

August 4, 2026

Colonel Joshua D. Lundebly
Commander, 71st Flying Training Wing
246 Brown Parkway, Suite 224
Vance AFB, OK 73705-5015

RE: RCRA Corrective Action and Post-Closure Permit Renewal
Public Draft Permit
Vance Air Force Base ("VAFB")
EPA ID No. OK4571524095; RCRA Permit No. 4571524095

Dear Colonel Lundebly:

On March 30, 2020, the Oklahoma Department of Environmental Quality ("DEQ") received the Resource Conservation and Recovery Act ("RCRA") corrective action and post-closure permit renewal application dated March 23, 2020. The application was reviewed for administrative completeness in accordance with Title 40 of the Code of Federal Regulations ("40 C.F.R.") Parts 264 and 270, the Oklahoma Hazardous Waste Management Act (27A O.S. §§ 2-7-101 *et seq.*), and Oklahoma Administrative Code ("OAC") 252:4 and 252:205. DEQ issued an administrative notice of deficiency ("NOD") on August 11, 2020. VAFB submitted responses to the administrative NOD on October 9, 2020. DEQ determined that the application addressed the requirements of the applicable laws and regulations and found the application to be administratively complete in a letter dated November 17, 2020.

In accordance with OAC 252:4-7-8, DEQ has reviewed the application for technical completeness in accordance with the applicable laws and regulations. DEQ issued technical notices of deficiency ("NODs") regarding the application on August 26, 2021; April 18, 2023; and November 7, 2023. VAFB submitted revisions to the Permit Attachments dated October 8, 2021; July 13, 2023; and July 21, 2025, addressing technical deficiencies. The latest technical deficiency revision of the application, received on July 23, 2025, and the revision of Figures 4a and 4b, received January 22, 2026, resolve all previously identified deficiencies. DEQ has determined that the application is technically complete.

On January 29, 2026, DEQ issued a courtesy draft of the permit to VAFB for review and comment. On March 9, 2026, DEQ received comments from VAFB. On April 26 and May 1, 2026, DEQ met with VAFB to review and revise the courtesy draft permit. On May 5, 2026, DEQ received an additional comment from VAFB. On July 20, 2026, DEQ received the final revisions to the Permit Attachments from VAFB dated July 17, 2026. DEQ has reviewed the comments, incorporated VAFB's suggested changes in the Draft Permit, and prepared the enclosed RCRA Corrective Action and Post-Closure Permit for public comment.

The enclosed Draft Permit has been finalized for public review and comment. VAFB is required to publish notice of opportunity to comment and request a public meeting on the Draft Permit in at least one (1) local newspaper of general circulation. Concurrently, a notice should be broadcast

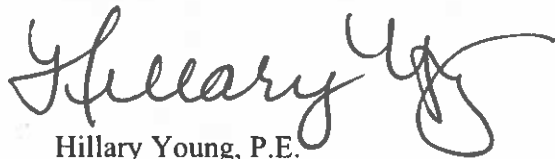
Colonel Lundebly
August 4, 2026
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on a local radio station. These notices will announce the opening of a forty-five (45) day comment period. Additionally, VAFB is to send a notice of the Draft Permit to all persons on the facility mailing list and to appropriate state and local government agencies as specified in 40 C.F.R. §124.10(c)(1)(viii) and (ix). Subsequently, proofs of publication and broadcasts must be furnished to DEQ within twenty (20) days after the date of publication pursuant to OAC 252:4-7-13(d).

A fact sheet is included in the Draft Permit for public information. Please ensure that a copy of the Draft Permit is made available at the Enid Public Library. A copy of the Draft Permit will also be available at DEQ's office and on the DEQ website at <https://oklahoma.gov/deq/permits/land-permits/permit-public-participation-process/>.

If you have any questions, please contact Mike Schornick at (405) 702-5166 or mike.schornick@deq.ok.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Hillary Young", with a stylized flourish at the end.

Hillary Young, P.E.
Chief Engineer
Land Protection Division

HY/MS

Enclosures: Fact Sheet
Radio Notice
Newspaper Notice
Draft Permit

cc: Harry Shah, US EPA Region 6 (6LCR-RP)

Newspaper Notice Text

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY NOTICE OF DRAFT RCRA CORRECTIVE ACTION AND POST-CLOSURE PERMIT FOR A HAZARDOUS WASTE MANAGEMENT FACILITY

The Oklahoma Department of Environmental Quality (“DEQ”) has received an application to renew a hazardous waste permit for the remediation and monitoring of closed Hazardous Waste Management Units at Vance Air Force Base (“VAFB”), 246 Brown Parkway, Suite 224 Vance AFB, Oklahoma 73705-5015, located in Sections 1 and 2 of Township 21 North, Range 7 West, and Sections 25, 26, 35, and 36 of Township 22 North, Range 7 West, Indian Meridian, Garfield County, Oklahoma. The application was filed on March 30, 2020.

DEQ has tentatively found that the application meets the requirements of Title 40 of the Code of Federal Regulations (“40 C.F.R.”) Parts 264 and 270, Title 27A of the Oklahoma Statutes (27A O.S. §§ 2-7-101 *et seq.*), and Oklahoma Administrative Code (“OAC”) 252:4 and OAC 252:205 and has prepared a draft corrective action and post-closure permit for public review.

The draft Resource Conservation and Recovery Act corrective action and post-closure permit and its conditions propose that VAFB continue to remediate and monitor the existing closed Hazardous Waste Management Units. It includes annual and quinquennial groundwater monitoring of Installation Restoration Program (“IRP”) Sites and ongoing onsite corrective actions at IRP Sites. The corrective action and post-closure permit would be issued under the authority of the Oklahoma Hazardous Waste Management Act and the federal Resource Conservation and Recovery Act.

The application, draft permit, and related documents may be reviewed on DEQ’s website at <https://oklahoma.gov/deq/permits/land-permits/permit-public-participation-process> and at the Enid Public Library at 120 West Maine St., Enid, Oklahoma 73701. The DEQ and VAFB contacts are:

Hillary Young, P.E., Chief Engineer
Land Protection Division
Oklahoma Department of Environmental Quality
P. O. Box 1677
Oklahoma City, Oklahoma 73101-1677
(405) 702-5100

Gail A. Hamill
Remediation Project Manager (RPM)
Vance AFB
140 Channel Street Suite 101
Vance AFB, OK, 73705-5015
(580) 213-6419

Persons wishing to comment on the draft permit should submit their comments in writing to DEQ at the above address or website. Also, any person may request, in writing, a formal public meeting to

present written or oral statements and data concerning the draft permit. A request for a public meeting must identify the nature of the issues to be raised in the meeting. If DEQ determines, based on the requests it receives, that there is significant degree of public interest in the draft permit, it will schedule a public meeting and provide notice of the date, time, and place.

Written comments and requests for a public meeting must be received by DEQ within forty-five (45) days after the date of this publication at the DEQ address or website given above. More specific information may be obtained by contacting the applicant at the VAFB contact given above or by contacting DEQ at the contact listed above.

Radio Broadcast Text

Oklahoma Department of Environmental Quality Notice of Draft RCRA Corrective Action and Post-Closure Permit For a Hazardous Waste Management Facility

The Oklahoma Department of Environmental Quality, DEQ, has made a tentative determination to renew a Resource Conservation and Recovery Act corrective action and post-closure permit for Vance Air Force Base located in Sections 1 and 2 of Township 21 North, Range 7 West, and Sections 25, 26, 35, and 36 of Township 22 North, Range 7 West, Indian Meridian, Garfield County, Oklahoma. The street address is 246 Brown Parkway, Suite 224, Vance AFB, Oklahoma, 73705.

The draft permit and its conditions propose that Vance Air Force Base continues to remediate and monitor the existing closed Hazardous Waste Management Units. It includes annual and quinquennial groundwater monitoring and ongoing onsite corrective actions of Installation Restoration Program Sites. The corrective action and post-closure permit would be issued under the authority of the Oklahoma Hazardous Waste Management Act and the federal Resource Conservation and Recovery Act.

Further information, including the application, draft permit, and a fact sheet may be reviewed on DEQ's website at www.oklahoma.gov/deq. and at the Enid Public Library at 120 West Maine St., Enid, Oklahoma, 73701 telephone number 580-234-6313.

Persons wishing to comment on the draft permit or to request a public meeting should submit their comments or requests in writing to DEQ no later than forty-five days from the date of this broadcast. DEQ's mailing address is P. O. Box 1677, Oklahoma City, Oklahoma, 73101-1677.

For further information about this notice, please contact Hillary Young with DEQ at 405-702-5100. That number again is 405-702-5100.



OKLAHOMA
Environmental
Quality

VANCE AIR FORCE BASE
Vance AFB, OKLAHOMA

EPA ID No. OK4571524095

RCRA CORRECTIVE ACTION AND POST-CLOSURE PERMIT
FOR A HAZARDOUS WASTE MANAGEMENT FACILITY

ISSUED BY

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

Month Day, 2026

VANCE AIR FORCE BASE
FACT SHEET

Potential Permit Conditions for the renewal of a Resource Conservation and Recovery Act (“RCRA”) Corrective Action and Post-Closure Permit. This is a Tier II Permit Action.

Type of Proposed Action:	Renewal RCRA Corrective Action and Post-Closure Permit.
Type of Facility:	Hazardous Waste Post-Closure and Corrective Action Facility
Facility Name:	Vance Air Force Base
EPA ID Number:	OK4571524095
Location:	246 Brown Parkway, Suite 224, Vance AFB, OK, 73705
Legal Description:	Sections 1 and 2 of Township 21 North, Range 7 West, and Sections 25, 26, 35, and 36 of Township 22 North, Range 7 West, Indian Meridian, Garfield County, Oklahoma.
Geographic Location:	Latitude: 36° 20' 23.75" North Longitude: 97° 54' 10.75" West
Landowner:	Vance Air Force Base 246 Brown Parkway Vance AFB, OK 73705
Facility Operator:	Vance Air Force Base 246 Brown Parkway Vance AFB, OK 73705
Comment Period:	45 days from the date of publication

Basis of the Draft Permit

Vance Air Force Base (“VAFB” or the “Permittee”) is located within Sections 1 and 2 of Township 21 North, Range 7 West, and Sections 25, 26, 35, and 36 of Township 22 North, Range 7 West, Indian Meridian, Garfield County, Oklahoma, at 246 Brown Parkway, Suite 224, Vance AFB, OK 73705. VAFB is a Department of Defense (“DOD”) installation located on approximately two thousand one hundred and twenty-two (2,122) acres. It has been in operation since approximately 1941 and was established to train pilots. Wastes historically managed at VAFB include various residuals from materials used to maintain planes such as waste solvents, waste paints, and contaminated jet fuel.

The sites regulated under this Permit are registered in the DOD Environmental Restoration Account (“ERA”) for management, funding, and remediation as Installation Restoration Program (“IRP”) Sites under the Defense Environmental Restoration Program (“DERP”). The RCRA Post-closure and Corrective Action Permit is for two (2) closed Hazardous Waste Management Unit IRP Sites (Sites ST-008 and ST-012) under post-closure care and several other IRP Sites recognized as solid waste management units (“SWMUs”) or areas of concern (“AOCs”) located on the facility property that are listed in Tables 2(a), 2(b), and 2(c) of the Draft Permit. Closed IRP Site ST-008 is the physical location of Underground Storage Tank (“UST”) No. 106 that was used to manage waste solvents and contaminated fuels during the 1970s and early 1980s. UST No. 106, a 12,000-gallon steel tank, was excavated and removed in 1989 as part of the closure process. Closed IRP Site ST-012, the Paint Stripping Equalization Tank (“PSET”), was a reinforced concrete UST with a capacity of approximately 10,000 gallons. The PSET was installed in 1961 and had been used solely to hold paint stripping waste; it was taken out of service in 1988 and removed in June 1995. There is groundwater and soil contamination associated with releases from both of these closed IRP Sites, which are under post-closure care. Groundwater monitoring is required. The Permittee has undertaken corrective action to remediate the permitted IRP Sites.

On March 30, 2020, the Oklahoma Department of Environmental Quality (“DEQ”) received the Permit Renewal Application (“Application”) dated March 23, 2020. The Application has been through a series of Notices of Deficiency and responses. The Permittee submitted revisions to the Application dated October 9, 2020; October 8, 2021; July 13, 2023; and July 21, 2025. The latest revision of the Application, received on July 23, 2025, and the revision of the Permit Attachments, received on January 22, 2026 and July 20, 2026, resolved all previously identified deficiencies. DEQ determined that the Application was administratively complete on November 17, 2020 and ~~on~~ technically complete on August 4, 2026.

The basic requirements of the Oklahoma Hazardous Waste Management Act, 27A O.S. §§ 2-7-101 *et seq*; the Oklahoma Administrative Code (OAC 252:205), as amended; the federal Resource Conservation and Recovery Act (“RCRA”); and the Hazardous and Solid Waste Amendments of 1984 (“HSWA”), having been met, the DEQ has prepared draft permit conditions. DEQ has the authority to issue permits for these activities and to enforce compliance with RCRA and HSWA programs.

DEQ developed the draft permit conditions and incorporated applicable requirements of OAC 252:205 and Title 40 of the Code of Federal Regulations (“40 C.F.R.”) Part 270, additional conditions to enhance compliance with OAC 252:205 and 40 C.F.R. Part 264, and other conditions (as required) to achieve environmentally sound hazardous waste management.

The administrative record supporting this draft permit consists of the Part B permit application, additional supporting documentation, the Draft Permit, and this Fact Sheet.

Information Resources

Copies of the proposed draft permit conditions, this Fact Sheet, and the application are available for review on DEQ’s website at <https://oklahoma.gov/deq/permits/land-permits/permit-public-participation-process> and during normal business hours at the Enid Public Library at 120 West Maine

St., Enid, Oklahoma 73701.

Telephone inquiries may be directed to:

Hillary Young, Chief Engineer
Land Protection Division, DEQ
(405) 702-5100

Comment Period and Procedures

Persons wishing to comment on the draft permit conditions may submit their comments in writing to DEQ at the address listed below. Comments should be directed to the appropriateness of the permit decision and the permit conditions and should be of a factual nature. All comments must be submitted to DEQ no later than forty-five days (45) after notice of this Permit action has been published. Comments should be directed to:

Oklahoma Department of Environmental Quality
Land Protection Division
707 N. Robinson, Oklahoma City, Oklahoma 73102 or
P.O. Box 1677, Oklahoma City, OK 73101-1677

Attn: Hillary Young, PE, Chief Engineer
Land Protection Division

Or through DEQ's website at <https://oklahoma.gov/deq/permits/land-permits/permit-public-participation-process>.

DEQ's comment and public meeting procedures may be found in OAC 252:4 and 40 C.F.R. §§ 124.10 and 124.12. A public meeting will be held by DEQ upon written request when there is a significant degree of public interest.

Public Meeting

Pursuant to 40 C.F.R. Part 124 and the Oklahoma Uniform Environmental Permitting Act, Title 27A of the Oklahoma Statutes, § 2-14-303, interested parties may request a public meeting on the permit. The request must be in writing and submitted prior to the closing date of the comment period which expires forty-five (45) days from the date of publication of the public notice of the draft permit. Persons wishing to request a public meeting should submit their request in writing to Hillary Young, Chief Engineer, Land Protection Division at the above address.

If a public meeting is requested, public notice of the date, time, and place will be given at least thirty (30) days before the meeting. If a public meeting is held, any person may submit oral or written statements and data concerning the draft permit. Reasonable limits may be set upon time allowed for oral statements.

Notice of Final Determination

DEQ will notify the applicant and each person who has submitted written comments or requested notice of the final permit decision. Within thirty (30) days after a RCRA permit decision has been issued, any person who filed comments on the draft permit renewal or participated in the public meeting may petition the Executive Director of DEQ to review any condition of the permit decision. The petition shall include a statement of the reasons supporting that review, including a demonstration that any issues being raised were raised during the public comment period, and when appropriate, a showing that the condition in question is based on a finding of fact or conclusion of law which is clearly erroneous or an exercise of discretion or important policy consideration which DEQ should review. A petition to DEQ is a prerequisite to judicial review under OAC 252:205-3-2, OAC 252:205-3-5, and 40 C.F.R. § 124.19 and should be directed to the address listed below:

Robert Singletary, Executive Director
Department of Environmental Quality
707 N. Robinson
Oklahoma City, Oklahoma 73101-1677

If no comments are received during the comment period, the permit will become final and effective immediately upon issuance.

**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
RCRA CORRECTIVE ACTION AND POST-CLOSURE PERMIT
FOR A HAZARDOUS WASTE MANAGEMENT FACILITY**

Permittee: Vance Air Force Base
246 Brown Parkway, Suite 224
Vance AFB, OK 73705

EPA ID No.: OK4571524095

Permit No.: 4571524095-PC

Effective Date: Month Day, 2026

Expiration Date: Month Day, 2036

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. §§ 6901 *et seq.*, commonly known as “RCRA”), including the Hazardous and Solid Waste Amendments of 1984 (“HSWA”), and regulations promulgated thereunder by the U.S. Environmental Protection Agency (“EPA”) (codified in Title 40 of the Code of Federal Regulations); the Oklahoma Hazardous Waste Management Act (“OHWMA”, Title 27A of the Oklahoma Statutes (“27A O.S.”) §§ 2-7-101 *et seq.*, as amended), and regulations promulgated thereunder in the Oklahoma Administrative Code (“OAC”) 252:205; and the Oklahoma Uniform Environmental Permitting Act at 27A O.S. § 2-14-101 *et seq.*, and rules promulgated thereunder in OAC 252:4-7, this Permit to perform corrective action and post-closure care is hereby issued by the Oklahoma Department of Environmental Quality (“DEQ”) to Vance Air Force Base (hereafter referred to as “VAFB” or “Permittee”). The facility is located within Sections 1 and 2 of Township 21 North, Range 7 West, and Sections 25, 26, 35, and 36 of Township 22 North, Range 7 West, Indian Meridian, Garfield County, Oklahoma, at 246 Brown Parkway, Vance AFB, OK, 73705, at latitude 36° 20' 23.75" North and longitude 97° 54' 10.75" West.

VAFB is a Department of Defense (“DOD”) installation located on approximately 2,122 acres. It has been in operation since approximately 1941 and was established to train flight pilots. Wastes historically managed at VAFB include various residuals from materials used to maintain planes such as waste solvents, waste paints, and contaminated jet fuel.

The sites regulated under this Permit are registered in the DOD Environmental Restoration Account (“ERA”) for management, funding, and remediation as Installation Restoration Program (“IRP”) Sites under the Defense Environmental Restoration Program (“DERP”). The RCRA corrective action and post-closure Permit is for two (2) closed Hazardous Waste Management Unit IRP Sites (ST-008 and ST-012) under post-closure care and several other IRP Sites recognized as solid waste management units (“SWMUs”) or areas of concern (“AOCs”) located on the facility property that are listed in Section V of the Permit. Closed IRP Site ST-008 is the physical location of Underground Storage Tank (“UST”) No. 106 that was used to manage waste solvents and contaminated fuels during the 1970s and early 1980s. UST No. 106, a 12,000-gallon steel tank, was excavated and removed in 1989 as part of the closure process. Closed IRP Site ST-012, the Paint Stripping Equalization Tank (“PSET”), was a reinforced concrete UST with a capacity of approximately 10,000 gallons. The PSET was installed in 1961 and had been used solely to hold paint stripping waste; it was taken out of service in 1988 and removed in June 1995. There is groundwater and soil contamination associated with releases from both of these closed IRP Sites, which are under post-closure care. Groundwater monitoring is required. The Permittee has

undertaken corrective action to remediate the IRP Sites.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in Title 40 of the Code of Federal Regulations (“40 C.F.R.”) Parts 124, 260 through 264, 266, 268, and 270, as specified in the Permit. Applicable regulations are those which are in effect on the date of issuance of the Permit, in accordance with 40 C.F.R. § 270.32(c). Primary responsibility for the enforcement of the provisions of this Permit lies with DEQ.

This Permit is based on the assumption that all the information submitted in the Part B Permit application dated March 23, 2020, as modified through Permittee submittals dated October 9, 2020; October 8, 2021; July 13, 2021; July 21, 2025; January 22, 2026; and July 17, 2026 (hereafter referred to as the “application”) is accurate and that the facility will be operated as specified in the application.

Any inaccuracies found in the submitted information may be grounds for the termination, revocation and reissuance, or modification of this Permit in accordance with 40 C.F.R. §§ 270.41, 270.42, and 270.43. This Permit is effective as of ~~xx-xx~~, 2026, and shall remain in effect until ~~xx-xx~~, 2036, unless revoked and reissued under 40 C.F.R. § 270.41, terminated under 40 C.F.R. § 270.43, or continued in accordance with 40 C.F.R. § 270.51(a) and the Oklahoma rules and regulations for hazardous waste management (OAC 252:205) and the Oklahoma Administrative Procedures Act.

Hillary Young, P.E.
Chief Engineer
Land Protection Division
Oklahoma Department of Environmental Quality

Date

Kelly Dixon
Director
Land Protection Division
Oklahoma Department of Environmental Quality

Date

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ATTACHMENTS

Attachment 1	Post-Closure Plan for Site ST-008
Attachment 2	Post-Closure Plan for Site ST-012
Attachment 3	Groundwater Sampling and Analysis Plan
Attachment 4	Fire and Emergency Safety Plan

SECTION I – GENERAL PERMIT CONDITIONS

A. GENERAL

The Permittee shall operate, monitor, and maintain the facility in compliance with the provisions of the Oklahoma Hazardous Waste Management Act (“OHWMA”), Title 27A of the Oklahoma Statutes (“27A O.S.”) §§ 2-7-101 *et seq.*, the Oklahoma Department of Environmental Quality rules for hazardous waste (“OAC” 252:205), the federal Resource Conservation and Recovery Act (“RCRA”), the Hazardous and Solid Waste Amendments of 1984 (“HSWA”), and this Permit as specified through the permit conditions set herein.

B. BASIS OF PERMIT

This Permit is granted based on the information submitted and the design criteria presented in the application and all subsequent revisions. Any inaccuracies found in this information could provide cause for the termination or modification of this Permit and for enforcement action. The Permittee is to inform the Oklahoma Department of Environmental Quality (“DEQ”) of any deviation from or changes in the design or operation of the facility which could affect the Permittee’s ability to comply with the applicable regulations or Permit conditions.

This Permit shall be reviewed by DEQ five (5) years after the date of Permit reissuance but may be reviewed at any time and shall be modified as necessary, as provided in Title 40 of the Code of Federal Regulation (“40 C.F.R.”) § 270.41 and 27A O.S. § 2-7-127(B). Except as provided in Permit Condition I.F.3, and 40 C.F.R. § 270.51, the term of the Permit shall not be extended by modification beyond the expiration date appearing on the face of this Permit. 40 C.F.R. § 270.50(b).

C. INCORPORATION BY REFERENCE

The referenced 40 C.F.R. Parts 124, 260 through 266, 268, and 270 as specified in this Permit are, unless otherwise stated, incorporated in their entirety by OAC 252:205-3-1 through OAC 252:205-3-6.

D. DEFINITIONS

Except for the terms defined below, for purposes of this Permit, terms used herein shall have the same meaning as those in 40 C.F.R. Parts 124, 260 through 266, 268, and 270 and OAC 252:205-1-2 through OAC 252:205-3-6, unless this Permit specifically provides otherwise. Where terms are not defined in OAC, RCRA regulations, or this Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

“**Action Levels**” means health and environmental-based levels of constituent concentrations determined by DEQ to be indicators for protection of human health and the environment.

“Application” refers to the RCRA Part B Application and subsequent amendments submitted by the Permittee for obtaining a permit.

“Area of Concern” (“AOC”) means any discernable unit or area which, in the opinion of DEQ, may have received solid or hazardous waste or waste containing hazardous constituents at any time and which may have released hazardous constituents. DEQ may require investigation of the unit as if it were a solid waste management unit (“SWMU”). If shown to be a SWMU by the investigation, the AOC must be reported by the Permittee as a newly identified SWMU. If the AOC is shown not to be a SWMU by the investigation, DEQ may determine that no further action is necessary and notify the Permittee in writing.

“Conceptual Site Model” (“CSM”) is part of the Data Quality Objective (“DQO”) process that presents a three-dimensional picture of site conditions at a discrete point in time that conveys what is known about the facility, releases, release mechanisms, contaminant fate and transport, exposure pathways, potential receptors, and risks. The information for the CSM is documented into six profiles (i.e., Facility Profile, Land Use and Exposure Profile, Physical Profile, Release Profile, Ecological Profile, and Risk Management Profile). The CSM evolves as data gaps in the profiles become more complete, and it will be refined based upon results of site characterization data. The final CSM is documented in the Risk Management Plan (“RMP”).

“Constituents of Concern” (“COC”) means those chemical compounds which have been frequently encountered during sampling events and have been selected as having a reasonable likelihood of having been or being released, are consistent with the Conceptual Site Model, and pose a potential adverse hazard or risk to human health or the environment.

“Constituents of Potential Concern” (“COPC”) means chemicals from hazardous waste and hazardous waste constituents that are potentially site-related and have data of quality for use in site screening or a site-specific risk assessment. The facility should compile a list of COPCs for each release site based on existing sampling data, waste analysis reports, etc.

“Corrective Action” is a requirement under RCRA that facilities that treat, store, or dispose of hazardous wastes investigate and clean up hazardous releases into soil, groundwater, surface water, and air. Corrective Action is principally implemented through RCRA permits and orders. Facilities are generally brought into the RCRA Corrective Action process when there is an identified release of hazardous waste or hazardous constituents.

“Corrective Action Objectives” (“CAOs”) means (1) those Corrective Action objectives established by DEQ, (2) preferred alternatives for corrective measures to meet the intended remedial goals, and (3) performance-based measures to ensure protectiveness. The CAOs are developed by DEQ and are based on current and reasonably anticipated land and groundwater uses.

“Corrective Action Process” occurs when the RCRA Corrective Action cleanup process focuses on results rather than specific steps and is flexible, depending on site-specific conditions. A typical cleanup may include steps such as: initial site assessment, site characterization, interim actions,

evaluation of remedial alternatives, and implementation of the selected remedy.

“Corrective Action Strategy” (“CAS”) means the EPA Region 6 Corrective Action Strategy. CAS is a risk management, performance-based alternate Corrective Action approach using the development of Corrective Action Objectives based upon performance standards.

“CMS” means Corrective Measures Study.

“DEQ” means the Oklahoma Department of Environmental Quality.

“DNAPL” means Dense Non-Aqueous Phase Liquid.

“Director” means the Executive Director of the Oklahoma Department of Environmental Quality, or his/her designee or authorized representative.

“Division Director” means the Director of the Land Protection Division of the Oklahoma Department of Environmental Quality, or his/her designee or authorized representative.

“EPA” means the United States Environmental Protection Agency.

“Facility” means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

“GWMU” means Groundwater Management Unit.

“HSWA” means the 1984 Hazardous and Solid Waste Amendments to RCRA.

“Hazardous Constituent” means any constituent identified in Appendix VIII of 40 C.F.R. Part 261, or any constituent identified in Appendix IX of 40 C.F.R. Part 264.

“Hazardous Waste” means a hazardous waste as defined in 40 C.F.R. § 261.3.

“IRP Site” means a site added to the Department of Defense (“DOD”) Environmental Restoration Account as an Installation Restoration Program (“IRP”) site for management, funding, and remediation under the Defense Environmental Restoration Program (“DERP”).

“Land Protection Division” (“LPD”) means the Land Protection Division of the Oklahoma DEQ.

“LNAPL” means Light Non-Aqueous Phase Liquid.

“Maximum Contaminant Level” (“MCL”) is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act. MCLs are standards set by EPA, and an MCL is an enforceable regulation.

“Permit” means the full Permit, all Permit Attachments, and all provisions and documents that are

incorporated herein.

“Permittee” means Vance Air Force Base, Oklahoma (“VAFB”, “Vance AFB”, or the “Base”), EPA ID No. OK4571524095.

“Point of Compliance” (“POC”) is defined as the most down-gradient boundary (i.e., groundwater and/or surface water) of the applicable on-base or off-base properties described by the legal descriptions in the restrictive (environmental) covenant and easement agreements. Point-of-Compliance wells are specified in Section IV.

“RCRA” means the Resource Conservation and Recovery Act of 1976, as amended by HSWA in 1984.

“RCRA Permit” means the full Permit, with RCRA and HSWA portions.

“RFA” means RCRA Facility Assessment.

“RFI” means RCRA Facility Investigation.

“RSL” means the EPA Region 6 Regional Screening Levels developed using risk assessment guidance. RSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are used in site screening to identify areas, contaminants, and conditions that require further attention.

“Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

“Solid Waste Management Unit” (“SWMU”) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. The definition includes regulated units (i.e., landfills, surface impoundments, waste piles, and land treatment units). (See AOC definition for passive leakage of a product or one-time spills, potential or suspected contamination, or off-site areas).

“SVOCs” means Semi-Volatile Organic Compounds.

“VOCs” means Volatile Organic Compounds.

E. EFFECT OF PERMIT

Any storage, treatment or disposal of hazardous waste not authorized in this Permit is prohibited, unless exempted from Permit requirements. Pursuant to 40 C.F.R. § 270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with Subtitle C of RCRA.

Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons, animals, or property, any invasion of other private rights, or any infringement of state or local laws or regulations. 40 C.F.R. § 270.4 and 40 C.F.R. § 270.30(g). Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under the OHWMA; Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; Sections 104, 106(a) or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 *et seq.*, commonly known as CERCLA), or any other law providing for protection of public health or the environment from an imminent or substantial endangerment.

F. PERMIT ACTIONS

1. Permit Modification, Revocation and Reissuance, or Termination

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in 40 C.F.R. §§ 270.41, 270.42, and 270.43. The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition. 40 C.F.R. §§ 270.4(a)(2) and 270.30(f).

2. Permit Renewal

This Permit may be renewed as specified in 40 C.F.R. § 270.30(b) and Permit Condition I.H.2. Review of any application for a permit renewal shall consider improvements in the state of control and measurement technology as well as changes in applicable regulations. HSWA § 212, and 27A O.S. § 2-7-127(B).

3. Permit Expiration

Pursuant to 40 C.F.R. § 270.50, this Permit shall be effective for a fixed term not to exceed ten (10) years from its effective date. This Permit and all conditions herein will remain in effect beyond the Permit's expiration date if the Permittee has submitted a timely, complete application pursuant to 40 C.F.R. §§ 270.10 and 270.13 through 270.29 and, through no fault of the Permittee, DEQ has not issued a new Permit, as set forth in 40 C.F.R. § 270.51. Permits continued under this section remain fully effective and enforceable. When the Permittee is not in compliance with the conditions of the expiring or expired Permit, DEQ may choose to do any one or more of the following:

- a. Initiate enforcement action based upon the Permit which has been continued. Pursuant to 27A O.S. §§ 2-7-126, 2-7-127, 2-7-129, 2-7-130, 2-7-131 and/or 2-7-134, DEQ may issue an order with penalties; require Corrective Action; temporarily suspend the Permit; revoke the Permit and/or cause proceedings to be instituted in the district court for civil or criminal penalties;

- b. Issue a notice of intent to deny the new Permit under 40 C.F.R. § 124.6. If the Permit is denied, the owner or operator would then be required to cease the activities authorized by the continued Permit or be subject to enforcement action for operating without a Permit;
- c. Issue a new Permit under 40 C.F.R. Part 124 with appropriate conditions; or
- d. Take other actions authorized by 27A O.S. §§ 2-7-101 through 2-7-134, OAC 252:205-1 through 252:205-25, or other applicable laws or regulations.

4. Transfer of Permit

This Permit is not transferable, except after notice to DEQ. DEQ may require modification or revocation and reissuance of the permit pursuant to 40 C.F.R. § 270.40. 40 C.F.R. § 270.30(l)(3). Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 40 C.F.R. Parts 264 and 270 and this Permit. 40 C.F.R. § 264.12(c).

G. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

H. DUTIES AND REQUIREMENTS

1. Duty to Comply

The Permittee shall comply with the approved Permit application and all conditions of this Permit, except to the extent and for the duration that noncompliance is authorized by an emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an emergency Permit, constitutes a violation of OHWMA and RCRA and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. 40 C.F.R. § 270.30(a).

2. Duty to Reapply

If the Permittee intends to continue an activity allowed or required by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to permit expiration. 40 C.F.R. §§ 270.10(h) and 270.30(b).

3. Permit Extension

This Permit and all conditions herein will remain in effect beyond the Permit's expiration date until DEQ issues a final decision on the re-application, provided the Permittee has

submitted a timely and complete new permit application as provided in 40 C.F.R. § 270.51.

4. Biennial Report

The Permittee shall comply with the biennial reporting requirements of 40 C.F.R. §§ 262.41 and 264.75.

5. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit. 40 C.F.R. § 270.30(c).

6. Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. 40 C.F.R. § 270.30(d).

7. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. 40 C.F.R. § 270.30(e).

8. Duty to Provide Information

The Permittee shall furnish to DEQ, within a reasonable time, any relevant information which DEQ may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to DEQ, upon request, copies of records required to be kept by this Permit. 40 C.F.R. § 270.30(h).

9. Inspection and Entry

Pursuant to 40 C.F.R. § 270.30(i) and 27A O.S. § 2-3-501(A), the Permittee shall allow DEQ, upon the presentation of credentials and other documents to meet the security and confidence requirements of the United States Air Force and Vance AFB Security, and

accompanied by Vance AFB personnel, as may be required by law, to:

- a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
- d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring Permit compliance or as otherwise authorized by RCRA.

10. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. 40 C.F.R. § 270.30(j)(1). The method used to obtain a representative sample of the waste and/or contaminated media to be analyzed must be the appropriate method from Appendix I of 40 C.F.R. Part 261 or an equivalent method approved by DEQ. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA Method Compendium SW-846, or an equivalent method approved by DEQ.
- b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this Permit, the certification required by 40 C.F.R. § 264.73(b)(9), and records of all data used to complete the application for this Permit for a period of at least three (3) years from the date of the sample, measurement, report, record, certification, or application. These periods may be extended by request of DEQ at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. 40 C.F.R. §§ 264.74(b) and 270.30(j)(2).
- c. Pursuant to 40 C.F.R. § 270.30(j)(3), records of monitoring information shall specify:
 - i. The date(s), exact place, and times of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;

- iii. The date(s) analyses were performed;
- iv. The individual(s) who performed the analyses;
- v. The analytical techniques or methods used; and
- vi. The results of such analyses.

11. Reporting Planned Changes

The Permittee shall give notice to DEQ, as soon as possible, of any planned physical alterations or additions to the permitted facility, only if such changes relate to hazardous waste management or Corrective Action operations. 40 C.F.R. § 270.30(l)(1).

12. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to DEQ of any planned changes in the permitted facility or activity which may result in noncompliance with Permit requirements. 40 C.F.R. § 270.30(l)(2).

13. Monitoring Reports

- a. The Permittee shall conduct the sampling at the intervals specified elsewhere in the permit.
- b. The Permittee must report the results of all environmental monitoring to the DEQ per the schedules set forth in the Permit or other DEQ approved time frame. 40 C.F.R. § 270.30(l)(4).

14. Compliance Schedules

Reports of compliance or non-compliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in this Permit shall be submitted no later than fourteen (14) days following each schedule date. 40 C.F.R. § 270.30(l)(5).

15. Immediate Reporting

- a. The Permittee shall report to DEQ any noncompliance which may endanger health or the environment. 40 C.F.R. § 270.30(l)(6) and OAC 252:205-13-1. Any such information shall be reported orally immediately after the Permittee becomes aware of the circumstances. Upon release of materials that are or become hazardous waste whether by spillage, leakage, or discharge to soils or to air or to surface or ground waters (outside the limits of a discharge permit) or by other means, and which could threaten human health or the environment, the facility shall

immediately notify DEQ and take all necessary action to contain, remediate, and mitigate hazards from the release. The report shall include the following:

- i. Information concerning release of any hazardous waste that may cause an endangerment to base personnel or drinking water supplies; and
 - ii. Any information of a release or discharge of contaminated groundwater, or of a compromise to remedial operations which could threaten the environment or human health on-base or outside the facility.
- b. The description of the occurrence and its cause shall include:
- i. Name, address, and telephone number of the person reporting the incident, the owner/operator, and the facility;
 - ii. Date, time, and type of incident;
 - iii. Location of the incident;
 - iv. Name and quantity of materials involved;
 - v. The extent of injuries, if any;
 - vi. An assessment of actual or potential hazards to the environment and human health on-base and/or outside the facility, where this is applicable; and
 - vii. Estimated quantity and disposition of recovered material that resulted from the incident.
- c. A written submission shall also be provided within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected and, if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. DEQ may waive the five-day written notice requirement in favor of a written report within fifteen (15) days.

16. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition I.H.14. 40 C.F.R. § 270.30(l)(10).

17. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit application or submitted incorrect information in a Permit application or in any report to DEQ, the Permittee shall promptly submit such facts or information. 40 C.F.R. § 270.30(l)(11).

I. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to DEQ shall be signed and certified in accordance with 40 C.F.R. § 270.11. 40 C.F.R. § 270.30(k).

J. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO DEQ

All reports, notifications, or other submissions which are required by this Permit to be sent or given to DEQ should be sent by certified mail or given to:

Chief Engineer
Land Protection Division
Oklahoma Department of Environmental Quality
707 N. Robinson, P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677
Telephone Number (405) 702-5100

K. CONFIDENTIAL INFORMATION

In accordance with 40 C.F.R. § 270.12, OAC 252:4-1-5(d), and OAC 252:205-1-4, the Permittee may claim confidential any information required to be submitted by this Permit. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions, or in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of the submission, DEQ may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information) and the Oklahoma Open Records Act, 51 O.S. § 24A.5. Claims of confidentiality for the name and address of any permit applicant or Permittee will be denied.

L. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittee shall maintain at the facility, until all corrective measures and monitoring are complete, and closure is completed and certified by an independent, registered professional engineer, the following documents and all amendments, revisions, and modifications to these documents:

1. Inspection schedules, as required by 40 C.F.R. § 264.15(b)(2) and this Permit;

2. Personnel training documents and records, as required by 40 C.F.R. § 264.16(d) and this Permit;
3. Groundwater Sampling and Analysis Plan (Permit Attachment 3), as required by 40 C.F.R. § 264.97(d);
4. Operating Record, as required by 40 C.F.R. § 264.73 and this Permit;
5. Post-Closure Plans (Permit Attachments 1 and 2) as required by 40 C.F.R. § 264.118(a) and this Permit; and
6. All other documents required by Permit Condition I.H.

SECTION II – GENERAL FACILITY CONDITIONS

A. DESIGN AND OPERATION OF FACILITY

The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste constituents to air, soil, ground water, or surface water which could threaten human health or the environment, as required by 40 C.F.R. § 264.31 and OAC 252:205-9-1.

B. REQUIRED NOTICES

The Permittee is not authorized to receive any hazardous waste from any source either on-site or off-site or from a foreign source unless the conditions, notices, and requirements of 40 C.F.R. § 264.12 are met.

C. SECURITY

The Permittee is a closed, high-security DOD installation and therefore has 24-hour armed patrols. These security conditions are not anticipated to change during the term of this Permit. Therefore, as long as these conditions remain, the Permittee meets the requirements of 40 C.F.R. § 264.14(b)(2) and (c).

D. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection provisions of 40 C.F.R. § 264.15 and the inspection requirements set out in Permit Attachment 1 - Post-Closure Plan for Site ST-008, Permit Attachment 2 - Post-Closure Plan for Site ST-012, and Permit Attachment 3 - Groundwater Sampling and Analysis Plan. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by 40 C.F.R. § 264.15(c). Records of inspections shall be kept, as required by 40 C.F.R. § 264.15(d).

E. PERSONNEL TRAINING

The Permittee shall be responsible for assuring that adequate training is provided for all personnel performing hazardous waste management practices and operating the remedial systems. 40 C.F.R. § 264.16.

F. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements concerning the management of ignitable, reactive, and incompatible wastes pursuant to 40 C.F.R. § 264.17.

G. PREPAREDNESS AND PREVENTION

1. Required Equipment

At a minimum, the Permittee shall maintain at the facility the equipment required by 40 C.F.R. § 264.32.

2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified above, as necessary, to ensure its proper operation in time of emergency, as required by 40 C.F.R. § 264.33.

3. Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system, as required by 40 C.F.R. § 264.34.

4. Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local authorities, as required by 40 C.F.R. § 264.37. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

The Permittee is a contractor-operated Air Force Base. The third-party contractor provides on-Base fire and emergency services. (See Permit Attachment 4 - Fire and Emergency Safety Plan). Police services are provided by DOD employees. Should the status of the Base change, the Permittee shall make arrangements with direct military (i.e., non-contracted) services and/or local services.

5. Emergency Coordinator

A trained emergency coordinator shall be available at all times in case of an emergency, as required by 40 C.F.R. § 264.55.

H. AIR EMISSION STANDARDS

The Permittee shall follow the 40 C.F.R. Part 264 Subparts BB and CC requirements as applicable.

I. GENERAL CLOSURE REQUIREMENTS

This facility has no permitted operating RCRA waste management units that will require closure as anticipated by 40 C.F.R. Part 264 Subpart G. All clean-up, remediation, and post-closure activities are subject to the Corrective Action measures specified in Section IV and Section V of this Permit.

**J. COST ESTIMATE FOR FACILITY POST-CLOSURE; FINANCIAL
ASSURANCE; LIABILITY INSURANCE REQUIREMENTS**

As a federally owned and operated facility, financial assurance for Corrective Action and Post-Closure, and accompanying cost estimates, and liability insurance are not required. Should the facility change ownership to a nonfederal entity, both cost estimates, financial assurances, and liability insurance will be required prior to approval of a permit transfer. 40 C.F.R. Part 264 Subpart H.

SECTION III – POST-CLOSURE CARE

A. SECTION HIGHLIGHTS

The IRP (see Permit Condition I.D - Definitions) Sites at Vance Air Force Base, covered under this Permit, are delineated in Permit Section V. IRP Site ST-008 and IRP Site ST-012 are permitted for post-closure care activities. IRP Site ST-008 is under post closure care due to releases at this site which occurred from a tank farm that contained listed wastes, chlorinated solvents, and fuel. IRP Site ST-012 is under post-closure care due to releases at this site from a former paint stripping equalization tank which was a below-grade concrete vault. Both tanks were removed from service, excavated, and removed from the facility.

B. UNIT IDENTIFICATION

IRP Site ST-008 is the physical location of Underground Storage Tank (“UST”) No. 106 at Building 110 that was used to manage waste solvents and contaminated fuels during the 1970s and early 1980s. UST No. 106, a 12,000-gallon steel tank, was excavated and removed in 1989 as part of the closure process.

IRP Site ST-012, the Paint Stripping Equalization Tank, was a reinforced concrete UST with a capacity of approximately 10,000 gallons. The Paint Stripping Equalization Tank was installed in 1967 and had been used solely to hold paint stripping waste; it was taken out of service in 1988 and removed in June 1995.

There is groundwater and soil contamination associated with releases from both IRP Sites. Groundwater monitoring is required. The Permittee has undertaken Corrective Action to remediate the permitted sites with current remedies described in Section V of this Permit.

C. FACILITY AND FUNCTIONS AUTHORIZED

1. The Permittee is authorized to monitor and maintain the Corrective Action sites, subject to the terms and conditions of this Permit.
2. The above sites were identified in the Permit Applications received initially on March 30, 2020, and as revised on July 23, 2025.

D. POST-CLOSURE CARE AND USE OF PROPERTY

1. The Permittee shall conduct post-closure care for the units listed in Permit Condition III.B and comply with all applicable post-closure requirements contained in 40 C.F.R. §§ 264.117 through 264.120. The post-closure care period of 30 years after the certification of closure may be shortened or extended, if necessary, as per 40 C.F.R. § 264.117(a) in accordance with the permit modification procedures in 40 C.F.R. Parts 124 and 270.

2. The Permittee shall not allow any use of the closed units which will disturb the integrity of the final cover or the function of the monitoring systems unless the DEQ finds the disturbance: (1) is necessary for the proposed use of the property and will not increase the potential hazard to human health or the environment or (2) is necessary to reduce a threat to human health or the environment.
3. The Permittee shall comply with all applicable requirements of 40 C.F.R. § 264.310 and shall at least:
 - a. Continue all applicable operations necessary to provide long-term minimization of migration of liquids through the closed Corrective Action units. 40 C.F.R. § 264.310(a)(1).
 - b. Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events. 40 C.F.R. § 264.310(b)(1).
 - c. Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of 40 C.F.R. Part 264 Subpart F. 40 C.F.R. § 264.310(b)(4).
 - d. Prevent run-on and run-off from eroding or otherwise damaging the final cover. 40 C.F.R. § 264.310(b)(5).
 - e. Protect and maintain surveyed benchmarks or markers used in complying with 40 C.F.R. § 264.309. 40 C.F.R. § 264.310(b)(6).
4. The Permittee shall follow the post-closure care plans for IRP Site ST-008 and IRP Site ST-012 presented in Attachment 1 and Attachment 2 of this Permit, respectively.
5. No later than sixty (60) days after completion of the established post-closure care period, the Permittee shall submit a certification that the post-closure care for the sites was performed in accordance with the specifications in the approved post-closure plans, as required by 40 C.F.R. § 264.120.

E. POST-CLOSURE PERMIT MODIFICATIONS

The Permittee must request a permit modification to authorize a change in the approved post-closure plan(s). This request must be in accordance with applicable requirements of 40 C.F.R. Parts 124 and 270 and must include a copy of the proposed amended post-closure plan for approval by DEQ.

SECTION IV – GROUNDWATER MONITORING

A. SECTION HIGHLIGHTS

Groundwater monitoring is required for twelve (12) IRP Sites (classified as SWMUs) located in and associated with three (3) different areas at Vance AFB. The Corrective Measures Implementation (“CMI”) area contains three (3) IRP Sites: ST-012, SS-024, and SS-025. The Industrial Zone area contains six (6) IRP sites: LF-003, SS-007, ST-008, ST-011, SS-026, and SS-028. The South Boundary area contains three (3) IRP Sites: DP-005, FT-002, and SS-047. The twelve (12) regulated IRP Sites requiring groundwater monitoring can be summarized as follows:

Permitted Post-closure Care IRP Sites (also classified as SWMUs):

- Site ST-008 (UST No. 106 at Bldg. 110)
- Site ST-012 (Paint Stripping Equalization Tank)

Other SWMU IRP Sites:

- FT-002 (Fire Training Area)
- LF-003 (Tank Farm Landfill)
- DP-005 (Sludge Disposal Area)
- SS-007 (Hazardous Waste Accumulation Point)
- ST-011 (Former Aqua/Avgas Fuel Distribution System)
- SS-024 (Jet Engine Cleaning Shop)
- SS-025 (COMBS Warehouse)
- SS-026 (Jet Fuel Storage Area)
- SS-028 (Intermediate Zone Solvent Spill)
- SS-047 (Spill Site at B047))

The monitoring wells for the regulated sites are installed in three different groundwater system transmissive zones present at the facility which collectively define the uppermost aquifer underlying the sites: the Shallow Transmissive Zone (“STZ”) from approximately 10 feet below ground surface to 30 feet below ground surface, the Intermediate Transmissive Zone (“ITZ”) from approximately 35 to 50 feet below ground surface, and the Deep Transmissive Zone (“DTZ”) from approximately 55 to 75 feet below ground surface.

The facility-wide Groundwater Monitoring System has been and shall continue to be designed, constructed, operated, and maintained to enable evaluation of groundwater resources at the facility Point-of-Compliance (including interaction with surface water). The monitoring system will be maintained in accordance with the detailed plans and specifications presented in this Section. The monitoring system consists of 73 Point-of-Compliance wells, of which 69 are monitored on an annual basis and 4 are monitored every 5 years. Monitoring will continue until such time as the requirements of this Permit are met. The monitoring well network has been designed using a conceptual site model approach that realigns all monitoring wells to the site from where the groundwater contamination originated.

B. WELL LOCATION, INSTALLATION, AND CONSTRUCTION

The Permittee shall maintain the existing groundwater monitoring system to comply with the requirements of 40 C.F.R. § 264.100(d), with Point-of-Compliance monitoring wells at the locations specified in the figures presented in Permit Attachment 3, and in compliance with the following table for the duration of this Permit unless modified:

SITES	AREA	MONITORING WELL	MONITORING PARAMETERS
FT-002	South Boundary Area	02-04, 02-05	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 Metals
LF-003	Industrial Zone Area	03-09, 03-13, 11-02, 11-03, OB-02, OB-03	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 Metals
DP-005	South Boundary Area	05-01, 05-03, 05-04R, 05-06, 05-07, 05-08, 05-09R, 05-18, 05-19R	VOCs, naphthalene, TPH-GRO/DRO, arsenic, and lead; and 1,4 dioxane for 5-04R
SS-007	Industrial Zone Area	07-04, 07-07, OB-04, OB-05, OB-06, OB-13, OB-16, OB-19, OB-21, N7-38, N7-41, N7-48, N7-50, N7-52, N7-78	VOCs, naphthalene, arsenic, and lead
ST-008	Industrial Zone Area	08-05, 08-09	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 Metals
ST-011	Industrial Zone Area	OB-02, OB-03, 03-09, 11-02, 07-15	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 Metals
ST-012	CMI Area	12-09, 12-13R, 12-30, 12-34, 12-38, 23-05, 23-21, 23-22, 25-01, 25-02, 25-04	VOCs, naphthalene, and RCRA 8 Metals
SS-024	CMI Area	12-33, 12-34, 12-35	VOCs, naphthalene, and 1,4 dioxane for 12-33
SS-025	CMI Area	12-43, 12-45, 23-14, 24-05, 25-07	VOCs, naphthalene, and 1,4 dioxane for 25-07
SS-026	Industrial Zone Area	26-01, 26-02, 26-03, 26-04	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 Metals
SS-028	Industrial Zone Area	08-18, 08-19, 08-25, 28-09, 28-15	VOCs, naphthalene, TPH-GRO/DRO, and RCRA 8 metals
SS-047	South Boundary Area	47-01, 47-02, 47-03, 47-04, 47-07, 47-11, 47-12	VOCs, TPH-GRO/DRO, SVOCs, and RCRA 8 Metals

C. GROUNDWATER PROTECTION STANDARD

1. The Permittee has implemented a Corrective Action program to ensure that regulated sites achieve compliance with the Groundwater Protection Standard. 40 C.F.R. § 264.100(d). The Permittee shall achieve compliance with the MCLs for contaminated groundwater at the Point of Compliance.
2. The Permittee shall monitor the wells described in Permit Condition IV.B. as specified in Permit Attachments 1, 2, and 3.
3. The Permittee shall monitor for hazardous constituents identified in Permit Condition IV.B during the compliance period. The compliance period is defined as the interval the Permittee can demonstrate that the Groundwater Protection Standard has not been exceeded for a period of three (3) consecutive years. 40 C.F.R. § 264.96. The monitoring shall be conducted at frequencies in accordance with the tables beginning on page IV-6 at the end of this Permit Section. At Sites ST-008 and ST-012, the monitoring shall be conducted for the 30-year post-closure care period. Data summary reports containing the groundwater analytical results shall be produced annually. Monitoring Parameters at each site are noted in Permit Condition IV.B. The analytical methods are as follows:

Sites FT-002, DP-005, SS-047 (South Boundary Area)

VOCs	EPA Method 8260 D or approved equivalent method
SVOCs	EPA Method 8270 E or approved equivalent method
TPH	EPA Method 8015 Modified or approved equivalent method
RCRA metals	EPA Method 6010 D / 7470 or approved equivalent method
1,4 dioxane	EPA Method 8270 SIM

Sites LF-003, SS-007, ST-008, ST-011, SS-026, SS-028 (Industrial Zone Area)

VOCs	EPA Method 8260 D or approved equivalent method
SVOCs	EPA Method 8270 E or approved equivalent method
TPH	EPA Method 8015 Modified or approved equivalent method
RCRA metals	EPA Method 6010 D / 7470 or approved equivalent method

Sites ST-012, SS-024, SS-025 (CMI Area)

VOCs	EPA Method 8260 D or approved equivalent method
SVOCs	EPA Method 8270 E or approved equivalent method
1,4 dioxane	EPA Method 8270 SIM

D. CORRECTIVE ACTION PROGRAM

1. The Permittee has implemented a Corrective Action program intended to prevent hazardous constituents in groundwater from exceeding their respective concentration limits (as provided under Permit Condition IV.C.3) at the Point of Compliance by removing the hazardous constituents or by treating them in place, as required by 40

C.F.R. § 264.100(b).

2. Contaminated groundwater shall be remediated such that the MCLs are not exceeded at the Point of Compliance.
3. The specifications and schedules of the Corrective Action measures shall be in accordance with the requirements of Section V of this Permit.
4. The Permittee shall continue Corrective Action until the groundwater protection standard has not been exceeded for three (3) consecutive years and the Permittee receives DEQ approval for discontinuation of the Corrective Action. 40 C.F.R. § 264.100(f).

E. SAMPLING AND ANALYSIS PROCEDURES

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition IV.B. 40 C.F.R. § 264.97(d)-(e).

1. Samples shall be collected, preserved, and analyzed by the techniques specified in the Groundwater Sampling and Analysis Plan, Permit Attachment 3.
2. Samples shall be tracked and controlled using the chain-of-custody procedures specified in the Groundwater Sampling and Analysis Plan, Permit Attachment 3.

F. GROUNDWATER SURFACE ELEVATIONS

1. The Permittee shall determine the groundwater surface elevation at each well each time groundwater is sampled in accordance with Permit Condition IV.G. 40 C.F.R. § 264.97(f).
2. The Permittee shall measure total well depths at least annually.

G. MONITORING PROGRAM AND DATA EVALUATION

The Permittee has implemented a groundwater monitoring program to demonstrate the effectiveness of the Corrective Action program. Groundwater monitoring shall be conducted and shall be as effective as the program for compliance monitoring under 40 C.F.R. § 264.97 and 40 C.F.R. § 264.99. The Permittee shall determine groundwater quality as follows:

1. The Permittee shall collect, preserve, and analyze samples in accordance with Permit Condition IV.E;
2. The Permittee shall determine the concentrations of the hazardous constituents specified in Permit Condition IV.C throughout the compliance period and any

extensions due to Corrective Action implementation to demonstrate conformance with the groundwater protection standard. 40 C.F.R. § 264.96;

3. The Permittee shall determine the groundwater flow rate and direction in the uppermost aquifer at least annually. 40 C.F.R. § 264.99(e); and
4. The Permittee shall submit to DEQ an annual report presenting groundwater monitoring analytical results, groundwater elevations, well depths, groundwater potentiometric figures, field forms, laboratory reports and custody control forms, summary tables of all findings, problems and deviations encountered during the reporting period, and figures of groundwater concentrations of the parameters listed in Permit Condition IV.C.3. The annual report must be submitted no later than March 1 following each calendar year.

H. RECORDKEEPING AND REPORTING

The Permittee shall report on an annual basis, in writing, to the DEQ on the effectiveness of the Corrective Action program. These reports shall provide a chronology of the annual events during the preceding twelve (12) months and provide a summary of the planned activities for the following twelve (12) months. These reports shall be submitted no later than April 1 of each year until the Corrective Action program has been completed. 40 C.F.R. § 264.100(g).

**List of Monitoring Wells
South Boundary Area
Vance Air Force Base, Oklahoma**

Well ID	Well Type	Monitoring Frequency
Site DP-005		
05-01	STZ	Annual
05-03	STZ	Annual
05-04R	STZ	Annual
05-06	STZ	Annual
05-07	STZ	Annual
05-08	STZ	Annual
05-18	ITZ	Annual
05-09R	DTZ	Annual
05-19R	STZ	Annual
Site FT-002		
02-04	STZ	Annual
02-05	STZ	Annual
Site SS-047		
47-01	STZ	Annual
47-02	STZ	Annual
47-03	STZ	Annual
47-04	STZ	Annual
47-07	STZ	Annual
47-11	STZ	Annual
47-12	STZ	Annual

**List of Monitoring Wells
Industrial Zone Area
Vance Air Force Base, Oklahoma**

Well ID	Well Type	Monitoring Frequency
Site LF-003		
03-09	STZ	Annual
11-02	STZ	Annual
11-03	STZ	Annual
OB-02	STZ	Annual
OB-03	STZ	Annual
Site SS-007 (including North Site 7)		
07-04	STZ	Annual
07-07	DTZ	Quinquennial
OB-04	STZ	Annual
OB-05	STZ	Annual
OB-06	STZ	Annual
OB-13	STZ	Annual
OB-16	STZ	Annual
OB-19	STZ	Annual
OB-21	STZ	Annual
N7-38	ITZ	Annual
N7-41	STZ	Annual
N7-48	ITZ	Annual
N7-50	ITZ	Annual
N7-52	ITZ	Annual
N7-78	ITZ	Annual
Site ST-008		
08-05	STZ	Annual
08-09	STZ	Annual
Site ST-011		
OB-02	STZ	Annual
OB-03	STZ	Annual
03-09	STZ	Annual
11-02	STZ	Annual
07-15	STZ	Annual
Site SS-028		
08-19	ITZ	Annual
08-25	ITZ	Annual
28-09	ITZ	Annual
28-15	ITZ	Annual
08-18	ITZ	Annual

**List of Monitoring Wells
Industrial Zone Area (continued)
Vance Air Force Base, Oklahoma**

Well ID	Well Type	Monitoring Frequency
Site SS-026		
26-01	STZ	Annual
26-02	ITZ	Annual
26-03	STZ	Annual
26-04	STZ	Annual

**List of Monitoring Wells
CMI Area
Vance Air Force Base, Oklahoma**

Well ID	Well Type	Monitoring Frequency
Site ST-012		
12-13R	DTZ	Annual
12-09	STZ	Annual
12-30	ITZ	Annual
12-34	ITZ	Annual
12-38	ITZ	Annual
23-05	STZ	Annual
23-21	ITZ	Annual
23-22	ITZ	Annual
25-01	STZ	Annual
25-02	STZ	Annual
25-04	STZ	Annual
Site SS-024		
12-33	STZ	Annual
12-34	ITZ	Annual
12-35	STZ	Annual
Site SS-025		
25-07	STZ	Annual
12-43	STZ	Annual
12-45	STZ	Annual
23-14	STZ	Annual
24-05	STZ	Annual

SECTION V - SPECIAL CONDITIONS PURSUANT TO THE 1984 HAZARDOUS AND SOLID WASTE AMENDMENTS (“HSWA”)

A. VAFB AREA IRP SITES AND AOCs

This section applies to the following IRP sites and/or to any newly identified IRP/SWMU/AOCs.

South Boundary Area Sites:

DP-005 (Sludge Disposal Area):

Site DP-005 resulted from a one-time disposal of approximately 1,000 gallons of fuel tank sludge. Multiple investigations have been conducted since 1990. The source of consequential groundwater contamination has been removed. At least two interim remedial measures removed soils at Site DP-005. DEQ concurred with the Draft Final Feasibility Study Addendum, presenting groundwater removal with an interceptor collection trench (“ICT”) and large-diameter vertical wells, water treatment with air stripping, surface water and groundwater monitoring, and institutional controls as the selected remedial alternative. The system was in operation continuously since its installation in May 2003. In 2014, the remedy for Site DP-005 was changed to emulsified vegetable oil (“EVO”) injections to create conditions conducive to enhanced reductive dechlorination (“ERD”) and to reduce contaminant mass and mass flux in areas of elevated concentrations of chlorinated COCs. The existing groundwater extraction system was modified to a groundwater recirculation system where extracted groundwater is treated using granular activated carbon amended with lactate and reinjected immediately up-gradient of the plume to dispense the carbon source throughout the plume. As a result, the groundwater extraction treatment system and ICT were turned off. A small soil vapor extraction (“SVE”) system was used to treat soils adjacent to the groundwater ICT. However, the SVE was discontinued in 2015 due to low mass removal rates. The current remedy consists of ERD using an updated longer lasting EVO substrate, bioaugmentation, zero-valence iron in-situ chemical reduction (“ZVI/ISCR”) and an interim action to excavate and remove contaminated soils. Additionally, two sediment samples and two surface water samples are collected and analyzed annually at Site DP-005, as specified in Attachment 3 of this Permit.

FT-002 (Fire Training Area):

Site FT-002 is a two-acre area located near the south-central boundary of the Base. It was used for firefighting training during the 1950s until the 2000s. The RFI for this site was completed in 1992. In 2014, the remedy for this site was changed to include EVO injections and an SVE system to create conditions conducive to ERD and to reduce contaminant mass and mass flux. However, the SVE was discontinued in 2016 due to low mass removal rates. EVO injections were conducted only around monitoring well MW02-04. This site is currently undergoing long-term groundwater monitoring. The current remedy consists of ERD using longer-lasting EVO substrate, bioaugmentation,

ZVI/ISCR, and an interim action to excavate and remove contaminated soils.

SS-047 (Spill Site at Building 47):

Site SS-047 is a spill site located at the southern end of the apron, north of the Fire Training Area Site FT-002. VAFB notified DEQ by correspondence dated August 6, 2024, Site SS-047 was a newly designated SWMU. Fuel contamination exists in both soil and groundwater at Site SS-047. In 2018, approximately 2,700 gallons of Jet A fuel were released at this location. The suspected release source was an underground line which was connected to the engine test stands in Building 47. In April 2022, light nonaqueous phase liquid (“LNAPL”) was determined to be present in 6 out of 14 on-site monitoring wells. The areal extent of the LNAPL plume is approximately 200 feet by 250 feet. The LNAPL, with an estimated thickness of 2 feet, has been mapped. VAFB is required to perform an RFI for Site SS-047. A current remedy has not yet been specified. However, proposed remedy options include soil vapor extraction with ozone sparging or air sparging and/or multi-phase extraction.

CMI Area Sites

ST-012 (Paint Stripping Equalization Tank): (permitted for post-closure care activities)

Site ST-012, the Paint Stripping Equalization Tank, was a reinforced concrete UST with a capacity of approximately 10,000 gallons. The Paint Stripping Equalization Tank was installed in 1967 and had been used solely to hold paint stripping waste; it was taken out of service in 1988 and removed in June 1995. In 2014, the remedy for this site was changed to using injections of EVO to create conditions conducive to ERD and to reduce contaminant mass and mass flux in shallow, intermediate, and deep zones. Included in the remedy was a flow-through bio barrier to treat the down-gradient portions of the plume. SVE wells were used to reduce contaminant mass in the subsurface by volatilizing COCs in the vadose and “smear” zone soils. The SVE wells have been inactive since 2014. The remedy specified in the previous Permit was groundwater compliance monitoring and ERD using EVO substrate. The current remedy consists of ERD using a longer-lasting EVO substrate, bioaugmentation, and ZVI/ISCR.

The Permittee shall follow the post-closure care plan presented in Attachment 2 of the Permit.

SS-024 (Jet Engine Cleaning Shop):

Site SS-024 is located at Building 187. Before 1992, hazardous material was transferred from inside the building via piping and an associated manhole outside Building 187. Spills that may have occurred during these transfers could have been the source of the area’s contamination. The RFI for this site was completed in 1992. A groundwater monitoring system is in place. In 2014, the remedy for Site SS-024 was changed to EVO injections

to create conditions conducive to ERD and to reduce contaminant mass and mass flux in areas of elevated concentrations of chlorinated COCs in the shallow zone. Included in the remedy was a flow-through bio barrier to treat the down-gradient portions of the plume. The existing groundwater extraction system was modified to a SVE system used to control methane emissions. However, the SVE system was discontinued in 2016 due to low methane concentrations. The current remedy consists of ERD using an updated longer-lasting EVO substrate, bioaugmentation, and ZVI/ISCR.

SS-025 (COMBS Warehouse):

Site SS-025 is located at Building 174, approximately 85 feet west of Elam Road at the east side of the flight apron, which was constructed in 1994. A review of historical information and existing analytical data suggests that a wash rack previously associated with Building 170 is the probable source of contamination at Site SS-025. The investigations for this site have been completed, and a groundwater monitoring system is in place. In 2014, the remedy for Site SS-025 was changed to EVO injections to create conditions conducive to ERD and to reduce contaminant mass and mass flux in areas of elevated concentrations of chlorinated COCs in the shallow zone. Included in the remedy was a flow-through bio barrier to treat the down-gradient portions of the plume. The existing groundwater extraction system was modified to an SVE system used to control possible methane emissions. However, the SVE system was discontinued in 2016 due to low methane concentrations. The current remedy consists of ERD using an updated longer-lasting EVO substrate, bioaugmentation, and ZVI/ISCR.

WP-023 (Industrial Waste Pit):

Site WP-023 is located between Buildings 182 and 183, approximately 250 feet north of Site ST-012. Past investigations found evidence of an impoundment (pond) approximately 10 feet by 20 feet in area. The depth of the pond, the total amount of waste transported to the pond, the specifications of the liner material (if any), and the period of operation of the pond are unknown. The pond is believed to have been abandoned in 1967 and subsequently covered with soil and grass by the early-to-mid-1970s. The RFI for the site has been completed. A groundwater monitoring system is in place. Multiple investigations at this site found the contamination to not be from historical activities at Site WP-023 and therefore would be addressed under Site ST-012. As a result, some monitoring wells associated with Site WP-023 were reassigned to other SWMUs in 2019 and contemporaneously Site WP-023 remains in the groundwater monitoring program.

Industrial Zone Area Sites

ST-008 (UST No. 106 at Building 110): (permitted for post-closure care activities)

Site ST-008 is the physical location of UST No. 106 that was used to manage waste solvents and contaminated fuels during the 1970s and early 1980s. UST No. 106, a 12,000-gallon steel tank, was excavated and removed in 1989 as part of the closure

process. In August 2013, as part of a Predesign Investigation, a subsurface investigation found chlorinated VOCs in the intermediate zone at Site ST-008 with concentrations increasing hydraulically up-gradient. It was determined there was an unknown source not related to Site ST-008 and thus would be addressed under Site SS-028. In March 2017, the remedy for Site ST-008 was changed to dual-phase extraction to address residual petroleum contamination in the shallow soil and groundwater STZ. Groundwater extracted by the dual-phase extraction system was conveyed to the Central Groundwater Treatment Facility for treatment. The dual-phase extraction was discontinued in 2020 due to diminishing results. The current remedy uses direct push technology to implement a trap-and-treatment system by installing permeable reactive barriers with a proprietary microscale activated carbon mixture. The remedy consists of injecting the proprietary amendment with sulfate and nitrate salts into the impacted groundwater STZ to absorb naphthalene, TPH, and vinyl chloride to create favorable anaerobic biodegradation.

The Permittee shall follow the post-closure care plan presented in Attachment 1 of the Permit.

LF-003 (Tank Farm Landfill):

This former landfill covering approximately three acres was used from 1941 until 1952 to dispose of general refuse, containerized liquids, and tank sludge to depths of approximately fifteen (15) feet using the trench and fill method. The RFI was completed in 1993. Free-product was discovered at this site in 1997 and a free-product recovery ("FPR") system and phytoremediation plot were installed in 2004. The FPR system was discontinued after a lack of recoverable free-product. During a 2013 Predesign Investigation, benzene contamination at Site LF-003 was determined to not be from historical activities at the site and therefore would be addressed under Site ST-011. As a result, trees associated with the phytoremediation plot were removed in 2017. This site is currently included in the groundwater monitoring program. The proposed updated remedy includes air sparge or bio-sparge (managed under Site ST-011).

SS-007 (Hazardous Waste Accumulation Point):

Site SS-007 is located northeast of the flightline apron, with portions of the site being located to the west and north of Site LF-003 (South Site SS-007 and North Site SS-007, respectively). The Hazardous Waste Accumulation Point consists of three different areas. The first area has been used by the Defense Reutilization and Marketing Office ("DRMO"). Temporary storage of hazardous waste drums occurred from 1980 until 1994. Wastes stored at this site included solvents, metal treatment sludges, waste oils, and contaminated fuels. DRMO also stored new product in an open storage area. The second area is the old Base Civil Engineering ("BCE") storage area where polychlorinated biphenyl transformers were stored after removal and new solvents were stored for usage. At the time of issuance of the 1996 Permit, the area was open space. The third area is north of Fox Drive. In July 1997, the City of Enid deeded 158 acres to the Permittee for the expansion of the Permittee's operations. Historically, this area,

known as North Site SS-007, was used for agricultural purposes. The source area for contamination at this site appears to be located in the BCE storage area. This contamination has spread to the North Site SS-007 area. In 2014, the remedy for Site SS-007 was changed to EVO injections to create conditions conducive to ERD and to reduce contaminant mass and mass flux in areas of elevated concentrations of COCs in the shallow zone. The existing groundwater extraction system was modified to a groundwater recirculation system where extracted groundwater is treated using granular activated carbon amended with lactate and reinjected up-gradient and side-gradient of the plume to dispense the carbon source throughout the plume. As a result, the groundwater extraction treatment system and ICT extraction wells in the southern portion of the site were turned off. The ICT extraction wells on the northern portion of the site remain operational. The current Site SS-007 groundwater remedy includes ERD treatment injections with microbial culture bioaugmentation and a longer lasting EVO substrate. In addition to bioaugmented ERD, operation of the existing groundwater circulation system will be optimized to create hydraulic gradients across ten (10) strategically placed permeable reaction barriers. The remedy requires installation of additional injection wells. The current groundwater recirculation system, including the existing northern ICT, will continue to operate. Additionally, two sediment samples and two surface water samples are collected and analyzed annually at Site SS-007, as specified in Attachment 3 of this Permit.

SS-026 (Jet Fuel Storage Area):

Aboveground storage tanks (“ASTs”) containing jet fuel for Vance AFB operations are located approximately 100 feet west of a concrete-paved area used to store recreational vehicles. Groundwater contamination at the site reportedly resulted from activities in the 1970s and early 1980s. Residual fluids, sludges, and/or rainwater (which might have contained JP-4 fuel contamination) were periodically discharged onto the ground from a diked area surrounding the ASTs where the recreational vehicle facility was later constructed. Investigations for this site have been completed. In 2007, forty-three (43) tons of soil were removed from the site followed by the planting of a phytoremediation plot. In 2014, a biosparge system was installed at Site SS-026 to enhance monitored natural attenuation of residual petroleum contamination. As a result, trees associated with the phytoremediation plot were removed in 2017. Groundwater contamination present at this site is currently considered to be associated with Site ST-011, and the Site ST-011 remedy applies to Site SS-026. This site is currently included in the groundwater monitoring program. A supplemental RFI is being conducted for Site ST-011 and subsequently an updated remedy will be proposed in a permit modification to be submitted to DEQ for review and approval.

SS-027 (Entomology Shop):

Site SS-027 is Building 255, just to the east of the Central Groundwater Treatment Facility. A Preliminary Assessment/Site Inspection (“PA/SI”) was performed in 2007 to address the potential for pesticide and/or herbicide contamination at the site. Due to

elevated levels of pesticides and herbicides detected in groundwater samples, the PA/SI Report recommended additional investigations be performed to evaluate the nature and extent of groundwater contamination. This site was closed with no further action required per the Class 2 Modification on November 23, 2011.

ST-011 (Former Aqua/Avgas Fuel Distribution System):

Site ST-011, the former Aqua/Avgas Fuel Distribution System, consisted of 10 petroleum, oil, and lubricant USTs which were closed in accordance with the Oklahoma Corporation Commission in March 2000. Monitoring wells for Site ST-011, and down-gradient Site LF-003, have historically contained hydrocarbons. During a 2013 Predesign Investigation, benzene contamination at Site LF-003 was determined to not be from historical activities at the site and therefore would be addressed under Site ST-011. The current remedy for the site is bio-sparging. A supplemental RFI is being conducted for Site ST-011 and subsequently an updated remedy will be proposed in a permit modification to be submitted to DEQ for review and approval. VAFB has indicated the updated remedy may include chemical reduction and air-sparging or bio-sparging.

SS-028 (Intermediate Zone Solvent Spill):

Site SS-028 was designated as a separate site in 2018 after a subsurface investigation found chlorinated VOCs in the intermediate zone at Site ST-008 with concentrations increasing hydraulically up-gradient. This site includes Buildings 119 (Media Blaster - Corrosion Control), 121 (LOX AGE Maintenance Shop), 122 (Flightline Maintenance Shelter), and 125 (AGE Maintenance Shop and Admin). An additional subsurface investigation was conducted to further characterize the extent of soil gas screening level exceedances and the potential vapor intrusion pathway into buildings. A supplemental RFI is required for Site SS-028 and a supplemental RFI Work Plan will be submitted to DEQ for review and approval and may require a permit modification. VAFB has indicated, subsequent to completing the Supplemental RFI, a remedy may be proposed to include ERD with EVO substrate injections, which would require an additional permit modification.

B. STANDARD CONDITIONS

1. Waste Minimization

The Permittee shall submit a plan, certified according to 40 C.F.R. § 270.11, in writing annually, by December 1, for the previous year ending September 30, specifying that:

The Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the facility's operation to the degree determined to be economically practicable, and the proposed method of treatment, storage, or disposal is the practicable method currently available to the Permittee which minimizes the present

and future threat to human health and the environment. This certified plan must address the following items:

- a. Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility;
- b. Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities;
- c. Any source reduction and/or recycling measures implemented in the last five (5) years or planned for the near future;
- d. An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;
- e. Factors that have prevented implementation of source reduction and/or recycling;
- f. Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.);
- g. An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;
- h. The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces by quantity, type, and building/area; and
- i. The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes or available technology that would produce less hazardous waste.

2. Dust Suppression

Pursuant to 40 C.F.R. § 266.23(b), the Permittee shall not use waste or used oil or any other material which is contaminated with dioxin, polychlorinated biphenyls (PCBs), or any other hazardous waste (other than a waste identified solely on the basis of ignitability) for dust suppression or road treatment.

3. Permit Modification

- a. If at any time for any of the reasons specified in 40 C.F.R. § 270.41, DEQ determines that modification of this Permit is necessary, DEQ may initiate a

permit modification according to 40 C.F.R. § 124.5.

- b. The Permittee may initiate permit modification proceedings under 40 C.F.R. § 270.42. All applicable requirements and procedures as specified in 40 C.F.R. § 270.42 shall be followed.
- c. If DEQ receives written comment on the proposed modification, DEQ will make a final determination concerning the modification after the end of the comment period.

4. Permit Review

This Permit shall be reviewed by DEQ five (5) years after the date of permit issuance and may be modified as necessary as provided for in Permit Condition V.B.3. Nothing in this Section shall preclude DEQ from reviewing and modifying the Permit at any time during its term.

5. Compliance with Permit

Compliance with this Permit during its term constitutes compliance, for the purposes of enforcement, with 40 C.F.R. Parts 264 and 266 only for those management practices specifically authorized by this Permit. The Permittee is also required to comply with 40 C.F.R. Parts 260, 261, 262, and 263 and OAC 252:205 as applicable.

6. Specific Waste Ban

- a. All land banned wastes that are generated from remediation or corrective action will be handled in accordance with 40 C.F.R. Part 268. Failure to comply with the regulations may subject the Permittee to enforcement action under Section 3008 of RCRA and OAC 252:4.
- b. The Permittee may store wastes restricted under 40 C.F.R. Part 268 solely for the purpose of accumulating quantities necessary to facilitate proper recovery, treatment, or disposal provided that it meets the requirements of 40 C.F.R. § 268.50(a)(2) including, but not limited to, clearly marking each tank or container.
- c. The Permittee is required to comply with all requirements of 40 C.F.R. § 268.7, as amended.

7. Information Submittal

Failure to comply with any condition of the Permit, including information submittal, constitutes a violation of the Permit and is grounds for enforcement action, permit amendment, termination, or revocation and reissuance. See 40 C.F.R. § 270.43. Falsification of any submitted information is grounds for enforcement, including possible

criminal enforcement.

The Permittee shall ensure that all plans, reports, notifications, and other submissions to DEQ required in this Permit are signed and certified in accordance with 40 C.F.R. § 270.11. A summary of the planned reporting requirements pursuant to this Permit is found in Table 1. Two (2) hard copies of all deliverables shall be delivered to the DEQ LPD. The Permittee shall also submit to the DEQ a copy of all reports on a compact disc ("CD") or IBM-compatible electronic storage device.

8. Plans and Schedules Incorporated into Permit

All plans and schedules required by this Permit are, upon approval by DEQ, incorporated into this Permit by reference and become an enforceable part of this Permit. Since required items are essential elements of this Permit, failure to submit any of the required items or submission of inadequate or insufficient information may subject the Permittee to enforcement action under OHWMA and Section 3008 of RCRA and may include fines, suspension, or revocation of the Permit.

Any noncompliance with approved plans and schedules shall be termed noncompliance with this Permit. Written requests for extensions of due dates for submittals may be granted by DEQ in accordance with Permit Condition V.B.3.

If DEQ determines that actions beyond those provided for or changes to what is stated herein are warranted, DEQ may modify this Permit according to procedures in Permit Condition V.B.3.

9. Data Retention

All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained at the facility during the term of this Permit, including any reissued Permits.

C. SPECIAL CONDITIONS

1. Based on submitted information, DEQ has determined the IRP Sites listed in Table 2(a) require an RFI or currently have an ongoing RFI in the DERP.
2. For those DERP IRP Sites listed in Table 2(b) of this Section, an IRP Site report has been prepared, and the Permittee submitted the Remedial Investigation and Feasibility Study reports to DEQ for review. DEQ accepted these reports, and the IRP Sites are currently undergoing corrective action.
3. Based on the submitted information, DEQ has determined there is no further action required for the DERP IRP Sites, SWMUs, and/or AOCs listed in Table 2(c) of this

Section.

4. There are DERP IRP Sites listed in Table 2(c) as requiring no further action which were underground petroleum product tank sites and were under the authority and jurisdiction of the Oklahoma Corporation Commission; therefore, the following sites are exempt from the requirements of this Permit: IRP Site 13 (Quartermaster Service Station), IRP Site 14 (Abandoned UST by Building 202), IRP Site 15 (Abandoned UST by Building 1023), IRP Site 16 (Abandoned UST by Building 1024), IRP Site 17 (Abandoned UST by Building 1030), IRP Site 18 (Abandoned UST by Building T-1), and IRP Site 19 (Abandoned UST by Building T- 2).

D. CORRECTIVE ACTION

1. Corrective Action for Releases: OHWMA; Section 3004(u) of RCRA, as amended by HSWA; and 40 C.F.R. § 264.101 require that permits issued after November 8, 1984, address corrective action for releases of hazardous waste, including hazardous constituents, from any SWMU at the facility, regardless of when the waste was placed in the unit.
2. Releases Beyond Facility Boundary
 - a. The Permittee shall notify DEQ verbally, within 24 hours of discovery of any release of hazardous waste or hazardous constituent that has the potential to migrate off-site.
 - b. OHWMA; Section 3004(v) of RCRA, as amended by HSWA; and federal regulations promulgated as 40 C.F.R. § 264.101(c) require corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the Permittee demonstrates that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied.
3. Dispute Resolution
 - a. The parties shall use their best efforts to informally and in good faith resolve all disputes or differences of opinion at the Project Manager level. If, however, disputes arise concerning the corrective action which the parties are unable to resolve at this level, including but not limited to disputes over implementation of work plans, approval of documents, scheduling of any work, selection, performance or completion of any corrective action, or any other obligation assumed hereunder, the Permittee shall present a written notice of such dispute, and the basis for the objections, to the Chief Engineer of the LPD of DEQ within ten (10) business days of the receipt of DEQ's original disapproval,

decision, or directive. The notice shall set forth the specific points of the dispute, the position the Permittee maintains should be adopted as consistent with the Permit's requirements thereof, and any matters which it considers necessary for DEQ's proper determination. The Chief Engineer shall provide to the Permittee a written statement of his/her decision on the pending dispute, which shall be deemed incorporated into the final Permit.

- b. If the Permittee objects to the Chief Engineer's determination, the Permittee shall, within ten (10) days of its receipt of the Chief Engineer's written decision, notify DEQ in writing of its objections and may request that the Director of the LPD of DEQ convene an informal conference. Promptly after such conference, the Director shall state in writing his/her decision regarding the issues in dispute. Such decision shall be the final resolution of the dispute and shall be implemented immediately by the Permittee according to the schedule contained therein.

E. REPORTING REQUIREMENTS

- 1. The Permittee shall submit, in accordance with Permit Condition V.B.7, signed quarterly progress reports of all activities (i.e., RFI, CMS) conducted pursuant to the provisions of this Permit no later than the 15th day of the month following the end of the quarter. These reports shall contain:
 - a. A description of the work completed and an estimate of the percentage of work completed;
 - b. Summaries of all findings, including summaries of laboratory data;
 - c. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;
 - d. Projected work for the next reporting period;
 - e. Summaries of contacts pertaining to corrective action or environmental matters with representatives of the local community, public interest groups, or State government during the reporting period;
 - f. Changes in key project personnel during the reporting period; and
 - g. Summaries of all changes made in implementation during the reporting period.
- 2. Copies of other reports (e.g., inspection reports), drilling logs, and laboratory data shall be made available to DEQ upon request.

F. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SWMUs AND POTENTIAL AOCs

1. The Permittee shall notify DEQ, in writing, of any newly identified SWMU(s) and potential AOC(s) (i.e., a unit or area not specifically identified in the RFA) discovered in the course of groundwater monitoring, field investigations, environmental audits, or other means no later than thirty (30) calendar days after discovery. The notification shall include the following items, to the extent available:
 - a. The location of the newly identified SWMU or potential AOC in relation to other SWMUs on the topographic map required in 40 C.F.R. § 270.14(b)(19);
 - b. The type and function of the unit;
 - c. The general dimensions, capacities, and structural description of the unit (supply any available drawings);
 - d. The period during which the unit was operated;
 - e. The specifics, to the extent available, on all wastes that have been or are being managed at the SWMU or potential AOC; and
 - f. Results of any sampling and analysis required for the purpose of determining whether releases of hazardous waste, including hazardous constituents, have occurred, are occurring, or are likely to occur from the SWMU or whether the AOC should be considered a SWMU.
2. Based on the results of this notification, DEQ will determine the need for further investigations or corrective measures at any newly identified SWMU(s) or AOC(s). If DEQ determines that such investigations are needed, DEQ may require the Permittee to prepare a plan for such investigations. The Permit will be modified according to Permit Condition V.B.3 to incorporate the investigation requirements for the newly identified SWMU(s) or AOC(s), if required.

G. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT SWMU(s) AND AOCs

The Permittee shall notify DEQ in writing, no later than fifteen (15) calendar days after discovery, of any release(s) of hazardous waste or hazardous constituents from a SWMU or AOC discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other means as described in OAC 252:205-13-1. Such newly discovered releases may be from newly identified units or from units for which, based on the findings of the RFA, or completed RFI, DEQ had previously determined no further investigation was necessary. The notification shall include information concerning actual and/or potential impacts beyond the facility boundary and on human health and the environment, if available at the time of the notification. DEQ may require further

investigation and/or interim measures for the newly identified release(s) and may require the Permittee to prepare a plan for the investigation and/or interim measure. The plan will be reviewed for approval as part of the RFI Work Plan or a new RFI Work Plan. The Permit will be modified according to Permit Condition V.B.3 to incorporate the investigation, if required.

H. INTERIM MEASURES

1. If, during the course of any activity initiated under this Permit, DEQ determines that a release or potential release of hazardous constituents from a SWMU or AOC poses a threat to human health and the environment, DEQ may require interim measures. DEQ shall determine the specific measure(s) or require the Permittee to propose a measure(s). The interim measure(s) may include a permit modification, a schedule for implementation, and a written plan. DEQ shall notify the Permittee in writing of the requirement to perform interim measures. DEQ shall modify this Permit according to Permit Condition V.B.3 to incorporate interim measures into the Permit.
2. The Permittee may propose interim measures at any time. The proposal shall include a written plan and a schedule for implementation. Depending upon the nature of the interim measure, a permit modification may not be required.
3. The following factors will be considered by DEQ in determining the need for interim measures or presumptive remedies:
 - a. Time required to develop and implement a final remedy;
 - b. Actual and potential exposure to human and environmental receptors;
 - c. Actual and potential contamination of drinking water supplies and sensitive ecosystems;
 - d. The potential for further degradation of the medium in the absence of interim measures;
 - e. Presence of hazardous wastes in containers that may pose a threat of release;
 - f. Presence and concentration of hazardous waste, including hazardous constituents, in soil having the potential to migrate to groundwater or surface water;
 - g. Weather conditions that may affect the current levels of contamination;
 - h. Risks of fire, explosion, or accident; and
 - i. Other situations that may pose threats to human health and the environment.
4. The Permittee shall continue to operate the Central Groundwater Treatment Facility

and to implement the remedies outlined for each location until remediation of groundwater is achieved or another type of remediation system can demonstrate the reduced concentration of contaminants in groundwater does not exceed regulatory levels.

5. The Permittee shall continue to maintain the operating interceptor/collection trenches and extraction wells to provide adequate hydraulic containment of contaminated groundwater. Each system in operation shall be maintained in operative condition until cleanup is achieved or another type of remediation system can demonstrate the reduced concentration of contaminants in groundwater does not exceed regulatory levels.

I. DETERMINATION OF NO FURTHER ACTION

1. Based on the results of the RFI and other relevant information, the Permittee may submit an application to DEQ for a Class 3 permit modification under 40 C.F.R. § 270.42(c) to terminate further corrective action for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste, including hazardous constituents, from a particular SWMU or AOC at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 C.F.R. § 270.42(c).

If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the sixty (60) day public comment period required for Class 3 permit modifications, DEQ determines that releases or suspected releases which were investigated either are non-existent or do not pose a threat to human health and/or the environment, DEQ will grant the requested modification.

2. If necessary to protect human health or the environment, a determination of no further action shall not preclude DEQ from requiring continued or periodic monitoring of air, soil, groundwater, or surface water when site-specific circumstances indicate that releases of hazardous waste or hazardous constituents are likely to occur.
3. A determination of no further action shall not preclude DEQ from requiring further investigations, studies, or remediation at a later date if new information or subsequent analysis indicates a release or likelihood of a release from a SWMU or AOC at the facility that is likely to pose a threat to human health or the environment. In such a case, DEQ shall initiate a modification to the Permit according to Permit Condition V.B.3 and 40 C.F.R. § 270.41.

Table 1
RFI/CMS Submission Summary

Below is a summary of the planned reporting requirements pursuant to this Permit which may be required by DEQ.

<u>ACTIONS</u>	<u>DUE DATE</u>
Progress reports on all activities	Quarterly, no later than the 15 th date of the month following the end of the quarter
Notification of newly identified SWMUs	30 calendar days after discovery
Notification of newly discovered releases	15 calendar days after discovery
Interim Measures Plan	As determined by DEQ
Revised Interim Measures Plan	As determined by DEQ
CMS Plan (if required)	180 calendar days after notification of requirement to perform CMS
Revised CMS Plan	As determined by DEQ, usually within 30 calendar days of receipt of the notice of deficiency
CMS Final Report and Summary (if required)	180 calendar days after completion of CMS
Revised CMS Final Report	As determined by DEQ, usually within 30 calendar days of receipt of the notice of deficiency
RFI Work Plan and Report (if required)	As determined by DEQ

Table 2(a)
DERP IRP Sites, SWMUs, and/or AOCs Requiring or Implementing an RFI

Below is a list of DERP IRP Sites, SWMUs, and/or AOCs characterized as requiring or implementing an RFI.

<u>SITE</u>	<u>DESCRIPTION</u>
ST-011	AQUA/AVGAS Fuel Distribution System
SS-028	Intermediate Zone Spill Site adjacent to ST-008
SS-047	Spill Site at B-047

Table 2(b)
DERP IRP Sites, SWMUs, and/or AOCs Undergoing Corrective Action

Below is a list of DERP IRP Sites, SWMUs (see Note 1), and/or AOCs characterized as undergoing corrective action.

<u>SITE</u>	<u>DESCRIPTION</u>
ST-012 (SWMU 10)	Paint Stripping Equalization Tank
WP-023	Industrial Waste Pit
SS-024	Jet Engine Shop, Building 187
SS-025	COMBS Warehouse
LF-003 (SWMU 3)	Tank Farm Landfill
SS-007 (SWMU 1)	Hazardous Waste Accumulation Point
ST-008 (SWMU 4)	USTs near Building 110 Sludge
DP-005	Disposal Area
ST-011	Former AQUA/AVGAS Fuel System
ST-028	Intermediate Zone Solvent Spill
SS-047	Spill Site at B-047
FT-002 ¹	Fire Training Area 2
SS-026 ¹	Jet Fuel Storage Area

Notes:

1. The corrective action at Site FT-002 and Site SS-026 is long-term groundwater monitoring.

Table 2(c)
DERP IRP Sites, SWMUs, and/or AOCs Requiring No Further Action

Below is a list of historical DERP IRP Sites, SWMUs (see Note 1), and/or AOCs with designations of No Further Action.

<u>SITE</u>	<u>DESCRIPTION</u>
LF-004 (SWMU 5) ¹	East Boundary Landfill
WP-001 (SWMU 7) ¹	Chemical Disposal Pit
SWMU 12.1 ¹	IWTP – Raw Waste Lift Station #1
SWMU 19 ¹	Paint Booth Water Curtain in Building 128
SWMU 20 ¹	Paint Booth Water Curtain in Building 297
SWMU 23 ¹	Concrete Sump outside Building 128
SWMU 26 ¹	Washrack at Building 141
AOC 1	Grit Separator at Building 141
AOC 2	Grit Separator at Building 187
AOC 3	Industrial Wastewater Sewer Lines
AOC 4	Sanitary Wastewater Sewer Lines
AOC 5	Paint Booth Water Curtain in Building 284
AOC 6	Paint Stripping Collection Channel - Building 192
AOC 8	Lift Station East of Building 130
ST-013	Quartermaster Service Station
ST-014	Abandoned UST at Building 202
ST-015	Abandoned UST at Building 1023
ST-016	Abandoned UST at Building 1024
ST-017	Abandoned UST at Building 1030
ST-018	Abandoned UST at Building T-1
ST-019	Abandoned UST at Building T-2
SS-027	Entomology Shop

Notes:

1. SWMU numbers are secondary historical permit action and/or VAFB site designations.

VANCE AIR FORCE BASE

Vance AFB, OKLAHOMA

PERMIT ATTACHMENT 1

POST-CLOSURE PLAN FOR SITE ST-08

**NOTE: ALL THE PAGES FOR THE ATTACHMENTS ARE TAKEN
FROM THE PERMIT APPLICATION AND PAGE NUMBERS MAY
NOT BE IN SEQUENCE.**

**VANCE AIR FORCE BASE
RCRA POST-CLOSURE CARE PERMIT
RENEWAL APPLICATION**

ATTACHMENT 1



POST-CLOSURE CARE PLAN FOR ST008

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POST-COSURE PLAN FOR SITE ST-08
VANCE AIR FORCE BASE, OKLAHOMA

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ACRONYMS

AFB	Air Force Base
BGL	Below Ground Level
CFR	Code of Federal Regulation
CGTF	Central Groundwater Treatment Facility
DEQ	Oklahoma Department of Environmental Quality
DOD	Department of Defense
IRP	Installation Restoration Program
LF	Landfill
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SS	Spill Site
ST	Storage Tank
USAF	United States Air Force
UST	Underground Storage Tank

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1.0 INTRODUCTION

Vance Air Force Base (AFB) has submitted this Post-Closure Plan in accordance with 40 CFR Code of Federal Regulations (CFR) Part 264.118. It is also intended to fulfill the requirements of the Part B Post-Closure Permit Application for the renewal of the existing permit issued on August 6, 1996 by Oklahoma Department of Environmental Quality (DEQ). Regulations for the Part B Post-Closure Permit include but are not limited to applicable section of 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal, Subpart G, Closure and Post-Closure, 40 CFR 270, Hazardous Waste Permit Program, Subpart B, Permit application, and all Oklahoma Department of Environmental Quality (DEQ) Land Protection Division rules and regulations as applicable.

1.1 Site Location, Description and History

Vance AFB lies in north central Oklahoma, in Garfield County, about 5 miles southwest of downtown Enid, Oklahoma. Figure 1-1 provides a location map. The base covers approximately 2,122 acres and is surrounded by privately owned farming lands. The majority of Vance AFB is dedicated to aircraft runways and taxiways that cover approximately 1,100 acres. Base living quarters for Air Force personnel and their dependent are located on the far northeastern side of base in the military family housing area. In addition to the facilities at Vance AFB, a remote facility known as Kegelman Auxiliary Field (KAux) is used for "touch- and-go" landings. KAux is located 30 miles north-northwest of Vance AFB in Alfalfa County, Oklahoma. Figure 1-1 shows the location of Vance AFB and KAux.

Site ST-08 consists of the former underground storage tanks (USTs) at Building 110. The Site is located in the northern area of Vance AFB, due south of Site SS-07, west of Elam Road, and east of the flight line. Figure 1-2 is a Site ST-08 location map.

Site ST-08 has five (5) USTs that were removed in March 1989. The individual tanks were designated as UST #106, UST #108, UST #109, UST #112 and UST #113. UST #106 was the farthest west in the series of tanks. Each tank had a capacity of 12,000 gallons and was constructed of steel. From 1941 to 1970, USTs #108 and #109 stored lubricating oil, UST #112 stored diesel fuel, UST #113 stored kerosene, and UST #106 stored oil. These USTs were located southeast of Building 116 (Building 110 has been demolished) at the northeast corner of the flight line apron.

From 1970 to 1980, UST #106 stored a variety of solvents, contaminated fuels, and waste oils. UST #106 was removed in 1989; however, contaminants in the soil were left in place during closure and the area was covered with a Resource Conservation and Recovery Act (RCRA) concrete cap. The RCRA Closure Plan was approved in 1990. A summary of that plan is provided in the following paragraphs.

1.2 RCRA Closure Plan

The RCRA Closure Plan, dated April 1990, presented the results of extensive soil and groundwater sampling conducted at the Site, an evaluation of the nature and extent of

contamination and presented "clean" and "landfill" closure plans. The "landfill" closure plan was chosen since the Site could not be "clean closed". After the removal of the tank and once foot of topsoil, the subgrade was compacted and covered with a compacted aggregate base layer. The top layer of the final landfill cap system consisted of a minimum of 10 inches of reinforced concrete. The final concrete cap was approximately one hundred feet by eighty feet and had a three percent slope to a concrete curb system located along the cap and soil interface. Figure 1-3 is a Site plan of conditions prior to closure. Figure 1-4 is a topographic map. Figure 1-5 is a landfill closure cap plan and Figure 1-6 is a concrete cap section. Closure certification of IRP Site ST-08 was accepted by Oklahoma State Department of Health Hazardous Waste Management Services in a letter dated April 13, 1993. The approved closure plan, modifications, and all correspondence are available for review in the Information Repository at the Enid Public Library.

A RCRA Post-Closure Plan, dated November 1990 was the regulatory mechanism for post-closure activities until the RCRA Post-Closure Care Permit was issued to Vance AFB on August 8, 1996. The Permit incorporated both the Closure and Post-Closure Plans. The Permit identified groundwater and soil contamination associated with releases from former USTs near Building 110. As a results, the Permit required corrective action and monitoring of specified monitoring wells at Site ST-08 on a semi-annual basis, as set forth in Permit Conditions IV.C.2 and IV.C.3.

Site ST-08 is one of six sites known as the Industrial Zone. Even though only ST-08 is the subject of this post-closure plan, information from the other Sites is included because they are all part of one operable unit. Site ST-13 is a petroleum site and is considered closed. There is no ongoing activity at this Site.

Corrective action occurred in 1996 when Site ST-08 and SS-07 were connected to the newly constructed Central Groundwater Treatment Facility (CGTF). In September 1997 a final work plan for the construction of an interim remedial action was submitted to Oklahoma DEQ for approval. Upon approval, construction of an interceptor collection trench took place in November 1997. Further corrective action took place when a final work plan for an interim remedial action at North Site SS-07, dated November 16, 2001 was approved by DEQ. Another interceptor collection trench was constructed in January 2002. The two trenches collect contaminated groundwater, which is transported via a gathering system to the CGTF. A site map is shown on Figure 2-1. In March 2003 the monitoring well network for the Industrial Zone was expanded in a permit modification. A list of wells for Site ST-08 is shown in Figure 2-5. Final remedial action for the Industrial Zone took place when a final work plan, dated February 2003, was approved by DEQ for the installation of a free product recovery system and a phytoremediation system at Site LF-03. Construction was completed in May 2004.

Additional remediation was initiated in 2017 to address the residual soil contamination as well as residual contamination in the shallow transmissive zone at ST-08 (AECOM, 2015). The remediation will consist of the installation and operation of a dual phase extraction system in the vicinity of the old tank pit. A new site was discovered immediately up-gradient of Site ST-08. The Site has been designated SS-28 and monitoring well MW08-18 has been reassigned to this site.

1.3 Scope of Post-Closure Plan

The scope of appropriate post-closure activities described within this Post-Closure Plan has been developed to satisfy the specific requirements of 40 CFR 264.117 through 264.120. This Post-Closure Plan consists of the following sections:

Section 2	Groundwater Monitoring
Section 3	Inspection and Maintenance Activities
Section 4	Post-Closure Care Implementation and Duration
Section 5	Post-Closure Care Documentation and Certification
Section 6	References

2.0 GROUNDWATER MONITORING

The groundwater monitoring activities discussed in this section provide a description of the following items:

- Existing conditions at Site ST-08
- Monitoring well network
- Evaluation procedures and frequency for groundwater sampling
- Types of laboratory analyses

2.1 Existing Conditions

Groundwater occurs at Site ST-08 from six to twelve feet below land surface and flows to the north-northeast. A geologic cross section is shown in Figure 2-2. A potentiometric surface map is shown in Figure 2-3. The CGTF had been operating only 8 hours a day until June 2004, when it began operations 24 hours a day/7 days per week. The increasing distance between the potentiometric contours up-gradient of the two interceptor collection trenches located on Site SS-07 suggests that the shallow transmissive zone is shifting to a new equilibrium state with a broader capture zone and flatter gradients. The hydraulic gradient was last calculated to be 0.005 ft/ft for the shallow transmissive zone in September 2003. The average hydraulic conductivity is estimated to be 6.75×10^{-4} cm/sec for the shallow transmissive zone. The groundwater flow velocity in the shallow zone had an average rate of 17.5 ft/yr. A photograph of the Site is shown in Figure 2-4.

2.2 Monitoring Well Network

The compliance monitoring well network for Site ST-08 consists of two monitoring wells screened in the shallow transmissive zone (10 to 30 feet below ground level (bgl)).

2.3 Evaluation Procedures

All compliance well samples at Site ST-08 are taken annually. During each event, wells are purged and sampled in accordance with the Sampling and Analysis Plan (SAP) provided in Attachment 3-1 to the 2020 Permit Renewal Application.

2.4 Types of Laboratory Analysis

Groundwater is sampled for volatile organic compounds, Naphthalene, TPH and RCRA metals. Methods and procedures are outlined in detail in the SAP provided in Attachment 3-1.

3.0 INSPECTION AND MAINTENANCE ACTIVITIES

Throughout the post-closure care period, the integrity and effectiveness of the concrete cap and other site features will be monitored and maintained. The appropriate post-closure care inspections and maintenance activities for the concrete cap, run-off and run-on control measures, and monitoring wells equipment are listed in Figure 3-1.

The appropriateness and effectiveness of the groundwater monitoring system will be routinely evaluated and modified throughout the post-closure care period.

Although the final concrete cap is inherently secure, restricted facility access and other site security measures will help prevent unauthorized disturbance of the final concrete cap and associated site features.

The semi-annual site inspection activities will require approximately two hours of onsite personnel time during each event. United States Air Force (USAF) contractors will conduct site inspections while completing sampling and analysis events. A site inspection will also be conducted after any known earthquake, severe storm, or disturbance in the vicinity of the Site.

Each site inspection will assess the integrity and effectiveness of the concrete cap system and other site features.

Stored equipment and vehicles will be moved as necessary to facilitate site inspections, maintenance activities, and repair efforts.

Qualified personnel will investigate subsided or settled area of the concrete cap system before repair to determine the cause of displacement.

Drainage structures in the vicinity of the Site will be kept free of vegetation and debris. Erosion of soils bermed adjacent to the final cap will be restored to the original contours. Additional surface grading will also be performed as necessary to prevent ponding or run-on conditions.

Records of all maintenance and repair activities conducted during the post-closure care period will be kept at the facility.

4.0 CLOSURE CARE IMPLEMENTATION AND DURATION

4.1 Point of Contact

A copy of the approved Post-Closure Plan will be kept at the facility throughout the post-closure care period. The current point of contact at the facility for matters concerning the post-closure care of the Site is as follows:

Ms. Gail Hamill

Remediation Project Manager
140 Channel Street, Suite #102
Vance AFB, Oklahoma 73705-5610
(580) 213 - 6419

In addition, the facility contact will be responsible for updating the post-closure plan as needed and ensuring that OSDH and EPA copies are also kept current.

If operations at Vance AFB were to cease before the end of the post-closure care period, another contact point will be provided to DEQ 180 days prior to operations ceasing at Vance. The Tinker Installation Support Section (ISS) would be the secondary contact during the post-closure care period. That point of contact is as follows:

Mr. James Dawson
Tinker ISS
Building 1, Room 221
Tinker AFB, Oklahoma 73145
(405) 736 - 3060

4.2 Site Security

Vance AFB is a Department of Defense facility with restricted access to the property. Vance AFB is fenced, secured, and patrolled by security personnel 24 hours a day. The ongoing security program includes daily inspection of all perimeter fences and gates for damage caused by intruders, accidents, or natural events. Damaged fencing is repaired or replaced as soon as practically possible.

4.3 Duration of Post-Closure Care Period

The post-closure care period will be 30 years from the date of the final closure of the UST#106 Site. In a letter from Oklahoma State Department of Health (now DEQ the acceptance of closure certification was April 13, 1993).

4.4 Modification of Post-Closure Care Period

The Oklahoma DEQ Administrative Authority may shorten or lengthen the post-closure care period applicable to the hazardous waste management unit, or facility in accordance with 40 CFR 264.117(2)(i) and (ii).

Vance AFB may submit a written notification or request to the DEQ Administrative Authority for a permit modification at amend the post-closure plan at any time during the active life of the facility or during the post-closure care period in accordance with 40 CFR 264.118(d)(1)(2).

5.0 POST-CLOSURE CARE DOCUMENTATION AND CERTIFICATION

5.1 Post-Closure Documentation

The post-closure documentation to be retained by the designated point of contact specified in Section 4.1 will include the following items:

- Survey plat from the final closure activities
- Closure certification documents
- Local zoning authority approval and filing of survey plat and restrictive covenant
- Surveying and recordkeeping information
- Groundwater monitoring records of sampling, analyses, and results
- Copies of all the approved Post-Closure Plans and modifications used during the post-closure care period
- Copies of any field notes, site photographs, survey data, or field reports that have been generated during the semi-annual inspection activities
- Records of all maintenance and repair activities conducted at the site during the post-closure care period.

5.2 Post-Closure Certification

Semi-annual inspections, to be conducted throughout the 30-year post-closure care period, will result in information associated with 60 inspections. Copies of all the post-closure documentation items listed in Section 5.1 will be made available for review.

Upon completion of the post-closure period, an independent professional engineer registered in Oklahoma and a Vance AFB official will certify that the post-closure care activities have been conducted in accordance with the approved Post-Closure Plan and any approved modifications to the plan.

Certification documents will be submitted to the Oklahoma DEQ Administrative Authority within 60 days of completion of the established post-closure care period. When Vance AFB submits the certification documents, it will request that DEQ confirm the end of the post-closure care period for Site 8.

6.0 REFERENCES

AECOM, 2015, Draft Final Remedial Design/Corrective Measures Implementation Plan for ST-08, Vance AFB, Oklahoma, July

Title 40 CFR Part 264, Standards for Owners and operators of Hazardous Waste Treatment, Storage, and Disposal

Title 40 CFR Part 270, Hazardous Waste Permit Program

Vance AFB, 1990 Approved Closure Plan UST#106 at Building 106 (IRP Site 8) and all subsequent modifications

Vance AFB, 1990 Approved Post-Closure Plan, UST# 106 at Building 106 (IRP Site 8) and all subsequent modifications

Vance AFB, Final Project Work Plan, Central Groundwater Treatment Facility, June 18, 1996

Vance AFB, Final Project Work Plan, Industrial Zone Interim Remedial Action, September, 1997

Vance AFB, Final Project Work Plan, Industrial Zone Interim Remedial Action, North Site SS-07, November 16, 2001

Vance AFB, Final Project Work Plan, Industrial Zone Remedial Action, November 2

Figure 1-1: Location Map

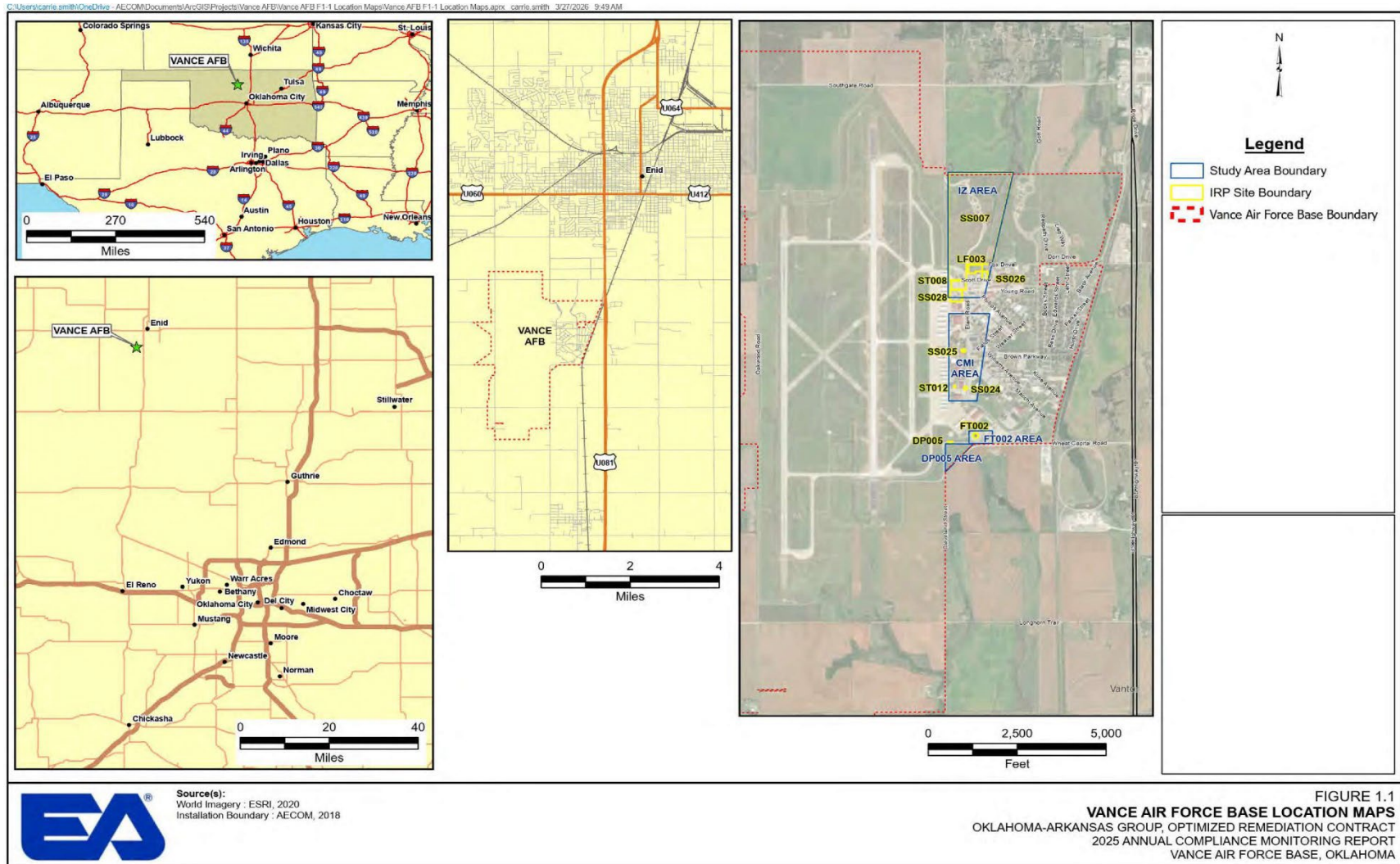


Figure 1-2 Site ST-08 Location

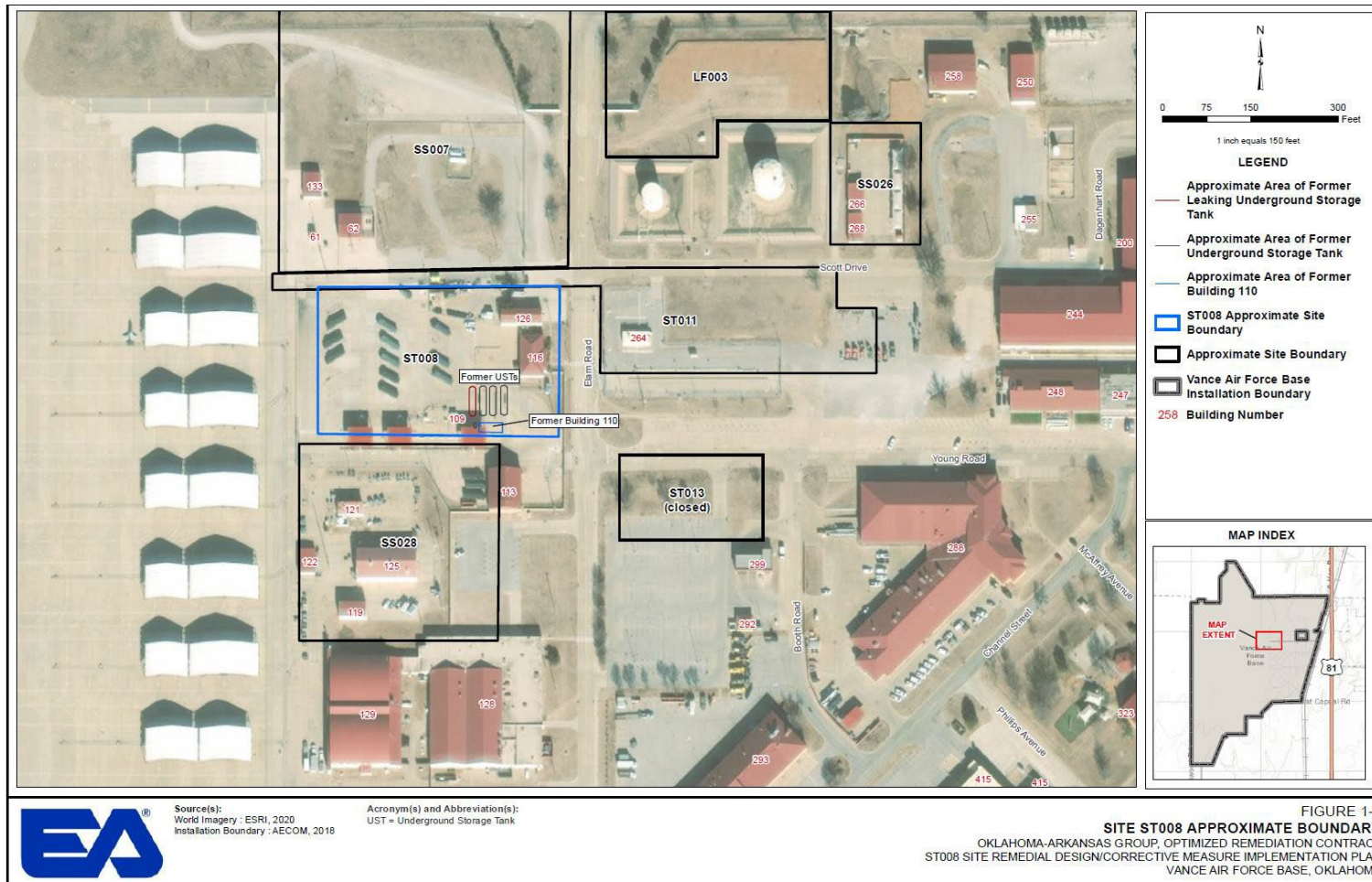
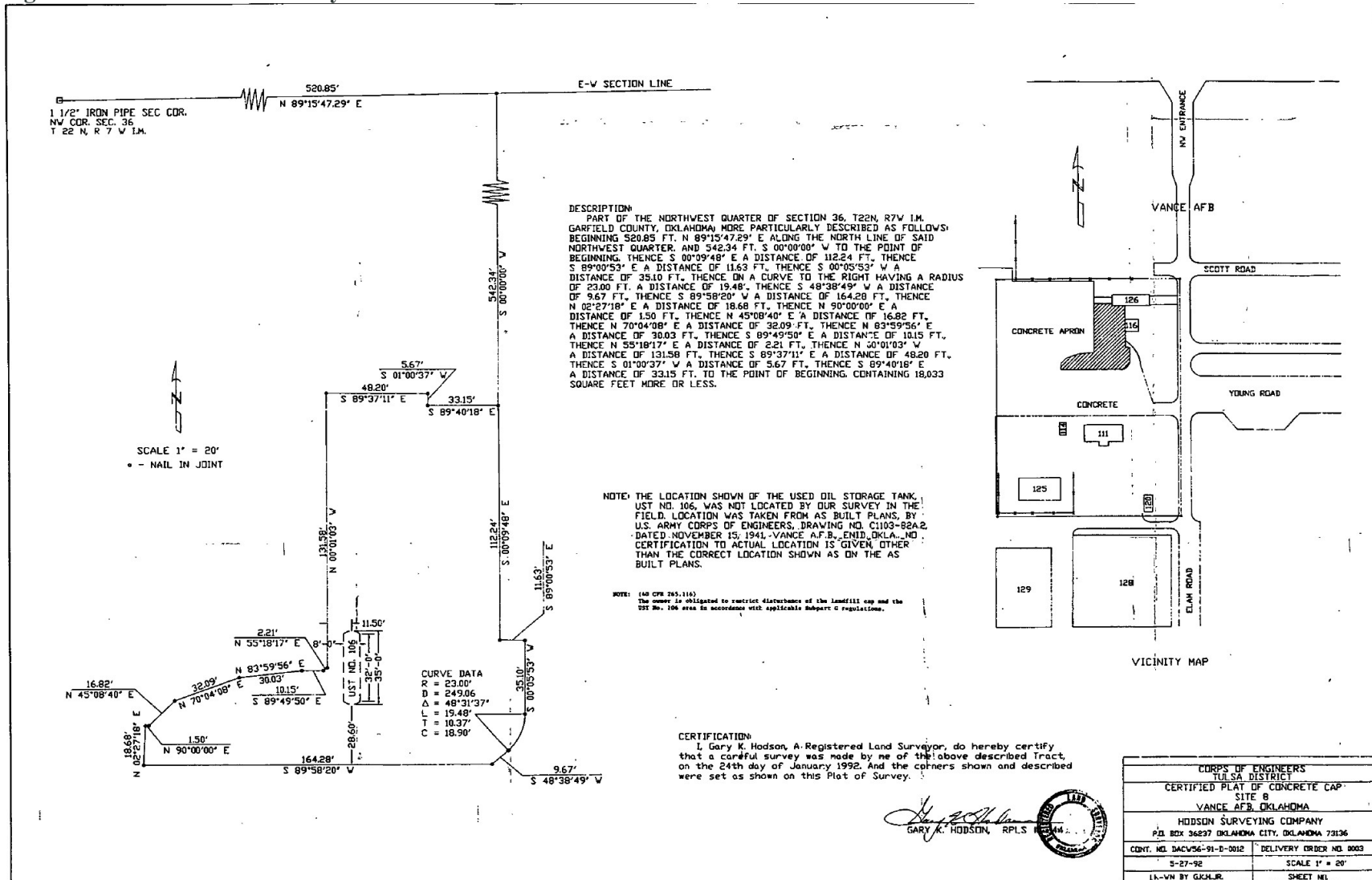


Figure 1-3 Site ST-08 Site Survey



Post-Closure Plan for Site ST-08

A1-12

March 2025

Figure 1-4 Topographic Map

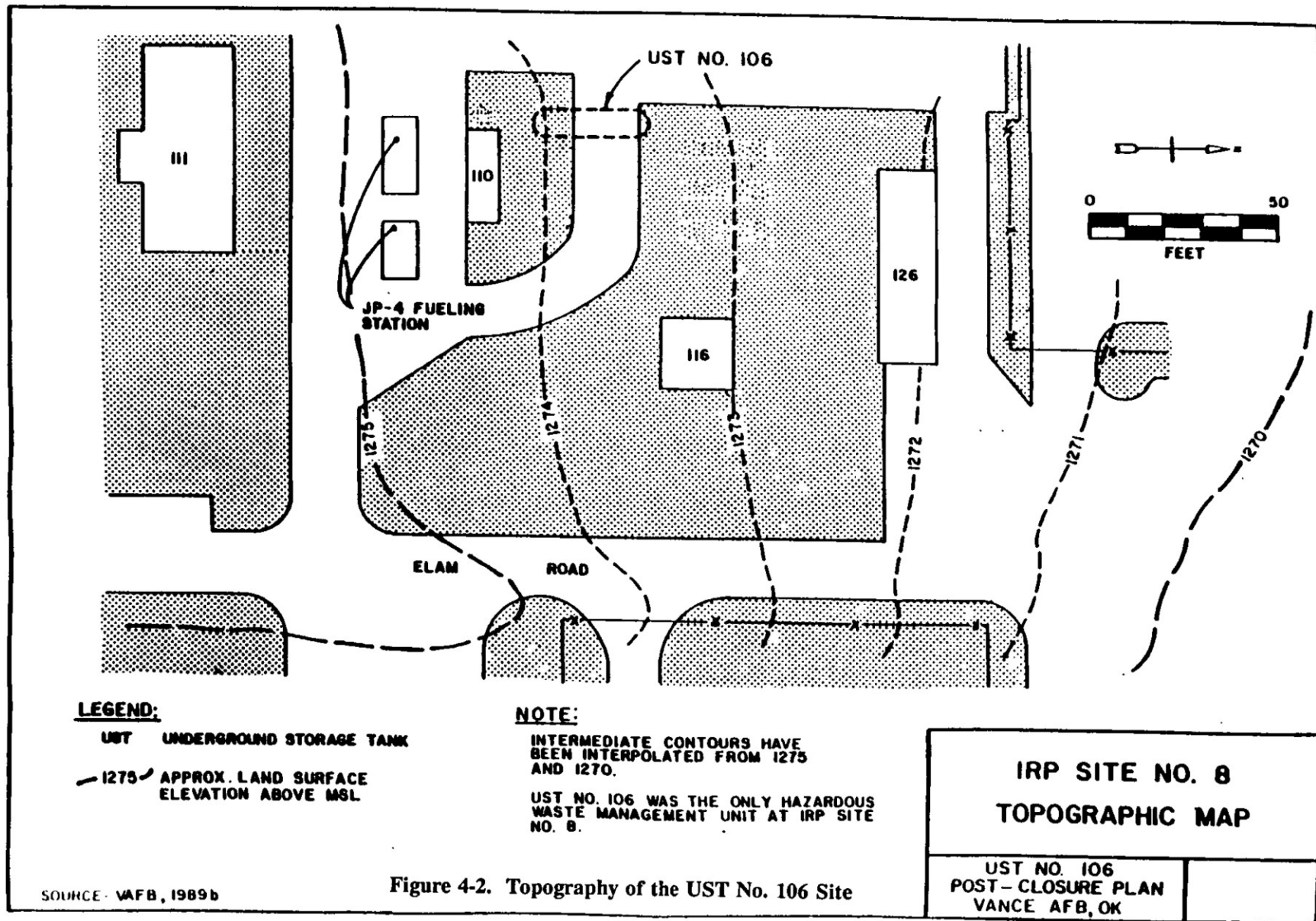


Figure 1-5 Landfill Closure Cap Plan

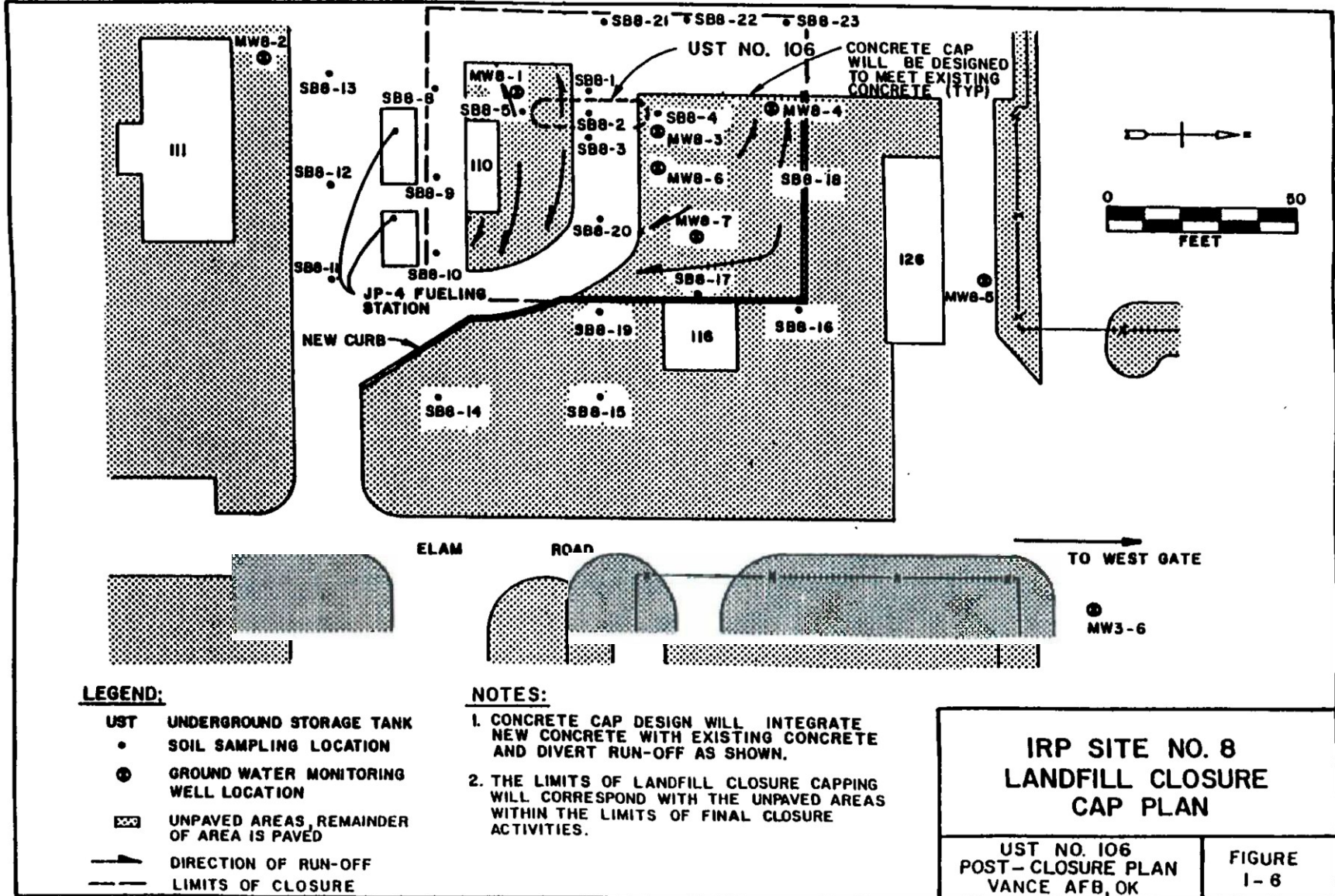
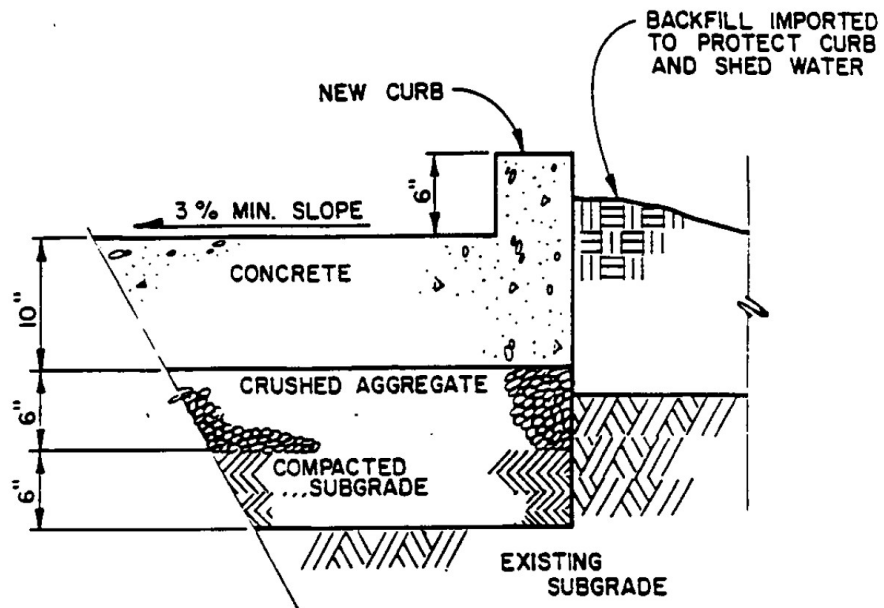


Figure 1-6 Landfill Closure Cap Section



CONCRETE CAP SECTION

NOTE: DESIGN MEETS USAF PAVEMENT SPECIFICATIONS.

IRP SITE NO. 8
LANDFILL CLOSURE
CAP SECTION

UST NO. 106
POST-CLOSURE PLAN
VANCE AFB, OK

FIGURE
1-7

Figure 2-1 Industrial Zone IRP Sites

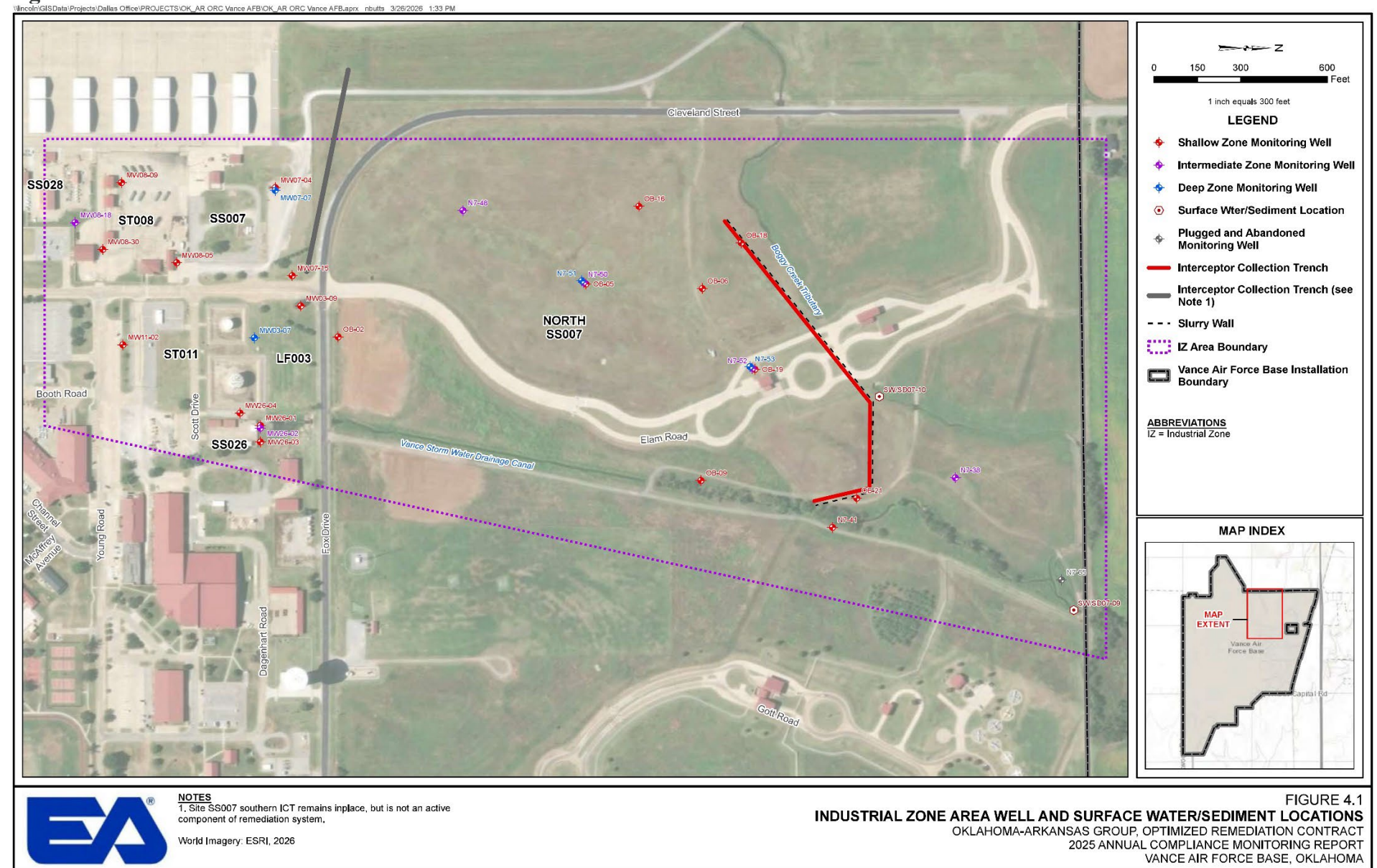


Figure 2-2 Geologic Cross Section

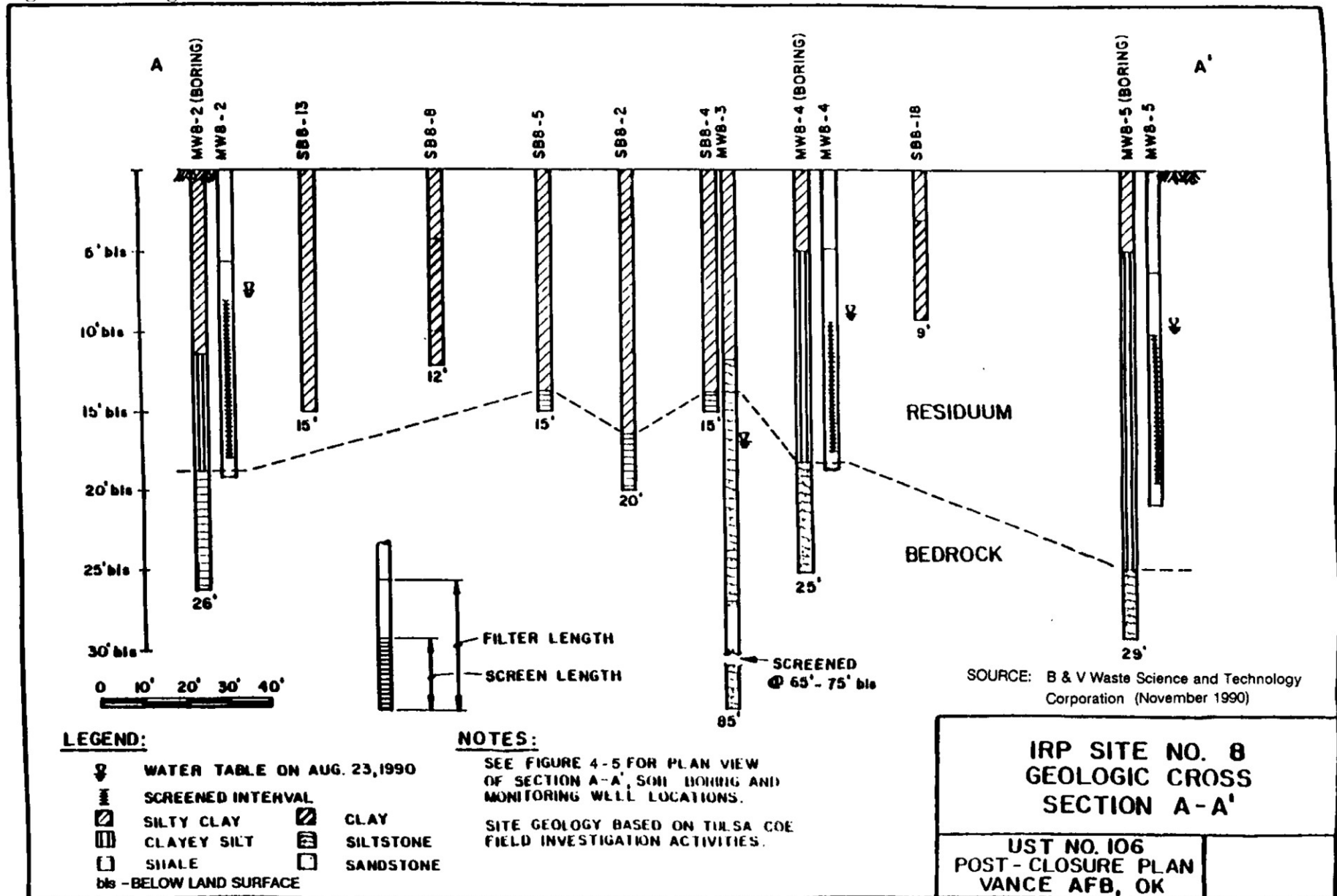


Figure 2-3 Potentiometric Surface Map

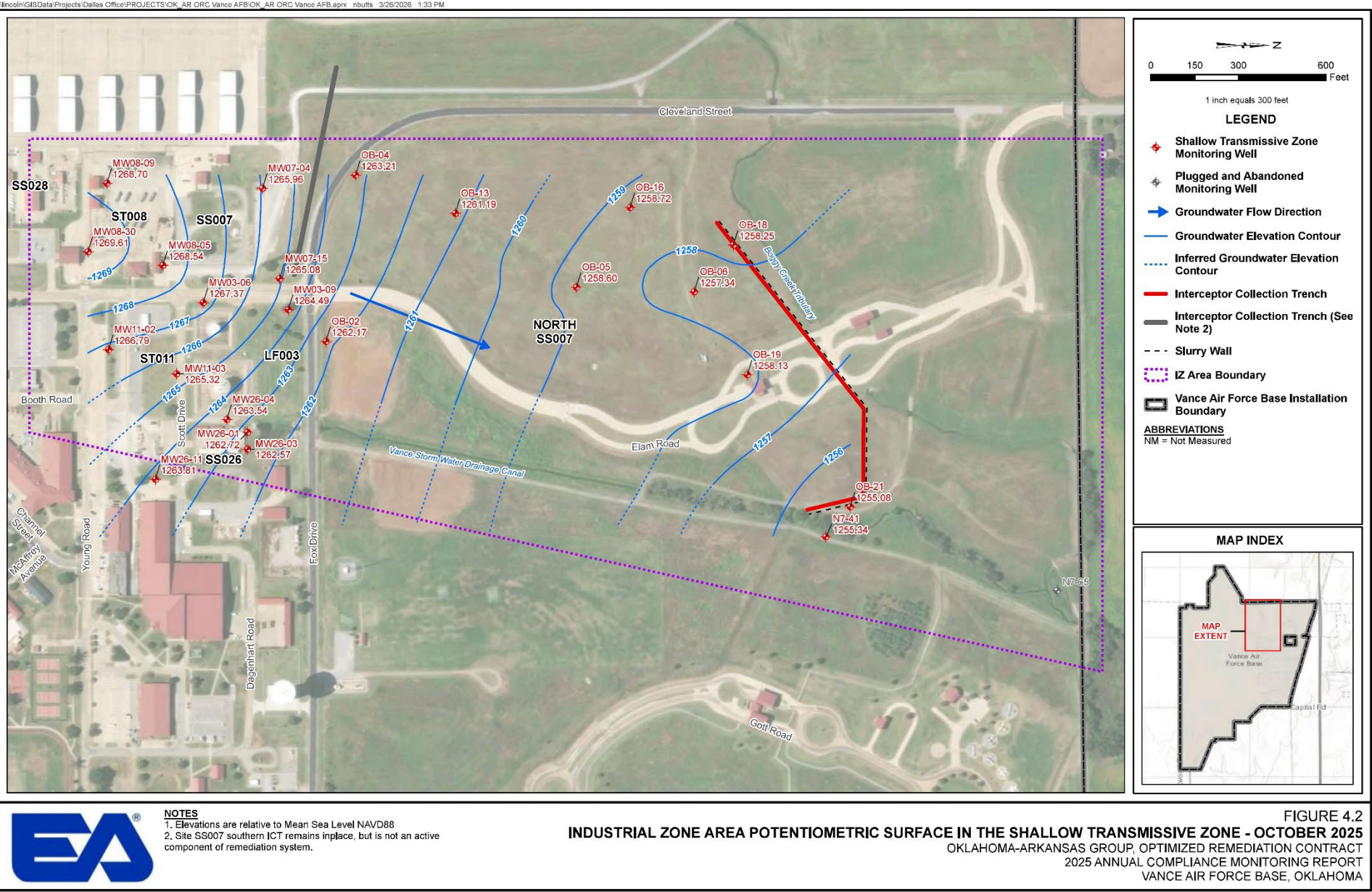


Figure 2-4 Photograph of Site ST-08

IRP SITE ST-08



Figure 2-5

COMPLIANCE MONITORING WELL NETWORK
SITE ST-08

The following monitoring wells are sampled as shown:

Well ID	Well Type	Monitoring Frequency
Site ST-08		
8-05	Shallow	Annual
8-09	Shallow	Annual

Wells sampled for volatile organic compounds, Naphthalene, TPH and RCRA metals in accordance with the Sampling and Analysis Plan.

Figure 2-6 Industrial Zone Monitoring Wells (2023)

C:\Data\Federal\OK_AR_ORCID\GIS\Vance\MXD and PDFs\Vance Annual CM Report\2023\Vance Figure X Site SS007 Shallow TCE Concentrations.mxd jcdhertz 9/7/2023 8:08:46 AM

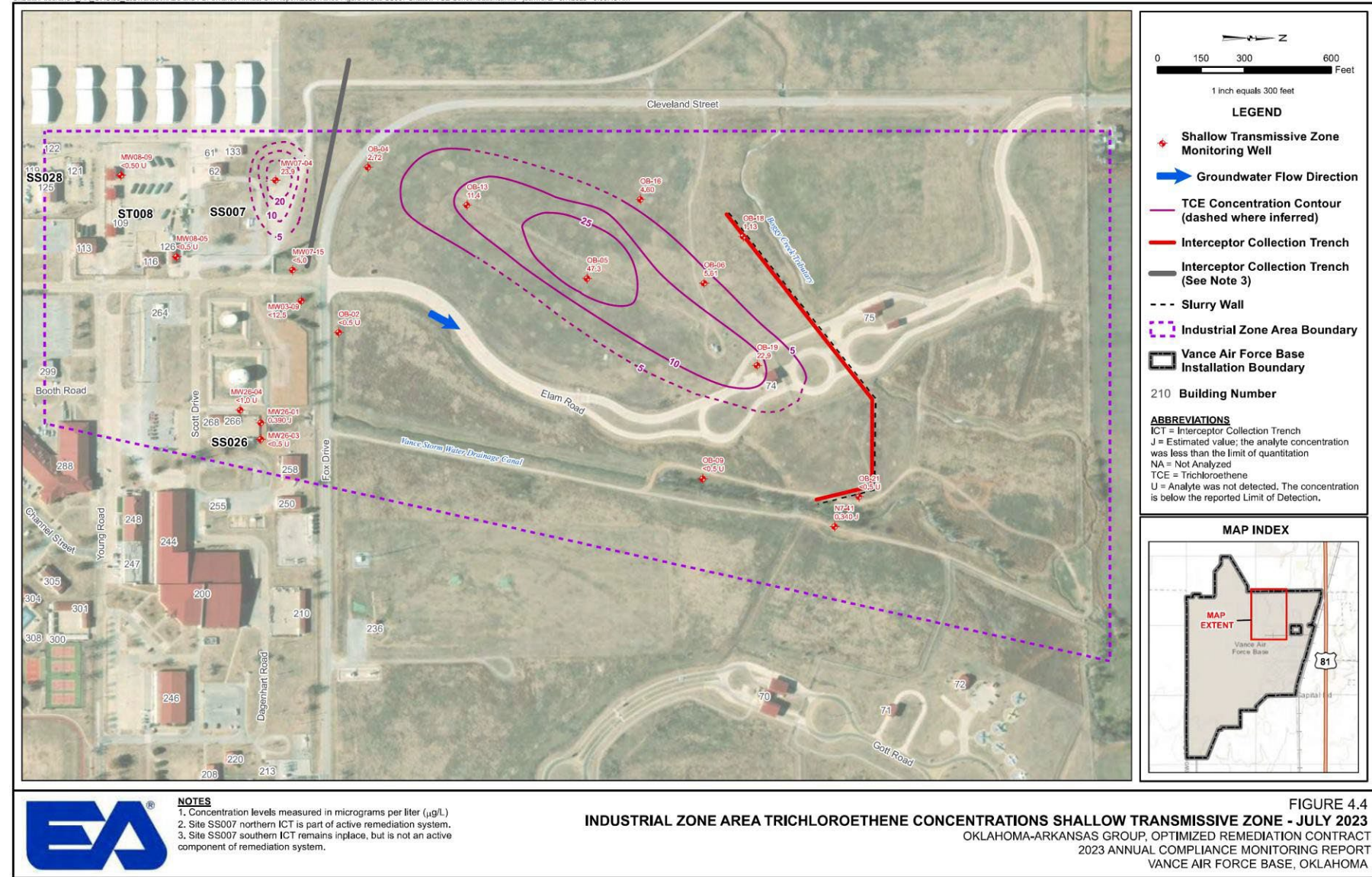


Figure 3-1

INSPECTION AND MAINTENANCE ACTIVITIES

<u>Item</u>	<u>Potential Problems</u>	<u>Maintenance Response</u>
Concrete Cap Surface	Cracking Vegetative Growth in Cracks Holes Structural Damage	Seal or Patch Remove Vegetation/Repair Cracks Seal or Patch Resurface/Replace Portions of Cap
Run-off and Run-on	Surface Ponding Unsatisfactory Runoff Downgrade Ponding Erosion of Adj. Soil	Resurface Cap Depression Resurface Cap Resurface and/or Grade Adj. to Cap Import Additional soil and/or Grading Adjacent to Cap
DPE	Wells not pumping pipes clogged	Repair or replace equipment remove sediment
Monitoring Well Equipment	broken risers tampered, broken or stolen locks Broken, stolen or lost bailers Minimal or no recovery of samples Damaged Well cap/casing	Repair or replace Replace locks Replace dedicated bailers Replace monitoring well Replace well cap or monitoring well
Surveyed Benchmarks Or Markers	Physical Damage Severe Weathering Evidence of Tampering Physically Obstructed	Establish Substitute Benchmark(s) Establish Substitute Benchmark(s) Establish Substitute Benchmark(s) Uncover and provide protection

Note: Vance AFB's perimeter fence is routinely inspected and repaired as necessary.

VANCE AIR FORCE BASE

Vance AFB, OKLAHOMA

PERMIT ATTACHMENT 2

POST-CLOSURE PLAN FOR SITE ST-012

**NOTE: ALL THE PAGES FOR THE ATTACHMENTS ARE TAKEN
FROM THE PERMIT APPLICATION AND PAGE NUMBERS MAY
NOT BE IN SEQUENCE.**

**VANCE AIR FORCE BASE
RCRA POST-CLOSURE CARE PERMIT
RENEWAL APPLICATION**

ATTACHMENT 2



POST-CLOSURE CARE PLAN FOR ST012

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POST-CLOSURE PLAN IRP SITE ST012
VANCE AIR FORCE BASE, OKLAHOMA

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
BGL	Below Ground Level
CFR	Code of Federal Regulations
CGTF	Central Groundwater Treatment Facility
DEQ	Oklahoma Department of Environmental Quality
DOD	Department of Defense
IRP	Installation Restoration Program
LF	Landfill
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SS	Spill Site
ST	Storage Tank
USAF	United States Air Force
UST	Underground Storage Tank

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1.0 INTRODUCTION

Vance Air Force Base (VAFB) has submitted this Post-Closure Plan in accordance with 40 Code of Federal Regulations (CFR) Part 264.118. It is also intended to fulfill the requirements of the Part B Post-Closure Permit Application for the renewal of the existing permit issued on August 6, 1996 by Oklahoma Department of Environmental Quality (DEQ). Regulations for the Part B Post-Closure Permit include but are not limited to applicable sections of 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal, Subpart G Closure and Post-Closure, 40 CFR 270, Hazardous Waste Permit Program, Subpart B, Permit application, and all Oklahoma Department of Environmental Quality (DEQ) Land Protection Division rules and regulations as applicable.

1.1 Site Location, Description, and History

Vance AFB lies in north central Oklahoma, in Garfield County, about 5 miles southwest of downtown Enid, Oklahoma. Figure 1-1 provides a location map. The base covers approximately 2,122 acres and is surrounded by privately owned farming lands. The majority of Vance AFB is dedicated to aircraft runways and taxiways that cover approximately 1,100 acres. Base living quarters for Air Force personnel and their dependents are located on the far northeastern side of the base in the military family housing area. In addition to the facilities at Vance AFB, a remote facility known as Kegelman Auxiliary Field (KAux) is used for "touch- and-go" landings. KAux is located 30 miles north-northwest of Vance AFB in Alfalfa County, Oklahoma.

Site ST012 consists of an underground paint stripping equalization tank (PSET) (concrete vault) that was used to provide temporary holding and separation of paint stripping wastes from 1967 to 1988. The PSET was located immediately southeast of Building 192 in which aircraft were periodically repainted as part of a maintenance program. In 1988, the tank was taken out of service. Figure 1-2 is a Site ST012 location map.

The RCRA Closure Plan was approved in January 1994 and amended in October 1994. A summary/history of that plan is provided in the following paragraphs.

1.2 RCRA Closure Plan

The RCRA Closure Plan, dated January 1994 and the amendment dated October 1994, presented the results of extensive soil and groundwater sampling conducted at the site, an evaluation of the nature and extent of contamination and presented "clean" and "landfill" closure plans. The "landfill" closure plan was chosen since the site could not be "clean closed". The amendment to the closure plan provided details for the tank removal.

In a letter dated March 27, 1995, a project work plan for an interim remedial action at Site ST012 was approved by Oklahoma DEQ. In May 1995, the contents of the PSET, approximately 200- 300 gallons of water and residual sludge, was removed, tested and disposed of as required. The top five feet of clean soil was removed and later used for backfill. A modular trench box was installed to prevent the need for shoring. The demolition and removal of the PSET occurred on June 5-6, 1995. Concrete debris from demolition of the PSET was classified as RCRA

hazardous waste and transported to a permitted hazardous waste landfill. Soils surrounding the PSET were removed to a depth at which bedrock was encountered at approximately 10 feet below existing ground surface. Excavated soil was tested and disposed of as required.

Geotextile filter fabric was placed and filled against the excavation bottom and side walls. The sump pipe was positioned in place. The excavation was filled with coarse stone to the designed elevation. A section of filter fabric was placed on top. A layer of sand was placed atop the geotextile fabric followed by placement of HDPE liner. A soil cap was placed and compacted on top of the liner. Concrete pavement was replaced and extended to the west and south. A complete description of the tank removal process can be found in the Final Quality Control Summary Report for the Interim Remedial Action for the PSET, dated September 13, 1995.

Figure 1-3 is a geologic cross section of Site ST012. Figure 1-4 is a 2017 potentiometric surface and groundwater flow map. Figure 1-5 is a 2021 potentiometric map.

A RCRA Post-Closure Care Permit was issued to Vance AFB on August 8, 1996. The Permit incorporated the approved Closure Plan and subsequent amendment and a Draft Post-Closure Plan. The Permit required corrective action and monitoring of specified monitoring wells at Site ST012 on a semi-annual basis, as set forth in Permit Conditions IV.C.2 and IV.C.3. A RCRA Facility Investigation was conducted in 1998 with a final report dated December 1998. A follow-on corrective measures study was conducted in 1998. A report dated April 28, 1998, five corrective measures alternatives were deployed, evaluated and ranked. Alternative number 2, Groundwater Extraction was selected as the final remedy. Field activity for the final remedy was completed on April 27, 2002 and a final report, dated October 18, 2002 was submitted to DEQ for approval. DEQ approval was obtained in a letter dated November 18, 2002.

In April 2008, the Permit was modified to reduce groundwater monitoring frequency at Site ST012 from semi-annual to annual.

In 2014, the ST012 remedy was changed to injections of emulsified vegetable oil creating conditions conducive to enhanced reductive dechlorination of chlorinated volatile organic compound (CVOC) contamination. The groundwater extraction system was turned off and retrofitted to an SVE system in order to efficiently reduce contaminant mass in the subsurface by volatilizing VOCs in the vadose and "smear" zone soils. The use of the SVE was discontinued in 2016 due to low mass removal rates and no significant methane concentrations being extracted by the system.

1.3 Scope of Post-Closure Plan

The scope of appropriate post-closure activities described within the Post-Closure Plan has been developed to satisfy the specific requirements of 40 CFR 264.117 through 264.120. This Post-Closure Plan consists of the subsequent sections:

- | | |
|-----------|---|
| Section 2 | Groundwater Monitoring |
| Section 3 | Inspection and Maintenance Activities |
| Section 4 | Post-Closure Care Implementation and Duration |

Section 5	Post-Closure Care Documentation and Certification
Section 6	References

2.0 GROUNDWATER MONITORING

The groundwater monitoring activities discussed in this section provide a description of the following items:

- Existing conditions at Site ST012
- Monitoring well network
- Evaluation procedures and frequency for groundwater sampling
- Types of laboratory analyses

2.1 Existing Conditions

Site ST012 is one of four sites known as the Corrective Measures Implementation (CMI) sites. Even though only Site ST012 is the subject of this post-closure plan, information from the other sites is included because they are all part of one operable unit. Site WP023, the Industrial Waste Pond, is located between building 182 and 183, approximately 250 feet north of the former PSET. It is believed that the waste pond was abandoned when the paint stripping operation moved to Building 192 in 1967. Site SS024, the Jet Engine Shop, is located approximately 100 feet east of Site ST012 and was a spill site for hazardous materials. Site SS025 the Contractor Owned Management Base Supply (COMBS) Warehouse is located north and east of Site ST-12. Contaminants for SS025 originated from a wash rack associated with a previous building.

Historically, recovered groundwater from the ST012 site was pumped to the Central Groundwater Treatment Facility (CGTF) since May, 1998 via a gathering system. Recovered groundwater from Sites SS024 and SS025 was pumped to the CGTF since May 2002. No extraction well was installed at Site WP-23. Treated groundwater was discharged to the sanitary sewer and then to the City of Enid, Publicly Owned Treatment Works, until 2014.

In 2014, the ST012 remedy was changed to injection of emulsified vegetable oil creating conditions conducive to enhanced reductive dechlorination (ERD) in areas of elevated concentrations (i.e., hot spots) in the shallow, intermediate, and deep zones to reduce contaminant mass and mass flux. The remedy also has flow-through biobarrier walls to treat the down-gradient portions of the plume.

In addition to the ERD, the groundwater extraction system was retrofitted as a soil vapor extraction (SVE) system to efficiently reduce contaminant mass in the subsurface by volatilizing VOCs in the vadose and "smear" zone soils. The system also created a negative pressure beneath building 192 that mitigates/prevents soil vapors from entering the building through the sub-slab foundation. The use of the SVE was discontinued in 2016 due to loss mass removal rates and no significant methane concentrations being extracted by the system.

The existence of three water-bearing zones in the CMI area was determined by the RCRA Facility Investigation in 1998. These zones are referred to as the shallow, intermediate, and deep transmissive zones. The shallow transmissive zone occupies the lower portion of the unconsolidated overburden and the upper portion of the underlying weathered bedrock. It is the broadest of the three zones, averaging 15 to 20 feet thick. The direction of groundwater

migration, as inferred from the potentiometric surface map, is generally from south to north. The intermediate transmissive zone is similar to the shallow transmissive zone in orientation, elevation and inferred flow direction. The deep transmissive zone is the thinnest of the three units, averaging 5 to 7 feet thick. The orientation of the potentiometric surface of the deep transmissive zone is different. It exhibits high elevations and steep slopes beneath the western portion of the area and much lower elevations and a virtually flat gradient beneath the eastern portion of the CMI area. The difference in water level elevation between the two domains is as great as 25 feet. The inferred flow directions, for potential contaminant migration is from Site ST012 and WP023 from the southern portion of Site SS024 into Site SS025 and the eastern portion of Site SS024. The groundwater flow velocities calculated for the shallow transmissive zone in 2004 were 40.29 ft/yr and 54.36 ft/yr respectively for May and November 2004 water level measurements. Potentiometric surface maps of the shallow transmissive zone continue to be to the north-northeast.

2.2 Monitoring Well Network

The compliance monitoring well network for Site ST012 and the other sites in the CMI area consists of 11 monitoring wells. There are five monitoring wells screened in the shallow transmissive zone (10 to 30 feet below ground level [bgl]), five monitoring wells screened in the intermediate transmissive zone (35 to 50 feet bgl), and one monitoring well screened in the deep transmissive zone (55 to 75 feet bgl). Multiple investigations at this Site found the contamination to not be from historical activities at Site WP023 and therefore would be addressed under Site ST012. As a result, the monitoring well network has been realigned such that all monitoring wells used to monitor groundwater contamination originating from Site ST012 have been moved under the Site ST012 heading regardless of previous well designation. To keep the integrity of the historical data intact, the individual monitoring well names will not change.

2.3 Evaluation Procedures

All compliance monitoring well samples are taken annually in the fall. During each sampling event, wells are purged and sampled according to the Sampling and Analysis Plan (SAP) provided in Attachment 3 to this Permit and updated in 2025.

2.4 Types of Laboratory Analysis

Groundwater is sampled for volatile organic compounds, Naphthalene, and RCRA metals. Methods and procedures are outlined in detail in the SAP provided in Attachment 3 to this Permit and updated in 2025.

3.0 INSPECTION AND MAINTENANCE ACTIVITIES

Throughout the post-closure care period, the integrity and effectiveness of the corrective action will be monitored and maintained. Inspection and maintenance activities for the Site ST012 remedial infrastructure, gathering system, monitoring well equipment, and surveyed benchmarks are listed in Figure 3-1. Monitoring wells/equipment are inspected annually, and the remedial infrastructure are checked monthly or on an as needed basis depending on the level of remediation occurring at the site.

The appropriateness and effectiveness of the corrective action will be evaluated every five years and modified throughout the post-closure care period as required.

Records of all maintenance and repair activities conducted during the post-closure care period will be kept at the facility.

Remedial Action will be taken immediately where an environmental or human health hazard is imminent or has already occurred.

4.0 POST-CLOSURE CARE IMPLEMENTATION AND DURATION

4.1 Point of Contact

A copy of the approved Post-Closure Plan will be kept at the facility throughout the post-closure care period. The current point of contact at the facility for matters concerning the post-closure care of the site is as follows:

Ms. Gail Hamill
Remedial Project Manager
140 Channel Street, Suite #102
Vance AFB, OK 73705-5610
(580) 213-6419

In addition, the facility contact would be responsible for updating the post-closure plan as needed and ensuring that Oklahoma DEQ copies are kept current.

If operations at Vance AFB were to cease before the end of the post-closure period, another contact point will be provided to DEQ 180 days prior to operations ceasing at Vance.

4.2 Site Security

Vance AFB is a Department of Defense facility with restricted access to the property. Vance AFB is fenced, secured, and patrolled by security personnel 24 hours a day. The ongoing security program includes daily inspection of all perimeter fences and gates for damage caused by intruders, accidents, or natural events. Damaged fencing is repaired or replaced as soon as practically possible.

4.3 Duration of Post-Closure Care Period

The post-closure care period will be 30 years from the date of final closure of the PSET which was November 18, 2002. In a letter from Oklahoma DEQ the implementation of the corrective action was approved.

4.4 Modification of Post-closure Care Period

The Oklahoma DEQ Administrative Authority may shorten or lengthen the post-closure care period applicable to the hazardous waste management unit, or facility in accordance with 40 CFR 264.117(a)(2)(i) and (ii).

Vance AFB may submit a written notification or request to the Oklahoma DEQ Administrative Authority for a permit modification to amend the post-closure plan at any time during the active life of the facility or during the post-closure care period in accordance with 40 CFR 264.118(d)(1) and (2).

5.0 POST-CLOSURE CARE DOCUMENTATION AND CERTIFICATION

5.1 Post-Closure Documentation

The post-closure documentation to be retained by the designated point of contact specified in Section 4.1 will include the following items:

- Survey plat from the final closure activities;
- Closure certification documents;
- Local zoning authority approval and filing of survey plat;
- Surveying and recordkeeping information;
- Groundwater monitoring records of sampling, analyses and results
- Copies of all approved Post-Closure Plans and modifications used during the post-closure care period
- Copies of any field notes, site photographs, survey data, or field reports that have been generated during the semi-annual/monthly inspection activities
- Records of all maintenance and repair activities conducted at the site during the post-closure care period

5.2 Post-Closure Certification

Inspections, to be conducted throughout the 30-year post-closure care period, will result in information associated with over 30 inspections. Copies of all the post-closure documentation items listed in Section 5.1 will be made available for review.

Upon completion of the post-closure care period, an independent professional engineer registered in Oklahoma and a Vance AFB official will certify that the post-closure care activities have been conducted in accordance with the approved Post-Closure Plan and any approved modifications to the plan.

Certification documents will be submitted to the Oklahoma DEQ Administrative Authority within 60 days of completion of the established post-closure care period. When Vance AFB submits the certification documents, it will request that DEQ confirm the end of the post-closure care period for the PSET.

6.0 REFERENCES

AECOM, 2014, Draft Final Remedial Design/Corrective Measures Implementation Plan for ST-12, Vance AFB, Oklahoma, January

Title 40 CFR Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal

Title 40 CFR Part 270, Hazardous Waste Permit Program

Vance AFB, 1996 Post-closure Permit for Hazardous Waste Landfill Units and all subsequent modifications

Vance AFB, 1990 Approved Closure Plan, UST No. 106 at Building 106 (IRP Site ST-08) and all subsequent modifications

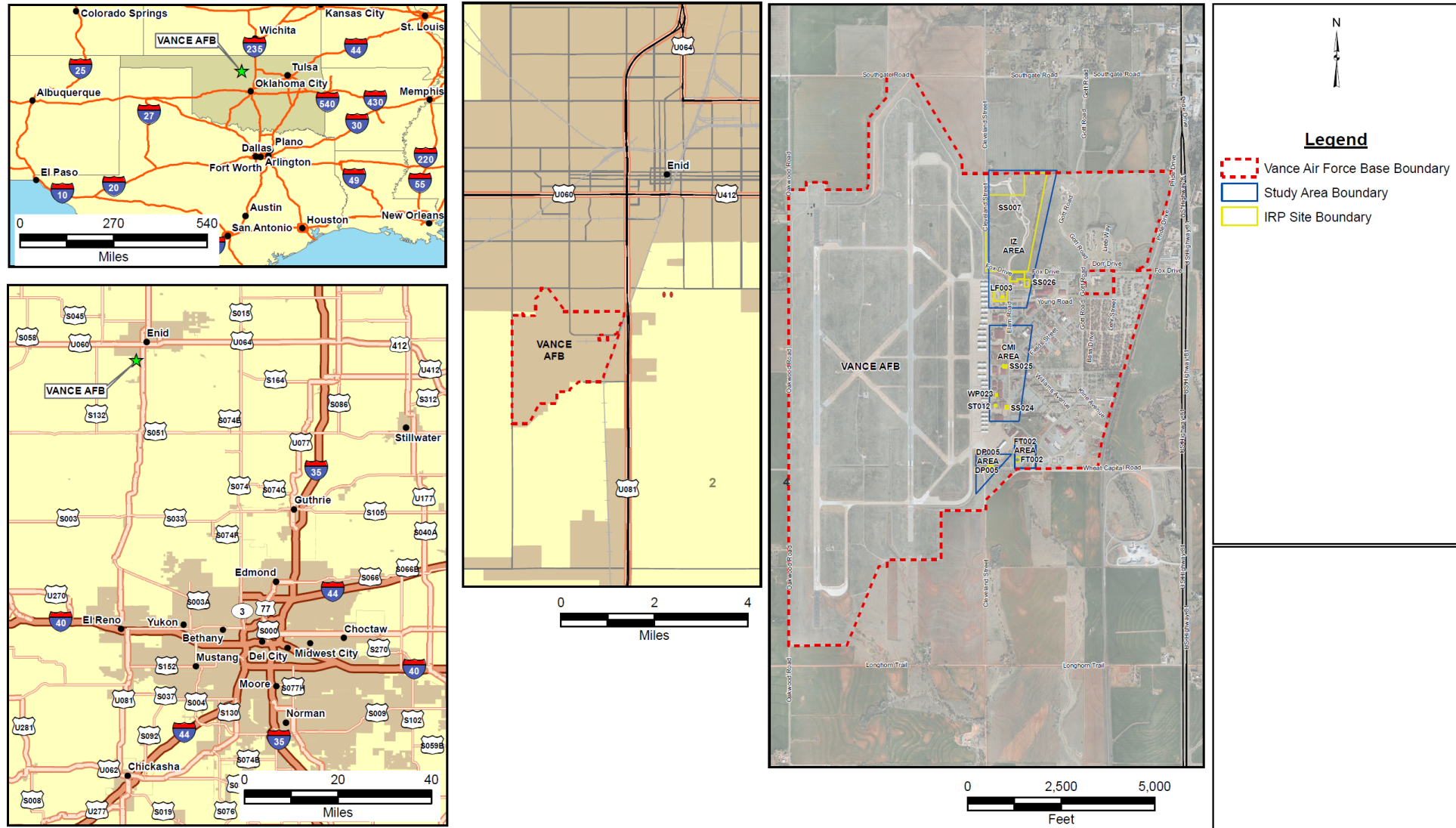
Vance AFB, 1990 Approved Post-Closure Plan, UST No. 106 at Building 106 (IRP Site ST-08) and all subsequent modifications

Vance AFB, RCRA Facility Investigation, IRP Sites ST-12, WP-23, SS-24 and SS-25, December 4, 1998

Vance AFB, Corrective Measures Study, IRP Sites ST-12, WP-23, SS-24 and SS-25, April 28, 2000

Vance AFB, Corrective Measures Implementation, IRP Sites ST-12, WP-23, SS-24 and SS-25, October 18, 2002

Figure 1-1 Location Map



Source(s):
World Imagery : ESRI, 2020
Installation Boundary : AECOM, 2018

FIGURE 1-1
VANCE AIR FORCE BASE LOCATION MAPS
OKLAHOMA-ARKANSAS GROUP, OPTIMIZED REMEDIATION CONTRACT
RD/CMIP
VANCE AIR FORCE BASE, OKLAHOMA

Figure 1-2 Site ST-12 Location

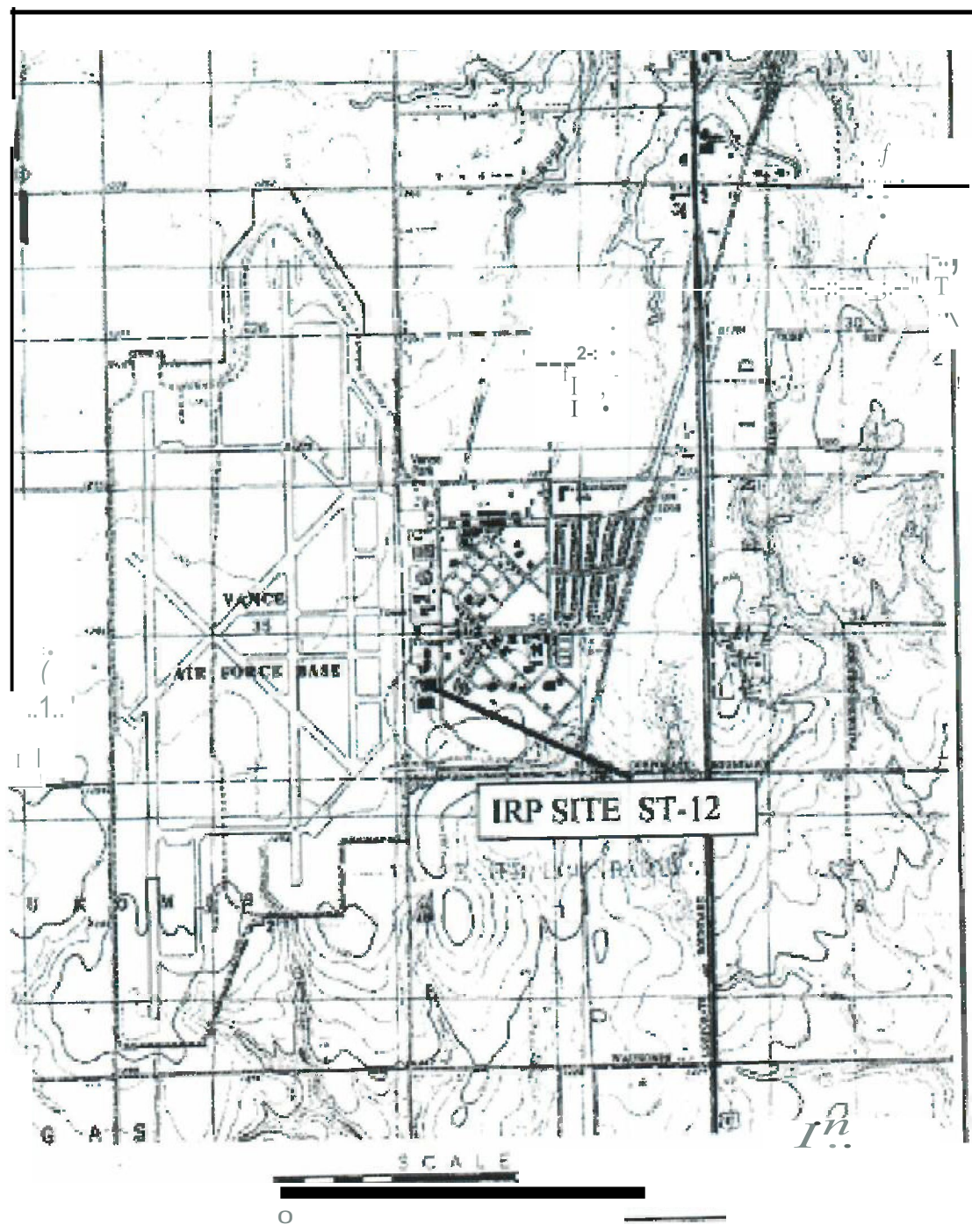


Figure 1-2 IRP Site 12 Location Map

Figure 1-3 Geologic Cross Section

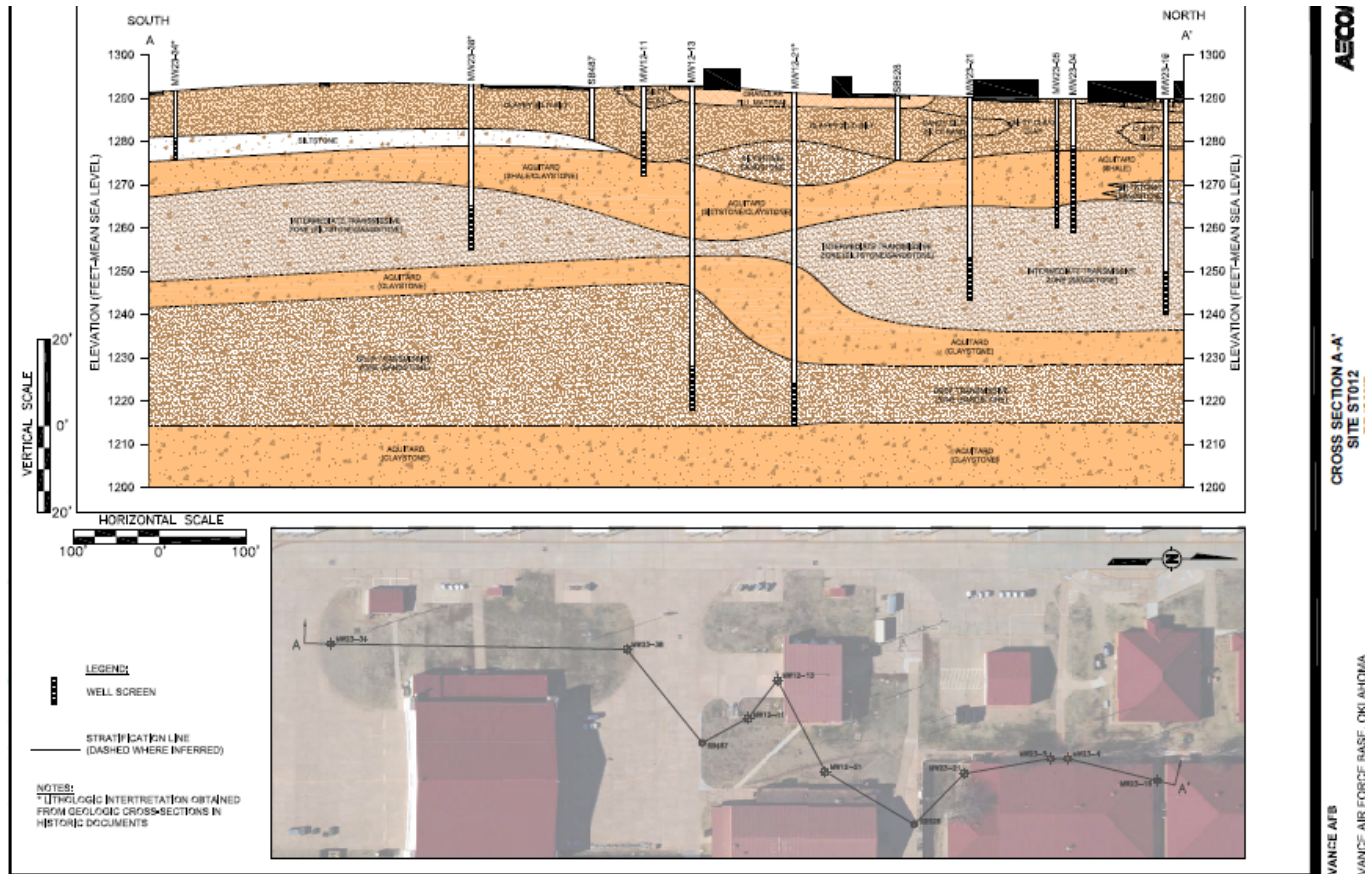


Figure I-4 Potentiometric Map (2017)

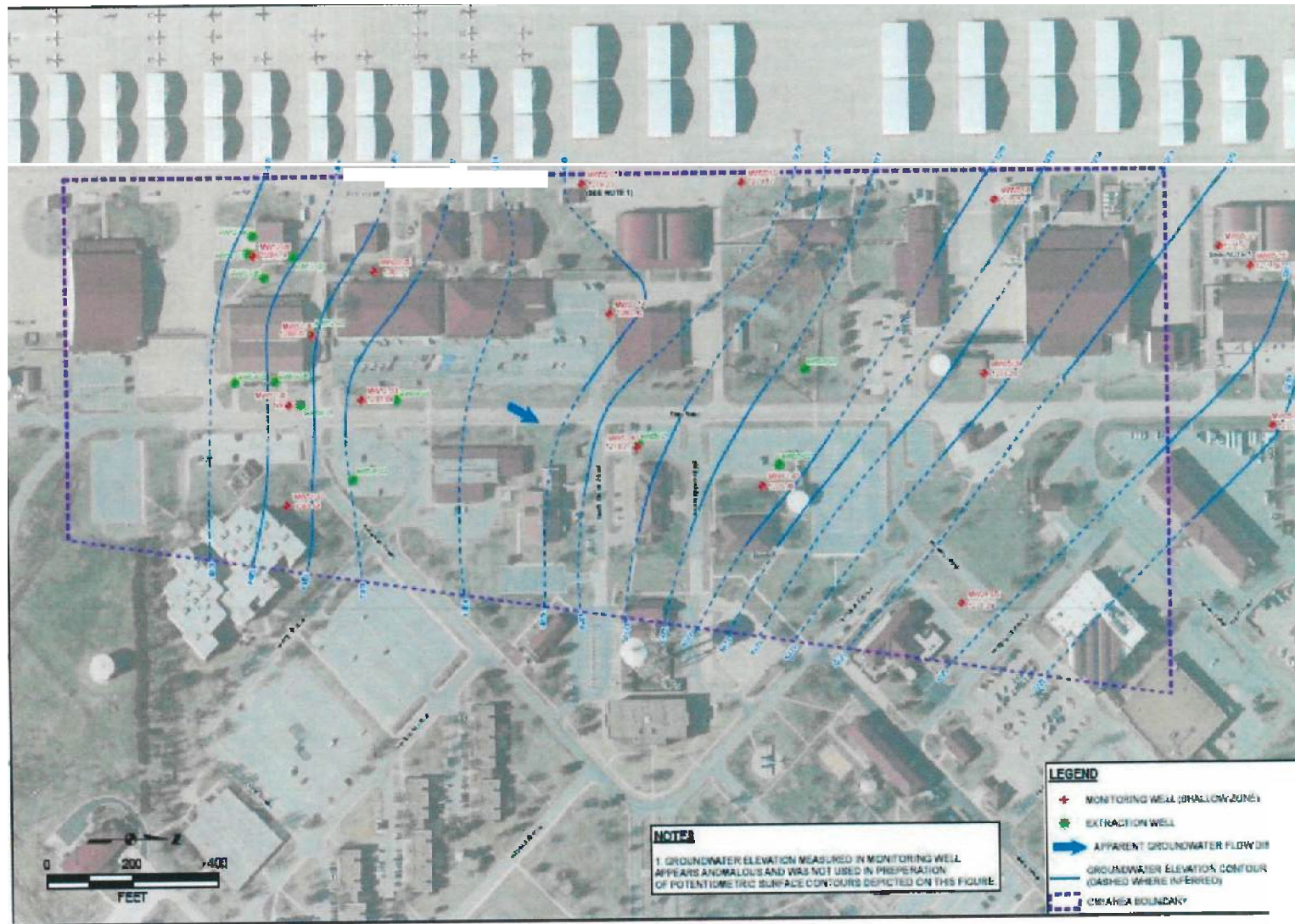
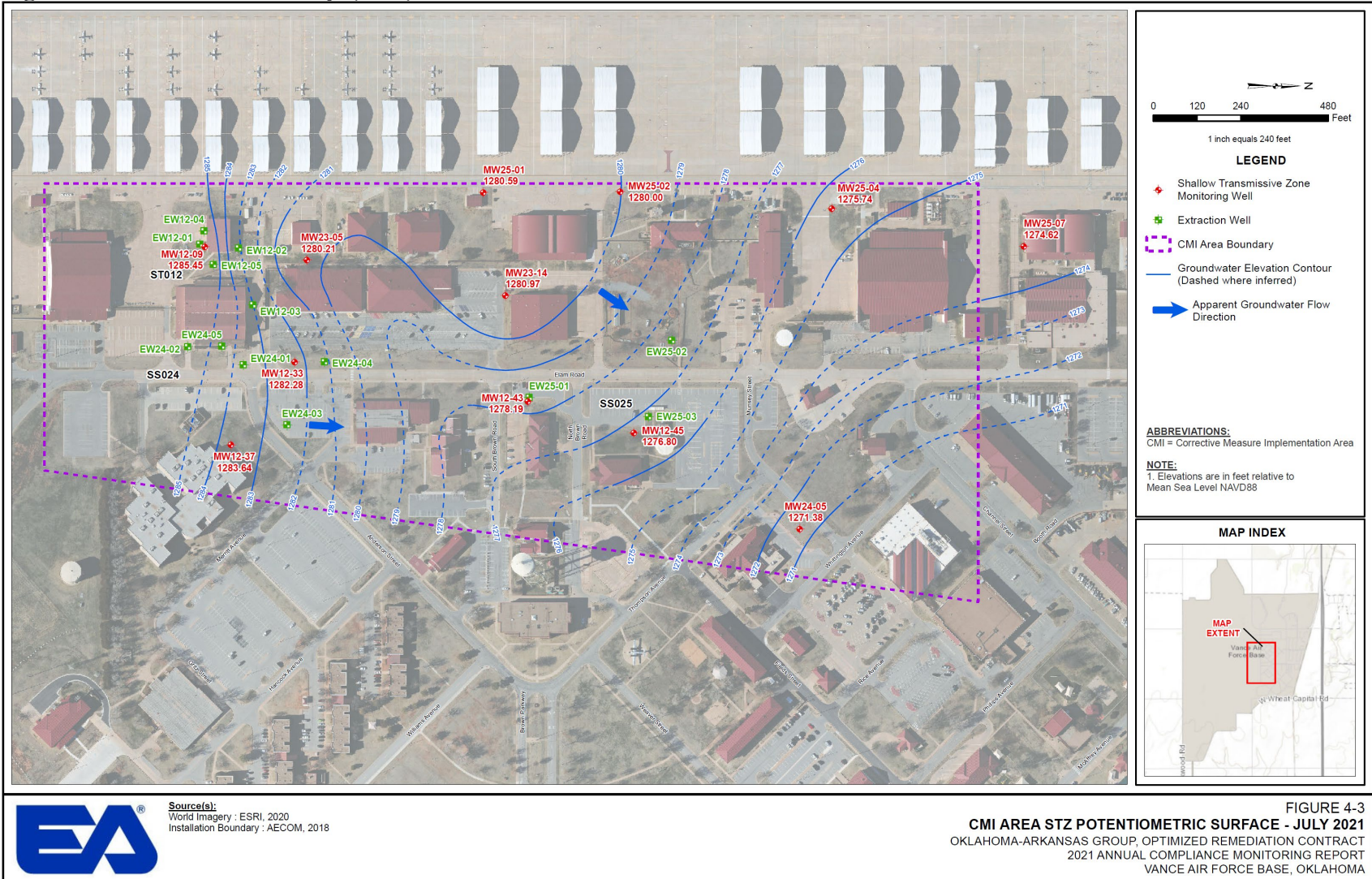


Figure 1-5 Potentiometric Map (2021)



Sources:
World Imagery: ESRI, 2020
Installation Boundary: AECOM, 2018

Figure 1-6 ST012 Survey

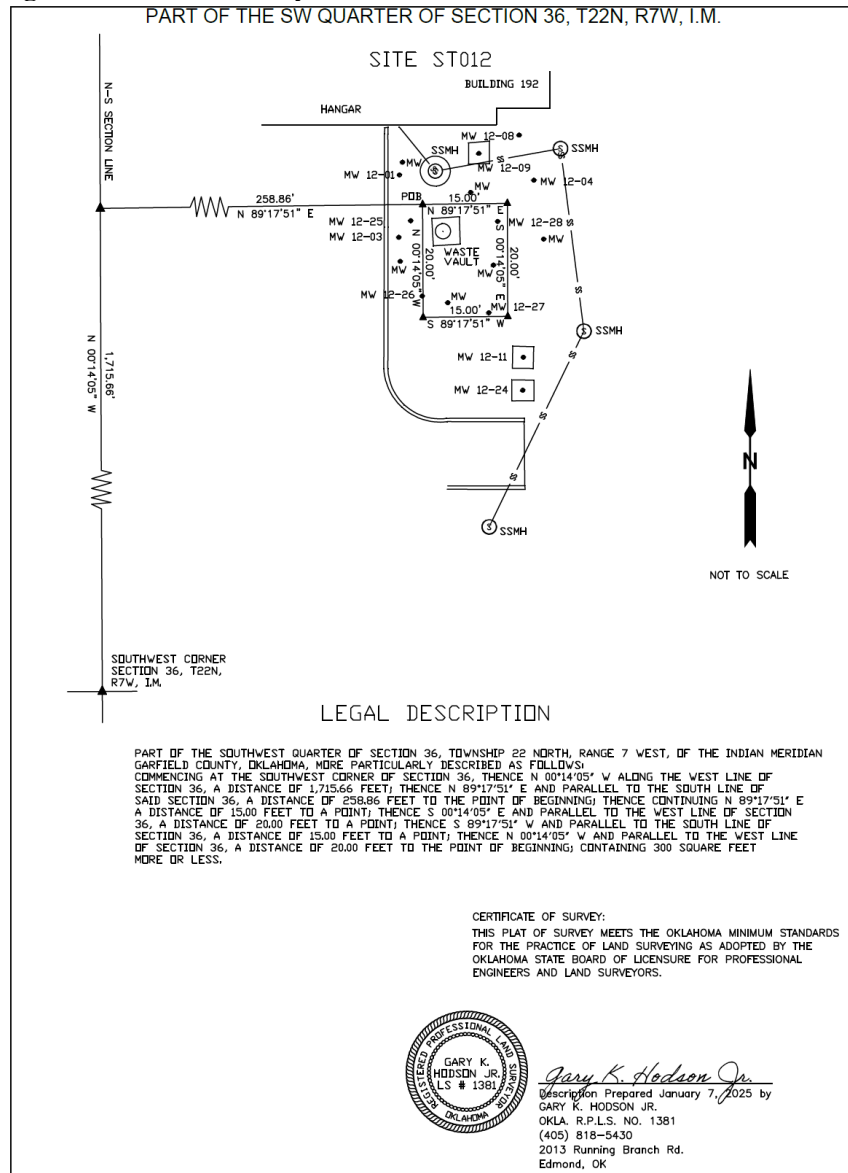


Figure 2-1

COMPLIANCE MONITORING WELL NETWORK
SITE ST-12

The following monitoring wells are sampled as shown:

Well ID	Well Type
Site ST-12	
12-09	Shallow
12-13R	Deep
12-30	Intermediate
12-34	Intermediate
12-38	Intermediate
23-05	Shallow
23-21	Intermediate
23-22	Intermediate
25-01	Shallow
25-02	Shallow
25-04	Shallow

Wells sampled for volatile organic compounds, Naphthalene and RCRA Metals annually in accordance with the SAP.

Figure 3-1

INSPECTION AND MAINTENANCE ACTIVITIES

<u>Item</u>	<u>Potential problems</u>	<u>Maintenance Response</u>
Gathering System	Pipes Clogged	Repair or Replace Equipment Remove Sediment
SVE and Injection Wells	Broken Risers well covers	Repair or Replace Equipment
Monitoring Well Equipment	Broken Risers Tampered, Broken or Stolen Locks Broken, Stolen or Lost Bailers Minimal or no Recovery of Samples Damaged Well Cap/Casing	Repair or Replace Replace Locks Replace Dedicated Bailers Replace Monitoring Well Replace Well Cap or Mon. Well
Surveyed Benchmarks	Physical Damage Severe Weathering Evidence of Tampering Physically Obstructed	Establish Substitute Benchmark(s) Establish Substitute Benchmark(s) Establish Substitute Benchmark(s) Uncover and Provide Protection

Note: Vance AFB's perimeter fence is routinely inspected and repaired as necessary

VANCE AIR FORCE BASE

Vance AFB, OKLAHOMA

PERMIT ATTACHMENT 3

**GROUNDWATER SAMPLING AND ANALYSIS
PLAN**

**NOTE: ALL THE PAGES FOR THE ATTACHMENTS ARE TAKEN
FROM THE PERMIT APPLICATION AND PAGE NUMBERS MAY
NOT BE IN SEQUENCE.**

**VANCE AIR FORCE BASE
RCRA POST-CLOSURE CARE PERMIT
RENEWAL APPLICATION**

ATTACHMENT 3



SAMPLING AND ANALYSIS PLAN (SAP)

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GROUNDWATER SAMPLING AND ANALYSIS PLAN
VANCE AIR FORCE BASE, OKLAHOMA

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ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AG	amber glass
°C	degrees Celsius
CDQAR	Chemical Data Quality Assurance Report
CF	casing factor
CGTF	Central Groundwater Treatment Facility
COC	chain of custody
CRRL	contract required reporting limits
DEQ	Department of Environmental Quality
DOT	Department of Transportation
DQCR	Daily Quality Control Report
DQO	data quality objective
DRO	diesel range organic
DTW	depth-to-water
EM	Engineer Manual
EPA	U.S. Environmental Protection Agency
ER	Engineer Regulation
ERPIMS	Environmental Resources Program Information Management System
FTL	field team leader
GC	Gas Chromatograph
GCMS	Gas Chromatograph / Mass Spectrometry
GFAA	Graphite Furnace Atomic Absorption
GRO	gasoline range organics
HCl	hydrochloric acid
HDPE	high density polyethylene
HNO ₃	nitric acid
ICAP	Inductively Coupled Plasma-Atomic Emission Spectrometry
IRP	Installation Restoration Program
LQMP	Laboratory Quality Management Plan
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
MS	matrix spike
MSD	matrix spike duplicate
PARCCS	precision, accuracy, representativeness, comparability, completeness and sensitivity

ACRONYMS AND ABBREVIATIONS (continued)

PID	photo ionization detector
PM	project manager
PPE	personal protective equipment
PTFE	polytetrafluoroethylene
QA	quality assurance
QAO	quality assurance officer
QA/QC	quality assurance/quality control
QC	quality control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SSHO	site safety and health officer
SVOC	semi-volatile organic compound
TAT	turnaround time
TD	total depth
TM	technical Manager
TPH	Total Petroleum Hydrocarbons
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

1.0 INTRODUCTION

1.1 Purpose and Scope

This Sampling and Analysis Plan (SAP) presents the procedures required to sample and analyze groundwater samples at Vance Air Force Base (AFB), Oklahoma, and describes the analytical and Quality Assurance/Quality Control (QA/QC) programs. This SAP includes general procedures and performance requirements for compliance monitoring programs at identified Installation Restoration Program (IRP) sites required by the Oklahoma Department of Environmental Quality (DEQ) Resource Conservation and Recovery Act (RCRA) Post-Closure Permit, signed on August 8, 1996, and subsequent permit modifications. Sampling and analytical requirements for specific sites will be subject to change based on the results of on-going compliance monitoring and achievement of permit goals.

This SAP documents procedures for field screening and monitoring well water level measurements, well purging, groundwater sample collection, sample containerization, preservation, handling, custody, and shipping; field documentation, equipment decontamination, analytical testing, electronic deliverables, and presents an overview of the QA/QC program. The SAP also addresses the process for establishing procedures for the sampling and analysis of other matrices, such as surface water and sediment when required. The SAP was prepared in accordance with the applicable regulations contained in 40 CFR Part 264.97.

The ultimate accuracy of any data generation begins with a sampling and measurement procedure that is fully conceived and implemented. This SAP is designed to delineate the methods that will be used to accomplish the chemical data quality objectives. Data quality objectives include the data quality indicators of precision, accuracy, representativeness, comparability, completeness and sensitivity.

Sampling and analytical activities will be documented in accordance with this plan and Environmental Resources Program Information Management System (ERPIMS) protocols which is the current Air Force system for validation and management of data from environmental projects at all Air Force bases. Analytical methods and target compounds for compliance monitoring activities are provided in Attachment 3-1.

1.2 References

References used in the preparation of the SAP include the following:

- (a) U.S. Environmental Protection Agency, December 1996, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846 (Third Edition)*.

- (b) U.S. Army Corps of Engineers, February 2001, *Engineer Manual EM 200-1-3, Engineering and Design - Requirements for the Preparation of Sampling and Analysis Plans*.
- (c) U.S. Army Corps of Engineers, February 2001, *Performance Evaluation (PE) Program*.
- (d) U.S. Army Corps of Engineers, April 1998, *Engineer Regulation ER 1110-1-263, Engineering and Design - Chemical Data Quality Management for Hazardous, Toxic, Radioactive Waste Remedial Activities*.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The project management organization will be based on specific project requirements. Key project personnel and their roles/responsibilities for various aspects of groundwater sampling activities performed at Vance AFB are listed below. Not all of these personnel may be required to support these activities, and one individual may serve in dual roles when applicable. Due to the general nature of this document, the project organization and personnel responsibilities will be identified in site-specific work plans or addenda to these work plans required for environmental activities.

2.1 Responsibilities of Key Personnel

Project Manager:

The project manager (PM) is responsible for overall control of project schedules, budgets, and technical performance. The project manager is also responsible for identifying the overall project objectives.

Technical Manager:

The technical manager (TM) is responsible for identifying tasks and developing site-specific work plans and procedures for completing these tasks in order to achieve the project objectives.

Field Team Leader:

The field team leader (FTL) is responsible for completing the tasks identified in the work plan as they apply to the field investigation team. The FTL is responsible for documenting the day-to-day activities and notifying the TM and PM whenever deviations to the work plan may occur due to change in site conditions.

Site Safety and Health Officer:

The site safety and health officer (SSHO) is responsible for the development of the Site Safety and Health Plan as it relates to the work plan. The SSHO is also responsible for the day-to-day control of health and safety activities.

Project Chemist:

The project chemist is responsible for the development of the Sampling and Analysis Plan as it relates to the work plan. The project chemist is also responsible for reviewing field efforts and analytical laboratory deliverables and generating a chemical data quality assurance report (CDQAR), also known as a data validation report.

Project Geologist:

The project geologist is responsible for reviewing and interpreting groundwater data and making recommendations regarding future well locations, monitoring well construction, well rehabilitation, pump configuration, etc.

Quality Assurance Officer:

The quality assurance officer (QAO) is responsible for overseeing the technical aspects of the project and reviews the deliverables for the project to verify that the work meets the objectives established in the work plan.

Field Sampling Personnel:

The field sampling personnel report to the team leader and are responsible for obtaining samples, completing other sampling tasks, and packaging and shipping samples to the designated off- site laboratory.

2.2 Analytical Laboratory

An off-site analytical laboratory will be designated to provide analytical services for each groundwater sampling event. The laboratory will be appropriately certified to perform the project analyses. The contract laboratory will be responsible for receiving, preparing and analyzing samples, and for reporting the results.

A copy of the Laboratory Quality Management Plan (LQMP) from the lab will be supplied to the project chemist as a submittal prior to execution of project work. The designated laboratory will be provided a copy of the SAP or site-specific addenda to the SAP for their reference.

3.0 FIELD ACTIVITIES

3.1 Groundwater

3.1.1 Field Screening Measurements

Each monitoring well will be screened for organic vapors with a photo ionization detector (PID) immediately upon opening the well for water level measurements to determine if appropriate personal protective equipment (PPE) is being used. Any adjustments to PPE will be made at this time.

The SSHO may choose to modify the level of PPE and the frequency at which monitoring wells are screened dependent upon the amount of historical data that are available for each site.

3.1.2 Water Level Measurements

Before a well is purged and samples are collected, the static water level will be measured to the nearest 0.01 foot using an electronic water level indicator. The total well depth will be measured to the nearest 0.01 foot at least annually. Static water level and any total well depth measurements will be recorded. All site wells should be opened prior to purging to allow for equilibration before water level measurements are made.

3.1.3 Monitoring Well Purging Procedures

Before sampling begins, new plastic sheeting must be placed on the ground surrounding the well. The plastic sheeting must be of sufficient size to keep all equipment from contacting the ground surface.

Before opening the well cap, remove any standing water from around the protective casing. **Do not allow any standing water to enter the well casing.**

Remove the well cap and use PID to check for volatile organic compounds (VOCs) in breathing zone and in the well casing. Record all data on the monitoring well sample collection form. **If well is pressurized, allow at least several minutes for the water level to equilibrate and note this information on the well sampling form.**

Measure depth-to-water from the top of the well casing. Consult previous sample collection form or well database to determine the depth of the screened interval for the well. Record all the information on the monitoring well sample collection form.

Wells with slow recharge (wells unable to yield at least three casing volumes) will be pumped or bailed dry and then sampled as soon as sufficient recharge has occurred to fill the sample

containers. Wells shall be sampled within 24 hours of purging, including those wells that are purged dry. Depth to water at the time of sampling shall also be recorded.

If sediment has accumulated in a monitoring well or if turbidity levels cannot be maintained within acceptable limits during purging, the well may be considered for redevelopment at the discretion of the field team leader or project geologist. Well redevelopment will be accomplished using standard methods and protocols. Well purge and redevelopment fluids will be containerized and subsequently treated at the Central Groundwater Treatment Facility (CGTF).

3.1.3.1 Low-Flow Purging Procedures

When placing the pump in the well to be sampled, lower the pump with one continuous smooth motion to minimize the disturbance of any sediment that may have accumulated in the well. The water level meter probe may be lowered with the pump to monitor the depth. The pump should be placed within three feet of the bottom of the screened interval. **Do not raise and lower the pump in the well.** It is important to minimize mixing of stagnant borehole water and disturbing sediment which may have collected at the bottom of the well. Secure the pump at the well head when it reaches the appropriate depth.

Set up the water quality meter and flow-through cell:

- Attach the pump tubing to the flow-through cell.
- Retract the water level meter to the top of the water and record the water level. If the water level has not changed significantly (< 0.3 feet), the well will likely sustain low-flow sampling. Secure the water level meter at the appropriate depth to monitor draw-down as pumping proceeds.
- Record the pump controller settings.
- Record the time, the depth to water, and estimated pump intake depth.
- Begin pumping. Bypass the flow-through cell and monitor the pump discharge. Adjust the discharge to a rate that is just high enough to pump water to the surface. Attach the flow through cell and adjust the flow rate as necessary to maintain flow through the cell. **The flow rate must be set and maintained constant throughout the purge and sampling process.**
- Monitor the flow rate and draw down. The highest flow rate that produces **NO DRAWDOWN** is ideal. The flow rate must be less than 500 milliliters per minute and create drawdown of no more than half the length of submerged screened portion of the well. **The water level should never be allowed to drop to within 2 feet of the top of the pump.** If the well will not sustain a 40 milliliters per minute purge rate with no drawdown,

the well will be pumped dry, and a grab sample will be collected with a disposable Teflon bailer. The standard suite of water quality parameters will be recorded at the time of sample collection.

- While purging, initially measure and record the stabilization parameters every 5 minutes. As the readings begin to stabilize, begin recording the parameters every three minutes. The monitoring well will be considered purged when all parameters are stabilized for three consecutive readings. The three readings should be within:
 - 0.5 degrees C for Temperature
 - 3% for specific conductivity
 - 10% for DO
 - 0.1 for pH
 - 10mv ORP
 - Turbidity as low as possible (<10 NTU ideal)

Once stabilization has been confirmed with three consecutive readings, sample collection may begin. All monitoring wells should be purged for a minimum of 40 minutes before sample collection should be considered.

3.1.3.2 Other Purging Procedures

Wells will be purged prior to sample collection to remove stagnant well water and to ensure that representative samples are collected. Purging of wells will be accomplished using a dedicated purge pump if the well is equipped with a dedicated pump system, a portable purging system, such as a submersible pump with discharge hose, or a bailer. If a submersible pump is used, it will be powered by a portable generator that will not introduce oil constituents or other contaminants into the well during purging operations. If bailers are used, they will be pre-cleaned or new, disposable bailers.

Monitoring wells will be purged by removing approximately three to five casing volumes of water from each well. A casing volume is equal to that amount of water present inside the well. To determine the casing volume, the depth-to-water (DTW) (in feet), the total depth (TD) of the well (feet), and the well casing radius (R) (in inches) must be known. To obtain one casing volume (in gallons), apply the following equation:

$$1 \text{ casing volume (gallons)} = [n(R)^2 \times (TD-DTW) \times (7.48)] / 144$$

Alternatively, for typical well casing diameters, the volume can be determined using the casing factor (CF) (in gallons per linear foot) as shown below:

Well Diameter (Inches)	Casing Factor (CF) (gallons/foot)
2	0.16
4	0.65
6	1.47
8	2.61
10	4.08
12	5.88

During the purging procedures, groundwater quality parameters consisting of turbidity, pH, temperature, and conductivity, will be measured after each well casing volume has been purged. Well purging data will be recorded.

The well will be sampled after three casing volumes have been purged and the groundwater quality parameters have stabilized (or five casing volumes have been purged, whichever occurs first). Groundwater quality parameters will be considered stabilized when the results of the last three measurements are within ten percent of each other.

3.1.4 Determine Immiscible Layers/Free Product Presence and Sampling

Immiscible layers are not anticipated, but, if present, an electronic interface probe will be used to measure the level of the immiscible surface in order to determine the apparent thickness prior to water level measurements. A sample will be collected using a transparent, pre-cleaned Teflon® bailer, and the presence of the immiscible layer will be confirmed visually. The collected liquids will be containerized separately from well purge fluids for storage and disposal.

3.1.5 Groundwater Quality Measurement Procedures

Commercially available, field rugged analytical instrumentation will be used to collect field measurements. Measurements will be taken in accordance with manufacturer specifications and guidelines. The instruments will meet or exceed applicable state and federal guidelines associated with groundwater sampling.

3.1.6 Groundwater Monitoring Well Sampling Procedures

Monitoring wells will be sampled with a dedicated Teflon® bladder or acceptable sample pump if the well is not equipped with a dedicated pump system, or using a Teflon® bailed with a new nylon or polypropylene cord. Generators used to power sampling pumps will be placed downwind of the well to prevent exhaust fumes from contaminating the sample. For samples intended for volatile organics analysis, the pumping rate will be no greater than 100 milliliters per minute to prevent agitation of the water. Similarly, if bailers are used, they will be slowly lowered into the wells. Sampling will progress from the least contaminated well to the most contaminated well, if such information exists. Otherwise, up-gradient wells will be sampled before down-gradient wells. The sampling progression is not as critical for wells with dedicated pump systems.

Pre-cleaned sample containers will be filled directly from the bailer or pump discharge tube. Samples will be preserved prior to shipment to the laboratory for analysis. Groundwater sampling analytical parameters and methods are given in Table 3-1. Individual analytical constituents and associated detection limits are given in Attachment 3-1. The appropriate sample size/containers, preservation methods, and holding times for all required analyses are given in Table 3-2. Samples will be collected (when applicable) in the following sequence:

- Volatile Organic Compounds (VOCs)
- Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO)
- Semi-Volatile Organic Compounds (SVOCs)
- Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO)
- Metals

3.1.7 Sampling Handling Procedures for Groundwater

Groundwater samples will be collected in appropriate containers, which will be filled, preserved (when required), and chilled as soon as possible. The sampler will wear disposable latex gloves and will change to new gloves between each monitoring well location. Groundwater samples will not be filtered. Pre-preservation of sample containers will be performed when applicable.

If high levels of metals results possibly caused by suspended solids in groundwater samples, are of concern, consideration may be given to collecting and submitting samples for laboratory analysis for both total and dissolved metals.

3.1.8 Sample Containers and Preservation Techniques

Samples will be containerized and preserved in accordance with current state and federal guidelines. Groundwater, wastewater, travel blank, and rinsate blank samples are anticipated to be collected for this effort. Table 3-1 and Table 3-2 reference information pertaining to sample containers and preservation techniques.

In the absence of any specific sampling or analytical method or technique, the project team will reference the most current edition of EPA's Office of Solid Waste SW-846 analytical method manual.

Table 3-1
Compliance Monitoring – Sampling and Analytical Requirements

ERP Site	Matrix	# of samples	QC	Monitoring Parameter	Method*	Turn Around Time
FT002	Groundwater	2	See note	VOCs	SW-846 8260D	30 days
		2	See note	Naphthalene	SW-846 8270D	30 days
		2	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
LF003	Groundwater	4	See note	VOCs	SW-846 8260D	30 days
		4	See note	Naphthalene	SW-846 8270D	30 days
		4	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		4	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
DP005	Groundwater	9	See note	VOCs	SW-846 8260D	30 days
		9	See note	Naphthalene	SW-846 8270D	30 days
		9	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		9	See note	Arsenic & Lead	SW-846 6010D/7470	30 days
	Surface Water	2	See note	VOCs	SW-846 8260D	30 days
		2	See note	SVOCs, Naphthalene	SW-846 8270D	30 days
		2	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
	Sediment	2	See note	VOCs	SW-846 8260D	30 days

		2	See note	SVOCs, Naphthalene	SW-846 8270D	30 days
		2	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
SS007	Groundwater	16	See note	VOCs	SW-846 8260D	30 days
		16	See note	Naphthalene	SW-846 8270D	30 days
		16	See note	Arsenic & Lead	SW-846 6010D/7470	30 days
	Surface Water	2	See note	VOCs	SW-846 8260D	30 days
		2	See note	SVOCs, Naphthalene	SW-846 8270D	30 days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
	Sediment	2	See note	VOCs	SW-846 8260D	30 days
		2	See note	SVOCs, Naphthalene	SW-846 8270D	30 days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
ST008	Groundwater	2	See note	VOCs	SW-846 8260D	30 days
		2	See note	Naphthalene	SW-846 8270D	30 days
		2	See note	TPH-GRO/DRO	SW-846 8015M	30days
		2	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
ST011	Groundwater	5	See note	VOCs	SW-846 8260D	30 days
		5	See note	Naphthalene	SW-846 8270D	30 days
		5	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		5	See note	RCRA 8 metals	SW-846 6010D/7470	30 days

ST012	Groundwater	11	See note	VOCs	SW-846 8260D	30 days
		11	See note	Naphthalene	SW-846 8270D	30 days
		11	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
SS024	Groundwater	3	See note	VOCs	SW-846 8260D	30 days
		3	See note	Naphthalene	SW-846 8270D	30 days
SS025	Groundwater	5	See note	VOCs	SW-846 8260D	30 days
		5	See note	Naphthalene	SW-846 8270D	30 days
SS026	Groundwater	4	See note	VOCs	SW-846 8260D	30 days
		4	See note	Naphthalene	SW-846 8270D	30 days
		4	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		4	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
SS028	Groundwater	5	See note	VOCs	SW-846 8260D	30 days
		5	See note	Naphthalene	SW-846 8270D	30 days
		5	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		5	See note	RCRA 8 metals	SW-846 6010D/7470	30 days
SS047	Groundwater	7	See note	VOCs	SW-846 8260D	30 days
		7	See note	SVOCs, Naphthalene	SW-846 8270D	30 days
		7	See note	TPH-GRO/DRO	SW-846 8015M	30 days
		7	See note	RCRA 8 Metals	SW-846 6010D/7470	30 days
Drums or poly	Redevelopment/purge water	1 per site	See note	VOCs	SW-846 8260D	30 days

tanks (disposal)			See note	SVOCs, Naphthalene	SW-846 8270D	30 days
			See note	RCRA 8 metals	SW-846 6010D/7470	30 days

*U.S. EPA, 1996 *Test Methods for Evaluating Solid Waste, Physical/chemical Methods (SW-846) Update III*

DRO- diesel range organics

GRO- gasoline range organics

RCRA- Resource Conservation and Recovery Act

SVOC- semi-volatile organic compounds

TPH- Total Petroleum Hydrocarbons

VOC- volatile organic compounds

Note: A minimum of ten percent (10%) of the groundwater samples collected at each site (or group of sites) and of the additional samples associated with other matrices such as surface water and sediment shall be quality control samples. The groundwater specific analyte list for each well is found in Section IV Part B of the Permit.

Table 3-2
Sample Volume, Containerization, Preservation, and Holding Times

Parameter	Container/Minimum Sample Volume	Holding Time	Preservation
Water (Groundwater, Surface Water, Wastewater, Travel Blanks, Rinsate Blanks)			
VOC	3 x 40 ml Vial with PTFE septa cap	14 days to Analysis	HCl to pH< 2 4°C with no headspace
SVOC	2 x 1 L AG	7 Days to Extraction 40 Days to Analysis	4°C
RCRA Metals	1 x 1L HDPE bottle	6 Months, except for Mercury (28) days	HNO ₃ to pH<2 4°C
TPH-GRO	3 x 40 ml Vial with PTFE septa cap	14 days to Analysis	HCl to pH< 2 4°C with no headspace
TPH-DRO	2 x 1 L AG	7 Days to Extraction 40 Days to Analysis	4°C
Sediment			
VOC	1 4oz. wide mouth jar with PTFE septa lid	14 days to Analysis	No preservation
SVOC	1 8oz. wide mouth jar with PTFE septa lid	14 Days to Extraction 40 Days to Analysis	No preservation
RCRA Metals	1 8oz. wide mouth jar with PTFE septa lid	6 Months, except for Mercury (28) days	No preservation
TPH-GRO	1 8oz. wide mouth jar with PTFE septa lid	14 days to Analysis	No preservation
TPH-DRO	1 8oz. wide mouth jar with PTFE septa lid	14 Days to Extraction 40 Days to Analysis	No preservation

The above listed volumes provide an adequate quantity of sample to analyze a matrix spike (MS) and matrix spike duplicate (MSD).

AG - amber glass jug

°C - degrees Celsius

DRO-diesel range organic

GRO - gasoline range organic

HCl - hydrochloric acid

HDPE - high-density polyethylene

HNO₃ - nitric acid
mL- milliliter
PTFE - polytetrafluoroethylene
RCRA - Resource Conservation and Recovery Act
SVOC-semi-volatile organic compound
TPH - total petroleum hydrocarbons
VOC - volatile organic compound

3.1.9 Field Quality Control Sampling Procedures

Groundwater samples will be collected in duplicate to monitor the accuracy and precision of field and laboratory techniques and methods. Additionally, travel blanks and rinsate blanks will be collected and analyzed for quality control purposes. Discussions regarding these sample types are listed in Section 8.0 of this plan.

3.1.10 Instrumentation and Equipment Decontamination Procedures

Reusable sampling equipment, such as bailers, buckets, funnels, and spoons, will be decontaminated prior to each use. At a minimum, this equipment will be washed using a biodegradable non-phosphate detergent (such as Alconox, Liquinox, or equivalent) and potable water, followed by two deionized water rinses, and allowed to air dry.

Sample locations known to be grossly contaminated as determined by field observation or former analytical testing will require sample equipment to include a final isopropyl alcohol rinse prior to being air-dried.

Equipment used to develop or purge groundwater from a monitoring well will be washed and rinsed as required. The field team leader is responsible for ensuring that all equipment coming into contact with soil or groundwater is free of contamination and will not compromise the validity of the sample results.

The electronic water level indicator used to measure depth to groundwater in monitoring wells will be decontaminated in the field prior to use at each well. The decontamination procedure will be the same as that used for sampling equipment. Decontamination fluids will be containerized and subsequently treated at the CGTF.

3.2 Surface Water and Sediment

Additional samples associated with such matrices as surface water and sediment will be collected during groundwater sampling activities at identified IRP Sites. Sampling and analytical requirements are shown in Table 3-1 and sample volume, containerization, preservation, and holding times are shown in Table 3-2. Individual analytical constituents and associated detection limits are given in Attachment 3-1.

4.0 FIELD OPERATIONS DOCUMENTATION

4.1 Field Logbook and Sample Field Sheets

The field team leader and other team members will maintain bound field logbooks to provide a daily record of significant events, observations, and measurements during sampling. All information pertinent to sampling will be recorded in the logbooks. All entries will be signed and dated and must include at least the following information:

- Name and title of author, date and time of entry, and weather/environmental conditions during the field activity.
- Location of sampling activity
- Name and title of field crew
- Name and title of site visitors
- Sample media (i.e., groundwater)
- Sample collection method
- Number and volume of sample(s) taken
- Date and time of collection
- Sample identification number(s)
- Sample distribution (i.e., which laboratory the sample was sent for analysis)
- Field observations
- Field measurements (i.e., groundwater quality parameters)

These notes must be dated and signed (each page) for validity in a court of law. All logbook entries will be made with waterproof ink and legibly written. Field notes will be entered into a bound logbook and the pages will be consecutively numbered. All entries will be in chronological order. The language will be factual and objective. No erasures will be permitted. If an incorrect entry is made, the error will be crossed out with a single strikeout mark, initialed, and dated.

4.2 Data Quality Control Reports

The field logbook will be used to prepare a Daily Quality Control Report (DQCR). DQCRs will be completed each day of field activities, if required, by the field team leader or other authorized personnel and forwarded to the TM or PM daily or upon request. The report will include the following general information:

- Name of site personnel and visitors
- Summary of field activities and progress of work
- Verbal instructions/recommendations from government personnel
- Change in site conditions
- Safety issues
- General remarks

4.3 Field Measurement Records

The field logbook will be used to document and track the calibration and maintenance of all instrumentation used in the field.

5.0 SAMPLE PACKAGING AND SHIPPING REQUIREMENTS

Samples collected during the field activities will be shipped via commercial or government courier to the designated analytical laboratory(s).

Coolers will not be shipped for Saturday delivery unless arrangements have been made with the respective laboratory prior to the shipment. A cooler of suitable strength for packaging and shipping samples **will** be used and will be manifested to meet U.S. Department of Transportation (DOT) regulations (dangerous goods, etc.). The inside of each cooler will be lined with a plastic commercial grade trash bag or otherwise sealed to prevent leaking, and all samples and sample packing materials will be placed inside the bag. The bottom and sides of each cooler will be lined with bubble wrap, a polyethylene foam insert, or other cushioning material.

All samples will be kept upright in the cooler. Once the samples are in the cooler, ice will be placed in the cooler with the samples. A sufficient amount of ice will be added to the coolers to ensure that they arrive at the laboratory at a temperature of 4° Celsius (°C) ($\pm 2^{\circ}\text{C}$).

The original chain-of-custody record will be placed in a watertight plastic bag and taped to the inside lid of the cooler. The cooler will be secured with strapping tape and custody seals will be affixed to or near the seal/lip of the cooler lid. The custody seals will be covered with wide, clear adhesive tape. Appropriate shipping labels will be placed on each cooler. These labels should identify the shipper and the laboratory, points of contact, phone numbers and street addresses.

6.0 DATA ASSESSMENT ORGANIZATION AND RESPONSIBILITIES

Data assessment will begin with the evaluation of the samples received onsite and will include all relevant and appropriate requirements. The contract laboratory will perform a similar assessment of the received samples. All analyses will be conducted with respect to the laboratory's standard operating procedures, and applicable federal method requirements and guidance. The laboratory will document all concerns encountered with the various analyses with respect to these regulations. The project chemist will prepare an analytical data package, which will substantiate the results reported by the off-site laboratory. The off-site laboratory will prepare a similar analytical data package and deliver it to the project chemist.

7.0 DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of data required from field and laboratory data collection activities to support decisions concerning risk and remediation. DQOs are established prior to data collection and describe what data are needed, why the data are needed, and how the data will be used to address the problems being investigated. DQOs help to ensure that all data collected are legally and scientifically defensible.

7.1 Measurement Quality Objectives for Chemical Data Management

All groundwater samples collected from monitoring wells and samples collected from other matrices will be analyzed off-site. At a minimum, 10% of the samples collected will be collected in duplicate. These samples will be shipped off-site to the same analytical laboratory for analysis as the primary (field) samples. These samples will be identified as QC duplicate samples and labeled accordingly.

One equipment or rinsate blank will be collected and analyzed for 10% of the groundwater samples; whenever the same sampling equipment is used repeatedly. Results from these samples assist in evaluating decontamination procedures and equipment cross-contamination.

Travel blanks will accompany all aqueous sample shipments, specifically with those samples being collected and analyzed for volatile organics. Travel blanks are collected and analyzed to assist with evaluating cross-contamination among each volatile organic sample shipment.

8.0 SAMPLE HANDLING, DELIVERY, AND CUSTODY REQUIREMENTS

Proper sample handling, delivery, and maintenance of a chain of custody are key components to building the documentation and support for data that can be used for decision-making. It is essential that all sample handling and sample chain of custody requirements be performed in a complete, accurate, and consistent manner.

8.1 Sample Handling and Delivery

Samples will be delivered to the designated laboratories by local courier or by a common carrier such as Federal Express. Hard plastic ice chests or coolers with similar durability will be used for shipping samples. The coolers must be able to withstand a 4-foot drop onto solid concrete in the position most likely to cause damage. The samples must be cushioned to cause the least amount of damage if such a fall occurs.

All aqueous volatile organic compound sample vials will be shipped in the same cooler on a given day. A travel blank will be included in each cooler with aqueous volatile organic samples (travel blanks are not required for coolers containing volatile organic soil or sediment samples). After packing is complete, the cooler will be strapped closed with strapping tape and with chain of custody seals affixed across the top and bottom joints. Each container will be clearly marked with a sticker containing the originator's address and the address and point of contact for the receiving laboratory.

The following procedures must be used when transferring samples for shipment:

- An original chain of custody (COC) form identifying the contents must accompany all sample coolers/packages. When transferring possession of the samples, the individuals relinquishing and receiving the samples must sign, date and note the time on the record. This record documents transfer of custody samples from the field sampler to another person or to the laboratory. The original chain of custody record must accompany the shipment, and the technician must retain a copy.
- Samples must be properly packaged for shipment and delivered to the appropriate laboratory for analysis with a separate signed chain of custody form enclosed in each sample box or cooler.

8.2 Sample Custody

Sample custody and documentation procedures described in this section will be followed throughout all sample collection activities. Components of sample custody procedures include the use of field logbooks, sample labels, custody seals, and chain of custody forms. Each person involved with sampling handling must be trained in chain of custody procedures before the start

of the field project. The original chain of custody form must accompany the samples during shipment from the field to the off-site laboratory.

A sample is under custody under the following conditions:

- It is in one's actual possession
- It is in one's view, after being in one's physical possession
- It was in one's physical possession and that person locks it up to prevent tampering
- It is in a designated and identified secure area

8.2.1 Field Custody

The following procedures must be used to document, establish, and maintain custody of field samples:

- Sample labels must be completed for each sample with waterproof ink, ensuring that the labels are legible and affixed firmly on the sample container.
- All sample-related information must be recorded in the project logbook.
- The field sampler must retain custody of samples until they are transferred or properly dispatched.
- An original chain of custody record will accompany all samples. This record documents the transfer of custody of samples from the field investigator to another person, to the laboratory, or to other organizational entities. An authorized signature for relinquishment and receipt of the samples must accompany each change of possession.
- Completed original chain of custody forms will be enclosed in a plastic cover and placed inside the shipping container used for sample transport from the field to the laboratory.
- When samples are relinquished to a shipping company for transport, the tracking number from the shipping bill or receipt will be recorded on the chain of custody form.
- Custody seals must be affixed on shipping containers when samples are shipped to the laboratory to prevent sample tampering during transportation.

8.2.2 Laboratory Custody

Each laboratory receiving samples must comply with the laboratory sample custody requirements outlined in the subcontract document and its own quality assurance plan. The field team leader or project chemist will notify the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped, and the expected date of arrival.

The laboratory sample custodian will use the following procedures once the samples have arrived at the laboratory:

- The laboratory will designate a sample custodian who will be responsible for maintaining the custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check the original chain of custody and request-for-analysis documents and compare them with the labeled contents of each sample container for corrections and traceability. The sample custodian will sign the original chain of custody and record the date and time received. The sample custodian also will assign a unique laboratory sample number to each sample.
- Cooler temperature will be checked and recorded.
- Care will be exercised to annotate any labeling or descriptive errors. If discrepancies occur in the documentation, the laboratory will immediately contact the field team leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming chain of custody procedure.
- If all data and samples are correct and there has been no tampering with the custody seals, the "Received by Laboratory" box will be signed and dated.
- Samples will be stored in a secured area and at a temperature of 4°C ($\pm$ 2°C), if necessary, until analyses are to begin.
- The laboratory will send a sample acknowledgement letter to the project chemist and project manager as a record that the shipment arrived and the condition of the containers upon arrival. Any discrepancy will be identified and corrective actions performed. The project chemist may need to provide guidance concerning additional actions. The project manager will retain a copy of the sample acknowledgement with the chain of custody.
- A chain of custody form will accompany all samples. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time of

the record. This record documents transfer of custody of samples from the field sampler to another person, or to the laboratory. Overnight carriers will be treated as a single entity, and a single signature will be required when samples are delivered to the laboratory.

- A laboratory chain of custody form will accompany the sample or sample fraction through final analysis for control.
- Copies of the chain of custody and request-for-analysis forms will accompany the laboratory report and will become a permanent part of the project records.
- Samples must be properly packaged for shipment and delivered to the appropriate laboratory for analysis with a separate signed chain of custody form enclosed in each sample box or cooler.
- A chain of custody form identifying the contents must accompany all packages. The original record must accompany the shipment, and the field team leader must retain a copy. Additional details about laboratory sample custody will be included in the laboratory comprehensive quality assurance plan.

8.3 Holding Time Requirements

All samples will be processed as required to provide compliance with the holding time limits for preparation and analysis. The sample holding time will be determined from the date and time the sample is collected in the field. Sufficient lead time will also be allowed for the reanalysis of samples within holding times in the event that calibration, method, or quality control failures occur. Noncompliance with the method-specific holding time limits, without proper justification, will be grounds for rejecting the data results.

8.4 Verification/Documentation of Cooler Receipt Condition

The off-site laboratory will submit a tabulation of samples received from the project team within 10 days after the sampling event is completed and will update their records to include any subsequent sampling events. The following information will be provided for each sample received:

- Date sample was received by the lab
- Lab package identification number
- Field sample identification number
- Project site

- Cooler number
- Cooler condition (temperature, packaging, damage, etc.)
- Type of sample media and the parameters listed on the chain-of-custody.

8.5 Corrective Action for Incoming Samples

The off-site laboratory will not be held accountable for any sample deficiencies noted upon arrival at the performing laboratory, such as broken or leaking sample containers, high cooler temperatures, etc. The laboratory will immediately notify the project chemist or technical manager by telephone concerning such deficiencies in order to obtain guidance regarding the appropriate action required.

9.0 ANALYTICAL PROCEDURES

Off-site analyses will be conducted utilizing the latest approved update of the methods stipulated in the field sampling plan and individual contract laboratory task orders. Required — compounds, methods and contract required reporting limits (CRRLs) are listed in Attachment 3-1. The analyses for these parameters will comply with current EPA SW 846 method guidance.

The contract laboratory will maintain written laboratory-specific standard operating procedures for all methods and general operations necessary to perform the requested analytical services. The standard operating procedures will fully detail the actual procedures and documentation used to implement performance-based methods. Simply referencing a given method or method number **will** not be acceptable. The standard operating procedures will be based on the latest available guidance published by the federal government and other pertinent references.

10.0 DATA REDUCTION AND EVALUATION

The data reduction and evaluation process begins with the receipt of all laboratory data submittals and the associated chemical data quality review reports or case narratives. The off-site laboratory will have been required to meet a list of laboratory deliverables designated specifically for the project prior to start of work. The project chemist then evaluates the data generated by all the laboratories and determines whether the data are reliable, defensible, and complete.

The data shall be evaluated with regards to project specific quality assurance objectives (i.e., Precision, Accuracy, Representativeness, Comparability, Completeness, and Sensitivity); otherwise known as PARCCS. They are defined as follows:

10.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Evaluating spiked sampled recoveries and associated duplicate recoveries are commonly used to assess analytical precision.

10.2 Accuracy

Accuracy measures the bias in a measurement system and is difficult to measure for the entire data collection activity. Analytical accuracy is commonly assessed by evaluating known and unknown QC sample and spiked sample recoveries. This includes the evaluation of internal and surrogate standard recoveries. Evaluating travel blank, method blank, and equipment blank results to determine potential concentration contribution from various outside sources (i.e., field or lab activities), is also used to assess accuracy.

10.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely depicts the characteristics of a population of samples. Representativeness is commonly assessed by evaluating duplicate field and laboratory samples, (i.e., field and QC samples).

10.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability is assessed by evaluating field samples to previous sampling data at a particular site.

10.5 Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements compared to the total number of measurements planned.

10.6 Sensitivity

Sensitivity addresses how well selected analytical methods and instruments respond to change in analyte concentration. The appropriate analytical methods must be selected to meet or exceed specific project data requirements. Some methods may not be applicable for the analysis of certain environmental matrices. Sensitivity is assessed by evaluating the reported method detection limits and evaluating calibration information provided by the laboratory.

11.0 LABORATORY OPERATIONS DOCUMENTATION

11.1 Data Reporting Procedures Data Management Procedures

Chemical data quality management and laboratory documentation will fully comply with the latest edition of USACE ER-1110-1-263, "Chemical Data Quality Management for Hazardous Waste Remedial Activities." The off-site analytical laboratory will provide the following data and documentation in the paper and electronic copies of the data packages will comply with the following requirements:

- Complete documentation of all incoming sample shipments by the performing laboratories is required. This will include at a minimum, the following: (a) signing for sample shipments; (b) receiving and reviewing all shipments for completeness and accuracy against enclosed letters and forms; (c) signing and dating the enclosed chain-of-custody forms; (d) logging all shipments of samples into appropriate logbooks and/or computer laboratory information management systems; and (e) contacting the project chemist immediately for resolution of any problems that may have been noted. Individual cooler receipt forms will be used for each shipment to verify and document any problems noted.
- The chain-of-custody form, any shipping documents, completed cooler receipt forms, telephone conversation record forms, and any corrective action forms will be maintained by the laboratory for each shipment and included in the data package when the final results are reported.
- Analytical results will be provided on the performing laboratory's letterhead, dated and signed by the designated laboratory project manager. Results for more than one field sample or more than one parameter will not be combined on the same data results sheet. The data results sheets, will contain the following information at a minimum:
 - Client identification
 - Project site identification and Contract Task Order Number
 - Field sample identification number as written on custody form
 - Laboratory sample identification number
 - Matrix (soil, water, sediment, etc.)
 - Date sample was collected and received at the laboratory
 - Date and time sample was extracted or prepared
 - Date and time sample was analyzed with parameter identification
 - Preparation, extraction and method numbers
 - Preparation, analysis, quality control and other batch number
 - Method quantitation limit for each analyte
 - Method detection limit for each analyte
 - Results reported in consistent units

- Results reported as an actual value, estimated value or value below the method detection limit (i.e., non-detected)
 - Applicable data qualifiers
 - Tentatively identified compounds for applicable parameters
 - Dilution factors for each analyte
 - Percent solids for solid media samples with results reported on a dry-weight basis.
- If significant equipment fouling and/or matrix interference can be avoided, samples will initially be analyzed undiluted. Otherwise, serial dilution or screening protocols will be practiced to analyze samples at the lowest possible dilution factor. If the results for one or more analytes exceed their calibration range, when the sample is analyzed near or at a particular dilution, those results should be qualified, and the sample diluted and reanalyzed to obtain valid results for those analytes. The desired goal is to report the results for a particular target analyte, either undiluted or at the lowest possible dilution factor, as long as the result falls within its calibration range.
- Standard EPA data qualifiers will be used to indicate: (1) blank contamination; (2) sample-analytical anomalies associated with an analyte; (3) analyte results which fall between the method detection limit and actual sample quantitation limits; (4) data rejected due to exceedance of method-specific holding times, high cooler temperatures, or other signification quality control data deficiencies; and (5) data results which exceed the upper calibration curve limit for that analyte.
- A quality control summary, which provides tabulate results of laboratory blanks, surrogate spikes and recoveries, matrix spike/matrix spike duplicate and laboratory control spike, laboratory duplicates, relative percent differences and field duplicates will be provided. Acceptable surrogate, matrix spike and laboratory control spike recovery ranges and relative percent difference limits will be shown on the field or quality control data packages adjacent to the actual results obtained.
- Sample calibration and internal standard/retention time summaries will be provided for applicable parameters.
- Sample identification numbers will be cross-referenced with laboratory identification numbers and quality control sample numbers. Tables which cross-reference field samples with associated method blanks, matrix spike/matrix spike duplicate, and laboratory control spike samples will be provided.
- A detailed case narrative will be provided for each parameter or parameter set. The case narrative will include analysis/preparation method numbers, batch numbers, standard operating procedures references, statements concerning the validity of the calibration, internal standard and quality control sample results, use of manual integrations, and other technical information concerning holding times, sample preservation-integrity and

conformance with the method standard operating procedures. Recommendations regarding qualification or rejection of the associated data will be provided.

- An electronic deliverable will be provided with each data package.
- Analytical documentation, such as detailed calibration data, mass spectra, chromatograms, method detection limit studies, performance standards, and other laboratory quality control information will not be included in the deliverables, however, these data will be provided if requested.
- The contractor will promptly address comments received from the project chemist regarding the data package deliverables. A copy of any resulting data package revisions will be promptly provided to the project chemist for compliance review.

11.2 Laboratory Turnaround Time

Unless specified otherwise in the analytical services contract, an unbound copy of each completed laboratory data package, including all required quality control documentation, will be provided to the project chemist within a period of 30 calendar days after the associated samples were received by the performing laboratory.

Accelerated data submittals required within three (3) to twenty-one (21) calendar days can be faxed. Electronic copies of the data results with the associated quality control sample results can also be delivered. The performing laboratory will also concurrently provide information regarding any significant quality control deficiencies related to those sample results.

11.3 Data Archival/Retention Requirements

Sufficient and appropriate controlled-access archiving space will be provided by the contract laboratory to store the data and its associated detailed quality control documentation generated by the laboratory for a period of 36 months after the analysis had been completed.

11.4 Electronic Data Deliverable

The contract laboratory will also provide all project analytical data in an electronic data format. The file structure will comply with the latest version of the ERPIMS format. ERPIMS is the current Air Force system for validation and management of data from environmental sites at all Air Force bases. These data contain analytical chemistry samples, tests, and results as well as hydrogeological information, site/location descriptions, and monitoring well characteristics. QC data are also required input into the database.

11.5 Review of ERPIMS Electronic Media Deliverable

Upon receipt of the laboratory electronic media deliverable, the media will be reviewed by contractor technical personnel. The review will consist of reviewing the format and files to ensure that they also comply with the format. The review will also consist of a review of the media contents for completeness; all analytical data has been entered correctly. If problems are encountered in the analytical data, the media will be returned to the analytical laboratory for a correction. After the database review is completed, the files will be converted into ERPIMS files. Unless otherwise instructed by Vance AFB, the ERPIMS format files will be submitted to the Air Force Civil Engineer Center (AFCEC) for addition to the Vance AFB ERPIMS data set.

12.0 DATA ASSESSMENT PROCEDURES

The project chemist shall closely scrutinize field and quality control sample results. Inconsistencies found between these results shall be examined and Federal guidelines employed to judge the validity of the results. Differences in field and quality control results which are greater than five (5) times the sample quantitation limit are noted and reviewed. Duplicate sample result differences that are greater than a factor of two (for aqueous samples) and a factor of five (5) (for soil and sediment samples) are considered to fall outside typical quality control ranges and are reviewed. Differences, which cannot be adequately interpreted by the project chemist, shall be noted and evaluated by the technical team. The data will either be accepted, rejected, or if practical, the sample in question may be reanalyzed.

ATTACHMENT 3-1

**ANALYTICAL METHODS AND
CONSTITUENT/REPORTING LIMITS**

VOLATILE ORGANIC ANALYSES BY GWMS - LIQUID AND SOLID BY METHOD SW 846 8260D		
Parameter	Reporting Limit	
Total Volatile Organics	Liquid (µg/L)	Solid (µg/kg)
Acetone	20	50
Benzene	1	5
Bromodichloromethane	1	5
Bromoform	1	5
Bromomethane (Methyl Bromide)	1	5
Carbon Tetrachloride	1	5
Chlorobenzene	1	5
Chloroethane	1	5
2-Chloroethylvinyl Ether	5	5
Chloroform	1	5
Chloromethane	1	5
Dibromochloromethane	1	5
1,2-Dichlorobenzene	1	5
1,3-Dichlorobenzene	1	5
1,4-Dichlorobenzene	1	5
1,1-Dichloroethane	1	5
1,2-Dichloroethane	1	5
1,1-Dichloroethene	1	5
cis-1,2-Dichloroethene	1	5
trans-1,2-Dichloroethene	1	5
1,2-Dichloropropane	1	5
cis-1,3-Dichloropropene	1	5
trans-1,3-Dichloropropene	1	5
Ethyl Benzene	1	5
Methylene Chloride	10	10
Methyl Ethyl Ketone (MEK)	10	10
4-Methyl-2-pentenone (MIBK)	10	10
1,1,2,2-Tetrachloroethane	1	5
Tetrachloroethene	1	5
Toluene	1	5
1,1,1-Trichloroethane	1	5
1,1,2-Trichloroethane	1	5
Trichloroethene	1	5
Trichlorofluoromethane	1	5
Vinyl Chloride	2	5
Semi-Volatile Organics	Liquid (µg/L)	Solid (µg/kg)
o-Xylenes	1	5
m & p-Xylenes	1	5

SEMI-VOLATILE ORGANIC ANALYSES BY GWMS- LIQUID AND SOLID BY METHOD SW 846 8270 E		
Parameter	Reporting Limit	
Semi-Volatile Organics	Liquid (µg/L)	Solid (µg/kg)
Acenaphthene	10	330
Acenaphthylene	10	330
Anthracene	10	330
Benz(a)anthracene	10	330
Benzo(b)fluoranthene	10	330
Benzo(k)fluoranthene	10	330
Benzo(g,h)perylene	10	330
Benzo(a)pyrene	10	330
Benzyl alcohol	20	670
Bis(2-chloroethyl)ether	10	330
Bis(2-chloroethoxy)methane	10	330
Bis(2-chloroisopropyl)ether	10	330
Bis(2-ethylhexyl)phthalate	10	330
4-Bromophenyl Phenyl Ether	10	330
Butyl benzyl phthalate	10	330
Carbazole	10	330
4-Chloraniline	20	670
4-Chloro-3-methylphenol	20	670
2-Chloronaphthalene	10	330
2-Chlorophenol	10	330
4-Chlorophenyl Phenyl Ether	10	330
Chrysene	10	330
Dibenz(a,h)anthracene	10	330
Dibenzofuran	10	330
Di-n-butyl Phthalate	10	330
1, 2-Dichlorobenzene	10	330
1, 3-Dichlorobenzene	10	330
1, 4-Dichlorobenzene	10	330
3, 3-Dichlorobenzidine	20	670
2, 4-Dichlorophenol	10	330
Diethylphthalate (DEP)	10	330
2, 4-Dimethyl Phenol	10	330
Dimethylphthalate	10	330
4, 6-Dinitro-2-methylphenol	50	1,700
2, 4-Dinitrophenol	50	1,700
2, 4-Dinitrotoluene	10	330
2, 6-Dinitrotoluene	10	330
Di-n-octyl phthalate	10	330

SEMI-VOLATILE ORGANIC ANALYSES BY GWMS -LIQUID AND SOLID BY METHOD SW 846 8270 E		
Parameter	Reporting Limit	
Semi-Volatile Organics	Liquid (µg/L)	Solid (µg/kg)
Fluoranthene	10	330
Fluorene	10	330
Hexachlorobenzene	10	330
Hexachlorobutadiene	10	330
Hexachlorocyclopentadine	10	330
Hexachloroethane	10	330
Indeno (1,2,3-cd) pyrene	10	330
Isophorone	10	330
2-Methylnaphthalene	10	330
2-Methylphenol	10	330
3-Methylphenol	10	330
4-Methylphenol	10	330
Naphthalene	10	330
2-Nitroaniline	50	1,700
3-Nitroaniline	50	330
4-Nitroaniline	50	1,700
Nitrobenzene	10	330
2-Nitrophenol	10	330
4-Nitrophenol	10	330
N-Nitrosodiphenylamine	10	330
N-Nitroso-di-n-propylamine	10	330
Pentachlorophenol	50	1,700
Phenanthrene	10	330
Phenol	10	330
Pyrene	10	330
Pyridine	10	330
1, 2, 4-Trichlorobenzene	10	330
2, 4, 5-Trichlorophenol	10	330
2, 4, 6-Trichlorophenol	10	330

TOTAL PETROLEUM HYDROCARBONS BY GC - LIQUID AND SOLID BY METHOD SW846 8015M		
Parameter	Reporting Limit	
Total Petroleum Hydrocarbons	Liquid (ml/L)	Solid (mg/kg)
Gasoline Range Organics	0.1	1
Diesel Range Organics	1.0	10

METALLIC (TOTAL) PARAMETERS BY GFAA FURNACE OR ICAP- LIQUID AND SOLID			
Parameter	Method	Reporting Limit	
Total Metals	SW-846 7010, 6010 D (ICP) or 6020 B	Liquid (ug/L)	Solid (mg/kg)
Arsenic	SW-846 6010B, 6020 or 7060A	5.0	1.0
Barium	SW-846 6010B	100	10
Cadmium	SW-846 6010B	5.0	1.0
Chromium	SW-846 6010B	10	1.0
Lead	SW-846 7421	5.0	1.0
Mercury	SW-846 7470A	0.20	0.5
Selenium	SW-846 7740	5	1.0
Silver	SW-846 6010B	10	1.0

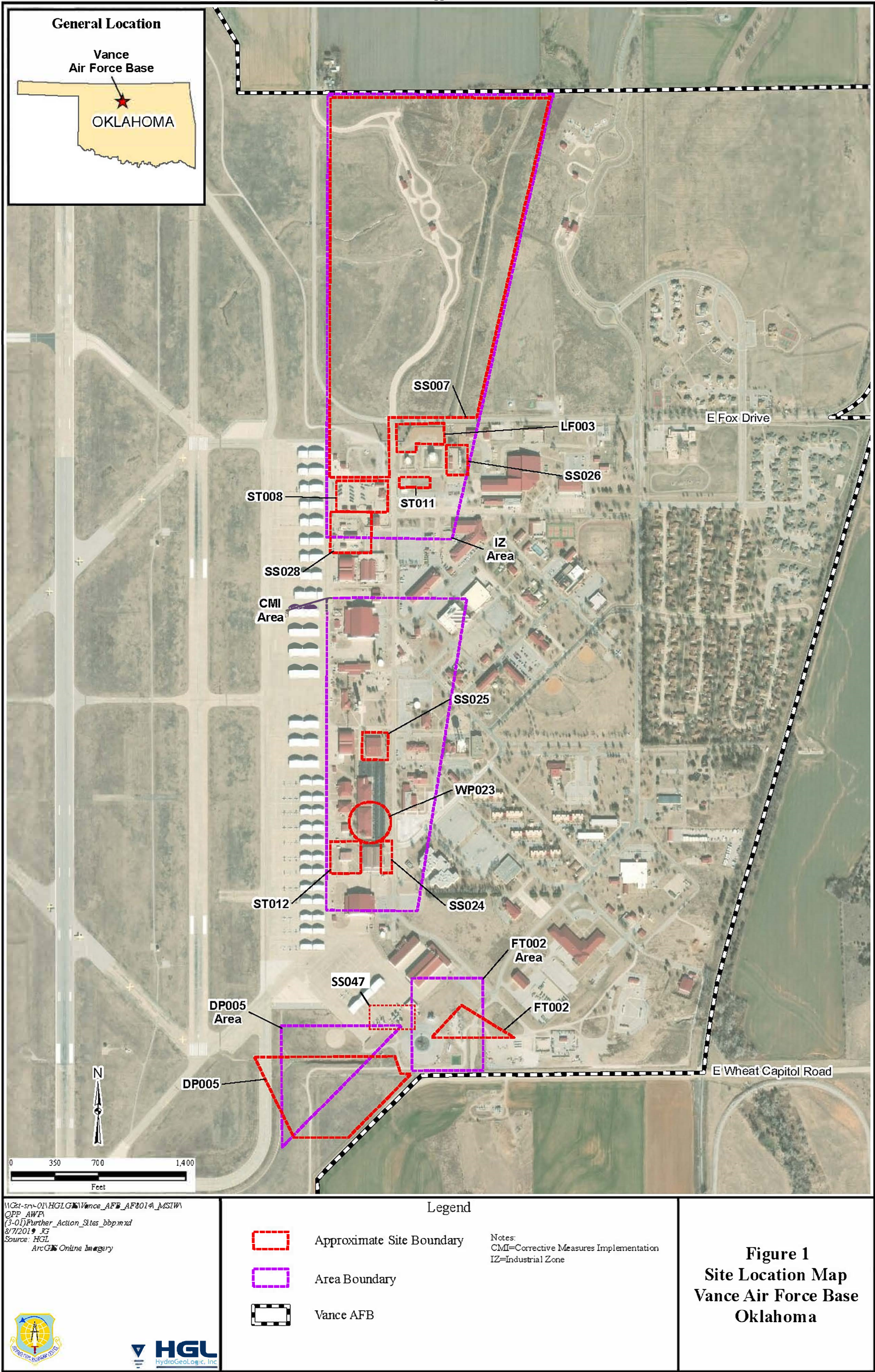
VANCE AIR FORCE BASE

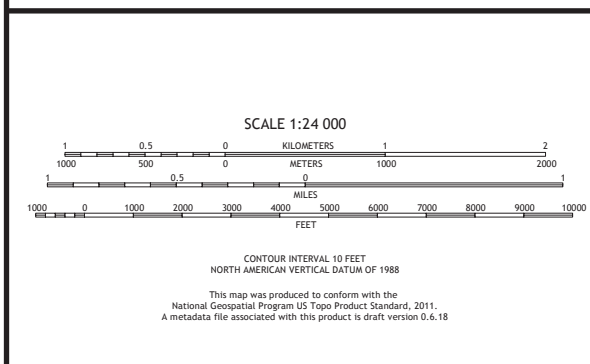
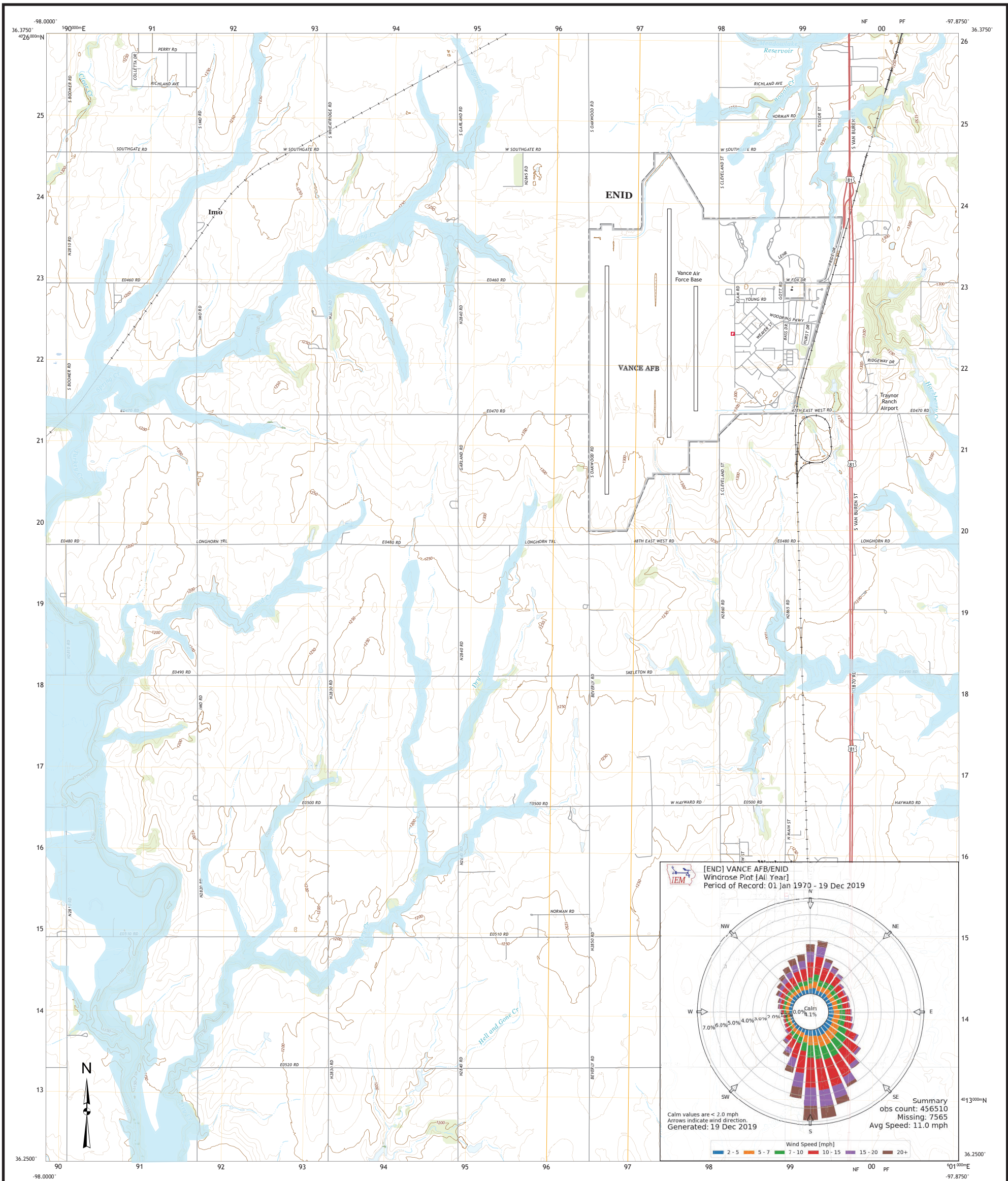
Vance AFB, OKLAHOMA

PERMIT ATTACHMENT 3

ATTACHMENT 3-2: GROUNDWATER MONITORING WELL LOCATION FIGURES

**NOTE: ALL THE PAGES FOR THE ATTACHMENTS ARE TAKEN
FROM THE PERMIT APPLICATION AND PAGE NUMBERS MAY
NOT BE IN SEQUENCE.**





Legend

- Topographic Contour (ft amsl, interval=10 feet)
 Surface Water Course
 100-Year Floodplain (FEMA, 2019)
 Vance Air Force Base

Notes: or clarity in showing topographic and natural features, certain features, such as access control, wells, buildings/structures, barriers for flood control and location of SWMUs and operational units, are not shown. These are provided via other figures.

Figure 2
Topographic Map
Vance Air Force Base
Oklahoma

LEGEND

- MONITORING WELL (SHALLOW ZONE)
- 2018 VC CONCENTRATION CONTOUR
- 2018 TCE CONCENTRATION CONTOUR (DASHED WHERE INFERRED)
- APPARENT GROUNDWATER FLOW DIRECTION
- CM AREA BOUNDARY
- PROPOSED WELL TO BE DROPPED FROM CM PROGRAM

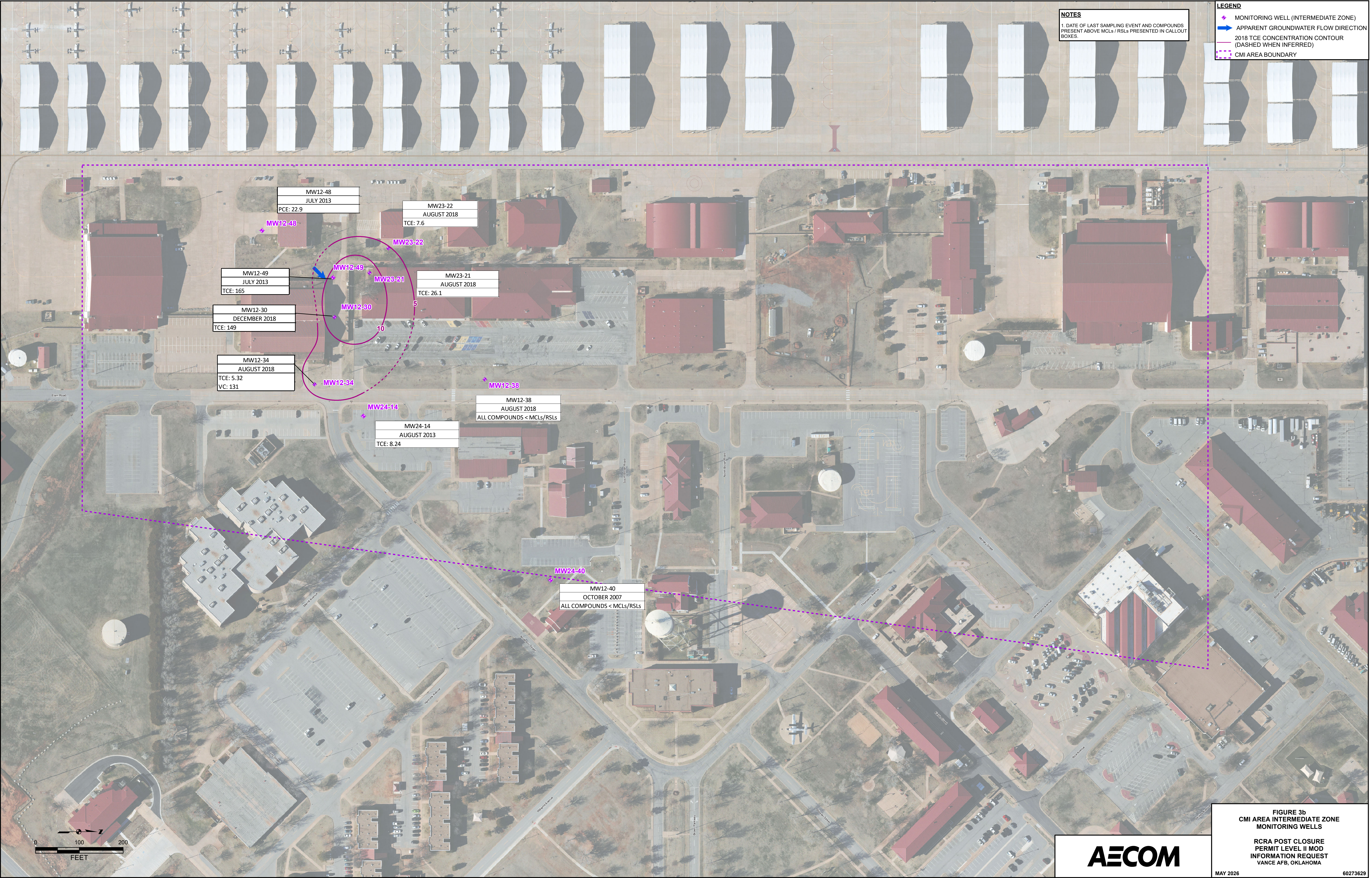
NOTES

1. DATE OF LAST SAMPLING EVENT AND COMPOUNDS PRESENT ABOVE MCLs / RSLs PRESENTED IN CALLOUT BOXES.



FIGURE 3a
CM AREA SHALLOW ZONE
MONITORING WELLS

RCRA POST CLOSURE
PERMIT LEVEL II MOD
INFORMATION REQUEST
VANCE AFB, OKLAHOMA



NOTES
1. DATE OF LAST SAMPLING EVENT AND COMPOUNDS PRESENT ABOVE MCLs / RSLs PRESENTED IN CALLOUT BOXES.

- LEGEND**
- MONITORING WELL (INTERMEDIATE ZONE)
 - APPARENT GROUNDWATER FLOW DIRECTION
 - 2018 TCE CONCENTRATION CONTOUR (DASHED WHEN INFERRED)
 - CMI AREA BOUNDARY

MW12-48
JULY 2013
PCE: 22.9

MW23-22
AUGUST 2018
TCE: 7.6

MW12-49
JULY 2013
TCE: 165

MW23-21
AUGUST 2018
TCE: 26.1

MW12-30
DECEMBER 2018
TCE: 149

MW12-34
AUGUST 2018
TCE: 5.32
VC: 131

MW24-14
AUGUST 2013
TCE: 8.24

MW12-38
AUGUST 2018
ALL COMPOUNDS < MCLs/RSLs

MW12-40
OCTOBER 2007
ALL COMPOUNDS < MCLs/RSLs

FIGURE 3b
CMI AREA INTERMEDIATE ZONE
MONITORING WELLS

RCRA POST CLOSURE
PERMIT LEVEL II MOD
INFORMATION REQUEST
VANCE AFB, OKLAHOMA

LEGEND

- DEEP ZONE MONITORING WELL
- 2018 PCE, TCE, CIS 1-2 DCE
- CMI AREA BOUNDARY
- PROPOSED WELL TO BE DROPPED FROM CM PROGRAM

NOTES

1. DATE OF LAST SAMPLING EVENT AND COMPOUNDS PRESENT ABOVE MCLs / RSLs PRESENTED IN CALLOUT BOXES.

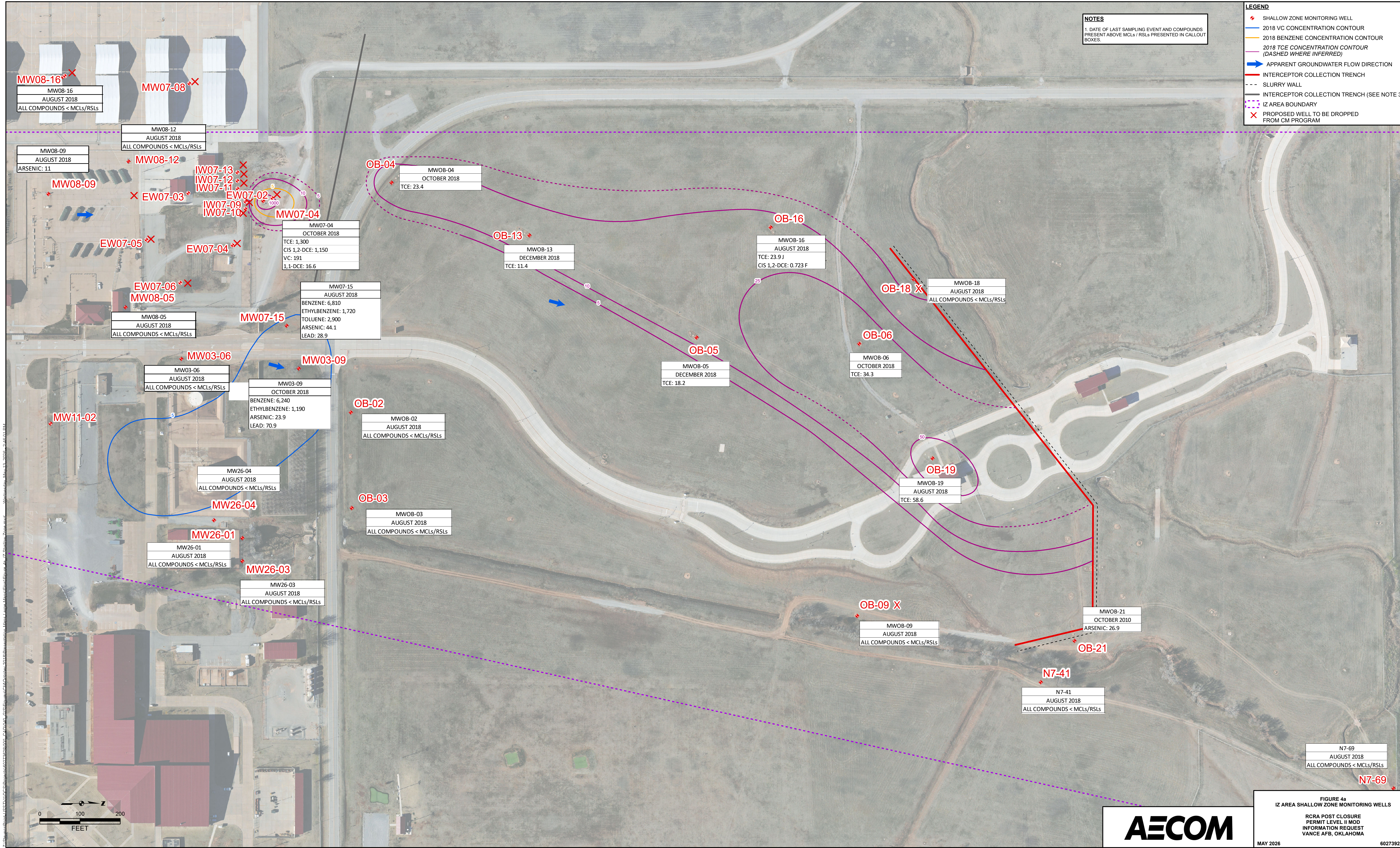
2. RELEASE AT MW12-13 IS HIGHLY LOCALIZED AROUND MONITORING WELL.



FIGURE 3c
CMI AREA DEEP ZONE
MONITORING WELLS

RCRA POST CLOSURE
PERMIT LEVEL II MOD
INFORMATION REQUEST
VANCE AFB, OKLAHOMA

AECOM



AECOM

FIGURE 4a
IZ AREA SHALLOW ZONE MONITORING WELLS
RCRA POST CLOSURE
PERMIT LEVEL II MOD
INFORMATION REQUEST
VANCE AFB, OKLAHOMA



LEGEND

- MONITORING WELL
- APPARENT GROUNDWATER FLOW DIRECTION
- INTERCEPTOR COLLECTION TRENCH
- SLURRY WALL
- IZ AREA BOUNDARY
- PROPOSED WELL TO BE DROPPED FROM CM PROGRAM

NOTES

1. DATE OF LAST SAMPLING EVENT AND COMPOUNDS PRESENT ABOVE MCLs / RSLs PRESENTED IN CALLOUT BOXES.



AECOM

FIGURE 6
IZ AREA DEEP
MONITORING WELLS
RCRA POST CLOSURE
PERMIT LEVEL II MOD
INFORMATION REQUEST
VANCE AFB, OKLAHOMA

MAY 2026

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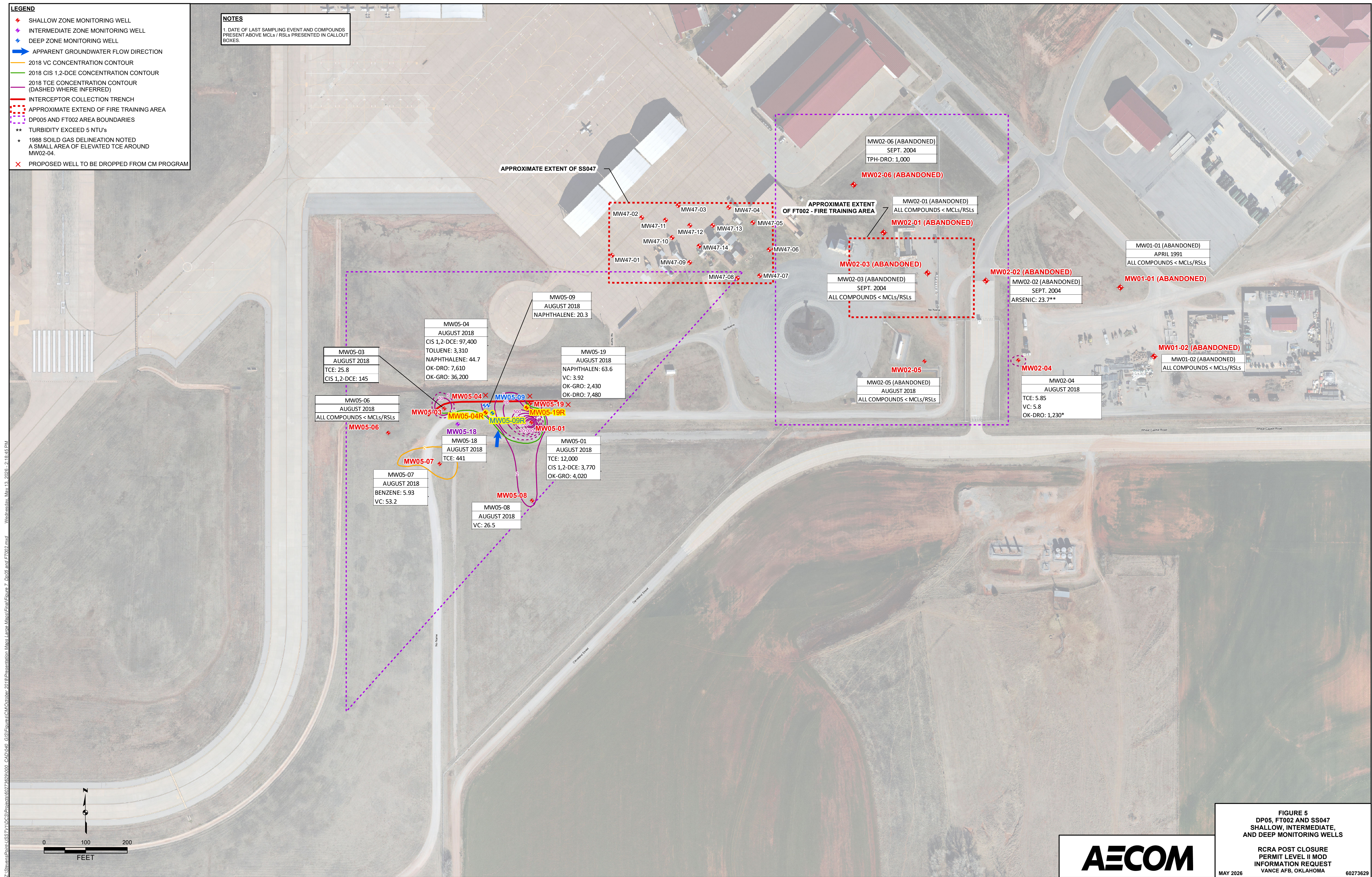
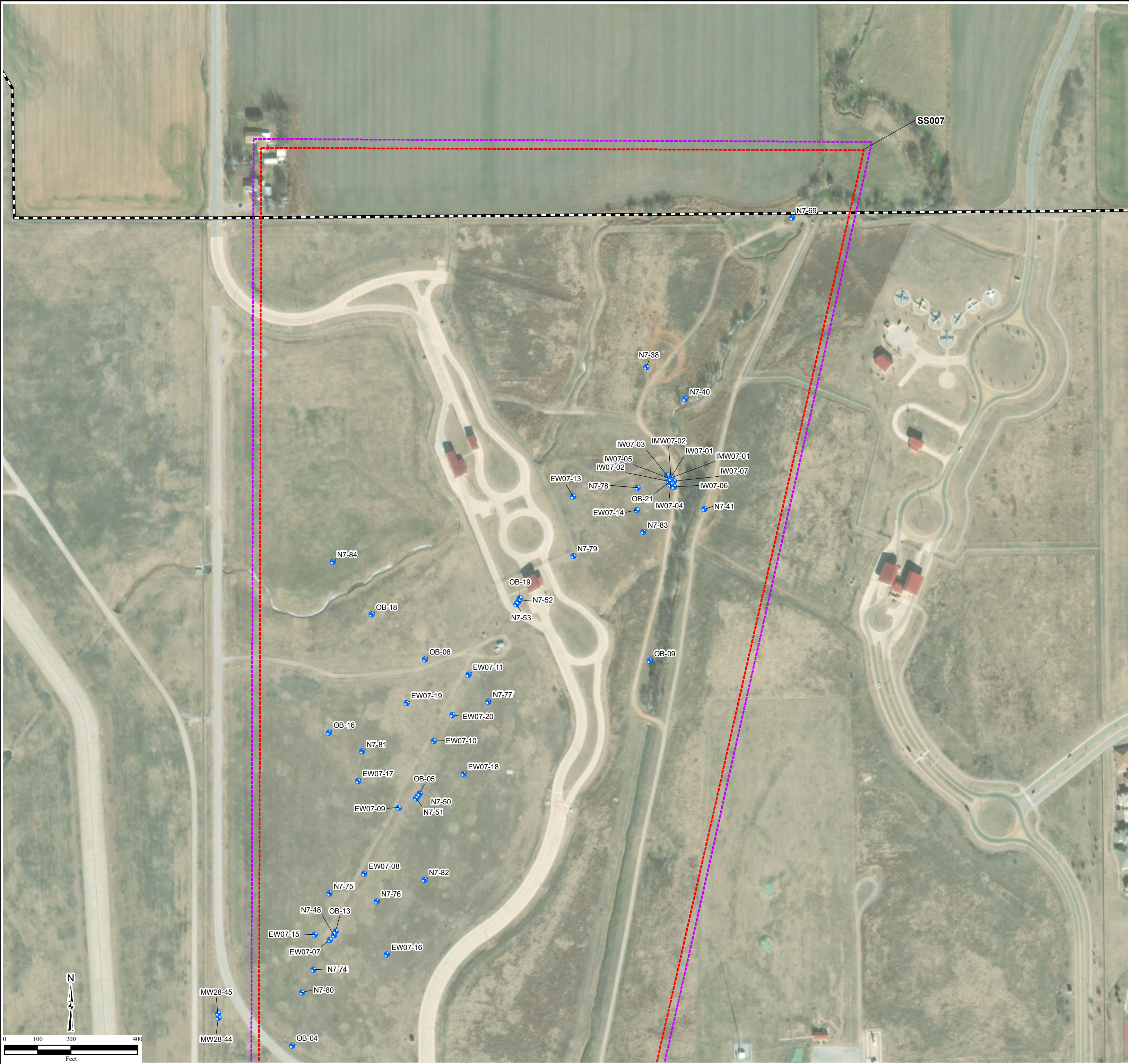


Figure 6a
Well Locations, North
Vance Air Force Base Oklahoma

Legend

- Well Location
- Approximate Site Boundary
- Area Boundary
- Vance AFB

Note:
AFB=Air Force Base



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(06)Well_Locs_North.mxd
5/22/2013 JG
Source: HGL
ArcGIS Online Imagery

Figure 6b
Well Locations, North Central
Vance Air Force Base Oklahoma

Legend

- Well Location
- Approximate Site Boundary
- Area Boundary

Note:
AFB=Air Force Base



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5/22/2013 JG
Source: HGL
ArcGIS Online Imagery

Figure 6c
Well Locations, Central
Vance Air Force Base Oklahoma

Legend

- Well Location
- Approximate Site Boundary
- Area Boundary



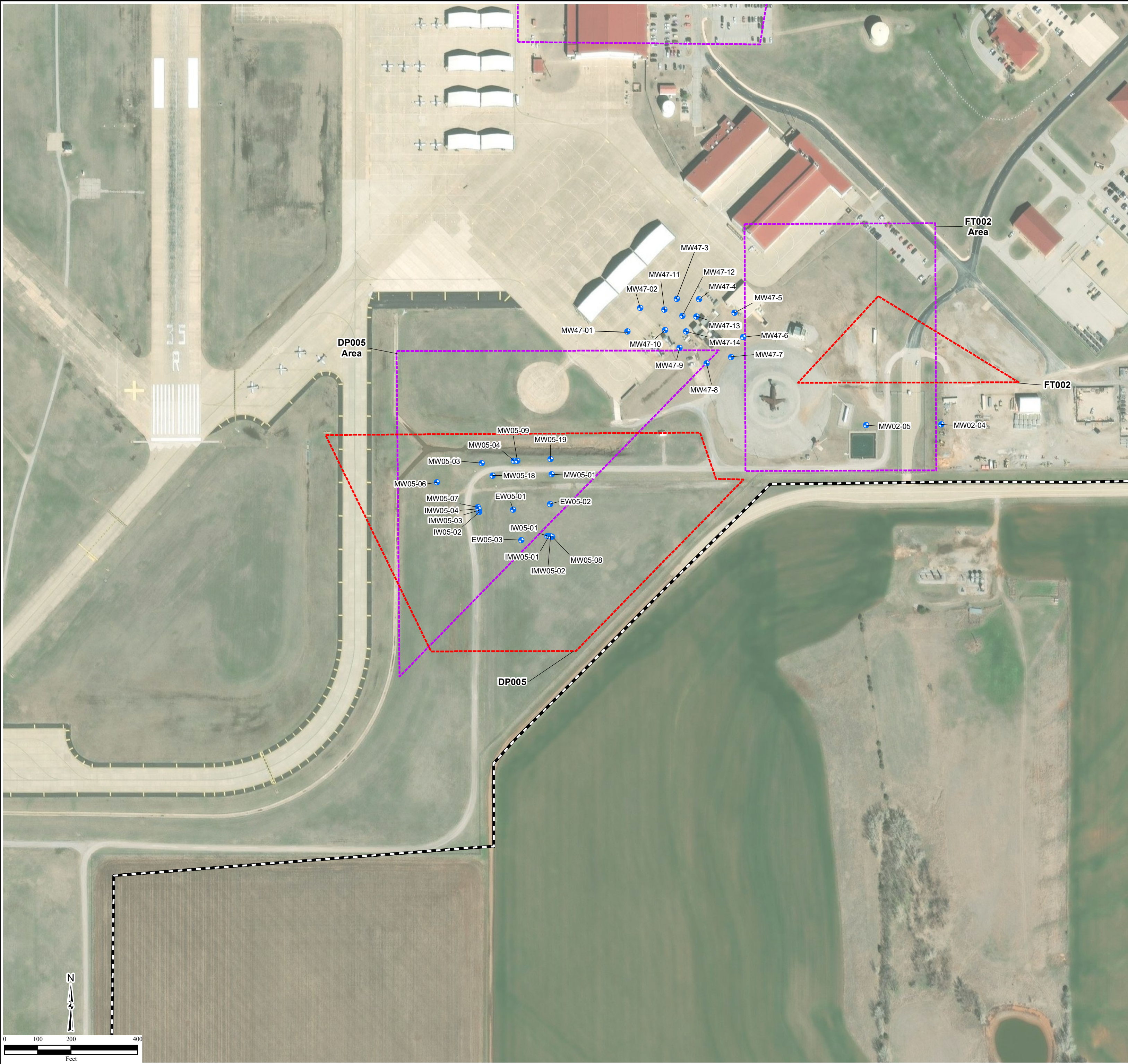
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Source: HGL
ArcGIS Online Imagery

Figure 6d
Well Locations
Vance Air Force Base Oklahoma

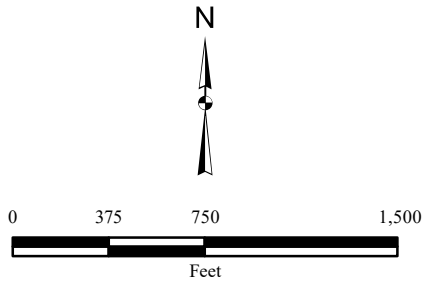
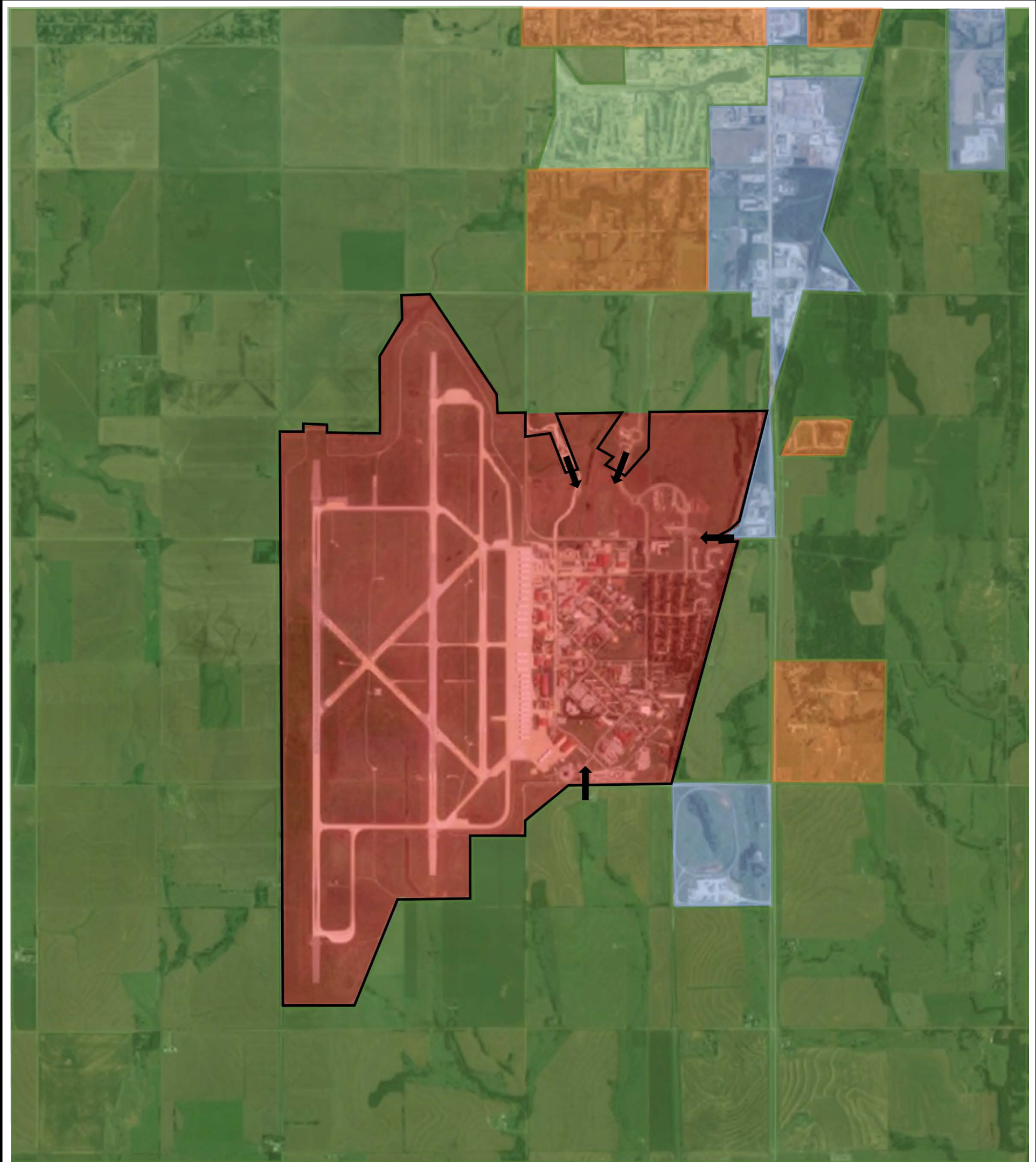
Legend

- Well Location
- Approximate Site Boundary
- Area Boundary
- Vance AFB

Note:
AFB=Air Force Base



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Source: HGL
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Legend			
	Vance AFB (Military)		Recreation
	Commercial/Industrial		Vance AFB Fenceline
	Agriculture		Vance AFB Gates/ Entry Points
	Residential		

Figure 7
Surrounding Land Uses
Vance Air Force Base
Oklahoma

VANCE AIR FORCE BASE

Vance AFB, OKLAHOMA

PERMIT ATTACHMENT 4

Fire and Emergency Safety Plan

**NOTE: ALL THE PAGES FOR THE ATTACHMENTS ARE TAKEN
FROM THE PERMIT APPLICATION AND PAGE NUMBERS MAY
NOT BE IN SEQUENCE.**

ATTACHMENT 7

**FIRE AND EMERGENCY SERVICES
PERFORMANCE WORK STATEMENT (PWS)**

Section 18: Fire and Emergency Services Performance Work Statement (PWS)

21 DEC 2023



U.S. AIR FORCE

VANCE AFB
FIRE & EMERGENCY SERVICES

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SECTION 18-1

18.1. DESCRIPTION OF SERVICES

18.1.1. OVERVIEW. The F&ES activity is responsible for providing continuous fire protection and fire prevention services at Vance Air Force Base (VAFB) on a twenty-four hour a day/seven days a week basis. Provide fire protection and fire prevention services at Kegelman Auxiliary Airfield (KCKA) beginning sixty minutes prior to scheduled flight operations and ending thirty minutes after flying operations cease; KCKA shall be staffed no more than twelve hours per day, to include the sixty minutes prior to flying operations and the thirty minutes after flying operations cease, as required to support flying operations. The F&ES activity will provide continuous fire protection and fire prevention services at any attached or related properties under the control of VAFB as needed to support operations and Government interests. The F&ES activity is broadly categorized as: Management, Fire Prevention, Training, and Operations. F&ES services include management, health & safety, fire prevention, training, emergency communications, and fire protection. F&ES fire protection services will include aircraft rescue & firefighting, structural & miscellaneous firefighting, fire alarm responses, wildland urban interface firefighting, limited wildland firefighting, technical rescue, hazardous materials response, and emergency medical response programs. All F&ES duties and associated tasks will be performed in accordance with (IAW) applicable standards and guidelines (i.e., National Fire Codes, Technical Implementation Guide (TIG), Fire Emergency Services Assessment Program (FESAP), and the most current VAFB, Air Force (AF), Higher Headquarters (HHQ), Department of Defense (DoD), Occupational Safety and Health Administration (OSHA), and Code of Federal Regulations (CFR) directives, instructions, regulations and supplements).

18.1.2. GENERAL INFORMATION

18.1.2.1. The 71 FTW/CC is responsible for fire safety of personnel and property.

18.1.2.2. The 71 FTW/CC is the VAFB Authority Having Jurisdiction (AHJ) for F&ES. The 71 FTW/CC may delegate AHJ for F&ES to a subordinate leadership position no lower than the 71 ISS/CC.

18.1.2.3. The 71 ISS/CC is the VAFB Fire Marshal. The Base Fire Marshal is responsible to the 71 FTW/CC for oversight of F&ES programs and provides resources to execute the F&ES mission.

18.1.2.4. The Service Provider (SP) cannot accept risk for the Government. The SP cannot approve deviations from regulatory requirements and/or National Fire Protection Association (NFPA) Standards. To request deviation from regulatory requirements and/or NFPA Standards, complete AF Form 4437, *Deliberate Risk Assessment Worksheet*, and develop a Risk Management Plan (RMP) for review and approval/disapproval by the 71 ISS/CC.

18.1.2.4.1. Review of existing AF Form 4437s and approved RMPs is required every two years by F&ES and the 71 ISS/CC.

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18.1.2.5. The Military Treatment Facility (MTF) Director is the AHJ for all matters concerning provision of Emergency Medical Services (EMS) on VAFB.

18.1.2.5.1. The MTF Director has determined the F&ES EMS Level of Care (LOC) shall be that of Emergency Medical Responder (EMR). The MTF Director shall appoint in writing an EMS Medical Director. The EMS Director shall provide approved EMS Protocols for the LOC provided by F&ES, EMS program guidance, EMS program management oversight, evaluation of F&ES EMS equipment requirements against the standardized Surgeon General's approved EMS equipment list, and F&ES EMS equipment procurement assistance. F&ES will be recognized as State of the Air Force.

18.1.2.5.2 The SP will not provide patient transport except in an austere environment during extraordinary circumstances in which the SP may provide non-ambulatory transportation of a patient to an awaiting ambulance. EMS transport services are provided by "LIFE EMS Inc." through a Memorandum of Agreement (MOA) between the 71st Flying Training Wing (FTW) and Life EMS.

18.1.2.6. The SP is responsible for all Personal Protective Equipment (PPE) for F&ES personnel. The SP is responsible for all PPE selection, procurement, management, maintenance, repair, replacement and utilization costs. Utilization costs include, but are not limited to, inspection, maintenance, testing, repair, and replacement. Establish program requirements and implement procedures for asset management, accountability, inspection, testing and repair of F&ES PPE, to include local PPE risk assessment, local job hazard analysis, and Certificate(s) of Hazard Assessment for each F&ES PPE item. Ensure all F&ES PPE is inspected, tested, and repaired as required by DoD, AF, HHQ, OSHA, CFR, National Fire Code (NFC), NFPA, and equipment manufacturer's requirements/recommendations. Conduct and document required periodic F&ES PPE inspections, maintenance, tests, and repairs in Fire Emergency Services - Information Management System - Automated Readiness Information System (FES-IMS-ARIS) and government designated replacement systems. Ensure F&ES PPE warranties are not voided.

18.1.2.6.1. Hazardous Materials (HazMat) protective equipment requirements identified in the United States Air Force (USAF) FES Hazardous Materials Equipment Plan (HMEP) is considered HazMat response equipment, not F&ES PPE. Comply with the USAF FES HMEP for "Medium" installation.

18.1.2.6.2. Self-Contained Breathing Apparatus (SCBA) which are provided by the Government are not considered F&ES PPE. SCBAs are considered F&ES equipment.

18.1.2.6.3. Utilization of the USAF F&ES PPE Indefinite Delivery Indefinite Quantity (IDIQ) contract for procurement, inspection, testing, repair, maintenance, and replacement of SP F&ES PPE is prohibited as this property is provided by the SP, not the Government.

18.1.3. F&ES STAFFING

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18.1.3.1. VAFB & KCKA F&ES Operations will maintain a Minimum Team Complement (MTC). MTC at VAFB will consist of fourteen personnel (one Assistant Chief (A/C) of Operations and thirteen firefighters). This shall include a minimum of seven DoD certified HazMat Technicians and two Emergency Medical Technicians (EMT) on-duty at all times. MTC at KCKA will include one Assistant Chief and five firefighters. This shall include a minimum of two EMTs on duty at all times KCKA F&ES is staffed. The Installation Fire Chief is responsible for devising a systematic approach to vehicle staffing and performing emergency response risk assessments, subject to approval by the Installation Commander, to ensure compliance with FY23 National Defense Authorization Act (NDAA) F&ES requirements, DoDI 60566.06, and DAFI 32-2001 F&ES Service Delivery Objectives.

18.1.3.2. Ensure the F&ES Management Staff consists of one Installation Fire Chief and one Deputy Fire Chief.

18.1.3.2.1. The Installation Fire Chief is the responsible person for the overall management and supervision of the fire protection/crash rescue and fire prevention program for VAFB. The Installation Fire Chief is responsible for establishing, executing, and maintaining all F&ES programs and is fully accountable for the effectiveness of all F&ES programs and operations. The Installation Fire Chief shall conduct risk assessments, perform external agency coordination, establish fire demand zones, develop organization programs, and risk management plans, which detail action to be taken during periods of reduced F&ES capability.

18.1.3.3. Ensure the F&ES Administrative Staff consists of a minimum of one A/C of Training, one A/C of Fire Prevention, and one A/C of Health and Safety (H&S).

18.1.3.3.1. The Administrative Staff shall develop, implement and maintain an F&ES self-inspection program to address the areas outlined in the current HHQ Inspector General (IG) Inspection Guidance, to include FESAP. Utilize the most current edition of the FESAP as the standard inspection checklist for the F&ES self-inspection program, Command Staff Assistance Visits (SAV), and HHQ IG Inspections. (CDRL 1801)

18.1.3.3.2. The A/C of H&S shall be assigned as F&ES H&S Officer. The A/C of H&S shall develop directives to establish, implement, and maintain an F&ES Occupational Safety and Health (OSH) program, Facility Safety program, F&ES Operational Safety program, Firefighter Fitness & Wellness program, F&ES Respiratory Protection program, and F&ES PPE program and establish, implement, and maintain a safety incident reporting program.

18.1.3.3.2.1. The H&S staff administers the Fire and Emergency Services Safety and Health Program (FDOSHP) and Firefighter Fitness and Wellness Program. F&ES H&S services included, but are not limited to: OSH program, Facility Safety program, Operational Safety program, PPE program, Respiratory Protection program, and Firefighter Fitness & Wellness program.

18.1.3.3.3. The F&ES Fire Prevention staff shall consist of the A/C of Fire Prevention and two Fire Inspectors at a minimum. The Fire Prevention staff shall administer the Fire Safety Education program, Fire Investigation program, and Fire Prevention and Code Compliance program.

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18.1.3.3.3.1. The Fire Prevention staff shall establish, implement, and maintain a fire protection design review program for all proposed construction and facility modifications. Provide review comments to Installation Engineering for incorporation in project plans. Attend pre-construction and pre-performance meetings with independent third-party contractors. Witness inspections for all fire alarm and fire suppression systems for all construction and renovation activities. Attend final acceptance meetings and activities for all construction and renovation activities. Aid in the development of Pre-Incident Plans and Pre-Fire Plans. Establish, implement and maintain an Installation Fire Extinguisher program. Provide Subject Matter Expert (SME) guidance for all matters involving fire extinguishers. Provide fire extinguisher training monthly and as requested by organizational leadership. Inspect commercial kitchen hood and duct systems as required. Observe, monitor and document the performance of deep vat fryer inspection and testing. Document observation of deep vat fryer inspection and testing on AF Form 218, *Facility Fire Prevention and Protection Record*.

18.1.3.3.3.2. Fire Prevention services include but are not limited to: Fire Prevention program management, Facility Inspection/Code Compliance program, Fire Safety Deficiency (FSD) program, Risk Assessment Code (RAC) program, Fire Investigation program, Project Design Review, Facility Plans Review, witness tests of new fire alarm and fire suppression systems, Hot Work Permit program, Fire Safety Education program, and Facility Manager Fire Safety Training program.

18.1.3.3.4. The A/C of Training shall establish, implement, execute, and maintain the F&ES Training Program, to include, but not limited to, annual and recurring training program, EMS training program, skills validation program, certification training program, credentialing program, training facility program, and driver training program.

18.1.3.3.4.1. The EMS training program shall encompass EMS training, certification and registration or licensure. The A/C of Training shall ensure all F&ES personnel maintain National Registry of Emergency Medical Technicians (NREMT) EMS certification. The A/C of Training shall also be the F&ES EMS Administrator (NREMT site coordinator) responsible for training, tracking, and maintaining F&ES EMS certifications and ensuring that EMS training, registration, certification, and/or licensing remains current.

18.1.3.3.4.2. Establish, implement, execute and maintain a Firefighter Certification program. The F&ES Certification shall utilize government computer-based testing tools, such as MyLearning. A record of all personnel certifications must be maintained and available for Government review upon request.

18.1.3.3.4.3. Establish, implement, execute and maintain a Firefighter Credentialing program. Ensure this program is IAW the Fire Emergency Services Credentialing (FESCRE) program. Ensure personnel are appropriately credentialed IAW assigned duty position. A record of all personnel credentials must be maintained and available for government review upon request.

18.1.3.3.4.4. Document all F&ES training facility inspections, maintenance actions, and repair actions in Fire Emergency Services-Information Management System (FES-IMS). Document all F&ES training facility use in FES-IMS (Structural Live Fire Training Facility Operations, Aircraft Live Fire Training Facility Operations). Any modifications to the live fire trainers shall be coordinated with AFIMSC Detachment 7 and approved by the Air Force Civil Engineer Center (AFCEC) Engineering Support Division. All operators of live-fire training facilities shall be appropriately trained and authorized to operate the aircraft and/or the structural live fire training facility.

18.1.3.3.4.5. Provide Semi-Annual HazMat refresher training at the HazMat Awareness, Operations, Technician, and Incident Commander levels to Government personnel with required pre-requisite training documentation.

18.1.3.4. Provide a minimum of five F&ES Emergency Communications Center (ECC) Operators. The ECC shall be fully staffed with a minimum of one ECC Operator twenty-four hours a day, seven days a week. The ECC shall be staffed with a minimum of two ECC Operators to support special events. ECC personnel shall not be included in the minimum staffing for F&ES Operations.

18.1.3.4.1. ECC services include, but are not limited to receive emergency notifications, dispatch appropriate initial response resources, provide ECC support to Incident Commander, dispatch appropriate follow-on resources, maintain an Official F&ES Log of Events, provide situational awareness to the Emergency Operations Center (EOC) and Installation Control Center (ICC), update required information systems to facilitate installation Common Operating Picture, information dispersal, and event notification.

18.1.3.5. Provide a minimum of thirteen F&ES Operations personnel for Offensive HazMat/Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) operations after Defensive operations conclude. This will include one HazMat Incident Commander, seven HazMat Technicians, and five HazMat Operations qualified personnel. On-scene medical transport capability will be provided via the 71 MDG MOU with Life EMS. Perform Offensive HazMat and CBRNE operations at the HazMat Technician Level per the USAF FES HazMat Equipment Plan.

18.1.3.6. Provide a minimum of two firefighters who are trained and certified NREMT instructors to provide EMS training at the EMR and EMT level.

18.1.3.7. The SP will provide one employee to assist the A/C of Operations to ensure daily fire station operations are conducted and completed. Qualification requirements for this position are detailed in PWS 18 Appendix F, *Special Training, Certification, and Licensing Requirements* section 18F.1 item four. This duty position is a firefighter position. This individual shall staff firefighting apparatus in the role of Lead Firefighter. In the absence of the A/C of Operations, this individual is the Senior Fire Officer at an incident and performs Incident Command until relieved by a more senior Fire Officer (Assistant Fire Chief, Deputy Fire Chief, Installation Fire Chief).

18.1.3.8. In accordance with FY23 NDAA Sec 388 Part a., SP will comply with the following inclusions:

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18.1.3.8.1. Members of the Armed Forces and employees of Defense Agencies who provide fire protection services to military installations comply with the notational consensus standards developed by the National Fire Protection Association.

18.1.3.8.2. The minimum staffing requirement for any firefighting vehicle responding to a structural building emergency at a military installation is not less than four firefighters per vehicle; and

18.1.3.8.3. The minimum staffing requirement for any firefighting vehicle responding to an aircraft or airfield incident at a military installation is not less than three firefighters per vehicle.

18.1.4. SPECIFIC TASKS

18.1.4.1. Provide FES Management and Administration Services, Training, Prevention and Education Services, Fire and Rescue Emergency Response Services, HazMat Mitigation (to the Technician Level), non-transport pre-hospital Emergency Medical Services, Emergency Management Support Services, Extinguisher Maintenance and Education, ECC services, intervention at other emergency situations (such as natural or manmade disasters that threaten life, property or the environment), and associated tasks for any attached or related properties on VAFB and KCKA.

18.1.4.2. Provide overall F&ES program management, resource management, planning, administration, F&ES operations, supervision, labor, uniforms, PPE, materials, supplies, vehicles; except as identified as Government provided in PWS 18 Appendix G, *Government Furnished Property*.

18.1.4.3. Provide SP developed directives and/or instructions and/or procedures and/or guides and/or management plans to the Administrative Contracting Officer (ACO), Base Fire Marshal, and F&ES Contracting Officer Representative (COR) ninety days after contract start date and upon revision. (CDRL 1802)

18.1.4.4. Provide continued F&ES services 24 hours a day, 7 days a week throughout a crisis declared by Presidential and/or Secretary of Defense authority. Create and maintain a F&ES Crisis Management Plan. Review and update the F&ES Crisis Management Plan as required to ensure currency. Submit the F&ES Crisis Management Plan to the ACO and the F&ES COR for review and Contracting Officer (CO) for approval within 35 days after award date, annually thereafter at the start of the Calendar Year (CY), and as required to ensure currency. (CDRL 1803)

18.1.4.5. Ensure all F&ES personnel meet experience, training and certification requirements IAW PWS 18 Appendix F, *Special Training, Certification, And Licensing Requirements*, for duty positions to which they are assigned.

18.1.4.6. Populate, maintain, update, generate, and manage data and reports from government designated computer database system to include for example, but not limited to: FES-IMS, FES-

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IMS-ARIS, Fire Emergency Services Management Tool (FESMT), NextGen IT, Civil Engineering Material Acquisition System (CEMAS), Management Internal Control Toolset (MICT), FESAP, Air Force Common Output Levels of Service (AFCOLS), other data manipulation and collection systems, and any other government designated replacement systems. Ensure Self-Assessment Program is in compliance with 2022 MICT/FESAP playbook. Comply with all DAFI 32-2001 requirements for a F&ES Program. Maintain all F&ES Official Files IAW AFRIMS.

18.1.4.7. Ensure the Installation Fire Chief, Deputy Fire Chief, Assistant Fire Chiefs, VAFB Assistant to A/C of Operations, KCKA F&ES Additional Duty Anti-Terrorism Officer, Alternate KCKA F&ES Additional Duty Anti-Terrorism Officer, and F&ES ECC staff obtain and maintain a SECRET security clearance.

18.1.4.8. Conduct, develop and maintain a F&ES Installation Risk Assessment (IRA) for VAFB and KCKA within thirty days after contract start date and annually thereafter at the start of the Fiscal Year (FY). Utilize the USAF FES Facility Risk Calculation (FRC) included in the FESMT. The F&ES IRA shall include all facilities and structures, installation infrastructure, mission assigned aircraft and common transient aircraft, mission related activities, and routine and hazardous processes performed on the installation for both VAFB and KCKA. (CDRL 1804)

18.1.4.9. Develop, establish and maintain a F&ES Standard of Coverage (SOC) for VAFB and KCKA within forty-five days after contract start date and annually thereafter at the start of the CY. The F&ES SOC shall include written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization to address fire response districts and fire demand zones. The SOC will include an analysis of risks and expectations to assist in making decisions on resource utilization issues. (CDRL 1805)

18.1.4.10. Develop, establish and maintain a F&ES 3-5 Year Plan within ninety days after contract start date and annually thereafter at the start of the FY. (CDRL 1806)

18.1.4.11. Provide monthly F&ES responses to housing National Fire Incident Reporting System (NFIRS) activity report entitled "Fire & Emergency Service Responses to Housing". (CDRL 1807)

18.1.4.12. Establish, implement, maintain, and manage a flightline fire extinguisher program. Provide testing, inspection, and maintenance for all VAFB and KCKA wheeled halon flightline fire extinguishers. Ensure all flightline fire extinguishers are inspected, tested, and maintained according to all applicable regulations and the equipment manufacturer's requirements and recommendations.

18.1.4.13. Provide stand-by medical support as requested to Explosive Ordnance Disposal (EOD) personnel during explosive operations on VAFB and KCKA, and special events. Attendance is required at operational safety briefings.

18.1.4.14. Participate in all contingency exercises IAW installation plans, to include but not limited to: Wing Inspection Team (WIT) exercises and inspections, Emergency Management (EM)

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exercises, Force Protection Condition (FPCON) exercises, SAVs, and all HHQ-mandated inspections and exercises. Respond to Deficiencies and Findings generated from exercises and inspections in MICT and Inspector General Enterprise Management System (IGEMS). Appoint, in writing, two F&ES Senior Fire Officers to supplement the VAFB WIT as a “Trusted Agent”. The F&ES WIT Trusted Agent(s) shall attend all meetings, pre-planning sessions, and exercise events.

18.1.4.15. Ensure personnel performing Respirator Protection Equipment (RPE) maintenance, testing, and repair are certified Air Mask Repair Technicians IAW the equipment manufacturer’s technical publications. Manufacturer’s technical manuals’ preventative maintenance checks and tables shall be used to performer scheduled services that inspect for serviceability, sustain the SCBA, and extend the lifetime of the equipment. Conduct annual performance test for each SCBA (PosiChek required), hydrostatic testing of cylinders as required and annual quantitative mask fit testing for employees (Port-a-Count unit required). Document all RPE inspections, testing, maintenance, and repair in FES-IMS-ARIS and government designated replacement system. Maintain all RPE to ensure a constant state of readiness. Ensure equipment warranties are not voided. Maintain quantities of replacements parts to perform repair/replacement based on local use rates. Firefighters shall perform daily inspections on SCBA to detect deficiencies, and if needed, perform corrective maintenance actions within their capabilities. Firefighters shall perform scheduled routine cleaning of the SCBA. Firefighter inspections and cleanings shall be conducted IAW timelines prescribed in the manufacturer’s technical manual. The Government shall provide sufficient SCBA units, PosiChek, and Port-a-Count to meet mission requirements. Provide RPE maintenance, testing and repair services for 71 ISS/EM.

18.1.4.16. Provide maintenance, testing, and repair services for six 71 ISS/EM SCBAs. They are identical to F&ES SCBAs.

18.1.4.17. Respond to and take immediate action to mitigate all aircraft emergencies and hazardous situations involving aircraft. Respond with required number of qualified personnel and appropriate equipment to all aircraft in-flight, ground emergencies, aircraft related incidents and stand-by requests. These include on-base and off-base aircraft incidents involving government and government contracted aircraft. The SP shall be responsible to establish emergency egress, perform aircraft rescue, render medical aid, and perform fire suppression and extinguishment. If munitions are involved, immediately notify the ECC and Wing Command Post and perform safe-distance operations. Communicate with the ECC, EOC, and other VAFB agencies as required.

18.1.4.18. Upon hangar fire suppression system activation or discharge/release of Aqueous Film Forming Foam (AFFF), immediately notify Office of the Chief, Air Force Emergency Services (AFCEC/CXF), Base Civil Engineer (BCE), F&ES COR and Environmental COR within two hours of ECC activation/discharge. (CDRL 1808)

18.1.4.19. Respond to and perform Wildland Urban Interface IAW the Installation Wildland Fire Management Plan and the AF Wildland Fire Center Playbook.

18.1.4.20. The SP shall not perform initial wildland fire response and wildland firefighting within

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the wooded area of KCKA; request Mutual Aid Agreement (MAA) assistance/response for initial wildland fire response and wildland firefighting.

18.1.4.21. The SP is responsible for the procurement and utilization costs of all duty uniforms for F&ES personnel. Duty uniforms consist of station work uniforms, dress uniforms, and PT uniforms. F&ES duty uniform selection, procurement, management, maintenance, repair, and replacement is the responsibility of the SP. Comply with USAF and NFPA F&ES duty uniform wear guidance, to include rank and duty insignia. Dress Uniform is not required for F&ES personnel, except for Chief Fire Officers.

18.1.4.22. Establish program requirements and implement procedures for development of Facility Pre-Fire Plans. Develop Pre-Fire Plans for all installation facilities, military family housing, and the elementary school. Record all Facility Pre-Fire Plans on AF Form 1028, *Facility Pre-Fire Plan*. (CDRL 1809)

18.1.4.23. Establish program requirements and implement procedures for development of Aircraft Pre-Incident Plans. Develop Aircraft Pre-Incident Plans for aircraft assigned to VAFB and all non-emergent transient aircraft as announced via the military aircraft prior permission required (PPR) process maintained through the Airfield Manager. Once a PFP has been established for an aircraft, it does not need to be accomplished for every PPR if the PFP has been reviewed and validated as current IAW established review timeline requirements. Record all Aircraft Pre-Fire Plans on Air Force Technical Order (AFTO) Form 88, *Aircraft Pre-Fire Plan*. (CDRL 1810)

18.1.4.24. The Installation Fire Chief shall perform initial and biennial review and validation of all Pre-Incident Action Plans, Facility Pre-Fire Plans, and Aircraft Pre-Fire Plans. The Installation Fire Chief shall document each initial review and validation with wet ink signature and date on the Master Copy. If the Master Copy is revised and re-printed, the Installation Fire Chief shall document initial review and validation of the revised plan with wet ink signature and date on the revised Master Copy. The Installation Fire Chief shall document completion of biennial review and validation on a Memorandum for Record (MFR) for Pre-Incident Action Plans, on a MFR for Facility Pre-Fire Plans, and on a MFR for Aircraft Pre-fire Plans. Each MFR shall specifically identify which plans were reviewed and validated and the date of each review and validation.

18.1.4.25. The SP shall participate in the MAA program. The 71 ISS/IDRC will maintain a copy of F&ES MAAs. MAAs may include automatic response agreements when approved by the 71 FTW/CC. Upon ECC dispatch receipt of a mutual aid support request, immediately notify 71 FTW/CP and the 71 ISS/CC. Immediately review on-hand risk assessments and communicate operational impact to 71 ISS/CC for awareness. Do not respond off the installation without approval of the 71 FTW/CC or designated representative. Provide a qualified Incident Safety Officer at every MAA incident supported with full authority to alter or suspend Fire/Rescue Emergency Operations, and authority to suspend VAFB F&ES participation in emergency operations.

18.1.4.26. Manage all F&ES Real Property (facilities) resources, to include but not limited to: Real Property (facilities), vehicles (Incidental to Place of Performance (ItPoP) Vehicles), and equipment

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(GFP and ItPoP Equipment). F&ES real property (facilities) provided by the Government for SP use are identified in Appendix 18C, *Maps and Work Area Layout*.

18.1.4.27. Establish and maintain sufficient stock levels of ancillary fire ground equipment and training equipment.

18.1.4.28. Establish, implement, and maintain an operational F&ES supply system for all expendable, non-expendable, and supply and equipment items which is IAW VAFB supply system procedural guidance and policies. All procurement and utilization costs for F&ES supplies are the sole responsibility of the SP. Maintain a reserve quantity of AFFF and dry chemical agents equal to the total capacity of assigned fire fighting vehicles. Establish local F&ES procedures to provide immediate transport of firefighting agents for emergency operations. Government provided F&ES equipment funds shall be utilized for replacement of reserve firefighting agents.

18.1.4.29. Provide and maintain a budget management function for F&ES to account for expenditures. The F&ES budget management function shall provide an annual budget input to the Civil Engineering (CE) Resources office. The Financial Analysis Office, through the 71 MSG/RA, 71 ISS/RA, contractor CE Resources, COR, and ACO shall provide the SP with annual budget development and allocation information, amounts of any withheld funds, the reason for the withhold, and assign an annual budget (distribution) for F&ES. It is this distribution that the SP shall manage as the annual equipment budget. The SP shall report changes or potential problems in requirements that shall have a significant impact on funding to the CE Resources office and 71 ISS/RA to ensure necessary material and services are available to support the activity and determine if expenditures are progressing as planned. Procurement of replacement F&ES GFP and ItPoP government provided/government replaced equipment is funded with United States Government (USG) provided F&ES equipment funds. Ensure that the Force Activity Designator (FAD) codes for fire protection vehicles, equipment, and supplies is equal to the mission being supported. Provide an annual budget request recommendation to the VAFB Housing Manager for projected requirements for fire station sleeping and entertainment area furnishings which are provided by the housing management function via Furnishings Management Office (FMO) by 1 February each year. (CDRL 1811)

18.1.4.30. The annual FDOSHP Worksheet submission shall include approved ORM plan(s) for all non-compliant areas. Operational Risk Management (ORM) plans shall be developed by the SP, coordinated with the VAFB Fire Marshal and the F&ES COR, reviewed by the ACO, and approved by the 71 FTW/CC. (CDRL 1812)

18.1.4.31. All firefighters whose positions require participation in emergency incident operations shall participate in the Firefighter Fitness and Wellness program. Individuals not physically capable of performing essential job functions shall be referred to the Fire Department Physician for a fitness-for-duty evaluation. Employees disqualified for duty by the Fire Department Physician shall be immediately removed from firefighting duties.

18.1.4.32. Provide periodic inspection, maintenance, testing, certification, upgrades and repair of all F&ES equipment as required by manufacturer's requirements and recommendations and DoD,

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AF, HHQ, OSHA and NFPA requirements.

18.1.4.33. Provide EMS. The MTF Director has ultimate oversight and accountability for installation EMS. F&ES shall act as initial EMS responder and provide patient care at the EMS LOC directed by the MTF Director up to and including the EMT LOC. F&ES role in EMS shall be limited to non-transport Basic Life Support (BLS) at the EMR or EMT LOC from fire department apparatus, as determined by the MTF Director.

18.1.4.34. Comply with MTF Director EMS requirements and guidance. Provide emergency medical treatment under the medical direction of the MTF Director or his/her designee. The EMS program remains the responsibility of the MTF Director. The MTF Director shall provide: an EMS Medical Director, EMS protocols, EMS program guidance, EMS program management oversight, evaluation of F&ES EMS equipment requirements against the standardized Surgeon General's approved EMS equipment list, F&ES EMS equipment procurement assistance, and allow F&ES personnel to affiliate with the local MTF NREMT site code. F&ES shall budget for and use Fire CEMAS funds to fund all EMS supply and equipment purchases.

18.1.4.35. The minimum level of medical training for all F&ES personnel is Cardiopulmonary Resuscitation (CPR). All F&ES personnel below Assistant Chief position shall be trained to at least the EMR or EMT level and shall be certified and registered as EMR or EMT by the NREMT. All F&ES ECC Dispatcher shall be trained and certified to the EMD level.

18.1.4.36. Respond with required number of qualified personnel and appropriate equipment and provide emergency medical care IAW applicable directives, instructions, regulations, standards, and AF EMS protocols. F&ES responders shall annotate EMS response actions on the AF Form 552, *Air Force Patient Care Report*. The original copy of the completed AF Form 552 must be turned in to the local MTF. AF EMS protocols shall be used IAW MTF Director guidance. (CDRL 1813)

18.1.4.37. The SP may request AETC Technical Training to upgrade personnel qualifications and utilize Department of Defense Fire Academy (DoDFA) in-residence and DoDFA Mobile Training Teams as a training resource. Government funds shall not be used to support this training.

18.1.4.38. Technical Rescue at the technical level shall include, but is not limited to: high angle rescue, rope rescue, structural collapse search and rescue, confined space search and rescue, vehicle search and rescue, trench search and rescue, machinery search and rescue, tower search and rescue, natural disaster response, F&ES mutual aid response, and pre-incident planning.

18.1.4.39. IAW VAFBI 13-204 and AFMAN 13-204 V2 5.2.3, perform KCKA Delegated Airfield Management Duties (DAMD) (CLIN X038), to include performing daily airfield checks on KCKA active landing surface and aircraft movement areas prior to start of F&ES required workday, perform additional runway condition surveys as requested and as delegated to F&ES, and perform emergency wildlife hazard response as requested and as delegated to F&ES. F&ES personnel shall be trained and certified by Airfield Manager or Assistant Airfield

Manager to perform KCKA DAMD.

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18.1.4.40. Marshal aircraft as required at KCKA.

18.1.4.41. Tailor the Fire Safety Education (FSE) program to the mission and processes at VAFB. Target the FSE program to the entire VAFB populace, to include, but not limited to military, civilian, and contracted personnel, privatized housing residents, facility managers, mission partners, tenant organizations, and transient personnel. Promote FSE objectives to equip personnel with the information needed to prevent fires, protect themselves, and intervene early when a fire occurs.

18.1.4.42. The fire protection design review program entails review of plans, drawings, and specifications to ensure all required fire protection and fire prevention features are present and local emergency response elements are incorporated (ex. facility accessibility, fire hydrant locations). Coordination and discussion with the Installation Engineering element Fire Protection Engineer shall be accomplished.

18.1.4.43. Respond to all In-Flight Emergencies (IFE) 24 hours a day, seven days a week. Upon notification of a physiological IFE, contact Life EMS to respond on standby to the scene and immediately respond. The on-call Flight Surgeon (FS) from the MDG will initiate contact with the IC for a telephonic patient evaluation and will be responsible for all medical decisions during the physiological IFE response, to include the decision to transport the patient via Life EMS to an off-station hospital. In the event telephonic communication cannot be established between the FS and IC, all medical care will be transferred to Life EMS for patient evaluation and off-station hospital transport for further screening.

SECTION 18-2

18.2. SERVICE SUMMARY

Performance Objectives	PWS Reference	Performance Threshold
1. Provide MTC twenty-four hours a day/seven days a week for VAFB.	18.1.1 18.1.3.1	100% compliance within five hours after occurrence causing SP to fall below OLS staffing.
2. Provide fire protection services at MTC at KCKA as required to support scheduled flight operations.	18.1.1 18.1.3.1	100% Compliance within five hours after emergency circumstances (i.e. unannounced illness, personal emergency, etc.) cause SP to

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		fall below MTC staffing. Staffing below MTC for non-emergent circumstances will not be accepted. Emergent circumstances will be adjudicated by the AHJ.
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APPENDIX 18A

18A.1. PUBLICATIONS

Publication Number	Date	Title	Applicable Paragraphs
DAFI 32-2001	27-Jul-22	Fire and Emergency Services Program	ALL
DESR6055.09_ AFMAN91-201	28-May-20	Explosives Safety Standards	ALL
DAFMAN 91-203	25-Mar-22	Air Force Occupational Safety, Fire, and Health Standards	ALL
AFPD 32-20	10-Jul-18	Fire and Emergency Services	ALL
DoDM 6055.06	22-Jan-20	DoD Fire and Emergency Services Certification Program	ALL
DoDI 6055.06	3-Oct-19	DoD Fire and Emergency Services (F&ES) Program	ALL
DoDIO-2000.16V1_ AFI10-245-O_ AFGM2020-01	26-May-20	Antiterrorism (AT) Program Implementation (CUI)	ALL
National Fire Codes	Current Edition	National Fire Protection Association (NFPA) Standards and Recommended Practices	ALL
USAF FES TIG 403-18	Mar-18	TIG NFPA 403, Standard for Aircraft Rescue and Fire-Fighting Services at Airports	ALL
USAF FES TIG 1710	Jan-17	NFPA 1710, Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments	ALL

18A1.1. DoD and USAF F&ES operational policy consolidates a wide variety of requirements from the United States Code (U.S.C.), CFR, DoD, OSHA, NFPA, and state and local codes and standards. NFPA standards and recommended practices form the foundation for F&ES and are adopted as written or as implemented based off TIG guidance. Various DoD and USAF publications provide publication references and support information for implementation of F&ES.

APPENDIX 18B**18B.1. WORKLOAD DATA****18B.1.1. Installation Information**

VAFB consists of:

- Land – 2,133 acres
- Facilities – 29

KCKA consists of:

- Land – 1,054 acres
- Facilities – 36

Numbers of Buildings by Type and Year of Construction:

TYPE OF CONSTRUCTION							
Location		Permanent	Semi-Permanent	Temporary	Totals		
Vance	# Buildings	126	3	2	131		
	Square Foot (SF)	1,513,034	3,781	17,960	1,534,775		
Kegelman	# Buildings	7	0	0	7		
	SF	11,093	0	0	11,093		
Total	# Buildings	133	3	2	138		
	SF	1,524,127	3,781	17,960	1,545,868		
YEAR OF CONSTRUCTION							
Location		1942-1965	1966-1989	1990-1999	2000-2010	2011-2020	Totals
Vance	# Buildings	25	48	18	34	6	131
	SF	406,504	660,491	87,707	354,306	25,767	1,534,775
Kegelman	# Buildings	0	1	3	3	0	7
	SF	0	1,600	2,101	7,392	0	11,093
Total	# Buildings	25	49	21	37	6	138
	SF	406,504	662,091	89,808	361,698	25,767	1,545,868

18B.1.2. Workload Information

18B.1.2.1. Provide continuous fire protection and fire prevention services at VAFB on a twenty-four hour a day/seven days a week basis.

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18B.1.2.1.1. VAFB F&ES Operations will maintain the MTC. MTC will consist of fourteen personnel (one Assistant Chief (A/C) of Operations and thirteen firefighters). This shall include a minimum of seven DoD certified HazMat Technicians and two Emergency Medical Technicians (EMT) on-duty at all times.

18B.1.2.2. Provide fire protection and fire prevention services at KCKA sixty minutes prior to scheduled flight operations and end thirty minutes after flying operations cease; KCKA shall be staffed no more than twelve hours per day, to include the sixty minutes prior to flying operations and the thirty minutes after flying operations cease, as required to support flying operations.

18B.1.2.2.1. KCKA F&ES Operations will maintain MTC. MTC for KCKA, is one Assistant Chief and five firefighters. This shall include a minimum of two EMTs on-duty at all times KCKA F&ES is staffed.

18B.1.2.3. Provide F&ES dispatch services twenty-four hours a day/seven days a week. The F&ES ECC shall be staffed twenty-four hours a day/seven days a week. The ECC shall be fully staffed with a minimum of one ECC Operator at all times. The ECC shall be fully staffed with a minimum of two ECC Operators to support special events. F&ES ECC Operators shall not be included in the minimum staffing for F&ES Operations.

18B.1.2.4. Provide F&ES Management personnel which shall consist of one Installation Fire Chief and one Deputy Fire Chief. Normal duty hours shall be 0730-1630 hours Monday through Friday.

18B.1.2.5. Ensure that administrative personnel consist of one A/C for Training, one A/C for Fire Prevention, and one A/C for Health and Safety. Normal duty hours shall be 0730-1630 hours Monday through Friday.

18B.1.2.6. Provide F&ES Fire Prevention personnel consisting of two Fire Inspectors. Normal duty hours shall be 0730-1630 hours Monday through Friday.

18B.1.2.7. Provide periodic inspection, maintenance, testing, certification, upgrades and repair of all F&ES equipment as required by all manufacturer, DoD, AF, HHQ, OSHA, and NFPA requirements.

18B.1.2.8. Provide maintenance, testing, and repair services for six 71 ISS/EM SCBAs.

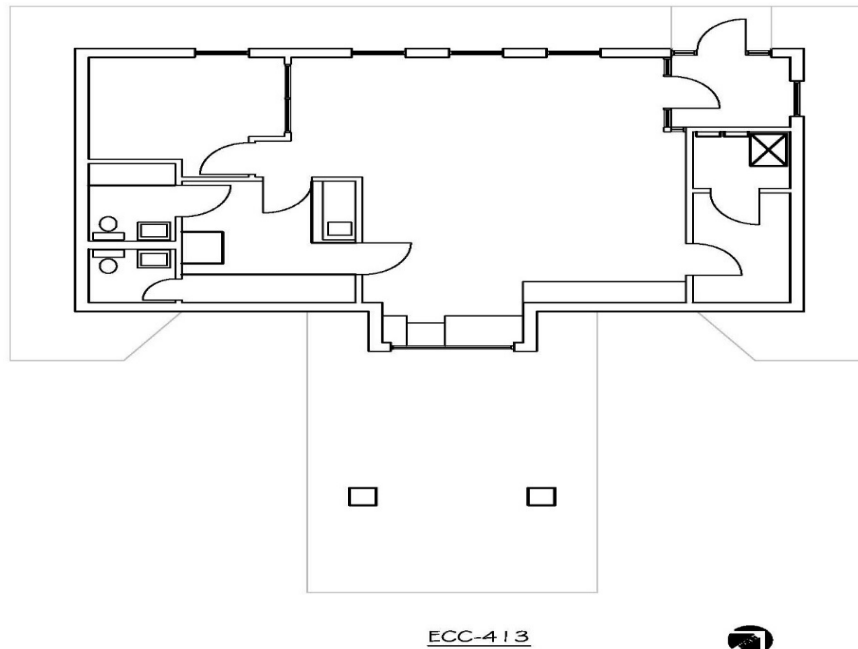
18B.1.2.9. Provide maintenance, testing, and repair services for approximately 150 wheeled halon flightline fire extinguishers.

APPENDIX 18C

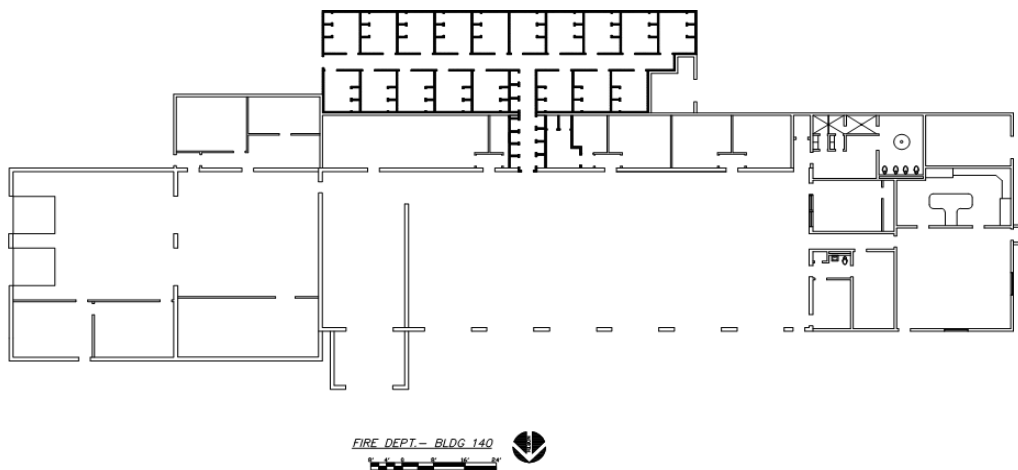
18C.1. MAPS AND WORK AREA LAYOUT

18C.1.1. Building (Bldg) 413, 316 Fields Street, ECC, Space Allocated: 694 SF

NOTE: Facility is joint-use with government Security Forces dispatchers per the AF Concept of Operations (CONOPS).

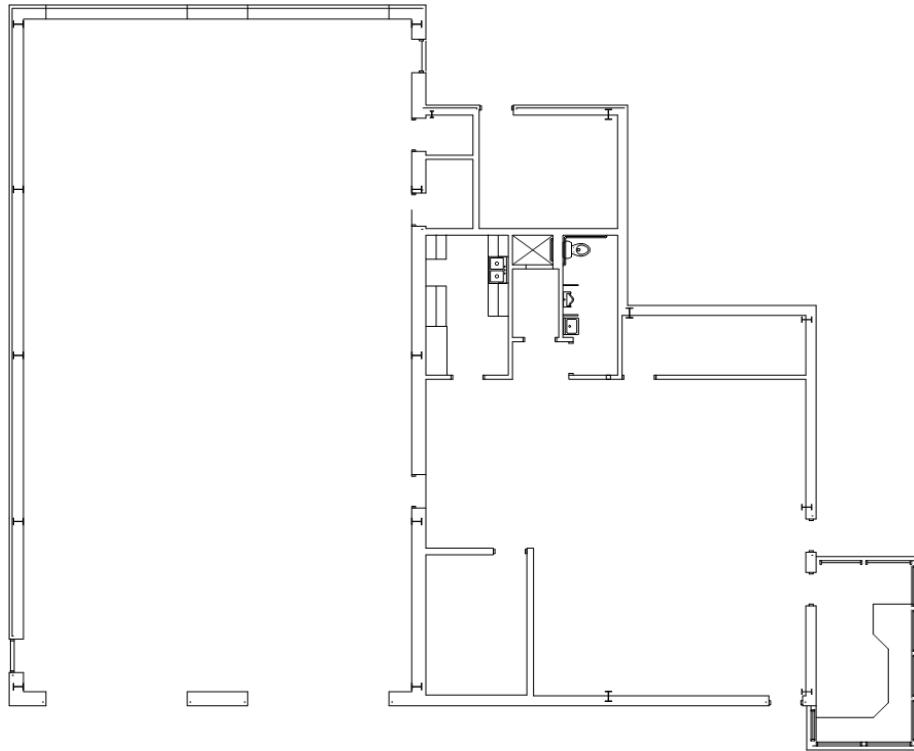


18C.1.2. Bldg 140, 546 Elam Road, Vance Fire Station, Space Allocated: 18,116 SF

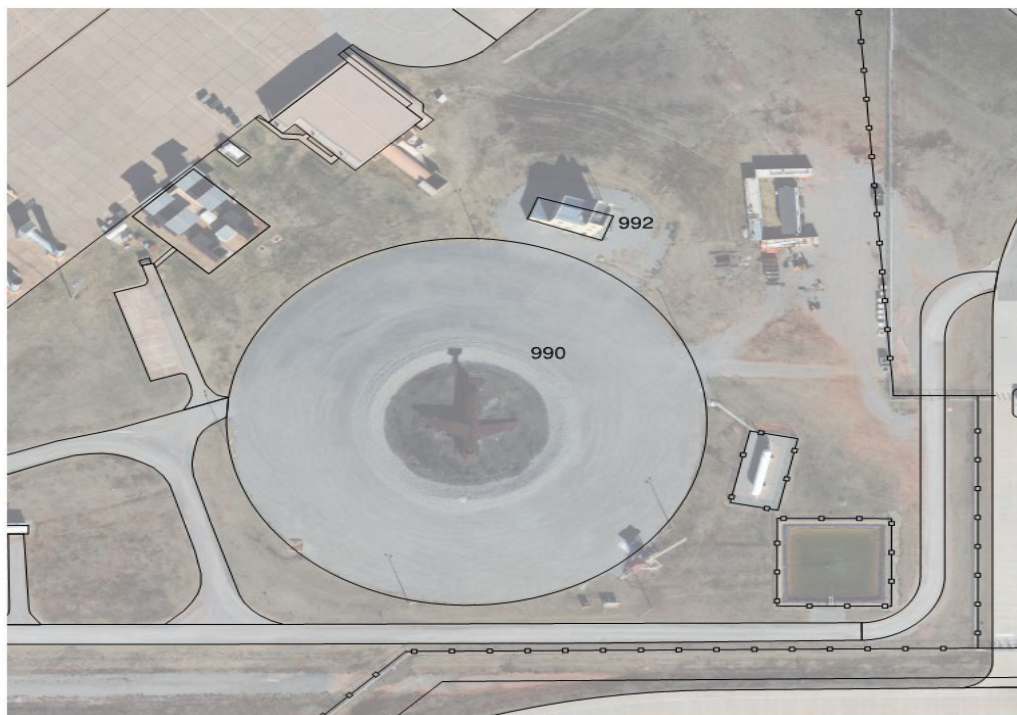


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18C.1.3. KCKA Bldg 115, 22970 State Hwy 38, Jet, Oklahoma (OK), Kegelman Fire Station,
Space Allocated: 5,306 SF



18C.1.4. Facilities 990 and 992, Southeast Quadrant of VAFB, Aircraft Fire Trainer and
Structural Fire Trainer



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APPENDIX 18D

18D.1. CONTRACT DATA REQUIREMENTS LIST (CDRL)

18D.1.1. Various Government regulations and F&ES directives require submission of reports. The following list of CDRLs is not an all-inclusive list of all requirements as the Government routinely issues and revises F&ES reporting directives. Additional reports may be required.

Report Title	Description/Form	Submit Through/To:	Frequency	PWS Para.
1801. FESAP Report	Electronic	Higher Headquarters	As Required, IAW MICT requirements	18.1.3.4.1.
1802. Approved SP developed F&ES directives	Electronic	ACO and F&ES COR	Within 90 days after contract start date and upon review/revision	18.1.4.3.
1803. F&ES Crisis Management Plan	Electronic	ACO and F&ES COR	Within 35 days after award date; annually at start of CY; as required to ensure currency	18.1.4.4.
1804. F&ES IRA	Electronic	Functional Commander (FC), BCE, ACO, F&ES COR, prior to routing for signature	Within 30 days after Pre-Performance Conference and annually at the start of the FY	18.1.4.8.
1805. F&ES SOC	Electronic; SOC is signed by the 71 FTW/CC and provided to HHQ	BCE, ACO, F&ES COR, prior to routing for signature	45 days after contract start date; annually at start of CY	18.1.4.9.
1806. F&ES 3-5 Year Plan	Electronic	FC, BCE, ACO, F&ES COR, prior to routing	90 days after contract start; annually at the start of the FY	18.1.4.10.
1807. F&ES Responses to Housing Report	Electronic	Housing Program Manager, FC, BCE and F&ES COR	By the fifth day of the month following the report month	18.1.4.11.

1808. Aircraft Hanger Fire Suppression System Activation or Discharge/Release of AFFF	Electronic	AFCEC/CXF, BCE, F&ES COR, and Environmental COR	NLT 2 hours after ECC notification	18.1.4.18.
1809. Facility Pre-Fire Plan	AF Form 1028	Recorded in FES-IMS and in F&ES Official File	Within 15 days after contract start date	18.1.4.23.
1810. Aircraft Pre-Fire Plan	AFTO Form 88	Recorded in FES-IMS and in F&ES Official File	Within 15 days after contract start date	18.1.4.24.
1811. Annual Budget	Electronic	Financial Analysis Office, 71 MSG/RA, 71 ISS/RA, ACO, contractor CE Resources, and F&ES COR.	As required, IAW with USG directions.	18.1.4.29.
1812. FDOSHP Worksheet with ORM Plan	Electronic	Coordinated with the VAFB Fire Marshal and the F&ES COR, reviewed by the ACO, and approved by the 71 FTW/CC.	Annually	18.1.4.30.
1813. Air Force Patient Care Report	AF Form 552, Electronic	Local MTF	Per Incident	18.1.4.34.

APPENDIX 18E

18E.1. REQUIRED F&ES MANAGEMENT AND OPERATIONS DOCUMENTATION

18E.1.1. Various F&ES program management documents and directives are required by various Government regulations, NFPA Standards and state and local requirements. The following list of required documents is not an all-inclusive list of required F&ES program management documents and directives per statutory requirements.

F&ES Program Documentation	Requirement Source
F&ES SOC	NFPA 1201, 1500, 1710, & AFI 32-2001
F&ES IRA	NFPA 1201, DAFI 32-2001
F&ES 3-5 Year Plan	NFPA 1201
F&ES Program Management Documents	Requirement Source
Comprehensive Firefighter Health and Safety Program	NFPA 1500
Management Program	DAFI 32-2001, NFPA 1710, NFPA 1201, NFPA 1500
Self-Inspection Program	DAFI 32-2001
OSH Program	NFPA 1500
Operational Safety Program	NFPA 1500
Firefighter Fitness & Wellness Program	NFPA 1500
Respiratory Protection Program	NFPA 1500
PPE Program	NFPA 1500, 29 CFR 1910.132
Safety Incident Reporting Program	AFI 91-202, AFI 91-204
Facility Safety Program	NFPA 1500, AFI 32-1001, DAFMAN 91-203
Vehicle Safety Program	AFI 24-302, AFMAN 91-203
Vehicle Management Program	AFI 24-302
FSE Program	NFPA 1201, DAFI 32-2001
Fire Prevention and Code Compliance Program	NFPA 1201, DAFI 32-2001
“Hot Works” Inspection and Permit Program	DAFMAN 91-203
Commercial Kitchen Hood and Duct System Inspection Program	DAFMAN 91-203
Fire Protection Design Review Program	DAFI 32-2001
Fire Investigation Program	DAFI 32-2001
Installation Fire Extinguisher Program	DAFMAN 91-203
F&ES Training Program	NFPA 1500
EMS Training Program	DAFI 32-2001
Firefighter Certification Program	DAFI 32-2001
Firefighter Credentialing Program	DAFI 32-2001, USAF FES Credentialing Procedural Guide, 6 U.S.C. § 320 NIMS Guideline for the

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	Credentialing of Personnel, Aug 2011
Training Facility Program	NFPA 1202
Training and Certification Record Management Program	NFPA 1500, NFPA 1201
Driver training Program	NFPA 1500
ECC Program	NFPA 1201
Emergency Response Program	NFPA 1710
Vehicle Program	AFI 24-302
Infection Control Program	AFI 44-108
Equipment Management Program	NFPA 1201
Equipment Inventory Program	NFPA 1201
EMS Program	DAFI 32-2001
F&ES Management Plans	Requirement Source
Airport Risk Management Plan for Fire and Emergency Scene Strategy	NFPA 403
Comprehensive F&ES Risk Management Plan	NFPA 1201 & 1500
Safety/Health/Risk Management Implementation Plan	NFPA 1201
Community Risk and Emergency Operation Plans	NFPA 1561
Comprehensive ECC Plan	NFPA 1201
(ECC) Tactical Interoperable Communications Plan	NFPA 1221
(ECC) Regional Emergency Communications Plan	NFPA 1221
ECC Data Security Plan	NFPA 1221
(ECC) Rerouting Incoming Calls on Emergency Lines Plan	NFPA 1221
(ECC) On-Demand Interoperability of Communication	NFPA 1221
(ECC) Damage Control Plan	NFPA 1221
(ECC) Emergency Fire Plan	NFPA 1221
Alternate ECC Plan	NFPA 1221
Pre-Incident Management Plans	Requirement Source
Aircraft Incident Operations Plan	NFPA 403
Structural Firefighting Incident Operations Plan	NFPA 1710
Special Operations Incident Response Plan (Technical Rescue)	NFPA 1670
Special Operations Incident Response Plan (HazMat)	DAFI 32-2001
Wildfire Control Incident Response Plan	NFPA 295
Deployment of Resources Plan	NFPA 1201
Aircraft Pre-Fire Plans	DAFI 32-2001
Facility Pre-Fire Plans	DAFI 32-2001
Standard Operating Instructions/Procedures	Requirement Source
Aircraft Emergency Response	NFPA 403
Structural Firefighting	NFPA 1710
HazMat Emergency Response	NFPA 1710
Technical Search and Rescue	NFPA 1670
Water Supply Operations	NFPA 1201
Rapid Intervention Crew	NFPA 1500 & 1407

Incident Emergency Evacuation Procedure	NFPA 1670
Rehabilitation during Emergency Operations Procedure	NFPA 1500
Personnel Accountability System	NFPA 1500
Incident Management System	NFPA 1500
Respiratory Protection Equipment	NFPA 1500
Respiratory Protection Training	NFPA 1404
Comprehensive Firefighter Health & Safety	NFPA 1500
Operating Near Energized Lines or Equipment	NFPA 1500
Emergency Operations for Traffic Incidents	NFPA 1500
Safety at Incidents Involving Violence, Unrest, or Civil Disturbance	NFPA 1500
Standardized Post-Incident Analysis (PIA) of Significant Incidents	NFPA 1500
Standardized PIA of Incidents Involving Firefighter Injury or Death	NFPA 1500
Infectious Exposure Procedure	NFPA 1581
Fire Apparatus Operation	NFPA 1500
PPE	NFPA 1500
ECC Telecommunication Device for the Deaf (TDD)/Telephone, Typewriter, Teletypewriter, or Text Phone (TTY)	NFPA 1221
ECC Public Alerting System (PAS)	NFPA 1221
ECC Land Mobile Radio (LMR) Use	NFPA 1221
Policies	Requirement Source
Occupational Safety, Health, and Wellness Policy	NFPA 1500

APPENDIX 18F

18F.1. SPECIAL TRAINING, CERTIFICATION, AND LICENSING REQUIREMENTS

Duty Position	Experience, Certification, Special Training, Registration or Licensing Requirement	Special Training, Certification, or License	Required by
1. Fire Fighter	Experience: One-year Structural Fire Fighter and Aircraft Fire Fighter	N/A	N/A
	Fire Fighter I & II	DoD/International Fire Service Accreditation Congress (IFSAC) Cert.	DoDM 6055.06
	Airport Fire Fighter *Note 1	DoD/IFSAC Cert.	DoDM 6055.06
	Hazardous Materials Operations Core with Mission Specific Competency (MSC), PPE, and Product Control (PC)	DoD/IFSAC Cert.	DoDM 6055.06, AFI 10-2501
	EMR Certification and Registration **Note 2	NREMT Certification	AFI 32-2001
	Munitions Fire Fighting Course ***Note 3	Civil Engineering Virtual Learning Center (CE-VLC) Web Based Training (WBT)	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	Air Force Emergency Response Operations (AERO): First and Emergency Responders Course ****Note 4	MyLearning WBT	AFI 10-2501
2. Driver/Operator	Experience: Twenty-two months Structural and Aircraft Fire Fighter; Twenty-two months Fire Service	SP Validated	
	Fire Fighter I & II	DoD/IFSAC Cert.	DoDM 6055.06

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	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Driver Operator Pumper	DoD/IFSAC Cert.	DoDM 6055.06
	Driver Operator Aircraft Rescues and Fire Fighting (ARFF)	DoD/IFSAC Cert.	DoDM 6055.06
	Driver Operator Mobile Water Supply (MWS)	DoD/IFSAC Cert.	DoDM 6055.06
	Hazardous materials Operations Core with MSC PPE and PC	DoD/IFSAC Cert.	DoDM 6055.06, AFI 10-2501
	HazMat Technician (recommended)	DoD/IFSAC Cert.	
	EMR Certification & Registration**	NREMT Certification	AFI 32-2001
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
3. Lead Firefighter	Experience: Fourteen months F&ES Driver/Operator and three years Fire Service	SP Validated	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Officer I	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor I	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector I	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Technician	DoD/IFSAC Cert.	AFI 10-2501
	Incident Safety Officer *****Note 5	DoD/IFSAC Cert.	
	EMR Certification & Registration**	NREMT Certification	AFI 32-2001
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
4. VAFB Assistant to A/C of Operations	Experience: Two years lead firefighter and five years Fire Service	SP Validated	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06

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	Fire Officer II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor I	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector I	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Technician	DoD/IFSAC Cert.	AFI 10-2501
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	EMR Certification & Registration**	NREMT Certification	AFI 32-2001
	Incident Command System (ICS) 300/400	DoD/IFSAC Cert.	AFI 10-2501
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	SECRET Security Clearance	Defense Security Service (DSS)	
5. KCKA Assistant Fire Chief	Experience: Five years lead firefighter and eight years Fire Service	SP Validated	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Officer III	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Technician	DoD/IFSAC Cert.	AFI 10-2501
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
	SECRET Security Clearance	DSS	
6. Assistant Fire Chief of Operations	Experience: Five years lead firefighter and eight years Fire Service	SP Validated	
	SECRET Security Clearance	DSS	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Officer III	DoD/IFSAC Cert.	DoDM 6055.06

	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
7. Assistant Fire Chief of Training	Experience: Five years lead firefighter and eight years Fire Service	SP Validated	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Officer III	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor III	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
8. Assistant Installation Fire Chief of Health & Safety	Experience: Five years lead firefighter and eight years Fire Service	SP Validated	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Officer III	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	Health and Safety Officer *****Note 6	DoD/IFSAC Cert.	
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	

	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
9. Assistant Fire Chief of Fire Prevention	Experience: Five years lead firefighter and eight years fire service (see requirements above)	SP Validated	
	SECRET Security Clearance	DSS	
	Fire Officer III	DoD/IFSAC Cert.	DoDM 6055.06
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector III	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
10. Deputy Fire Chief	Experience: Three years Assistant Fire Chief and eleven years fire service (see requirements above)	SP Validated	
	SECRET Security Clearance	DSS	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Fire Officer IV	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	

	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
11. Installation Fire Chief	Experience: Three years Deputy Fire Chief and fourteen years fire service (see requirements above)	SP Validated	
	SECRET Security Clearance	DSS	
	Airport Fire Fighter*	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor II	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	HazMat Incident Commander	DoD/IFSAC Cert.	DoDI 6055.06-M
	Incident Safety Officer*****	DoD/IFSAC Cert.	
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders ****	MyLearning WBT	AFI 10-2501
	ICS 300/400	DoD/IFSAC Cert.	AFI 10-2501
	Fire Officer IV	DoD/IFSAC Cert.	
12. Fire Inspector	Experience: Fourteen months F&ES Driver/Operator and three years fire service (see requirements above)	SP Validated	
	HAZMAT Awareness	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Instructor I	DoD/IFSAC Cert.	DoDM 6055.06
	Fire Inspector II	DoD/IFSAC Cert.	DoDM 6055.06
	Public Fire and Life Safety Educator	DoD/IFSAC Cert.	DoDM 6055.06
	Plans Examiner I	DoD/IFSAC Cert.	DoDM 6055.06
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency	MyLearning	AFI 10-2501

	Responders ****	WBT	
13. Dispatcher	HAZMAT Awareness	DoD/IFSAC Cert.	DoDM 6055.06
	Telecommunicator II	DoD/IFSAC Cert.	DoDM 6055.06
	EMD Certification		AFI 32-2001
	Munitions Fire Fighting Course***	CE-VLC WBT	
	AF Emergency Management Program (ZZ133131)	MyLearning WBT	AFI 10-2501
	AERO: First and Emergency Responders (ZZ133130)****	MyLearning WBT	AFI 10-2501

*Note 1: For new employees, Aircraft Fire Fighter certification is required to be completed within twelve months after hire.

** Note 2: NREMT EMR certification shall be obtained within twelve months after hire.

***Note 3: Course completion is required within two months after initial issuance of Common Access Card (CAC). After initial certification, Munitions Firefighting recertification is required every two years by re-accomplishing the computer-based training or passing the challenge review test on the Air Force Civil Engineer Center Virtual Learning Center (AFCEC-VLC).

****Note 4: Course completion is required within two months after initial issuance of CAC.

*****Note 5: For new employees, DoD/IFSAC Incident Safety Officer certification is required to be completed within six months after hire.

*****Note 6: For new employees, DoD/IFSAC Health and Safety Officer Certification is required to be completed within twelve months after hire.

APPENDIX 18G

18G.1. GOVERNMENT FURNISHED PROPERTY (GFP)

18G.1.1. Equipment (R-14 Listing).

Item Name	National Stock Number (NSN)	Quantity	Acquisition Cost	As Is
BINOCULAR	6650011695247	2	\$599.98	Yes
PYROMETER, OPTICAL	6685010979062	3	\$2,133.75	Yes
RESCUE SYSTEM, AIR BA	4220012121052	1	\$11,126.57	Yes
WASHER-EXTRACTOR, LAU	3510013850234	1	\$7,103.72	Yes
CAMERA, THERMAL IMAGE	5855P0075023029	2	\$23,966.40	Yes
CART, TEST, SYS, E-ONE	4120PELOGICCART	1	\$7,336.00	Yes
TESTER, DETECTOR, FIR	4920010220201	1	\$60.75	Yes
TREADMILL	7830PAFMC-01359	2	\$10,707.68	Yes
KAWASAKI SCOOTER	2340PAFMC-06108	1	\$5,700.00	Yes
BULLSEYE DIGITAL FIRE	6910PAFMC-06179	1	\$16,150.00	Yes
DELSAR MINI LISTENING	4240PAFMC-06240	1	\$6,652.02	Yes
FIRESLED EDITION LADD	7830PAFMC-08990	1	\$9,595.00	Yes
INFLATABLE FIREHOUSE	9999PAFMC-08988	1	\$8,495.00	Yes
FIRESLED MULTI-PURPOS	7830PAFMC-08989	1	\$5,995.00	Yes
STAIRMASTER	7830PAFMC-09971	1	\$5,887.00	Yes
MASS DECON SHELTER	4230PAFMC-07979	1	\$39,766.00	Yes
FORCIBLE ENTRY DOOR	6910PAFMC-09033	1	\$7,895.00	Yes
HURST JAWS OF LIFE	4240PAFMC-10046	3	\$9,160.00	Yes
HURST JAWS OF LIFE	4240PAFMC-10047	1	\$10,650.00	Yes
HURST JAWS OF LIFE	4240PAFMC-10048	1	\$11,620.00	Yes
PLUGGIE THE FIRE PLUG	6910PAFMC-09924	1	\$6,076.00	Yes
PORTACOUNT RESPIRATOR	4240PAFMC-11802	1	\$9,700.00	Yes
RECEIVER-	5820016337376	2	\$8,036.00	Yes

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TRANSMITTER				
KAWASAKI SCOOTER	2340PAFMC-12273	1	\$9,776.50	Yes
LUCAS 3.1 CHEST COMPR	6515PAFMC-11721	3	\$16,190.00	Yes
INTERSTATE & MOTORWAY	4240PAFMC-11722	1	\$17,015.66	Yes
ARRF GRAB & GO KIT	4240PAFMC-11721	4	\$5,736.50	Yes
CMC RESQMAX SWIFTWATE	4240PAFMC-12178	1	\$2,800.00	Yes
BINOCULARS, LASER RAN	1240PAFMC-12571	3	\$1,199.00	Yes
RAPID EXTRACTION KIT	4240PAFMC-12938	1	\$14,304.00	Yes
SEARCH/RESCUE/TRNG	4240PAFMC-12965	1	\$11,136.65	Yes
TESTER, FIRE HOSE	6625PAFMC-13002	2	\$1,975.00	Yes
RANGER CREW XP 1000	2340PAFMC-14047	1	\$50,248.75	Yes
TESTER, FIRE HOSE	6625PAFMC-13002	1	\$2,952.95	Yes
RECEIVER- TRANSMITTER	5820015549530	2	\$6,000.00	Yes
WASHER EXTRACTOR EAI	3510P30015M4J	1	\$5,288.82	Yes
SHELTERAIR INFLAT	5410P76393029	1	\$5,750.00	Yes
DRYERFIRE HOSE	4210P75403029	1	\$5,000.00	Yes
BLUEBLACK COMBINATION	4210P273115000	2	\$9,974.81	Yes
LIFT AIR BAGDUEL DEAD	4240P3110088001	1	\$6,362.27	Yes
ECC COMMUNICATIONS CO	5820P76453029	1	\$15,252.78	Yes
TRAILERHAZMAT	2330P76483029	1	\$12,659.40	Yes
PORTA COUNT PRO RESPI	4240P8038	1	\$12,995.00	Yes
BREATHING APPARATUS, S	4240015319936	59	\$5,000.00	Yes
PORTA COUNT PRO RESPI	4240P8038	1	\$12,995.00	Yes

18G.1.2. All ItPoP items will be annually inventoried via CheckMate, FES-IMS-ARIS, the SP maintained Appliance Inventory, the Precision Measurement Equipment Laboratory (PMEL) Inventory, SP maintained tool inventories, and the ITEC and Radio inventories. These databases are maintained by SP personnel.

18G.1.3. PWS 25 is the authoritative reference for all government provided firefighting and emergency response vehicles.

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APPENDIX 18H

18H.1. ACRONYMS & DEFINITIONS

Acronym	Definition
A/C	Assistant Chief
ACO	Administrative Contracting Officer
AERO	Air Force Emergency Response Operations
AETC	Air Education and Training Command
AF	Air Force
AFCEC	Air Force Civil Engineer Center
AFCEC/CXF	Office of the Chief, Air Force Emergency Services
AFCEC-VLC	Air Force Civil Engineer Center Virtual Learning Center
AFCOLS	Air Force Common Output Levels of Service
AFFF	Aqueous Film Forming Foam
AFI	Air Force Instruction
AFIMSC	Air Force Installation & Mission Support Center
AFMAN	Air Force Manual
AFPD	Air Force Policy Directive
AFTO	Air Force Technical Order
AHJ	Authority Having Jurisdiction
AO	Airfield Operations
ARFF	Aircraft Rescues and Fire Fighting
AT	Anti-Terrorism
AWIMS	ACES Work Information Management System
BCE	Base Civil Engineer
Bldg	Building
BLS	Basic Life Support
CAC	Common Access Card
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
CC	Commander
CDRL	Contract Data Requirements List
CE	Civil Engineering
CEMAS	Civil Engineering Material Acquisition System
CE-VLC	Civil Engineering Virtual Learning Center
CFR	Code of Federal Regulations
CLIN	Contract Line Item Number
CO	Contracting Officer

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CONOPS	Concept of Operations
COR	Contracting Officer Representative
CP	Command Post
CUI	Controlled Unclassified Information
CY	Calendar Year
DAFI	Department of the Air Force Instruction
DAFMAN	Department of the Air Force Manual
DAMD	Delegated Airfield Management Duties
DoD	Department of Defense
DoDFA	Department of Defense Fire Academy
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DSS	Defense Security Service
ECC	Emergency Communications Center
EM	Emergency Management
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
F&ES	Fire and Emergency Services
FAD	Force Activity Designator
FC	Functional Commander
FDOSHHP	Fire and Emergency Services Safety and Health Program
FESAP	Fire Emergency Services Assessment Program
FESCRE	Fire Emergency Services Credentialing
FES-IMS	Fire Emergency Services - Information Management System
FES-IMS-ARIS	Fire Emergency Services - Information Management System - Automated Readiness Information System
FESMT	Fire Emergency Services Management Tool
FS	Flight Surgeon
FMO	Furnishings Management Office
FPCON	Force Protection Condition
FRC	Facility Risk Calculation
FSD	Fire Safety Deficiency
FSE	Fire Safety Education
FTW	Flying Training Wing
FY	Fiscal Year
GFP	Government Furnished Property
H&S	Health and Safety

HazMat	Hazardous Materials
HQ	Headquarters
HHQ	Higher Headquarters
HMEP	Hazardous Materials Equipment Plan
IAW	In Accordance With
ICC	Installation Control Center
ICS	Incident Command System
IDIQ	Indefinite Delivery Indefinite Quantity
IDRC	Installation Deployment Readiness Cell
IFE	In-Flight Emergency
IFSAC	International Fire Service Accreditation Congress
IG	Inspector General
IGEMS	Inspector General Enterprise Management System
IRA	Installation Risk Assessment
ISS	Installation Support Squadron
ItPoP	Incidental to Place of Performance
KCKA	Kegelman Auxiliary Airfield
LMR	Land Mobile Radio
LOC	Level of Care
MAA	Mutual Aid Agreement
MDG	Medical Group
MFR	Memorandum for Record
MICT	Management Internal Control Toolset
MOU	Memorandum of Understanding
MSC	Mission Specific Competency
MTC	Minimum Team Complement
MTF	Military Treatment Facility
MWS	Mobile Water Supply
NDAA	National Defense Authorization Act
NFC	National Fire Code
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NREMT	National Registry of Emergency Medical Technicians
NSN	National Stock Number
OK	Oklahoma
ORM	Operational Risk Management
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PAS	Public Alerting System
PC	Product Control

PIA	Post-Incident Analysis
PMEL	Precision Measurement Equipment Laboratory
PPE	Personal Protective Equipment
PPR	Prior Permission Required
PWS	Performance Work Statement
RA	Resource Advisor
RAC	Risk Assessment Code
RMP	Risk Management Plan
RPE	Respirator Protection Equipment
SAV	Staff Assistance Visit
SCBA	Self-Contained Breathing Apparatus
SF	Square Foot
SME	Subject Matter Expert
SOC	Standard of Coverage
SP	Service Provider
TDD	Telecommunications Device for the Deaf
TDY	Temporary Duty Location
TIG	Technical Implementation Guide
TTY	Telephone Typewriter, Teletypewriter, or Text Phone
U.S.C.	United States Code
USAF	United States Air Force
USG	United States Government
VAFB	Vance Air Force Base
WBT	Web Based Training
WIT	Wing Inspection Team