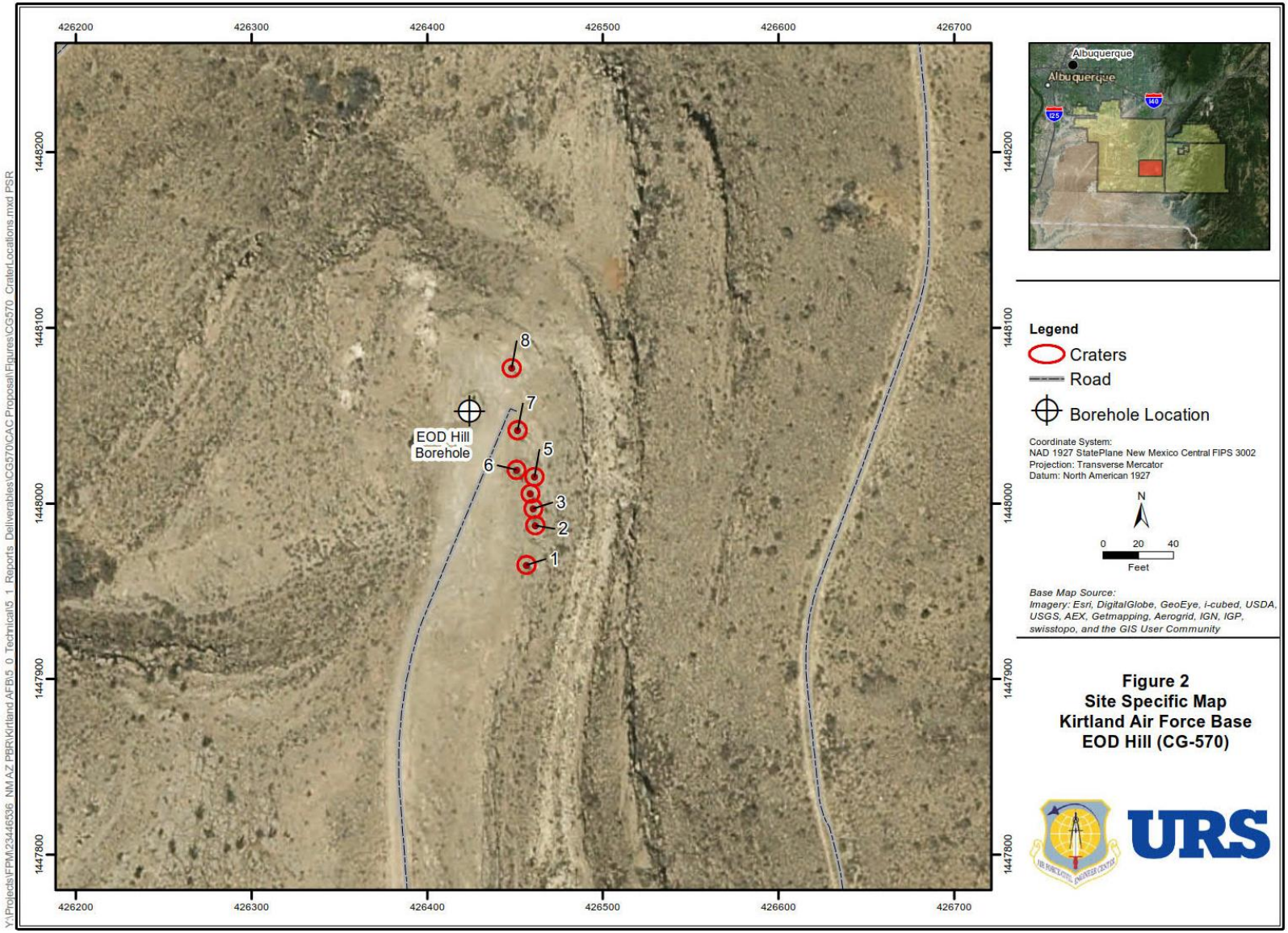

Figure 2. Site Specific Map, EOD Hill (CG-570)

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The EOD-BH was drilled by Sandia National Laboratories, New Mexico (SNL/NM), in the early 1970s as a "geotechnology test hole" (Copland, 2005).

2.4 History/Current and Anticipated Future Land Use

A variety of operations have been conducted from 1957 to the present by Kirtland AFB, SNL/NM, the New Mexico School of Mines, the Defense Threat Reduction Agency, and possibly other organizations in the multi-use area encompassing the EOD Hill and the adjacent EOD Range. Historical events for the EOD Hill Site were compiled by CE2 Corporation (CE2) and are discussed in Copland (2005). The listed events, which occurred starting in the 1940s (Copland, 2005), include:

- mining of prospect pits (probably hand-dug during the 1940s);
- rocket motor testing;
- Project 56/Moonlight Shot residual collection;
- Vortman cratering tests;
- a ground shock study;
- witness plate tests;
- downhole geophysics;
- well survey;
- a hydrogeochemical investigation;
- The Central Coyote Test Area Study;
- Site-wide hydrogeological characterization geologic mapping;
- military compass training;
- video logging for determining well construction details and
- groundwater monitoring.

Explosives, some possibly containing perchlorate, may have been associated with some of these events.

The EOD Hill Site is currently a hill surrounded by vacant land that is not being used for any purpose, approximately 2,000 feet west of the EOD range. Based on the Installation Development Plan (IDP) (Burns McDonnell, 2016), the Site is located within the Southern R&D Planning District, an area of low development and existing military range, training and testing areas, encompassing the majority of land in the south-central portion of Kirtland AFB. There are no planned uses for the area of the Site, and it is designated as "open space" under future land use (Burns McDonnell, 2016).

2.5 Evaluation of Relevant Information

An RFI was performed at the EOD Hill (CG-570) to determine if a release has occurred due to activities conducted at the site (URS, 2017a). Characterization activities included two groundwater sampling events, soil sampling of craters located on the EOD Hill, and a background perchlorate evaluation of groundwater at Kirtland AFB.

2.5.1 Groundwater Evaluation

Historically, groundwater samples collected from EOD-BH indicated perchlorate concentrations ranging from 0.96 micrograms per liter (µg/L) to a maximum of 4,500 µg/L in 2004 (Copland, 2005). Based on these results, the New Mexico Environment Department (NMED) requested that Kirtland AFB define the nature and extent of impacts in the vicinity of the EOD Hill Site.

Prior to the current contract, the most recent groundwater samples collected from the Explosive Ordnance Disposal Borehole (EOD-BH) well were collected in June 2011. The perchlorate concentration in the EOD-BH well, as sampled in June 2011, was 22 µg/L and 27 µg/L (duplicate) (URS, 2011). The New Mexico Water Quality Control Commission (NMWQCC) water quality standards (New Mexico Administrative Code [NMAC] 20.6.2) list perchlorate as a toxic pollutant, with a tap water screening level of 13.8 µg/L (NMED, 2019a). At the time of this Corrective Action Complete Proposal, the EPA is proposing a National Primary Drinking Water Regulation (NPDWR) to establish a Maximum Contaminant Level (MCL) of 56 µg/L for perchlorate, with alternative regulatory options of MCLs ranging from 18 µg/L to 90 µg/L (EPA NPDWR for Perchlorate, 2019).

As agreed at a meeting held between Kirtland AFB personnel, NMED, and URS on September 3, 2014, the *CG-570 – Explosive Ordnance Disposal Hill Supplemental Site Investigation Work Plan – Final* (URS, 2014a) was prepared. It proposed a time-series groundwater sampling event and step-down tests to further evaluate the groundwater associated with EOD-BH.

The *CG-570 – Explosive Ordnance Disposal Hill Supplemental Site Investigation Report – Final* (URS, 2015) provided results of samples collected in December 2014 under "extended purge" pumping conditions following removal of 0, 3, 6, 9, 12, 15 and 18 borehole volumes of purge water to evaluate whether perchlorate impacts were localized or represented broader impacts. Perchlorate results from the 2014 extended purge sampling event are provided in **Table 2**. High explosives were also analyzed from the initial 2014 sample and results are provided in **Appendix A**, Table A-2.

Table 2. December 2014 EOD-BH Analytical Results

Field Sample Number*	Lab Sample Number	Sample Date	Perchlorate Concentration (µg/L)	Qualifier	MDL (µg/L)	RL (µg/L)
EOD-BH-Initial	L737362-01	12-03-2014	27.4		2.5	10
EOD-BH-03	L737362-02	12-03-2014	9.31		1	4
EOD-BH-06	L737362-03	12-03-2014	8.57		1	4
EOD-BH-09	L737362-04	12-03-2014	8.56		1	4
EOD-BH-12	L737362-05	12-03-2014	8.20		1	4
EOD-BH-15	L737362-06	12-03-2014	8.06		1	4
EOD-BH-FD-15	L737362-07	12-03-2014	7.65		1	4
EOD-BH-18	L737362-08	12-03-2014	7.70		1	4

*The Sample Number suffix represents the corresponding number of purged borehole volumes at the time of the sample.

BH	Borehole
EOD	Explosive Ordnance Disposal
FD	field duplicate
MDL	minimum detection limit
RL	reporting limit
µg/L	micrograms per liter

Subsequent to the submittal of the CG-570 – Explosive Ordnance Disposal Hill Supplemental Site Investigation Report – Final (URS, 2015), the CG-570 – Explosive Ordnance Disposal Hill Site Investigation Work Plan – Final (URS, 2015c) was revised as outlined in the NMED Approval with Modifications letter for the Site Investigation Work Plan (NMED, 2015). Also, the Final Groundwater Monitoring Plan, CG-570 – Explosive Ordnance Disposal Hill (URS, 2015b) dated September 2015 was written superseding the Final Long-Term Monitoring Plan, CG-570 – Explosive Ordnance Disposal Hill (URS, 2014c). At the request of NMED, both the work plan and the new monitoring plan reflected the path forward to conduct two additional groundwater sampling events to evaluate perchlorate impacts. The first event was to consist of the collection of a single groundwater sample from EOD-BH for perchlorate analysis to determine the current perchlorate concentration. If the concentration exceeded the NMED screening level of 13.8 µg/L, then an extended purge sampling event was to be conducted consisting of the collection of groundwater samples following purge volumes of 3, 6, 9, and 12 borehole volumes. Both events were conducted, and the results are summarized below.

The RCRA Facility Investigation (RFI) was conducted in 2015 (soil sampling) and 2016. Groundwater samples were collected from the EOD-BH (see **Figure 2**) in accordance with the Site Investigation Work Plan (URS, 2015c). A total of two groundwater sampling events were conducted. The first sampling event was performed during January 2016, with groundwater sampling and analysis for perchlorate. The second sampling event was performed in December 2016 based on the results from the initial sampling event that indicated perchlorate concentrations exceeded the 13.8 µg/L proposed screening level. The second sampling event followed an extended purge procedure that included pumping a minimum of 12 well volumes, with samples for perchlorate analysis collected every three well volumes. The objective of taking extended purge samples was to characterize formation groundwater as opposed to groundwater immediately adjacent to the borehole.

Samples were collected and analyzed for perchlorate in accordance with SW-846 Method 6850. **Table 3** presents the analytical data from the January 2016 sampling event (URS, 2017a). **Table 4** presents the analytical data from the December 2016 sampling event (URS, 2017a).

Table 3. January 2016 EOD-BH Analytical Results

Field Sample Number	Lab Sample Number	Sample Date	Perchlorate Concentration (µg/L)	Qualifier	MDL (µg/L)	RL (µg/L)
EOD-012716-1	390428001	01-27-2016	17.5	J	1.25	5.00
EOD-012716-2	390428002	01-27-2016	16.2		1.00	4.00
EOD-012716-FB	390428003	01-27-2016	0.100	U	0.050	0.200
EOD-012716-EB	390428004	01-27-2016	0.100	U	0.050	0.200

BH borehole
EB equipment blank
EOD Explosive Ordnance Disposal
FB field blank
J concentration is an estimated value
MDL minimum detection limit
RL reporting limit
U not detected at the limit of detection
µg/L micrograms per liter

Table 4. December 2016 EOD-BH Analytical Results

Field Sample Number*	Lab Sample Number	Sample Date	Perchlorate Concentration (µg/L)	Qualifier	MDL (µg/L)	RL (µg/L)
EOD HILL-3	280-92081-3	12-09-2016	7.0	D	0.20	2.5
EOD HILL-6	280-92081-4	12-09-2016	13	D, J	0.20	2.5
EOD HILL-9	280-92081-5	12-09-2016	8.9	D	0.20	2.5
EOD HILL-12	280-92081-6	12-09-2016	8.7	D	0.20	2.5
FB-EOD HILL-12	280-92081-7	12-09-2016	0.010	U	0.0040	0.050
EB-EOD HILL-3	280-92081-1	12-09-2016	0.010	U	0.0040	0.050
FD-EOD HILL-3	280-92081-2	12-09-2016	11	D	0.20	2.5

*The Sample Number suffix represents the corresponding number of purged borehole volumes at the time of the sample.

D	dilution
EB	equipment blank
EOD	Explosive Ordnance Disposal
FB	field blank
FD	field duplicate
J	concentration is an estimated value
MDL	minimum detection limit
RL	reporting limit
U	not detected at the limit of detection
µg/L	micrograms per liter

Based on the results of the more extensive purging technique employed during the extended purge sampling event, it is apparent that the groundwater being drawn from the formation surrounding EOD-BH has lower concentrations of perchlorate. The perchlorate concentrations are less than the NMED screening level for tap water of 13.8 µg/L (NMED, 2019a), as well as the EPA's proposed MCL of 56 µg/L (EPA NPDWR for Perchlorate, 2019). These results are comparable to those obtained during the previous time-series test performed in December 2014 (**Table 2**) as reported in the *CG-570 – Explosive Ordnance Disposal Hill Supplemental Site Investigation Report – Final* (URS, 2015). The concentrations indicated that the presence of perchlorate was associated with the borehole itself and not tied to actual groundwater conditions in the surrounding area (URS, 2017a).

2.5.2 Soil Sample Evaluation

The soil samples collected from craters located on the EOD Hill on November 23, 2015 were analyzed for perchlorate (SW-846 Method 6850) and nitroaromatics (SW-846 Method 8330) in accordance with the Site Investigation Work Plan (URS, 2015c). The analytical results for nitroaromatics were all below the detection limits for the method employed. With the exception of two sample locations, the perchlorate results were below the detection limit for the analytical method. The maximum perchlorate result for the soil samples was 4.43 micrograms per kilogram (µg/kg), which is more than four orders of magnitude below than the NMED residential soil screening level of 54,800 µg/kg (NMED, 2019a). Soil sampling results indicate soils at the Site are not impacted with contaminants of potential concern at levels exceeding residential soil screening levels. Results of the 2015 soil samples are provided in **Appendix A**, Table A-3.

2.5.3 Perchlorate Background Evaluation

As part of the overall evaluation of perchlorate in groundwater, an effort was undertaken to determine a background concentration for perchlorate associated with Kirtland AFB. An extensive sampling campaign was performed to collect groundwater samples from 73 wells across the base associated with on-going monitoring being performed in support of the performance-based remediation contract. Perchlorate concentrations in groundwater ranged from less than the method detection limit to a maximum of 7.32 µg/L. This maximum result was determined to be a statistical outlier. Taking the conservative approach that the 7.32 µg/L concentration is an outlier, there is a 95% certainty that 95% of the background concentrations are below 1.78 µg/L, and 99% of background concentrations are less than 2.11 µg/L.

Groundwater samples from the EOD-BH indicate that the elevated perchlorate concentrations were associated with the borehole itself and not with the surrounding formation. The perchlorate concentrations in groundwater associated with Kirtland AFB are well below the NMED Screening Level for tap water of 13.8 µg/L (NMED, 2019a), as well as the EPA's Interim Drinking Water Health Advisory level of 15 µg/L. Based on the screening of the analytical data in the RFI, neither perchlorate nor nitroaromatics pose an unacceptable risk to human health.

2.5.4 EOD Hill Borehole Abandonment

Abandonment of the EOD-BH was approved by the NMED HWB in the approval letter to the U.S. Air Force dated 8 December 2017 for the Final CG-570 RCRA Facility Investigation Report. The approval letter allowed for discontinuance of groundwater monitoring and approved abandonment of the EOD-BH (NMED, 2017a) (**Appendix B**).

The EOD Hill borehole was plugged and abandoned on 21 May and 22 May 2019. The objective of the abandonment was to eliminate the EOD Borehole casing to serve as a potential conduit for surface contamination to reach groundwater. An abandonment work plan was prepared prior to abandonment and approved by NMED HWB on 6 February 2019 (NMED, 2019b). JR Drilling, a New Mexico Licensed Drilling contractor, performed the borehole abandonment. A Well Plugging Plan of Operations (Form WD08) was submitted by the USAF and approved in advance by the New Mexico Office of the State Engineer (NMOSE) (**Appendix C**).

Prior to abandonment the depth of water was measured in the EOD BH at 146.50 feet below the top of (6 inch) casing (btoc). The EOD BH was plugged by first backfilling with 3/8-inch washed pea gravel from the bottom of the open EOD BH (250 feet btoc) to 171 feet btoc. Approximately 6 5-gallon buckets of ¼-inch coated bentonite pellets were placed above the pea gravel from 171 feet btoc to 149 feet btoc. The remaining cased BH was pressure grouted with neat cement-bentonite grout consisting of 240 gallons of water and 24 90-pound bags of Portland Type I and II cement. The cement grout was allowed to settle and topped off with additional grout until the volume/height of grout was stabilized. The total volume of grout installed was measured against the BH volume and indicated no bridging or grout loss had occurred. **Table 5** presents the theoretical quantities of abandonment materials placed to actual volumes for the different intervals and materials used.

Table 5. Theoretical versus Actual Volumes of Abandonment Materials Used, EOD-BH

Depth Interval (feet bgs)	Borehole Material	Diameter (inches)	Theoretical Quantity	Actual Quantity
248-165	3/8-inch pea gravel	6.5	1.05 tons	1.75 tons
165-146	1/4-inch bentonite pellets	6	268 pounds	306 pounds
146-0	Cement grout	6	214 gallons	240 gallons

bgs below ground surface
EOD-BH Explosive Ordnance Disposal Borehole

For all intervals, the actual quantities of borehole abandonment materials used exceeded the theoretical volumes calculated for the given intervals. The increased amount of 3/8 inch pea gravel required indicates that there was likely more fracture zones and/or solution cavities in the uncased portion of the borehole than previously understood. The results in **Table 5** indicate that total open borehole volume was sealed completely with no unfilled void space.

At the surface, the 10.5-inch steel protective casing, 6-inch inner casing, and concrete pad were removed following completion of the BH grouting. The 10.5-inch steel protective casing and 6-inch inner casing were cut as close to level with the ground surface as possible using a cutting torch. The concrete pad was broken into small pieces using a jack hammer. The removed portions of the 10.5-inch steel protective casing, 6-inch inner casing, and concrete pad were disposed of in Kirtland's construction debris landfill. Following completion of the EOD BH abandonment, the signed WD-11 Plugging Record (**Appendix C**) was submitted to the New Mexico Office of the State Engineer.

2.6 Basis of Determination

Based upon the information presented, it is recommended that a CAC *without* controls determination be provided for the EOD Hill borehole. The borehole was abandoned on 21 and 22 May 2019 in accordance with the NMED Ground Water Quality Bureau and the New Mexico Office of the State Engineer abandonment procedures, which will preclude any accidental future introduction of contaminants into the groundwater.

EOD Hill (CG-570) is proposed for CAC *Without* controls based upon Section 6.1.9, *Determination of Corrective Action Complete (No Further Action)* of the Kirtland AFB Permit for the Open Detonation Unit (NMED, 2010), which states:

"Based on the results of the Investigation Report or other relevant information, the Permittee may submit a request to the Department for a Class 3 permit modification under 40 Code of Federal Regulation (CFR) § 270.42(c) to terminate corrective action for a specific SWMU or AOC. This permit modification request must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU or AOC at the Facility that pose a threat to human health or the environment, as well as additional information required in § 270.42(c)."

This criterion was accomplished by conducting an RFI that met the requirements outlined in the work plan approved in the NMED correspondence dated 24 September 2015. NMED received the *Final CG-570 Explosive Ordnance Disposal Hill – Resource Conservation and Recovery Act Facility Investigation Report*

(URS, 2017a) recommending no further action on 23 October 2017 for review. A letter from NMED dated 8 December 2017 (NMED, 2017a) documents its approval of the Final RFI Report and indicates that the Permittee may petition for CAC Status for EOD Hill (CG-570). A copy of the Final RFI approval letter is provided in **Appendix B**.

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3.0 CG-105, MANZANO BASE GROUNDWATER

The Manzano Base Groundwater Site is listed in the Kirtland AFB RCRA Permit (NMED, 2010) and consists of five groundwater monitoring wells located at the Central Training Facility (formerly known as Manzano Base). The regulatory history, relevant environmental sampling history, recommendations and basis of determination are described below.

3.1 Regulatory History

Investigation and remediation of SWMUs and AOCs at Kirtland AFB are conducted under both the USAF Environmental Restoration Program (ERP) and the RCRA Corrective Action Program. The ERP, formerly called the Installation Restoration Program (IRP), was initiated in 1983. A RCRA Facility Assessment was conducted in 1987 that identified SWMUs and AOCs at Kirtland AFB to be included in the RCRA Corrective Action Program. A RCRA permit, as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), was originally issued to Kirtland AFB to operate as a hazardous waste disposal facility in October 1990. Under the original RCRA permit there was no listing for the Manzano Base Groundwater Site; however, the permit did include Site ST-105 TCE and Nitrate Contaminated Groundwater listed as a "Non-RCRA Unit". The current RCRA permit was issued in 2010 (NMED, 2010) and includes the MBG Site (also known as CG-105). The MBG Site has been identified with contamination, or the potential for groundwater contamination with trichloroethene (TCE), as described in Section 6.4.1.3 of the Kirtland AFB Permit (NMED, 2010).

3.2 Area of Concern Description

The Site was originally a base-wide area of concern that was designated to address broad perched and regional groundwater issues with nitrate and/or TCE across Kirtland AFB, called Site ST-105 TCE and Nitrate Impacted Groundwater. The Site was divided into two components, one related to TCE impacts in groundwater and the other related to nitrate impacts in groundwater. This CAC proposal only addresses TCE impacts at the MBG Site, which is located in the south-central portion of Kirtland AFB (**Figure 3**). ST-105 now only addresses base-wide nitrate impacts to regional and perched groundwater and is not addressed under this CAC proposal.

3.3 Location

Site CG-105 addresses TCE impacts to the regional aquifer at the Manzano Base Groundwater Site. The general area of Manzano Base is also referred to as the Kirtland AFB Central Training Academy. The monitoring details for the TCE component are provided in the ST-105 – Trichloroethene Contaminated Groundwater Long Term Monitoring Plan, Kirtland Air Force Base, Albuquerque, New Mexico (USAF, 2014), and the Uniform Federal Policy Quality Assurance Project Plan, ST-105 – Trichloroethene Contaminated Groundwater, Kirtland Air Force Base, Albuquerque, New Mexico (URS, 2014).

The Manzano Base facility (Central Training Academy) includes the AOCs and SWMUs (**Figure 4**):

- SWMU ST-72 (Manzano Weapons Storage Area Security Garage Oil/Water Separator),
- SWMU 6-29 (Manzano Landfill-20),
- SWMU 6-32 (former Manzano Fire Training Area [FT-14]),
- SWMU 10-1-H (Manzano Sanitary Sewer [ST-327]), and
- SWMU 10-7-U (Building 30142, Oil Water Separator [ST-264]) areas.

3.4 History/Current and Anticipated Future Land Use

The Manzano Base area formerly contained operations and support functions related to the United States weapons stockpile. In more recent years it comprised the Central Training Academy, which supported USAF training initiatives. No land use changes are anticipated at Kirtland AFB as it relates to this site.

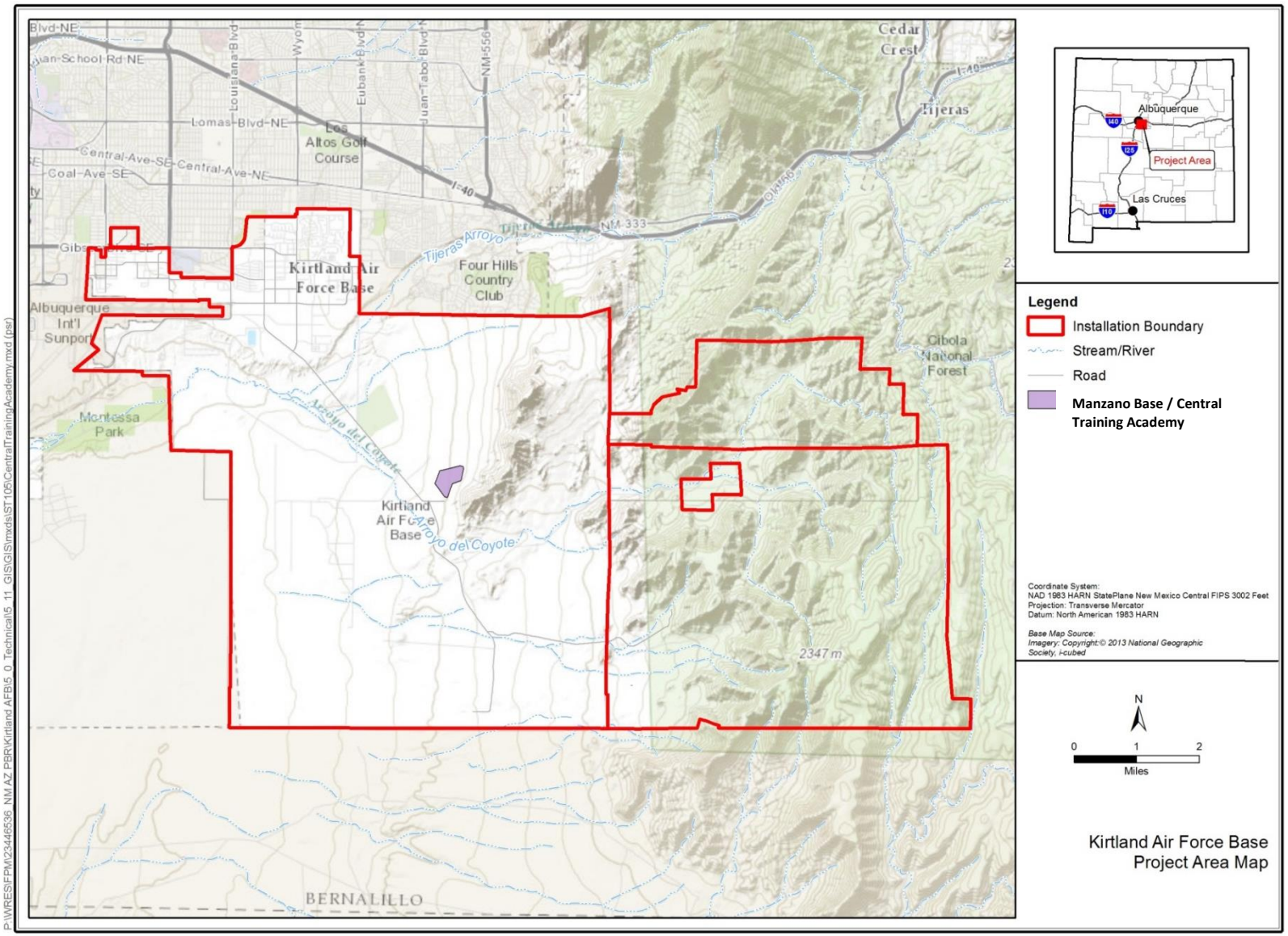

Figure 3. Site Location Map, Manzano Base

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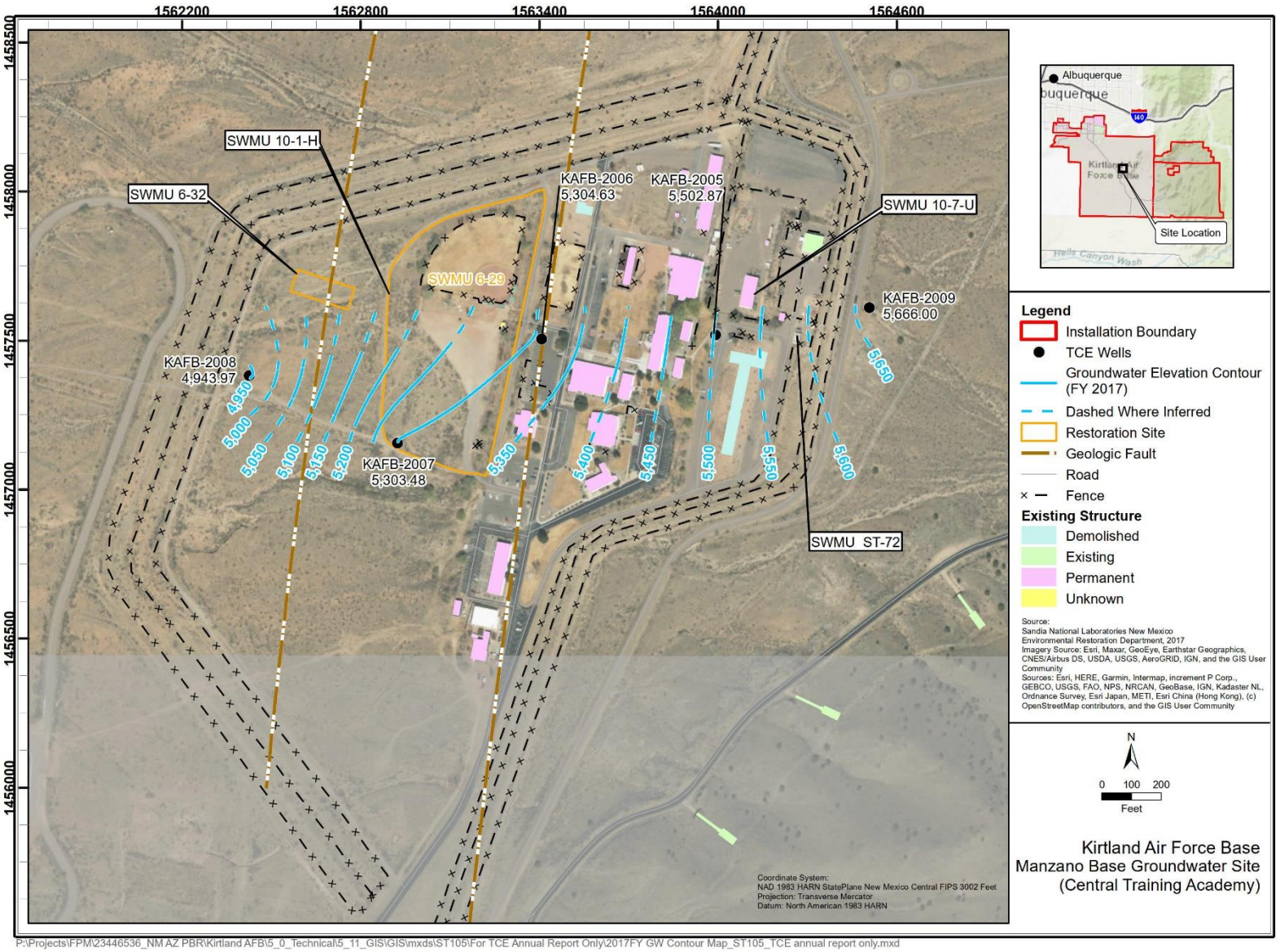

Figure 4. Site Specific Map, Manzano Base Groundwater (CG-105)

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The source of TCE in the groundwater is believed to have originated from SWMU ST-72. Volatile organic compounds were present in soil at the site and occurred in groundwater samples collected from onsite monitoring wells. Contaminated soil at SWMU ST-72 was excavated and properly disposed during the 1999 Interim Corrective Measure and the likely source of the TCE in groundwater was removed. As summarized in **Table 6**, the TCE concentrations in groundwater have been declining and are consistently below all regulatory standards.

There are no water supply production wells located in the area. In addition, the shallow aquifer in the fractured bedrock is likely to be not a sufficiently yielding or sustainable water-bearing zone to be used for a water supply. Impacted shallow groundwater in the fractured bedrock aquifer has not affected regional groundwater. The Sandia fault appears to be a substantial barrier to groundwater flow for the shallow groundwater to the east of the site and the regional groundwater to the west. Based upon this information, the impact to potential receptors from groundwater is negligible.

3.5 Evaluation of Relevant Information

Five groundwater monitoring wells were sampled between July 2006 and January 2017 within the MBG area. The monitoring wells were installed upgradient, adjacent to, and downgradient of Manzano Landfill (LF-20) and other SWMUs and facilities of the MBG area (**Section 3.3**) in order to evaluate potential TCE contamination in groundwater. TCE concentrations at these monitoring wells ranged from non-detect to 2.6 µg/L, and no results were above the EPA MCL (or the NMWQCC standard) for drinking water of 5 µg/L. A summary of the historical TCE results are provided in **Table 6**.

Table 6. CG-105 Historic Trichloroethene Data (µg/L)

Date	KAFB-2005	KAFB-2006	KAFB-2007	KAFB-2008	KAFB-2009
July 2006	0.54	1.3	2.1	—	—
October 2006	0.37	1.1	2.1	—	—
January 2007	0.51	1.3	2.6	—	—
April 2007	0.30	0.94	2.1	—	—
July 2007	< 1	< 1	1.8	—	—
October 2007	0.41	0.94	1.8	—	—
February 2008	0.47	1.0	1.9	—	—
May 2008	0.41	1.1	2.3	—	—
October 2010	0.40	0.26	2.1	< 0.38	< 0.38
January 2011	0.53	0.31	2.5	< 0.38	< 0.38
April 2011	0.46	< 0.38	2.2	< 0.38	< 0.38
July 2011	0.47	< 0.38	1.8	< 0.38	< 0.38
January 2012	0.48	0.18	1.8	< 0.20	< 0.20
April 2012	0.42	< 0.20	2.1	< 0.20	< 0.20
July 2012	0.34	< 0.20	1.9	< 0.20	< 0.20
October 2012	0.36	< 0.20	2.0	< 0.20	< 0.20
December 2014/ January 2015	< 0.50	—	1.70	< 0.50	< 0.50
December 2015	< 0.50	< 0.50	1.76	< 0.50	< 0.50
January 2017	0.28	< 0.40	1.7	< 0.40	< 0.40

KAFB Kirtland Air Force Base
µg/L micrograms per liter

As recommended in the conclusions provided in the *Final ST-105 – Fiscal Year 2016 Trichloroethene Impacted Groundwater Monitoring Report* (URS, 2017b), one more round of groundwater monitoring was performed in FY 2017. This event was performed to determine if further monitoring was warranted. During the January 2017 sampling event concentrations of all analytes were below their associated state and/or federal regulatory levels. Therefore, a recommendation was made for CAC *without* controls at the site.

Groundwater samples were collected from the MBG site (see **Figure 4**) in accordance with the *ST-105 – Trichloroethene Contaminated Groundwater Quality Assurance Project Plan* (URS, 2014). A total of nineteen groundwater sampling events were conducted beginning in 2006. All groundwater sampling analytical results since 2006 are provided in **Appendix A** (Tables A-4 and A-5(a) through A-5(e)).

During the last event in 2017, low level detections of bromodichloromethane, carbon tetrachloride, chloroform, and TCE in the groundwater samples collected from wells KAFB-2005, KAFB-2006, KAFB-2007, and KAFB-2009. No VOCs were detected in the sample collected from KAFB-2008. All detectable concentrations are below levels of regulatory concern. The only analyte identified as a potential constituent of concern has been TCE. A summary of the detections is provided in **Table 7**.

Table 7. January 2017 CG-105 Summary of Analytical Results for Detected VOCs (µg/L)

Well ID	Bromodichloromethane[1]	Carbon Tetrachloride	Chloroform[1]	TCE
KAFB-2005	0.33 J	< 0.40	0.90 J	0.28 J
KAFB-2006	1.6	< 0.40	1.5	< 0.40
KAFB-2007	0.55	0.32	2.2	1.7
KAFB-2008	< 0.40	< 0.40	< 0.40	< 0.40
KAFB-2009	< 0.40	< 0.40	3.7	< 0.40
NMWQCC Human Health Standards[2]	NE	10	NE	100
MCL[3]	80	5.0	80	5.0

µg/L micrograms per liter
ID Identification
KAFB Kirtland Air Force Base
NMWQCC New Mexico Water Quality Control Commission
MCL maximum contaminant level
NE not established
VOCs volatile organic compounds
TCE trichloroethene

1. The MCL listed for bromodichloromethane and chloroform is for total trihalomethanes.
2. Human Health Standards, New Mexico Administrative Code (NMAC) 20.6.2.3103A.
3. United States Environmental Protection Agency March, 2018.

Results for a total of 35 VOC analytes were reported with no other VOCs being detected in any of the samples collected during the groundwater monitoring event. **Table 7** provides a summary of the analytes detected in groundwater samples collected. In addition, **Table 6** presents the historic data associated with TCE concentrations. As can be seen from examination of the analytical data, the TCE concentrations have remained below the regulatory level of concern of 5 µg/L since sampling began in 2006. No trends whatsoever are apparent in the data with numerous data points being below the laboratory's method detection limit.

3.6 Basis of Determination

Based upon the information presented, it is recommended that a CAC *without* controls determination be provided for CG-105. TCE concentrations are below levels of regulatory concern.

CG-105 is proposed for CAC *Without* Controls based upon Section 6.1.9, *Determination of Corrective Action Complete (No Further Action)* of the Kirtland AFB Permit for the Open Detonation Unit (NMED, 2010), which states:

"Based on the results of the Investigation Report or other relevant information, the Permittee may submit a request to the Department for a Class 3 permit modification under 40 Code of Federal Regulation (CFR) § 270.42(c) to terminate corrective action for a specific SWMU or AOC. This permit modification request must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU or AOC at the Facility that pose a threat to human health or the environment, as well as additional information required in § 270.42(c)."

The NMED received the *Final ST-105 Fiscal Year 2017 Trichloroethene Impacted Groundwater Monitoring Report* (URS, 2017b) recommending no further action on 4 October 2017 for review. A letter from NMED dated 3 November 2017 (NMED, 2017b) documents its approval of the report and indicates that the Permittee may petition for CAC Status for MBG (CG-105). A copy of the Groundwater Monitoring Report approval letter is provided in **Appendix B**.

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APPENDIX A

Historical Sampling Data

Table A-1. EOD-BH January 2010 and June 2011 Groundwater Monitoring Data

Analyte	USEPA Drinking Water Standards[1]	EOD Hill 01-10 Well Sample	EOD Hill 06-11 Well Sample
SM6640 Herbicides by Gas Chromatography/Electron Capture Detector (µg/L)			
2,4,5-T	NE	<20.0	<0.28
2,4,5-TP (Silvex)	50	<10.0	<0.28
2,4-D	70	<10.0	<0.92
SW846 3510C/8081A Pesticides by Gas Chromatography/Electron Capture Detector (µg/L)			
α-BHC	NE	<100	<100
α-Chlordane	NE	<100	<100
Aldrin	NE	<100	<100
β-BHC	NE	<100	<100
Chlordane, total	2	<100	<100
Δ-BHC	NE	<100	<100
Dieldrin	NE	<100	<100
Endosulfan I	NE	<100	<100
Endosulfan II	NE	<100	<100
Endosulfan Sulfate	NE	<100	<100
Endrin	2	<100	<100
Endrin Aldehyde	NE	<100	<100
Endrin Ketone	NE	<50	<100
γ-BHC (Lindane)	0.2	<100	<100
γ-Chlordane	NE	<100	<100
Heptachlor	0.4	<100	<100
Heptachlor Epoxide	0.2	<100	<100
Methoxychlor	40	<500	<100
p,p-DDD	NE	<100	<100
p,p-DDE	NE	<100	<100
p,p-DDT	NE	<100	<100
Toxaphene, total	3.0 µg/L	<1,000	<800
USEPA 300.0 Anions by Ion Chromatography (µg/L)			
Chloride	250,000*	400000	400000
Fluoride	4000	1500	1700
Nitrate, as N	10000	<1,000	<200
Nitrite, as N	1000	<2,000	<200
Sulfate	250,000*	120000	120000

Table A-1. EOD-BH January 2010 and June 2011 Groundwater Monitoring Data (Cont.)

Analyte	USEPA Drinking Water Standards[1]	EOD Hill 01-10 Well Sample	EOD Hill 06-11 Well Sample
USEPA 420.1 Section 8.3 Phenolics (µg/L)			
Phenolics, total	NE	13 (Estimated)**	20
SW846 3005A/6010B ICP or SW846 3005A/6020 ICP-MS (µg/L)			
Arsenic	10	10	62
Barium	2000	130	240
Cadmium	5	0.1	0.19
Chromium	100	3.3	17
Iron	300*	24000	27000
Lead	15	5.5	4.7
Manganese	50*	1400	2900
Selenium	50	<2,000	4
Silver	100*	0.057	0.15
Sodium	NE	470000	460000
SW846 7470A Cold Vapor Atomic Absorption (µg/L)			
Mercury	2	<0.2	<0.08
9040C pH, Electrometric			
pH	6.5 - 8.5*	6.5	NA
SW-846 9020A (µg/L)			
Total Organic Halogens	NE	25	35
SM5310B (µg/L)			
Carbon, Total Organic	NE	<1,000	470
SWA846 6850 (µg/L)			
Perchlorates	15[2]	2.7	27

[1] If the USEPA National Primary Drinking Water Standards were not available, then the USEPA National Secondary Drinking Water Standards were listed.

[2] USEPA Interim Drinking Water Health Advisory.

*USEPA Secondary Drinking Water Standards.

**Result was estimated. Compound was detected but was less than the reportable limit.

NE was listed if USEPA standards were not available.

A duplicate sample was collected during the June 2011 sampling event. The reported value was the higher of the two samples.

< less than
DDD dichlorodiphenyldichloroethane
DDE dichlorodiphenyldichloroethene
DDT dichlorodiphenyltrichloroethane
EOD Explosive Ordnance Disposal
NA not available
NE not established
USEPA U.S. Environmental Protection Agency
µg/L micrograms per liter

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-Initial	6850	Perchlorate	27.4		15[1], 13.8[2], 14.1[3]	2.5	10
EOD-BH-Initial	8330B	2,4,6-Trinitrotoluene	0.287	U	0.98[3]	0.092	0.287
EOD-BH-Initial	8330B	2,4-Dinitrotoluene	0.287	U	0.24[3]	0.092	0.287
EOD-BH-Initial	8330B	RDX	0.287	U	0.70[3]	0.092	0.287
EOD-BH-Initial	8330B	4-Amino-2,6-dinitrotoluene	0.287	U	3.9[3]	0.092	0.287
EOD-BH-Initial	8330B	HMX	0.287	U	100[3]	0.092	0.287
EOD-BH-Initial	8330B	2-Amino-4,6-dinitrotoluene	0.287	U	3.9[3]	0.092	0.287
EOD-BH-Initial	8330B	2,6-Dinitrotoluene	0.287	U	0.048[3]	0.092	0.287
EOD-BH-Initial	8330B	o-Nitrotoluene	0.287	U	0.31[3]	0.0943	0.287
EOD-BH-Initial	8330B	Nitrobenzene	0.287	U	0.14[3]	0.092	0.287
EOD-BH-Initial	8330B	m-Nitrotoluene	0.287	U	0.17[3]	0.092	0.287
EOD-BH-Initial	8330B	1,3,5-Trinitrobenzene	0.287	U	59[3]	0.092	0.287
EOD-BH-Initial	8330B	m-Dinitrobenzene	0.287	U	0.2[3]	0.092	0.287
EOD-BH-Initial	8330B	Tetryl	0.575	U	3.9[3]	0.092	0.575
EOD-BH-Initial	8330B	Nitroglycerin	0.575	U	1.96[2], 0.2[3]	0.191	0.575
EOD-BH-Initial	8330B	PETN	0.575	U	3.9[3]	0.115	0.575
EOD-BH-Initial	8330B	p-Nitrotoluene	0.575	U	4.2[3]	0.172	0.575
EOD-BH-Initial	8330B	3,5-Dinitroaniline	1.15	U	NE	0.345	1.15
EOD-BH-03	6850	Perchlorate	9.31		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-03	8330B	2,4,6-Trinitrotoluene	0.263	U	0.98[3]	0.0842	0.263
EOD-BH-03	8330B	2,4-Dinitrotoluene	0.263	U	0.24[3]	0.0842	0.263
EOD-BH-03	8330B	RDX	0.263	U	0.70[3]	0.0842	0.263
EOD-BH-03	8330B	4-Amino-2,6-dinitrotoluene	0.263	U	3.9[3]	0.0842	0.263
EOD-BH-03	8330B	HMX	0.263	U	100[3]	0.0842	0.263
EOD-BH-03	8330B	2-Amino-4,6-dinitrotoluene	0.263	U	3.9[3]	0.0842	0.263
EOD-BH-03	8330B	2,6-Dinitrotoluene	0.263	U	0.048[3]	0.0842	0.263

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014 (Cont.)

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-03	8330B	o-Nitrotoluene	0.263	U	0.31[3]	0.0863	0.263
EOD-BH-03	8330B	Nitrobenzene	0.263	U	0.14[3]	0.0842	0.263
EOD-BH-03	8330B	m-Nitrotoluene	0.263	U	0.17[3]	0.0842	0.263
EOD-BH-03	8330B	1,3,5-Trinitrobenzene	0.263	U	59[3]	0.0842	0.263
EOD-BH-03	8330B	m-Dinitrobenzene	0.263	U	0.2[3]	0.0842	0.263
EOD-BH-03	8330B	Tetryl	0.526	U	3.9[3]	0.0842	0.526
EOD-BH-03	8330B	Nitroglycerin	0.526	U	1.96[2], 0.2[3]	0.175	0.526
EOD-BH-03	8330B	PETN	0.526	U	3.9[3]	0.105	0.526
EOD-BH-03	8330B	p-Nitrotoluene	0.526	U	4.2[3]	0.158	0.526
EOD-BH-03	8330B	3,5-Dinitroaniline	1.05	U	NE	0.316	1.05
EOD-BH-06	6850	Perchlorate	8.57		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-06	8330B	2,4,6-Trinitrotoluene	0.248	U	0.98[3]	0.0792	0.248
EOD-BH-06	8330B	2,4-Dinitrotoluene	0.248	U	0.24[3]	0.0792	0.248
EOD-BH-06	8330B	RDX	0.248	U	0.70[3]	0.0792	0.248
EOD-BH-06	8330B	4-Amino-2,6-dinitrotoluene	0.248	U	3.9[3]	0.0792	0.248
EOD-BH-06	8330B	HMX	0.248	U	100[3]	0.0792	0.248
EOD-BH-06	8330B	2-Amino-4,6-dinitrotoluene	0.248	U	3.9[3]	0.0792	0.248
EOD-BH-06	8330B	2,6-Dinitrotoluene	0.248	U	0.048[3]	0.0792	0.248
EOD-BH-06	8330B	o-Nitrotoluene	0.248	U	0.31[3]	0.0812	0.248
EOD-BH-06	8330B	Nitrobenzene	0.248	U	0.14[3]	0.0792	0.248
EOD-BH-06	8330B	m-Nitrotoluene	0.248	U	0.17[3]	0.0792	0.248
EOD-BH-06	8330B	1,3,5-Trinitrobenzene	0.248	U	59[3]	0.0792	0.248
EOD-BH-06	8330B	m-Dinitrobenzene	0.248	U	0.2[3]	0.0792	0.248
EOD-BH-06	8330B	Tetryl	0.495	U	3.9[3]	0.0792	0.495
EOD-BH-06	8330B	Nitroglycerin	0.495	U	1.96[2], 0.2[3]	0.164	0.495
EOD-BH-06	8330B	PETN	0.495	U	3.9[3]	0.099	0.495
EOD-BH-06	8330B	p-Nitrotoluene	0.495	U	4.2[3]	0.149	0.495
EOD-BH-06	8330B	3,5-Dinitroaniline	0.99	U	NE	0.297	0.990

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014 (Cont.)

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-09	6850	Perchlorate	8.56		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-09	8330B	2,4,6-Trinitrotoluene	0.269	U	0.98[3]	0.086	0.269
EOD-BH-09	8330B	2,4-Dinitrotoluene	0.269	U	0.24[3]	0.086	0.269
EOD-BH-09	8330B	RDX	0.269	U	0.70[3]	0.086	0.269
EOD-BH-09	8330B	4-Amino-2,6-dinitrotoluene	0.269	U	3.9[3]	0.086	0.269
EOD-BH-09	8330B	HMX	0.269	U	100[3]	0.086	0.269
EOD-BH-09	8330B	2-Amino-4,6-dinitrotoluene	0.269	U	3.9[3]	0.086	0.269
EOD-BH-09	8330B	2,6-Dinitrotoluene	0.269	U	0.048[3]	0.086	0.269
EOD-BH-09	8330B	o-Nitrotoluene	0.269	U	0.31[3]	0.0882	0.269
EOD-BH-09	8330B	Nitrobenzene	0.269	U	0.14[3]	0.086	0.269
EOD-BH-09	8330B	m-Nitrotoluene	0.269	U	0.17[3]	0.086	0.269
EOD-BH-09	8330B	1,3,5-Trinitrobenzene	0.269	U	59[3]	0.086	0.269
EOD-BH-09	8330B	m-Dinitrobenzene	0.269	U	0.2[3]	0.086	0.269
EOD-BH-09	8330B	Tetryl	0.538	U	3.9[3]	0.086	0.538
EOD-BH-09	8330B	Nitroglycerin	0.538	U	1.96[2], 0.2[3]	0.178	0.538
EOD-BH-09	8330B	PETN	0.538	U	3.9[3]	0.108	0.538
EOD-BH-09	8330B	p-Nitrotoluene	0.538	U	4.2[3]	0.161	0.538
EOD-BH-09	8330B	3,5-Dinitroaniline	1.08	U	NE	0.323	1.08
EOD-BH-12	6850	Perchlorate	8.20		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-12	8330B	2,4,6-Trinitrotoluene	0.258	U	0.98[3]	0.0825	0.258
EOD-BH-12	8330B	2,4-Dinitrotoluene	0.258	U	0.24[3]	0.0825	0.258
EOD-BH-12	8330B	RDX	0.258	U	0.70[3]	0.0825	0.258
EOD-BH-12	8330B	4-Amino-2,6-dinitrotoluene	0.258	U	3.9[3]	0.0825	0.258
EOD-BH-12	8330B	HMX	0.258	U	100[3]	0.0825	0.258
EOD-BH-12	8330B	2-Amino-4,6-dinitrotoluene	0.258	U	3.9[3]	0.0825	0.258
EOD-BH-12	8330B	2,6-Dinitrotoluene	0.258	U	0.048[3]	0.0825	0.258
EOD-BH-12	8330B	o-Nitrotoluene	0.258	U	0.31[3]	0.0845	0.258
EOD-BH-12	8330B	Nitrobenzene	0.258	U	0.14[3]	0.0825	0.258

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014 (Cont.)

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-12	8330B	m-Nitrotoluene	0.258	U	0.17[3]	0.0825	0.258
EOD-BH-12	8330B	1,3,5-Trinitrobenzene	0.258	U	59[3]	0.0825	0.258
EOD-BH-12	8330B	m-Dinitrobenzene	0.258	U	0.2[3]	0.0825	0.258
EOD-BH-12	8330B	Tetryl	0.515	U	3.9[3]	0.0825	0.515
EOD-BH-12	8330B	Nitroglycerin	0.515	U	1.96[2], 0.2[3]	0.171	0.515
EOD-BH-12	8330B	PETN	0.515	U	3.9[3]	0.103	0.515
EOD-BH-12	8330B	p-Nitrotoluene	0.515	U	4.2[3]	0.155	0.515
EOD-BH-12	8330B	3,5-Dinitroaniline	1.03	U	NE	0.309	1.03
EOD-BH-15	6850	Perchlorate	8.06		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-15	8330B	2,4,6-Trinitrotoluene	0.26	U	0.98[3]	0.0833	0.26
EOD-BH-15	8330B	2,4-Dinitrotoluene	0.26	U	0.24[3]	0.0833	0.26
EOD-BH-15	8330B	RDX	0.26	U	0.70[3]	0.0833	0.26
EOD-BH-15	8330B	4-Amino-2,6-dinitrotoluene	0.26	U	3.9[3]	0.0833	0.26
EOD-BH-15	8330B	HMX	0.26	U	100[3]	0.0833	0.26
EOD-BH-15	8330B	2-Amino-4,6-dinitrotoluene	0.26	U	3.9[3]	0.0833	0.26
EOD-BH-15	8330B	2,6-Dinitrotoluene	0.26	U	0.048[3]	0.0833	0.26
EOD-BH-15	8330B	o-Nitrotoluene	0.26	U	0.31[3]	0.0854	0.26
EOD-BH-15	8330B	Nitrobenzene	0.26	U	0.14[3]	0.0833	0.26
EOD-BH-15	8330B	m-Nitrotoluene	0.26	U	0.17[3]	0.0833	0.26
EOD-BH-15	8330B	1,3,5-Trinitrobenzene	0.26	U	59[3]	0.0833	0.26
EOD-BH-15	8330B	m-Dinitrobenzene	0.26	U	0.2[3]	0.0833	0.26
EOD-BH-15	8330B	Tetryl	0.521	U	3.9[3]	0.0833	0.521
EOD-BH-15	8330B	Nitroglycerin	0.521	U	1.96[2], 0.2[3]	0.173	0.521
EOD-BH-15	8330B	PETN	0.521	U	3.9[3]	0.104	0.521
EOD-BH-15	8330B	p-Nitrotoluene	0.521	U	4.2[3]	0.156	0.521
EOD-BH-15	8330B	3,5-Dinitroaniline	1.04	U	NE	0.313	1.04
EOD-BH-FD-15*	6850	Perchlorate	7.65		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-FD-15*	8330B	2,4,6-Trinitrotoluene	0.255	U	0.98[3]	0.0816	0.255

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014 (Cont.)

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-FD-15*	8330B	2,4-Dinitrotoluene	0.255	U	0.24[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	RDX	0.255	U	0.70[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	4-Amino-2,6-dinitrotoluene	0.255	U	3.9[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	HMX	0.255	U	100[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	2-Amino-4,6-dinitrotoluene	0.255	U	3.9[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	2,6-Dinitrotoluene	0.255	U	0.048[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	o-Nitrotoluene	0.255	U	0.31[3]	0.0837	0.255
EOD-BH-FD-15*	8330B	Nitrobenzene	0.255	U	0.14[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	m-Nitrotoluene	0.255	U	0.17[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	1,3,5-Trinitrobenzene	0.255	U	59[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	m-Dinitrobenzene	0.255	U	0.2[3]	0.0816	0.255
EOD-BH-FD-15*	8330B	Tetryl	0.51	U	3.9[3]	0.0816	0.51
EOD-BH-FD-15*	8330B	Nitroglycerin	0.51	U	1.96[2], 0.2[3]	0.169	0.51
EOD-BH-FD-15*	8330B	PETN	0.51	U	3.9[3]	0.102	0.51
EOD-BH-FD-15*	8330B	p-Nitrotoluene	0.51	U	4.2[3]	0.153	0.51
EOD-BH-FD-15*	8330B	3,5-Dinitroaniline	1.02	U	NE	0.306	1.02
EOD-BH-18	6850	Perchlorate	7.7		15[1], 13.8[2], 14.1[3]	1	4
EOD-BH-18	8330B	2,4,6-Trinitrotoluene	0.26	U	0.98[3]	0.0833	0.26
EOD-BH-18	8330B	2,4-Dinitrotoluene	0.26	U	0.24[3]	0.0833	0.26
EOD-BH-18	8330B	RDX	0.26	U	0.70[3]	0.0833	0.26
EOD-BH-18	8330B	4-Amino-2,6-dinitrotoluene	0.26	U	3.9[3]	0.0833	0.26
EOD-BH-18	8330B	HMX	0.26	U	100[3]	0.0833	0.26
EOD-BH-18	8330B	2-Amino-4,6-dinitrotoluene	0.26	U	3.9[3]	0.0833	0.26
EOD-BH-18	8330B	2,6-Dinitrotoluene	0.26	U	0.048[3]	0.0833	0.26
EOD-BH-18	8330B	o-Nitrotoluene	0.26	U	0.31[3]	0.0854	0.26
EOD-BH-18	8330B	Nitrobenzene	0.26	U	0.14[3]	0.0833	0.26
EOD-BH-18	8330B	m-Nitrotoluene	0.26	U	0.17[3]	0.0833	0.26
EOD-BH-18	8330B	1,3,5-Trinitrobenzene	0.26	U	59[3]	0.0833	0.26

Table A-2. Perchlorate and High Explosives Analytes Analytical Results - 2014 (Cont.)

Sample ID	EPA Method	Analyte	Concentration (µg/L)	Q	Project Action Limit (µg/L)	MDL	PQL/RL
EOD-BH-18	8330B	m-Dinitrobenzene	0.26	U	0.2[3]	0.0833	0.26
EOD-BH-18	8330B	Tetryl	0.521	U	3.9[3]	0.0833	0.521
EOD-BH-18	8330B	Nitroglycerin	0.521	U	1.96[2], 0.2[3]	0.173	0.521
EOD-BH-18	8330B	PETN	0.521	U	3.9[3]	0.104	0.521
EOD-BH-18	8330B	p-Nitrotoluene	0.521	U	4.2[3]	0.156	0.521
EOD-BH-18	8330B	3,5-Dinitroaniline	1.04	U	NE	0.313	1.04

[1]US EPA Interim Drinking Water Health Advisory for Perchlorate (December 2008)

[2]NMED Risk Assessment Guidance for Site Investigations and Remediation, Table A-1 (December 2014)

[3]EPA Region 6 Regional Screening Levels for Tapwater (January 2015)

NE – Not Established

*Also known as EOD-BH-21; however, this sample is a field duplicate of EOD-BH-15

Table A-3. Sampling Results for Soils, Equipment Blank and Field Blank (2015 RFI)

Location	Explosives Pit #8				Explosive Pit #7				Explosive Pit #6			
Field Sample Number	EXP-8-11232015				EXP-7-11232015				EXP-6-11232015			
Lab Sample Number	386514001				386514002				386514003			
Sample Date	11/23/15 1155				11/23/15 1140				11/23/15 1200			
Sample Type	Surface Soil - Original				Surface Soil - Original				Surface Soil - Original			
Parameter (µg/kg or µg/L)	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL
Perchlorate	2.61	U	0.652	2.61	**4.43**		0.661	2.64	**0.594**	J	0.549	2.19
Nitroaromatics	150	U	150	500	149	U	149	498	150	U	150	500
2,4,6-Trinitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
2,4-Dinitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
RDX	150	U	150	500	149	U	149	498	150	U	150	500
4-Amino-2,6-dinitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
2-Amino-4,6-dinitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
Tetryl	150	U	150	500	149	U	149	498	150	U	150	500
2,6-Dinitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
o-Nitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
Nitrobenzene	150	U	150	500	149	U	149	498	150	U	150	500
m-Nitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
1,3,5-Trinitrobenzene	150	U	150	500	149	U	149	498	150	U	150	500
m-Dinitrobenzene	150	U	150	500	149	U	149	498	150	U	150	500
p-Nitrotoluene	150	U	150	500	149	U	149	498	150	U	150	500
PETN	250	QU	250	1,000	249	QU	249	995	250	QU	250	1,000
3,5-Dinitroaniline	300	U	300	1,000	299	U	299	995	300	U	300	1,000
Nitroglygerin	500	U	500	1,000	498	U	498	995	500	U	500	1,000
HMX	150	U	150	500	149	U	149	498	150	U	150	500

µg/kg -Micrograms per kilogram
µg/L - Micrograms per liter
MDL - Method Detection Limit
PQL -Practical Quantitation Limit
RL -Reporting Limit

Qualifiers:

U - Not detected at the LOD
J - Estimated value below the lowest calibration point. Confidence correlates with the concentration.
Q -One or more quality control criteria have not been met.

Table A-3. Sampling Results for Soils, Equipment Blank and Field Blank (2015 RFI) (Cont.)

Location	Explosive Pit #5				Explosive Pit #4				Explosive Pit #3			
Field Sample Number	EXP-5-11232015				EXP-4-11232015				EXP-3-11232015			
Lab Sample Number	386514004				386514005				386514006			
Sample Date	11/23/15 1210				11/23/15 1245				11/23/15 1225			
Sample Type	Surface Soil - Original				Surface Soil - Original				Surface Soil - Original			
Parameter (µg/kg or µg/L)	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL
Perchlorate	2.05	U	0.513	2.05	2.11	U	0.527	2.11	2.02	U	0.506	2.02
Nitroaromatics	150	U	150	500	150	U	150	500	149	U	149	498
2,4,6-Trinitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
2,4-Dinitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
RDX	150	U	150	500	150	U	150	500	149	U	149	498
4-Amino-2,6-dinitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
2-Amino-4,6-dinitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
Tetryl	150	U	150	500	150	U	150	500	149	U	149	498
2,6-Dinitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
o-Nitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
Nitrobenzene	150	U	150	500	150	U	150	500	149	U	149	498
m-Nitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
1,3,5-Trinitrobenzene	150	U	150	500	150	U	150	500	149	U	149	498
m-Dinitrobenzene	150	U	150	500	150	U	150	500	149	U	149	498
p-Nitrotoluene	150	U	150	500	150	U	150	500	149	U	149	498
PETN	250	QU	250	1,000	250	QU	250	1,000	249	QU	249	995
3,5-Dinitroaniline	300	U	300	1,000	300	U	300	1,000	299	U	299	995
Nitroglygerin	500	U	500	1,000	500	U	500	1,000	498	U	498	995
HMX	150	U	150	500	150	U	150	500	149	U	149	498

µg/kg -Micrograms per kilogram
µg/L - Micrograms per liter
MDL - Method Detection Limit
PQL -Practical Quantitation Limit
RL -Reporting Limit

Qualifiers:

U - Not detected at the LOD
J - Estimated value below the lowest calibration point. Confidence correlates with the concentration.
Q -One or more quality control criteria have not been met.

Table A-3. Sampling Results for Soils, Equipment Blank and Field Blank (2015 RFI) (Cont.)

Location	Explosive Pit #2				Explosve Pit #2 Field Duplicate				Explosive Pit #1			
Field Sample Number	EXP-2-11232015				FD-EXP-2-11232015				EXP-1-11232015			
Lab Sample Number	386514007				386514008				386514009			
Sample Date	11/23/15 1235				11/23/15 1235				11/23/15 1240			
Sample Type	Surface Soil - Original				Surface Soil - Duplicate				Surface Soil - Original			
Parameter (µg/kg or µg/L)	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL
Perchlorate	2.05	U	0.513	2.05	2.06	U	0.515	2.06	2.06	U	0.515	2.06
Nitroaromatics	149	U	149	495	150	U	150	500	149	U	149	498
2,4,6-Trinitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
2,4-Dinitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
RDX	149	U	149	495	150	U	150	500	149	U	149	498
4-Amino-2,6-dinitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
2-Amino-4,6-dinitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
Tetryl	149	U	149	495	150	U	150	500	149	U	149	498
2,6-Dinitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
o-Nitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
Nitrobenzene	149	U	149	495	150	U	150	500	149	U	149	498
m-Nitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
1,3,5-Trinitrobenzene	149	U	149	495	150	U	150	500	149	U	149	498
m-Dinitrobenzene	149	U	149	495	150	U	150	500	149	U	149	498
p-Nitrotoluene	149	U	149	495	150	U	150	500	149	U	149	498
PETN	248	QU	248	990	250	QU	250	1,000	249	QU	249	995
3,5-Dinitroaniline	297	U	297	990	300	U	300	1,000	299	U	299	995
Nitroglygerin	495	U	495	990	500	U	500	1,000	498	U	498	995
HMX	149	U	149	495	150	U	150	500	149	U	149	498

µg/kg -Micrograms per kilogram
µg/L - Micrograms per liter
MDL - Method Detection Limit
PQL -Practical Quantitation Limit
RL -Reporting Limit

Qualifiers:

U - Not detected at the LOD
J - Estimated value below the lowest calibration point. Confidence correlates with the concentration.
Q -One or more quality control criteria have not been met.

Table A-3. Sampling Results for Soils, Equipment Blank and Field Blank (2015 RFI) (Cont.)

Location	Equipment Blank				Field Blank			
Field Sample Number	EB-EXP-1-11232015				FB-EXP-5-11232015			
Lab Sample Number	386514010				386514011			
Sample Date	11/23/15 1240				11/23/15 1210			
Sample Type	Field Quality Control				Field Quality Control			
Parameter (µg/kg or µg/L)	Results	Qualifier	MDL	RL/PQL	Results	Qualifier	MDL	RL/PQL
Perchlorate	0.200	U	0.05	0.200	0.200	U	0.05	0.200
Nitroaromatics								
2,4,6-Trinitrotoluene								
2,4-Dinitrotoluene								
RDX								
4-Amino-2,6-dinitrotoluene								
2-Amino-4,6-dinitrotoluene								
Tetryl								
2,6-Dinitrotoluene								
o-Nitrotoluene								
Nitrobenzene								
m-Nitrotoluene								
1,3,5-Trinitrobenzene								
m-Dinitrobenzene								
p-Nitrotoluene								
PETN								
3,5-Dinitroaniline								
Nitroglygerin								
HMX								

µg/kg -Micrograms per kilogram
µg/L - Micrograms per liter
MDL - Method Detection Limit
PQL -Practical Quantitation Limit
RL -Reporting Limit

Qualifiers:

U - Not detected at the LOD
J - Estimated value below the lowest calibration point. Confidence correlates with the concentration.
Q -One or more quality control criteria have not been met.

Table A-4
Groundwater Results
December 2014 - January 2017
MBG Site, Kirtland AFB

Parameter	Standard	Units	KAFB-2005 01/19/15 N	KAFB-2005 12/21/15 N	KAFB-2005 01/20/17 N	KAFB-2006 12/15/15 N	KAFB-2006 01/19/17 N	KAFB-2007 12/23/14 N	KAFB-2007 12/23/14 FD	KAFB-2007 12/21/15 N
Field Data										
FIELD										
Dissolved Oxygen		mg/L	5.78	10.52	8.98	8.19	7.08	8.71	---	8.24
Oxidation-Reduction Potential		mV	260	269	181	244	155	231	---	267
pH		SU	7.23	7.35	7.28	7.44	7.47	7.35	---	7.45
Specific Conductance		uS/cm	0.817	0.963	0.864	0.701	0.75	0.807	---	0.861
Temperature		Deg C	19.27	15.8	15.88	14.11	16.6	15.96	---	18.2
Turbidity		NTU	0	0	0.6	0	0	0	---	0
Inorganic										
E351.2										
Nitrogen, Kjeldahl, Total		mg/L	---	---	<0.5 UJ	---	<0.5 UJ	---	---	---
E353.2										
Nitrogen, Nitrate-Nitrite	10 GN18	mg/L	4.9 J	4.39	4.9	0.321	0.52	5.5	5.4	5.89
SW9056										
Bromide		mg/L	0.15	<0.5	---	<0.5	---	2.8	2.7	<0.5
Chloride (as Cl)	250 GN18	mg/L	49	56.9	---	23.8	---	46	46	48.1
Fluoride	1.6 GN18	mg/L	***2.1***	***2.23***	---	***4.74***	---	***2.3***	***2.3***	***2.37***
Sulfate	600 GN18	mg/L	150	154	---	64.3	---	170	170	201
SW9056A										
Bromide		mg/L	---	---	0.35 F	---	0.14 F	---	---	---
Chloride (as Cl)	250 GN18	mg/L	---	---	40	---	22	---	---	---
Fluoride	1.6 GN18	mg/L	---	---	***2.3***	---	***5.4***	---	---	---
Sulfate	600 GN18	mg/L	---	---	150	---	74	---	---	---
MNO										
SW6850										
Perchlorate	15 EM8	ug/L	1.15	---	---	---	---	1.06	---	---
Volatile Organics										
SW8260B										
1,1,1-Trichloroethane	200 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	10 GN18	ug/L	<0.75	<0.75	<0.8	<0.75	<0.8	<0.75	<0.75	<0.75
1,1,2-Trichloroethane	5 GN18	ug/L	<0.5	<0.5	<0.8	<0.5	<0.8	<0.5	<0.5	<0.5
1,1-Dichloroethane	25 GN18	ug/L	<0.5	<0.5	<0.8	<0.5	<0.8	<0.5	<0.5	<0.5
1,1-Dichloroethene	7 GN18	ug/L	<0.5	<0.5	<0.8	<0.5	<0.8	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	600 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
1,2-Dichloroethane	5 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
1,2-Dichloropropane	5 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
1,3-Dichlorobenzene		ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	75 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5

Table A-4
Groundwater Results
December 2014 - January 2017
MBG Site, Kirtland AFB

		Location ID:	KAFB-2005	KAFB-2005	KAFB-2005	KAFB-2006	KAFB-2006	KAFB-2007	KAFB-2007	KAFB-2007
		Sample Date:	01/19/15	12/21/15	01/20/17	12/15/15	01/19/17	12/23/14	12/23/14	12/21/15
		Sample Type:	N	N	N	N	N	N	FD	N
Parameter	Standard	**nits**								
Acetone		ug/L	<25	<25	<6.4	<25	<6.4	<25	<25	<25
Benzene	5 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Bromodichloromethane	80 EM8	ug/L	<0.5	<0.5	0.33 F	3.05	1.6	0.68	0.64	0.537
Bromoform	80 EM8	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Bromomethane		ug/L	<2.5	<2.5	<0.8	<2.5	<0.8	<2.5	<2.5	<2.5
Carbon Tetrachloride	5 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Chlorobenzene	100 EM8	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Chloroethane		ug/L	<2.5	<2.5	<1.6	<2.5	<1.6	<2.5 UJ	<2.5 UJ	<2.5
Chloroform	80 EM8	ug/L	0.57 J	0.373	0.9 FJ	2.84	1.5 J	2	2	1.98
Chloromethane		ug/L	<0.5	<0.5	<0.8	<0.5	<0.8	<0.5	<0.5	<0.5
Cis-1,2-Dichloroethylene	70 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Cis-1,3-Dichloropropene		ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Dibromochloromethane	80 EM8	ug/L	<0.5	<0.5	<0.4	0.416	<0.4	<0.5	<0.5	<0.5
Ethylbenzene	700 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Methyl Ethyl Ketone		ug/L	<5	<5	<4	<5	<4	<5	<5	<5
Methyl Isobutyl Ketone		ug/L	<5	<5	<3.2	<5	<3.2	<5	<5	<5
Methylene Chloride	5 GN18	ug/L	<2.5	<2.5	<0.8	<2.5	<0.8	<2.5	<2.5	<2.5
Styrene	100 GN18	ug/L	<0.5	<0.5	<0.4 J	<0.5	<0.4 J	<0.5	<0.5	<0.5
Tetrachloroethylene (PCE)	5 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Toluene	1000 GN18	ug/L	<2.5	<2.5	<0.4	<2.5	<0.4	1.2	1.1	<2.5
Total Xylenes	620 GN18	ug/L	<1.5	<1.5	<0.8	<1.5	<0.8	<1.5	<1.5	<1.5
Trans-1,2-Dichloroethene	100 GN18	ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Trans-1,3-Dichloropropene		ug/L	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	<0.5
Trichloroethylene (TCE)	5 GN18	ug/L	<0.5	<0.5	0.28 F	<0.5	<0.4	1.7	1.4	1.76
Vinyl Chloride	2 GN18	ug/L	<0.5	<0.5	<0.2	<0.5	<0.2	<0.5	<0.5	<0.5

Table A-4
Groundwater Results
December 2014 - January 2017
MBG Site, Kirtland AFB

Parameter	Standard	Units	Location ID: / Sample Date: / Sample Type:	KAFB-2007 01/19/17 N	KAFB-2008 01/21/15 N	KAFB-2008 12/29/15 N	KAFB-2008 01/18/17 N	KAFB-2008 01/18/17 FD	KAFB-2009 12/17/14 N	KAFB-2009 12/15/15 N	KAFB-2009 01/19/17 N
Field Data											
FIELD											
Dissolved Oxygen		mg/L		8.79	3.23	0	0.33	---	8.45	9.51	9.27
Oxidation-Reduction Potential		mV		166	120	91	40	---	228	264	170
pH		SU		7.53	7.43	7.64	7.74	---	7.3	7.46	7.46
Specific Conductance		uS/cm		0.867	0.514	0.565	0.605	---	0.576	0.632	0.599
Temperature		Deg C		17.49	18.47	20.09	20.32	---	15.9	14.1	16.23
Turbidity		NTU		0.5	4	0	0.6	---	0.4	0.4	0.4
Inorganic											
E350.1											
Ammonia		mg/L		---	<0.041	---	---	---	---	---	---
E351.2											
Nitrogen, Kjeldahl, Total		mg/L		<0.5 UJ	<0.08	---	<0.5 UJ	<0.5 UJ	---	---	<0.5 UJ
E353.2											
Nitrogen, Nitrate-Nitrite	10 GN18	mg/L		6.1	<0.085	<0.085	<0.12 U	<0.05 U	1.3	1.42	1.5
SW9056											
Bromide		mg/L		---	2.7	0.386	---	---	2.6	<0.5	---
Chloride (as Cl)	250 GN18	mg/L		---	22	22.5	---	---	38	30.6	---
Fluoride	1.6 GN18	mg/L		---	***2.4***	***2.34***	---	---	***3.1***	***2.97***	---
Sulfate	600 GN18	mg/L		---	100	100	---	---	77	82.3	---
SW9056A											
Bromide		mg/L		0.48 F	---	---	0.29 F	0.31 F	---	---	0.21 F
Chloride (as Cl)	250 GN18	mg/L		50	---	---	23	23	---	---	31
Fluoride	1.6 GN18	mg/L		***2.6***	---	---	***2.4***	***2.5***	---	---	***3.2***
Sulfate	600 GN18	mg/L		180	---	---	100	100	---	---	74
MNO											
SW6850											
Perchlorate	15 EM8	ug/L		---	<0.1	---	---	---	0.465 J	---	---
Volatile Organics											
SW8260B											
1,1,1-Trichloroethane	200 GN18	ug/L		<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
1,1,2,2-Tetrachloroethane	10 GN18	ug/L		<0.8	<0.75	<0.75	<0.8	<0.8	<0.75	<0.75	<0.8
1,1,2-Trichloroethane	5 GN18	ug/L		<0.8	<0.5	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8
1,1-Dichloroethane	25 GN18	ug/L		<0.8	<0.5	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8
1,1-Dichloroethene	7 GN18	ug/L		<0.8	<0.5	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8
1,2-Dichlorobenzene	600 GN18	ug/L		<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
1,2-Dichloroethane	5 GN18	ug/L		<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
1,2-Dichloropropane	5 GN18	ug/L		<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
1,3-Dichlorobenzene		ug/L		<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4

Table A-4
Groundwater Results
December 2014 - January 2017
MBG Site, Kirtland AFB

		Location ID:	KAFB-2007	KAFB-2008	KAFB-2008	KAFB-2008	KAFB-2008	KAFB-2009	KAFB-2009	KAFB-2009
		Sample Date:	01/19/17	01/21/15	12/29/15	01/18/17	01/18/17	12/17/14	12/15/15	01/19/17
		Sample Type:	N	N	N	N	FD	N	N	N
Parameter	Standard	**nits**								
1,4-Dichlorobenzene	75 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Acetone		ug/L	<6.4	<25	<25	<6.4	<6.4	<25	<25	<6.4
Benzene	5 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Bromodichloromethane	80 EM8	ug/L	0.55 F	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Bromoform	80 EM8	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Bromomethane		ug/L	<0.8	<2.5	<2.5	<0.8	<0.8	<2.5	<2.5	<0.8
Carbon Tetrachloride	5 GN18	ug/L	0.32 F	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Chlorobenzene	100 EM8	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Chloroethane		ug/L	<1.6	<2.5	<2.5	<1.6	<1.6	<2.5	<2.5	<1.6
Chloroform	80 EM8	ug/L	2.2 J	<2.5	<2.5	<0.4 J	<0.4 J	2.8	3.86	3.7 J
Chloromethane		ug/L	<0.8	<0.5	<0.5	<0.8	<0.8	<0.5	<0.5	<0.8
Cis-1,2-Dichloroethylene	70 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Cis-1,3-Dichloropropene		ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Dibromochloromethane	80 EM8	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Ethylbenzene	700 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Methyl Ethyl Ketone		ug/L	<4	<5	<5	<4	<4	<5	<5	<4
Methyl Isobutyl Ketone		ug/L	<3.2	<5	<5	<3.2	<3.2	<5	<5	<3.2
Methylene Chloride	5 GN18	ug/L	<0.8	<2.5	<2.5	<0.8	<0.8	<2.5	<2.5	<0.8
Styrene	100 GN18	ug/L	<0.4 J	<0.5	<0.5	<0.4 J	<0.4 J	<0.5	<0.5	<0.4 J
Tetrachloroethylene (PCE)	5 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Toluene	1000 GN18	ug/L	<0.4	1.8 J	<2.5	<0.4	<0.4	<2.5	<2.5	<0.4
Total Xylenes	620 GN18	ug/L	<0.8	<1.5	<1.5	<0.8	<0.8	<1.5	<1.5	<0.8
Trans-1,2-Dichloroethene	100 GN18	ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Trans-1,3-Dichloropropene		ug/L	<0.4	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Trichloroethylene (TCE)	5 GN18	ug/L	1.7	<0.5	<0.5	<0.4	<0.4	<0.5	<0.5	<0.4
Vinyl Chloride	2 GN18	ug/L	<0.2	<0.5	<0.5	<0.2	<0.2	<0.5	<0.5	<0.2

Qualifiers:

--- = Not analyzed or historic data not available

F = The analyte was positively identified but the associated numerical value is between the detection limit and the limit of quantitation

J = Result is estimated

U = The analyte was not detected above the limit of detection

Sample Type:

N = Normal Sample

FD = Field Duplicate

Units:

mg/L = milligrams per liter

ug/L = micrograms per liter

Standards

GN18 = Human health, domestic water, and Irrigation use New Mexico water standards, NMWQCC GW 20.006.0002 (Dec 2018)

EM8 = EPA MCL, National primary Drinking Water Regulations EPA 816-F-09-004

Exceedence format

Bold = Standard exceedence

Table A-5(a)
MBG Site, Kirtland AFB
Well KAFB-2005 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE 7/19/2006	10/18/2006	1/30/2007	4/24/2007	7/12/2007	10/17/2007	2/11/2008	5/19/2008	10/21/2010	1/24/2011	4/14/2011	7/11/2011	1/24/2012	1/24/2012 (Duplicate)	4/24/2012	7/24/2012	10/2/2012
VOCs (µg/L)																		
1,1,1,2-Tetrachloroethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	—	—	—	—	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	60	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2,2-Tetrachloroethane	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1-Dichloroethane	25	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trichlorobenzene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.17 J	< 0.26	< 0.26	< 0.26	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dibromo-3-chloropropane	0.2	< 3	< 3 UJ	< 5 UJ	< 5 UJ	< 5	< 5	< 3	< 5	< 2	< 2	< 2	< 2	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
1,2-Dibromoethane (EDB)	0.05	< 1	< 1	< 1	< 1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.22	< 0.22	< 0.22	< 0.22	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.15	< 0.15	< 0.15	< 0.15	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane (EDC)	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethene (total)	NA	< 1	< 1	< 1	< 1	—	—	< 1	—	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.24 J	< 0.28	< 0.28	< 0.28	< 0.8	< 0.8	< 0.4	< 0.4	< 0.4
1,3-Dichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	75	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
2,2-Dichloropropane	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 0.34	< 0.34	< 0.34	< 0.34	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
2-Butanone (MEK)	NA	< 5 UJ	< 5	< 6 UJ	< 6 UJ	6 UJ	6 UJ	< 5	6 UJ	< 4	< 4	< 4	< 4	< 3.2	< 3.2	< 3.2	< 3.2	< 3.2
2-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.14	< 0.14	< 0.14	< 0.14	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
2-Hexanone	NA	< 5	< 5	< 5	< 5 UJ	< 5	< 5	< 5	< 5	< 0.96	< 0.96	< 0.96	< 0.96	< 3.2	< 3.2	< 3.2	< 3.2	< 3.2
4-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
4-Isopropyltoluene	NA	—	—	—	—	< 1	< 1	< 1	< 1	—	—	—	—	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
4-Methyl-2-pentanone	NA	1.0 J	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 2	< 3.2	< 3.2	< 3.2	< 3.2	< 3.2
Acetone	NA	< 10 UJ	< 10 UJ	< 10 UJ	< 10 UJ	10 UJ	< 10	10 UJ	10 UJ	< 2.6	< 2.6	< 2.6	< 2.6	< 6.4	< 6.4	< 6.4	< 6.4	< 6.4
Benzene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.2 J	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bromobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NA	0.74 J	< 1	< 1	0.63 J	< 1	0.79 J	0.65 J	0.57 J	0.34 J	0.33 J	< 0.41	0.41 J	0.42 J	0.44 J	0.43 J	< 1	0.41 J
Bromoform	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Bromomethane	NA	< 2	< 2 UJ	< 2	< 2	< 2	2 UJ	< 2	< 2	< 0.86	< 0.86	< 0.86	< 0.86	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Carbon disulfide	NA	< 2	< 2	< 2	< 2	< 2	< 2	2 UJ	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 1.4	< 1.4	< 1.4	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Chloroform	100	1.6	< 1	< 1	1.4	1.4	1.5	< 1.3	1.2	1.1	1.3	< 1.5	1.2	1.4	1.4	1.2	< 1	1.2
Chloromethane	NA	< 2 UJ	< 2	< 2	< 2	< 2	< 2	< 2	< 2	3.1	< 0.64	< 0.64	0.36 J	< 1.6	< 1.6	< 0.8	< 0.8	< 0.8
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Dibromomethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Dichlorodifluoromethane	NA	< 2	< 2 UJ	< 2	< 2	< 2	< 2	< 2	< 2	< 0.34	< 0.34	< 0.34	< 0.34	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Ethylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.44	< 0.44	< 0.44	< 0.44	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobutadiene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.72	< 0.72	< 0.72	< 0.72	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Isopropylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
m,p-Xylene	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0.45 J	< 0.46	< 0.46	< 0.46	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Methyl tert-butyl ethter (MTBE)	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Methylene chloride	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1.3	< 1.3	< 1.3	< 1.3	< 0.54	< 0.46	< 1	< 0.4	< 0.4
Naphthalene	NA	< 1	< 1 UJ	< 1	< 1	< 1	< 1	< 1	< 1	0.8 J	< 1	< 1	< 1	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
n-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.28 J	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
n-Propylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

Table A-5(a)
MBG Site, Kirtland AFB
Well KAFB-2005 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE 7/19/2006	10/18/2006	1/30/2007	4/24/2007	7/12/2007	10/17/2007	2/11/2008	5/19/2008	10/21/2010	1/24/2011	4/14/2011	7/11/2011	1/24/2012	1/24/2012 (Duplicate)	4/24/2012	7/24/2012	10/2/2012
sec-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Styrene	100	< 1	< 1	< 1	< 1 UJ	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
tert-Butylbenzene	NA	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Toluene	750	15	43	54	20 J	12	19	18	16	108	1.5	23.6	0.2 J	0.34 J	0.34 J	0.2 J	< 0.4	< 0.4
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
trans-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Trichloroethene	5	0.54 J	0.37 J	0.51 J	0.3 J	< 1	0.41 J	0.47 J	0.41 J	0.4 J	0.53 J	0.46 J	0.47 J	0.48 J	0.47 J	0.42 J	0.34 J	0.36 J
Trichlorofluoromethane	NA	< 2	< 2 UJ	< 2	< 2 UJ	< 2	< 2	< 2	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Vinyl chloride	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.36	< 0.36	< 0.36	< 0.36	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Xylene, o-	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Xylenes, Total	620	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0.86 J	0.86 J	0.86 J	0.86 J	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Anions (mg/L)																		
Bromide	NA	—	—	—	—	—	—	—	—	1.5	—	< 0.93	0.67	0.3 J	0.29 J	0.35 J	0.35 J	0.3 J
Chloride	250	—	—	—	—	—	—	—	—	31	—	28.9	28.5	33	33	< 30	31	32
Fluoride	1.6	—	—	—	—	—	—	—	—	2.9	—	3	2.8	2.8	2.8	2.7	2.6	2.6
Nitrate (as Nitrogen)	10	4.9	8.6	< 1	5.0	5.4	5.6	5.3	5.3	6.2	6.1	5.6	5.7	6.1	6.1	5.1	5.1	5.4
Nitrite (as Nitrogen)	1	—	—	—	—	—	—	—	—	—	—	—	—	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	250	—	—	—	—	—	—	—	—	159	—	156	154	160	160	160	150	150
Field Parameters																		
Temperature (degrees C)		29.4	20.5	20.1	19.3	22.3	21.04	20.49	24.4	26.27	20.67	21.97	21.33	21.89		24.08	21.7	21.36
pH (standard pH units)		7.82	8.21	7.31	7.88	7.34	7.69	8.02	7.8	7.34	7.84	6.79	7.3	7.47		7.87	7.42	7.09
Conductivity (mS/cm)		0.748	0.844	0.798	0.785	0.689	0.968	0.753	0.69	0.642	0.681	0.783	0.89	0.834		0.778	0.772	0.701
Turbidity (NTU)		4.49	9.06	5.09	—	1.4	0.63	5.27	1.37	8	0	0.56	2.6	1.54		0.72	0.44	19.7
Dissolved Oxygen (mg/L)		11	2.53	4.54	142	NA	8.9	7.66	14.4	6.46	9.51	9.89	9.15	11.23		8.43	8.72	8.12
Redox Potential (mV)		152	110	162	—	NA	201	151	174	155	133	135	64	88		85	128	166

Shaded = detected
Bold = Exceeds Standard
C - celsius
µg/L - micrograms per liters
mg/L - milligrams per liter
mS/cm - milliisiemens per centimeter
mV - millivolt
NA - Not Applicable
NTU - nephelometric turbidity unit
VOCs - volatile organic compounds

Table A-5(b)
MBG Site, Kirtland AFB
Well KAFB-2006 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE																	
		7/18/2006	10/18/2006	1/29/2007	4/23/2007	4/23/2007 Duplicate	7/12/2007	10/18/2007	2/11/2008	5/20/2008	5/20/2008 Duplicate	10/22/2010	1/24/2011	4/12/2011	7/11/2011	1/23/2012	4/23/2012	7/23/2012	7/23/2012 Duplicate
VOCs (µg/L)																			
1,1,1,2-Tetrachloroethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	—	—	—	—	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	60	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2,2-Tetrachloroethane	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1-Dichloroethane	25	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trichlorobenzene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.16 J	< 0.26	< 0.26	< 0.26	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dibromo-3-chloropropane	0.2	< 3	< 3 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5	< 5	< 3	< 5	< 5	< 2	< 2	< 2	< 2	< 1.6	< 1.6	< 1.6	< 1.6
1,2-Dibromoethane (EDB)	0.1	< 1	< 1	< 1	< 1	< 1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.22	< 0.22	< 0.22	< 0.22	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.15	< 0.15	< 0.15	< 0.15	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane (EDC)	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethene (total)	NA	< 1	< 1	< 1	< 1	< 1	—	—	< 1	—	—	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.15 J	< 0.28	< 0.28	< 0.28	< 0.8	< 0.8	< 0.4	< 0.4
1,3-Dichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	75	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
2,2-Dichloropropane	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 0.34	< 0.34	< 0.34	< 0.34	< 0.4	< 0.4	< 0.4	< 0.4
2-Butanone (MEK)	NA	< 5 UJ	< 5	< 6 UJ	< 6 UJ	< 6 UJ	6 UJ	6 UJ	< 5	6 UJ	6 UJ	< 4	< 4	< 4	< 4	< 3.2	< 3.2	< 3.2	< 3.2
2-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.14	< 0.14	< 0.14	< 0.14	< 0.4	< 0.4	< 0.4	< 0.4
2-Hexanone	NA	< 5	< 5	< 5	< 5 UJ	< 5 UJ	< 5	< 5	< 5	< 5	< 5	< 0.96	< 0.96	< 0.96	< 0.96	< 3.2	< 3.2	< 3.2	< 3.2
4-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
4-Isopropyltoluene	NA	—	—	—	—	—	< 1	< 1	< 1	< 1	< 1	—	—	—	—	< 0.4	< 0.4	< 0.4	< 0.4
4-Methyl-2-pentanone	NA	< 1	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 2	< 3.2	< 3.2	< 3.2	< 3.2
Acetone	NA	< 10 UJ	< 10 UJ	< 10 UJ	< 10 UJ	< 10 UJ	10 UJ	< 10	10 UJ	10 UJ	10 UJ	< 2.6	< 2.6	< 2.6	< 2.6	< 6.4	< 6.4	< 6.4	< 6.4
Benzene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NA	< 1	< 1	0.96 J	0.83 J	0.84 J	< 1	0.78 J	0.86 J	0.82 J	0.85 J	5.7	5.1	6.2	4.2	5	6.9	6.6	6.5
Bromoform	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1.1	1	2.4	0.61 J	1.2	1.5	0.91 J	0.88 J
Bromomethane	NA	< 2	< 2 UJ	< 2	< 2	< 2	< 2	2 UJ	< 2	< 2	< 2	< 0.86	< 0.86	< 0.86	< 0.86	< 0.4	< 0.4	< 0.4	< 0.4
Carbon disulfide	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2 UJ	< 2	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Carbon tetrachloride	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 1.4	< 1.4	< 1.4	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
Chloroform	100	< 1	< 1	1.9	1.6	1.7	1.5	1.5	< 1.5	1.6	1.5	6.1	5.8	5.6	3.5	4.2	5.3	< 1	< 1
Chloromethane	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2	< 0.64	< 0.64	0.4 J	< 1.6	< 1.6	< 0.8	< 0.8
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	3.5	3.5	< 4.1	2	3.6	4.2	2.9	2.8
Dibromomethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	0.14 J	< 0.22	< 0.22	< 0.4	< 0.4	< 0.4	< 0.4
Dichlorodifluoromethane	NA	< 2	< 2 UJ	< 1	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 0.34	< 0.34	< 0.34	< 0.34	< 0.8	< 0.8	< 0.8	< 0.8
Ethylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.44	< 0.44	< 0.44	< 0.44	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobutadiene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.72	< 0.72	< 0.72	< 0.72	< 0.4	< 0.4	< 0.4	< 0.4
Isopropylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
m,p-Xylene	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	0.28 J	< 0.46	< 0.46	< 0.46	< 0.8	< 0.8	< 0.8	< 0.8
Methyl tert-butyl ethter (MTBE)	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Methylene chloride	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1.3	< 1.3	< 1.3	< 1.3	< 0.54	< 0.46	< 1	< 0.4
Naphthalene	NA	< 1	< 1 UJ	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.8	< 0.8	< 0.8	< 0.8
n-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
n-Propylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
sec-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4
Styrene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.4	< 0.4	< 0.4	< 0.4

Table A-5(b)
MBG Site, Kirtland AFB
Well KAFB-2006 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE																	
		7/18/2006	10/18/2006	1/29/2007	4/23/2007	4/23/2007 Duplicate	7/12/2007	10/18/2007	2/11/2008	5/20/2008	5/20/2008 Duplicate	10/22/2010	1/24/2011	4/12/2011	7/11/2011	1/23/2012	4/23/2012	7/23/2012	7/23/2012 Duplicate
tert-Butylbenzene	NA	< 5	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.4	< 0.4	< 0.4	< 0.4
Toluene	750	20	91	49	25 J	16 J	31	24	25	20	21	28.2	5.9	26.3	0.41 J	11	1.6	< 0.4	< 0.4
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
trans-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
Trichloroethene	5	1.3	1.1	1.3	0.94 J	1.0	< 1	0.94 J	1	1.1	1.2	0.26 J	0.31 J	< 0.38	< 0.38	0.18 J	< 0.2	< 0.2	< 0.2
Trichlorofluoromethane	NA	< 2	< 2 UJ	< 2	< 2 UJ	< 2 UJ	< 2	< 2	< 2	< 2	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Vinyl chloride	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.36	< 0.36	< 0.36	< 0.36	< 0.8	< 0.8	< 0.8	< 0.8
Xylene, o-	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Xylenes, Total	620	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 1	< 1	< 1	< 1	< 1.6	< 1.6	< 1.6	< 1.6
Anions (mg/L)																			
Bromide	NA	—	—	—	—	—	—	—	—	—	—	1.4	—	0.75	0.56	0.25 J	0.24 J	0.19 J	0.19 J
Chloride	250	—	—	—	—	—	—	—	—	—	—	39.6	—	42	41.5	39	36	28	28
Fluoride	1.6	—	—	—	—	—	—	—	—	—	—	2.4	—	2.5	2.4	2.5	2.4	2.6	2.6
Nitrate (as Nitrogen)	10	3.6	4.5	4.3	5.2	5.2	5.3	5.4	5.2	5.2	< 0.5	1.4	1.9	1.8	1.9	1.6	< 1.1	0.84	0.84
Nitrite (as Nitrogen)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	250	—	—	—	—	—	—	—	—	—	—	181	—	176	192	200	170	130	130
Field Parameters																			
Temperature (degrees C)		23.1	20.2	20.1	21.2		23.6	21.25	20.99	24.1		24.64	20.88	22.84	25.07	22.67	23.66	27.5	
pH (standard pH units)		7.67	8.12	7.5	7.73		7.66	7.32	7.91	7.5		7.19	7.59	7.27	7.28	7.45	7.74	7.22	
Conductivity (mS/cm)		0.769	0.781	0.814	1.03		0.79	0.9	0.875	0.89		0.749	0.801	0.859	1.01	0.988	0.906	0.773	
Turbidity (NTU)		6.04	6.02	3.55	—		3.3	1.07	1.34	0.96		3	0.3	1.28	19	2.44	4.86	1.19	
Dissolved Oxygen (mg/L)		9	3.61	2.13	136		—	5.11	4.67	5.6		4.61	7.32	7.16	7.07	8.05	5.78	7.43	
Redox Potential (mV)		-39	29	180	—		—	139	160	156		120	92	172	73	88	95	128	

Shaded = detected
Bold = Exceeds Standard
C - celsius
µg/L - micrograms per liters
mg/L - milligrams per liter
mS/cm - milliisiemens per centimeter
mV - millivolt
NA - Not Applicable
NTU - nephelometric turbidity unit
VOCs - volatile organic compounds

Table A-5(c)
MBG Site, Kirtland AFB
Well KAFB-2007 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE																
		7/19/2006	10/17/2006	1/29/2007	4/23/2007	7/11/2007	7/11/2007 Duplicate	10/17/2007	2/11/2008	5/19/2008	10/20/2010	1/25/2011	4/12/2011	7/12/2011	1/23/2012	4/23/2012	7/23/2012	10/1/2012
VOCs (µg/L)																		
1,1,1,2-Tetrachloroethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	—	—	—	—	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	60	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2,2-Tetrachloroethane	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
1,1,2-Trichloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1-Dichloroethane	25	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trichlorobenzene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	< 0.2	< 0.2	< 0.2	0.2 J
1,2-Dibromo-3-chloropropane	0.2	< 3	< 3	< 5	< 5 UJ	< 5	< 5	< 5	< 3	< 5	< 2	< 2	< 2	< 2	< 1.6	< 1.6	< 1.6	< 1.6
1,2-Dibromoethane (EDB)	0.1	< 1	< 1	< 1	< 1	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.22	< 0.22	< 0.22	< 0.22	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.15	< 0.15	< 0.15	< 0.15	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane (EDC)	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethene (total)	NA	< 1	< 1	< 1	< 1	—	—	—	< 1	—	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloropropane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.8	< 0.8	< 0.4	< 0.4
1,3-Dichlorobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	75	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
2,2-Dichloropropane	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 0.34	< 0.34	< 0.34	< 0.34	< 0.4	< 0.4	< 0.4	< 0.4
2-Butanone (MEK)	NA	< 5 UJ	< 5 UJ	< 6 UJ	< 6 UJ	6 UJ	6 UJ	6 UJ	< 5	6 UJ	< 4	< 4	< 4	< 4	< 3.2	< 3.2	< 3.2	< 3.2
2-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.14	< 0.14	< 0.14	< 0.14	< 0.4	< 0.4	< 0.4	< 0.4
2-Hexanone	NA	< 5	< 5	< 5	< 5 UJ	< 5	< 5	< 5	< 5	< 5	< 0.96	< 0.96	< 0.96	< 0.96	< 3.2	< 3.2	< 3.2	< 3.2
4-Chlorotoluene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
4-Isopropyltoluene	NA	—	—	—	—	< 1	< 1	< 1	< 1	< 1	—	—	—	—	< 0.4	< 0.4	< 0.4	< 0.4
4-Methyl-2-pentanone	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 2	< 3.2	< 3.2	< 3.2	< 3.2
Acetone	NA	< 10 UJ	< 10 UJ	< 10 UJ	< 10 UJ	10 UJ	10 UJ	< 10	10 UJ	10 UJ	< 2.6	< 2.6	< 2.6	< 2.6	< 6.4	< 6.4	< 6.4	< 6.4
Benzene	5	0.32 J	0.25 J	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.34	< 0.34	< 0.34	< 0.34	0.6 J	< 0.2	< 0.2	< 0.2
Bromobenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NA	< 1	0.38 J	0.46 J	0.48 J	< 1	< 1	0.5 J	0.44 J	0.47 J	0.58 J	< 0.6	< 0.63	0.58 J	0.62 J	0.78 J	< 1	0.79 J
Bromoform	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.4	< 0.4	< 0.4	< 0.4
Bromomethane	NA	< 2	< 2	< 2	< 2	< 2	< 2	2 UJ	< 2	< 2	< 0.86	< 0.86	< 0.86	< 0.86	< 0.4	< 0.4	< 0.4	< 0.4
Carbon disulfide	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Carbon tetrachloride	5	< 1	0.2 J	0.26 J	0.26 J	< 1	< 1	0.2 J	0.19 J	0.27 J	0.39 J	0.3 J	< 0.28	0.33 J	0.34 J	0.35 J	0.4 J	0.37 J
Chlorobenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 1.4	< 1.4	< 1.4	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
Chloroform	100	1.1	1.5	1.8	1.8	1.7	1.8	1.9	< 1.6	1.9	2.4	2.7	2.8	2.4	2.5	2.7	< 1	2.7
Chloromethane	NA	< 2 UJ	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	1	< 0.64	< 0.64	< 0.43	< 1.6	< 1.6	< 0.8	< 0.8
cis-1,2-Dichloroethene	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.26	< 0.26	< 0.26	< 0.26	3.6	4.2	2.9	1.7
Dibromomethane	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.22	< 0.26	< 0.22	< 0.22	< 0.4	< 0.4	< 0.4	< 0.4
Dichlorodifluoromethane	NA	< 2	< 2	< 1	< 2	< 2	< 2	< 2	< 2	< 2	< 0.34	< 0.34	< 0.34	< 0.34	< 0.8	< 0.8	< 0.8	< 0.8
Ethylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.44	< 0.44	< 0.44	< 0.44	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobutadiene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.72	< 0.72	< 0.72	< 0.72	< 0.4	< 0.4	< 0.4	< 0.4
Isopropylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
m,p-Xylene	NA	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 0.46	< 0.46	< 0.46	< 0.46	< 0.8	< 0.8	< 0.8	< 0.8
Methyl tert-butyl ethter (MTBE)	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Methylene chloride	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 1.3	< 1.3	< 1.3	< 1.3	< 0.54	< 0.46	< 1	< 0.4
Naphthalene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.8	< 0.8	< 0.8	< 0.8
n-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
n-Propylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2

Table A-5(c)
MBG Site, Kirtland AFB
Well KAFB-2007 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE																
		7/19/2006	10/17/2006	1/29/2007	4/23/2007	7/11/2007	7/11/2007 Duplicate	10/17/2007	2/11/2008	5/19/2008	10/20/2010	1/25/2011	4/12/2011	7/12/2011	1/23/2012	4/23/2012	7/23/2012	10/1/2012
sec-Butylbenzene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4
Styrene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.24	< 0.24	< 0.24	< 0.24	< 0.4	< 0.4	< 0.4	< 0.4
tert-Butylbenzene	NA	< 5	< 5	< 5	< 5	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Tetrachloroethene	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.42	< 0.42	< 0.42	< 0.42	< 0.4	< 0.4	< 0.4	< 0.4
Toluene	750	100	70 J	36	45	30	32	62	63	36	6.8	1.4	91.2	0.25 J	2.9	< 1	0.25 J	< 0.4
trans-1,2-Dichloroethene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
trans-1,3-Dichloropropene	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
Trichloroethene	5	2.1	2.1	2.6	2.1	1.8	2	1.8	1.9	2.3	2.1	2.5	2.2	1.8	1.8	2.1	1.9	2
Trichlorofluoromethane	NA	< 2	< 2	< 2	< 2 UJ	< 2	< 2	< 2	< 2	< 2	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Vinyl chloride	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.36	< 0.36	< 0.36	< 0.36	< 0.8	< 0.8	< 0.8	< 0.8
Xylene, o-	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Xylenes, Total	620	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 1	< 1	< 1	< 1	< 1.6	< 1.6	< 1.6	< 1.6
Anions (mg/L)																		
Bromide	NA	—	—	—	—	—	—	—	—	—	1.6	—	1	0.74	0.46 J	0.48 J	0.47 J	0.49 J
Chloride	250	—	—	—	—	—	—	—	—	—	47.1	—	46.3	43.7	45	47	45	48
Fluoride	1.6	—	—	—	—	—	—	—	—	—	2.8	—	2.6	2.4	2.5	2.5	2.4	2.5
Nitrate (as Nitrogen)	10	1.2	4.0	5.0	4.9	5.2	5.2	5.5	5.4	5.2	5.3	5.3	5.1	4.9	4.9	4.8	4.9	5.1
Nitrite (as Nitrogen)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	250	—	—	—	—	—	—	—	—	—	204	—	192	182	180	190	180	190
Field Parameters																		
Temperature (degrees C)		25.3	23.3	20.5	22.7	23.5		23.75	23.8	23	25.19	23.54	23.67	25.6	24.92	25.78	29	25.22
pH (standard pH units)		7.79	8.52	7.61	7.8	7.56		7.7	7.87	7.6	7.53	7.66	7.48	7.45	7.6	7.83	7.22	6.82
Conductivity (mS/cm)		0.975	0.867	0.889	1.09	0.91		0.999	0.924	0.83	0.748	0.811	0.833	0.909	0.894	0.875	0.835	0.77
Turbidity (NTU)		5.84	7.68	3	—	20.6		3.65	15.4	43.6	58	5.4	6.22	6.2	12.4	2.51	9.7	26.9
Dissolved Oxygen (mg/L)		10	36	82.8	153	10.32		6.24	5.53	8.1	5.54	7.63	8.07	7.41	8.06	6.47	8.38	4.24
Redox Potential (mV)		-64	52	84	—	NA		173	147	146	77	48	138	95	66	83	134	191

Shaded = detected
Bold = Exceeds Standard
C - celsius
µg/L - micrograms per liters
mg/L - milligrams per liter
mS/cm - milliisiemens per centimeter
mV - millivolt
NA - Not Applicable
NTU - nephelometric turbidity unit
VOCs - volatile organic compounds

Table A-5(d)
MBG Site, Kirtland AFB
Well KAFB-2008 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE								
		10/19/2010	10/19/2010 Duplicate	1/25/2011	4/13/2011	7/12/2011	1/24/2012	4/25/2012	7/24/2012	10/2/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	NA	—	—	—	—	—	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	60	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2,2-Tetrachloroethane	10	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
1,1,2-Trichloroethane	5	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1-Dichloroethane	25	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	5	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichlorobenzene	NA	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichloropropane	NA	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trichlorobenzene	70	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trimethylbenzene	NA	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dibromo-3-chloropropane	0.2	< 2	< 2	< 2	< 2	< 2	< 1.6	< 1.6	< 1.6	< 1.6
1,2-Dibromoethane (EDB)	0.1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	600	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane (EDC)	5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethene (total)	NA	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloropropane	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.8	< 0.8	< 0.4	< 0.4
1,3-Dichlorobenzene	NA	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	75	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
2,2-Dichloropropane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.4	< 0.4	< 0.4	< 0.4
2-Butanone (MEK)	NA	< 4	< 4	< 4	< 4	< 4	< 3.2	< 3.2	< 3.2	< 3.2
2-Chlorotoluene	NA	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.4	< 0.4	< 0.4	< 0.4
2-Hexanone	NA	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 3.2	< 3.2	< 3.2	< 3.2
4-Chlorotoluene	NA	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
4-Isopropyltoluene	NA	—	—	—	—	—	< 0.4	< 0.4	< 0.4	< 0.4
4-Methyl-2-pentanone	NA	< 2	< 2	< 2	< 2	< 2	< 3.2	< 3.2	< 3.2	< 3.2
Acetone	NA	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	6.2 J	< 6.4	< 6.4	< 6.4
Benzene	5	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromobenzene	NA	< 0.42	< 0.42	< 0.42	< 0.42	< 0.42	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NA	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
Bromoform	NA	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.4	< 0.4	< 0.4	< 0.4
Bromomethane	NA	< 0.86	< 0.86	< 0.86	< 0.86	< 0.86	< 0.4	< 0.4	< 0.4	< 0.4
Carbon disulfide	NA	—	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Carbon tetrachloride	5	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
Chlorobenzene	100	0.21 J	0.21 J	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NA	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
Chloroform	100	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2
Chloromethane	NA	3.7 J	1.4 J	< 0.64	< 0.64	< 0.43	< 1.6	< 1.6	< 0.8	< 0.8
cis-1,2-Dichloroethene	70	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	NA	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NA	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
Dibromomethane	NA	< 0.22	< 0.22	< 0.26	< 0.22	< 0.22	< 0.4	< 0.4	< 0.4	< 0.4
Dichlorodifluoromethane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.8	< 0.8	< 0.8	< 0.8
Ethylbenzene	700	< 0.44	< 0.44	< 0.44	< 0.44	< 0.44	< 0.2	0.24 J	< 0.2	< 0.2
Hexachlorobutadiene	NA	< 0.72	< 0.72	< 0.72	< 0.72	< 0.72	< 0.4	< 0.4	< 0.4	< 0.4

Table A-5(d)
MBG Site, Kirtland AFB
Well KAFB-2008 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE								
		10/19/2010	10/19/2010 Duplicate	1/25/2011	4/13/2011	7/12/2011	1/24/2012	4/25/2012	7/24/2012	10/2/2012
Isopropylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
m,p-Xylene	NA	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.8	< 0.8	< 0.8	< 0.8
Methyl tert-butyl ethter (MTBE)	NA	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Methylene chloride	5	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 0.47	< 3.2	< 1	< 0.4
Naphthalene	NA	< 1	< 1	< 1	< 1	< 1	< 0.8	< 0.8	< 0.8	< 0.8
n-Butylbenzene	NA	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
n-Propylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
sec-Butylbenzene	NA	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4
Styrene	100	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.4	8.5	< 0.4	< 0.4
tert-Butylbenzene	NA	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Tetrachloroethene	5	< 0.42	< 0.42	< 0.42	< 0.42	< 0.42	< 0.4	< 0.4	< 0.4	< 0.4
Toluene	750	180	174	36.7	213	34.5	5.4	3.4	< 0.4	0.92 J
trans-1,2-Dichloroethene	100	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
trans-1,3-Dichloropropene	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
Trichloroethene	5	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
Trichlorofluoromethane	NA	—	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Vinyl chloride	1	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.8	< 0.8	< 0.8	< 0.8
Xylene, o-	NA	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Xylenes, Total	620	< 1	< 1	< 1	< 1	< 1	< 1.6	< 1.6	< 1.6	< 1.6
Anions (mg/L)										
Bromide	NA	1.4	1.4	—	0.61	0.52	0.19 J	0.3 J	0.29 J	0.28 J
Chloride	250	26.4	26.4	—	24.1	23.2	25	< 24	23	24
Fluoride	1.6	3	3.8	—	2.7	2.4	2.6	2.4	2.3	2.4
Nitrate (as Nitrogen)	10	< 0.072	< 0.072	< 0.072	< 0.072	< 0.072	< 0.1	< 0.1	< 0.5	0.048 J
Nitrite (as Nitrogen)	1	—	—	—	—	—	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	250	115	115	—	127	132	130	110	99	100
Field Parameters										
Temperature (degrees C)		25.33		23.25	26.51	26.8	27.91	22.82	25.3	25.43
pH (standard pH units)		8.04		7.88	7.17	7.67	7.55	8.04	7.6	7.33
Conductivity (mS/cm)		0.49		0.543	0.622	0.691	0.652	0.584	0.837	0.505
Turbidity (NTU)		44.2		127	6.87	179	7.98	8.48	10.3	9.0
Dissolved Oxygen (mg/L)		0.42		2.7	2.3	3.22	0.79	0.59	0.16	2.01
Redox Potential (mV)		138		21	44	16	73	88	104	193

Shaded = detected
Bold = Exceeds Standard
C - celsius
µg/L - micrograms per liters
mg/L - milligrams per liter
mS/cm - milliisiemens per centimeter
mV - millivolt
NA - Not Applicable
NTU - nephelometric turbidity unit
VOCs - volatile organic compounds

Table A-5(e)
MBG Site, Kirtland AFB
Well KAFB-2009 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE 10/20/2010	1/26/2011	4/14/2011	4/14/2011 Duplicate	7/13/2011	1/25/2012	4/24/2012	7/25/2012	10/4/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	NA	—	—	—	—	—	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	60	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2,2-Tetrachloroethane	10	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
1,1,2-Trichloroethane	5	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,1-Dichloroethane	25	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	5	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichlorobenzene	NA	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
1,2,3-Trichloropropane	NA	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trichlorobenzene	70	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.8	< 0.8	< 0.8	< 0.8
1,2,4-Trimethylbenzene	NA	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dibromo-3-chloropropane	0.2	< 2	< 2	< 2	< 2	< 2	< 1.6	< 1.6	< 1.6	< 1.6
1,2-Dibromoethane (EDB)	0.1	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	600	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane (EDC)	5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethene (total)	NA	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloropropane	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.8	< 0.8	< 0.4	< 0.4
1,3-Dichlorobenzene	NA	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	75	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
2,2-Dichloropropane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.4	< 0.4	< 0.4	< 0.4
2-Butanone (MEK)	NA	< 4	< 4	< 4	< 4	< 4	< 3.2	< 3.2	< 3.2	< 3.2
2-Chlorotoluene	NA	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.4	< 0.4	< 0.4	< 0.4
2-Hexanone	NA	< 0.96	< 0.96	< 0.96	< 0.96	< 0.96	< 3.2	< 3.2	< 3.2	< 3.2
4-Chlorotoluene	NA	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.4	< 0.4	< 0.4	< 0.4
4-Isopropyltoluene	NA	—	—	—	—	—	< 0.4	< 0.4	< 0.4	< 0.4
4-Methyl-2-pentanone	NA	< 2	< 2	< 2	< 2	< 2	< 3.2	< 3.2	< 3.2	< 3.2
Acetone	NA	< 2.6	< 2.6	< 2.6	< 2.6	< 2.6	< 6.4	< 6.4	< 6.4	< 6.4
Benzene	5	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromobenzene	NA	< 0.42	< 0.42	< 0.42	< 0.42	< 0.42	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NA	0.21 J	0.22 J	< 0.23	< 0.23	0.22 J	0.18 J	< 0.2	< 0.2	0.21 J
Bromoform	NA	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.4	< 0.4	< 0.4	< 0.4
Bromomethane	NA	< 0.86	< 0.86	< 0.86	< 0.86	< 0.86	< 0.4	< 0.4	< 0.4	< 0.4
Carbon disulfide	NA	—	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Carbon tetrachloride	5	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
Chlorobenzene	100	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NA	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
Chloroform	100	2.6	2.9	3.4	3.2	3	2.7	2.8	< 1	3
Chloromethane	NA	2.8	< 0.64	< 0.64	< 0.64	< 0.43	< 1.6	< 0.8	< 0.8	< 0.8
cis-1,2-Dichloroethene	70	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,3-Dichloropropene	NA	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NA	< 0.26	< 0.26	< 0.26	< 0.26	< 0.26	< 0.4	< 0.4	< 0.4	< 0.4
Dibromomethane	NA	< 0.22	< 0.26	< 0.22	< 0.22	< 0.22	< 0.4	< 0.4	< 0.4	< 0.4
Dichlorodifluoromethane	NA	< 0.34	< 0.34	< 0.34	< 0.34	< 0.34	< 0.8	< 0.8	< 0.8	< 0.8
Ethylbenzene	700	< 0.44	< 0.44	< 0.44	< 0.44	< 0.44	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobutadiene	NA	< 0.72	< 0.72	< 0.72	< 0.72	< 0.72	< 0.4	< 0.4	< 0.4	< 0.4

Table A-5(e)
MBG Site, Kirtland AFB
Well KAFB-2009 Historical Analytical and Field Data

Analyte	Regulatory Level	SAMPLE DATE								
		10/20/2010	1/26/2011	4/14/2011	4/14/2011 Duplicate	7/13/2011	1/25/2012	4/24/2012	7/25/2012	10/4/2012
Isopropylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
m,p-Xylene	NA	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.8	< 0.8	< 0.8	< 0.8
Methyl tert-butyl ethter (MTBE)	NA	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Methylene chloride	5	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3	< 0.47	< 3.2	< 1	< 0.4
Naphthalene	NA	< 1	< 1	< 1	< 1	< 1	< 0.8	< 0.8	< 0.8	< 0.8
n-Butylbenzene	NA	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.4	< 0.4	< 0.4	< 0.4
n-Propylbenzene	NA	< 0.28	< 0.28	< 0.28	< 0.28	< 0.28	< 0.2	< 0.2	< 0.2	< 0.2
sec-Butylbenzene	NA	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4	< 0.4	< 0.4
Styrene	100	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.4	< 0.4	< 0.4	< 0.4
tert-Butylbenzene	NA	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Tetrachloroethene	5	< 0.42	< 0.42	< 0.42	< 0.42	< 0.42	< 0.4	< 0.4	< 0.4	< 0.4
Toluene	750	51.8	< 0.28	108	102	< 0.28	< 0.4	< 0.4	< 0.4	< 0.4
trans-1,2-Dichloroethene	100	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.2	< 0.2	< 0.2	< 0.2
trans-1,3-Dichloropropene	NA	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.4	< 0.4	< 0.4	< 0.4
Trichloroethene	5	< 0.38	< 0.38	< 0.38	< 0.38	< 0.38	< 0.2	< 0.2	< 0.2	< 0.2
Trichlorofluoromethane	NA	—	—	—	—	—	< 0.8	< 0.8	< 0.8	< 0.8
Vinyl chloride	1	< 0.36	< 0.36	< 0.36	< 0.36	< 0.36	< 0.8	< 0.8	< 0.8	< 0.8
Xylene, o-	NA	< 1	< 1	< 1	< 1	< 1	< 0.4	< 0.4	< 0.4	< 0.4
Xylenes, Total	620	< 1	< 1	< 1	< 1	< 1	< 1.6	< 1.6	< 1.6	< 1.6
Anions (mg/L)										
Bromide	NA	1.3	—	< 0.62	< 0.68	< 0.5	0.22 J	0.24 J	0.24 J	0.23 J
Chloride	250	36.1	—	33.7	33.6	31.7	33	34	32	32
Fluoride	1.6	3	—	3.3	3.3	3	3.1	3.1	2.9	2.9
Nitrate (as Nitrogen)	10	1.7	1.6	1.6	1.6	1.4	1.5	1.5	1.5	1.2
Nitrite (as Nitrogen)	1	—	—	—	—	—	< 0.1	< 0.1	< 0.1	< 0.1
Sulfate	250	87.6	—	82.5	82.3	78.7	79	< 84	79	80
Field Parameters										
Temperature (degrees C)		24.25	19.81	21.47		21.6	20.33	23.09	22.7	20.22
pH (standard pH units)		7.57	7.85	6.91		7.55	7.38	7.91	7.53	7.17
Conductivity (mS/cm)		0.552	0.571	0.604		0.664	0.654	0.646	0.829	0.552
Turbidity (NTU)		6.52	0	1.17		6.1	3.55	0.48	0.61	1.2
Dissolved Oxygen (mg/L)		5.24	7.26	9.51		8.95	10.2	7.84	8.18	6.01
Redox Potential (mV)		144	119	120		—	115	98	148	199

Shaded = detected
Bold = Exceeds Standard
C - celsius
µg/L - micrograms per liters
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NA - Not Applicable
NTU - nephelometric turbidity unit
VOCs - volatile organic compounds

APPENDIX B

CG-570 – NMED Approval Letter for CG-570 Explosive Ordnance Disposal Hill RFI

CG-105 – NMED Approval Letter for CG-105 Trichloroethene Impacted Groundwater Monitoring Report

State of New Mexico
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary
J. C. BORREGO
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 8, 2017

Colonel Richard Gibbs
Base Commander
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB, NM 87117

Lt. Colonel Wayne J. Acosta
Civil Engineer Office
377 Civil Engineering Division
2050 Wyoming Blvd SE, Suite 116
Kirtland AFB, NM 87117

RE: APPROVAL
FINAL CG-570 EXPLOSIVE ORDNANCE DISPOSAL HILL - RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT, SEPTEMBER 2017
KIRTLAND AIR FORCE BASE, NEW MEXICO
EPA ID # NM9570024423
HWB-KAFB-17-009

Dear Colonel Gibbs and Colonel Acosta:

The New Mexico Environment Department (NMED) received the U.S. Air Force (Permittee) Kirtland Air Force Base *Final CG-570 Explosive Ordnance Disposal Hill - Resource Conservation and Recovery Act Facility Investigation Report* (Report), on October 23, 2017. NMED has reviewed the Report and hereby issues this approval. The Permittee may discontinue groundwater monitoring at the EOD Hill Borehole. Prior to plugging and abandoning the EOD Hill Borehole, the Permittee must submit a well abandonment work plan for NMED approval, as well as obtain approval from the New Mexico Office of the State Engineer for the well abandonment plan.

If you have any questions regarding this letter, please contact Naomi Davidson at (505) 222-9504.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
N. Davidson, NMED HWB
B. Wear, NMED HWB
L. King, EPA Region 6 (6MM-RC)
S. Clark, KAFB

File: KAFB 2017 and Reading, KAFB-17-009

State of New Mexico
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
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SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary
J. C. BORREGO
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 3, 2017

Colonel Richard Gibbs
Base Commander
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB, NM 87117

Lt. Colonel Wayne J. Acosta
Civil Engineer Office
377 Civil Engineering Division
2050 Wyoming Blvd SE, Suite 116
Kirtland AFB, NM 87117

RE: APPROVAL
FINAL ST-105 FISCAL YEAR 2017 TRICHLOROETHENE IMPACTED GROUNDWATER MONITORING REPORT, JULY 2017
KIRTLAND AIR FORCE BASE, NEW MEXICO
EPA ID # NM9570024423
HWB-KAFB-17-008

Dear Colonel Gibbs and Colonel Acosta:

The New Mexico Environment Department (NMED) received the *Final ST-105 Fiscal Year 2017 Trichloroethene Impacted Groundwater Monitoring Report, July 2017* (Report), on October 4, 2017. The Report is specific to monitoring of the TCE contamination at the AOC Manzano Base Groundwater (MBG) rather than ST-105, which includes MBG, Monitoring Well WYO-4 Area, Tijeras Arroyo Groundwater, and McCormick Ranch; therefore, this approval pertains only to MBG. NMED has reviewed the Report and hereby issues this approval. KAFB may discontinue periodic groundwater monitoring at MBG.

If you have any questions regarding this letter, please contact Naomi Davidson at (505) 222-9504.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
N. Davidson, NMED HWB
B. Wear, NMED HWB
L. King, EPA Region 6 (6MM-RC)
S. Clark, KAFB

File: KAFB 2017 and Reading, KAFB-17-008

APPENDIX C

New Mexico Office of the State Engineer Well Plugging Forms Site CG-570

PLUGGING RECORD

NOTE: **A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC**

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: EOD Hill Well (Unpermitted)

Well owner: POC: scott.clark@us.af.mil Kirtland Air Force Base Phone No.: 505-846-9017

Mailing address: 2000 Wyoming Blvd. SE

City: Albuquerque State: NM Zip code: 87117

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: JR Drilling, LLC

2) New Mexico Well Driller License No.: 1644 Expiration Date: 10/31/2020

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): Rob Helton

4) Date well plugging began: 5/21/2019 Date well plugging concluded: 5/22/2019

5) GPS Well Location: Latitude: 34 deg, 58 min, 48.01 sec
Longitude: 106 deg, 29 min, 44.25 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 250.00 ft below ground level (bgl), by the following manner: WLI

7) Static water level measured at initiation of plugging: 146.50 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 1/18/2019 Mr. Anthony Thompson

9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Version: September 8, 2009
Page 1 of 2

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
Unpermitted 6" Steel TD@ 250.00'	3/8" Washed Pea Gravel from 250' to 171' (1&3/4 Tons) ¼ Coated Bentonite Pellets from 171' to 149' (6 Pails) Portland Cement Type I/II (Neat Cement Grout)	230.00	223.50	TREMIE PIPE	2' Subsidence/Filled w/ Concrete No displacement of water occurred. Well Completion was removed, well cut below grade, and the surface was restored as required. Coated Pellets were allowed to hydrate for 24 hrs. before introducing Grout.

MULTIPLY		BY		AN
cubic feet	x	7.4805	=	gal

III. SIGNATURE:

I, Rob Helton, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

5/27/2019
Date

Version: September 8, 2009
Page 2 of 2

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: EOD-well (non-registered)

Name of well owner: Kirtland Air Force Base

Mailing address: 2000 Wyoming Blvd SE

City: Albuquerque State: NM Zip code: 87117

Phone number: 505-845-9017 E-mail: scottclark@us.af.mil

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: JR Drilling

New Mexico Well Driller License No.: WD-1644 Expiration Date: 10/31/2020

2019 JUN -9 PM 3:24 STATE ENGINEER OFFICE

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 34 deg 58 min 48.01N sec
Longitude: 106 deg 29 min 44.25W sec, WGS84
☒ Check if seconds are decimal format.

2) Reason(s) for plugging well:

No longer needed for water quality. The NMED has approved the abandonment in a letter to the Air Force.

3) Was well used for any type of monitoring program? Y If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? Y If yes, provide additional detail, including analytical results and/or laboratory report(s):

Well is an open hole used by the Air Force for testing. The well terminates in the Madera limestone at the top of the the Sandia Granite. The groundwater comes from fracture flow in the limestone.

5) Static water level: 145 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 250 feet

7) Inside diameter of innermost casing: 6 inches.

8) Casing material: steel

9) The well was constructed with:

[■] an open-hole production interval, state the open interval: 250-210 feet

[ ] a well screen or perforated pipe, state the screened interval(s):

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

11) Was the well built with surface casing? Y If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Y If yes, please describe:

The upper 5 feet is sealed with cement and a 4ft-4ft concrete pad is installed around a 10-inch steel protective casing.

12) Has all pumping equipment and associated piping been removed from the well? Y If not, describe remaining equipment and intentions to remove prior to plugging in Section VIII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:

The EOD well plugging intervals as follows: 3/8-inch pea gravel from the bottom of the open BH at 248 ft to approximately 205 ft, Above the pea gravel 2 ft of 3/8-inch coated bentonite pellets (205 ft to 203 ft). Pressure grout from 203 feet to surface with neat cement grout.

2) Will well head be cut-off below land surface after plugging? yes

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant.

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: 320 gallons

4) Type of Cement proposed: Portland Cement Type I/II

5) Proposed cement grout mix: 5.2 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

X mixed on site

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7)) Gravel additives requested and percent by dry weight relative to cement:

no additives used.

8)) Additional notes and calculations:

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

VIII. SIGNATURE:

I, RICHARD W. GIBBS, Colonel, USAF Commander, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

Richard W. Gibbs — Signature of Applicant

20 Dec 18 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

_____ Approved subject to the attached conditions.
_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this _____ day of _____, _____

Tom Blaine P.E., New Mexico State Engineer

By: _____

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2019 JAN -9 PM 3:24

TABLE A--For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1--deepest	Interval 2	Interval 3--most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)	surface		
Bottom of proposed interval of grout placement (ft bgl)	205		
Theoretical volume of grout required per interval (gallons)	320		
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement	5.2 gallons per 94 pound bag		
Mixed on-site or batch-mixed and delivered?	Mixed on Site		
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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2019 JAN -5 PM 3:24

TABLE B – For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and intersects only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			