SECOND FIVE-YEAR REVIEW REPORT

FINAL REV 1

Altus Air Force Base

Altus, Oklahoma

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Acronyms and Abbreviations

AAFB	Altus Air Force Base
ABW	Air Base Wing
Aerostar	Aerostar Environmental Services, Inc.
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AGE	Aerospace Ground Equipment
AOC	Area of Concern
bgs	below ground surface
Black & Veatch	Black & Veatch Special Projects Corp.
Bldg	building
BMW	Bio-mulch Wall (previously referred to as Bark Mulch Wall)
CAO	Corrective Action Objective
CAP	Corrective Action Plan
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
COC	chemical of concern
CSIA	Compound Specific Isotope Analysis
CSM	Conceptual Site Model
CUZ	Compatible Use Zones
CVOC	chlorinated volatile organic compound
DCE	dichloroethene
DD	Decision Document
DO	dissolved oxygen
EOD	Explosive Ordnance Demolition
ERA	Ecological Risk Assessment
ERD	Enhanced Reductive Dechlorination
ERP	Environmental Restoration Program
EVO	Emulsified Vegetable Oil
FDD	Final Decision Document
FPTA	Fire Protection Training Area
ft	feet/foot
FYR	Five-Year Review
GWMU	Groundwater Management Unit
HH&E	human health and the environment
HHRA	human health risk assessment
HSWA	Hazardous and Solid Waste Amendments
IA	Investigation Analysis

IC	institutional control
ICBM	Intercontinental Ballistic Missile
ICM	Interim Corrective Measures
IM	Interim Measure
IRP	Installation Restoration Program
ISCO	In Situ Chemical Oxidation
LAIRD	Lugert-Altus Irrigation District
LTM	Long-Term Monitoring
LUC	Land Use Control
MAROS	Monitoring and Remediation Optimization System
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
µg/L	micrograms per liter
MNA	Monitored Natural Attenuation
MSSL	Maximum Soil Screening Level
NFA	No Further Action
NGVD	National Geodetic Vertical Datum
NOD	Nature of Discharge
O&M	operation and maintenance
ODEQ	Oklahoma Department of Environmental Quality
ORP	oxidation-reduction potential
OU	Operable Unit
OWRB	Oklahoma Water Resources Board
OWS	Oil/Water Separator
PCE	perchloroethylene
POC	Point of Compliance
POL	Petroleum, Oils and Lubricants
P&T	pump and treat
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RCRA Permit	RCRA Corrective Action Permit
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RPM	Remedial Project Manager
RTCs	response to comments
SAC	Strategic Air Command
SOB	Statement of Basis

SS	Spill Site
SWMU	Solid Waste Management Unit
TAC	Tactical Air Command
TCE	trichloroethylene
TDS	Total Dissolved Solids
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VC	vinyl chloride
VOC	volatile organic compound
WP	washrack pond
WWII	World War II
WWTP	Waste Water Treatment Plant

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Executive Summary

Past releases from equipment cleaning, aircraft cleaning, fire training and disposal practices at Altus Air Force Base (AAFB) have resulted in soil and groundwater contamination, primarily chlorinated volatile organic compounds (CVOCs). Corrective action activities are presently being conducted under the Resource Conservation and Recovery Act (RCRA) authority by the Oklahoma Department of Environmental Quality (ODEQ) as directed in the Altus AFB RCRA Final Corrective Action Permit (Permit No. 9571824045-CA).

In November 1996, the U.S. Environmental Protection Agency (USEPA), Region 6 issued the Final Administrative Order to AAFB pursuant to Section 3008(h) of RCRA. The Final Administrative Order required AAFB to identify, investigate, and evaluate corrective actions for hazardous waste released at the Site and to design and implement corrective measures at sites where necessary to protect human health and the environment (HH&E).

In November 2002, AAFB completed the Draft RCRA Facility Investigation (RFI)/Investigation Analysis (IA)/Corrective Measure Study (CMS) Report (Earth Tech, 2002) to address the sites listed in the Final Administrative Order. The *Draft RFI/IA/CMS Report* addressed 55 geographically distinct sites at AAFB.

In January 2010, the ODEQ issued the RCRA Final Corrective Action Permit (RCRA Permit) pursuant to the Hazardous and Solid Waste Amendments (HSWA). The Response to Comments (RTCs)/Final Decision Document (FDD; which identified the corrective action objectives [CAOs] of the final selected remedy), is included in the Permit. Upon issuance of the RCRA Corrective Action Plan (CAP), which is equivalent in scope to the Final Administrative Order, the USEPA Region 6 terminated the Final Administrative Order. As a result, implementation of the final remedy for AAFB falls under the jurisdiction of the ODEQ Land Protection Division through the RCRA Permit. The Final CAP states all necessary conditions for the implementation of the final remedy for AAFB.

The final groundwater CAO is to contain the contaminant plume, rather than return the groundwater to its maximum beneficial use. There are four groundwater plumes associated with AAFB. Each plume management zone is called a Groundwater Management Unit (GWMU) and is delineated by groundwater monitoring wells. Historically, soil impacts at individual solid waste management units (SWMUs) or areas of concern (AOCs) were addressed separately from the GWMUs.

This review focused on the protectiveness of remedial actions for the GWMUs of AAFB. The methods, findings, and conclusions are documented in this report. Recommendations are also presented to address issues identified during the review.

The findings of this Five-Year Review (FYR) indicate that the immediate concerns have been addressed; however, the remedy does not comply with the requirements of the RCRA Permit because the plume has not been contained south of Highway 62.

The Corrective Action and Interim Corrective Measures for the sites at AAFB included demolition and removal of structures and impacted soil and groundwater in source areas of contamination; installation, operation and maintenance (O&M) of bioreactors, bio-mulch walls (BMWs), and injection of emulsified vegetable oil (EVO) to enhance bioremediation of impacted groundwater; implementation of a groundwater and surface water monitoring program; and implementation of land use controls (LUCs)/institutional controls (ICs). Groundwater monitoring and groundwater treatment projects including enhance reductive dechlorination (ERD)/bioremediation are ongoing at AAFB. Exposure

pathways through contaminated soil and groundwater that could otherwise result in unacceptable risks are currently being controlled by LUCs.

Issues identified for follow-up include recommendations for maintenance of the groundwater monitoring network, the possible need for LUCs further offsite, selection of additional POCs to provide a mechanism for implementing contingent corrective measures, further evaluation of groundwater plumes and trends, and following proper procedures for contingency corrective actions per the RCRA Permit.

Five-Year Review Summary

PROTECTIVENESS STATEMENTS:

The final remedy, including source removal, multiple ERD technologies, groundwater monitoring and the use of ICs to control exposure to contaminants, was chosen for the four GWMUs at AAFB and is described in the Final RCRA Permit. Concerns at the Sites are being addressed through source removal activities, ERD, bioremediation, groundwater monitoring and the implementation of LUCs/ICs. The remedy is expected to be protective of HH&E; provided the remedy is implemented as stated in the Final RCRA Permit and LUCs/ICs are enforced.

GWMU 1 (Sites SS017, SS018, SS022, SS023, ST012, washrack pond 002, SS016, SS010, and WP001)

The GWMU 1 remedy does not comply with the requirements of the RCRA Permit and associated issues that affect short-term and long-term protectiveness of the GWMU 1 remedy have been identified. The plume has not been contained north of Highway 62; contaminant concentrations at the Point-of-Compliance (POC) wells are increasing and trichloroethylene (TCE) has exceeded its Maximum Contaminant Level (MCL) in several POC wells, including off-Base POC wells. The existing remedies are not functioning to treat/contain contaminated groundwater. The plume is not stable and is migrating downgradient. Although the POC Contingency Work Plan is in place to manage POC wells and potential risks/exposures at GWMU 1 via LUCs, the plan does not address the loss of plume stability. Also, while LUCs have been implemented for all on-base property and for four off-base properties underlain by the GWMU 1 groundwater plumes, LUCs have not been implemented for the area south of the Mills property and Highway 62 that presents a risk to human health.

GWMU 2 (Site SS013)

The remedy at GWMU 2 remains protective of HH&E. Concerns at the Site are being addressed through long-term monitoring (LTM) and the implementation of LUCs/ICs. The results of the 2015 plume stability assessment indicated that the groundwater plumes at GWMUs 2 and 3 were generally stable.

GWMU 3 (Site SS024)

The remedy at GWMU 3 remains protective of HH&E. Concerns at the Site are being addressed through LTM and the implementation of LUCs/ICs. The results of the 2015 plume stability assessment indicated that the groundwater plumes at GWMUs 2 and 3 were generally stable.

GWMU 4 (Sites LF004, LF014, FT003, FT007, and DP019)

The remedy at GWMU 4 remains protective of HH&E. Concerns at the Sites are being addressed through ERD/bioremediation, LTM and the implementation of LUCs/ICs. The remedial action activities completed will likely continue to reduce the contaminant levels in groundwater at the Sites. According to the plume stability assessment, CVOCs are generally stable within GWMU 4 with the following exception:

- At LF004/SWMU 07, TCE concentrations have increased in the Lower Zone at the source area, likely due to the fact that the bioreactor re-circulation system had been off due to low groundwater levels (note: the re-circulation system was re-started in September 2015 when groundwater levels recovered). Re-start of the re-circulation system is expected to restore stability.

LONG-TERM PROTECTIVENESS:

GWMU 1 (Sites SS017, SS018, SS022, SS023, ST012, WP002, SS016, SS010, and WP001)

Current monitoring data indicates that the remedy is functioning as required and the groundwater contaminant plumes remain within the POCs, except for contaminants at concentrations in excess of the MCL at the downgradient edge of GWMU 1. Additional monitoring wells may need to be installed and additional LUCs may need to be considered further downgradient of GWMU 1. Long-term protectiveness of the remedial action will be verified by continued LTM.

Long-term protectiveness requires compliance with effective LUCs (or ICs). Annual review and reporting of the LUCs is required to ensure that the remedy is functioning as intended with regard to the LUCs and to ensure effective procedures are in-place for long-term stewardship at the Sites.

GWMU 2 (Site SS013)

Current monitoring data indicates that the remedy is functioning as required and the groundwater contaminant plumes remain on-site. Long-term protectiveness of the remedial action will be verified by continued LTM.

Long-term protectiveness requires compliance with effective LUCs (or ICs). Annual review and reporting of the LUCs is required to assure that the remedy is functioning as intended with regard to the LUCs and to ensure effective procedures are in-place for long-term stewardship at the Site.

GWMU 3 (Site SS024)

Current monitoring data indicates that the remedy is functioning as required and the groundwater contaminant plumes remain on-site. Long-term protectiveness of the remedial action will be verified by continued LTM.

Long-term protectiveness requires compliance with effective LUCs (or ICs). Annual review and reporting of the LUCs is required to assure that the remedy is functioning as intended with regard to the LUCs and to ensure effective procedures are in-place for long-term stewardship at the Site.

GWMU 4 (Sites LF004, LF014, FT003, FT007, and DP019)

Current monitoring data indicates that the remedy is functioning as required and the groundwater contaminant plumes remain on-site. Long-term protectiveness of the remedial action will be verified by continued LTM.

Long-term protectiveness requires compliance with effective LUCs (or ICs). Annual review and reporting of the LUCs is required to assure that the remedy is functioning as intended with regard to the LUCs and to ensure effective procedures are in-place for long-term stewardship at the Sites.

1.0 Introduction

The purpose of this Five-Year Review (FYR) is to evaluate whether the remedy being implemented at Altus Air Force Base (AAFB) is protective of human health and the environment (HH&E).

On November 6, 1996, the U.S. Environmental Protection Agency (USEPA) Region 6 issued a Resource Conservation and Recovery Act (RCRA) Final Administrative Order (Docket No. VI-002(h)-95-H) requiring AAFB to identify, investigate, and prevent the further migration of releases of hazardous waste or hazardous constituents to the environment and to ensure that corrective actions deemed necessary USEPA be designed and implemented.

In August 2007, AAFB completed the Final Corrective Measures Study (CMS) Report outlining the corrective measures to be implemented to meet the USEPA Administrative Order. Based on the information presented in the Final CMS Report, USEPA issued a Statement of Basis (SOB) describing AAFB proposed remedies. AAFB then prepared and submitted a Final Decision Document (FDD). On December 19, 2007, USEPA Region 6 in their response to comments (RTCs) to the FDD declared that the selected remedy was appropriate and would be protective of HH&E.

In 2010, regulatory authority over the Final Administrative Order was transferred from the USEPA Region 6 to the Oklahoma Department of Environmental Quality (ODEQ). In January 2010, the ODEQ issued a RCRA Corrective Action Permit (RCRA Permit; No. 9571824045-CA) for AAFB presenting the specific requirements for the selected remedy and remedial operations. On March 23, 2010, USEPA Region 6 terminated the AAFB Administrative Order, delegating regulatory authority to the ODEQ.

The ODEQ RCRA Corrective Action Plan (CAP) contained a list of 16 sites that required further action; including Areas of Concern (AOCs), buildings, oil-water separators (OWS), and spill sites (SS). These sites were identified from both Installation Restoration Program (IRP) and RCRA Facilities Assessments (RFAs) and Investigations (RFIs). Five of the sites included on the further action list were described as “pending closure”. The permit also contained a list of 42 solid waste management units (SWMUs) and RFI Sites that had been closed, with No Further Action (NFA) recommended. ODEQ issued a Class 2 Modification to the RCRA Permit, effective July 25, 2010, designating NFA status at five sites described as “pending closure” in the Permit. ODEQ issued a Class 1 Modification to the RCRA Permit June 2, 2015 which addresses clerical corrections and informational changes. Within this FYR Report, sites are referred to using the following convention: IRP site name/RFI or AOC site name. Note that the term “site” is used generically when discussing these individual SWMUs, AOCs, and SSs (IRP sites); it does not convey any additional regulatory status. Table 1.1 provides a cross-reference table of IRP, RFI, and AOC sites.

The first Five Year Performance Review Report for AAFB was completed in October 2012. The Air Force Civil Engineer Center (AFCEC) is submitting this second FYR for AAFB. Black & Veatch Special Projects Corp. (Black & Veatch) is preparing this FYR for AFCEC. This review was initiated in Sep 2016 and completed in March 2018.

The background and historical information provided in this report was derived from published reports completed for AAFB including, but not limited to: the Draft RFI, Investigation Analysis (IA), and CMS Report, the Final CMS Report, multiple long-term monitoring (LTM) Reports, the 2014 Corrective Measures Implementation (CMI) Performance Review and Annual Performance Monitoring Report, the SOB, and the RCRA Permit and subsequent modifications.

Table 1.1 - Cross-Reference Table of RFI and IRP Site Names

IRP Site	RFI Name	RCRA AOC	Descriptive Name	GWMU
FT006	SWMU 01		Fire Protection Training Area (FPTA) No 1	GWMU 2
FT005	SWMU 02		FPTA No 2	GWMU 2
FT003	SWMU 03		FPTA No 3 (Operable Unit [OU]-1)	GWMU 4
FT007	SWMU 04		FPTA No 4 (OU-1) & OWS 417	GWMU 4
LF008	SWMU 05		Landfill No 1	
LF009	SWMU 06		Landfill No 2	GWMU 4
LF004	SWMU 07		Landfill No 3 & Petroleum, Oils and Lubricants (POL) Tank Sludge Burial (OU-1)	GWMU 4
LF014	SWMU 08		Landfill No 4	GWMU 4
WP001	SWMU 09		Abandoned Aircraft Washrack Pond & OWS 042	GWMU 1
WP002	SWMU 10		Abandoned Aerospace Ground Equipment (AGE) Washrack Pond (WP-2); adjacent to OWS 506	GWMU 1
ST025	SWMU 11	AOC 3	Former Wastewater Treatment Plant (WWTP)	
DP019	SWMU 12	AOC 4	Red Fuming Nitric Acid Neutralization & Burial Site	GWMU 4
RW020	SWMU 13	AOC 5	Low-level Radioactive Tank & Drum Storage Area	
	SWMU 14		Former RCRA Underground Tank & Drum Storage Area	GWMU 1
WP015	SWMU 15		POL Tank Sludge Burial Area	GWMU 2
	SWMU 16		Bulk Fuel Storage Tank Area	
DP021	SWMU 17		Explosive Ordnance Demolition (EOD) Area Aircraft	
	SWMU 18		Various Oil Water Separators	
	SWMU 19		Former Holding Tank & OWS at Facility 291	GWMU 1
SS010	SWMU 21		BX Service Station (Facility 303)	GWMU 1
ST012	SWMU 26		Auto Hobby Shop & OWS 343	GWMU 1
SS016		AOC 6	Facility 392 (Originally known as AOC 6, now referred to as SS-16)	GWMU 1
SS017			Trichloroethylene (TCE) Spill Site (SS-17)	GWMU 1
		AOC 1	Sanitary Sewage Evaporation Ponds (North & South)	
SS013		AOC 2	Flight Line Fuel System (North) AOC2 KC-135 & AOC2 C-5	GWMU 2
SS013		AOC 2	Flight Line Fuel System (South) AOC2 - C-17	GWMU 1
		AOC 4	Sanity Sewer System	GWMU 1
SS018			TCE/Carbon Tetrachloride Spill Site (SS-18)	GWMU 1
SS022			TCE Spill Site (SS-22) near Bldg 323 & 285 also known as Group 7	GWMU 1
SS023			TCE Spill Site (SS-23) near OWS 515	GWMU 1
SS024			TCE Spill Site (SS-24) near SWMU 17	GWMU 3

Notes: GWMU – Groundwater Management Unit

2.0 Site Chronology/Status

The chronology presented in Table 2.1 begins during early 1940s and ends at the time this report was prepared. The chronology includes site-related activities and regulatory events.

Table 2.1 - Chronology of Site Events

Event	Date
Altus Army Air Field was authorized and constructed.	1942
Altus Army Air Field was opened for military use as an advanced flight training school during World War II (WWII).	1943
The Base was deactivated after the end of the European phase of WWII and served as the City of Altus Municipal Airport.	1945
The Base was reactivated under the Tactical Air Command (TAC), with the 63rd Troop Carrier Wing assuming base operations and maintenance duties.	1953
The Strategic Air Command (SAC) assumed jurisdiction over the base; the following month the 96th Bomber Wing was activated. Many modifications to buildings and runways at AAFB were undertaken at this time.	1953
The 577th Strategic Missile Squadron was activated and operated 12 Atlas intercontinental ballistic missile (ICBM) locations around the base.	1961
The 577th Strategic Missile Squadron was deactivated, and the Atlas ICBM was phased out.	1965
AAFB submitted the Notification of Hazardous Waste Activity to obtain a generator identification number	1980
A Phase I Records Search was conducted under the U.S. Air Force (USAF) IRP (Engineering Science)	1985
A RFA completed by the USEPA identified 26 SWMUs and 5 AOCs (PRC, 1990).	1990
Phase I Remedial Investigation (RI) for SWMUs identified in the Phase I Record Search (Sites 01 through 07, 09, and 10) completed under the IRP (U.S. Geological Survey [USGS], 1992).	1988 to 1991
Phase II RI (for Sites 03, 04, 06 and 07) completed under the IRP	1992 and 1993
EPA Region 6 issued RCRA Final Administrative Order (Docket No. VI-002(h)-95-H) requiring AAFB to identify, investigate, and prevent further migration of releases of hazardous wastes or hazardous constituents to the environment and to ensure that corrective action deemed necessary by USEPA be designed and implemented.	November 6, 1996
AAFB installs groundwater extraction and treatment system to recover and treat impacted groundwater at the southern base boundary.	1999
Oklahoma Water Resources Board (OWRB) concurred that groundwater at Altus is a non-potable source (Class III aquifer with agricultural and municipal/industrial cooling beneficial uses). By virtue of high concentrations of naturally occurring total dissolved solids (TDS) salt water" the groundwater is "not considered treatable or usable for human consumption."	November 8, 2001
A Bio-Mulch Wall (BMW) was installed at LF004 in support of a bioremediation pilot study.	June 2002
AAFB completed the *Draft RFI/IA/CMS Report* to address the sites listed in the Final Administrative Order.	November 2002

Event	Date
A bioreactor and associated groundwater interceptor trench was installed at a LF004 source area as part of a bioremediation pilot study.	2003
The Draft Off-base Indoor Air Evaluation Report is completed by AAFB.	September 2004
A full-scale BMW was completed along the southern base boundary at SS017 and SS018.	June 2005
AAFB conducts IM at Bldg 506. Excavation and installation of bioreactor and supplemental BMWs.	2006-2007
EPA Region 6 approves recommendation for NFA at SWMU 1/FT006.	January 24, 2007
EPA Region 6 approves recommendation for NFA for: SWMU 2/FT005, SWMU 04/ FT007, SWMU 05/LF008, SWMU 06/LF009, SWMU 09/WP001, SWMU 10/WP002, SWMU 11/ST025, SWMU 12/DP019, SWMU 13/RW020, SWMU 14, SWMU 15/ WP015, SWMU 16, SWMU 17, SWMU 19; OWS 188, 189A, 278, 284B, 291, 298, 321 ,349, 353, 354, 377, 388, 402, 417, 424, 433, 435, 458, 506, 509, 515, 518, 523, 553, 554, 563; and AOC 1N, AOC 1S, AOC 2-C17, AOC 2-KC-135, and AOC 4.	July 5, 2007
The Final Corrective Measures Study Report is Completed by AAFB.	August 2007
The Building 506 Source Area Interim Measure (IM) Report is submitted by AAFB.	August 2007
EPA Region 6 issued the SOB describing the proposed remedies to address ground water and soil contamination at AAFB.	September 6, 2007
AAFB conducted IMs at Buildings 296, 343 and 392. Excavation to remove contaminated soil was conducted at all three areas.	October 2007
Draft LTM Work Plan submitted by AAFB.	October 2007
EPA Region 6 issued the RTCs/FDD declaring that the selected remedy to be ordered at Buildings 296, 343, and 392 is appropriate and will be protective of HH&E.	December 19, 2007
The Final Report – Interim Corrective Measures for Buildings 296, 343, and 392 is completed by AAFB.	March 2008
The Final Performance Summary Report for Substrate Injection and Bioaugmentation at the LF003 Bioreactor is completed by AAFB.	April 2008
The Final Proof of Performance for Hydraulic Testing and Substrate Injection in the LF003 Section A2 Biowall (BMW) is submitted.	April 2008
The Final Construction Completion Report for the SS017 Bioreactor is submitted by AAFB.	May 2008
The Final Technical Summary Report for the Bark Mulch Trench Interim Corrective Action (Sites SS017, SS018, and SS023) is completed by AAFB.	June 2008
In situ treatment was conducted at five source areas within Sites SS018 and SS022.	June-August 2008
Bioremediation enhancements were conducted for the BMWs located at Sites SS017 and SS018	June-October 2008
Final 2007 LTM Report submitted by AAFB.	April 2009
The Final CMI Work Plan is submitted by AAFB.	April 2009
The Final IM Implementation Report for Off-site Groundwater Contamination is completed by AAFB.	April 2009
The First Quarterly Report for Bioremediation Enhancements at Sites SS017 and SS018 is submitted by AAFB.	May 2009
The Final IM Implementation Report for Off-site Groundwater Contamination is completed by AAFB.	August 2009
The Second Quarterly Report for Bioremediation Enhancements at Sites SS017 and	September 2009

Event	Date
SS018 is submitted by AAFB.	
Executed restrictive environmental convents for four off-site properties were recorded with Jackson County Property Records office (see Figure 10).	June 2009
The Third Quarterly Report for Bioremediation Enhancements at Sites SS017 and SS018 is submitted by AAFB.	December 2009
ODEQ issued RCRA CAP (No. 9571824045-CA5) for AAFB, presenting the specific requirements for the selected remedy and remedial operations (effective January 21, 2010 - January 21, 2020).	January 21, 2010
EPA Region 6 terminated Unilateral Administrative Order. Regulatory authority over the Final Administrative Order was transferred from the USEPA Region 6 to ODEQ.	March 23, 2010
ODEQ granted request for a reduction from quarterly to semi-annually monitoring at SS17 and SS18 BMWs.	March 25, 2010
ODEQ granted request for a reduction of 5 monitor well clusters from semi-annually monitoring requirements at SS17 and SS18 BMWs.	May 11, 2010
The Final 2009 Annual Report for Bioremediation Enhancements at Sites SS17 and SS18 is submitted by AAFB.	June 2010
ODEQ issued a Class 2 Modification to the RCRA Permit, designating NFA status to five additional Sites. (SWMU 26, SWMU 21, OWS 343, AOC 6/OWS 392, and OWS 296)	July 25, 2010
The 2010 Semi-Annual Monitoring Report for Bioremediation Enhancements at Sites SS17 and SS18 is completed by AAFB.	August 2010
The Final Source Area Reduction Report is completed by AAFB.	January 2011
The Draft 2010 Annual Report for Bioremediation Enhancements at Sites SS017 and SS018 is completed by AAFB.	January 2011
The Draft Plume Stability Report is submitted by AAFB.	July 2011
The Draft Report for Bioremediation Enhancements at Sites SS017 and SS018 is completed by AAFB.	August 2011
The Final Plume Stability Report is submitted by AAFB.	February 2012
2012 Land Use Control (LUC) Inspections submitted by AAFB.	October 2012
First Performance Review (GWMU focused Five Year Review) Report submitted by AAFB.	October 9, 2012
ODEQ Letter accepting First Performance Review (FYR) Report by AAFB.	December 3, 2012
Class 1 Permit Mod, RCRA CAP #9571824025-CA submitted by AAFB.	March 27, 2013
Semiannual Corrective Action Progress Report submitted by AAFB (1 Oct 12 – 31 Mar 13).	April 2013
Correction to Proposed Performance Monitoring System, RCRA CAP #9571824025-CA submitted by AAFB.	May 1, 2013
Semiannual Corrective Action Progress Report submitted for AAFB (1 Apr 13 – 30 Sep 13).	October 2013
2013 Annual Performance Monitoring Report submitted by AAFB.	October 2013
2013 LUC Inspections submitted by AAFB.	November 22, 2013

Event	Date
Semiannual Corrective Action Progress Report submitted by AAFB (1 Oct 13 – 31 Mar 14).	April 2014
Point-of-Compliance (POC) Contingency Plan by AAFB.	April 2014
Corrective Measures Completion Report for Site WP002 submitted by AAFB.	August 2014
Semi-annual Corrective Action Progress Report submitted by AAFB (1 Apr 14 – 30 Sep 14).	October 2014
2014 CMI Performance Review and Annual Performance Monitoring Report submitted by AAFB.	October 2014
2014 LUC Inspections submitted by AAFB.	October 22, 2014
Draft Decision Documents (DDs) for SWMU 04/IRP Site SWMU 4/FT007; SWMU 09/WP001; SWMU 10/WP002; SWMU 12/DP 019 – submitted for NFA.	December 2014
Final Remedial Design/CMI Plan for Site SS017 submitted by AAFB.	January 2015
LTM Plan for SWMU 10 / WP 002 Submitted by AAFB. ODEQ Approved LTM Plan for SWMU 10/WP 002.	March 23, 2015 June 4, 2015
Semi-annual Corrective Action Progress Report submitted by AAFB (1 Oct 14 – 31 Mar 15).	April 2015
Corrective Measures Completion Report for Site SS016 submitted by AAFB. ODEQ Approved CM Completion Report for Site SS016.	April 3, 2015 June 1, 2015
2010 Corrective Action RCRA Permit (# 9571824045-CA) - ODEQ approved the Class 1 modifications to the Permit to correct clerical errors and provide informational changes.	June 2, 2015
Nature Of Discharge (NOD) letter submitted for DDs for SWMU 04/FT007; SWMU 09/WP001; SWMU 10 /WP002; SWMU 12/DP 019 – submitted for NFA.	August 6, 2015
90-day extension granted for NOD-response for DDs for SWMU 04/ FT007; SWMU 09 / WP001; SWMU 10/WP002; SWMU 12 / DP 019 – submitted for NFA.	October 14, 2015
Semi-annual Corrective Action Progress Report submitted by AAFB (1 Apr 15 – 30 Sep 15).	October 2015
2015 Annual Performance Monitoring Report submitted by AAFB.	October 2015
CMI Report for Site SS017 submitted by AAFB.	October 2015
RCRA Permit Mod Request Supplemental Information (Gridded map with locations of proposed groundwater/surface water sampling locations; spreadsheet listing the sampling locations using the grid), RCRA CAP #9571824045-CA submitted by AAFB.	December 16, 2015
DD for SWMU 4/FT007 submitted by AAFB.	December 2015
DD for SWMU 12/DP019 submitted by AAFB.	December 2015
DD for SWMU 09/WP001 submitted by AAFB.	December 2015
DD for SWMU 10/WP002 submitted by AAFB.	December 2015
Revised DD for SWMU 12/IRP Site DP019 submitted by AAFB.	January 4, 2016
ODEQ letter requesting current confirmation samples and additional information on DP-19 (acid pit) before SWMU 04/ FT007; SWMU 09 / WP001; SWMU 10 / WP002; SWMU 12 / DP 019 - DDs/NFA can be confirmed.	February 24, 2016
Semiannual Corrective Action Progress Report submitted by AAFB (1 Oct 15 – 31 Mar 16).	April 2016
Supplemental Analytical Information for RCRA Permit Mod Application, RCRA CAP #9571824045-CA submitted by AAFB.	July 8, 2016
2016 Annual Performance Monitoring Report submitted by AAFB.	October 2016

2.1 SITE STATUS

The site status at time this report was prepared (2017-2018) is presented in Tables 2.2 and 2.3. Groundwater plumes (and associated sites) were grouped into four Groundwater Management Units (GWMUs) based on geographic location (see Section 3.1.4). Sites requiring action are listed by GWMU in Table 2.2. Sites designated "NFA status" are listed in Table 2.3.

Table 2.2 – Current Site Status

Site	Description	Status
GWMU 1		
SS017	TCE Spill Site at the Southern Base Boundary	An IM groundwater pump and treat (P&T) system was installed at SS017, but was removed in 2008. BMWs have been installed at SS017, and SS018 which replaced the P&T system at SS017. A source area removal project has been completed at Building 506, the primary source for the SS017 plume. A bioreactor has been installed as part of the backfill for the removal project at Building 506. A base boundary groundwater treatment project is ongoing to treat deeper groundwater under the SS017 BMW. Monitoring wells located at the Site are included in the LTM program. Remedy-specific monitoring is ongoing for the Building 506 bioreactor, the SS017 BMWs, and the base boundary groundwater treatment project. Semi-annual groundwater monitoring is conducted in GWMU 1 at Point of Compliance wells and surface water locations. All other wells are sampled either annually or every 3 years.
SS018	TCE/Carbon Tetrachloride Spill Site	BMWs have been installed at SS017 and SS018 which replaced the P&T system at SS017. A source area groundwater treatment project is ongoing at Building 394 and an area south of the building. The Site was included in the LTM programs for AAFB. Remedy-specific monitoring is ongoing for the BMWs and the source area groundwater treatment project. Semi-annual groundwater monitoring is conducted in GWMU 1 at Point of Compliance wells and surface water locations. All other wells are sampled either annually or every 3 years.
SS022	Site SS022 has no direct operational history and is comprised of source areas originating from OWS 284A, OWS 285/Building 285 and Building 323 (described separately below)	
SS022/ OWS 284A	OWS at Former Aerospace Ground Equipment Wash Rack	No active remediation is presently operating at the Site. Monitoring wells located at the Site are included in the LTM program.

Site	Description	Status
GWMU 1 (continued)		
SS022/ OWS 285	OWS at Inactive Lift Station at Building 285	No active remediation is presently operating at the Site. Monitoring wells located at the Site are included in the LTM program.
SS022/ Building 323	Primary Source Area for SS022 Groundwater Plume TCE Spill Site near Building 323 and Building 285	Remedy-specific monitoring is ongoing for the source area groundwater treatment project for Building 323 and Building 285. Semi-annual groundwater monitoring is conducted in GWMU 1 at Point of Compliance wells and surface water locations. All other wells are sampled either annually or every 3 years.
SS023	TCE Spill Site near OWS 515	The selected remedy for SS023 is monitored natural attenuation (MNA). The SS023 groundwater plume is currently located upgradient of the BMW; however, it is anticipated that if the plume migrates downgradient in the future it will be intercepted by the BMW.
GWMU 2		
SS013/ AOC 2–C-5	C-5 Parking Area – Flight Line Fuel System	No active remediation is presently operating at the Site. Monitoring wells located at the Site are included in the LTM program.
GWMU 3		
SS024	TCE Spill Site near SWMU 17	No active remediation is presently operating at the Site. Monitoring wells located at the Site are included in the LTM program.
GWMU 4		
SWMU 07/ LF004	Landfill No. 3 & POL Tank Sludge Burial Area	A bioreactor and BMW have been installed (2003) and currently being monitored. Monitoring wells located at the Site are included in the LTM program.
SWMU 08/ LF014	Former Landfill No. 4	AAFB submitted an Interim Corrective Measures (ICM) Report for LF014 work conducted in February-March 2015, consisting of installing 3 monitoring wells and 22 remediation wells for EVO injection. Monitoring wells located at the Site are included in the LTM program.

Table 2.3 – Current Site Status, NFA Sites

Site	Description	Status
SWMU 01	Former FPTA No. 1	NFA (January 24, 2007)
SWMU 02/FT005	Former FPTA No. 2	NFA (July 5, 2007)
SWMU 03/FT003	Former FPTA No. 3	NFA (July 25, 2010)
SWMU 04 and OWS 417	Former FPTA No. 4 and OWS 417	NFA (July 5, 2007) DD Submitted Dec 2015 – regulatory response pending
SWMU 05	Landfill No. 1	NFA (July 5, 2007)
SWMU 06	Former Landfill No. 2	NFA (July 5, 2007)
SWMU 09 and OWS 402	Abandoned Aircraft Wash Rack Pond and OWS 402	NFA (July 5, 2007) DD Submitted Jan 2016 – regulatory response pending
SWMU 10	Abandoned Aerospace Ground Equipment Wash Rack Pond	NFA (July 5, 2007) DD Submitted Jan 2016 – regulatory response pending
SWMU 11	Former Wastewater Treatment Plant	NFA (July 5, 2007)
SWMU 12/DP019	Red Fuming Nitric Acid Neutralization and Burial Site	NFA (July 5, 2007) DD Submitted Jan 2016 – regulatory response pending
SWMU 13	Low-Level Radioactive Material Deposit Site	NFA (July 5, 2007)
SWMU 14	Former RCRA Underground Storage Tank (UST) and Drum Storage Area	NFA (July 5, 2007)
SWMU 15	POL Tank Sludge Burial Area	NFA (July 5, 2007)
SWMU 16	Bulk Fuel Storage Tank Area	NFA (July 5, 2007)
SWMU 17	Explosive Ordnance Disposal Area	NFA (July 5, 2007)
SWMU 19 and OWS 291	Former Holding Tank and OWS at Facility 291	NFA (July 5, 2007)
SWMU 21/SS010	Former Base Exchange Service Station	NFA (July 25, 2010)
SWMU 26	Auto Hobby Shop	NFA (July 25, 2010)
OWS 188	OWS at Organizational Aircraft Maintenance Shop	NFA (July 5, 2007)
OWS 189A	OWS at Vehicle Maintenance Building	NFA (July 5, 2007)
OWS 278	OWS at C-141 Aerospace Ground Equipment Facility	NFA (July 5, 2007)
OWS 284B	OWS at Aerospace Ground Equipment Wheel and Tire Garage	NFA (July 5, 2007)
OWS 296	OWS at Aircraft Tire and Wheel Shop	NFA (July 25, 2010)
OWS 298	OWS at Aircraft Engine Test Cell Facility	NFA (July 5, 2007)
OWS 321	OWS at Privately Owned Vehicle Wash Rack	NFA (July 5, 2007)
OWS 343	OWS at Auto Hobby Shop	NFA (July 25, 2010)
OWS 349	OWS at Government-Owned Vehicle Wash Rack	NFA (July 5, 2007)

Site	Description	Status
OWS 353	OWS at Government-Owned Vehicle Maintenance Facility	NFA (July 5, 2007)
OWS 354	OWS at Government-Owned Vehicle Fueling Service Station	NFA (July 5, 2007)
OWS 388	OWS at Aircraft Refueling Vehicle Parking Area	NFA (July 5, 2007)
OWS 392	OWS at Aircraft Vehicle Maintenance Facility	NFA (July 25, 2010)
OWS 424	OWS at Former Aircraft Tire and Wheel Shop	NFA (July 5, 2007)
OWS 433	North Remote Fire Station	NFA (July 5, 2007)
OWS 435	OWS at Aircraft Maintenance Facility	NFA (July 5, 2007)
OWS 458	OWS at South Ramp Fueling Area	NFA (July 5, 2007)
OWS 506	OWS at Former Aerospace Ground Equipment Wash Rack	NFA (July 5, 2007)
OWS 509	OWS at Aircraft Maintenance Facility	NFA (July 5, 2007)
OWS 515	OWS at Former Aircraft Fuel-Cell Repair Hangar	NFA (July 5, 2007)
OWS 518	OWS at Aircraft Fuel-Cell Repair Hangar	NFA (July 5, 2007)
OWS 523	OWS at Aircraft Maintenance Hangar	NFA (July 5, 2007)
OWS 553	OWS at Aircraft Fuel-Cell Repair Hangar	NFA (July 5, 2007)
OWS 554/563	North Ramp Fueling Area	NFA (July 5, 2007)
AOC 1 North	Sanitary Sewage Evaporation Ponds	NFA (July 5, 2007)
AOC 1 South	Sanitary Sewage Evaporation Ponds	NFA (July 5, 2007)
377/AOC 2	Fuel Line Spill Area	NFA (July 5, 2007)
AOC 2 – KC-135	KC-135 Parking Area – Flight Line Fuel System	NFA (July 5, 2007)
AOC 2 – C-17	C-17 Parking Area – Flight Line Fuel System	NFA (July 5, 2007)
AOC 4	Sanitary Sewer System	NFA (July 5, 2007)
SS016/AOC 6	Aircraft Refueling and Vehicle Maintenance	NFA (July 25, 2010)

3.0 Background

3.1 GENERAL SITE BACKGROUND

This section provides a description of the site characteristics and the risks posed to HH&E. The background and historical information provided in this report was derived from published reports completed for the AAFB including, but not limited to, the Draft RFI, IA, and CMS Report, the Final CMS Report, multiple LTM Reports, the Draft SOB and the RCRA Permit.

3.1.1 Physical Characteristics

AAFB comprises approximately 6,000 acres within the eastern portion of the city of Altus, in southwestern Oklahoma. The location of AAFB is depicted on Figure 1. The AAFB is located within Sections 34, 35, and 36 of Township 3 North, Range 20 West, Indian Meridian, and parts of Sections 1, 2, 3, 9, 10, 11, 12, 13, 14, and 15 of Township 2 North, Range 20 West, Indian Meridian. The geographic coordinates for the centroid of the AAFB are 34° 39' 8" North latitude and 99° 17' 17" West longitude.

The western portion of AAFB contains mainly military housing, recreational facilities, administrative buildings, warehouses and some maintenance facilities. The central portion of the AAFB includes hangars, aircraft parking aprons, taxiways and the main runway (35L-17R). The eastern portion of the AAFB is sparsely developed and includes Runway 35R-17L and Taxiway M, and several bunkers.

The AAFB is adjoined by agricultural land to the north, east, and west; and mixed residential and industrial land, Highway 62 and mixed municipal and agricultural land to the south.

3.1.2 Topography and Geology

3.1.2.1 Topography

The topography at AAFB is nearly level to slightly sloping. Surface elevations at the AAFB range from approximately 1,390 feet (ft) National Geodetic Vertical Datum (NGVD) of 1929 at the northern end to approximately 1,330 ft NGVD at the southern end. The AAFB is located between the North Fork of the Red River and its main channel. Local relief is mostly due to stream erosion.

3.1.2.2 Regional Geology

AAFB is located on the north flank of the Hollis Basin. Unconsolidated Quaternary-age terrace deposits underlie the AAFB at the northern end and the Hennessey Group underlies the remainder of AAFB. The estimated regional dip of the Hennessey Group is to the west. The Hennessey shale ranges from approximately 500 to 1,000 ft thick to the north and thickens to the southeast into the Hollis Basin, toward AAFB. The Hennessey Group in southwestern Oklahoma is mostly reddish-brown shale with thin interbeds of siltstone and sandstone. The uppermost 5 to 40 ft of the formation predominantly consists of shale.

3.1.2.3 Local Geology

The four principal geologic units at AAFB consist of fill soil, the Hennessey shale (and its residual mantle), Quaternary-aged terrace deposits, and Quaternary-aged alluvium. Fill soils associated with grading operations during the construction of the Site cover a majority of AAFB. The thickness of the fill averages from approximately 5 to 8 ft and consists primarily of silty and sandy clay. The majority of AAFB is underlain by the Hennessey shale and its associated residual soil. The uppermost 5 to 20 ft of the Hennessey consists of dark red clay/silty clay. Weathered Hennessy shale is encountered at depths of 10 to 20 ft below ground surface (bgs) and the weathered portion of the shale transitions to

consolidated shale below depths of approximately 40 ft. During site assessment activities auger refusal was generally encountered at approximately 45 ft bgs or less with hollow-stem augers. The northern third of AAFB is underlain mostly by terrace deposits of Quaternary age. Quaternary alluvium is generally found along Stinking Creek and its tributaries.

3.1.2.4 Precipitation

The average annual precipitation as measured at Altus Dam, located approximately 15 miles north of AAFB, is 25 inches (Earth Tech, 2002). Most of the precipitation falls in the spring as the result of thunderstorms. May is normally the wettest month of the year, with an average rainfall of approximately 5 inches (Earth Tech, 2002).

3.1.2.5 Regional Hydrology

The major surface water bodies in the vicinity of AAFB are the main channel of the Red River, located approximately 13 miles south of AAFB, the North Fork of the Red River, located approximately 11 miles east of the Base, and the Salt Fork of the Red River, which is located approximately 5 miles west of the Base.

3.1.2.6 Local Hydrology

Surface water drainage at AAFB is dominated by Stinking Creek and a southern unnamed tributary to Stinking Creek. Stinking Creek drains the northern and eastern portions of AAFB while the southern unnamed tributary of Stinking Creek drains the southern and western portions of AAFB. Surface water drainage is generally toward the southeast. Stormwater runoff generally drains into Stinking Creek and a southern unnamed tributary through a series of open ditches at AAFB. Lugert-Altus Irrigation District (LAIRD) irrigation canals also cross AAFB; however, these canals are generally dry or ponded. Flow in these canals mainly occurs during irrigation season from the spring to the fall.

A wetlands survey conducted by the U.S. Fish and Wildlife Service (USFWS) in 1995 identified 11 small seasonal wetland habitats that comprise approximately 4.4 acres at AAFB (Earth Tech, 2002). The majority of the wetland areas consist of manmade excavations or impoundments such as ponds, sewage evaporation ponds and drainage canals.

3.1.2.7 Regional Hydrogeology

In southwest Oklahoma the amount of regional precipitation has a direct effect on groundwater movement and the availability of recharge to the shallow aquifer system. The principal regional aquifers around AAFB are the unconsolidated alluvial and terrace deposits associated with the Salt Fork Red River and the North Fork Red River. The unconsolidated alluvial and terrace deposits underlie the AAFB at the northern end and the Hennessey Group underlies the remainder of AAFB. However, the Hennessey Group is not considered to be a primary aquifer. Water quality in the Hennessey shale and local alluvial sediments is quite variable. The water can have excessive hardness, sulfates, chlorides, and iron. Therefore, the Conservancy District, which provides untreated water from the primary water source for AAFB is the Mountain Park Tom Steed Reservoir. A secondary source of water is from the Altus Well Field in Wilbarger County, Texas which draws water from the Seymour Aquifer. Wells located in the Altus Well Field were rehabilitated in 2015 to make them serviceable again.

3.1.2.8 Local Hydrogeology

The shallow aquifer system beneath Altus AFB occurs within the residual clay or alluvial deposits and the upper part of the weathered shale of the Hennessey group and extends to an approximate depth of 55 ft bgs. While the shallow aquifer system has been grouped into four zones (Upper, Lower, Upper

Intermediate and Lower Intermediate), differentiation between these zones is based primarily on depth and the occurrence of groundwater. While localized confining conditions have been observed in some areas, the shallow aquifer system beneath Altus AFB is considered a phreatic aquifer, and these four zones represent a single, interconnected hydrostratigraphic unit (AECOM, 2016).

Groundwater flow beneath AAFB is primarily through secondary porosity features (fracture sand solution cavities) within the Hennessey Group shale. Small scale fracture flow (shale) is most prevalent while solution cavity flow appears to dominate the shallow aquifer system in select areas. Although small-scale fractures and solutions features exist, overall, the shallow aquifer system behaves as a porous media. Primary discharge of groundwater at AAFB is via surface water bodies/incised channels (Earth Tech, 2011).

Groundwater flow in the shallow aquifer at AAFB is generally from the northwest to the southeast; however, flow patterns can be locally influenced by streams, drainage ditches and irrigation canals. The operation of the canal systems can cause significant increases in recharge to the shallow water table aquifer and profound influence on contaminant migration.

The water quality of the shallow aquifer was a primary focus of the RFI/IA/CMS groundwater investigation activities. Observations made during the RFI/IA/CMS and previous investigations indicated that well yield increased with depth up to approximately 40 ft bgs and the occurrence of groundwater diminishes below 50 ft bgs. The deeper materials are more consolidated and not as altered by weathering as the shallow materials. Due to the significant difference in groundwater quality and hydraulic heads between the shallow and the deep groundwater, it appears that little to no communication exists between the shallow aquifer and the deep groundwater (Earth Tech, 2011).

A hydrogeologic Conceptual Site Model (CSM) for AAFB was initially developed from data collected prior to 1998. It was originally assumed that the upper 40 ft of the subsurface was a single hydrologic zone and that the chemicals of concern (COCs) extended to the base of this zone. Since the COCs are chlorinated volatile organic compounds (CVOCs), AAFB was required to evaluate the potential for vertical migration of COCs beyond the base of the assumed hydrologic zone. As additional assessment activities were conducted, significant zones of groundwater flow and COCs were identified below the initial assumed base of hydrologic zone, and the hydrogeologic CSM was refined. The revised hydrogeologic CSM separates the subsurface at AAFB into five (upper, lower, upper intermediate, lower intermediate, and deep) hydrostratigraphic zones. The hydrogeologic CSM is illustrated on Figure 2.

From 2010 to 2014, hydrologic conditions changed over the Southwest United States to produce extremely dry weather patterns (i.e., very low precipitation); during this period no irrigation water was released to the Altus-Lugert canal system, and leakage from the Altus reservoir to the Southern Unnamed Tributary was limited. The four years through which the canal system was inoperative represented a major shift in the groundwater budget for Altus AFB, which was followed by a second shift when record precipitation occurred in May 2015. As a result of the drought followed by the Spring 2015 precipitation, water levels during the Spring 2015 performance monitoring event on average increased approximately 2 to 6 ft depending on the GWMU and the specific groundwater zone in comparison to levels measured in 2014. Water levels measured in Spring 2016 are generally lower than those measured in Spring 2015, but remain elevated as compared to levels measured in Spring 2014.

The four-year lapse in all sources of hydraulic and hydrological inputs to the aquifer system followed by the record precipitation, the renewed operation of the canal system, and the increased leakage to the Southern Unnamed Tributary likely impacted plume migration, particularly near the SS017 POC due to

very low VOC concentrations and the influence of the Southern Unnamed Tributary. The significant concentration fluctuations observed in many POC wells may be evidence of this impact (AECOM, 2016).

3.1.3 Former, Current and Future Land Use

Altus Army Airfield was authorized and constructed in 1942. It was activated as a multi-engine flight training school in 1943 and was placed on temporary inactive status prior to the end of WWII. Following WWII, the Site served as the Altus Municipal Airport and was also used as a scrap yard for military aircraft from the war. The Site reactivated as Altus AFB in 1953 and served briefly as a TAC base before reassignment as an operational SAC wing. Many mission changes were experienced through the 1950s and into the 1960s, including in-flight refueling and alert missions. AAFB also hosted 12 Atlas Nike missile silos during the early 1960s. In 1967, AAFB was selected as the training site for cargo aircraft, including the C-141 Starlifter and the C-5 Galaxy; followed by the addition of KC-135 tankers in the early 1970s, and the C-17 Globemasters in 1996. Training operations for the C-141 and the C-5 ceased in 2001 and 2007, respectively.

Currently, the primary mission of AAFB is to provide quality training to produce combat-ready C-17, and KC-135 aircrew members for Strategic Airlift and Air Refueling. There are no significant planned changes in the primary mission of AAFB.

Agricultural-zoned land extends at least two miles in all directions surrounding AAFB, except to the west, where AAFB base housing adjoins the City of Altus. The lot size and residential dwelling density are restricted under the agricultural zoning. All lots must be at least one acre in size, and may not contain more than one dwelling per lot. Height restrictions of not more than 200 ft are also imposed on any structures in the agricultural zoned area, and not more than 150 ft in areas adjoining AAFB to the north, east, and south. Development in the area surrounding AAFB is further restricted under a series of Compatible Use Zones (CUZs) adopted by the City of Altus in 2004. In general, these CUZs restrict residential dwelling density to less than one per 5 to 10 acres, to the south of AAFB, and to less than one per 2.5 acres to the east of AAFB.

3.1.4 History of Contamination

AAFB (originally Altus Army Airfield) was constructed during WWII for use as an advanced flight training school. Operations included equipment cleaning, aircraft cleaning and fire training. Past releases and disposal practices resulted in soil and groundwater contamination at the Site with cleaning solutions, solvents, oil, grease and JP-4 jet fuel. COCs relating to these releases include TCE, 1,2-dichloroethene (DCE), perchloroethylene (PCE), carbon tetrachloride, cis-1,2 DCE, vinyl chloride (VC), benzene, xylenes and toluene. Contaminants were identified and characterized during a number of site investigations conducted between 1985 and the present. The history of contamination at specific sites is described in Section 3.2.

Human and ecological risks associated with the COCs identified at AAFB were evaluated in the *Draft RFI/IA/CMS Report*. The report identified and characterized 55 distinct sites at AAFB. Interim corrective measures were implemented where necessary to protect HH&E. Based on the anticipated land and groundwater use, Corrective Action Objectives (CAOs) were established for AAFB to ensure protection of HH&E.

In an effort to streamline remediation and monitoring, groundwater plumes were grouped into four GWMUs based on geographic location (Figure 3). Horizontal boundaries were established to completely contain the contaminant plumes at each site and include a buffer for potential plume migration. The designations provided in the Final CMS Report are as follows:

- GWMU 1 refers to multiple commingled CVOC plumes originating from SS017, SS018, SS022/OWS 284A/OWS 285, Building 323, and SS023. The COCs at GWMU 1 are TCE, PCE, 1,2-DCE, and VC.
- GWMU 2 refers to the CVOC plume originating from SS013. The COCs at GWMU 2 are TCE and carbon tetrachloride.
- GWMU 3 refers to one CVOC plume originating at SS024. The COCs at GWMU 3 are TCE and PCE.
- GWMU 4 refers to two separate CVOC plumes originating from FT003, LF004, and LF014. The COCs at GWMU 4 are TCE, 1,2-DCE, 1,1-DCE, and VC.

3.1.5 Summary of Initial Responses

In 1985 a records search was completed for AAFB, which identified and evaluated past hazardous material disposal sites and provided recommendations for the IRP sites. In 1990, the USEPA completed a RFA that identified 26 SWMUs and five AOCs. Further investigation was recommended at 24 of the SWMUs and two of the AOCs. Following completion of RIs for multiple sites between 1988 and 1995, the USEPA issues an Administrative Order requiring AAFB to identify, investigate and evaluate corrective actions for 21 SWMUs, three AOCs and an SS; and to design and implement corrective measures necessary to protect HH&E.

In 2002, AAFB completed the *Draft RFI/IA/CMS Report*. The purpose of the CMS is to develop and evaluate the corrective action or alternatives, and to recommend the corrective measure or measures to be taken at the facility. Based on the results of the RFI, the facility shall identify, screen, and develop the alternatives for removal, containment, treatment, and/or other remediation of the contamination, based on the objectives established for the corrective action. The report identified and characterized 55 distinct sites at AAFB.

In 2007, the USEPA issued the Draft SOB, identifying the CAOs developed for AAFB. In 2009, AAFB issued the Final CMI Work Plan describing the necessary components to achieve the CAOs. In 2010, the ODEQ issued the Final RCRA Permit and designated NFA status to five additional sites (SWMU 26, SWMU 21, OWS 343, AOC 6/OWS 392, and OWS 296).

3.1.6 General Basis for Taking Action

AAFB is a large quantity generator of hazardous waste. Historically, AAFB engaged in the treatment, storage, or disposal of hazardous waste after November 19, 1980, which made it subject to the interim status requirements of 40 CFR Part 265. Between 1985 and 1995 several investigations were conducted at AAFB to evaluate suspected environmental problems associated with previous operations that used hazardous substances. The investigations found that hazardous wastes and/or constituents had been released to soil and groundwater at many of the investigated sites. Therefore CAOs were specified in the February 2010 RCRA Final CA Permit to address soil and groundwater contamination at the Base.

3.2 SITE SPECIFIC BACKGROUND INFORMATION

The following subsections provide a description of the individual sites of concern at identified GWMUs at AAFB. Site specific descriptions include the physical characteristics, land use, history of contamination, initial responses and basis for taking action at each site.

The following table lists the COCs detected in groundwater above their respective maximum contaminant levels (MCLs) during performance monitoring activities conducted between October 2010 and May 2016.

Table 3.1 - Chemicals of Concern

Location	Chemicals of Concern
GWMU 1	PCE, TCE, 1,2-dichloroethene (1,2-DCE – total), VC, and carbon tetrachloride
GWMU 2	TCE and carbon tetrachloride
GWMU 3	PCE and TCE
GWMU 4	TCE, 1,2-DCE (total), and VC

3.2.1 Groundwater Management Unit 1

GWMU 1 is comprised primarily of CVOC groundwater plumes at sites SS017, SS018, SS022, and SS023 (Figure 4a). Site SS022 has no direct operational history and is comprised of source areas originating from OWS 284A, OWS 285/Building 285 and Building 323. Although NFA was designated for SWMU 21/ SS010, groundwater at this Site continues to be monitored as part of GWMU 1.

The 2014 CMI Performance Review (AECOM, 2014c) reported that Upper, Lower and Upper Intermediate Zones are the hydrogeologic zones of concern where CVOCs remain above MCLs at GWMU 1. The performance review provided the following GWMU 1 groundwater plume conclusions:

- SS017: TCE concentrations have significantly increased since 2011 in the Lower Zone at the former Building 506 source area and monitoring wells located downgradient of the source area.
- SS018: Carbon tetrachloride and TCE concentrations have increased since 2009 in the Upper and Lower Zones at the source area, and in monitoring wells located downgradient of the source area in the Lower Zone.
- TCE was detected above its MCL in three Upper Intermediate POC wells (WL787, WL819, and WL854) in Spring 2014. Concentration trends were increasing.

Although the 2014 CMI Performance Review concluded that the GWMU 1 groundwater plume was generally stable, increasing COC concentrations in POC wells should have indicated an unstable plume. To maintain compliance with the RCRA Permit, COCs must not exceed MCLs at the AAFB boundary and/or other property where the Air Force has control of the groundwater.

3.2.1.1 Spill Site 17

Site SS017 originates near the southwest end of Taxiway A in the southwestern portion of AAFB (Figure 4b). The Site includes former Building 506 and Facility 508. The primary source of the CVOC plume at SS017 originates from former Building 506. Facility 508 is a secondary source area for SS017.

TCE was detected in soil samples collected from Building 506 at concentrations which exceeded their USEPA, Region 6 Maximum Soil Screening Levels (MSSLs) for soil based on industrial land use and a risk level of 1E-06. TCE was detected in subsurface soil samples collected to depths of 32.5 ft bgs at Building 506. The maximum concentration of TCE detected exceeded its MSSL based on industrial land use and a risk level of 1E-05, which was the risk-based cleanup level established for the CMS.

TCE and PCE were detected in soil samples collected from Facility 508 at the northern portion of the Site at concentrations which exceeded their USEPA, Region 6 MSSLs for soil based on industrial land use and risk levels of 1E-06 and 1E-05. The lateral and vertical extent of TCE and PCE soil contamination has been delineated at the Site.

The SS017 CVOC groundwater plume extends southeast from the vicinity of Building 506, beyond the southern boundary of AAFB and the southern unnamed tributary of Stinking Creek to Highway 62. TCE

was detected at concentrations above the MCL in the POC wells located south of Highway 62, outside of the installation boundary at the southern boundary of GWMU1.

In the 2002 Draft RFI/IA/CMS, the AAFB and USEPA recommended the following corrective measures to contain and treat elevated concentrations of CVOCs in the groundwater:

- Installation of a groundwater extraction and treatment system to hydraulically control migration from the source area and remove contaminant mass at the primary source area (Building 506 area).
- Expansion of the existing interim groundwater extraction and treatment system for the on-base portion of the SS017 groundwater plume.
- Installation of a groundwater extraction and treatment system in areas where the AAFB has access to the SS017 groundwater plume that lies beyond the southern boundaries of AAFB.
- MNA for other off-base private property with restricted access.

The selected remedies for this Site are the SS017 bioreactor, the intermediate zone injection curtain, and the biowalls. The SS017 groundwater plume is monitored as part of the Performance Monitoring Program for GWMU 1.

3.2.1.2 Spill Site 18

Site SS018 is located west of the southwestern portion of AAFB (Figure 4c). The Site includes an area of approximately 30 acres including both on-base and off-base property. Two distinct source areas for the TCE and carbon tetrachloride plumes have been identified in the vicinity of Building 394: one is centered around WL759, WL760, and WL791, and the other is centered around WL778 and WL779. The plumes have migrated from the vicinity of Building 394 (on-base) to the municipal Greens of Altus Golf Course and the Winters property (off-base).

No CVOCs were detected in soil samples at concentrations that exceeded USEPA, Region 6 MSSLs for soil based on industrial land use. CVOC plumes consisting of TCE, carbon tetrachloride and other degradation compounds originated at SS018 in the vicinity of Building 394. TCE and carbon tetrachloride were detected in the SS018 groundwater plumes at concentrations which exceeded their respective MCLs. The SS018 CVOC plumes extend southeast of Building 394, and underlie portions of the off-base Greens of Altus Golf Course and the Winters property. The CVOC plumes extend through the upper and lower portions of the shallow aquifer, but were not detected in deep monitoring wells installed to evaluate SS018.

Based on the site characterization, the human health risk assessment (HHRA) and the ecological risk assessment (ERA) conducted for SS018, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002).

Because CVOCs have migrated beyond the southern AAFB boundary at concentrations that exceeded MCLs, extraction of contaminated groundwater throughout the on-base portion of the plume and MNA along with institutional controls (ICs) for the off-base portion of the plume was recommended in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Groundwater extraction ceased in 2007 and bio-mulch walls were installed which implemented the combined removal action and preferred source contaminant treatment technology approach selected by EPA in the Final Decision Document. The Site was included in the LTM programs for AAFB. Between 2008 and 2010 source area remediation and monitoring were conducted at the two suspected source areas for the CVOC plumes at SS018. The

selected remedy is MNA that has been enhanced by periodically injecting vegetable oil around the two primary source areas and the biowalls. The last emulsified vegetable oil (EVO) injections were conducted in February/March 2015. The SS018 groundwater plume is monitored as part of the Performance Monitoring Program for GWMU 1.

3.2.1.3 Spill Site 22

Site SS022 is located in the southwest portion of AAFB and is comprised of multiple source areas with commingled groundwater plumes (Figure 4d). The primary source area consists of buildings (Bldgs) 323/285. Bldg 323 has been in operation since 1953 and is used for maintenance and calibration of aircraft electronics, while Bldg 285 was a lift station that operated from 1957 to the early 1990's The primary source areas for SS022 are Bldg 323 and Bldg 285 Source Area A, centered around monitoring well WL480; and Source Area B centered around monitoring wells WL617, WL618, and WL838. The northernmost portion of the Site is located at OWS 284A, and it extends south to Aircraft Parking Spot 21. At its widest point, the Site extends from the area east of Building 353 and eastward to the eastern edge of Taxiway A.

CVOCs were detected in soil samples collected at OWS 284A, OWS 285, SWMU 19/OWS 291, OWS 296, and Building 323. CVOCs were detected in soil at all five sites; however, they were not detected at concentrations that exceeded USEPA, Region 6 MSSLs for soil based on industrial land use.

TCE detected in groundwater samples collected from upper and lower monitoring wells define commingled groundwater plumes that collectively have an area of approximately 100 acres. Based on the spatial distribution of TCE in groundwater, and detections of TCE and related CVOCs in soil, the above source areas were identified for the SS022 commingled groundwater plumes. Seven site-related chemicals were detected in groundwater at concentrations that exceeded their MCLs. Groundwater modeling suggested that four of these chemicals (1,2-DCE [total], PCE, TCE, and VC) may reach the AAFB boundary at concentrations that exceed their MCLs.

As a result, AAFB recommended a voluntary action to implement in situ chemical oxidation (ISCO) to reduce the contaminant mass of TCE in the groundwater at Building 323 (the primary source area for the SS022 groundwater plume), and further groundwater monitoring for the other portions of the commingled plumes in the RFI/IA/CMS Report (Earth Tech, 2002). The Site was included in the LTM program for AAFB. Performance monitoring for the SS022 groundwater plume is on-going.

3.2.1.4 Oil/Water Separator 284A – Former Aerospace Ground Equipment Wash Rack

The OWS 284A was constructed in 1960 and remained operational until it was taken off-line in 1994 and abandoned in place in 2004. OWS 284A was one of two OWSs associated with the Wheel and Tire Garage for AGE located at Facility 284. OWS 284A received effluent from the AGE washrack located at the facility. The Site is located north of the area occupied by hangars and maintenance facilities in the southwestern portion of AAFB (Figure 4d).

Benzene was detected in soil samples at concentrations that exceeded the USEPA Region 6 MSSL for soil based on industrial land use and a risk level of 1E-06; however, the chemicals were not detected in soil at maximum concentrations that exceeded the MSSL based on industrial land use and a risk level of 1E-05, which was the risk-based cleanup level that was established for the CMS. TCE was also detected in a down gradient soil sample collected to evaluate OWS 284A, but at a concentration that was below its USEPA Region 6 MSSL for soil based on industrial land use. The vertical and lateral extent of this contamination has been delineated at the Site. The detection of TCE in site soil is indicative of releases from the OWS. TCE and other solvent constituents were detected in groundwater at the Site. OWS

284A is considered one of the source areas for commingled CVOC groundwater plumes that are evaluated collectively as SS022.

Based on the site characterization assessments, HHRA, and ERA conducted for OWS 284A, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Because OWS 284A is considered one of the source areas for commingled CVOC groundwater plumes that are evaluated collectively as SS022, AAFB recommended groundwater monitoring for this Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). As a result, the Site was included in the LTM program for AAFB. The SS022 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 1.

3.2.1.5 Oil Water Separator 285 - Inactive Lift Station at Facility 285

The OWS 285 Site is located along Taxiway A in the southwestern portion of AAFB (Figure 4d). OWS 285 is an inactive sanitary sewer lift station that received water from the roof and floor drains of the aircraft maintenance hangar located at Facility 285. Between 1993 and 1994 the floor drains in Facility 285 were plugged and in 1996 the roof drains were re-plumbed into the storm drain.

No COCs were detected in soil samples at concentrations that exceeded USEPA Region 6 MSSLs for soil based on industrial land use indicating that OWS 285 is not a significant source of soil contamination. TCE and 1,2-DCE (total) were detected in soil samples collected at the Site at concentrations below their USEPA Region 6 MSSLs for soil based on industrial land use and are considered to be indicative of a release from the OWS and associated plumbing. CVOCs were detected in groundwater at the Site. OWS 285 is considered one of the source areas for commingled CVOC groundwater plumes that are evaluated collectively as SS022.

Based on the site characterization assessments, HHRA, and ERA conducted for OWS 285, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Because OWS 285 is considered one of the source areas for commingled CVOC groundwater plumes that are evaluated collectively as SS022, AAFB recommended groundwater monitoring for this Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). As a result, the Site was included in the LTM program for AAFB. The SS022 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 1.

3.2.1.6 Building 323

The Building 323 Site is located in the southwestern portion of AAFB (Figure 4d). The Precision Maintenance and Logistics Building (Building 323) conducts maintenance and calibration of aircraft electronic instrumentation and has been in operation since 1953. Hazardous wastes including lithium, mercury and batteries are generated and temporarily stored at the facility prior to off-site disposal.

No site-related COCs were detected in soil samples at concentrations that exceeded USEPA Region 6 MSSLs for soil based on industrial land use. TCE and 1,2 DCE (total) were detected in subsurface soil samples collected at Building 323, but at concentrations below their USEPA Region 6 MSSLs for soil based on industrial land use. The detection of these chemicals in site soil suggests that they are a result of past releases at Building 323. CVOCs were detected in groundwater at the Site. Building 323 is considered one of the primary source areas for commingled CVOC groundwater plumes that are evaluated collectively as SS022.

Based on the site characterization assessments, HHRA, and ERA conducted for Building 323, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Because Building 323 is considered one of the primary source areas for commingled CVOC groundwater plumes

that are evaluated collectively as SS022, AAFB recommended a voluntary action to reduce the mass of TCE in groundwater at Building 323 and recommended groundwater monitoring for the SS022 plume in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). As a result, the Site was included in the LTM programs for AAFB. A source area reduction project was initiated at the Site in 2008. The SS022 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 1.

3.2.1.7 Spill Site 23

Site SS023 is located under the aircraft parking apron east of Hangar 517 and Bldg 514, (Figure 4e). SS023 has no direct operational history and no specific source(s) were identified for this CVOC plume. The SS023 plume has been detected in both the upper and the lower portions of the shallow aquifer.

No COCs were detected in soil samples at concentrations that exceeded USEPA Region 6 MSSLs for soil based on industrial land use indicating that SS023 is not a significant source of soil contamination. TCE was detected in groundwater at a maximum concentration which exceeded its MCL. The suspected source area for the TCE concentrations detected in groundwater is near the southwest corner of Building 514. The TCE contamination in groundwater has been delineated laterally and vertically at the Site. The SS023 TCE groundwater plume commingles with the SS022 and SS017 TCE groundwater plumes to the west.

Based on the site characterization assessments, HHRA, and ERA conducted for SS023, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Because groundwater modeling predicted that TCE may reach the AAFB boundary at a concentration near its MCL, AAFB recommended groundwater monitoring for TCE at this Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). The Site was included in the LTM program for AAFB. Two sections of the BMW are located downgradient of the SS023 plume along the southern boundary of AAFB. The main remedy at SS023 is MNA. The SS023 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 1.

3.2.2 Groundwater Management Unit 2

GWMU 2 is comprised of two separate CVOC groundwater plumes that originate from FT005 and SS013 (Figure 5a). Site FT005, which was originally part of GWMU 2, is designated as NFA. However, three FT005 monitoring wells are included in the GWMU 2 sampling network.

The 2014 CMI Performance Review (AECOM, 2014c) reported that Upper and Lower Zones are the hydrogeologic zones of concern where CVOCs remain above MCLs at GWMU 2. The performance review provided the following GWMU 2 conclusions:

- GWMU 2 groundwater plumes are generally stable.
- Concentrations are low. TCE was detected at a maximum concentration of 14 micrograms per liter (µg/L) in GWMU 2 in Spring 2014.
- The plume does not threaten a POC well.

3.2.2.1 Spill Site 13

The SS013 (also known as AOC 2 - C-5 Flight Line Fuel System) Site is located along Taxiway B in the southwestern portion of AAFB (Figure 5b). The Site includes portions of the airfield support area and the C-17 aircraft parking apron (formerly the C-5 aircraft parking apron). The Site was investigated as part of the flight line fueling system investigation. The original fueling system was installed in 1942 and

was replaced with a new system between 1994 and 2000. The piping for the original system was abandoned in place.

TCE and carbon tetrachloride were detected in the groundwater at maximum concentrations which exceeded their MCLs and are likely related to historical operations at the Site. The Site is suspected to be the source area for these contaminants, which have been detected in groundwater samples collected from monitoring wells installed in the upper and lower portions of the shallow aquifer. The concentrations of TCE and carbon tetrachloride that exceeded their MCLs have been delineated at the Site.

Based on the site characterization assessments, HHRA, and ERA conducted for SS013, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Groundwater monitoring was recommended for the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). As a result, the Site was included in the LTM programs for AAFB. The SS013 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 2.

3.2.3 Groundwater Management Unit 3

GWMU 3 consists of a single CVOC groundwater plume originating from SS024 (Figure 6a). The 2014 CMI Performance Review (AECOM, 2014c) reported that Upper and Lower Zones are the hydrogeologic zones of concern where CVOCs remain above MCLs at GWMU 3. The performance review concluded that the GWMU 3 groundwater plume is generally stable and does not threaten a POC well.

3.2.3.1 Spill Site 24

Site SS024 is located south of Taxiway E-2 in the southeastern portion of AAFB (Figure 6b). The suspected source of the CVOCs at the Site is Facility 492, a former missile maintenance facility.

No COCs were detected in soil at concentrations that exceeded USEPA Region 6 MSSLs for soil based on industrial land use indicating that SS024 is not a significant source of soil contamination. TCE and PCE were detected in groundwater at maximum concentrations which exceeded their MCLs. The concentrations of TCE and PCE that exceeded their MCLs have been delineated at the Site.

AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). Based on the groundwater modeling, AAFB recommended groundwater monitoring for this Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). As a result, the Site was included in the LTM program for AAFB. The SS024 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 3.

3.2.4 Groundwater Management Unit 4

GWMU 4 groundwater plume underlies LF004 and LF014 (Figure 7a). LF004 is considered the primary source and LF014 is considered a minor contributor.

The 2014 CMI Performance Review (AECOM, 2014c) reported that Upper, Lower, and Upper Intermediate Zones are the hydrogeologic zones of concern where CVOCs remain above MCLs at GWMU 4. The performance review concluded that the GWMU 4 groundwater plumes are generally stable and does not threaten a POC well. However, TCE was detected at concentrations below its MCL at Upper Zone POC well WL060 and Lower Zone POC well WL458 in Spring 2014.

3.2.4.1 Solid Waste Management Unit 07 - Landfill No. 3 (IRP Site LF004)

Site LF004 (also known as SWMU 07) is located west of Stinking Creek in the east-central portion of AAFB (Figure 7b). The Site consists of a former unlined sanitary landfill (Former Landfill No. 3) and POL tank sludge burial area. The landfill was approximately 15 acres in size and was in operation from approximately 1956 to 1983. The POL sludge burial area was reportedly located at the north end of the landfill.

LF004 is considered the primary source of the commingled CVOC plume; LF014 is considered a minor contributor. With respect to the vertical extent of chlorinated contamination in groundwater at LF004, the majority of the groundwater contamination has been detected in groundwater samples collected from the upper and lower monitoring wells at the Site. TCE was detected in the groundwater sample collected from only one upper intermediate monitor well, and no contamination has been detected in the groundwater samples collected from lower intermediate monitoring wells at the Site.

AAFB recommended the excavation and off-base disposal of the arsenic contaminated area and the North-South Cell of the former landfill, followed by backfilling and grading of the landfill surface as the most appropriate alternative in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). AAFB also recommended anaerobic bioremediation as the most appropriate alternative for remediation of the commingled LF004 and LF014 groundwater plume. The Site was included in the LTM program for AAFB. In June 2002, AAFB installed a BMW at LF004 and between October and November 2003 AAFB installed a bioreactor at the LF004 source area. The LF004 groundwater plume is monitored as part of the Performance Monitoring Program (LTM) for GWMU 4.

3.2.4.2 Solid Waste Management Unit 08 - Landfill No.4 (IRP Site LF014)

Site LF014 (also known as SWMU 08) is located in the east-central portion of AAFB (Figure 7c). The Site consists of former Landfill No.4, a POL tank sludge disposal area and hard fills Area No.3. Landfill No. 4 was in operation between 1966 and 1968, the POL tank sludge disposal area was active in 1974 and Hardfill Area No.3 began receiving building debris from on-base tornado damage in 1982.

Trace concentrations of CVOCs were detected in soil samples at the Site, indicating that the Site contributes to the LF004 and LF014 plumes; however, no COCs were detected in soil samples at concentrations exceeding USEPA Region 6 MSSLs for soil based on industrial land use indicating that LF014 is not a significant source of soil contamination.

Based on the site characterization, HHRA, and ERA conducted for LF014, AAFB recommended NFA for soil at the Site in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002). TCE has migrated to near the AAFB boundary at concentrations above its MCL. AAFB evaluated corrective measures alternatives in the *Draft RFI/IA/CMS Report* (Earth Tech, 2002) and recommended anaerobic bioremediation for the LF004 and LF014 CVOC plumes. Two wells from LF014 are included in the current Performance Monitoring Well Network (AECOM, 2016).

AAFB submitted a July 2015 ICM Report for LF014 work conducted in February-March 2015, consisting of installing three monitoring wells and 22 remediation wells for EVO injection (AECOM, 2015d). In March 2016, an addendum to the ICM was submitted to install six additional injection wells base on February 2016 monitoring results. Final results of the EVO injection have not been reported as of this FYR.

3.2.5 No Further Action Sites

Based on various letters issued by USEPA Region 6 and ODEQ, 47 RFI sites (Table 3b) have been closed based on commercial/industrial land use and are designated NFA sites. Many of the sites overlie impacted groundwater plumes; therefore additional groundwater monitoring is planned. The locations of the NFA sites are illustrated in Figure 3.

SWMU 01, SWMU 02, SWMU 03, SWMU 04, SWMU 05, SWMU 06, SWMU 09, SWMU 10, SWMU 11, SWMU 12, SWMU 13, SWMU 14, SWMU 15, SWMU 16, SWMU 17, SWMU 19, SWMU 21, SWMU 26, AOC 1 North, AOC 1 South, 377/ AOC 2, AOC 2 - KC-135 Parking Area, AOC 2 - C-17 Parking Area, AOC 4 - AAFB Sanitary Sewer System, AOC 6 - Aircraft Refueling Vehicle Maintenance Facility and OWS392, and OWS 296 – Aircraft Tire and Wheel Shop are NFA sites and will not be discussed individually. For soils at these NFA sites, the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) are still valid. The sites are located in either an industrial area or on the airfield of an active installation. ODEQ uses Risk Based Industrial Worker exposure levels when making a determination of NFA status, it is ODEQ's policy to conduct confirmatory sampling if the analytical data is older than two years for groundwater and 5 years for soils before they will make the determination that the Site has reached its cleanup goals (ODEQ, 2013). Of the 55 sites identified in the RFI, 47 sites have been designated for NFA (as listed on Table 2.3).

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4.0 Remedial Actions

4.1 REMEDY SELECTION

The selected final remedy involves a combined approach of removal actions, treatment technology and ICs. The final selected remedy, described in the 2007 RTCs/FDD (Attachment 1 of the 2010 RCRA Permit) includes the following elements:

- Soil and groundwater excavation (source removal) at source areas.
- Enhanced Reductive Dechlorination (ERD) for source zone treatment using bioreactors.
- ERD for source containment using BMWs at the facility boundary and additional upgradient BMWs or enhancements of the BMWs, if necessary to meet the CAOs.
- ERD using a well injection circulation system enhancing mass transfer from the non-aqueous phase to the aqueous phase.
- Optimization of selected groundwater wells to monitor the GWMUs for compliance with the CAOs.
- Use of ICs to control offsite exposure to contaminated groundwater.

Location of remedial actions conducted in GWMU 1 and GWMU 4 are illustrated on Figures 8 and 9, respectively.

4.2 REMEDY IMPLEMENTATION

Cleanup and remedial activities at AAFB were prioritized and sites that posed the highest risk to HH&E were generally addressed first. The Final CMI Work Plan describes the recommended corrective measures to be implemented for the purpose of achieving the final CAOs. Remedial actions conducted at AAFB, since selecting the final remedy in the 2007 RTCs/FDD, are described below.

GWMU 1 remedial actions include the following:

- A soil removal action was completed in May 2014, centered at monitoring well WL132 to remove source VOCs at WP002.
- Ongoing anaerobic reductive dechlorination of CVOCs in groundwater via the network of BMWs installed at SS017 and SS018. In 2008, EVO was injected into the BMWs at SS017 and SS018 to refresh the organic carbon content in the walls and to enhance the reductive dechlorination of CVOCs in the groundwater.
- Ongoing anaerobic reductive dechlorination of CVOCs in groundwater via the substrate injected at two source areas at SS018 and three source areas at SS022. In February 2015 EVO was injected into the Lower Zone at SS018.
- Implementation of an in situ groundwater treatment project beneath the SS017 BMWs to treat deeper groundwater under the SS017 BMW in the upper intermediate zone and reduce off-Base migration of contaminants. The treatment project included one injection of a carbon substrate below the BMW in 2008. Periodic re-injection was specified in the Final CMI Work Plan (AECOM, 2015a).

- Refreshing the carbon substrate and restarting the Building 506 bioreactor and recirculation system at SS017 in 2015 as a contingent remedial action due to MCL exceedances at POC wells.
- Ongoing monitoring for remedy performance and/or natural attenuation.

No remedial actions other than ongoing monitoring for natural attenuation were conducted at GWMU 2 or GWMU 3.

GWMU 4 remedial actions include the following:

- Ongoing anaerobic reductive dechlorination of CVOCs in groundwater via the BMW and bioreactor installed at LF004/SWMU 07. The bioreactor was restarted in 2015.
- EVO injections conducted at LF014/SWMU 8 in June 2015.
- Ongoing monitoring for remedy performance and/or natural attenuation.

4.2.1 Performance Monitoring

Altus AFB, in coordination with the USEPA, Region 6 and ODEQ, established four GWMUs (designated GWMUs 1, 2, 3 and 4) and a performance monitoring well network for each GWMU to manage the groundwater contamination at the Base. The four GWMUs required further remedial action and/or performance monitoring as described in the CMI Performance Monitoring Plan (Earth Tech, 2009c), which was approved by the USEPA Region 6 on January 30, 2009 and the ODEQ on February 23, 2009. At GWMUs 1 and 4, multiple corrective actions have been implemented, including source excavations, installation of bioreactors and BMWs, and injection of EVO.

As described in the CMI Performance Monitoring Plan, the performance monitoring well network for each GWMU (as applicable) consists of the following types of groundwater monitoring wells:

a. Source Area Monitoring Wells (all GWMUs) - located at or within the known or suspected source areas of the plumes for the purpose of providing data about contaminant degradation processes and rates.

b. Body-of-plume Monitoring Wells (all GWMUs) - located within the body of the plumes for the purpose of providing information on contaminant concentrations within the plume.

c. POC Monitoring Wells (for GWMUs 1 and 4 only) - located at or near the most down gradient limit of implemented ICs for Altus AFB. The purpose of the POC wells is to demonstrate that contaminant concentrations are less than federal MCLs for drinking water at the POC, thereby demonstrating that groundwater exposure within the plume is under the control of Altus AFB.

d. Sentinel Monitoring Wells (all GWMUs) - located immediately upgradient of the POC wells. The sentinel wells are intended to provide an early indication of plume migration that may potentially result in a contaminant concentration exceeding its MCL at a POC well.

In March 2013, Altus AFB submitted a Class 1 Modification of the Permit to the ODEQ, to formalize the Performance Monitoring Systems in groundwater sampling and monitoring schedules based on the initial CMI Performance Review and the results of 2012 plume stability assessment. The Class 1 Modification proposed a three-year monitoring cycle, where the first two years consist of monitoring an optimized performance monitoring well network and the third year monitors a more comprehensive well network (for each GWMU). This more comprehensive sampling event corresponds with the remedy effectiveness review and documentation in a CMI Performance Review Report. The changes proposed

in the permit modification optimize the GWMU performance monitoring well networks (number of sampling locations of sentinel wells, body-of-plume wells, and source wells) and monitoring frequency; however, no changes were proposed for POC wells. The reduction in wells is based on performance monitoring where analytical results are either duplicative of other nearby wells or are less than MCLs. The proposed optimized network is the network that has been monitored from the Spring 2013 through Spring 2016 performance monitoring events.

A 16 September 2013 letter from ODEQ notified Altus AFB that the correct Permit Modification application for the groundwater monitoring systems was a Class 2 Tier I modification; this modification was approved by ODEQ on 21 March 2017. The modifications approved by ODEQ in their 16 September 2013 letter were for typos and clarifications.

The last effectiveness review and associated performance review report was completed in 2014, requiring the next to be completed in 2017. A review of the 2014 CMI Performance Review and Annual Performance Monitoring identified that the following three items were not included in the report as required by the RCRA Permitted monitoring program:

- An assessment of in situ attenuation rates.
- A summary or graphical representation of the evaluation of the geochemical indicator parameters.
- Groundwater flow direction and velocities and the equations, calculations, and parameters used to make the calculations.

Without comparing CVOC concentration data to attenuation rates and geochemical indicator parameters (such as oxidation-reduction potential [ORP] and dissolved oxygen [DO], in particular), the stimulation of ERD/natural attenuation and ongoing remedy effectiveness cannot be dependably assessed.

4.2.2 RAO Monitoring

Additional remedial activities were triggered after concentrations in POC wells were above MCLs. RAO monitoring was also conducted at sites undergoing remedial action in accordance with their individual Corrective Measures Reports:

GWMU 1

- SS016 – SVE system operated through March 10, 2016, and a biosparge system to be installed April 2016 (AECOM, 2015b).
- SS017 – EVO injection and bioreactor restarted January 2015 (AECOM, 2015e).
- SS018 – EVO injections to begin 2015 (AECOM, 2014c).
- WP002 – PermeOx (calcium peroxide) injections are ongoing (AECOM, 2014b).

GWMU 4

- LF014 – Injections to begin April 2016 (AECOM, 2015d).

Data from RAO monitoring are provided in annual performance monitoring reports.

4.3 OPERATION AND MAINTENANCE (O&M)/LONG TERM MONITORING (LTM)

Maintenance of the current engineered remedies along with additional treatments at source areas and the AAFB boundary are ongoing. A base-wide LTM Plan to ensure ongoing plume stability and protectiveness is in progress.

Remedial Action O&M activities are conducted at SS017 (GWMU 1) - EVO injection and bioreactor restarted January 2015 (AECOM, 2015e). An O&M Manual for the bioreactors was submitted to ODEQ on 12 May 2014. The O&M manual provides guidance for the monitoring and maintenance of the recirculation extraction pumps, pressure transducers, pump controllers, filters, water meters, and other miscellaneous items. The O&M manual provides recommended maintenance and monitoring procedures and schedules for these key components of the SS017 Source Area Bioreactor (Versar, 2015). ODEQ also requested an O&M Manual for the biowalls. To date it has not been submitted.

4.4 LAND USE CONTROLS

The selected Remedy and CAOs for AAFB and the associated off-base properties were designed to be protective of human and ecological receptors based on the intended land use, and were not intended for unlimited exposure and unrestricted use scenarios; therefore, LUCs and ICs were included as part of the remedy. LUCs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Effective LUCs are required to ensure the protectiveness of the remedy at AAFB.

The LUCs vary depending upon impacted media and the intended land use, but share at least one common objective; to limit the exposure of human and ecological receptors to contaminated soil or groundwater in order to avoid unacceptable risks. Compliance with LUCs is required to assure long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure. Contaminated environmental media at AAFB include soil, groundwater, and surface water.

Further details regarding the LUCs and recommendations to enhance documentation of compliance with the LUCs to verify that they are being implemented correctly, are presented in the following sections.

4.4.1 Land Use Controls for On-base Activities

All projects that may involve intrusive activities must first undergo review and notification procedures so base environmental management can determine if potential for exposure to environmental contamination exists for the project. Implementation of these controls occurs through the Base Civil Engineer work clearance request process as mandated by Air Force Instruction (AFI) 32-1001, Operations Management. Implementation also occurs through the formal planning process mandated by AFI 32-7062, Air Force Comprehensive Planning, and AFI 32-1021, Planning and Programming of Facility Construction Projects resulting in development restrictions included in the Base Area Development Plan. Work clearance procedures require coordination with and prior approval by 97th Civil Engineer Squadron, Environmental Flight personnel if a proposed project is located on or near an Environmental Restoration Program (ERP) site. All use of groundwater is prohibited within the AAFB boundary by the 97th Air Base Wing (ABW). Potable water is supplied to AAFB by the City of Altus. Indoor air exposures have been a concern at buildings located above the current groundwater plumes; however, based on indoor air evaluations in the potentially worst case areas, indoor air exposures were determined to be acceptable in the current administrative buildings located above the plumes. For future construction above the GWMUs, engineering controls to mitigate indoor air exposures will be required as part of the initial design plans. On-base land uses are shown on Figure 9.

4.4.1.1 Adherence to Land Use Controls for On-base Activities

LUCs have been implemented in the form of several administrative policies/procedures to prohibit intrusive activities and groundwater use as mentioned in Para 4.4.1. Annual inspections must be completed by 30 Sep each year at AAFB to ensure the adequacy and effectiveness of the LUCs. Annual reports are submitted to ODEQ and to EPA Region 6, documenting the findings of the annual inspection. These reports are to be included in the AAFB Administrative Record. Results of the annual LUC inspections conducted in October 2012, October 2013, October 2014, September 2015, and September 2016 did not reveal any issues or violations for the on-base property.

4.4.2 Land Use Controls for Off-base Activities

Groundwater plumes within GWMU 1 (i.e., SS017 and SS018) have migrated off-base and underlie four properties directly south of AAFB and properties south of Highway 62 (Figure 10). These properties include the Elks Lodge property, the Winters Property, the Altus Municipal Authority property (former Pixely property), and the Mills property. As of 2015, The Elks Lodge property is now owned by the City of Altus, it is a municipal golf course. LUCs for each of the four properties have been implemented in the form of restrictive (environmental) covenants. The restrictive covenants were finalized in June 2009 (Altus AFB, 2009). The restrictive covenants include groundwater use restrictions, subsurface excavation restrictions, residential use restrictions, conveyance of interest restrictions and require notification/ approval from AAFB for any use inconsistent with the permit. The restrictive covenants also allow AAFB to conduct monitoring and inspections of the properties to ensure protectiveness to human health. The activity and use limitations as described in Restrictive Covenants for the four off-base properties are listed below:

- Grantor shall not use the groundwater beneath the Property as a water supply source for any use; potable, industrial, or irrigation.
- Grantor shall not excavate the subsurface of Property unless the excavation is less than 8 ft bgs and does not encounter the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager at AAFB for human health safety advice and assistance.
- The Grantor of the property must give thirty (30) days advance written notice to Grantee of the Grantor's intent to convey any interest in the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the Grantor without adequate and complete provision for continued monitoring, operation, and maintenance of the environmental system operated by AAFB.
- The Grantor must restrict leases and easements to uses and activities consistent with the Covenant and notify all lessees of the restrictions on the use of the Property.
- The Grantor must notify and obtain approval from Grantee prior to any use of the Property that is inconsistent with the terms of this Covenant. Grantee may approve any inconsistent use only after public notice and comment.

4.4.2.1 Adherence to Land Use Controls for Off-base Activities

The executed restrictive covenants were recorded with the Jackson County Property Records office in June 2009. Results of the annual LUC inspections conducted in October 2012, October 2013, October

2014, September 2015, and September 2016 did not reveal any issues or violations for the off-base properties (Appendix A).

The extent of the GWMU 1 groundwater plumes has extended past the southern boundary of the Mills property and across Highway 62, to the current southernmost POCs for the groundwater plumes. Groundwater contaminant concentrations are increasing at the POCs; it is recommended to institute LUCs for the properties located south and east of Mills property to property to ensure protectiveness of human health.

No activities were observed that would have violated the LUCs during the site inspection.

4.4.3 Summary of Land Use Controls

LUCs have been designed and implemented for all on-base property and four off-base properties underlain by the GWMU 1 groundwater plumes. These LUCs are protective of HH&E and protect the integrity of the remedy; however there is an area outside of the current LUC area south of the Mills property and Highway 62 that presents a risk to HH where LUCs are recommended to be implemented (Figure 10). Similar LUCs may be required for the properties located down gradient of GWMU 1 to ensure protectiveness of human health.

4.4.4 Recommendations to Enhance Implementation of Land Use Controls

The CMI LUC Plan (Earth Tech, 2009d) identifies the areas that are under restriction, the objectives of the LUCs, and the mechanisms required to achieve them. The CMI LUC Plan recommended that a clear understanding of current roles and responsibilities with respect to monitoring, reporting, and enforcement of compliance with the LUCs be developed for the on-base and off-base properties.

5.0 Progress since the Last Five-Year Review

This is the second FYR for AAFB. LUCs were implemented in 2009. The first FYR was performed in 2012 for years 2007-2011 (Aerostar Environmental Services, Inc. [Aerostar], 2012). The 2012 FYR concluded that the remedy is functioning as intended and is protective of HH&E under the current and future land use. Land use inspections have been conducted annually since the first FYR.

Additional corrective measures were conducted at the following sites since the last FYR:

GWMU 1

- SS016 – SVE system operated through March 10, 2016, and a biosparge system to be installed April 2016 (AECOM, 2015b).
- SS017 - EVO injection and bioreactor restarted January 2015 (AECOM, 2015e).
- SS018 – EVO injections to begin 2015 (AECOM, 2014c).
- WP002 – injections of PermeOx (calcium peroxide) ongoing (AECOM, 2014b).

GWMU 4

- LF014 – injections to begin April 2016 (AECOM, 2015d).

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6.0 Five-Year Review Process

6.1 ADMINISTRATIVE COMPONENTS

The second FYR of the AAFB was performed by Black & Veatch, under contract to the AFCEC, on behalf of the USAF.

Components of the Performance Review included:

- Document Review
- Data Review
- Site Inspection
- FYR Report Development

The review team included members from the Black & Veatch project management and technical advisory staff with expertise in construction management, engineering, hydrology, chemistry, environmental regulations, and risk assessment.

The schedule of project activities extended from July 2012 to September 2016.

6.2 COMMUNITY INVOLVEMENT

Community involvement has regularly occurred during the corrective action program at AAFB. AAFB established a Restoration Advisory Board (RAB) in 1994 to allow for the exchange of information between AAFB, the regulatory agencies and the community. In 1995, AAFB published the Community Involvement Plan for community relations and public outreach activities. The Community Involvement Plan was updated during the RFI and has been updated by the CMI Community Relations Plan included in the 2009 CMI Work Plan. The RAB was active until 2005, when it was abolished due to the lack of community interest. AAFB will determine if there is sufficient interest in the community during the ongoing groundwater monitoring and corrective actions to reinstate the RAB in accordance with 32 C.F.R. 202.10(c).

6.3 DOCUMENT REVIEW

This second FYR consisted of a review of relevant documents including but not limited to work plans, monitoring reports, decision documents, O&M records, facility records, the SOB and the Final RCRA CAP. A list of documents that were reviewed during the FYR is presented in Section 12.

6.4 DATA REVIEW

Analytical data has been collected during many phases of assessment conducted at AAFB. Base-wide site characterization activities at AAFB addressed 55 sites during the RFI. The *Draft RFI/IA/CMS Report* was completed in November 2002. Groundwater sampling and modeling results collected in support of the RFI/IS/CMS were analyzed to determine which sites and locations to include in the LTM programs. Groundwater and surface water samples from several RFI sites were collected and analyzed as part of the LTM programs for AAFB including Corrective Measures semi-annual performance monitoring 2008 - 2016.

6.4.1 2014 Corrective Measures Implementation Performance Review and Annual Performance Monitoring Report

In October 2014, the 2014 CMI Performance Review and Annual Performance Monitoring Report (AECOM, 2014c) was submitted. Fall 2013 and Spring 2014 performance groundwater sampling events were incorporated into the CMI Performance Review and Annual Performance Monitoring Report. The following methods were used to assess the stability of the ground water plumes that make up GWMU 1 through GWMU 4:

- The updated GWMU 1 transport model (AECOM, May 2013) was used as the basis for transport simulations
- Mapping (Monitoring and Remediation Optimization System [MAROS] trends and Plume footprints)
- Natural attenuation analyses
- Groundwater flow and solute transport modeling for GWMU 1.

The following conclusions were made in the 2014 report for each of the GWMUs:

- The GWMU 1 Upper, Lower and Upper Intermediate Zones are the hydrogeologic zones of concern where CVOCs remain. The GWMU 1 groundwater plume is generally stable with the following exceptions:
  - SS017: TCE concentrations have significantly increased since 2011 in the Lower Zone at the former Building 506 source area and monitoring wells located downgradient of the source area.
  - SS018: Carbon tetrachloride and TCE concentrations have increased since 2009 in the Upper and Lower Zones at the source area, and in monitoring wells located downgradient of the source area in the Lower Zone.
- There is minimal groundwater contamination at GWMU 2 and no potential to impact a POC. The Upper and Lower Zones are the hydrogeologic zones of concern where CVOCs remain above MCLs.
- The GWMU 3 groundwater plume originating at SS024 is generally stable and does not threaten an AAFB POC.
- The groundwater plumes comprising GWMU 4 are generally stable and do not threaten an Altus AFB POC.

6.4.2 Annual Performance Monitoring (2013-2016)

Four performance groundwater monitoring events were conducted between 2013 and 2016. Site wells are sampled at varying intervals including semi-annually, annually, and every three years, according to the proposed 2013 Class 2 Modification of the Permit.

The maximum concentrations detected above their respective MCLs during the latest four rounds (2013 - 2016) of performance monitoring for the COCs identified within each GWMU are presented in Table 6.1. As of Spring 2016, there are still COCs significantly above the MCLs at all four GWMUs. The overall maximum COC concentrations at the GWMUs from 2013 – 2016 do not clearly appear to be decreasing.

Table 6.1 – Maximum Groundwater Concentration during the Performance Monitoring (2013 – 2016)

GWMU	Analyte	MCL (µg/L)	Performance Monitoring Results Maximum Concentration Exceeding MCL (µg/L)			
			Spring 2013	Spring 2014	Spring 2015	Spring 2016
GWMU 1	PCE	5	566	655	645	431
	TCE	5	24,200	21,900	34,200	16,600
	1,2-DCE	70	8,290	1.2	1.07	6,800
	VC	2	6,510	3,370	2,530	5,140
	CTC	5	15,700	15,00	13,700	12,000
GWMU 2	TCE	5	29.2	14	18.4	13.1
	CTC	5	269	102	158	94.3
GWMU 3	PCE	5	144	168	133	95.5
	TCE	5	210	178	148	117
GWMU 4	TCE	5	2,310	2,580	3,170	7,600
	1,2-DCE	70	1,690	1,140	600	685
	VC	2	814	587	79.3	214

Notes: CTC - Carbon Tetrachloride; µg/L - micrograms per liter

The purpose of the POC wells is to demonstrate that contaminant concentrations are less than federal MCLs for drinking water at the POC, thereby demonstrating that groundwater exposure within the plume is under the control of Altus AFB. TCE is the only COC that exceeded an MCL at GWMU 1; there were no POC exceedances at other GWMUs. TCE concentrations exceeded the MCL at one Lower Zone POC well (WL856 and WL858) and at three Upper Intermediate Zone POC wells (WL787, WL819, and WL854) in Spring 2016 at GWMU 1. While TCE concentrations in WL856 were generally stable and below MCLs during the drought, TCE concentrations have fluctuated significantly since the drought ended in Spring 2015; the fluctuating concentrations are likely related to the highly-variable groundwater/surface water hydraulics since Spring 2015. The TCE overall concentration trend is increasing over time in the Upper Intermediate Zone POC wells, including wells WL819 and WL854 (there is a discrepancy in the 2016 Performance Monitoring Report which states these as well are decreasing). The POC wells and potential risks/exposures in this area are being managed via the 2014 POC Contingency Plan for GWMU 1 (AECOM, 2014a).

6.4.2.1 Surface Water Monitoring

Surface water sampling networks were established for the southern unnamed tributary of Stinking Creek at GWMU 1 and Stinking Creek at GWMU 4.

No VOCs were detected above MCLs in the surface water sample collected from the GWMU 1 Southern Unnamed Tributary of Stinking Creek in Spring 2015. No VOCs were detected above MCLs in the surface water sample collected from the GWMU 1 Southern Unnamed Tributary of Stinking Creek in Spring 2016.

Surface water levels in Stinking Creek have decreased since 2010; surface water samples could not be collected at surface water POC location (RV015) during the 2013 and 2014 performance monitoring events. No VOCs were detected above MCLs in the surface water samples collected from GWMU 4 RV015 in either Fall 2015 or in Spring 2016.

6.4.3 2016 Annual Performance Monitoring Report

In October 2016, the 2016 Annual Performance Monitoring Report (AECOM, 2016) was submitted. Fall 2015 and Spring 2016 performance groundwater sampling events were incorporated into the 2016 Annual Performance Monitoring Report. In reviewing the Annual Monitoring Report conclusions and data during this FYR, it was determined that there are some additional conclusions and some apparent discrepancies with the 2016 Performance Monitoring Report conclusions that should be noted. This section presents report conclusions followed by supplementary conclusions and/or concerns with report conclusions.

Conclusions related to the groundwater plume at GWMU 1 are as follows:

- Hydrologic conditions
  - Report Conclusion: The four-year lapse (2010-2014) in all sources of hydraulic and hydrological inputs to the aquifer system followed by the record precipitation in May 2015, the renewed operation of the canal system, and the increased leakage to the Southern Unnamed Tributary likely impacted plume migration, particularly near the SS017 POC due to very low volatile organic compound (VOC) concentrations and the influence of the Southern Unnamed Tributary. The significant concentration fluctuations observed in many POC wells may be evidence of this impact.
  - Conclusion Supplement: Low groundwater levels and a decreased groundwater flow resulted in inaccurate plume stability assessments during this timeframe. The plume stability assessment (2012) conclusions that CVOC concentration trends were generally stable or decreasing were not accurate.
- SS017 Source Area
  - Report Conclusion: Upper Zone source area (former Building 506) well WL377 continues to indicate decreasing trends, although concentrations of degradation products (i.e., 1,2-DCE and VC) have increased since 2015, indicating degradation of TCE. Lower Zone source area well WL378 indicates an increasing trend for TCE due to increased TCE concentrations between 2009 and 2014; however, TCE concentrations have decreased sharply since 2014. Continued operation of the bioreactor re-circulation system and the EVO injections are expected to, over time, result in decreasing trends of GWMU 1 plumes in all three zones of the aquifer.
  - Conclusion Supplement: Upper Zone well WL607 in the secondary source area indicates an increasing trend for TCE. However, PCE concentrations are decreasing, indicating degradation of PCE and formation of TCE as a degradation product. The greatest and most immediate effects of the bioreactor system are anticipated for the groundwater closest to the system. Increasing trends have been observed farther downgradient in the plume body and at sentinel and POC wells.
- SS017 Upper Zone Body of Plume
  - Report Conclusion: Upper Zone wells in the body of plume are generally stable with the following exceptions: TCE concentrations in Upper Zone well WL139, located downgradient of the Building 506 source area, fluctuate significantly from year to year, and increased from 123 µg/L in Spring 2015 to 459 µg/L in Spring 2016. The increase in the TCE concentration resulted in an increasing TCE trend (versus no trend in 2015). Upper Zone well WL543, located downgradient of WL139 near Building 424, also has an

increasing TCE trend, but the TCE concentration decreased from 5,710 µg/L in Spring 2015 to 344 µg/L in Spring 2016. Because both wells are located downgradient of the SS017 bioreactor, continued operation of the bioreactor re-circulation system combined with the June 2015 EVO injections into the bioreactor are expected to result in decreasing concentrations over time.

- Conclusion Supplement: Although the report lists well WL139 as an exception to the generally stable plume, it is apparent that the increase in TCE concentrations at WL139 is likely due to the degradation of PCE and formation of TCE and other CVOC daughter products. PCE was 24.1 µg/L in May 2014 and had decreased to 4.58 µg/L in May 2016. As long as the bioreactor re-circulation system continues to supply carbon substrate and promote reducing conditions in groundwater, CVOC concentrations are expected to decrease over time. However, the greatest and most immediate effects of the bioreactor system are anticipated for the groundwater closest to the system. It appears that reducing conditions are not being verified during performance monitoring (via measurement of geochemical parameters such as DO and ORP). Therefore, farther downgradient from the system biodegradation versus advection process cannot be differentiated. The treatment of groundwater downgradient from the bioreactor system is also limited by groundwater velocity. (See additional discussion below for the Lower Zone Body of Plume.)

- SS017 Lower Zone Body of Plume
  - Report Conclusion: Lower Zone wells in the body of plume continue to show increasing trends downgradient of the Building 506 source area. However, because the wells with increasing trends are located downgradient of the SS017 bioreactor, continued operation of the bioreactor re-circulation system combined with the June 2015 EVO injections into the bioreactor are expected to, over time, result in decreasing concentrations for the these wells. As discussed above, TCE concentrations in Lower Zone source area well WL378 have decreased sharply since the restart of the bioreactor re-circulation system and the 2015 EVO injections. Additionally, TCE concentrations in wells WL383 and WL519, located immediately downgradient of the bioreactor, were lower in 2015 and 2016 (after restart of the bioreactor) than in previous years. Furthermore, increasing concentration trends of degradation products (i.e., 1,2-DCE and VC) in many Lower Zone wells indicates biodegradation is occurring.
  - Conclusion Supplement: There is evidence of increasing concentrations of CVOC degradation products at Lower Zone wells WL519 and WL383 located approximately 300 ft downgradient of the bioreactor/BMW re-circulation area. However, evidence of biodegradation is lacking in Lower Zone wells located approximately 800 ft downgradient in the plume body (e.g., WL318 and WL082). Using a linear groundwater velocity of 0.81 ft/day to estimate potential maximum transport distance (calculated for the Upper Intermediate Zone; Parsons, 2009a), since restarting the system in January 2015 groundwater would have travelled an estimated maximum distance of 400 ft. Therefore, it is likely that the treatment zone has extended downgradient to the wells located approximately 300 ft away, but not the wells 800 ft away. While operation of the system is expected to result in decreasing concentrations in the Upper and Lower Zones, effectiveness and the breadth of downgradient treatment is limited by distribution of carbon substrate and generation of reducing conditions in groundwater.

- SS017 Upper Intermediate Zone Body of Plume
  - Report Conclusions: All Upper Intermediate Zone wells in the body of plume indicate stable/decreasing trends for TCE, carbon tetrachloride and total molar concentrations. The data also indicate:
    1. TCE concentrations in well 000I17-MW3, located on the Base boundary near biowall Section B, have fluctuated significantly over time and increased in 2015 and 2016; and,
    2. Concentration trends of degradation products (i.e., 1,2-DCE and VC) are increasing in most body of plume wells, indicating biodegradation is occurring.
  - Conclusion Supplement: Without measurements of geochemical parameters, the conclusion that biodegradation is continuing to occur in the Upper Intermediate Zone cannot accurately be made. Direct treatment of the intermediate zone has not occurred since EVO injections in 2008. Fluctuations in concentrations of degradation products may also be attributed to advection of groundwater from Upper and Lower Zone treatment areas. Contaminant concentrations in Lower Intermediate Zone wells were not discussed in the report. Lower intermediate zone wells WL782 and WL802, located in the downgradient portion of the plume, had increasing TCE trends. Increasing trends in Lower Intermediate Zone wells could indicate that contamination is migrating downward and is not stable in the source/body of the plume despite decreasing concentrations in shallower zones.
- SS017 POC
  - Report Conclusion: TCE concentrations exceeded its MCL at one Lower Zone POC well (WL856) and at three Upper Intermediate Zone POC wells (WL787, WL819 and WL854) in Spring 2016. While TCE concentrations in WL856 were generally stable and below MCLs during the drought, TCE concentrations have fluctuated significantly since the drought ended in Spring 2015; the fluctuating concentrations are likely related to the highly-variable groundwater/surface water hydraulics since Spring 2015. TCE concentrations have also fluctuated significantly since the drought ended in the Upper Intermediate Zone POC wells, especially wells WL819 and WL854, where TCE concentrations have decreased since Fall 2014. The POC wells and potential risks/exposures in this area are being successfully managed via the 2014 POC Contingency Plan for GWMU 1 (AECOM, 2014b).
  - Conclusion Supplement: Increasing TCE trends were not observed in any Upper Zone sentinel or POC wells with MCL exceedances. TCE concentrations were above MCLs at two Lower Zone POC wells (WL856 and WL858), rather than the one exceedance noted in the report. Although there were no apparent trends in these two wells, they are located downgradient of Lower Zone sentinel well WL490 where TCE was above its MCL and showed an increasing trend. TCE was also above its MCL and showed an increasing trend in sentinel well WL499 located at the western installation boundary. Carbon tetrachloride was above its MCL in sentinel well WL492 and showed an increasing trend.

    In addition to exceeding the TCE MCL, concentration trends were increasing in Upper Intermediate Zone POC wells WL787, WL819 and WL854. Concentrations of TCE and carbon tetrachloride were also above MCLs with increasing trends in sentinel well WL848. These increasing concentrations in sentinel and POC wells in the Lower and

Upper Intermediate Zones indicate that the plume is not stable and is likely expanding both laterally and vertically in the direction of groundwater flow. Although a POC contingency plan has been activated, it may not continue to successfully manage risks/exposures based on continued increasing trends at POC wells.

- SS018 Upper Zone
  - Report Conclusions: With the exception of source area well WL778, Upper Zone wells indicate stable/decreasing trends. The increasing TCE and carbon tetrachloride trends in well WL778 are the result of increased concentrations in the Upper Zone in 2015 and 2016 following the February 2015 EVO injections into the Lower Zone at SS018. Because concentrations are significantly higher in the Lower Zone, injections into the Lower Zone resulted in a temporary increase in Upper Zone concentrations, which are expected to decrease over time.
- SS018 Lower Zone
  - Report Conclusions: In the Lower Zone, concentrations of TCE have dropped significantly in both Source Area A (WL779 dropped from 1,360 J µg/L in 2014 to 993 µg/L in 2016) and Source Area B (WL760 dropped from 4,880 µg/L in 2014 to 1,570 µg/L in 2016) since the February 2015 EVO injections into the Lower Zone. The Lower Zone plume downgradient of the source areas is stable; note: although well WL680 indicated an increasing TCE trend, the TCE concentration has dropped from 48.8 µg/L in 2014 to 30.5 µg/L in 2016.
- SS018 Upper Intermediate Zone
  - Report Conclusions: In the Upper Intermediate Zone, Source Area B well WL791 and body of plume well WL785 indicate increasing TCE and total molar trends. However, TCE concentrations have been very stable at WL791, and the increasing total molar trend is related to increasing 1,2-DCE concentrations. At well WL785, the TCE concentration has dropped from 154 µg/L in 2014 to 113 µg/L in 2016.
  - Conclusion Supplement: Concentrations of CVOCs, including carbon tetrachloride and TCE, have remained fairly stable above MCLs since 2012. Treatment conducted in the Lower Zone does not appear to have had an effect on concentrations in the Upper Intermediate Zone.
- SS022
  - Report Conclusions: Concentrations are generally stable across the Upper and Lower Zones since the 2008 EVO injections, and both the Building 323 area and Building 285 area show evidence of continued biodegradation (i.e., concentrations of degradation products). Increasing total molar concentration trends at WL511 and WL289 are the result of degradation product concentrations. Well WL507 indicates an increasing TCE trend, but TCE concentrations have been generally stable since 2011.
- SS023
  - Report Conclusions: Increasing trends were identified for Upper and Lower Zone source and body of plume wells at SS023, including wells WL515 (Upper), WL478 (Lower), WL726 (Lower) and WL705 (Lower). In addition to those wells, Lower Zone wells WL516 and WL723 also have increasing TCE concentrations in recent years (despite not demonstrating an increasing MAROS trend).

- SWMU 21/SS010
  - Report Conclusions: TCE and carbon tetrachloride were not detected in any monitoring events used for the trend analysis.
- AOC 6/SS016
  - Report Conclusions: Concentrations are generally low and stable in Upper Zone wells at AOC 6/SS016. TCE concentrations have fluctuated in Lower Zone well WL189, with an increase to 131 µg/L in Spring 2016. TCE concentrations indicate an increasing trend in Lower Zone well WL499, although pre-design investigations conducted in 2013 indicated that the TCE detected in the Lower Zone at AOC 6/SS016 is related to an upgradient source.
  - Conclusion Supplement: While concentrations of benzene and VC in the Upper Zone source well WL187 have generally decreased since 2010, concentrations of TCE in WL193 in the plume body have slowly increased. Increasing concentrations of TCE in this downgradient well could indicate that contamination is being transported with groundwater flow rather than degrading. Degradation potential is uncertain without measuring geochemical parameters.

GWMUs 2 and 3 groundwater plumes are generally stable and do not threaten an AAFB POC.

No VOCs were detected above their MCLs in the POC wells at GWMU 4 during the recent sampling event in Spring 2016. The groundwater plumes are generally stable, with the following exception:

- LF004/SWMU 7
  - Report Conclusions: TCE concentrations have increased in the Lower Zone at the source area, likely due to the fact that the bioreactor re-circulation system had been off due to low groundwater levels (the re-circulation system was re-started in September 2015 when groundwater levels recovered).
- LF014/SWMU 8
  - Report Conclusions: None
  - Conclusion Supplement: In the Upper Zone, wells WL253 and WL359 indicate increasing TCE and total molar trends. However, TCE concentrations have been fairly stable at WL253 since 2014. Since EVO injection in June 2015, concentrations of TCE have decreased in WL359 and biodegradation products were detected in May 2016. TCE concentration has decreased in Lower Zone well WL254 located in the same area as these wells.

6.5 SITE INSPECTION

Representatives from Black & Veatch conducted a site inspection on September 29, 2016 and were accompanied by Mary Bitney (Altus AFB Remedial Project Manager [RPM]). The purpose of the inspection was to assess the protectiveness of the remedy.

Photographs from the site inspections are included in Appendix B.

6.5.1 GWMU 1 (Sites SS017, SS018, SS022, SS023, ST012, WP002, SS016, SS010, and WP001)

SS016. The SS016 Site is around the paved parking area of Building 392. A skid mounted air sparging system is in operation as an active remedy. Prior to this, some ISCO and SVE were conducted. The SVE system was installed in the 2014-2015 timeframe. The SVE lines extend below grade to the east of the building. The trenches appear to have settled beneath the pavement and some well boxes appear to have some slight damage. No other issues impacting current or future protectiveness were observed.

SS017. The SS017 Site is in a completely grassed area and includes a bioreactor and BMWs. The extraction well system was offline until 2009, but was re-started in February 2015. An EVO injection was performed in 2015. The two extraction wells are active and pump water upstream of the BMW at rate of less than 3 gpm. Well covers and some signage are in place, but appear to be in need of maintenance due to the poor condition of the valve boxes and covers. No issues impacting current or future protectiveness were observed.

SS018. The SS018 Site is in an unpaved material storage area near Building 393. EVO injection events were completed in 2008 and 2015 to treat the portion of the plume migrating off base to the west. BMWs are present further downgradient. Site features are intact and no issues impacting current or future protectiveness were observed.

SS022. The SS022 Site is beneath a paved area east of Building 323. EVO injections were completed in 2008 and sampling results suggest that the carbon source has persisted since then. No action beyond basewide groundwater monitoring has been completed at this Site since injections were conducted. No issues impacting current or future protectiveness were observed.

SS023. The SS023 Site is a paved aircraft parking area east of Buildings 514 and 517. Site is in a restricted area of the flight line. Site features are intact and no issues impacting current or future protectiveness were observed. No photos were authorized at this Site.

ST012/SWMU 26. The ST012 Site is beneath a paved area, but has a storm-water drainage ditch that runs east-west along the south edge. The area is paved within the old auto hobby shop yard (now an outdoor recreation storage area) and grassed slopes are along the ditch. The fence surrounding the paved area slightly dips on the south side where the ground has settled as result of the past excavation and UST removal. Site features are intact and no issues impacting current or future protectiveness were observed.

WP002/SMWU 10. The WP002 Site is a completely grassed area northwest of Building 505. A chemical oxidation injection event was performed in June of 2014 and there is some visible subsidence of the ground as a result of the injection event. No additional site specific features to inspect although some monitoring wells are in the area. No issues impacting current or future protectiveness were observed.

SS010/SMWU 21. The SS010 Site is a completely grassed area located on the northwest side of 6th Street, east of Building 317. Site features are intact and no issues impacting current or future protectiveness were observed.

WP001/SWMU 09. The WP001 Site is a completely grassed area on the airfield next to the parking apron of Building 518. Site is in a restricted area of the flight line. Site features are intact and no issues impacting current or future protectiveness were observed. No photos were authorized at this Site.

6.5.2 GWMU 2 (Sites FT005 and SS013)

FT005/SWMU 2. The FT005 Site is a completely grassed area north of North Ramp Road. Site features are intact and no issues impacting current or future protectiveness were observed.

SS013/AOC2-C-5. The SS013 Site is a grassed area that also includes the asphalt parking lot for the base operations building. Site features are intact and no issues impacting current or future protectiveness were observed.

6.5.3 GWMU 3 (Site SS024)

SS024. The SS024 Site is a grassed area on the airfield. The Site is located primarily between Ordnance Rd. and Ammo Storage Rd., northwest of the munitions storage area around Buildings 492 and 498. Site features are intact and no issues impacting current or future protectiveness were observed.

6.5.4 GWMU 4 (Sites LF004, LF014, FT003, FT007, and DP019)

LF004/ SWMU 07. The LF004 Site is a completely grassed area on the airfield between Ordnance Road and Taxiway M. A bioreactor is in place for source area treatment along with a network of piezometers and monitoring wells. A solar panel provides power to the system. A 55-gallon drum with slight rust on the exterior is located at the Site. It was unclear during the inspection what the drum is used for or if any material is stored in the drum. No issues impacting current or future protectiveness were observed.

LF014/SWMU 08. The LF014 Site is a grassed area on the airfield to the west side of a taxiway. Site features are intact and no issues impacting current or future protectiveness were observed.

FT003/SWMU 03. The FT003 Site is a completely grassed area on the airfield north of Ordnance Road. Site features are intact and no issues impacting current or future protectiveness were observed.

FT007/SWMU 04. The FT007 Site is a completely grassed area on the airfield south of old taxiway. Site features are intact and no issues impacting current or future protectiveness were observed.

DP019/SWMU 12. The DP019 Site is a completely grassed area on the airfield east of Ordnance Road. Site features are intact and no issues impacting current or future protectiveness were observed.

6.6 INTERVIEWS

Interviews were not conducted as part of this FYR. Interviews were not necessary due to the remedy progression being well documented.

7.0 Technical Assessment

This FYR was conducted to determine whether the remedy at AAFB is protective of HH&E. The EPA Comprehensive FYR guidance (USEPA, 2001) lists three questions used to provide framework for organizing and evaluating data and information and to ensure all relevant issues are considered when determining the protectiveness of the remedy.

In general, naturally occurring conditions at AAFB favor natural attenuation of chlorinated contaminants. Results of a MNA study conducted at two sites within AAFB, where no remedial actions were implemented, identified several processes capable of degrading CVOCs under natural conditions. These processes included sorption, dispersion, and degradation. Results of compound specific isotope analysis (CSIA) identified significant accumulation of Carbon-13 in downgradient CVOCs relative to source area CVOCs, signifying degradation of the CVOCs.

Site-specific information is provided in Sections 7.1 through 7.4 for each sites located in GWMU 1 through GWMU 4 that have not been designated for NFA.

7.1 GROUNDWATER MANAGEMENT UNIT 1

GWMU 1 currently consists of multiple commingled CVOC plumes emanating from SS017, SS018, SS022/ OWS 284A/OWS 285, Building 323, and SS023. The commingled plumes comprised in GWMU 1 underlie the southwestern portion of AAFB and multiple off-base properties located on the south side of AAFB (Figure 4a). The purpose of these summaries is to evaluate whether the remedy is performing adequately.

7.1.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

1. Contain groundwater plume, and activate contingency plan as needed.

   Although a contingency plan has been activated, the remedy is not functioning to contain contaminated groundwater in the lower zone and the upper intermediate zone. Remedial actions to treat and/or contain groundwater contamination during the FYR review period include a BMW in upper and lower zones at SS017 and SS018 , EVO injections in the bioreactor at SS017 and SS018, PermeOx injections at WP002, and SVE system operation at SS016 through March 10, 2016. The main remedy at SS023 is MNA.

   Additionally, a BMW system was installed to a depth of approximately 35 ft bgs along the southern border of AAFB. BMWs were installed across the path of groundwater flow in GWMU 1 to reduce the TCE mass in groundwater migrating offsite; however, groundwater contamination deeper than 35 ft bgs is not directly addressed by the BMW system. However, EVO injections below the BMW have been used to address the affected areas.

   Not all aspects of planned corrective measures have been implemented and the corrective measures do not appear to be functioning to contain contaminated groundwater in the lower zone and the upper intermediate zone within AAFB. One component of the remedy included carbon substrate injection in 2008 to reduce off-Base migration of contaminated groundwater in the upper intermediate zone (below the depth of the BMWs). This remedy was to be maintained and periodically evaluated to determine if additional substrate injection was required to maintain conditions conducive to remediation (Earth Tech AECOM, 2009b). Evaluation of groundwater conditions and the necessity for additional upper intermediate zone injections has not been conducted.

In addition, there have been sustained exceedances of the TCE MCL at upper intermediate zone POC wells and in lower zone POC wells since 2015. Despite implementing contingent corrective measures beginning in 2015, increasing TCE concentration trends have been observed at upper intermediate zone POC wells and contamination has migrated offsite indicating the GWMU 1 plume is not stable. Contingent corrective measures implemented at SS017, including refreshing the EVO substrate in the bioreactor and restarting the bioreactor/BMW recirculation system, are not likely to contain the contaminated groundwater within AAFB boundaries in the short term. This additional corrective measure was designed to re-establish ERD within the target treatment area; however, the target treatment area is more than 4,000 ft upgradient of POC wells. Linear groundwater velocity/ TCE transport velocity in the upper intermediate zone was calculated as 0.81 ft/day in the Final Remedial Construction Report for Bioremediation for Site SS017 Intermediate Flow Zone (Parsons, 2009a). At this velocity, the effects of implemented contingent actions would not be observed at POC wells for 13 years or more, potentially allowing continued offsite contaminant migration during this time.

The POC wells are being managed via the 2014 POC Contingency Plan for GWMU 1 (AECOM, 2014a), which was accepted by the ODEQ on May 12, 2014. The POC Contingency Plan for GWMU 1 establishes corrective action triggers based on potential exposure scenarios related to the GWMU 1 groundwater plume south of Highway 62 that would pose a potential risk to human receptors. To date, no triggers have been activated; however, concentration trends are increasing.

2. Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater.

   Yes, the groundwater treatments are described in #1, and the soil removal is described in #3. However, some of the natural rock/soil types at AAFB have minerals that are abundant in sulfate compounds which are a continuing source for sulfate in groundwater at AAFB.

3. Remediate surface soils containing COCs to levels that do not exceed the human health-based risk levels.

   A soil removal action was completed in May 2014, centered at monitoring well WL132 at WP002 in GWMU 1 (AECOM, 2015h); as a result, there is no remaining source of VOCs at WP002.

4. Remove or treat source materials in subsurface soils that could migrate to groundwater and attain a media specific cleanup goal that is protective of groundwater.

   Yes, the soil removal is described in #3.

5. Monitor contaminant levels in surface waters associated with GWMUs to assure protection of HH&E.

   Yes, this is being completed during performance monitoring events.

It is anticipated that LUCs applicable to GWMU 1 have been implemented and will be effective in preventing exposure to COCs at the Site. Actual status of LUC implementation at the time of this report is unknown. LUCs must continue to be monitored, maintained and enforced to ensure the remedy functions as intended with regard to the LUCs and to ensure long-term protectiveness. To that end, recommendations to enhance implementation of ICs to ensure long-term protectiveness have been made in Section 9.0.

7.1.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs Used at the Time Of The Remedy Still Valid?

The exposure assumptions, toxicity data, cleanup levels and CAOs were reviewed and there were three MCLs added for analytes sampled for: chloroform, cis-1,2-DCE, and trans-1,2-DCE. There were no other changes that were found that would affect the performance of the cleanup goals presented in the RTCs/FDD for the Site. The groundwater plume originating at GWMU 1 is located in the military/industrial use zone. The anticipated future land use is for military/industrial use. The CAOs that were presented in the RTCs/FDD are still considered appropriate.

Table 7.1 GWMU 1 Changes in Chemical-Specific Standards

Contaminant	Media	Cleanup Level	Standard		Reference
chloroform	Groundwater	MCLG (µg/L)	Previous	NA	2013 EPA MCL
			Current	80	2016 EPA MCLG
cis-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	70	2016 EPA MCL
trans-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	100	2016 EPA MCL

Notes: µg/L - Micrograms per liter, MCL - Maximum contaminant level, MCLG - Maximum Contaminant Level Goal

7.1.3 Question C: Has any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

The cleanup goals presented in the RTCs/FDD are still considered health protective. The remedy at GWMU 1 is expected to be protective of HH&E. Improper stability assumptions affect the long term remedy effectiveness and protection of human health and may result in continued plume migration off base. The groundwater plume that appears to be continuing to move offsite south of Highway 62 onto a new property may need to be addressed with new LUCs and a restrictive covenant to protect human health.

7.2 GROUNDWATER MANAGEMENT UNIT 2

GWMU 2 consists of two separate CVOC plumes originating from AOC 2 – C-5 and FT005. FT005, which is located at the northern end of GWMU 2, has been designated for no further remedial action. The CVOC plumes comprised in GWMU 2 are located in the west-central portion of AAFB (Figure 5a). The purpose of these summaries is to evaluate whether the remedy is performing adequately.

7.2.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

1. Contain GW plume, and activate contingency plan as needed.

   According to the plume stability assessment, CVOCs are generally stable or decreasing within GWMU 2 and do not threaten an Altus AFB POC.

2. Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater.

   Not applicable to GWMU 2.

3. Remediate surface soils containing COCs to levels that do not exceed the human health-based risk levels.

No soil removal actions were required to be completed in GWMU 2.

4. Remove or treat source materials in subsurface soils that could migrate to groundwater and attain a media specific cleanup goal that is protective of groundwater.

   Not applicable to GWMU 2.

5. Monitor contaminant levels in surface waters associated with GWMUs to assure protection of HH&E.

   Yes, this is being completed during performance monitoring events.

LUCs applicable to GWMU 2 have been implemented and are effective in preventing exposure to COCs at the Site. LUCs must continue to be monitored, maintained and enforced to assure that the remedy functions as intended with regard to the LUCs and to ensure long-term protectiveness. To that end, recommendations to enhance implementation of ICs to ensure long-term protectiveness have been made in Section 9.0.

7.2.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs Used at the Time of the Remedy Still Valid?

The exposure assumptions, toxicity data, cleanup levels and CAOs were reviewed and there was one maximum contaminant level goal (MCLG) added for analytes sampled for: chloroform. There were no other significant changes that were found that would affect the performance of the cleanup goals presented in the RTCs/FDD for the Site. The AOC 2 – C-5 and FT005 groundwater plumes comprised in GWMU 2 are located within the military/industrial use zone at AAFB. The anticipated future land use is for military/industrial use. The CAOs that were presented in the RTCs/FDD are still considered appropriate.

Table 7.2 GWMU 2 Changes in Chemical-Specific Standards

Contaminant	Media	Cleanup Level	Standard		Reference
chloroform	Groundwater	MCLG (µg/L)	Previous	NA	2013 EPA MCL
			Current	80	2016 EPA MCLG

Notes: µg/L - Micrograms per liter, MCL - Maximum contaminant level, MCLG - Maximum Contaminant Level Goal

7.2.3 Question C: Has any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

The cleanup goals presented in the RTCs/FDD are still considered health protective, and groundwater monitoring has shown no exceedances of the MCLs for the COCs in any of the sentinel wells or POC wells. There are no POC wells identified (only Body and Source wells), which according to the RCRA CAP modification submitted in 2013, would trigger a contingency plan. With stable to decreasing concentrations at GWMU 2, though, it is not anticipated to be a significant potential issue. It is anticipated that the LUCs applicable to GWMU 2 and the sites it encompasses will be protective of human health.

7.3 GROUNDWATER MANAGEMENT UNIT 3

GWMU 3 consists of one CVOC plumes originating from SS024. The CVOC plume is located in the southeastern portion of AAFB (Figure 6a). The purpose of these summaries is to evaluate whether the remedy is performing adequately.

7.3.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

1. Contain GW plume, and activate contingency plan as needed.

   According to the plume stability assessment, CVOCs are generally stable or decreasing within GWMU 3 and do not threaten an Altus AFB POC.

2. Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater.

   Not applicable to GWMU 3.

3. Remediate surface soils containing COCs to levels that do not exceed the human health-based risk levels.

   No soil removal actions were required to be completed in GWMU 3.

4. Remove or treat source materials in subsurface soils that could migrate to groundwater and attain a media specific cleanup goal that is protective of groundwater.

   Not applicable to GWMU 3.

5. Monitor contaminant levels in surface waters associated with GWMUs to assure protection of HH&E.

   Yes, this is being completed during performance monitoring events.

LUCs applicable to GWMU 3 (SS024) have been implemented and are effective in preventing exposure to COCs at the Site. LUCs must continue to be monitored, maintained and enforced to assure that the remedy functions as intended with regard to the LUCs and to ensure long-term protectiveness. To that end, recommendations to enhance implementation of ICs to ensure long-term protectiveness have been made in Section 9.0.

7.3.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs Used at the Time of the Remedy Still Valid?

The exposure assumptions, toxicity data, cleanup levels and CAOs were reviewed and there were three MCLs added for analytes sampled for: chloroform, cis-1,2-DCE, and trans-1,2-DCE. There were no other changes that were found that would affect the performance of the cleanup goals presented in the RTCs/FDD for the Site. The groundwater plume originating at GWMU 3 (SS024) is located in the military/industrial use zone. The anticipated future land use is for military/industrial use. The CAOs that were presented in the RTCs/FDD are still considered appropriate.

Table 7.3 GWMU 3 Changes in Chemical-Specific Standards

Contaminant	Media	Cleanup Level	Standard		Reference
chloroform	Groundwater	MCLG (µg/L)	Previous	NA	2013 EPA MCL
			Current	80	2016 EPA MCLG
cis-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	70	2016 EPA MCL
trans-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	100	2016 EPA MCL

Notes: µg/L - Micrograms per liter, MCL - Maximum contaminant level, MCLG - Maximum Contaminant Level Goal

7.3.3 Question C: Has any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

The cleanup goals presented in the RTCs/FDD are still considered health protective. There does not appear to be a clear mechanism for implementing contingent corrective measures if the plume at GWMU 3 is determined to not be stable/shrinking. There are no POC wells identified (only Body, Sentinel, and Source wells), which according to the RCRA CAP modification submitted in 2013, would trigger a contingency plan. Based on the information provided for this FYR, it seems that by only reviewing TCE and having no POC set up, any potential unstable plume would not be dealt with in a timely manner. In addition, the potential increasing trend of PCE in the source well may indicate that the CAO to "Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater" was not met.

7.4 GROUNDWATER MANAGEMENT UNIT 4

GWMU 4 consists of two separate CVOC groundwater plumes. One groundwater plume originates from FT003 and the other groundwater plume originates from LF004 and LF014. LF004 is considered the primary source and LF014 is considered a minor contributor. FT003 has been designated for no further remedial action. The CVOC plumes comprised in GWMU 4 are located in the east-central portion of AAFB (Figure 7a). The purpose of these summaries is to evaluate whether the remedy is performing adequately.

7.4.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

1. Contain GW plume, and activate contingency plan as needed.

   Yes, according to the plume stability assessment, CVOCs are generally stable or decreasing within GWMU 4. Results of the numerical modeling indicted that none of the primary COCs detected at GWMU 4 will exceed their respect MCLs at the POC boundary during the 30-year simulation.

2. Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater.

   Yes, the soil removal is described in #3.

3. Remediate surface soils containing COCs to levels that do not exceed the human health-based risk levels.

   A soil removal action was completed in 2011 for the Trap and Skeet Range at DP019 in GWMU 4, and a DD was submitted presenting information that RA activities meet residential cleanup standards (AECOM, 2015i); all remaining RFI soil results are either below RSLs (based on residential land use) or are considered naturally occurring.

4. Remove or treat source materials in subsurface soils that could migrate to groundwater and attain a media specific cleanup goal that is protective of groundwater.

   Yes, the soil removal is described in #3.

5. Monitor contaminant levels in surface waters associated with GWMUs to assure protection of HH&E.

   Yes, this is being completed during performance monitoring events.

LUCs applicable to GWMU 4 will have been implemented and will be effective in preventing exposure to COCs at the Site. LUCs must continue to be monitored, maintained and enforced to assure that the

remedy functions as intended with regard to the LUCs and to ensure long-term protectiveness. To that end, recommendations to enhance implementation of ICs to ensure long-term protectiveness have been made in Section 9.0.

7.4.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and RAOs Used at the Time of the Remedy Still Valid?

The exposure assumptions, toxicity data, cleanup levels and CAOs were reviewed and there were 3 MCLs added for analytes sampled for: chloroform, cis-1,2-DCE, and trans-1,2-DCE. There were no other changes that were found that would affect the performance of the cleanup goals presented in the RTCs/FDD for the Site. The groundwater plume originating at GWMU 4 is located in the military/ industrial use zone. The anticipated future land use is for military/industrial use. The CAOs that were presented in the RTCs/FDD are still considered appropriate.

Table 7.4 GWMU 4 Changes in Chemical-Specific Standards

Contaminant	Media	Cleanup Level	Standard		Reference
chloroform	Groundwater	MCLG (µg/L)	Previous	NA	2013 EPA MCL
			Current	80	2016 EPA MCLG
cis-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	70	2016 EPA MCL
trans-1,2-dichloroethene	Groundwater	MCL (µg/L)	Previous	NA	2013 EPA MCL
			Current	100	2016 EPA MCL

Notes: µg/L - Micrograms per liter, MCL - Maximum contaminant level, MCLG - Maximum Contaminant Level Goal

7.4.3 Question C: Has any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

The cleanup goals presented in the RTCs/FDD are still considered health protective, and performance monitoring has shown no exceedances of MCLs for the COCs in any of the surface water samples, sentinel wells, or POC wells. A Potential issue is that there do not appear to be any Sentinel or POC wells directly downgradient of WL253 and WL359 which had TCE greater than the MCL with increasing trends. It is anticipated that the LUCs applicable to GWMU 4 will be protective of human health.

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8.0 Issues

Table 8.1 – Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Several monitoring wells found during the site inspection had some degree of damage to, or deterioration in condition of some well boxes. Disrepair of wells may threaten to contaminate the groundwater. If damaged monitoring wells are present that were installed as part of investigation activities and are no longer a part of the permitted groundwater monitoring network, they are required to be abandoned. Title 785 Oklahoma Water Resources Board, Chapter 35, subchapter 11, requires monitoring wells to be plugged within three days after final use.	N	N
TCE has exceeded its MCL in several POC monitoring wells for GWMU 1 during the performance groundwater monitoring rounds conducted between 2010 and 2016. The POC wells and potential risks/exposures in this area are being managed by the 2014 POC Contingency Plan for GWMU 1 (AECOM, 2014a).	Y	Y
No additional monitoring wells have been installed downgradient of current GWMU 1 POC monitoring wells that have had exceeded the MCL for TCE.	Y	Y
LUCs are in place for the off-Base property(s) located downgradient of GWMU 1, however no LUCs are in place for property(s) located across the road.	Y	Y

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9.0 Recommendations and Follow-Up Actions

Table 9.1 - Recommendations and Follow-Up Actions

Issues	Recommendations and Follow-up Actions	Affects Protectiveness? (Y/N)	
		Current	Future
Well condition	Repair and/or maintain well boxes.	N	Y
Wells not a part of the permitted groundwater monitoring network	Abandon wells according to Title 785 of the Oklahoma Water Resources Board, Chapter 35 Well Driller and Pump Installer Licensing.	Y	Y
LUC Implementation	Implement LUCs farther downgradient from GWMU 1; it is recommended to institute LUCs for the properties located south and east of Mills property to property to ensure protectiveness of human health where plume has migrated farther offsite (across Highway 62). Perform annual reviews and reporting of the LUCs to ensure that the remedy is functioning as intended.	Y	Y
POC Exceedances	Ensure proper follow-up actions for GWMU 1 Sentinel wells and POC wells are conducted and improve documentation of the follow-up actions. Implement corrective measures to address continued plume migration offsite in the upper intermediate zone.	N	Y
Increasing Concentration Trends	Follow procedures for contingency corrective actions per the RCRA Permit, potentially including addressing increasing concentration trends in source areas and downgradient areas of GWMU 1.	N	Y
POC Monitoring	Consider addition of POC wells at GWMU 2 and GWMU 3 for future protectiveness. To address long-term protectiveness, monitoring POC wells would provide a mechanism for implementing contingent corrective measures if plumes are determined to not be stable/shrinking.	N	Y
Plume Delineation	Install additional monitoring wells downgradient of the current GWMU 1 POC monitoring wells to confirm the extent of the TCE groundwater plume. Conduct corrective measures or implement LUCs/inspections if necessary.	N	Y

Issues	Recommendations and Follow-up Actions	Affects Protectiveness? (Y/N)	
		Current	Future
Plume Trends	Conflicting trend results trend data versus text conclusions in the 2016 Annual Performance Monitoring Report (Table 5-1 MAROS chemical concentration trends and molar concentration trends) suggest a second look should be given to the plume stability assessment summaries (ex: The Source Area at Building 506 Upper Zone at SS017 was reviewed). The summary concluded TCE concentrations are generally stable in this area. However, an increasing TCE trend was identified in WL138 and a decreasing TCE trend was identified in WL377. These results do not indicate that the TCE concentrations are stable in this area downgradient of the bioreactor and BMW. It is important to note that a decreasing trend in one area does not equal a stable trend.	Y	Y
Plume Trends	Analyze trends using a subset of the data set being looked at instead of using the entire historical data set. This may assist in assessing trends related to the most recent remedial activities. In addition, it is recommended that for future annual reports use of spring data only when determining Mann-Kendall trends should be considered. Mann-Kendall trend results are influenced by cyclic trends such as influences due to seasonal water level variations.	Y	Y
Plume Trends	Follow procedures for contingency corrective actions per the RCRA Permit to address increasing concentration trends in source areas and downgradient areas in GWMU 1 and GWMU 4.	Y	Y

10.0 Protectiveness Statement(s)

The final remedy, including source removal, multiple ERD technologies, groundwater monitoring and the use of ICs to control exposure to contaminants, was chosen for the four GWMUs at the AAFB and is described in the Final RCRA Permit and subsequent modifications. Threats at the Sites are being addressed through source removal activities, ERD, bioremediation, groundwater monitoring and the implementation of LUCs/ICs. The remedy is expected to be protective of HH&E; provided the remedy is implemented as stated in the Final RCRA Permit and LUCs/ICs are enforced.

10.1 GWMU 1 (SITES SS017, SS018, SS022, SS023, OWS 284, OWS 285, BUILDING 323, SS016, SS010)

The remedy at GWMU 1 is expected to be protective of HH&E once delineation of the TCE plume with POC exceedances are completely delineated. Threats at the Sites are being addressed through ERD/bioremediation, long-term monitoring, and the implementation of LUCs/ICs. The remedial action activities completed will likely continue to reduce the contaminant levels in groundwater at the Sites. According to the updated plume stability assessment, some wells indicate stable/decreasing trends within GWMU 1, while other wells indicate increasing trends. Improper stability assumptions affect the long term remedy effectiveness and protection of human health and may result in continued plume migration off base. The groundwater plume that appears to be continuing to move offsite south of Highway 62 onto a new property may need to be addressed with new LUCs and a restrictive covenant to protect human health.

Long-term protectiveness of the remedy will be verified during LTM to evaluate potential migration of the contaminant plume down-gradient from the former source areas. Current monitoring data indicate that the remedy is functioning as required; however plumes have migrated off-Base within GWMU 1. Long-term protectiveness requires compliance with the LUCs. Annual review and reporting of the LUCs will be needed to ensure that the remedy is functioning as intended.

10.2 GWMU 2 (SITE AOC 2 – C-5)

The remedy at GWMU 2 is expected to be protective of HH&E. There are no POC wells identified (only Body and Source wells), which according to the RCRA CAP modification submitted in 2013, would trigger a contingency plan. With stable to decreasing concentrations at GWMU 2, though, it is not anticipated to be a significant potential issue. Threats at the Site are being addressed through LTM and the implementation of LUCs/ICs. According to the updated plume stability assessment, CVOCs are generally stable within GWMU 2.

Long-term protectiveness of the remedy will be verified during LTM to evaluate potential migration of the contaminant plume down-gradient from the former source areas. Current monitoring data indicate that the remedy is functioning as required and that the plumes remain on-base within the respective GWMU. Long-term protectiveness requires compliance with the LUCs. Annual review and reporting of the LUCs will be needed to ensure that the remedy is functioning as intended.

10.3 GWMU 3 (SITE SS024)

There does not appear to be a clear mechanism for implementing contingent corrective measures if the plume at GWMU 3 is determined to not be stable/shrinking. There are no POC wells identified (only Body, Sentinel, and Source wells), which according to the RCRA Permit modification submitted in 2013, would trigger a contingency plan. Based on the information provided for this FYR, it seems that by only

reviewing TCE and having no POC set up, any potential unstable plume would not be dealt with in a timely manner. In addition, the potential increasing trend of PCE in the source well may indicate that the CAO to "Remove or treat source material in subsurface soils and/or groundwater to the extent practicable to discontinue migration into groundwater" was not met. Threats at the Site are being addressed through LTM and the implementation of LUCs/ICs. According to the updated plume stability assessment, CVOCs are generally stable within GWMU 3.

Long-term protectiveness of the remedy will be verified during LTM to evaluate potential migration of the contaminant plume down-gradient from the former source areas. Current monitoring data indicate that the remedy is functioning as required and that the plumes remain on-base within the respective GWMU. Long-term protectiveness requires compliance with the LUCs. Annual review and reporting of the LUCs will be needed to assure that the remedy is functioning as intended.

10.4 GWMU 4 (SITES LF004, LF014, FT003)

A Potential issue is that there do not appear to be any Sentinel or POC wells directly downgradient of WL253 and WL359 which had TCE greater than the MCL with increasing trends. The remedy at GWMU 4 is expected to be protective of HH&E. Threats at the Sites are being addressed through ERD/ bioremediation, LTM and the implementation of LUCs/ICs. The remedial action activities completed will likely continue to reduce the contaminant levels in groundwater at the Sites. According to the updated plume stability assessment, CVOCs are generally stable within GWMU 4.

Long-term protectiveness of the remedy will be verified during LTM to evaluate potential migration of the contaminant plume down-gradient from the former source areas. Current monitoring data indicate that the remedy is functioning as required and that the plumes remain on-base within the respective GWMU. Long-term protectiveness requires compliance with the LUCs. Annual review and reporting of the LUCs will be needed to assure that the remedy is functioning as intended.

11.0 Next Review

The next FYR Report for AAFB, Altus, Oklahoma is due in March 2022.

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Figures

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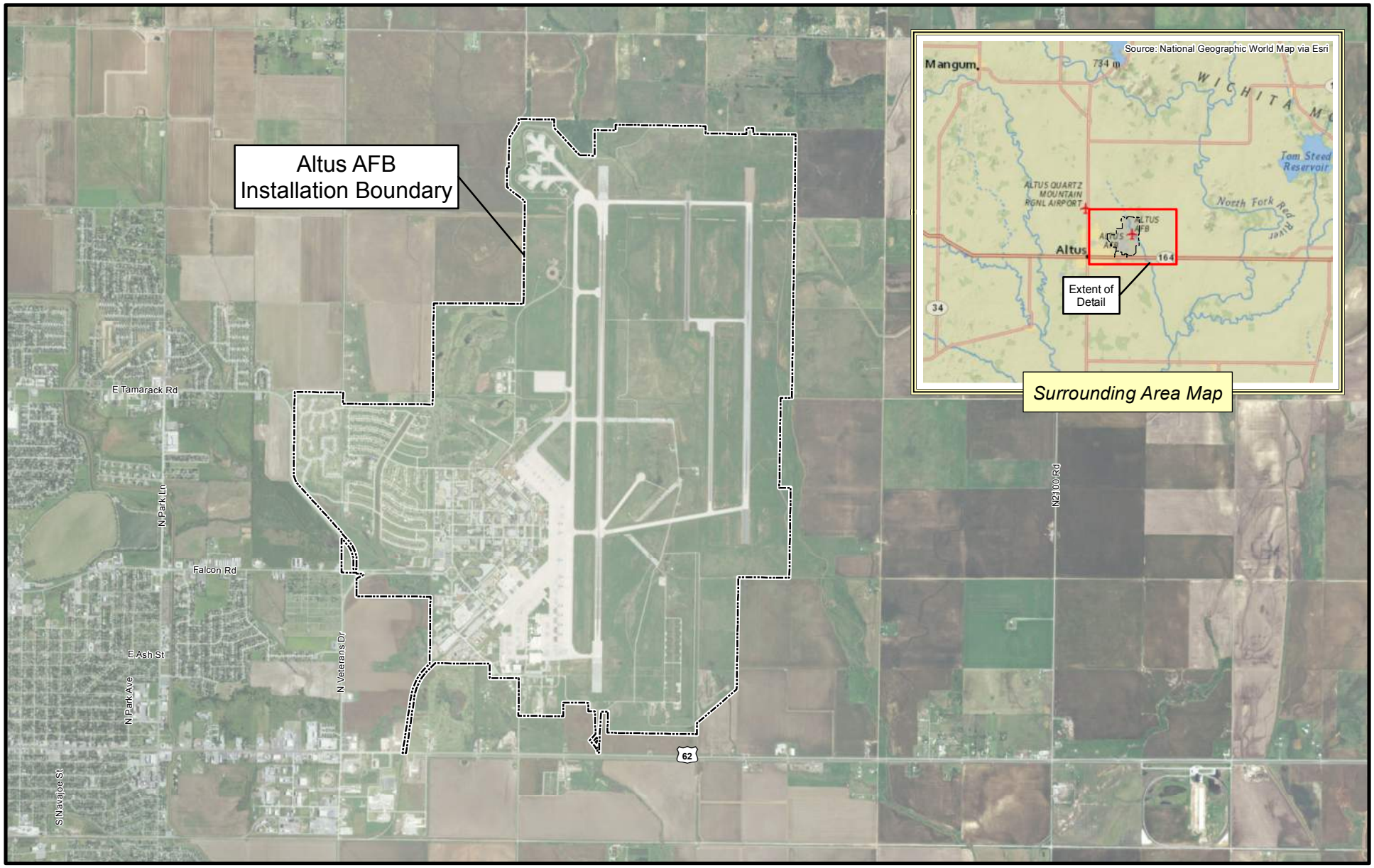

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

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0 2,000 4,000
Feet
Map Scale: 1 inch = 4,000 feet

Site Location Map
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 1

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042863.05.00	J. FRENCH	B. VESELKA	5/26/2017

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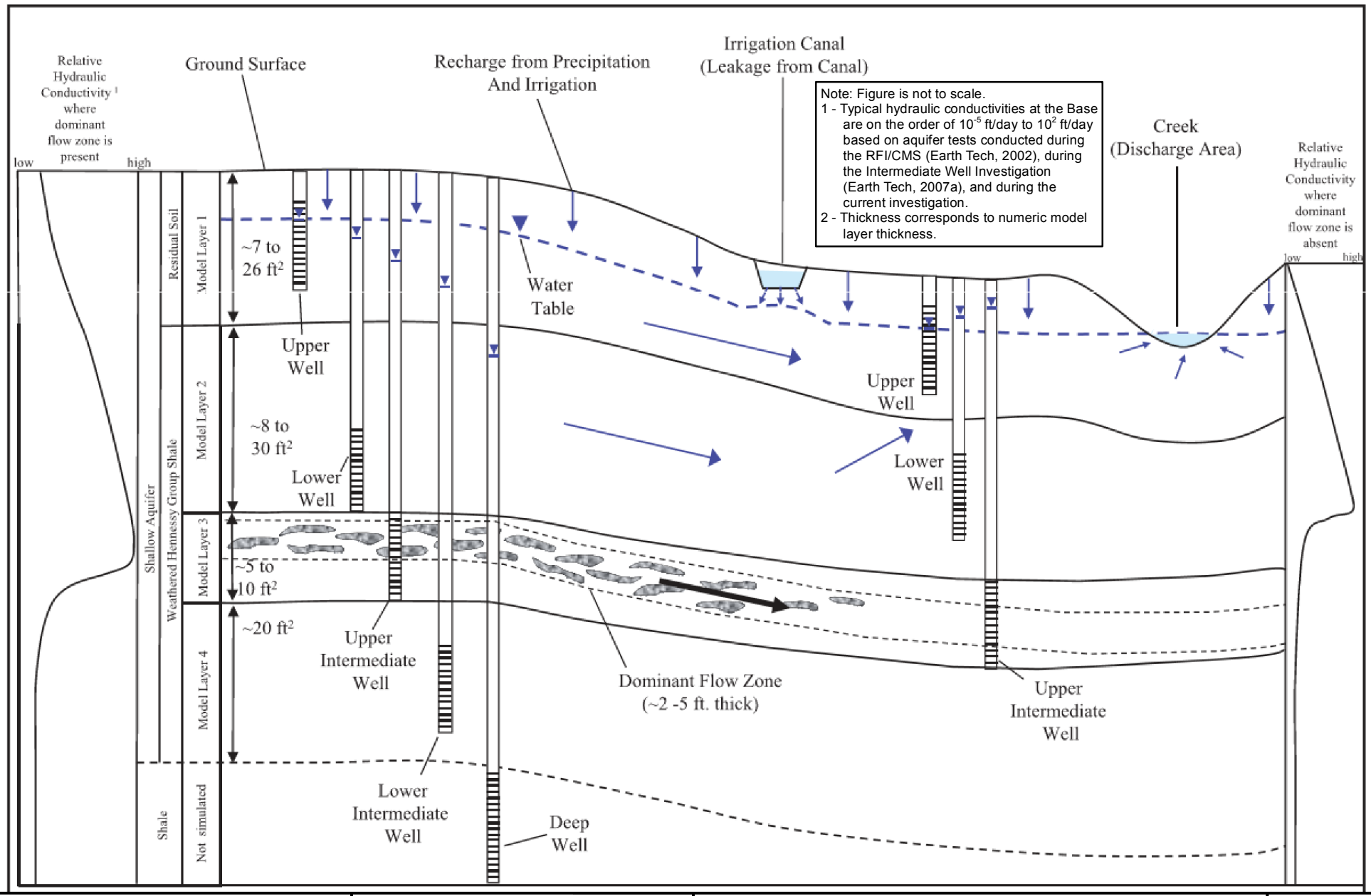

SOURCE:

AECOM, 2015c. 2015 Annual Performance Monitoring Report, Altus Air Force Base, Altus, Oklahoma. October 2015.

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97th AIR MOBILITY WING

Hydrogeologic Conceptual Site Model

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 2

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	5/26/2017

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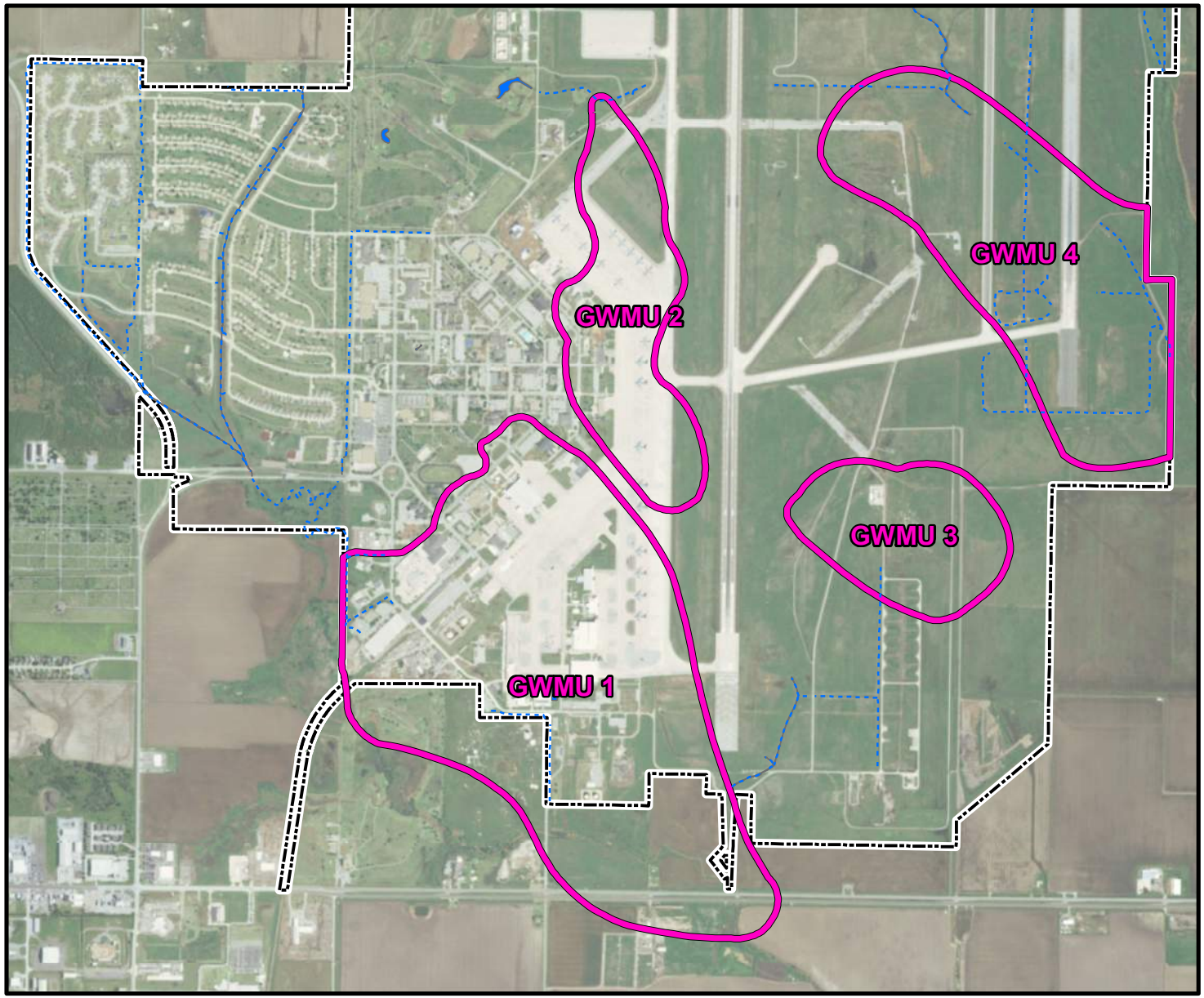

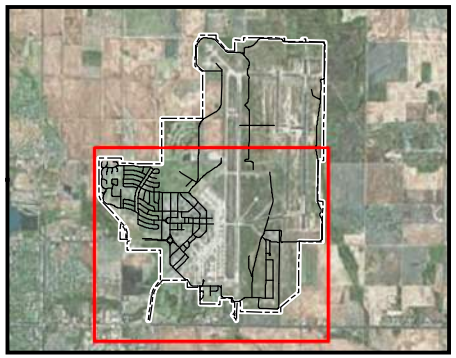

Legend

- Groundwater Management Unit
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

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0 1,000 2,000
Feet
Map Scale: 1 inch = 2,000 feet

RCRA Facility Investigation Site Locations

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 3

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	5/25/2017

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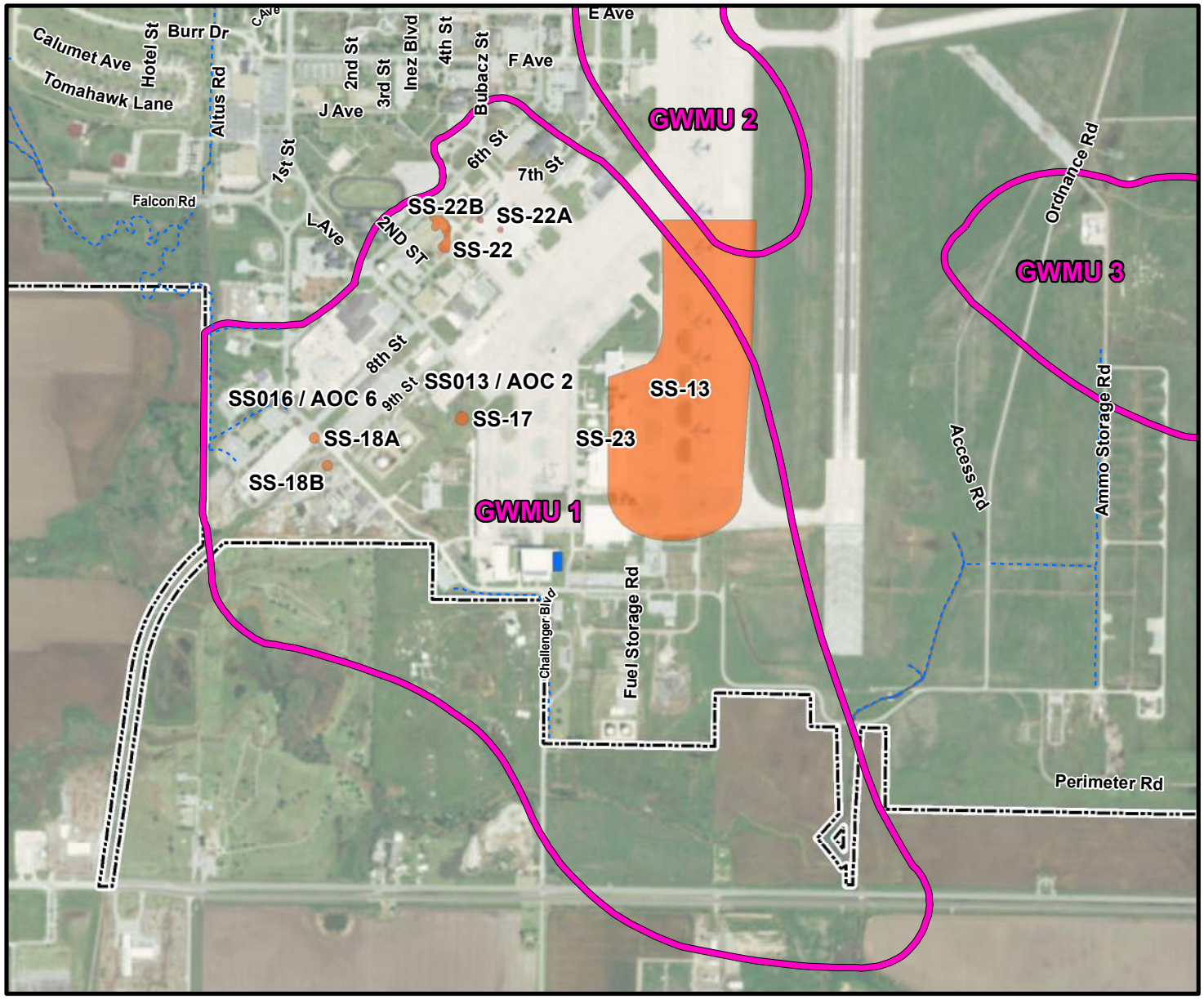

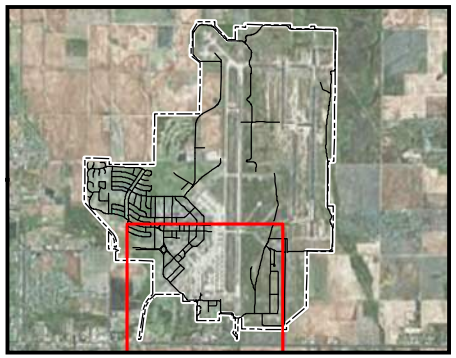

Legend

- Groundwater Management Unit
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 600 1,200
Feet
Map Scale: 1 inch = 1,200 feet

Groundwater Management Unit 1

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4a

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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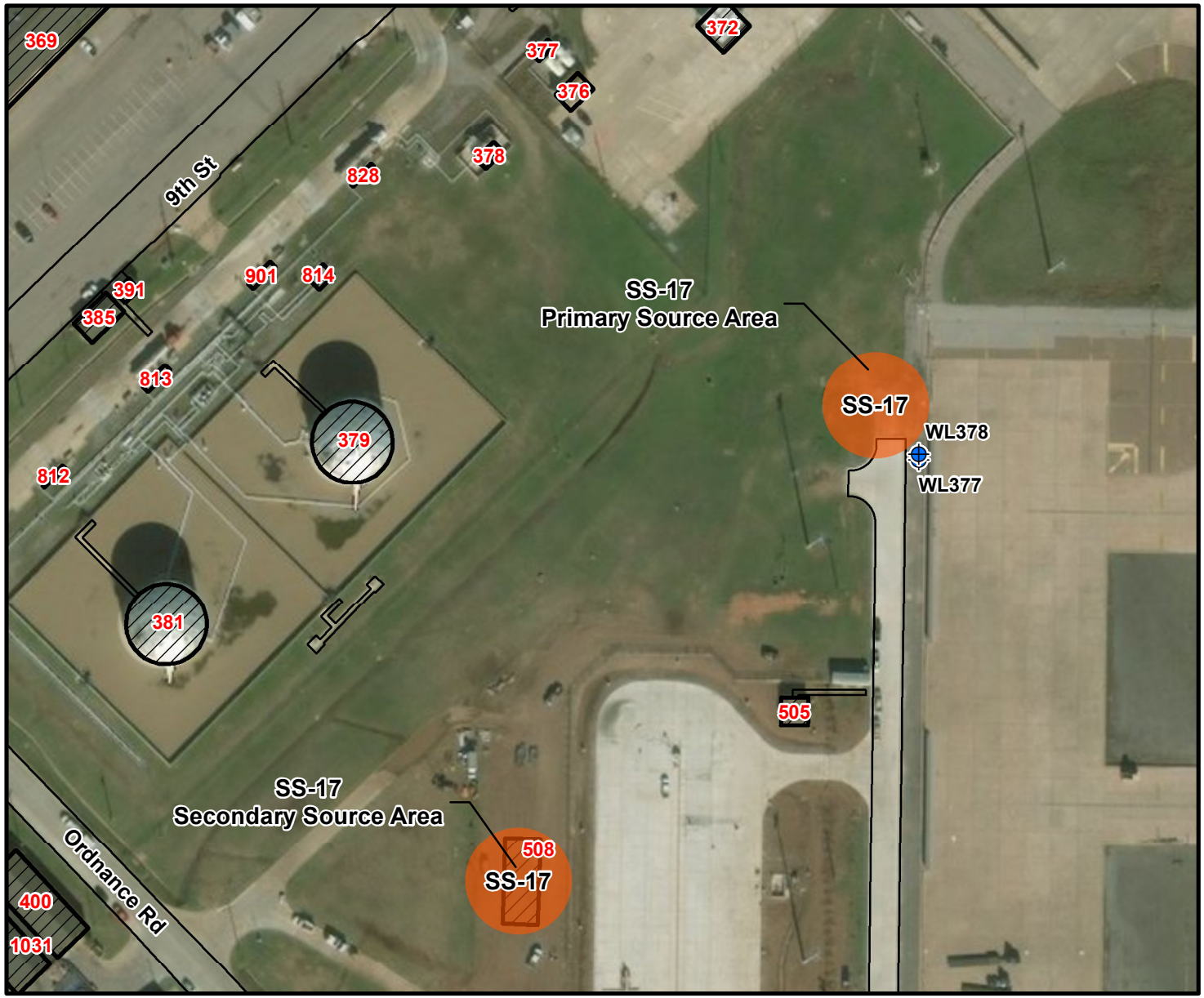

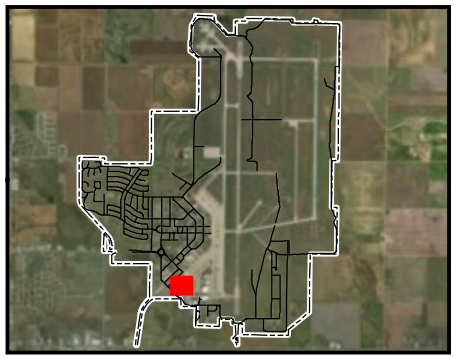

Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 75 150
Feet
Map Scale: 1 inch = 150 feet

GWMU 1: SS-17
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4b

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 50 100
Feet
Map Scale: 1 inch = 100 feet

GWMU 1: SS-18
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4c

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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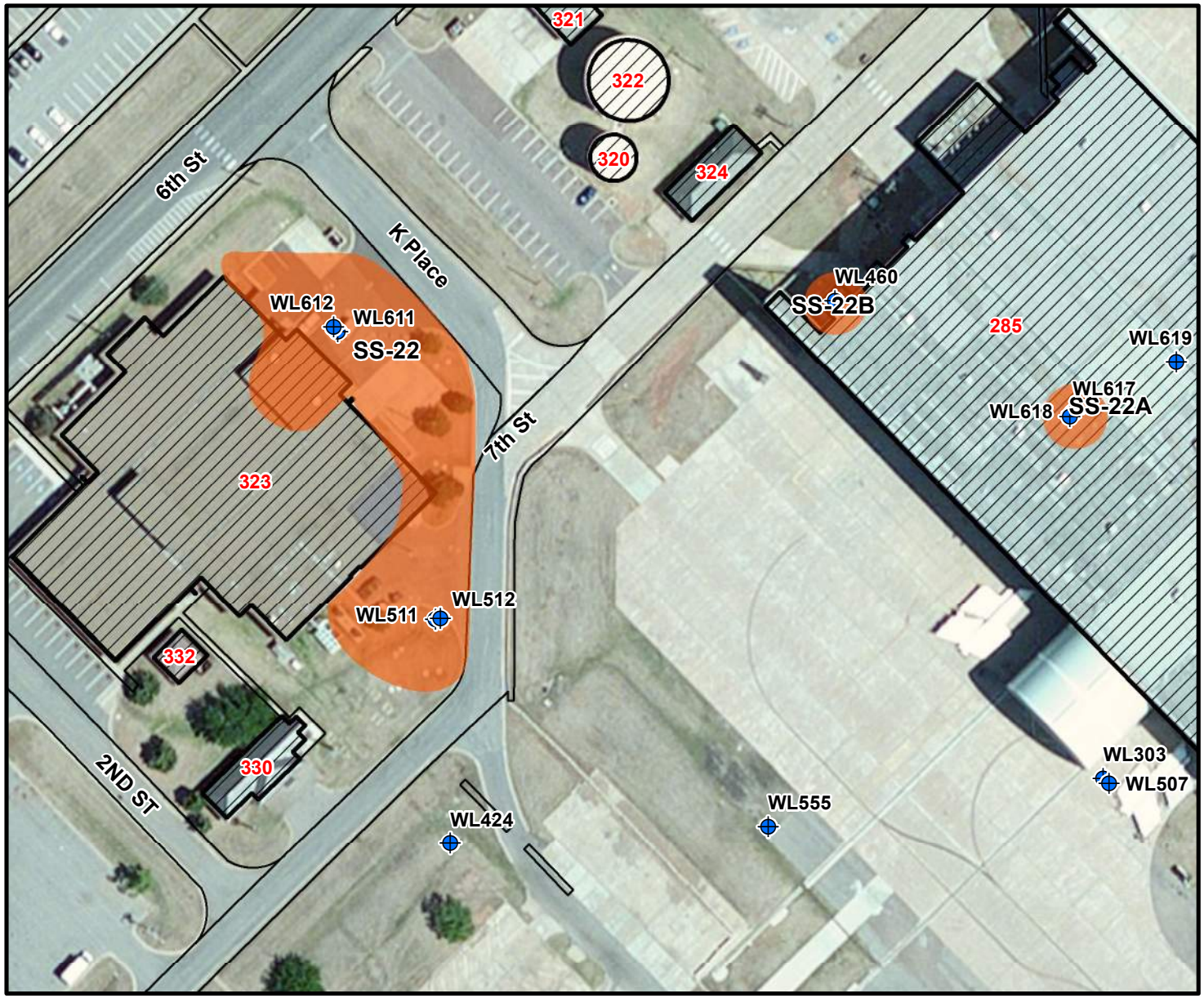

Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 50 100
Feet
Map Scale: 1 inch = 100 feet

GWMU 1: SS-22
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4d

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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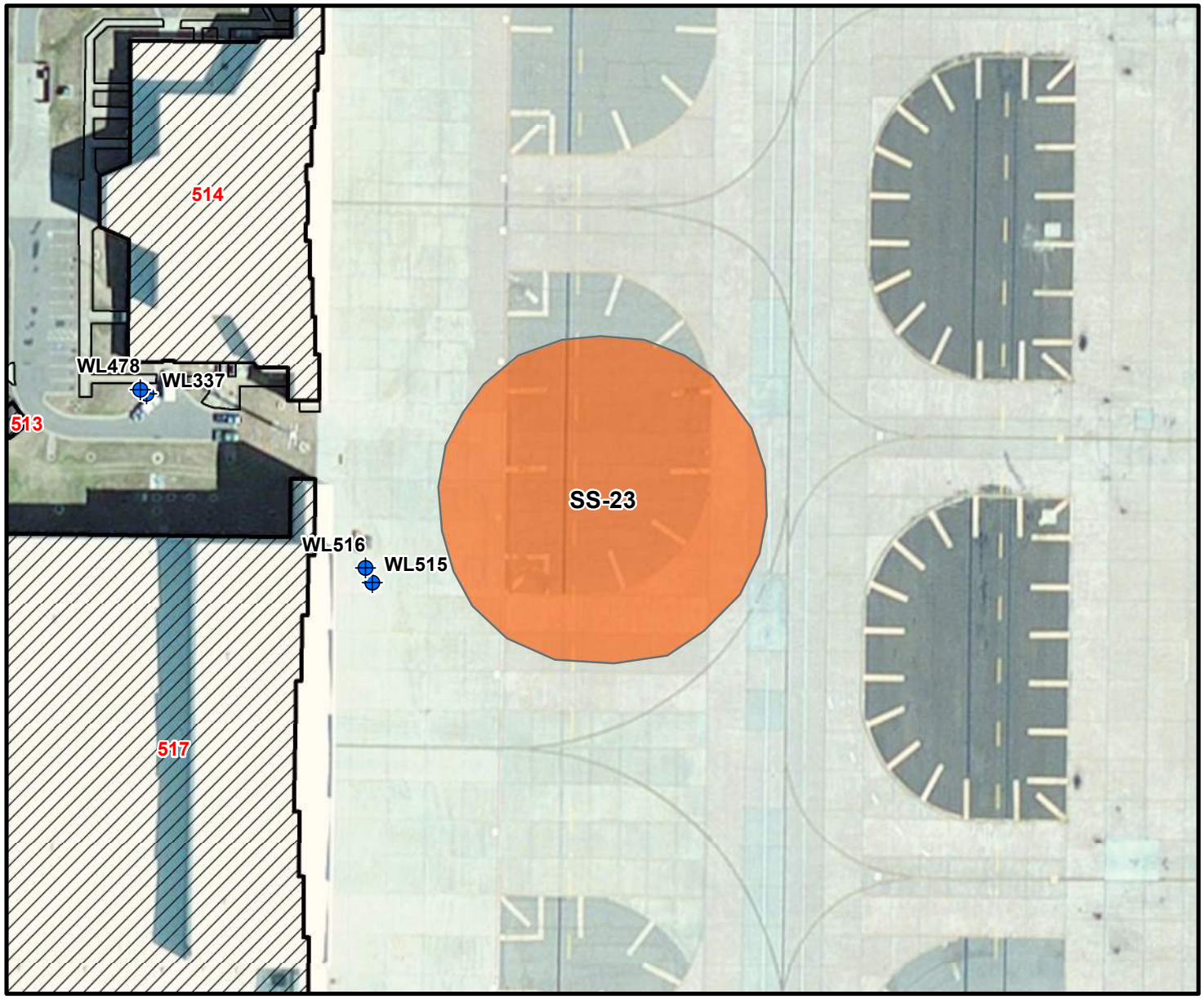

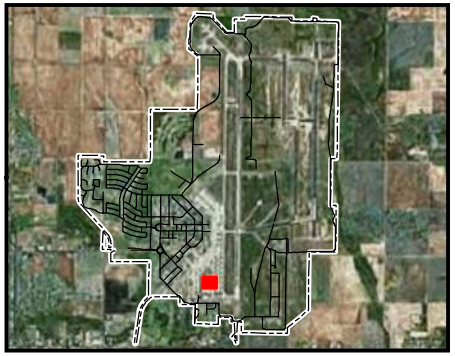

Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 50 100
Feet
Map Scale: 1 inch = 100 feet

GWMU 1: SS-23
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4e

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 50 100
Feet
Map Scale: 1 inch = 100 feet

GWMU 1: SS-16
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 4f

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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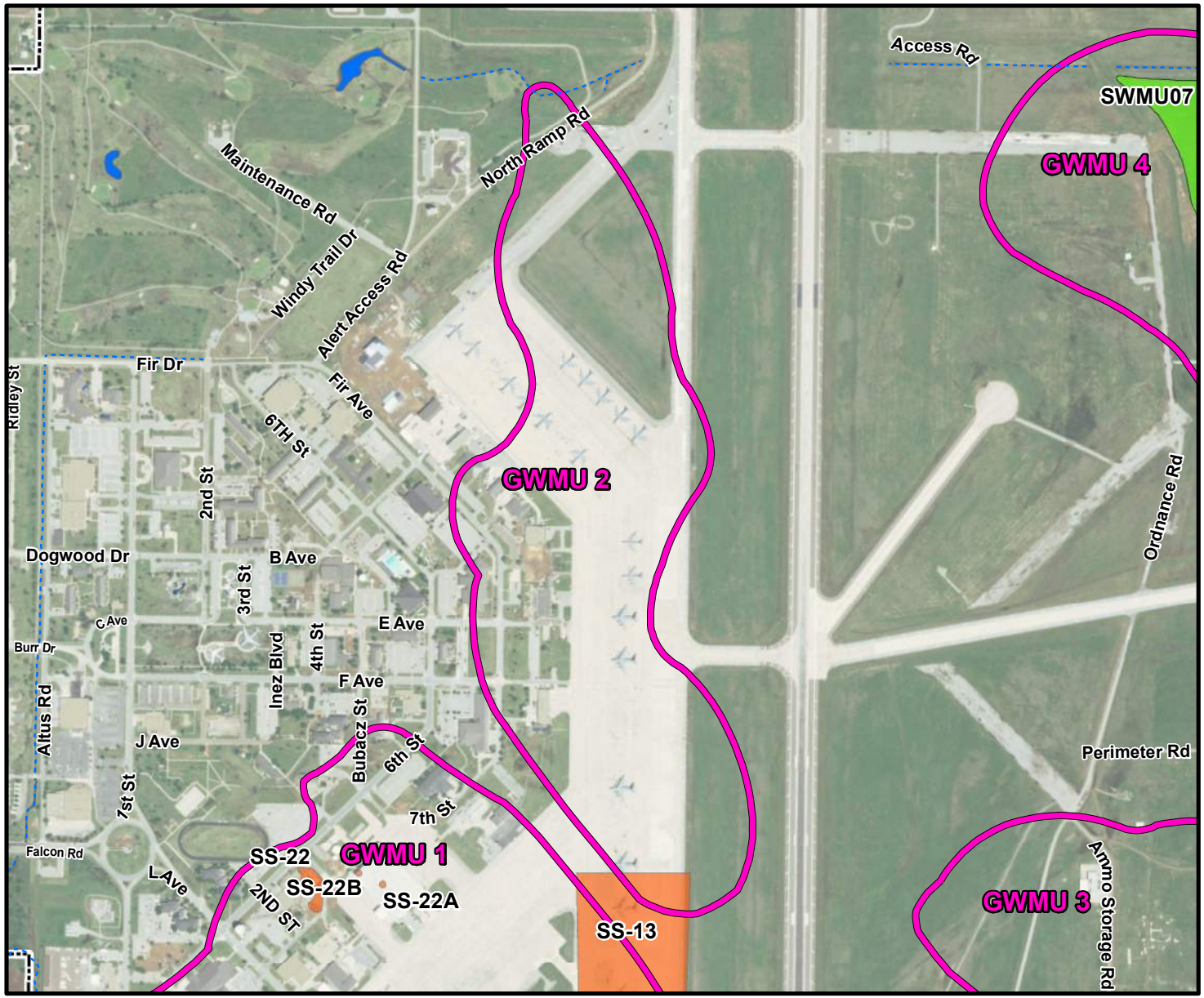

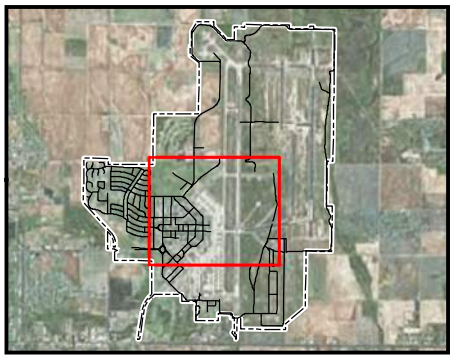

Legend

- Groundwater Management Unit
- IRP Site
- SWMU Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 600 1,200
Feet
Map Scale: 1 inch = 1,000 feet

Groundwater Management Unit 2

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 5a

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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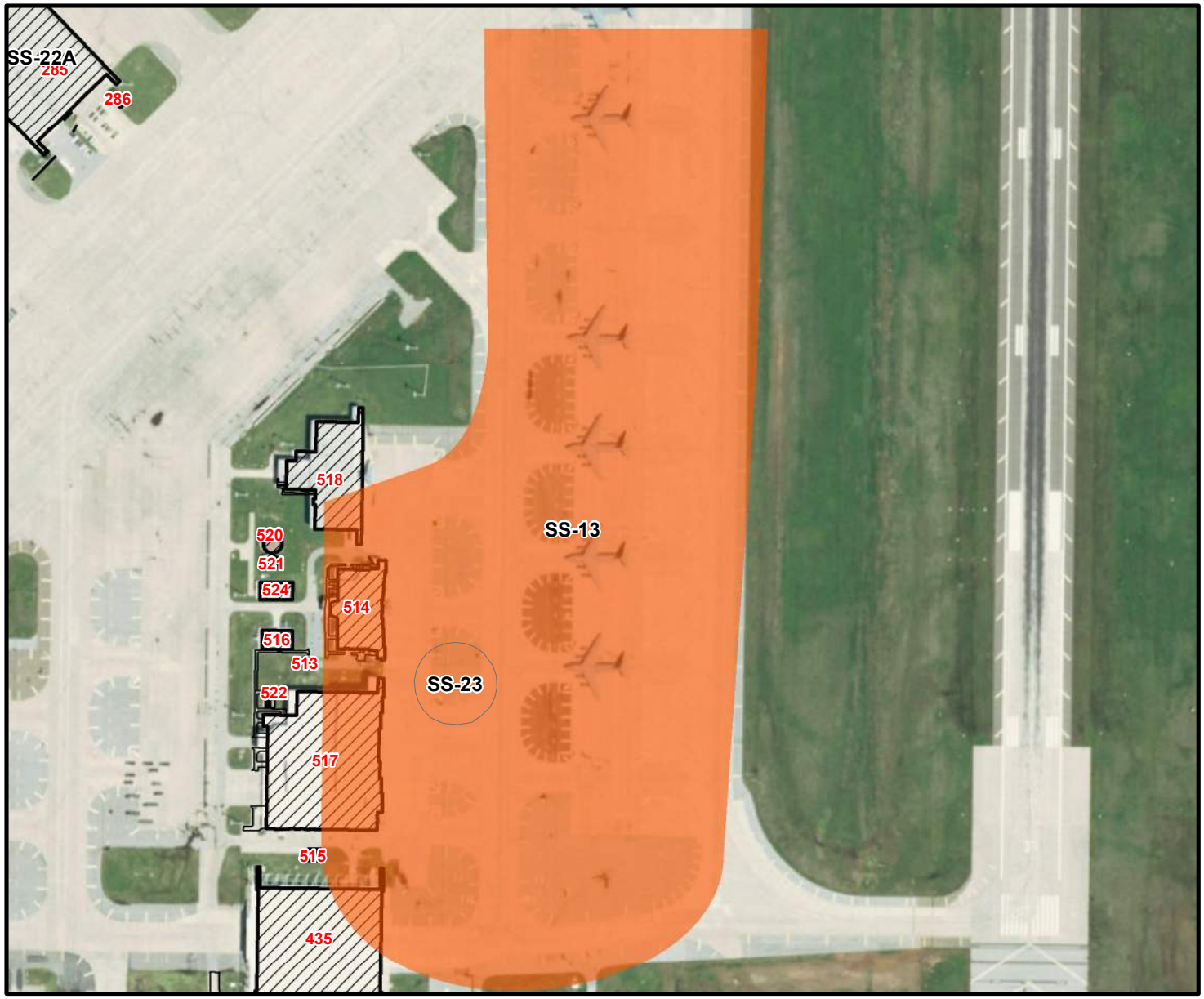
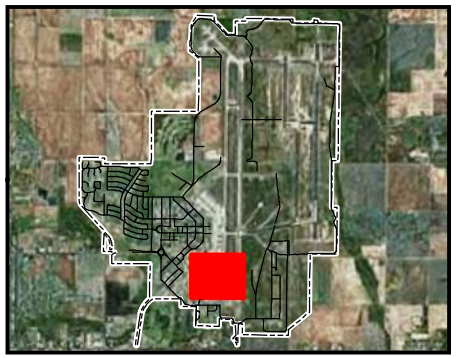
X:\proj\USAF\AltusAFB_5YR\gis\mxd\Altus AFB 5YR AOC Sites 2.mxd





Legend

IRP Site

Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 200 400
Feet
Map Scale: 1 inch = 400 feet

GWMU 2: SS-13 (BLDG 377/AOC 2)
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 5b

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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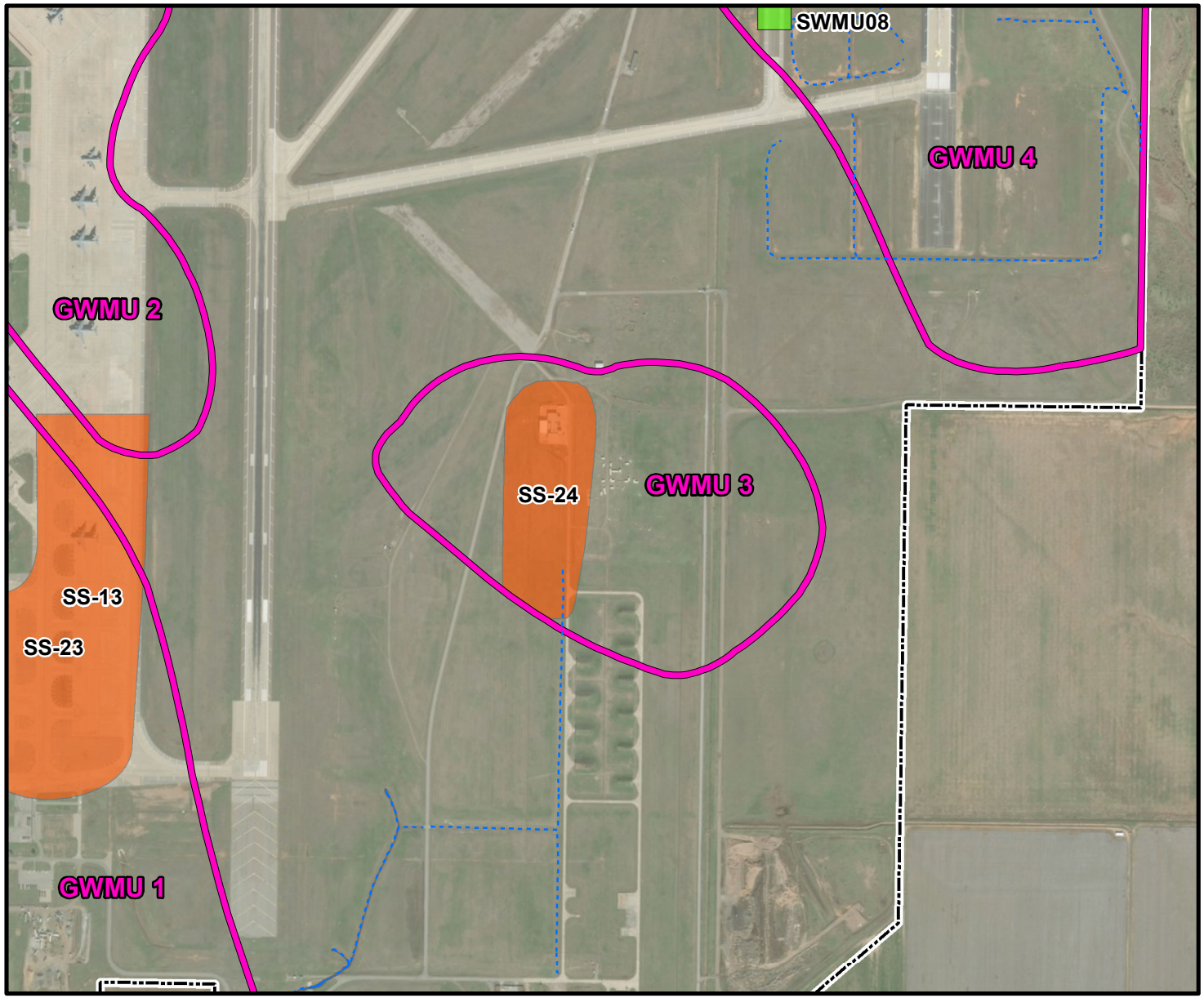

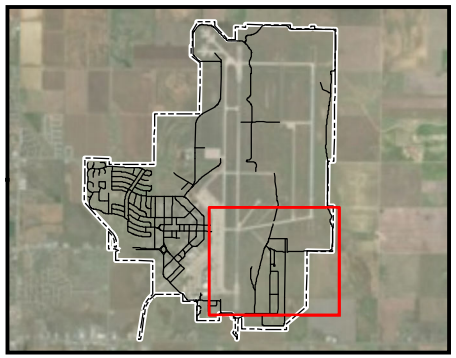

Legend

- Groundwater Management Unit
- IRP Site
- SWMU Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 600 1,200
Feet
Map Scale: 1 inch = 1,000 feet

Groundwater Management Unit 3

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 6a

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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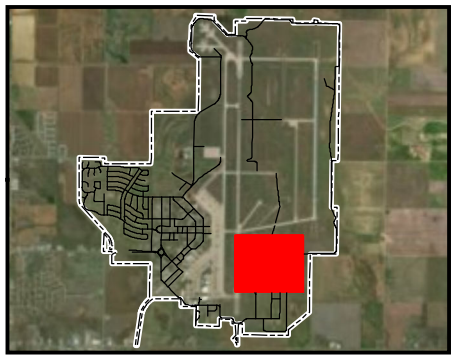

Legend

- Monitoring Well
- IRP Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 250 500
Feet
Map Scale: 1 inch = 500 feet

GWMU 3: SS-24
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 6b

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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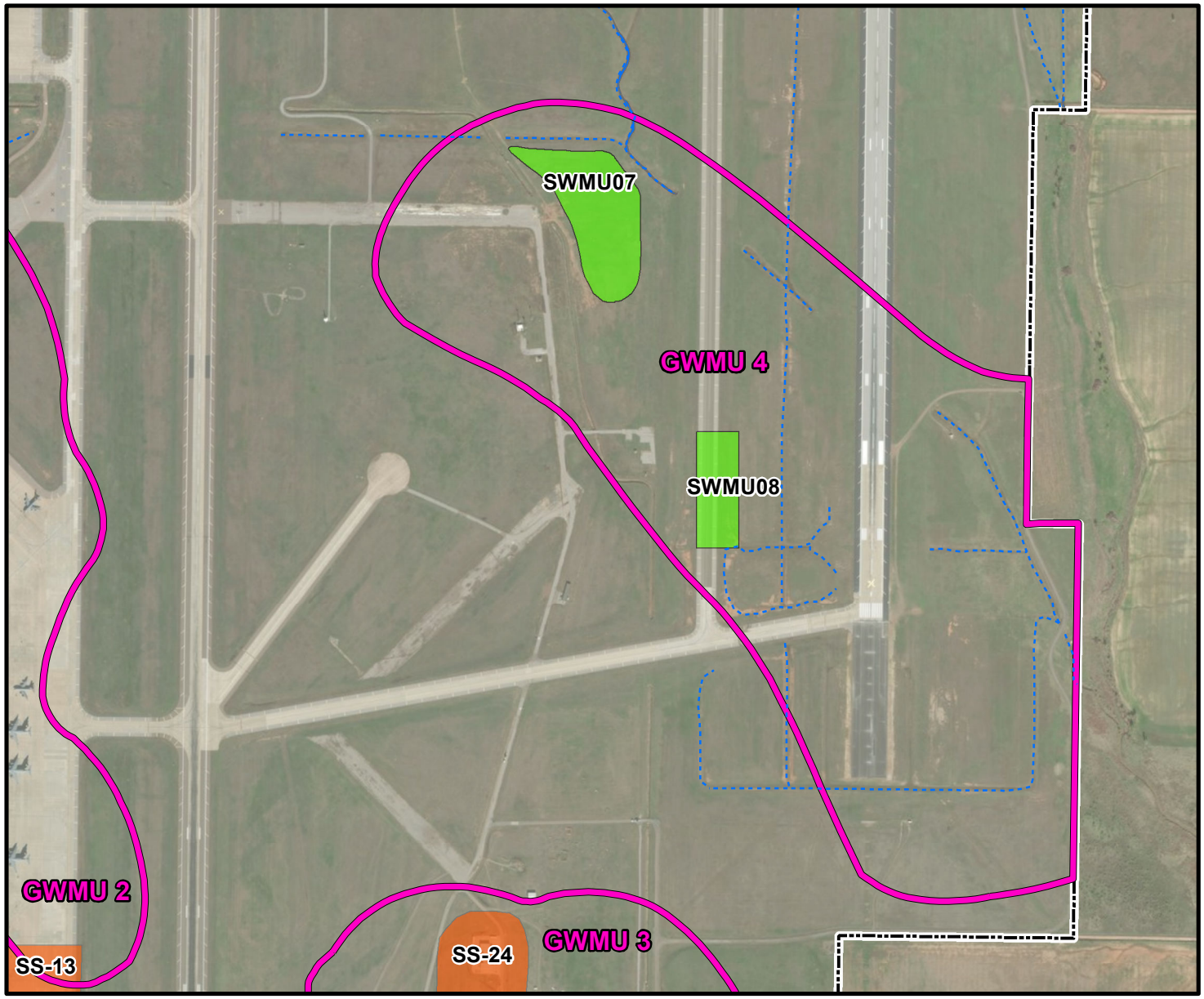

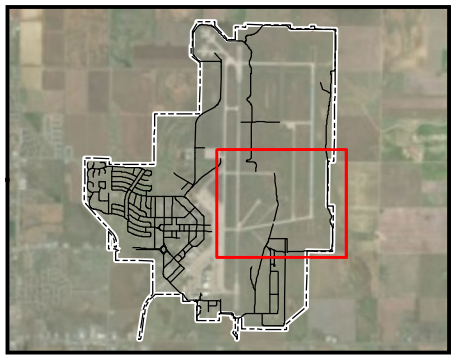

Legend

- Groundwater Management Unit
- IRP Site
- SWMU Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 600 1,200
Feet
Map Scale: 1 inch = 1,000 feet

Groundwater Management Unit 4

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 7a

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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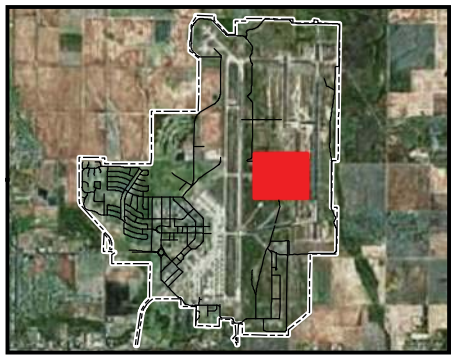

Legend

- Monitoring Well
- Extraction Well
- Piezometer
- SWMU Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 250 500
Feet
Map Scale: 1 inch = 400 feet

GWMU 4: LF004/SWMU07

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 7b

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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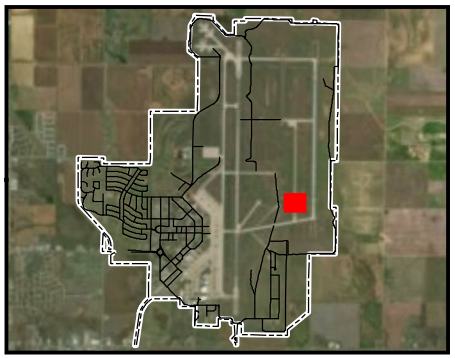

Legend

- Monitoring Well
- SWMU Site
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 75 150
Feet
Map Scale: 1 inch = 150 feet

GWMU 4: LF014/SWMU08
ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 7c

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	9/26/2017

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2017 Pollution Area-UZ

- TCE; 5 PPB; UZ
- TCE; 50 PPB; UZ
- TCE; 500 PPB; UZ
- TCE; 5000 PPB; UZ
- TCE; 50000 PPB; UZ

2017 Pollution Area-LZ

- TCE; 5 PPB; LZ
- TCE; 50 PPB; LZ
- TCE; 500 PPB; LZ
- TCE; 5000 PPB; LZ

2017 Pollution Area-UIZ

- TCE; 5 PPB; UIZ
- TCE; 50 PPB; UIZ
- TCE; 500 PPB; UIZ
- TCE; 5000 PPB; UIZ

Performance Sampling - Monitored

- Extraction Well
- Monitoring Well
- Piezometer
- River/Stream Sample
- Injection Well

SWMU01
SWMU02
SWMU03
SWMU04
SWMU07
SWMU08
SWMU09
SWMU10
SWMU11
SWMU12
SWMU16
SWMU26
GWMU1
GWMU2
GWMU3
GWMU4
SS-13
SS-16
SS-17
SS-18
SS-22
SS-23
SS-24
IW 1 to 11
IW 12 to 16
62

- Bioreactor
- Restor Treat Sys Line
- Env Rem Area
- Env Rem Site

The information herein is FOR OFFICIAL USE ONLY (FOUO)

Altus Air Force Base

TCE PLUME OVERLAY MAP

0 1,500 3,000
Feet

N

97th AIR MOBILITY WING

Map By: Tom Miller, GISP
Date Printed: 3/6/2018

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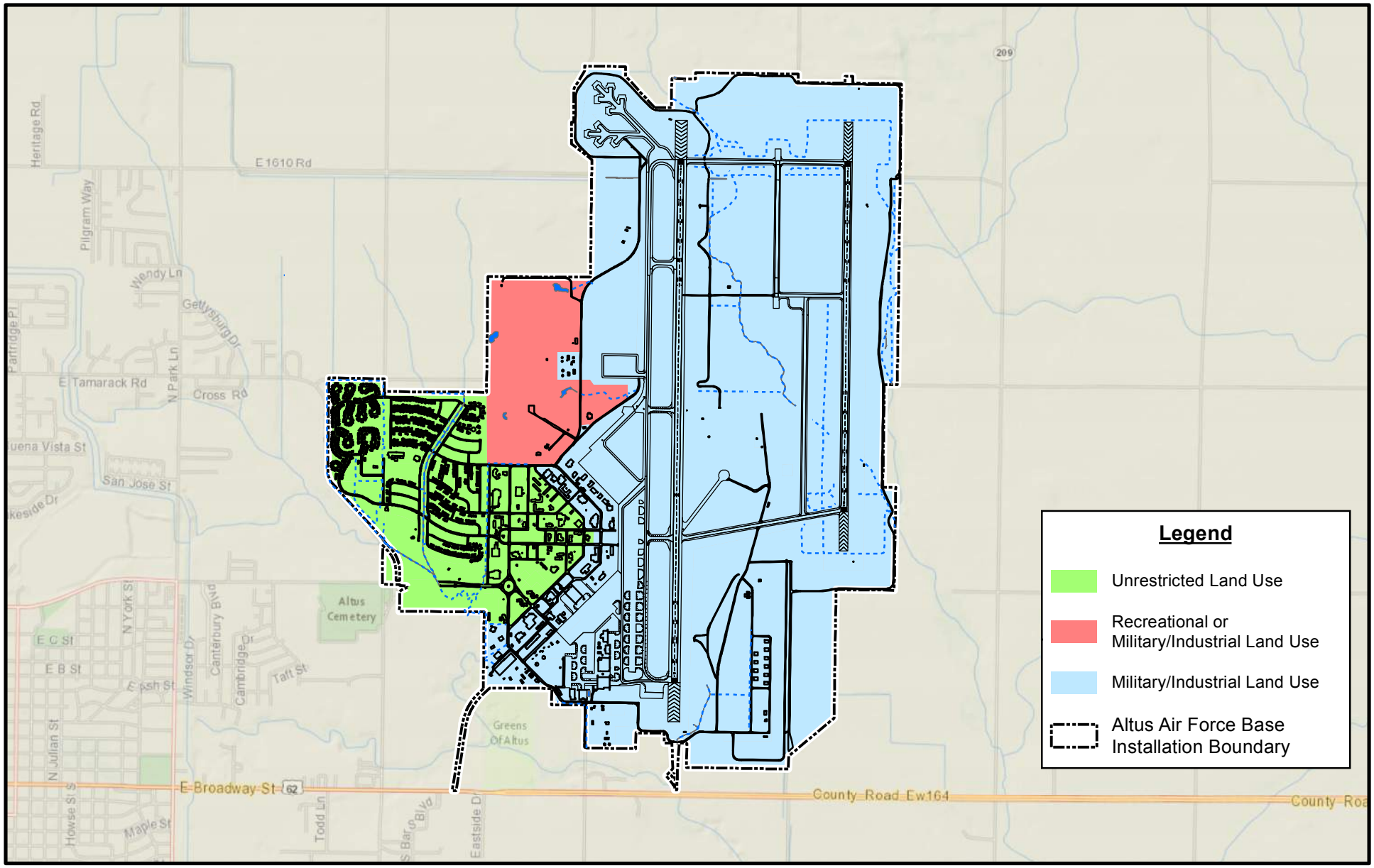

NOTES:

1) Base Map Source:
National Geographic World Map via Esri

BLACK & VEATCH

0 1,750 3,500
Feet
Map Scale: 1 inch = 3,500 feet

On-Base Land Use Control Areas

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 9

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	5/25/2017

X:\proj\USAF\AltusAFB_5YR\gis\mxd\Altus AFB 5YR On-Base Land Use Control Areas.mxd

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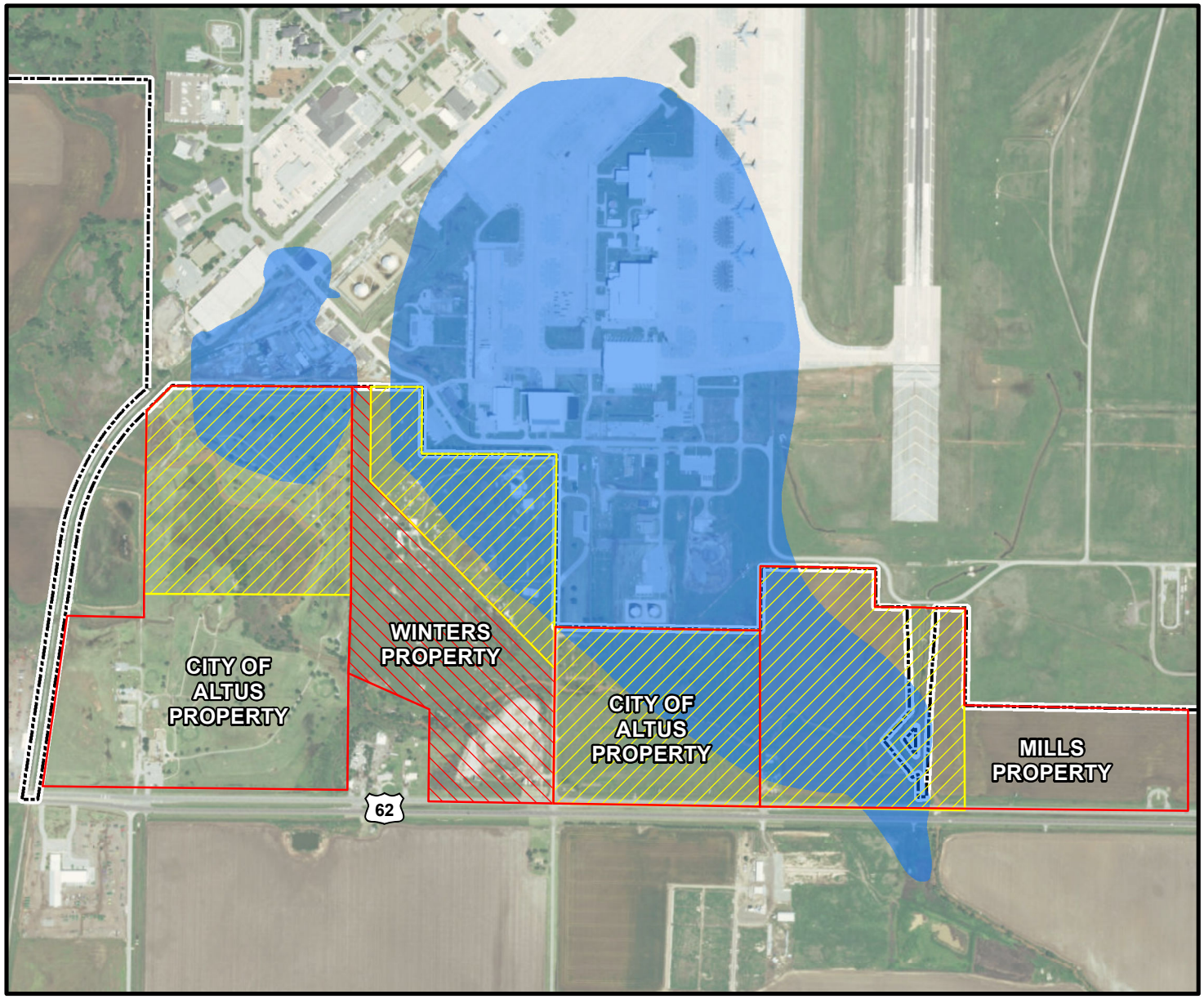

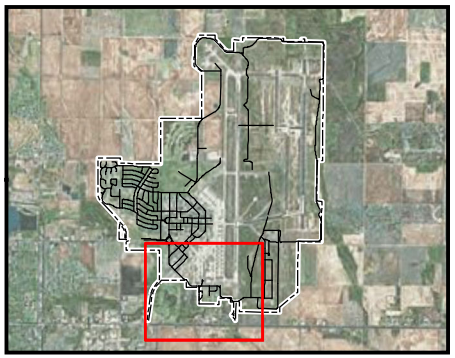

Legend

- Property Boundary
- Groundwater Use and Residential Use Restriction Area
- Groundwater Use Only Restriction Area
- Impacted Groundwater Plume (SS-15 and SS-17)
- Altus Air Force Base Installation Boundary

NOTES:

1) Aerial Photograph Source: USDA FSA, flown in 2015

BLACK & VEATCH

0 500 1,000
Feet
Map Scale: 1 inch = 1,000 feet

Off-Base Land Use Control Areas

ALTUS AIR FORCE BASE, OKLAHOMA

FIGURE 10

PROJECT NO.	DRAWN BY:	CHECKED BY:	DATE:
042863.05.00	J. FRENCH	B. VESELKA	10/13/2017

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Appendix A. LUC Annual Inspection Checklists

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Altus Air Force Base
Notification Requirements for Land Use Controls
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1612

Name of Inspector: Bitney, Mary C Mary C Bitney

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Annual inspections of the on-Base property and four adjacent off-Base properties are required to ensure that: On-base: There are no violations of the on-Base land use controls, and any required engineering mitigation controls for indoor air for administrative buildings located over groundwater plumes are appropriately implemented, if required by the administrative authority. Off-base: There are no violations of the off-Base restrictive (environment) covenant and easement agreements.	Were annual inspections for on-Base property and four adjacent off-Base properties completed last year? ☐ Yes ☒ No If not, was the administrative authority notified? ☒ Yes ☐ No If not, what was the reason for not conducting the annual inspections? IRP Manager position was vacant
Altus AFB will submit an annual inspection report to the administrative authority that documents the findings of annual inspections of the on-Base property and four adjacent off-Base properties.	Was an annual inspection report for on-Base and off-Base properties submitted to the administrative authority last year? ☐ Yes ☒ No
In addition to the annual inspections, the adequacy and effectiveness of the land use controls, and engineering mitigation controls for indoor air, will be reviewed and documented as part of the initial three-year performance review, and in subsequent periodic performance reviews thereafter.	Was the last required performance review for the on-Base and off-Base properties conducted and documentation submitted to the administrative authority? ☒ Yes ☐ No If **Yes**, on what date was the performance review submitted to the administrative authority? 10-Oct-12
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any unauthorized major land use change (e.g., from industrial or recreational land use to residential land use) or new receptors who are potentially exposed that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has Altus AFB discovered any unauthorized major land use change or any exposures to new receptors at the on-Base or four adjacent off-Base properties that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any activity that may interfere with the adequacy, or short-term or long-term effectiveness, of the land use controls, or engineering mitigation controls for indoor air.[2]	Has Altus AFB discovered any activity that interferes with the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, at the on-Base or off-Base adjacent properties? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority for any planned major land use change (e.g., from industrial or recreational land use to residential land use) that would be inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air	Has any major land use change for the on-Base or adjacent off-Base properties been proposed since the last inspection report that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority to terminate or modify any land use control, or any engineering mitigation control for indoor air	Has Altus AFB requested prior concurrence from the administrative authority to terminate or modify any approved land use control, or engineering mitigation control for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB may disrupt the adequacy, or short-term or long-term effectiveness, of the land use controls or engineering mitigation controls for indoor air.[2]	Has Altus AFB requested prior concurrence from the administrative authority because a planned action may disrupt the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB is intended to alter or negate the need for land use controls, or engineering mitigation controls for indoor air at administrative buildings.	Has Altus AFB requested prior concurrence from the administrative authority because a planned action is intended to alter or negate the need for the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority at least 6 months prior to any transfer or sale (including federal to federal) of any on-Base property where the land use controls, and/or engineering mitigation controls for indoor air at administrative buildings, are required by the administrative authority.	In the next 6 months, is there any planned transfer or sale (including federal to federal) of any on-Base property where the land use controls apply, and/or engineering mitigation controls for indoor air, are required by the administrative authority? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if any interest in the four adjacent off-Base properties has been conveyed by the property owner without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has any interest been conveyed by the off-Base property owners without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if the off-Base property owners have entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements.	Have the off-Base property owners entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements? ☐ Yes ☒ No **If Yes**, on what date were the administrative authority notified?

[1] Requests will be submitted in advance of any planned action(s) to allow sufficient time for regulatory concurrence.

[2] Examples of activities that may disrupt the effectiveness of the implemented land use controls include, but are not limited to, excavation at a landfill, removal of a fence, unlocking of a gate, or removal of warning signs.

Altus Air Force Base
Land Use Controls for On-Base Property
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1454

Name of Inspector: Bitney, Mary C Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use controls, and engineering mitigation controls for indoor air, established for on-Base property in Section 4.0 of the *CMI Land Use Control Plan*, Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Three land use control zones have been established for on-Base property as described in Section 5.1, and as illustrated on Figure 5.1-1, of the *CMI Land Use Control Plan*	Has any land use or development occurred that violates the land use restrictions of these control zones? ☐ Yes ☒ No
Groundwater use within the boundaries of Altus AFB will be prohibited. Installation of any wells within the boundaries of Altus AFB for the purpose of accessing groundwater for any use (e.g., potable, industrial, commercial, recreational, or agricultural) other than for environmental investigation/monitoring will be prohibited	Is groundwater within the boundaries of Altus AFB being used for any purpose? ☐ Yes ☒ No Have any wells been completed within the boundaries of Altus AFB for the purpose of extracting groundwater for any purpose other than for environmental investigation/monitoring? ☐ Yes ☒ No
To protect on-Base personnel from potential indoor air exposures, positive-pressure engineering mitigation controls may be necessary at administrative buildings located over contaminated groundwater plumes in the GWMUs at Altus AFB. The requirement for the installation of engineering mitigation controls will be made by the administrative authority based on the analytical data for contaminants in groundwater and other related data. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Have all administrative buildings that exist over contaminated groundwater plumes been evaluated to determine whether engineering mitigation controls for indoor air are required? ☒ Yes ☐ No Have engineering mitigation controls for indoor air been required at any administrative building(s) by the administrative authority? ☐ Yes ☒ No **If Yes:** 1. Have the required engineering mitigation controls for indoor air been implemented? ☐ Yes ☐ No 2. Are the implemented engineering mitigation controls for indoor air functioning properly? ☐ Yes ☐ No

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Engineering mitigation controls for indoor air will also be required as part of the initial design of any administrative or office building above a contaminated groundwater plume, and implemented according to design plans. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Is construction of a future administrative or office building(s) planned above a contaminated groundwater plume? [ ] Yes [X] No If **Yes**, have engineering mitigation controls for indoor air been incorporated as part of the initial design? [ ] Yes [ ] No
Altus AFB has several policies/procedures in place for the protection of workers via exposure to soil and groundwater contamination during intrusive activities (e.g., excavation/digging) within the boundaries of the Base.	Has any project occurred entailing intrusive activities (e.g., excavation/digging) potentially encountering soil/groundwater contamination within the boundaries of Altus AFB? [X] Yes [ ] No **If Yes:** 1. Has any on-Base project potentially encountering soil/groundwater contamination been initiated by an in-shop house or contracted outside entity without prior approval of the Base Environmental Restoration Manager? [ ] Yes [X] No 2. If on-Base projects potentially encountering soil/groundwater contamination have been performed by in-house shops, has Base bioenvironmental determined personnel protection equipment, and other worker safety, requirements for these projects? [X] Yes [ ] No 3. Have any on-Base projects potentially encountering soil/groundwater contamination been contracted to outside entities; thereby, requiring an EMP and HASP? [X] Yes [ ] No 4. Have all required EMPs and HASPs been reviewed and approved by the Base Environmental Restoration Manager? [X] Yes [ ] No 5. Have all on-Base projects potentially encountering soil/groundwater contamination performed by either in-shop houses or contracted outside entities been appropriately monitored by the Base Environmental Restoration Manager during project execution? [X] Yes [ ] No

Altus Air Force Base
Land Use Controls for the Elks Lodge Property
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1350

Name of Inspector: Bitney, Mary C. Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Elks Lodge property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

aquired by City about 2 years ago - per ~~Barbara~~ Burleson, Altus City Planner 481-2272

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Elks Lodge property.	Has any new residential land use occurred at the Elks Lodge property? ☐ Yes ☒ No
Groundwater beneath the Elks Lodge property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Elks Lodge property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Elks Lodge property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☐ No
Excavation of the subsurface of the Elks Lodge property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Elks Lodge is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No 2. Did the Elks Lodge contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No

Checked with Public Works 481-2295

481-2219 Priscilla

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Elks Lodge property. No conveyance of the Elks Lodge property shall be consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Elks Lodge provided notice to Altus AFB of intent to convey an interest in Elks Lodge property? ☐ Yes ☒ No If **Yes**, has the Elks Lodge provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No Has conveyance of any interest in the Elks Lodge property been consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No
The Elks Lodge must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Elks Lodge property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*. there is interest ~~by it~~ Verizon for cell tower, nothing signed	Has the Elks Lodge granted any leases or easements on the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Has the Elks Lodge restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Elks Lodge property? ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? ☐ Yes ☐ No
The Elks Lodge must notify and obtain approval from Altus AFB prior to any use of the Elks Lodge property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Elks Lodge used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Elks Lodge notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Elks Lodge property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Elks Lodge allowed Altus AFB to access the Elks Lodge property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Altus Municipal Authority Property
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1345

Name of Inspector: Bitney, Mary C. Mary C Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Altus Municipal Authority property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan*, Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Interview with Barbara Burleson, Altus City Planner (481-2272)

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Altus Municipal Authority property.	Has any new residential land use occurred at the Altus Municipal Authority property? ☐ Yes ☒ No
Groundwater beneath the Altus Municipal Authority property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Altus Municipal Authority property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Altus Municipal Authority property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☐ No
Excavation of the subsurface at the Altus Municipal Authority property is prohibited unless the excavation: (a) is less than approximately 8 feet bgs or the depth encountering the shallow groundwater, (b) consists of maintenance or replacement of existing underground utilities, buildings or roadways in the same or new locations, or (c) is previously approved by the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB.	Has excavation into the land surface occurred at the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater? ☐ Yes ☐ No 2. Did the excavation consist of maintenance or replacement of existing underground utilities, buildings, or roadways in the same or new locations? ☐ Yes ☐ No 3. Was prior approval provided by the Base Environmental Restoration Manager (97 CES/CEAN)? ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Altus Municipal Authority property. No conveyance of title in the Altus Municipal Authority property shall be consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Altus Municipal Authority provided notice to Altus AFB of intent to convey an interest in the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**, has the Altus Municipal Authority provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No Has conveyance of any interest in the Altus Municipal Authority property been consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No
The Altus Municipal Authority must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Altus Municipal Authority property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Altus Municipal Authority granted any leases or easements on the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Has the Altus Municipal Authority restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of the Altus Municipal Authority property? ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? ☐ Yes ☐ No
The Altus Municipal Authority must notify and obtain approval from Altus AFB prior to any use of the Altus Municipal Authority property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Altus Municipal Authority used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Altus Municipal Authority notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Altus Municipal Authority property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Altus Municipal Authority allowed Altus AFB to access the Altus Municipal Authority property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Mills Property
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1403

Name of Inspector: Bitney, Mary C Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Mills property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Interview with Bob Mills, property owner 482-1254

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Groundwater beneath Mills property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Mills property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Mills property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☐ No
Excavation of the subsurface of the Mills property is prohibited unless the excavation is less than approximately 8 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, Robert David Mills/Mills Living Trust is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. excavated to bury old brick from house didn't go below 5 ft	Has excavation into the land surface occurred at the Mills property? ☒ Yes ☐ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☒ No 2. Did Robert David Mills/Mills Living Trust contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☒ No NA

(Oct 13 14) last week end ne

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Mills property. No conveyance of title, easement, lease, or other interest in the Mills property shall be consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has Robert David Mills/Mills Living Trust provided notice to Altus AFB of intent to convey any interest in the Mills property? ☐ Yes ☒ No If **Yes**, has Robert David Mills/Mills Living Trust provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No Has conveyance of any interest in the Mills property been consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Mills property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Robert David Mills/Mills Living Trust granted any leases or easements on the Mills property? ☐ Yes ☒ No **If Yes:** 1. Has Robert David Mills/Mills Living Trust restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Mills property? ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*, been passed to all lessees as required by the agreement? ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must notify and obtain approval from Altus AFB prior to any use of the Mills property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has Robert David Mills/Mills Living Trust used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No **If Yes:** 1. Did Robert David Mills/Mills Living Trust notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Winters Property
Annual Inspection Checklist

Date: 17-Oct-12

Time: 1445

Name of Inspector: Bitney, Mary C Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Winters property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan).* The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Interview with Lorin Winters, Property Owner

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
Land use at the Winters property is restricted from new residential land use or human occupancy without proper engineering controls to address potential vapor intrusion into structures.	Has new residential land use or human occupancy occurred at the Winters property without proper engineering controls to address potential vapor intrusion into structures? ☐ Yes ☒ No
Groundwater beneath the Winters property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Winters property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Winters property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☐ No
Excavation of the subsurface of the Winters property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. few post holes for fences, about 1 ft deep	Has excavation into the land surface occurred at the Winters property? ☐ Yes ☒ No **If Yes:** 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No 2. Did the Winters contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
The Winters must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Winters property. No conveyance of title, easement, lease, or other interest in the Winters property shall be consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Have the Winters provided notice to Altus AFB of intent to convey an interest in the Winters property? ☐ Yes ☒ No If **Yes**, have the Winters provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No Has conveyance of any interest in the Winters property been consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No
The Winters must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Winters property.	Have the Winters granted any leases or easements on the Winters property? ☐ Yes ☒ No If **Yes**: Have the Winters restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Winters property? ☐ Yes ☐ No
The Winters must notify and obtain approval from Altus AFB prior to any use of the Winters property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Have the Winters used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Winters notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No
The Winters shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Winters property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Have the Winters allowed Altus AFB to access the Winters property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

DEPARTMENT OF THE AIR FORCE
97th AIR MOBILITY WING
ALTUS AIR FORCE BASE OKLAHOMA

22 Nov 13

Lt Col Tanya J. Anderson
Commander, 97 CES
401 L Avenue
Altus AFB OK 73523

Dr. Saba Tahmassebi, P.E.
Chief Engineer Land Protection Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City OK 73101-1677

RE: 2013 Land Use Control Inspections
RCRA Corrective Action Permit # 9571824025-CA
EPA ID# OK9571824045

Dear Dr. Tahmassebi

Reference Section III.B.2.c. of the Resource Conservation and Recovery Act (RCRA) Corrective Action Permit, Altus Air Force Base, Oklahoma established Land Use Controls as one Corrective Action Performance Standard. Annual inspections are required to demonstrate compliance with the established land use restrictions. The annual inspections were conducted between 10 – 23 October 2013. A hard copy of the referenced inspections is enclosed.

If you have any questions or comments, please contact Mary Bitney at 580-481-7346 or mary.bitney@us.af.mil.

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

Sincerely

TANYA J. ANDERSON, Lt Col, USAF
Commander, 97th Civil Engineer Squadron

Attachment:
Inspection Checklists

cc:
USEPA, Region 6

Annual LUC Inspections 2013

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- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
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ODEQ LAND PROTECTION DIVISION
P.O. BOX 1677
OKLAHOMA CITY OK 73101-1677

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X [signature] ☐ Agent ☐ Addressee

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Ms. Bitney
97 CES/CEAN
401 L Ave, Bldg 358
Altus, AFB OK 73523-5138

11/27

Altus Air Force Base
Notification Requirements for Land Use Controls
Annual Inspection Checklist

Date: 23-Oct-13

Time: 8:19 AM

Name of Inspector: Mary C. Bitney

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Annual inspections of the on-Base property and four adjacent off-Base properties are required to ensure that: On-base: There are no violations of the on-Base land use controls, and any required engineering mitigation controls for indoor air for administrative buildings located over groundwater plumes are appropriately implemented, if required by the administrative authority. Off-base: There are no violations of the off-Base restrictive (environment) covenant and easement agreements.	Were annual inspections for on-Base property and four adjacent off-Base properties completed last year? ☒ Yes ☐ No If not, was the administrative authority notified? N/A ☐ Yes ☐ No If not, what was the reason for not conducting the annual inspections?
Altus AFB will submit an annual inspection report to the administrative authority that documents the findings of annual inspections of the on-Base property and four adjacent off-Base properties.	Was an annual inspection report for on-Base and off-Base properties submitted to the administrative authority last year? ☒ Yes ☐ No
In addition to the annual inspections, the adequacy and effectiveness of the land use controls, and engineering mitigation controls for indoor air, will be reviewed and documented as part of the initial three-year performance review, and in subsequent periodic performance reviews thereafter. 3-yr performance review conducted 2011	Was the last required performance review for the on-Base and off-Base properties conducted and documentation submitted to the administrative authority? ☒ Yes ☐ No If **Yes**, on what date was the performance review submitted to the administrative authority?
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any unauthorized major land use change (e.g., from industrial or recreational land use to residential land use) or new receptors who are potentially exposed that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has Altus AFB discovered any unauthorized major land use change or any exposures to new receptors at the on-Base or four adjacent off-Base properties that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any activity that may interfere with the adequacy, or short-term or long-term effectiveness, of the land use controls, or engineering mitigation controls for indoor air. [2]	Has Altus AFB discovered any activity that interferes with the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, at the on-Base or off-Base adjacent properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority for any planned major land use change (e.g., from industrial or recreational land use to residential land use) that would be inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has any major land use change for the on-Base or adjacent off-Base properties been proposed since the last inspection report that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority to terminate or modify any land use control, or any engineering mitigation control for indoor air.	Has Altus AFB requested prior concurrence from the administrative authority to terminate or modify any approved land use control, or engineering mitigation control for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB may disrupt the adequacy, or short-term or long-term effectiveness, of the land use controls or engineering mitigation controls for indoor air. [2]	Has Altus AFB requested prior concurrence from the administrative authority because a planned action may disrupt the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB is intended to alter or negate the need for land use controls, or engineering mitigation controls for indoor air at administrative buildings.	Has Altus AFB requested prior concurrence from the administrative authority because a planned action is intended to alter or negate the need for the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority at least 6 months prior to any transfer or sale (including federal to federal) of any on-Base property where the land use controls, and/or engineering mitigation controls for indoor air at administrative buildings, are required by the administrative authority.	In the next 6 months, is there any planned transfer or sale (including federal to federal) of any on-Base property where the land use controls apply, and/or engineering mitigation controls for indoor air, are required by the administrative authority? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if any interest in the four adjacent off-Base properties has been conveyed by the property owner without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has any interest been conveyed by the off-Base property owners without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if the off-Base property owners have entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements.	Have the off-Base property owners entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

[1] Requests will be submitted in advance of any planned action(s) to allow sufficient time for regulatory concurrence.

[2] Examples of activities that may disrupt the effectiveness of the implemented land use controls include, but are not limited to, excavation at a landfill; removal of a fence; unlocking of a gate; or removal of warning signs.

Altus Air Force Base
Land Use Controls for the Elks Lodge Property
Annual Inspection Checklist

Date: 15-Oct-2013

Time: 4:55 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Elks Lodge property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Spoke to Ms. Barbara Burleson, Altus City Planner

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Elks Lodge property.	Has any new residential land use occurred at the Elks Lodge property? ☐ Yes ☒ No
Groundwater beneath the Elks Lodge property is prohibited as a water supply source for any use: potable, industrial, or irrigation. Spoke to Philip Beauchamp, Eng. Altus Public Works 10-Oct-13 stated City of Altus aware of Altus AFB water rights, no plan to drill well @ this time.	Is groundwater beneath the Elks Lodge property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Elks Lodge property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Elks Lodge property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Elks Lodge is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. pending - for cell tower - next to maintenance bldg @ golf course City lease to cell tower - pending	Has excavation into the land surface occurred at the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No N/A 2. Did the Elks Lodge contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Elks Lodge property. No conveyance of the Elks Lodge property shall be consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems. Pending w/ discussions w/ base - possible joint ownership w/ base -	Has the Elks Lodge provided notice to Altus AFB of intent to convey an interest in Elks Lodge property? ☒ Yes ☐ No If **Yes**, has the Elks Lodge provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No N/A - no decision Has conveyance of any interest in the Elks Lodge property been consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No ☒ N/A
The Elks Lodge must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Elks Lodge property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan.*	Has the Elks Lodge granted any leases or easements on the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Has the Elks Lodge restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Elks Lodge property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
The Elks Lodge must notify and obtain approval from Altus AFB prior to any use of the Elks Lodge property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Elks Lodge used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Elks Lodge notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Elks Lodge property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Elks Lodge allowed Altus AFB to access the Elks Lodge property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Mills Property
Annual Inspection Checklist

Date: 10/22/2013

Time: 1:49 pm

Name of Inspector: Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Mills property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Groundwater beneath Mills property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Mills property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Mills property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Mills property is prohibited unless the excavation is less than approximately 8 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, Robert David Mills/Mills Living Trust is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. Cleaned up old bldgs last year, is now all farm land.	Has excavation into the land surface occurred at the Mills property? ☐ Yes ☒ No If **Yes:** ~~cleaned up old bldgs last year~~ 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No 2. Did Robert David Mills/Mills Living Trust contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Mills property. No conveyance of title, easement, lease, or other interest in the Mills property shall be consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP. The intent is to keep property in the family. In 15 yrs will qualify as Centenial Farm. Now held in 2 trusts.	Has Robert David Mills/Mills Living Trust provided notice to Altus AFB of intent to convey any interest in the Mills property? ☐ Yes ☒ No If **Yes**, has Robert David Mills/Mills Living Trust provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Mills property been consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Mills property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan.*	Has Robert David Mills/Mills Living Trust granted any leases or easements on the Mills property? ☐ Yes ☒ No If **Yes**: 1. Has Robert David Mills/Mills Living Trust restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Mills property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must notify and obtain approval from Altus AFB prior to any use of the Mills property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has Robert David Mills/Mills Living Trust used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did Robert David Mills/Mills Living Trust notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust shall allow and does hereby grant a permanent, non-exclusive easement to Altus AFB and authorized representatives of Altus AFB the right to enter the Mills property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]). If Altus AFB obtains a No Further Action ("Closure") letter from the applicable regulatory agency that does not rely on the restrictive covenants, then Altus AFB will, within a reasonable time, prepare and file a supplemental deed instrument to terminate the restrictive covenants.	Has Robert David Mills/Mills Living Trust allowed Altus AFB to access the Mills property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No Has Altus AFB obtained a No Further Action (Closure) letter from the applicable regulatory agency that does not rely on the restrictive covenants? ☐ Yes ☒ No If **Yes**, has Altus AFB prepared and filed a supplemental deed instrument to terminate the restrictive covenants? ☐ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Altus Municipal Authority Property
Annual Inspection Checklist

Date: 15-Oct-2013

Time: 5 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Altus Municipal Authority property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Spoke to Ms. Barbara Burleson, Altus City Planner

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Altus Municipal Authority property.	Has any new residential land use occurred at the Altus Municipal Authority property? ☐ Yes ☒ No
Groundwater beneath the Altus Municipal Authority property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Altus Municipal Authority property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Altus Municipal Authority property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface at the Altus Municipal Authority property is prohibited unless the excavation: (a) is less than approximately 8 feet bgs or the depth encountering the shallow groundwater, (b) consists of maintenance or replacement of existing underground utilities, buildings or roadways in the same or new locations, or (c) is previously approved by the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB. N/A	Has excavation into the land surface occurred at the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater? ☐ Yes ☐ No 2. Did the excavation consist of maintenance or replacement of existing underground utilities, buildings, or roadways in the same or new locations? ☐ Yes ☐ No 3. Was prior approval provided by the Base Environmental Restoration Manager (97 CES/CEAN)? ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Altus Municipal Authority property. No conveyance of title in the Altus Municipal Authority property shall be consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Altus Municipal Authority provided notice to Altus AFB of intent to convey an interest in the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**, has the Altus Municipal Authority provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Altus Municipal Authority property been consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
The Altus Municipal Authority must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Altus Municipal Authority property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Altus Municipal Authority granted any leases or easements on the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Has the Altus Municipal Authority restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of the Altus Municipal Authority property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
The Altus Municipal Authority must notify and obtain approval from Altus AFB prior to any use of the Altus Municipal Authority property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Altus Municipal Authority used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Altus Municipal Authority notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Altus Municipal Authority property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Altus Municipal Authority allowed Altus AFB to access the Altus Municipal Authority property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for On-Base Property
Annual Inspection Checklist

Date: 22-Oct-2013

Time: 2:15 pm

Name of Inspector: Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use controls, and engineering mitigation controls for indoor air, established for on-Base property in Section 4.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Three land use control zones have been established for on-Base property as described in Section 5.1, and as illustrated on Figure 5.1-1, of the *CMI Land Use Control Plan.*	Has any land use or development occurred that violates the land use restrictions of these control zones? ☐ Yes ☒ No
Groundwater use within the boundaries of Altus AFB will be prohibited. Installation of any wells within the boundaries of Altus AFB for the purpose of accessing groundwater for any use (e.g., potable, industrial, commercial, recreational, or agricultural) other than for environmental investigation/monitoring will be prohibited.	Is groundwater within the boundaries of Altus AFB being used for any purpose? ☐ Yes ☒ No Have any wells been completed within the boundaries of Altus AFB for the purpose of extracting groundwater for any purpose other than for environmental investigation/monitoring? ☐ Yes ☒ No
To protect on-Base personnel from potential indoor air exposures, positive-pressure engineering mitigation controls may be necessary at administrative buildings located over contaminated groundwater plumes in the GWMUs at Altus AFB. The requirement for the installation of engineering mitigation controls will be made by the administrative authority based on the analytical data for contaminants in groundwater and other related data. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Have all administrative buildings that exist over contaminated groundwater plumes been evaluated to determine whether engineering mitigation controls for indoor air are required? ☒ Yes ☐ No Have engineering mitigation controls for indoor air been required at any administrative building(s) by the administrative authority? ☐ Yes ☒ No If **Yes**: 1. Have the required engineering mitigation controls for indoor air been implemented? N/A ☐ Yes ☐ No 2. Are the implemented engineering mitigation controls for indoor air functioning properly? N/A ☐ Yes ☐ No

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Engineering mitigation controls for indoor air will also be required as part of the initial design of any administrative or office building above a contaminated groundwater plume, and implemented according to design plans. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Is construction of a future administrative or office building(s) planned above a contaminated groundwater plume? ☐ Yes ☒ No If **Yes**, have engineering mitigation controls for indoor air been incorporated as part of the initial design? ☐ Yes ☐ No
Altus AFB has several policies/procedures in place for the protection of workers via exposure to soil and groundwater contamination during intrusive activities (e.g., excavation/digging) within the boundaries of the Base.	Has any project occurred entailing intrusive activities (e.g., excavation/digging) potentially encountering soil/groundwater contamination within the boundaries of Altus AFB? ☒ Yes ☐ No If **Yes**: 1. Has any on-Base project potentially encountering soil/groundwater contamination been initiated by an in-shop house or contracted outside entity without prior approval of the Base Environmental Restoration Manager? ☐ Yes ☒ No 2. If on-Base projects potentially encountering soil/groundwater contamination have been performed by in-house shops, has Base bioenvironmental determined personnel protection equipment, and other worker safety, requirements for these projects? N/A ☐ Yes ☐ No 3. Have any on-Base projects potentially encountering soil/groundwater contamination been contracted to outside entities; thereby, requiring an EMP and HASP? ☐ Yes ☒ No 4. Have all required EMPs and HASPs been reviewed and approved by the Base Environmental Restoration Manager? N/A ☐ Yes ☐ No 5. Have all on-Base projects potentially encountering soil/groundwater contamination performed by either in-shop houses or contracted outside entities been appropriately monitored by the Base Environmental Restoration Manager during project execution? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Winters Property
Annual Inspection Checklist

Date: 10-Oct-2013

Time: 10:46 A.M.

Name of Inspector: Mary C. Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Winters property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan).* The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Spoke to Mr. Lorin Winters @ 471-6495

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
Land use at the Winters property is restricted from new residential land use or human occupancy without proper engineering controls to address potential vapor intrusion into structures.	Has new residential land use or human occupancy occurred at the Winters property without proper engineering controls to address potential vapor intrusion into structures? no one living @ present ☐ Yes ☒ No
Groundwater beneath the Winters property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Winters property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Winters property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Winters property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Winters property? ☐ Yes ☒ No **If Yes:** 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No N/A 2. Did the Winters contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No N/A

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
The Winters must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Winters property. No conveyance of title, easement, lease, or other interest in the Winters property shall be consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Have the Winters provided notice to Altus AFB of intent to convey an interest in the Winters property? ☐ Yes ☒ No not considering selling at this time. If **Yes**, have the Winters provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No N/A Has conveyance of any interest in the Winters property been consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No N/A
The Winters must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Winters property.	Have the Winters granted any leases or easements on the Winters property? ☐ Yes ☒ No If **Yes**: Have the Winters restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Winters property? ☐ Yes ☐ No
The Winters must notify and obtain approval from Altus AFB prior to any use of the Winters property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Have the Winters used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Winters notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No
The Winters shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Winters property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Have the Winters allowed Altus AFB to access the Winters property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

DEPARTMENT OF THE AIR FORCE
97th AIR MOBILITY WING
ALTUS AIR FORCE BASE OKLAHOMA

22 October 2014

Lt Col Gregory T. Reich
Commander, 97th Civil Engineer Squadron
401 L Avenue, Bldg 358
Altus AFB OK 73523-5138

Dr. Saba Tahmassebi, P.E.
Chief Engineer Land Protection Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City OK 73101-1677

RE: 2014 Land Use Control Inspections
RCRA Corrective Action Permit # 9571824025-CA
EPA ID# OK9571824045

Dear Dr. Tahmassebi

Reference Section III.B.2.c. of the Resource Conservation and Recovery Act (RCRA) Corrective Action Permit, Altus Air Force Base, Oklahoma established Land Use Controls as one Corrective Action Performance Standard. Annual inspections are required to demonstrate compliance with the established land use restrictions. The annual inspections were conducted between 20 – 21 October 2014. A hard copy of the referenced inspections is enclosed.

If you have any questions or comments, please contact Mary Bitney at 580-481-7346 or mary.bitney@us.af.mil.

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

Sincerely

GREGORY T. REICH, Lt Col, USAF
Commander, 97th Civil Engineer Squadron

Attachment:
Inspection Checklists

cc:
USEPA, Region 6

Altus Air Force Base
Land Use Controls for the Altus Municipal Authority Property
Annual Inspection Checklist

Date: 10/20/2014

Time: 9 AM

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Altus Municipal Authority property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Phone + email Communication w/ Ms. Barbara Burleson

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Altus Municipal Authority property.	Has any new residential land use occurred at the Altus Municipal Authority property? ☐ Yes ☒ No
Groundwater beneath the Altus Municipal Authority property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Altus Municipal Authority property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Altus Municipal Authority property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface at the Altus Municipal Authority property is prohibited unless the excavation: (a) is less than approximately 8 feet bgs or the depth encountering the shallow groundwater, (b) consists of maintenance or replacement of existing underground utilities, buildings or roadways in the same or new locations, or (c) is previously approved by the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB.	Has excavation into the land surface occurred at the Altus Municipal Authority property? ☐ Yes ☒ No **If Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater? ☐ Yes ☐ No N/A 2. Did the excavation consist of maintenance or replacement of existing underground utilities, buildings, or roadways in the same or new locations? ☐ Yes ☐ No N/A 3. Was prior approval provided by the Base Environmental Restoration Manager (97 CES/CEAN)? ☐ Yes ☐ No N/A

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Altus Municipal Authority property. No conveyance of title in the Altus Municipal Authority property shall be consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Altus Municipal Authority provided notice to Altus AFB of intent to convey an interest in the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**, has the Altus Municipal Authority provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No N/A Has conveyance of any interest in the Altus Municipal Authority property been consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No N/A
The Altus Municipal Authority must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Altus Municipal Authority property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Altus Municipal Authority granted any leases or easements on the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Has the Altus Municipal Authority restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of the Altus Municipal Authority property? ☐ Yes ☐ No N/A 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? ☐ Yes ☐ No N/A
The Altus Municipal Authority must notify and obtain approval from Altus AFB prior to any use of the Altus Municipal Authority property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Altus Municipal Authority used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Altus Municipal Authority notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No N/A 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No N/A

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Altus Municipal Authority property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Altus Municipal Authority allowed Altus AFB to access the Altus Municipal Authority property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Elks Lodge Property
Annual Inspection Checklist

Date: 10/20/2014

Time: 9 AM

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Elks Lodge property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Phone + email communicatim w/ Ms. Barbara Burleson

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Elks Lodge property.	Has any new residential land use occurred at the Elks Lodge property? ☐ Yes ☒ No
Groundwater beneath the Elks Lodge property is prohibited as a water supply source for any use: potable, industrial, or irrigation. an irrigation well was drilled on the property outside of the area covered by this agreement.	Is groundwater beneath the Elks Lodge property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Elks Lodge property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Elks Lodge property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Elks Lodge is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. A communications tower was installed on property outside of the area covered by this agreement.	Has excavation into the land surface occurred at the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No N/A 2. Did the Elks Lodge contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No N/A

Note: Ms. Burleson called 10/23/14, she said there were 2 wells, I checked with Walt Duncan 10/27/14, both wells located west of area covered by covenant (see attached) MCB

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Elks Lodge property. No conveyance of the Elks Lodge property shall be consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Elks Lodge provided notice to Altus AFB of intent to convey an interest in Elks Lodge property? ☐ Yes ☒ No If **Yes**, has the Elks Lodge provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Elks Lodge property been consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No N/A
The Elks Lodge must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Elks Lodge property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has the Elks Lodge granted any leases or easements on the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Has the Elks Lodge restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Elks Lodge property? ☐ Yes ☐ No N/A 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*, been passed to all lessees as required by the agreement? ☐ Yes ☐ No N/A
The Elks Lodge must notify and obtain approval from Altus AFB prior to any use of the Elks Lodge property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Elks Lodge used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Elks Lodge notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No N/A 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No N/A

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Elks Lodge property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Elks Lodge allowed Altus AFB to access the Elks Lodge property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

MEMO FOR RECORD

27 October 2014

SUBJECT: Wells on Altus Municipal Golf Course

I contacted Walt Duncan, City of Altus Golf Course Manager, to inquire about the number of wells and their locations this morning. Mr. Duncan said there are 2 wells on their property, both wells are located west of the property which Altus AFB holds the groundwater rights. One well is marked on the email he sent to Mr. Charles Butchee on 30 October 2013. The other well is located to the south and west of the first well, near the area of the old tennis courts. Both wells are located in the SW quadrant of Section 15 (Altus AFB holds the water rights on the SE quadrant).

Mary C. Bitney

MARY C. BITNEY, GS-12
AFCEC 97 CES/CZO

BITNEY, MARY C GS-12 USAF AETC 97 CES/CEIER

From: BUTCHEE, CHARLES R GS-13 USAF AETC 97 CES/CEI
Sent: Wednesday, October 30, 2013 2:39 PM
To: wduncan@altusok.gov
Cc: ccoke@altusok.gov; BITNEY, MARY C GS-12 USAF AETC 97 CES/CEIER
Subject: FW: Proposed location of golf course well
Attachments: Proposed well site for golf course Oct 2013.pdf
Signed By: charles.butchee@us.af.mil

Walt,

The well location identified on the map that you provided is not inside the restricted area and is clear from any contamination or restriction.

Please understand that the groundwater for the entire area has been reclassified by the Oklahoma Water Resources Board as a "Class III non-potable aquifer with Agricultural and municipal/industrial cooling beneficial uses". In other words, the water meets the criteria to be considered "salt water" and is not to be used as a potable water source.

If you need further information, please let me know and we will work to provide.

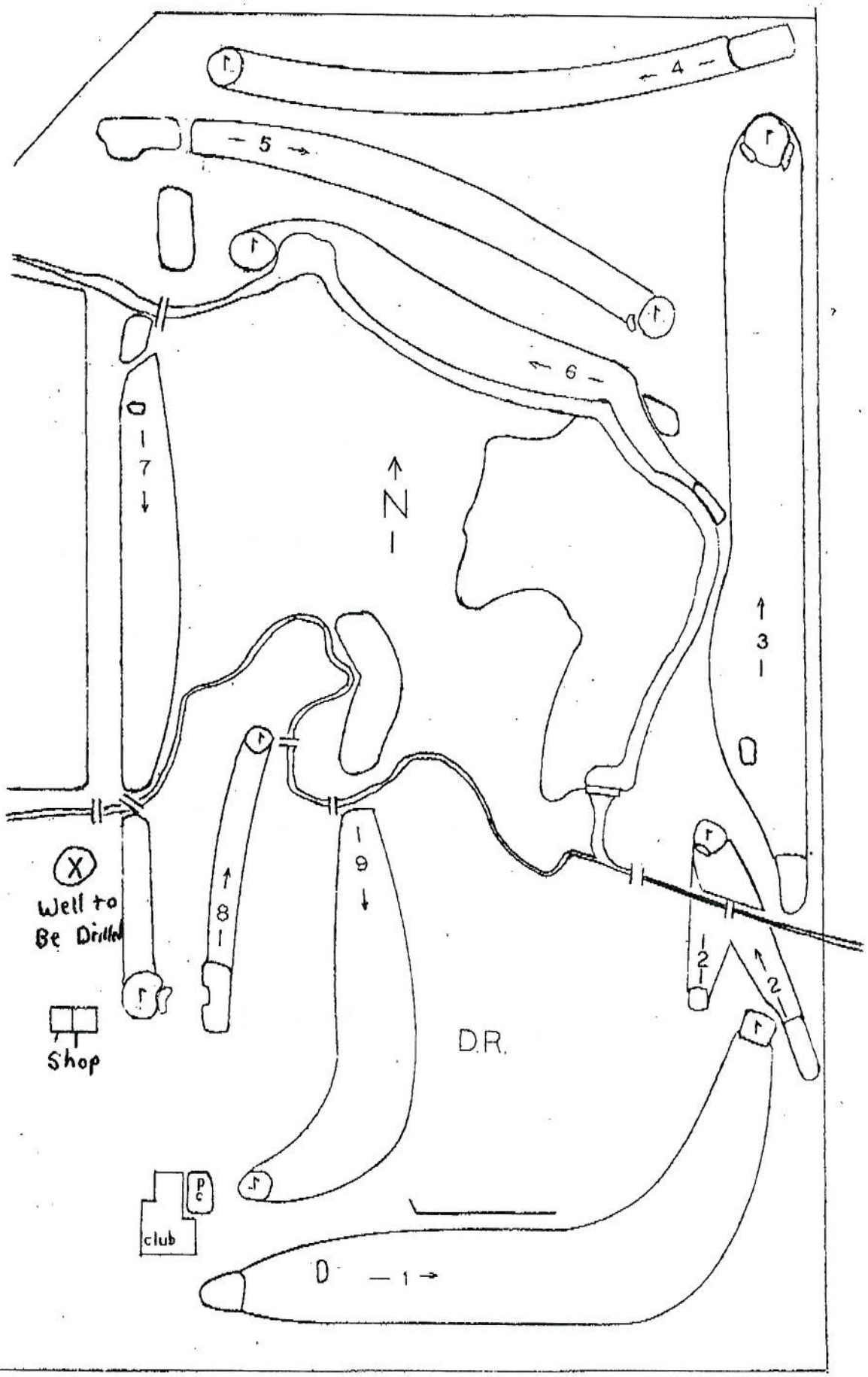
Chuck Butchee, GS-13, DAF
97 CES/CEI
Chief, Installation Management Flight
580-481-5187
DSN 866-5187

-----Original Message-----
From: BITNEY, MARY C GS-12 USAF AETC 97 CES/CEIER
Sent: Wednesday, October 30, 2013 12:13 PM
To: BUTCHEE, CHARLES R GS-13 USAF AETC 97 CES/CEI
Cc: WALLACE, DAVID B GS-13 USAF AETC 97 CES/CEIE
Subject: Proposed location of golf course well

I called John Woods on 7/1//2013 because I received a phone call from Dr. Lawson that the well driller had called Dr. Lawson again. Mr. Woods told me nothing more was being done at this time, his position was being eliminated, and Walt Duncan would be the new point of contact. He did tell me the location they were looking at was just inside the boundary of the SW 1/4 of Section 15. He had previously pointed it out to me when I went to the golf course in May.

//SIGNED//

Air Base



US Highway 62

Altus Air Force Base
Land Use Controls for the Mills Property
Annual Inspection Checklist

Date: 10/21/2014

Time: 9:51 AM

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Mills property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Spoke to Mr. Bob Mills by phone

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Groundwater beneath Mills property is prohibited as a water supply source for any use: potable, industrial, or irrigation. No wells	Is groundwater beneath the Mills property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Mills property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Mills property is prohibited unless the excavation is less than approximately 8 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, Robert David Mills/Mills Living Trust is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance. no plowing any more, use vertical till	Has excavation into the land surface occurred at the Mills property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☐ No N/A 2. Did Robert David Mills/Mills Living Trust contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No N/A

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Mills property. No conveyance of title, easement, lease, or other interest in the Mills property shall be consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has Robert David Mills/Mills Living Trust provided notice to Altus AFB of intent to convey any interest in the Mills property? ☐ Yes ☒ No If **Yes**, has Robert David Mills/Mills Living Trust provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No N/A Has conveyance of any interest in the Mills property been consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No N/A
Robert David Mills/Mills Living Trust must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Mills property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Robert David Mills/Mills Living Trust granted any leases or easements on the Mills property? ☐ Yes ☒ No If **Yes**: 1. Has Robert David Mills/Mills Living Trust restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Mills property? ☐ Yes ☐ No N/A 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? ☐ Yes ☐ No N/A
Robert David Mills/Mills Living Trust must notify and obtain approval from Altus AFB prior to any use of the Mills property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has Robert David Mills/Mills Living Trust used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did Robert David Mills/Mills Living Trust notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No N/A 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No N/A

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust shall allow and does hereby grant a permanent, non-exclusive easement to Altus AFB and authorized representatives of Altus AFB the right to enter the Mills property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]). If Altus AFB obtains a No Further Action ("Closure") letter from the applicable regulatory agency that does not rely on the restrictive covenants, then Altus AFB will, within a reasonable time, prepare and file a supplemental deed instrument to terminate the restrictive covenants.	Has Robert David Mills/Mills Living Trust allowed Altus AFB to access the Mills property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No Has Altus AFB obtained a No Further Action (Closure) letter from the applicable regulatory agency that does not rely on the restrictive covenants? ☐ Yes ☒ No If **Yes**, has Altus AFB prepared and filed a supplemental deed instrument to terminate the restrictive covenants? ☐ Yes ☐ No N/A

Altus Air Force Base
Land Use Controls for the Winters Property
Annual Inspection Checklist

Date: 10/21/2014

Time: 2:20 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Winters property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan).* The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Phone call w/ Mr. Lorin Winters

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
Land use at the Winters property is restricted from new residential land use or human occupancy without proper engineering controls to address potential vapor intrusion into structures.	Has new residential land use or human occupancy occurred at the Winters property without proper engineering controls to address potential vapor intrusion into structures? ☐ Yes ☒ No
Groundwater beneath the Winters property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Winters property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Winters property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Winters property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Winters property? ☒ Yes ☐ No If Yes: → less than 7 ft - about 1 ft deep 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? ☐ Yes ☒ No 2. Did the Winters contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? ☐ Yes ☐ No N/A

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
The Winters must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Winters property. No conveyance of title, easement, lease, or other interest in the Winters property shall be consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Have the Winters provided notice to Altus AFB of intent to convey an interest in the Winters property? ☐ Yes ☒ No If **Yes**, have the Winters provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No N/A Has conveyance of any interest in the Winters property been consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No N/A
The Winters must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Winters property.	Have the Winters granted any leases or easements on the Winters property? ☐ Yes ☒ No If **Yes**: Have the Winters restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Winters property? ☐ Yes ☐ No N/A
The Winters must notify and obtain approval from Altus AFB prior to any use of the Winters property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Have the Winters used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Winters notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No N/A 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No N/A
The Winters shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Winters property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Have the Winters allowed Altus AFB to access the Winters property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Notification Requirements for Land Use Controls
Annual Inspection Checklist

Date: 10/21/2014

Time: 2:49 pm

Name of Inspector: Mary Bitney

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Annual inspections of the on-Base property and four adjacent off-Base properties are required to ensure that: On-base: There are no violations of the on-Base land use controls, and any required engineering mitigation controls for indoor air for administrative buildings located over groundwater plumes are appropriately implemented, if required by the administrative authority. Off-base: There are no violations of the off-Base restrictive (environment) covenant and easement agreements.	Were annual inspections for on-Base property and four adjacent off-Base properties completed last year? ☒ Yes ☐ No If not, was the administrative authority notified? ☐ Yes ☐ No N/A If not, what was the reason for not conducting the annual inspections?
Altus AFB will submit an annual inspection report to the administrative authority that documents the findings of annual inspections of the on-Base property and four adjacent off-Base properties.	Was an annual inspection report for on-Base and off-Base properties submitted to the administrative authority last year? ☒ Yes ☐ No
In addition to the annual inspections, the adequacy and effectiveness of the land use controls, and engineering mitigation controls for indoor air, will be reviewed and documented as part of the initial three-year performance review, and in subsequent periodic performance reviews thereafter.	Was the last required performance review for the on-Base and off-Base properties conducted and documentation submitted to the administrative authority? ☒ Yes ☐ No If **Yes**, on what date was the performance review submitted to the administrative authority?
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any unauthorized major land use change (e.g., from industrial or recreational land use to residential land use) or new receptors who are potentially exposed that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has Altus AFB discovered any unauthorized major land use change or any exposures to new receptors at the on-Base or four adjacent off-Base properties that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any activity that may interfere with the adequacy, or short-term or long-term effectiveness, of the land use controls, or engineering mitigation controls for indoor air. [2]	Has Altus AFB discovered any activity that interferes with the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, at the on-Base or off-Base adjacent properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority for any planned major land use change (e.g., from industrial or recreational land use to residential land use) that would be inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has any major land use change for the on-Base or adjacent off-Base properties been proposed since the last inspection report that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority to terminate or modify any land use control, or any engineering mitigation control for indoor air.	Has Altus AFB requested prior concurrence from the administrative authority to terminate or modify any approved land use control, or engineering mitigation control for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB may disrupt the adequacy, or short-term or long-term effectiveness, of the land use controls or engineering mitigation controls for indoor air. [2]	Has Altus AFB requested prior concurrence from the administrative authority because a planned action may disrupt the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB is intended to alter or negate the need for land use controls, or engineering mitigation controls for indoor air at administrative buildings.	Has Altus AFB requested prior concurrence from the administrative authority because a planned action is intended to alter or negate the need for the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority at least 6 months prior to any transfer or sale (including federal to federal) of any on-Base property where the land use controls, and/or engineering mitigation controls for indoor air at administrative buildings, are required by the administrative authority.	In the next 6 months, is there any planned transfer or sale (including federal to federal) of any on-Base property where the land use controls apply, and/or engineering mitigation controls for indoor air, are required by the administrative authority? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if any interest in the four adjacent off-Base properties has been conveyed by the property owner without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has any interest been conveyed by the off-Base property owners without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if the off-Base property owners have entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements.	Have the off-Base property owners entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

[1] Requests will be submitted in advance of any planned action(s) to allow sufficient time for regulatory concurrence.

[2] Examples of activities that may disrupt the effectiveness of the implemented land use controls include, but are not limited to, excavation at a landfill; removal of a fence; unlocking of a gate; or removal of warning signs.

Altus Air Force Base
Land Use Controls for On-Base Property
Annual Inspection Checklist

Date: 10/21/2014

Time: 2:34 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use controls, and engineering mitigation controls for indoor air, established for on-Base property in Section 4.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Three land use control zones have been established for on-Base property as described in Section 5.1, and as illustrated on Figure 5.1-1, of the *CMI Land Use Control Plan.*	Has any land use or development occurred that violates the land use restrictions of these control zones? ☐ Yes ☒ No
Groundwater use within the boundaries of Altus AFB will be prohibited. Installation of any wells within the boundaries of Altus AFB for the purpose of accessing groundwater for any use (e.g., potable, industrial, commercial, recreational, or agricultural) other than for environmental investigation/monitoring will be prohibited.	Is groundwater within the boundaries of Altus AFB being used for any purpose? ☐ Yes ☒ No Have any wells been completed within the boundaries of Altus AFB for the purpose of extracting groundwater for any purpose other than for environmental investigation/monitoring? ☐ Yes ☒ No
To protect on-Base personnel from potential indoor air exposures, positive-pressure engineering mitigation controls may be necessary at administrative buildings located over contaminated groundwater plumes in the GWMUs at Altus AFB. The requirement for the installation of engineering mitigation controls will be made by the administrative authority based on the analytical data for contaminants in groundwater and other related data. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU. engineering mitigation controls incorporated into building designs.	Have all administrative buildings that exist over contaminated groundwater plumes been evaluated to determine whether engineering mitigation controls for indoor air are required? ☒ Yes ☐ No Have engineering mitigation controls for indoor air been required at any administrative building(s) by the administrative authority? ☐ Yes ☒ No If **Yes**: 1. Have the required engineering mitigation controls for indoor air been implemented? ☐ Yes ☐ No N/A 2. Are the implemented engineering mitigation controls for indoor air functioning properly? ☐ Yes ☐ No N/A

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Engineering mitigation controls for indoor air will also be required as part of the initial design of any administrative or office building above a contaminated groundwater plume, and implemented according to design plans. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Is construction of a future administrative or office building(s) planned above a contaminated groundwater plume? ☐ Yes ☒ No **If Yes**, have engineering mitigation controls for indoor air been incorporated as part of the initial design? ☐ Yes ☐ No N/A
Altus AFB has several policies/procedures in place for the protection of workers via exposure to soil and groundwater contamination during intrusive activities (e.g., excavation/digging) within the boundaries of the Base.	Has any project occurred entailing intrusive activities (e.g., excavation/digging) potentially encountering soil/groundwater contamination within the boundaries of Altus AFB? ☒ Yes ☐ No **If Yes**: 1. Has any on-Base project potentially encountering soil/groundwater contamination been initiated by an in-shop house or contracted outside entity without prior approval of the Base Environmental Restoration Manager? ☐ Yes ☒ No 2. If on-Base projects potentially encountering soil/groundwater contamination have been performed by in-house shops, has Base bioenvironmental determined personnel protection equipment, and other worker safety, requirements for these projects? ☐ Yes ☐ No N/A no base projects excavating deep enough to encounter grdwtr 3. Have any on-Base projects potentially encountering soil/groundwater contamination been contracted to outside entities; thereby, requiring an EMP and HASP? ☒ Yes ☐ No 4. Have all required EMPs and HASPs been reviewed ~~and approved~~ by the Base Environmental Restoration Manager? ☒ Yes ☐ No Reviewed also by Corp of Engineers, under their project management 5. Have all on-Base projects potentially encountering soil/groundwater contamination performed by either in-shop houses or contracted outside entities been appropriately monitored by the Base Environmental Restoration Manager during project execution? ☒ Yes ☐ No

Altus Air Force Base
Notification Requirements for Land Use Controls
Annual Inspection Checklist

Date: 9/28/2015

Time: 10:43 AM

Name of Inspector: Mary Bitney

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Annual inspections of the on-Base property and four adjacent off-Base properties are required to ensure that: On-base: There are no violations of the on-Base land use controls, and any required engineering mitigation controls for indoor air for administrative buildings located over groundwater plumes are appropriately implemented, if required by the administrative authority. Off-base: There are no violations of the off-Base restrictive (environment) covenant and easement agreements.	Were annual inspections for on-Base property and four adjacent off-Base properties completed last year? ☒ Yes ☐ No If not, was the administrative authority notified? ☐ Yes ☐ No N/A If not, what was the reason for not conducting the annual inspections?
Altus AFB will submit an annual inspection report to the administrative authority that documents the findings of annual inspections of the on-Base property and four adjacent off-Base properties.	Was an annual inspection report for on-Base and off-Base properties submitted to the administrative authority last year? ☒ Yes ☐ No
In addition to the annual inspections, the adequacy and effectiveness of the land use controls, and engineering mitigation controls for indoor air, will be reviewed and documented as part of the initial three-year performance review, and in subsequent periodic performance reviews thereafter.	Was the last required performance review for the on-Base and off-Base properties conducted and documentation submitted to the administrative authority? ☒ Yes ☐ No If **Yes**, on what date was the performance review submitted to the administrative authority? 10/22/2014
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any unauthorized major land use change (e.g., from industrial or recreational land use to residential land use) or new receptors who are potentially exposed that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has Altus AFB discovered any unauthorized major land use change or any exposures to new receptors at the on-Base or four adjacent off-Base properties that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any activity that may interfere with the adequacy, or short-term or long-term effectiveness, of the land use controls, or engineering mitigation controls for indoor air. [2]	Has Altus AFB discovered any activity that interferes with the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, at the on-Base or off-Base adjacent properties? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority for any planned major land use change (e.g., from industrial or recreational land use to residential land use) that would be inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has any major land use change for the on-Base or adjacent off-Base properties been proposed since the last inspection report that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority to terminate or modify any land use control, or any engineering mitigation control for indoor air.	Has Altus AFB requested prior concurrence from the administrative authority to terminate or modify any approved land use control, or engineering mitigation control for indoor air, for the on-Base or four adjacent off-Base properties? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB may disrupt the adequacy, or short-term or long-term effectiveness, of the land use controls or engineering mitigation controls for indoor air. [2]	Has Altus AFB requested prior concurrence from the administrative authority because a planned action may disrupt the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB is intended to alter or negate the need for land use controls, or engineering mitigation controls for indoor air at administrative buildings.	Has Altus AFB requested prior concurrence from the administrative authority because a planned action is intended to alter or negate the need for the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority at least 6 months prior to any transfer or sale (including federal to federal) of any on-Base property where the land use controls, and/or engineering mitigation controls for indoor air at administrative buildings, are required by the administrative authority.	In the next 6 months, is there any planned transfer or sale (including federal to federal) of any on-Base property where the land use controls apply, and/or engineering mitigation controls for indoor air, are required by the administrative authority? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if any interest in the four adjacent off-Base properties has been conveyed by the property owner without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has any interest been conveyed by the off-Base property owners without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if the off-Base property owners have entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements.	Have the off-Base property owners entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements? [ ] Yes [X] No If **Yes**, on what date were the administrative authority notified?

[1] Requests will be submitted in advance of any planned action(s) to allow sufficient time for regulatory concurrence.

[2] Examples of activities that may disrupt the effectiveness of the implemented land use controls include, but are not limited to, excavation at a landfill; removal of a fence; unlocking of a gate; or removal of warning signs.

Altus Air Force Base
Land Use Controls for On-Base Property
Annual Inspection Checklist

Date: 9/28/2015

Time: 10:30 am

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use controls, and engineering mitigation controls for indoor air, established for on-Base property in Section 4.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Three land use control zones have been established for on-Base property as described in Section 5.1, and as illustrated on Figure 5.1-1, of the *CMI Land Use Control Plan.*	Has any land use or development occurred that violates the land use restrictions of these control zones? ☐ Yes ☒ No
Groundwater use within the boundaries of Altus AFB will be prohibited. Installation of any wells within the boundaries of Altus AFB for the purpose of accessing groundwater for any use (e.g., potable, industrial, commercial, recreational, or agricultural) other than for environmental investigation/monitoring will be prohibited.	Is groundwater within the boundaries of Altus AFB being used for any purpose? ☐ Yes ☒ No Have any wells been completed within the boundaries of Altus AFB for the purpose of extracting groundwater for any purpose other than for environmental investigation/monitoring? ☐ Yes ☒ No
To protect on-Base personnel from potential indoor air exposures, positive-pressure engineering mitigation controls may be necessary at administrative buildings located over contaminated groundwater plumes in the GWMUs at Altus AFB. The requirement for the installation of engineering mitigation controls will be made by the administrative authority based on the analytical data for contaminants in groundwater and other related data. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Have all administrative buildings that exist over contaminated groundwater plumes been evaluated to determine whether engineering mitigation controls for indoor air are required? ☒ Yes ☐ No Have engineering mitigation controls for indoor air been required at any administrative building(s) by the administrative authority? ☐ Yes ☒ No If **Yes:** 1. Have the required engineering mitigation controls for indoor air been implemented? ☐ Yes ☐ No 2. Are the implemented engineering mitigation controls for indoor air functioning properly? ☐ Yes ☐ No

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Engineering mitigation controls for indoor air will also be required as part of the initial design of any administrative or office building above a contaminated groundwater plume, and implemented according to design plans. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Is construction of a future administrative or office building(s) planned above a contaminated groundwater plume? [ ] Yes [X] No If **Yes**, have engineering mitigation controls for indoor air been incorporated as part of the initial design? [ ] Yes [ ] No
Altus AFB has several policies/procedures in place for the protection of workers via exposure to soil and groundwater contamination during intrusive activities (e.g., excavation/digging) within the boundaries of the Base.	Has any project occurred entailing intrusive activities (e.g., excavation/digging) potentially encountering soil/groundwater contamination within the boundaries of Altus AFB? [X] Yes [ ] No If **Yes**: 1. Has any on-Base project potentially encountering soil/groundwater contamination been initiated by an in-shop house or contracted outside entity without prior approval of the Base Environmental Restoration Manager? [ ] Yes [X] No 2. If on-Base projects potentially encountering soil/groundwater contamination have been performed by in-house shops, has Base bioenvironmental determined personnel protection equipment, and other worker safety, requirements for these projects? [X] Yes [ ] No 3. Have any on-Base projects potentially encountering soil/groundwater contamination been contracted to outside entities; thereby, requiring an EMP and HASP? [ ] Yes [X] No 4. Have all required EMPs and HASPs been reviewed and approved by the Base Environmental Restoration Manager? [X] Yes [ ] No 5. Have all on-Base projects potentially encountering soil/groundwater contamination performed by either in-shop houses or contracted outside entities been appropriately monitored by the Base Environmental Restoration Manager during project execution? [X] Yes [ ] No

Altus Air Force Base
Land Use Controls for the Altus Municipal Authority Property
Annual Inspection Checklist

Date: 9/28/2015

Time: 9:07 am

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Altus Municipal Authority property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan*, Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Altus Municipal Authority property.	Has any new residential land use occurred at the Altus Municipal Authority property? [ ] Yes [X] No
Groundwater beneath the Altus Municipal Authority property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Altus Municipal Authority property being used for any purpose? [ ] Yes [X] No Have any wells been completed at the Altus Municipal Authority property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? [ ] Yes [X] No
Excavation of the subsurface at the Altus Municipal Authority property is prohibited unless the excavation: (a) is less than approximately 8 feet bgs or the depth encountering the shallow groundwater, (b) consists of maintenance or replacement of existing underground utilities, buildings or roadways in the same or new locations, or (c) is previously approved by the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB.	Has excavation into the land surface occurred at the Altus Municipal Authority property? [ ] Yes [X] No If Yes: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater? [ ] Yes [ ] No 2. Did the excavation consist of maintenance or replacement of existing underground utilities, buildings, or roadways in the same or new locations? [ ] Yes [ ] No 3. Was prior approval provided by the Base Environmental Restoration Manager (97 CES/CEAN)? [ ] Yes [ ] No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Altus Municipal Authority property. No conveyance of title in the Altus Municipal Authority property shall be consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Altus Municipal Authority provided notice to Altus AFB of intent to convey an interest in the Altus Municipal Authority property? [ ] Yes [X] No **If Yes**, has the Altus Municipal Authority provided 30 days advance written notice to Altus AFB? [ ] Yes [ ] No Has conveyance of any interest in the Altus Municipal Authority property been consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? [ ] Yes [ ] No
The Altus Municipal Authority must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Altus Municipal Authority property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Altus Municipal Authority granted any leases or easements on the Altus Municipal Authority property? [ ] Yes [X] No **If Yes:** 1. Has the Altus Municipal Authority restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of the Altus Municipal Authority property? [ ] Yes [ ] No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*, been passed to all lessees as required by the agreement? [ ] Yes [ ] No
The Altus Municipal Authority must notify and obtain approval from Altus AFB prior to any use of the Altus Municipal Authority property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Altus Municipal Authority used the property for any purpose that is inconsistent with the terms of the covenant? [ ] Yes [X] No **If Yes:** 1. Did the Altus Municipal Authority notify and obtain prior approval from Altus AFB? [ ] Yes [ ] No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? [ ] Yes [ ] No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Altus Municipal Authority property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Altus Municipal Authority allowed Altus AFB to access the Altus Municipal Authority property for the purposes identified in the permanent non-exclusive easement? [X] Yes [ ] No

Altus Air Force Base City of Altus
Land Use Controls for the ~~Elks Lodge~~ Property
Annual Inspection Checklist

Date: 9/28/2015

Time: 9:07 am

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Elks Lodge property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Elks Lodge property.	Has any new residential land use occurred at the Elks Lodge property? [ ] Yes [X] No
Groundwater beneath the Elks Lodge property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Elks Lodge property being used for any purpose? [ ] Yes [X] No Have any wells been completed at the Elks Lodge property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? [ ] Yes [X] No
Excavation of the subsurface of the Elks Lodge property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Elks Lodge is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Elks Lodge property? [ ] Yes [X] No If **Yes**: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? [ ] Yes [ ] No 2. Did the Elks Lodge contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? [ ] Yes [ ] No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Elks Lodge property. No conveyance of the Elks Lodge property shall be consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Elks Lodge provided notice to Altus AFB of intent to convey an interest in Elks Lodge property? [ ] Yes [X] No If Yes, has the Elks Lodge provided 30 days advance written notice to Altus AFB? [ ] Yes [ ] No Has conveyance of any interest in the Elks Lodge property been consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? [ ] Yes [ ] No
The Elks Lodge must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Elks Lodge property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has the Elks Lodge granted any leases or easements on the Elks Lodge property? [ ] Yes [X] No If Yes: 1. Has the Elks Lodge restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Elks Lodge property? [ ] Yes [ ] No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*, been passed to all lessees as required by the agreement? [ ] Yes [ ] No
The Elks Lodge must notify and obtain approval from Altus AFB prior to any use of the Elks Lodge property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Elks Lodge used the property for any purpose that is inconsistent with the terms of the covenant? [ ] Yes [X] No If Yes: 1. Did the Elks Lodge notify and obtain prior approval from Altus AFB? [ ] Yes [ ] No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? [ ] Yes [ ] No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Elks Lodge property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Elks Lodge allowed Altus AFB to access the Elks Lodge property for the purposes identified in the permanent non-exclusive easement? X Yes _ No

Altus Air Force Base
Land Use Controls for the Mills Property
Annual Inspection Checklist

Date: 9/25/2015

Time: 3:48 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Mills property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Groundwater beneath Mills property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Mills property being used for any purpose? [ ] Yes [X] No Have any wells been completed at the Mills property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? [ ] Yes [X] No
Excavation of the subsurface of the Mills property is prohibited unless the excavation is less than approximately 8 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, Robert David Mills/Mills Living Trust is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Mills property? [ ] Yes [X] No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater table? [ ] Yes [ ] No 2. Did Robert David Mills/Mills Living Trust contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? [ ] Yes [ ] No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Mills property. No conveyance of title, easement, lease, or other interest in the Mills property shall be consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has Robert David Mills/Mills Living Trust provided notice to Altus AFB of intent to convey any interest in the Mills property? ☐ Yes ☒ No If **Yes**, has Robert David Mills/Mills Living Trust provided 30 days advance written notice to Altus AFB? ☐ Yes ☐ No Has conveyance of any interest in the Mills property been consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Mills property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Robert David Mills/Mills Living Trust granted any leases or easements on the Mills property? ☐ Yes ☒ No **If Yes:** 1. Has Robert David Mills/Mills Living Trust restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Mills property? ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*, been passed to all lessees as required by the agreement? ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must notify and obtain approval from Altus AFB prior to any use of the Mills property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has Robert David Mills/Mills Living Trust used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No **If Yes:** 1. Did Robert David Mills/Mills Living Trust notify and obtain prior approval from Altus AFB? ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? ☐ Yes ☐ No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust shall allow and does hereby grant a permanent, non-exclusive easement to Altus AFB and authorized representatives of Altus AFB the right to enter the Mills property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]). If Altus AFB obtains a No Further Action ("Closure") letter from the applicable regulatory agency that does not rely on the restrictive covenants, then Altus AFB will, within a reasonable time, prepare and file a supplemental deed instrument to terminate the restrictive covenants.	Has Robert David Mills/Mills Living Trust allowed Altus AFB to access the Mills property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No Has Altus AFB obtained a No Further Action (Closure) letter from the applicable regulatory agency that does not rely on the restrictive covenants? ☐ Yes ☒ No If **Yes**, has Altus AFB prepared and filed a supplemental deed instrument to terminate the restrictive covenants? ☐ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Winters Property
Annual Inspection Checklist

Date: 9/25/2015

Time: 3:10 pm

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Winters property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan*, Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
Land use at the Winters property is restricted from new residential land use or human occupancy without proper engineering controls to address potential vapor intrusion into structures.	Has new residential land use or human occupancy occurred at the Winters property without proper engineering controls to address potential vapor intrusion into structures? Yes X No
Groundwater beneath the Winters property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Winters property being used for any purpose? Yes X No Have any wells been completed at the Winters property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? Yes X No
Excavation of the subsurface of the Winters property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance	Has excavation into the land surface occurred at the Winters property? Yes X No If Yes: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? Yes X No 2. Did the Winters contact the ERP Manager (Base Environmental Restoration Manager, 97 CES CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? Yes No N/A

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
The Winters must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Winters property. No conveyance of title, easement, lease, or other interest in the Winters property shall be consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Have the Winters provided notice to Altus AFB of intent to convey an interest in the Winters property? [ ] Yes [X] No If **Yes**, have the Winters provided 30 days advance written notice to Altus AFB? [ ] Yes [ ] No Has conveyance of any interest in the Winters property been consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? [ ] Yes [ ] No
The Winters must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Winters property.	Have the Winters granted any leases or easements on the Winters property? [ ] Yes [X] No **If Yes** Have the Winters restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Winters property? [ ] Yes [ ] No
The Winters must notify and obtain approval from Altus AFB prior to any use of the Winters property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Have the Winters used the property for any purpose that is inconsistent with the terms of the covenant? [ ] Yes [X] No **If Yes**: 1. Did the Winters notify and obtain prior approval from Altus AFB? [ ] Yes [ ] No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? [ ] Yes [ ] No
The Winters shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Winters property at reasonable times for the purpose of evaluating the ERP; to take samples; to inspect ERP protective measures implemented at the property; to determine compliance with the restrictive covenant and easement agreement; and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEANJ].	Have the Winters allowed Altus AFB to access the Winters property for the purposes identified in the permanent non-exclusive easement? [X] Yes [ ] No

Altus Air Force Base
Land Use Controls for the Mills Property
Annual Inspection Checklist

Date: 9/28/2016

Time: 8:12 Am

Name of Inspector: Mary Britney called Bob Mills

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Mills property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Groundwater beneath Mills property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Mills property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Mills property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Mills property is prohibited unless the excavation is less than approximately 8 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, Robert David Mills/Mills Living Trust is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Mills property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater table? N/A ☐ Yes ☐ No 2. Did Robert David Mills/Mills Living Trust contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? N/A ☐ Yes ☐ No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Mills property. No conveyance of title, easement, lease, or other interest in the Mills property shall be consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has Robert David Mills/Mills Living Trust provided notice to Altus AFB of intent to convey any interest in the Mills property? ☐ Yes ☒ No If **Yes**, has Robert David Mills/Mills Living Trust provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Mills property been consummated by Robert David Mills/Mills Living Trust without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Mills property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Robert David Mills/Mills Living Trust granted any leases or easements on the Mills property? ☐ Yes ☒ No If **Yes**: 1. Has Robert David Mills/Mills Living Trust restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Mills property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
Robert David Mills/Mills Living Trust must notify and obtain approval from Altus AFB prior to any use of the Mills property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has Robert David Mills/Mills Living Trust used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did Robert David Mills/Mills Living Trust notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Mills Property	
Land Use Restrictions	**Annual Inspection Question**
Robert David Mills/Mills Living Trust shall allow and does hereby grant a permanent, non-exclusive easement to Altus AFB and authorized representatives of Altus AFB the right to enter the Mills property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]). If Altus AFB obtains a No Further Action ("Closure") letter from the applicable regulatory agency that does not rely on the restrictive covenants, then Altus AFB will, within a reasonable time, prepare and file a supplemental deed instrument to terminate the restrictive covenants.	Has Robert David Mills/Mills Living Trust allowed Altus AFB to access the Mills property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No Has Altus AFB obtained a No Further Action (Closure) letter from the applicable regulatory agency that does not rely on the restrictive covenants? ☐ Yes ☒ No If **Yes**, has Altus AFB prepared and filed a supplemental deed instrument to terminate the restrictive covenants? ☐ Yes ☐ No N/A

Altus Air Force Base
Notification Requirements for Land Use Controls
Annual Inspection Checklist

Date: 9/28/2016

Time: 8:26 Am

Name of Inspector: Mary Bitney

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Annual inspections of the on-Base property and four adjacent off-Base properties are required to ensure that: On-base: There are no violations of the on-Base land use controls, and any required engineering mitigation controls for indoor air for administrative buildings located over groundwater plumes are appropriately implemented, if required by the administrative authority. Off-base: There are no violations of the off-Base restrictive (environment) covenant and easement agreements.	Were annual inspections for on-Base property and four adjacent off-Base properties completed last year? ☒ Yes ☐ No If not, was the administrative authority notified? N/A ☐ Yes ☐ No If not, what was the reason for not conducting the annual inspections? N/A
Altus AFB will submit an annual inspection report to the administrative authority that documents the findings of annual inspections of the on-Base property and four adjacent off-Base properties.	Was an annual inspection report for on-Base and off-Base properties submitted to the administrative authority last year? ☒ Yes ☐ No
In addition to the annual inspections, the adequacy and effectiveness of the land use controls, and engineering mitigation controls for indoor air, will be reviewed and documented as part of the initial three-year performance review, and in subsequent periodic performance reviews thereafter.	Was the last required performance review for the on-Base and off-Base properties conducted and documentation submitted to the administrative authority? ☒ Yes ☐ No If **Yes**, on what date was the performance review submitted to the administrative authority? 10/22/2014
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any unauthorized major land use change (e.g., from industrial or recreational land use to residential land use) or new receptors who are potentially exposed that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has Altus AFB discovered any unauthorized major land use change or any exposures to new receptors at the on-Base or four adjacent off-Base properties that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide to the administrative authority verbal and written notices upon discovery of any activity that may interfere with the adequacy, or short-term or long-term effectiveness, of the land use controls, or engineering mitigation controls for indoor air. [2]	Has Altus AFB discovered any activity that interferes with the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, at the on-Base or off-Base adjacent properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority for any planned major land use change (e.g., from industrial or recreational land use to residential land use) that would be inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air.	Has any major land use change for the on-Base or adjacent off-Base properties been proposed since the last inspection report that are inconsistent with the exposure assumptions that serve as the basis for the land use controls, or may require additional engineering mitigation controls for indoor air? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority to terminate or modify any land use control, or any engineering mitigation control for indoor air.	Has Altus AFB requested prior concurrence from the administrative authority to terminate or modify any approved land use control, or engineering mitigation control for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB may disrupt the adequacy, or short-term or long-term effectiveness, of the land use controls or engineering mitigation controls for indoor air. [2]	Has Altus AFB requested prior concurrence from the administrative authority because a planned action may disrupt the adequacy or effectiveness (short-term or long-term) of the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

Notification Requirements for On-Base Property and the Four Adjacent Off-Base Properties (Elks Lodge Property, Winters Property, Altus Municipal Authority Property, and Mills Property)	
Notification Requirements	**Annual Inspection Question**
Altus AFB will provide a written notice[1] to, and seek concurrence from, the administrative authority if a planned action by Altus AFB is intended to alter or negate the need for land use controls, or engineering mitigation controls for indoor air at administrative buildings.	Has Altus AFB requested prior concurrence from the administrative authority because a planned action is intended to alter or negate the need for the land use controls, or engineering mitigation controls for indoor air, for the on-Base or four adjacent off-Base properties? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority at least 6 months prior to any transfer or sale (including federal to federal) of any on-Base property where the land use controls, and/or engineering mitigation controls for indoor air at administrative buildings, are required by the administrative authority.	In the next 6 months, is there any planned transfer or sale (including federal to federal) of any on-Base property where the land use controls apply, and/or engineering mitigation controls for indoor air, are required by the administrative authority? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if any interest in the four adjacent off-Base properties has been conveyed by the property owner without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Has any interest been conveyed by the off-Base property owners without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?
Altus AFB will provide written notice to the administrative authority if the off-Base property owners have entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements.	Have the off-Base property owners entered into lease agreements that fail to restrict uses/activities to those consistent with the restrictive covenant and easement agreements? ☐ Yes ☒ No If **Yes**, on what date were the administrative authority notified?

[1] Requests will be submitted in advance of any planned action(s) to allow sufficient time for regulatory concurrence.

[2] Examples of activities that may disrupt the effectiveness of the implemented land use controls include, but are not limited to, excavation at a landfill; removal of a fence; unlocking of a gate; or removal of warning signs.

Altus Air Force Base
Land Use Controls for On-Base Property
Annual Inspection Checklist

Date: 9/28/2016

Time: 8:30 AM

Name of Inspector: Mary Bitney

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use controls, and engineering mitigation controls for indoor air, established for on-Base property in Section 4.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Three land use control zones have been established for on-Base property as described in Section 5.1, and as illustrated on Figure 5.1-1, of the *CMI Land Use Control Plan.*	Has any land use or development occurred that violates the land use restrictions of these control zones? ☐ Yes ☒ No
Groundwater use within the boundaries of Altus AFB will be prohibited. Installation of any wells within the boundaries of Altus AFB for the purpose of accessing groundwater for any use (e.g., potable, industrial, commercial, recreational, or agricultural) other than for environmental investigation/monitoring will be prohibited.	Is groundwater within the boundaries of Altus AFB being used for any purpose? ☐ Yes ☒ No Have any wells been completed within the boundaries of Altus AFB for the purpose of extracting groundwater for any purpose other than for environmental investigation/monitoring? ☐ Yes ☒ No
To protect on-Base personnel from potential indoor air exposures, positive-pressure engineering mitigation controls may be necessary at administrative buildings located over contaminated groundwater plumes in the GWMUs at Altus AFB. The requirement for the installation of engineering mitigation controls will be made by the administrative authority based on the analytical data for contaminants in groundwater and other related data. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Have all administrative buildings that exist over contaminated groundwater plumes been evaluated to determine whether engineering mitigation controls for indoor air are required? ☒ Yes ☐ No Have engineering mitigation controls for indoor air been required at any administrative building(s) by the administrative authority? ☐ Yes ☒ No If **Yes**: 1. Have the required engineering mitigation controls for indoor air been implemented? N/A ☐ Yes ☐ No 2. Are the implemented engineering mitigation controls for indoor air functioning properly? N/A ☐ Yes ☐ No

On-Base Property	
Land Use Restrictions/Engineering Mitigation Controls for Indoor Air	**Annual Inspection Question**
Engineering mitigation controls for indoor air will also be required as part of the initial design of any administrative or office building above a contaminated groundwater plume, and implemented according to design plans. Figure 4.1-1 of the *CMI Land Use Control Plan* illustrates the four GWMUs at Altus AFB and the groundwater plumes within each GWMU.	Is construction of a future administrative or office building(s) planned above a contaminated groundwater plume? ☐ Yes ☒ No If **Yes**, have engineering mitigation controls for indoor air been incorporated as part of the initial design? N/A ☐ Yes ☐ No
Altus AFB has several policies/procedures in place for the protection of workers via exposure to soil and groundwater contamination during intrusive activities (e.g., excavation/digging) within the boundaries of the Base.	Has any project occurred entailing intrusive activities (e.g., excavation/digging) potentially encountering soil/groundwater contamination within the boundaries of Altus AFB? ☒ Yes ☐ No If **Yes**: 1. Has any on-Base project potentially encountering soil/groundwater contamination been initiated by an in-shop house or contracted outside entity without prior approval of the Base Environmental Restoration Manager? ☐ Yes ☒ No 2. If on-Base projects potentially encountering soil/groundwater contamination have been performed by in-house shops, has Base bioenvironmental determined personnel protection equipment, and other worker safety, requirements for these projects? ☒ Yes ☐ No 3. Have any on-Base projects potentially encountering soil/groundwater contamination been contracted to outside entities; thereby, requiring an EMP and HASP? ☐ Yes ☒ No 4. Have all required EMPs and HASPs been reviewed and approved by the Base Environmental Restoration Manager? N/A ☒ Yes ☐ No 5. Have all on-Base projects potentially encountering soil/groundwater contamination performed by either in-shop houses or contracted outside entities been appropriately monitored by the Base Environmental Restoration Manager during project execution? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Winters Property
Annual Inspection Checklist

Date: Sept. 23, 2016

Time: 11 AM

Name of Inspector: Mary Bitney called Lorin Winters

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Winters property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan).* The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
Land use at the Winters property is restricted from new residential land use or human occupancy without proper engineering controls to address potential vapor intrusion into structures.	Has new residential land use or human occupancy occurred at the Winters property without proper engineering controls to address potential vapor intrusion into structures? ☐ Yes ☒ No
Groundwater beneath the Winters property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Winters property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Winters property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Winters property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Grantor is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Winters property? ☐ Yes ☒ No **If Yes:** 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? N/A ☐ Yes ☐ No 2. Did the Winters contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? N/A ☐ Yes ☐ No

Winters Property	
Land Use Restrictions	**Annual Inspection Question**
The Winters must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Winters property. No conveyance of title, easement, lease, or other interest in the Winters property shall be consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP.	Have the Winters provided notice to Altus AFB of intent to convey an interest in the Winters property? ☐ Yes ☒ No If **Yes**, have the Winters provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☒ No Has conveyance of any interest in the Winters property been consummated by the Winters without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
The Winters must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Winters property.	Have the Winters granted any leases or easements on the Winters property? ☐ Yes ☒ No If **Yes**: Have the Winters restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Winters property? N/A ☐ Yes ☐ No
The Winters must notify and obtain approval from Altus AFB prior to any use of the Winters property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Have the Winters used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Winters notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No
The Winters shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Winters property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Have the Winters allowed Altus AFB to access the Winters property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Altus Municipal Authority Property
Annual Inspection Checklist

Date: 9/23/2016

Time: 11:38 Am

Name of Inspector: Mary Bitney called Johnny Barron, PE - City of Altus Public Works Dir.

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Altus Municipal Authority property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan.* If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Altus Municipal Authority property.	Has any new residential land use occurred at the Altus Municipal Authority property? ☐ Yes ☒ No
Groundwater beneath the Altus Municipal Authority property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Altus Municipal Authority property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Altus Municipal Authority property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface at the Altus Municipal Authority property is prohibited unless the excavation: (a) is less than approximately 8 feet bgs or the depth encountering the shallow groundwater, (b) consists of maintenance or replacement of existing underground utilities, buildings or roadways in the same or new locations, or (c) is previously approved by the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB.	Has excavation into the land surface occurred at the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 8 feet bgs or the depth encountering the shallow groundwater? N/A ☐ Yes ☐ No 2. Did the excavation consist of maintenance or replacement of existing underground utilities, buildings, or roadways in the same or new locations? N/A ☐ Yes ☐ No 3. Was prior approval provided by the Base Environmental Restoration Manager (97 CES/CEAN)? N/A ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Altus Municipal Authority property. No conveyance of title in the Altus Municipal Authority property shall be consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Altus Municipal Authority provided notice to Altus AFB of intent to convey an interest in the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**, has the Altus Municipal Authority provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Altus Municipal Authority property been consummated by the Altus Municipal Authority without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
The Altus Municipal Authority must restrict leases and easements to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Altus Municipal Authority property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan*.	Has Altus Municipal Authority granted any leases or easements on the Altus Municipal Authority property? ☐ Yes ☒ No If **Yes**: 1. Has the Altus Municipal Authority restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of the Altus Municipal Authority property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
The Altus Municipal Authority must notify and obtain approval from Altus AFB prior to any use of the Altus Municipal Authority property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Altus Municipal Authority used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Altus Municipal Authority notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Altus Municipal Authority Property	
Land Use Restrictions	**Annual Inspection Question**
The Altus Municipal Authority shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Altus Municipal Authority property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Altus Municipal Authority allowed Altus AFB to access the Altus Municipal Authority property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Altus Air Force Base
Land Use Controls for the Elks Lodge Property
Annual Inspection Checklist

Date: 9/23/2016

Time: 11:36 Am

Name of Inspector: Mary Bitney called Johnny Barron, P.E., City of Altus Public Works Dir.

Purpose of Annual Inspection Checklist: This annual inspection checklist is designed to assist Altus AFB personnel in determining whether there are any violations to the land use restrictions established for the Elks Lodge property in the restrictive (environmental) covenant and easement agreement (Attachment E.2 of the *CMI Land Use Control Plan*). The restrictions are also identified and summarized in Section 5.0 of the *CMI Land Use Control Plan,* Appendix E of the *CMI Work Plan*. If the answer to any of the checklist questions deviates from the prescribed controls, please describe the deviations on a separate comment sheet.

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
New residential land use is prohibited at the Elks Lodge property.	Has any new residential land use occurred at the Elks Lodge property? ☐ Yes ☒ No
Groundwater beneath the Elks Lodge property is prohibited as a water supply source for any use: potable, industrial, or irrigation.	Is groundwater beneath the Elks Lodge property being used for any purpose? ☐ Yes ☒ No Have any wells been completed at the Elks Lodge property for the purpose of extracting groundwater for any use: potable, industrial, or irrigation? ☐ Yes ☒ No
Excavation of the subsurface of the Elks Lodge property is prohibited unless the excavation is less than approximately 7 feet bgs or to a depth encountering the shallow groundwater table. In the event that new development, including new utilities, maintenance of existing utilities, or extensive excavation work is planned that would encounter the shallow groundwater table, the Elks Lodge is strongly encouraged to contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance.	Has excavation into the land surface occurred at the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Did the excavation occur to less than approximately 7 feet bgs or the depth encountering the shallow groundwater table? N/A ☐ Yes ☐ No 2. Did the Elks Lodge contact the ERP Manager (Base Environmental Restoration Manager, 97 CES/CEAN) at Altus AFB for human health safety advice and assistance if a planned excavation project was anticipated to encounter the shallow groundwater table? N/A ☐ Yes ☐ No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge must give 30 days advance written notice to Altus AFB of intent to convey any interest in the Elks Lodge property. No conveyance of the Elks Lodge property shall be consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems.	Has the Elks Lodge provided notice to Altus AFB of intent to convey an interest in Elks Lodge property? ☐ Yes ☒ No If **Yes**, has the Elks Lodge provided 30 days advance written notice to Altus AFB? N/A ☐ Yes ☐ No Has conveyance of any interest in the Elks Lodge property been consummated by the Elks Lodge without adequate and complete provision for continued monitoring, operation, and maintenance of the ERP systems? N/A ☐ Yes ☐ No
The Elks Lodge must restrict leases to uses and activities consistent with the covenant and notify all lessees of the restrictions on the use of the Elks Lodge property. Specific language that should be passed to all lessees is provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan.*	Has the Elks Lodge granted any leases or easements on the Elks Lodge property? ☐ Yes ☒ No If **Yes**: 1. Has the Elks Lodge restricted all leases and easements to uses and activities consistent with the covenant and notified all lessees of the restrictions on the use of Elks Lodge property? N/A ☐ Yes ☐ No 2. Has the specific language provided in Exhibit B of the restrictive covenant and easement agreement, Attachment E.2 of the *CMI Land Use Control Plan,* been passed to all lessees as required by the agreement? N/A ☐ Yes ☐ No
The Elks Lodge must notify and obtain approval from Altus AFB prior to any use of the Elks Lodge property that is inconsistent with the terms of the covenant. Altus AFB may approve any inconsistent use only after public notice and comment.	Has the Elks Lodge used the property for any purpose that is inconsistent with the terms of the covenant? ☐ Yes ☒ No If **Yes**: 1. Did the Elks Lodge notify and obtain prior approval from Altus AFB? N/A ☐ Yes ☐ No 2. Did Altus AFB provide public notice and consider public comments prior to approval of the land use that is inconsistent with the covenant? N/A ☐ Yes ☐ No

Elks Lodge Property	
Land Use Restrictions	**Annual Inspection Question**
The Elks Lodge shall allow and does hereby grant a permanent non-exclusive easement (the easement shall terminate upon the release of the covenants granted) to Altus AFB and authorized representatives of Altus AFB the right to enter the Elks Lodge property at reasonable times for the purpose of evaluating the ERP; to take samples, to inspect ERP protective measures implemented at the property, to determine compliance with the restrictive covenant and easement agreement, and for the installation of groundwater monitoring wells (if and as deemed necessary by the ERP Manager [Base Environmental Restoration Manager, 97 CES/CEAN]).	Has the Elks Lodge allowed Altus AFB to access the Elks Lodge property for the purposes identified in the permanent non-exclusive easement? ☒ Yes ☐ No

Appendix B. Site Visit Photographs

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Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 1

Date: 9/29/2016

Comments: GWMU 1 SS016: View of trenches for air sparge system lines in asphalt surface. Settling is evident in the trenches and well aprons.

Photo Number: 2

Date: 9/29/2016

Comments: GWMU 1 SS016: View of pavement damage and settling around air sparge system well box.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 3

Date: 9/29/2016

Comments: GWMU 1 SS016: View of PVC pipe manifold for air sparge system.

Photo Number: 4

Date: 9/29/2016

Comments: GWMU 1 SS016: View of PVC pipe manifold and skid-mounted air sparge system.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client: U.S. Air Force Civil Engineer Center **Site Name:** Altus Air Force Base

Project Number: 042863 **Site Location:** Altus, Oklahoma

Photo Number: 5

Date: 9/29/2016

Comments: GWMU 1 SS016: View of trenches and well aprons for air sparge system. Settling in the trenches and damage to the concrete well aprons is evident.

Photo Number: 6

Date: 9/29/2016

Comments: GWMU 1 SS016: View of concrete damage around air sparge system well.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 7

Date: 9/29/2016

Comments: GWMU 1 SS017: View of valve box for bioreactor well system piping.

Photo Number: 8

Date: 9/29/2016

Comments: GWMU 1 SS017: View of site surface above the bioreactor.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 9

Date: 9/29/2016

Comments: GWMU 1 SS017: View of valve box for bioreactor well system piping.

Photo Number: 10

Date: 9/29/2016

Comments: GWMU 1 SS017: View of typical Site GW monitoring wells and ID signs.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 11

Date: 9/29/2016

Comments: GWMU 1 SS017: View of Site GW monitoring well without concrete apron.

Photo Number: 12

Date: 9/29/2016

Comments: GWMU 1 SS017: View of bioreactor electrical panels and valve boxes.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 13

Date: 9/29/2016

Comments: GWMU 1 SS017: View of bioreactor well system valve box.

Photo Number: 14

Date: 9/29/2016

Comments: GWMU 1 SS017: View of bioreactor well system flow meter.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 15

Date: 9/29/2016

Comments: GWMU 1 SS017: View of site grass surface looking northeast.

Photo Number: 16

Date: 9/29/2016

Comments: GWMU 1 SS017: View of site electrical power supply (bioreactor system).

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 17

Date: 9/29/2016

Comments: GWMU 1 SS017: View of typical monitoring well cover with brass ID tag.

Photo Number: 18

Date: 9/29/2016

Comments: GWMU 1 SS017: View of typical monitoring well cover with brass ID tag.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 19

Date: 9/29/2016

Comments: GWMU 1 SS017: View of typical monitoring well cover without brass ID tag.

Photo Number: 20

Date: 9/29/2016

Comments: GWMU 1 SS017: View of monitoring well and site surface looking west.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 21

Date: 9/29/2016

Comments: GWMU 1 SS018: View of site asphalt surface and GW wells used for injection event.

Photo Number: 22

Date: 9/29/2016

Comments: GWMU 1 SS018: View of site asphalt surface and GW wells used for injection event.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 23

Date: 9/29/2016

Comments: GWMU 1 SS022: View of typical site monitoring wells.

Photo Number: 24

Date: 9/29/2016

Comments: GWMU 1 SS022: View of site surface and monitoring well locations looking east.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 25

Date: 9/29/2016

Comments: GWMU 1 SS022: View of site wells outside of the facility.

Photo Number: 26

Date: 9/29/2016

Comments: GWMU 1 ST012: Looking north towards the UST excavation location at SWMU 26 along the storm water drainage ditch. The fence slightly dips at the excavation / backfill area.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 27

Date: 9/29/2016

Comments: GWMU 1 ST012: Former UST excavation area as seen facing south from inside former auto hobby shop yard. This area is currently used as Outdoor Recreation storage yard. The fence slightly dips and less vegetation with a variation in color was observed at the excavation / backfill area.

Photo Number: 28

Date: 9/29/2016

Comments: GWMU 1 ST012: View of GW monitoring well box and concrete apron inside former auto hobby shop yard.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 29

Date: 9/29/2016

Comments: GWMU 1 WP002 / SWMU 10: View of site surface looking east.

Photo Number: 30

Date: 9/29/2016

Comments: GWMU 1 WP002 / SWMU 10: View of typical site monitoring well with brass ID tag and concrete apron.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 31

Date: 9/29/2016

Comments: GWMU 1 SS010: Former gas station with 3 USTs. View of the site grass surface looking south. Site is currently NFA.

Photo Number: 32

Date: 9/29/2016

Comments: GWMU 1 SS010: Former gas station with 3 USTs. View of the site grass surface looking south. Site is currently NFA.

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 33

Date: 9/29/2016

Comments: GWMU 2 FT005 / SWMU 02: View of site grass surface looking north.

Photo Number: 34

Date: 9/29/2016

Comments: GWMU 2 FT005 / SWMU 02: View of site grass surface looking northeast.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 35

Date: 9/29/2016

Comments: GWMU 2 FT005 / SWMU 02: View of site grass surface looking north-northeast.

Photo Number: 36

Date: 9/29/2016

Comments: GWMU 2 SS013 / AOC 02: View of site surface and well pads looking east from Base Ops parking area.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client: U.S. Air Force Civil Engineer Center **Site Name:** Altus Air Force Base

Project Number: 042863 **Site Location:** Altus, Oklahoma

Photo Number: 37

Date: 9/29/2016

Comments: GWMU 3 SS024: View of site surface looking south.

Photo Number: 38

Date: 9/29/2016

Comments: GWMU 3 SS024: View of site surface looking south.

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 39

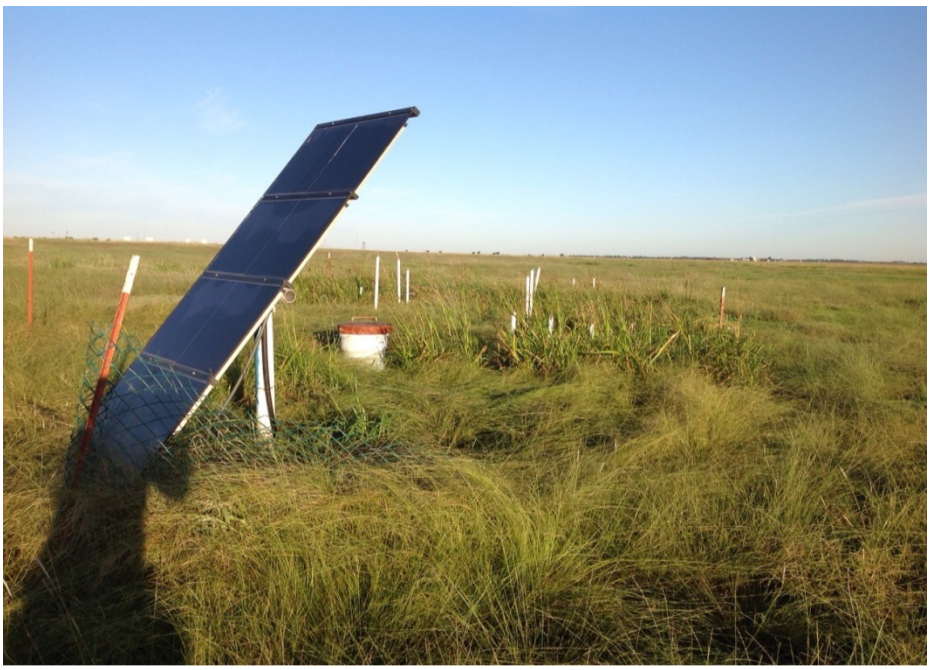
Date: 9/29/2016

Comments: GWMU 4 LF004; LF03/SWMU07: View of site looking northwest at solar powered bioreactor.

Photo Number: 40

Date: 9/29/2016

Comments: GWMU 4 LF004; LF03/SWMU07: View of bioreactor solar panel and piezometers.



Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 41

Date: 9/29/2016

Comments: GWMU 4 LF004; LF03 /SWMU07: View of site grass surface at Bio wall location looking northeast of bioreactor.

Photo Number: 42

Date: 9/29/2016

Comments: GWMU 4 LF004; LF03/SWMU07: View of bioreactor solar panel and piezometers.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 43

Date: 9/29/2016

Comments: GWMU 4 LF004, LF03 /SWMU07: View of site monitoring well and storage drum.

Photo Number: 44

Date: 9/29/2016

Comments: GWMU 4 LF004, LF03 /SWMU07: View of site grass surface along bio wall to the east of bioreactor.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 45

Date: 9/29/2016

Comments: GWMU 4 LF004, LF03 /SWMU07: View of site grass surface looking northwest.

Photo Number: 46

Date: 9/29/2016

Comments: GWMU 4 LF014: View of site grass surface looking east from Ordnance Rd.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 47

Date: 9/29/2016

Comments: GWMU 4 FT003/SWMU 03/LF 03: View of site grass surface and well locations looking north.

Photo Number: 48

Date: 9/29/2016

Comments: GWMU 4 FT003/SWMU 03/LF 03: View of site grass surface and well locations looking northwest.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 49

Date: 9/29/2016

Comments: GWMU 4 FT003/SWMU 03/LF 03: View of site grass surface and typical well location looking north.

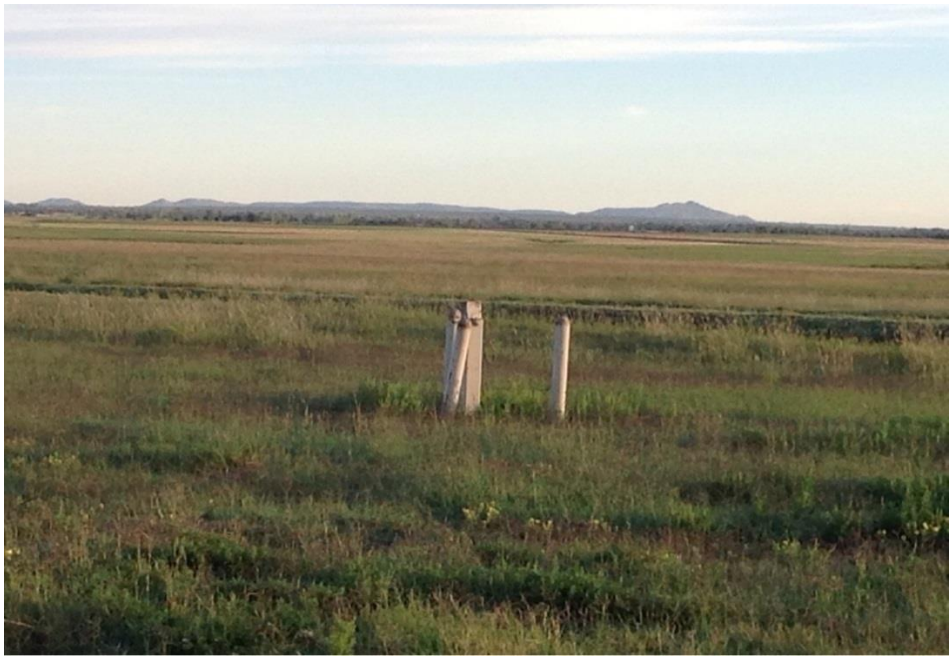


Photo Number: 50

Date: 9/29/2016

Comments: GWMU 4 FT003/SWMU 03/LF 03: View of site surface looking west.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 51

Date: 9/29/2016

Comments: GWMU 5 FT007 / SWMU 04: View of site surface and airfield lighting structures looking south.

Photo Number: 52

Date: 9/29/2016

Comments: GWMU 5 FT007/SWMU 04: View of site grass surface and airfield lighting structures.

Photographic Record – Altus Air Force Base 2nd Five Year Review

Client:	U.S. Air Force Civil Engineer Center	**Site Name:**	Altus Air Force Base
Project Number:	042863	**Site Location:**	Altus, Oklahoma

Photo Number: 53

Date: 9/29/2016

Comments: GWMU 7 FT007/SWMU 04: View of site grass surface and typical monitoring well (monument completion).

Photo Number: 54

Date: 9/29/2016

Comments: GWMU 4 FT007: View of site grass surface looking south.

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