



FINAL ENVIRONMENTAL ASSESSMENT
POWER PLANT UPGRADE
CONSTRUCT FUEL FARM
CAVALIER AIR FORCE STATION
NORTH DAKOTA

June 2013



**Air Force Space Command
20th Space Control Squadron**

Report Documentation Page

*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE JUN 2013		2. REPORT TYPE		3. DATES COVERED 00-00-2013 to 00-00-2013	
4. TITLE AND SUBTITLE Power Plant Upgrade Construct Fuel Farm Cavalier Air Force Station North Dakota				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Space Command,150 Vandenberg St,Peterson AFB,CO,80914				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FONSI

This page intentionally left blank.

FINDING OF NO SIGNIFICANT IMPACT
Power Plant Upgrade and Construction of Fuel Farm
Cavalier Air Force Station, North Dakota

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 U.S. Code 4321 et seq, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP), the U.S. Air Force (Air Force) conducted an assessment of the potential environmental consequences of upgrading the Power Plant and constructing a Fuel Farm. This Environmental Assessment (EA), Upgrade Power Plant and Construct Fuel Farm, Cavalier Air Force Station, North Dakota, incorporated by reference in this finding, considers the potential impacts of the Proposed Action and Alternatives on the natural and human environments.

Proposed Action

There are six components of the Power Plant upgrade. The site will not require extensive development work since no parking areas or driveways are required. The existing site is gently sloped with a grass covering. The upgrade consists of (1) Install high-altitude electromagnetic pulse (HEMP) protection for the electronic control system of the emergency backup generators and supporting infrastructure in the backup power facility to ensure the controls will survive a HEMP event. (2) Replace the 40-year old power switchgear and transformers with modern, safer switchgear and transformers. (3) Install a new mission uninterruptable power system (UPS) system capable of continuing the mission between the loss of commercial power and bringing the backup generators online. (4) Upgrade the power plant to include UPS protection for all mission critical systems and utilities. (5) Install a replacement backup power fuel storage. The requirement is for 360,000 gallons of petroleum diesel fuel. There will be seven 60,000 gallon tanks, six for the fuel and one for fuel polishing and for periodic inspections. (6) Install commercial power disconnect switches to isolate the mission system from HEMP effects conducted by the commercial long-line power grid.

Summary of Findings

Air Resources: Upgrade of the Power Plant and construction of the Fuel Farm will have short-term adverse impacts on air quality generated by heavy equipment and earth-moving activities during the construction. Impacts to air quality will not be significant. Operational emissions will reduce total operating emissions due to the use of new stand-by generators.

Geological Resources: Impacts to geological resources will not occur because the soil depths exceed the drilling depth along the entire perimeter of the fence boundary. Soils will be disturbed from boring, grading, and compaction by equipment during construction activities but impacts will not be significant.

Water Resources: There will not be any impacts to the aquifer. The fuel tank farm will be a slab on grade with concrete walls that extend to the tops of the fuel tanks. The concrete

structure will be designed to act as the secondary containment for the fuel storage. The use of standard best management practices will reduce the potential for erosion and sedimentation to the Tongue River.

Biological Resources: Excavation of soils and vegetative cover in order to construct the Fuel Farm and security fence will not require the disruption of important habitat or previously undisturbed land. Disturbed areas will be reestablished with native grasses. . No threatened or endangered species are known to occur on Cavalier AFS, so no impacts to these species will occur.

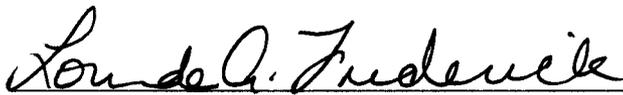
Cultural Resources: No known cultural resources have been identified in the area for construction of the Fuel Farm. This area has been previously disturbed due to past Installation operations; therefore, digging at this location is not anticipated to unearth any cultural resources. The Installation has coordinated with the tribes and tribal organizations who may have an interest in the Action. The three structures eligible for the National Register of Historic Places will not be significantly impacted by the Action.

Petroleum, Oil, Lubricants: The tanks at the Fuel Farm will be above ground tanks with secondary containment and have the necessary security protection. All aboveground storage tanks will have a secondary containment area that contains spills and allows leaks to be more easily detected. The containment area surrounding the tank will hold 110 percent of the contents of the largest tank. Impacts from construction and operation of the storage tanks will not be significant.

As there are no adverse environmental impacts that will result from implementation of the Proposed Action or Alternative, no mitigation measures are necessary. The management practices identified in the EA are standard construction management practices that will be implemented by the contractor.

Finding of No Significant Impact

Based upon my review of the facts and analyses contained in the attached EA, conducted in accordance with the provisions of NEPA, the CEQ Regulations, and 32 CFR Part 989, I conclude that the Proposed Action will not have a significant environmental impact, either by itself or cumulatively with other ongoing projects at Cavalier AFS, will not involve an element of high risk or uncertainty on the human environment, and its effects on the quality of the human environment are not highly controversial. Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact (FONSI) completes the environmental impact analysis process.



Lorinda A. Frederick, Lt Col, USAF
Commander

2 JUL 13

Date

FINAL
ENVIRONMENTAL ASSESSMENT
FOR THE
POWER PLANT UPGRADE
CONSTRUCT FUEL FARM
CAVALIER AIR FORCE STATION
NORTH DAKOTA



This page intentionally left blank.

TABLE OF CONTENTS

This page intentionally left blank.

Table of Contents

	Page
1.0	PURPOSE AND NEED FOR ACTION 1-1
1.1	Background and Location 1-1
1.2	Purpose and Need 1-3
1.3	Regulatory Requirements and Guidance 1-3
1.4	Applicable Regulations and Permits 1-6
1.5	Organization..... 1-6
2.0	PROPOSED ACTION AND ALTERNATIVES 2-1
2.1	Selection Criteria for Alternatives 2-1
2.2	Proposed Action – Upgrade of Perimeter Acquisition Rader Characterization System (PARCS) and Construct Fuel Farm 2-1
2.3	Alternative Action – Construct New Power Plant and Fuel Farm 2-4
2.4	No Action Alternative..... 2-5
3.0	AFFECTED ENVIRONMENT 3-1
3.1	Air Resources..... 3-3
3.1.1	Climate and Meteorology 3-3
3.1.2	Air Quality Standards 3-3
3.1.3	Air Pollutant Sources 3-5
3.2	Geological Resources 3-6
3.2.1	Geology and Topography 3-6
3.2.2	Soils 3-7
3.3	Water Resources 3-7
3.3.1	Groundwater 3-7
3.3.2	Surface Water 3-10
3.4	Biological Resources 3-10
3.4.1	Wildlife 3-10
3.4.2	Vegetation..... 3-12
3.5	Cultural Resources 3-12
3.6	POL Management..... 3-13
4.0	ENVIRONMENTAL CONSEQUENCES 4-1
4.1	Air Resources..... 4-1
4.1.1	Potential Impacts of the Proposed Action..... 4-1
4.1.2	Potential Impacts of the Alternatives 4-3
4.1.3	Potential Impacts of the No Action Alternative..... 4-4
4.2	Geological Resources 4-4
4.2.1	Potential Impacts of the Proposed Action..... 4-4
4.2.2	Potential Impacts of the Alternative Action..... 4-4
4.2.3	Potential Impacts of the No Action Alternative..... 4-5
4.3	Water Resources 4-5
4.3.1	Potential Impacts of the Proposed Action..... 4-5
4.3.2	Potential Impacts of the Alternative Action..... 4-6
4.3.3	Potential Impacts of the No Action Alternative..... 4-6
4.4	Biological Resources 4-6

4.4.1	Potential Impacts of the Proposed Action.....	4-6
4.4.2	Potential Impacts of the Alternative Action.....	4-7
4.4.3	Potential Impacts of the No Action Alternative.....	4-7
4.5	Cultural Resources	4-7
4.5.1	Potential Impacts of the Proposed Action.....	4-7
4.5.2	Potential Impacts of the Alternative Action.....	4-7
4.5.3	Potential Impacts of the No Action Alternative.....	4-7
4.6	POL Management	4-8
4.6.1	Potential Impacts of the Proposed Action.....	4-8
4.6.2	Potential Impacts of the Alternative Action.....	4-8
4.6.3	Potential Impacts of the No Action Alternative.....	4-8
4.7	Short-Term Uses of the Environment and Long-Term Productivity	4-8
4.8	Cumulative Impacts	4-8
4.9	Irreversible and Irrecoverable Commitment of Resources	4-9
5.0	CONSULTATION AND COORDINATION	5-1
6.0	REFERENCES	6-1
7.0	LIST OF PREPARERS.....	7-1

Appendix A AF Form 813

Appendix B Notice of Availability

Appendix C Agency Correspondence

List of Tables

	Page
Table 1. Federal Laws, Executive Orders and Air Force Requirements.....	1-4
Table 2. Environmental Resources Not Examined Further In This EA.....	3-1
Table 3. National Ambient Air Quality Standards (NAAQS) and North Dakota Ambient Air Quality Standards (NDAAQS)	3-4
Table 4. Actual Installation-Wide Air Pollutant Emissions at Cavalier AFS (values in tpy).....	3-6
Table 5 Summary of Actual Air Emissions from Emergency Generator Operations.....	3-6
Table 6. Cavalier AFS Soil Properties.....	3-7
Table 7. Summary of Estimated Air Emissions from Operation (720 hours).....	4-2
Table 8 Summary of Estimated Air Emissions from Operation (100 hours).....	4-2
Table 9. Summary of Estimated Air Emissions from Operation	4-3
Table 10 Summary of Estimated Air Emissions from Operation	4-3

List of Figures

	Page
Figure 1. General Location	1-2
Figure 2. Proposed Action	2-2
Figure 3. Alternative Action	2-6
Figure 4. Soil Properties in Project Area	3-8
Figure 5. Water Features.....	3-11

This page intentionally left blank.

ACRONYMS AND ABBREVIATIONS

This page intentionally left blank.

Acronyms and Abbreviations

ACM	Asbestos Containing Material
AAM	Annual arithmetic mean
ABM	Antiballistic Missile
AFB	Air Force Base
AFH	Air Force Handbook
AFI	Air Force Instruction
AFS	Air Force Station
AFSPC	Air Force Space Command
AST	Aboveground Storage Tank
BLDG	Building
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
DoD	Department of Defense
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EO	Executive Order
ERP	Environmental Restoration Program
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas Emissions
H ₂ S	Hydrogen sulfide
HAER	Historic American Engineering Record
HAP	Hazardous air pollutants
HAZMAT	Hazardous materials

HEMP	High-altitude Electromagnetic Pulse
ICRMP	Integrated Cultural Resources Management Plan
kW	Kilowatt
Mg/L	Milligrams per liter
MBTA	Migratory Bird Treaty Act
MIL-STD	Military Standard
NAAQS	National Ambient Air Quality Standards
ND	North Dakota
NDAAQS	North Dakota Ambient Air Quality Standards
NDAC	North Dakota Administrative Code
NDDH	North Dakota Department of Health
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O ₃	Ozone
OSHA	Occupational Safety and Health Act
PAR	Perimeter Acquisition Radar
PARCS	Perimeter Acquisition Radar Characterization System
Pb	Lead
PCB	Polychlorinated Biphenyl
PL	Protection Level
PM ₁₀	Particulate matter 10 microns in diameter
PM _{2.5}	Particulate matter 2.5 microns in diameter
PPB	Parts per Billion
PPM	Parts per Million

PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	Sulfur dioxide
SO _x	Sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SWS	Space Warning Squadron
TPY	Tons per year
TDS	Total dissolved solids
TSP	Total suspended particulates
µg/m ³	Micrograms per cubic meter
UFC	Unified Facilities Criteria
UPS	Uninterruptable Power System
USAF	United States Air Force
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile organic compounds

This page intentionally left blank.

SECTION 1
PURPOSE AND NEED

This page intentionally left blank.

1.0 PURPOSE AND NEED FOR ACTION

This environmental assessment (EA) evaluates the potential for environmental consequences from upgrading the aging site infrastructure related to mission power at Cavalier Air Force Station (AFS), North Dakota (ND). This project's focus is on sustaining the current mission while ensuring the longevity of the Installation through providing a quality facility that enhances mission effectiveness while protecting the environment.

1.1 BACKGROUND AND LOCATION

Cavalier AFS is operated by the 10th Space Warning Squadron (10 SWS), 21st Space Wing, Air Force Space Command (AFSPC). The facility was constructed by the U.S. Army Corps of Engineers in the early 1970s as one component of the SAFEGUARD Antiballistic Missile (ABM) System. In 1977, after the ABM system was decommissioned, the U.S. Air Force (USAF) began to operate the facility with an Air Force mission.

The 10 SWS operates Cavalier AFS with support from several civilian contractor organizations and the 319th Mission Support Squadron located at Grand Forks Air Force Base, ND. Support from the host base is governed by the Host Tenant Support Agreement and primarily involves supplies, small construction and service contracting services, civil engineering, security police forces, and administrative support for the military and Department of Defense (DoD) civilians who are assigned at Cavalier AFS.

The main structure at Cavalier AFS is the Perimeter Acquisition Radar Characterization System (PARCS), housed in a hardened concrete structure. The entire facility is fenced with most site structures committed to mission activities. Fifty eight acres of the facility are under structures, roadways, and other improvements.

Cavalier AFS occupies 278 acres approximately 14 miles west of Cavalier, North Dakota, in Pembina County. Cavalier AFS is located approximately 15 miles south of the Canadian border, 45 miles west of the Minnesota border, and 67 air miles north-northwest of Grand Forks, ND. Access to Cavalier AFS is by ND State Highway 89 which intersects with ND State Highway 5 two miles north of the Cavalier AFS main gate. Figure 1 shows the general location of the Installation.

The 10 SWS tactical mission is to detect and provide early warning of a ballistic missile attack of North America. Its collateral mission is to detect and monitor the behavior of satellites and space objects in the Earth's orbit.

Cavalier AFS is divided into two main areas:

- a controlled-access area for radar operations, related tactical support equipment, and most administrative offices.
- a non-controlled-access area with recreation areas, living quarters, law enforcement and fire department offices, facilities maintenance shop, transportation and motor pool, and the hazardous waste storage facility.



Figure 1. General Location

1.2 PURPOSE AND NEED

The existing power plant (Building 820) became operational in 1972 and most of the original electrical and mechanical support equipment is still in use today. The majority of the electrical support system is at or beyond its useful life and poses safety hazards. Many components of the mechanical system are also beyond their useful life. The power plant provides standby backup power to all mission critical systems for the perimeter acquisition radar (PAR). The power plant includes several groups of infrastructure equipment which are critical to mission operations. The power plant and the equipment are 40 years old and of declining future maintainability. The existing power plant is not high-altitude electromagnetic pulse (HEMP) shielded in accordance with Military Standard (MIL-STD) 188-125-1.

There is a key deficiency in the current power distribution system. Currently, no uninterruptible power system (UPS) for the most critical infrastructure system exists. Because no UPS exists, operators require up to 45 minutes to restart all supporting systems before radar operation can restart when a power disruption has occurred. Operators also require 45 minutes to restart the supporting systems when utility power suffers a momentary outage or sag, for example when lightning strikes the utility grid. Sags or longer disruptions cause motors to drop off line. When cooling water pumps are stopped, even momentarily, other protection systems trip off various breakers to protect high power equipment from overheating. Lightning surge energy in the form of spikes can also enter the PAR power system and damage radar equipment and other sensitive devices. For these reasons, current operations' protocol is to run the generators and be isolated from utility power when lightning is reported within 100 miles of the Installation. With an upgraded system this protocol would not be required which would save costs for generator run time, fuel, maintenance, and air permit loads.

The purpose and need for the upgrade is to provide reliable backup power to all mission critical systems for the PAR. As required by a DoD requirement, the emergency power source for the PAR needs to be uninterruptible and protected from a HEMP event. To meet Air Force requirements, the fuel farm must be capable of storing fuel to operate the power plant for up to 30-days and must be HEMP compliant.

In accordance with DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, Air Force Instruction (AFI) 31-101, *The Air Force Installation Security Program*, and Air Force Handbook (AFH) 32-1084, *Facility Requirements*, DoD installations are required to implement antiterrorism/force protection construction standards and to develop protective measures for DoD assets. AFH 32-1084 states that "a fence serves as a legal and physical demarcation of a boundary. It is an obstruction which must be jumped, climbed, or cut through to gain entry. From a security and law enforcement point of view, such actions would be regarded as unauthorized entry. Signs are displayed at appropriate and regular intervals on the exterior boundary of the fence line describing the type of area and conditions for entry. This combination of fencing and signs is intended to discourage trespass or unauthorized entry to legal entry points." The purpose of the security fence is to implement antiterrorism/force protection and increase security for personnel and increase protection of Air Force assets.

1.3 REGULATORY REQUIREMENTS AND GUIDANCE

The AFSPC prepared this EA in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC 4321-4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Department of the Air Force Environmental Impact Analysis Process (32 CFR 989). This EA analyzes the environmental consequences of implementing the Proposed Action and provides information to the public and to the AFSPC decision-makers regarding the potential significance of the federal action. Other federal laws, ex-

Executive orders (EO) and Air Force requirements related to environmental issues addressed in this EA are briefly described in Table 1.

TABLE 1. FEDERAL LAWS, EXECUTIVE ORDERS AND AIR FORCE REQUIREMENTS

Title	Citation	Description
Endangered Species Act	16 USC 1531	Requires federal agencies to evaluate the effects of their actions on endangered or threatened species of fish, wildlife, and plants and take steps to conserve and protect these species and their critical habitat.
Migratory Bird Treaty Act	16 USC 703	Provides for the protection of migratory birds and prohibits their unlawful take or possession.
Clean Water Act	33 USC 1251	Establishes limits on the amounts of specific pollutants discharged to surface waters to restore and maintain the chemical, physical and biological integrity of the water as established by ambient water quality standards.
Floodplain Management	EO 11988	Requires federal agencies to evaluate the potential effects of actions on floodplains and to consider alternatives to avoid adverse effects and incompatible development wherever possible.
Clean Air Act	42 USC 7401	Establishes policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. Federal actions must conform to a State Implementation Plan and cannot cause or contribute to new violations of National Ambient Air Quality Standards.
Federal Noxious Weed Act	7 USC 2801	Requires federal agencies to develop management programs to control undesirable plants on federal lands that have the potential to impact agriculture, wildlife resources or public health.
Invasive Species	EO 13112	Directs federal agencies to make efforts to prevent the introduction and spread of invasive plant species.
Protection of Wetlands	EO 11990	Requires federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.
Occupational Safety and Health Act of 1970	32 CFR 989.27	Requires the assessment of direct and indirect impacts of Proposed Action on the safety and health of Air Force employees and others at a work site.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act	42 USC Sec 9601	Provides for funding, enforcement, response, and liability for the release or threatened release of hazardous substances into the environment.
Resource Conservation and Recovery Act	42 USC 650	Addresses the control of solid and hazardous waste. The act defines hazardous waste and controls it by a complex manifest system designed to track a waste from its generation to final disposal.

Title	Citation	Description
Storage Tank Compliance	AFI 32-7044	Describes the environmental and engineering requirements for underground and aboveground storage tanks and associated piping that store petroleum and hazardous substances.
Corrosion Control	AFI 32-1054	Provides responsibilities and general requirements for the corrosion control program at major commands and bases. It applies to personnel involved in design, construction, acquisition, operations, and maintenance of real property assets and installed equipment at installations and facilities.
National Historic Preservation Act	16 USC 470	Requires federal agencies to determine the effect of their actions on cultural resources and take certain steps to ensure these resources are located, identified, evaluated and preserved.
Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	EO 12898	Directs federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of federal actions on minority or low-income populations.
Strengthening Federal Environmental, Energy, and Transportation Management	EO 13423	Sets goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, renewable energy, sustainable buildings, electronics stewardship, fleets, and water conservation.
Federal Leadership in Environmental, Energy, and Economic Performance	EO 13514	Expands on EO 13423 and sets sustainability goals for Federal agencies and focuses on making improvements in their environmental, energy and economic performance.
The Air Force Installation Security Program	AFI 31-101	This AFI is the basic Air Force directive for installation security. It sets out the security standards and requirements for all Air Force Bases located in the United States and overseas. This AFI includes requirements for fences, armed guards, vehicle/personnel inspections and other security requirements.
DoD Minimum Antiterrorism Standards for Buildings	Unified Facilities Criteria (UFC) 4-010-01	Requires DoD Components to adopt and adhere to common criteria and minimum construction standards to mitigate anti-terrorism vulnerabilities and terrorist threats.
DoD Security Engineering Facilities Planning Manual	UFC 4-020-01	This UFC supports the planning of DoD facilities that include requirements for security and antiterrorism. It will be used in conjunction with UFC 4-010-01, <i>DoD Minimum Antiterrorism Standards for Buildings</i> , to establish the security and antiterrorism design criteria that will be the basis for DoD facility designs. Those criteria include the assets to be protected, the threats to those assets, the levels to which those assets are to be protected against those threats, and any design constraints imposed by facility users. This document also provides a means for identifying the costs for providing the applicable levels of protection and a risk management process for evaluating those costs and the protection options.
Security Engineering: Final Design	UFC 4-020-03FA	This manual provides guidance on integrating criteria for protecting assets within facilities against a range of criminal, protester, terrorist, and subversive threats in the final design phase of a project. It also presents final design information on how to design and specify protective measures required in a construction project to resist specific design threats.

Title	Citation	Description
Mass Notification Systems	UFC 4-021-01	Mass notification provides real-time information and instructions to people in a building, area, site, or installation using intelligible voice communications along with visible signals, text, and graphics, and possibly including tactile or other communication methods. The purpose of mass notification is to protect life by indicating the existence of an emergency situation and instructing people of the necessary and appropriate response and action.
High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground-Based C4I Facilities Performing Critical Time-Urgent Missions	MIL-STD-188-125-1	This standard establishes minimum requirements and design objectives for HEMP hardening of fixed ground-based facilities that perform critical, time-urgent command, control, communications, computer, and intelligence missions.

1.4 APPLICABLE REGULATIONS AND PERMITS

- Installation contractors would follow safety guidelines of the Occupational Safety and Health Administration (OSHA) as presented in the Code of Federal Regulations. Should any Installation employees participate in the Proposed Action, they would comply with relevant Air Force occupational safety and health standards.
- For construction projects disturbing over one acre, a Notice of Intent to Obtain Coverage under North Dakota Pollutant Discharge Elimination System General permit for storm water discharge must be filed with the North Dakota Department of Health (NDDH), Division of Water Resources. Since the Proposed Action would disturb more than one acre, filing a Notice of Intent would be required.
- A storm water permit would be required from the NDDH since the project disturbs over one acre of land. To obtain authorization to discharge storm water runoff from a construction site, the construction contractor would submit a completed application and develop a storm water pollution prevention plan in accordance with the construction general permit. A plan must be in place as a condition of the permit and a copy of the plan must be retained. (NDDH, 2012c).
- The Installation would have to modify their Title V permit to include the new fuel tanks and new generators. The Installation would need a permit to construct and operate the fuel tanks in accordance with North Dakota Administrative Code (NDAC) Section 33-15-14.
- Installation contractors would follow the environmental compliance requirements for storage tanks and associated piping that store petroleum and hazardous substances in accordance with Federal (40 CFR Parts 112 and 280), and applicable North Dakota and local environmental regulations, and related DoD and Air Force directives.

1.5 ORGANIZATION

This EA follows the recommended outline in the CEQ and Air Force NEPA-implementing regulations.

Section 1.0 — Purpose and Need for the Action provides background information about the Installation; the purpose and need for the Proposed Action; applicable regulatory requirements; permits and a brief description of how the document is organized.

Section 2.0 — Provides details of the Proposed Action, Alternative Action and the No Action Alternative.

Section 3.0 — Affected Environment provides a description of the existing conditions of the areas potentially affected by the Proposed Action or Alternatives.

Section 4.0 — Environmental Consequences provides an analysis of potential direct, indirect, and cumulative impacts to environmental resources that may result from implementing the Proposed Action or Alternatives.

Section 5.0 — Provides a list of the agencies and tribes consulted for their review and comment of the EA.

Section 6.0 — References provides a listing of the references used in preparing this EA.

Section 7.0 — List of Preparers lists the names, affiliations, and qualifications of the document preparers.

Appendices — Provides the AF Form 813, a copy of the Notice of Availability and agency letters received.

(This page intentionally left blank)

SECTION 2
PROPOSED ACTION AND ALTERNATIVES

This page intentionally left blank.

2.0 PROPOSED ACTION AND ALTERNATIVES

This Section describes the Proposed Action, Alternative Action and the No Action Alternative. CEQ regulations require the inclusion of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and Alternatives are compared.

2.1 SELECTION CRITERIA FOR ALTERNATIVES

In accordance with 32 CFR Part 989.8(c) the development of site-selection criteria is an effective mechanism for the identification, comparison, and evaluation of reasonable alternatives. The following site selection criteria were developed to be consistent with the purpose and need for the action.

- Provide a quality facility that enhances mission effectiveness while protecting the environment;
- Support Installation's mission to detect and monitor the behavior of satellites and space objects in Earth orbit;
- Be protective of facilities, human health and the environment;
- Selection of power systems equipment must include reliability, failure documentation, and past experience.
- Not violate provisions of the National Historic Preservation Act;
- Meet current Air Force design standards and energy goals;
- Meet antiterrorism force protection standards; and
- Impacts to natural resources such as floodplains, wetlands, water bodies and threatened and endangered species and habitats must be minimized to the maximum extent practicable. Unavoidable impacts must be addressed according to federal, Air Force, state and local regulations.

2.2 PROPOSED ACTION – UPGRADE OF PERIMETER ACQUISITION RADAR CHARACTERIZATION SYSTEM (PARCS) AND CONSTRUCT FUEL FARM

There are six components of the PARCS upgrade. These components of the Proposed Action are described below. Figure 2 shows the location of the proposed upgrades. The proposed upgrades would be done within the existing footprint of the PAR and Power Plant with the exception of the Fuel Farm. The site would not require extensive development work since no parking areas or driveways are required. The existing site is gently sloped with a grass covering.

- Install HEMP protection for the electronic control system of the emergency backup generators and supporting infrastructure in the backup power facility to ensure the controls would survive a HEMP event. Existing mission critical pumping and air compressor systems in the existing power plant structure would receive upgraded HEMP shielding in place to meet MIL-STD-188-125-1.

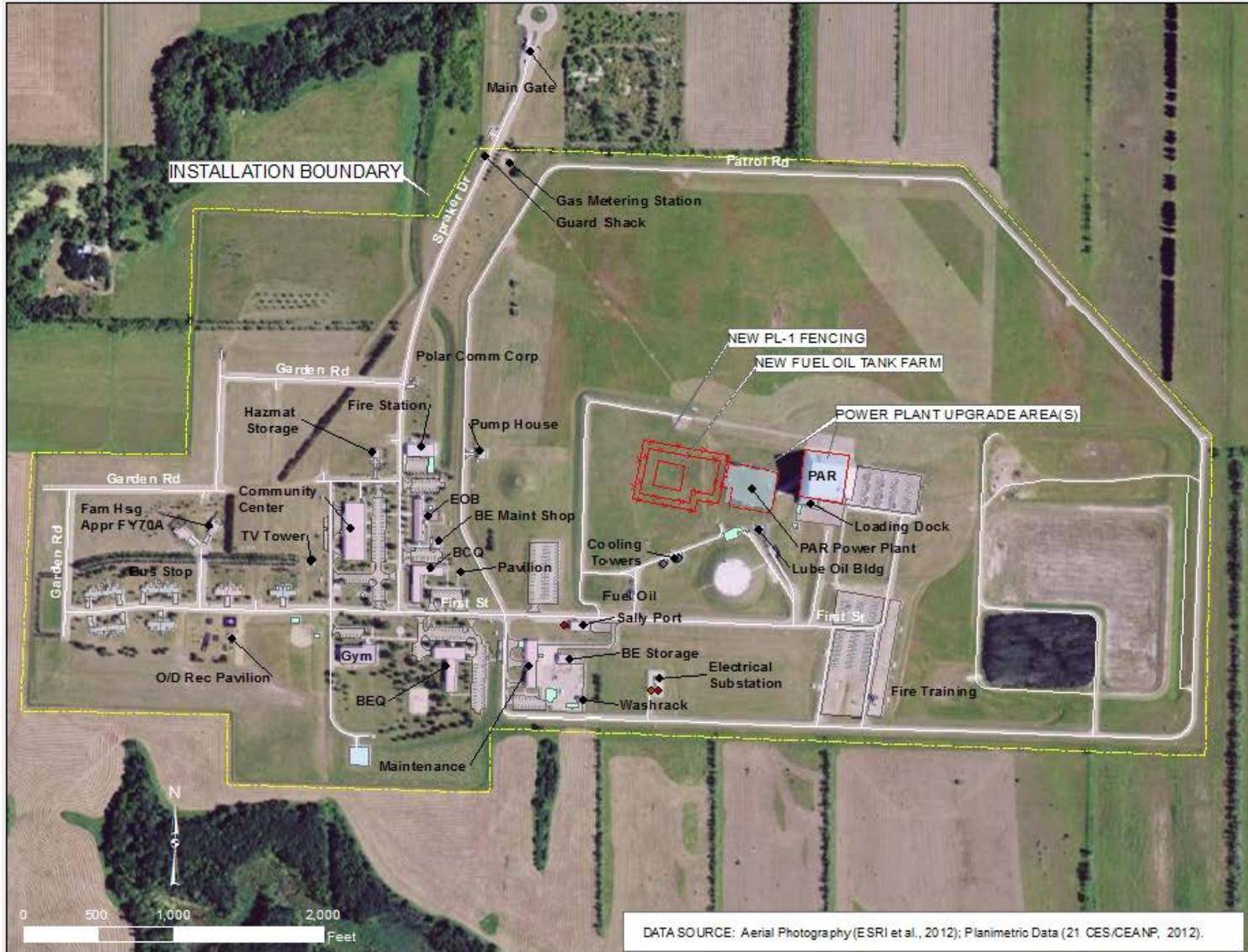


Figure 2. Proposed Action

- Replace the 40-year old power switchgear and transformers with modern, safer switchgear and transformers. The current switchgear switches between commercial and generator power. The new switchgear must be capable of switching between commercial, backup and the new UPS power sources.
- Install a new mission UPS system capable of continuing the mission between the loss of commercial power and bringing the backup generators online. The action may also require several additional smaller UPS at critical locations inside the mission facility. This would require taking those individually UPS systems and moving them from critical to non-critical power at the switchgear. The UPS would include installing four new USEPA compliant 2.5 MW backup power generators/UPS combination systems to replace the 40 year old increasingly unsupportable generators.
- Upgrade the power plant to include UPS protection for all mission critical systems and utilities. Upgrade the PARCS mission system infrastructure to ensure it would operate with the installed maximum capacity of the mission UPS. The largest feasible UPS would not carry the full mission load under the current configuration. The current configuration has some infrastructure that needs to be modified in order to remove it from critical UPS power. This action would specifically include the upgrade of the water cooling pumps to allow them to be off of critical power. This action would also include modifying the mission system to turn off in an over-temperature situation rather than the current loss of cooling water pressure configuration.
- Install a replacement backup power fuel storage. The requirement is for 360,000 gallons of petroleum diesel fuel. There would be seven 60,000 gallon tanks, six for the fuel and one for fuel polishing and for periodic inspections. A diesel fuel oil system is needed to supply fuel from the tank farm to the diesel engine day tanks for the generators. The system would consist of a main storage tank system with a central pumping system complete with a tank heating system and fuel polisher system. The tank farm would provide a minimum of 30 days of operation at full load (approximately 360,000 gallons total storage). A fuel distribution and final filtering system would be incorporated in the existing power plant and would have an external dual compartment day tank of approximately 10,000 gallons (20 hours of run time, full load) and a redundant fuel distribution piping and pumping system to the generator bays. The fuel farm would be HEMP protected. The fuel farm would be a slab on grade with concrete walls that extend to the tops of the fuel tanks. The underground fuel oil piping would be installed with double wall containment piping and leak detection as required by code. Fuel oil storage would be monitored by a central fuel inventory system. The tanks would be aboveground with secondary containment. The system would include the required piping and transfer pumps to transfer fuel from the existing off-loading area to the new tanks. A new underground fuel line would be provided to the existing transfer tanks in the power plant. The current off loading area for the existing UST's would be used for the new fuel farm, and the piping into the power plant would be replaced but in the same location.
- Install commercial power disconnect switches to isolate the mission system from HEMP effects conducted by the commercial long-line power grid.

The new fuel farm is considered a Protection Level (PL)-1 facility and would be provided antiterrorism and force protection measures in accordance with AFI 31-101 and UFC's 4-010-01, 4-010-02, and 4-020-01. The fuel farm would be enclosed with a dual perimeter fence. The interior fence would be crash rated and would be a minimum of 50 feet from the proposed facility. The exterior fence would be a 7 foot high double security fence with an 18-inch outrigger. The fence would have gates for occasional access for ground maintenance. The total enclosed area would be less than an acre (see Figure 2). The fence would be a seven-foot high, nine gauge steel wire fabric, chain-link fence with one outrigger (facing outward) with three strands of barbed wire. The overall height of the fence with outrigger would be eight feet. Foundations for line posts, constructed of concrete, would be 12 inches

in diameter with a minimum depth of 42 inches below grade. Foundations or terminal and gate posts would be 18 inches in diameter.

2.3 ALTERNATIVE ACTION – CONSTRUCT NEW POWER PLANT AND FUEL FARM

This Alternative is to construct a new stand-alone power plant for the PAR facility to be located to the west of and connected to the existing power plant (see Figure 3). The existing power plant would be decommissioned, but does contain existing cooling water, fire water, domestic water, sanitary systems, control room, and other requirements which would be utilized in place. Constructing a new power plant would provide a new emergency/uninterruptable electric power source for the PAR system.

Power Plant

The proposed power plant structure would be a 19,745 square foot facility which would house five-two megawatt engine-generators with five-two megawatt UPS units. The new facility would be HEMP shielded. The new power plant would be an above grade, steel framed structure with a concrete exterior to match the existing PAR facility. Existing mission critical pumping and air compressor systems remaining in the existing power plant structure would receive upgraded HEMP shielding in place to meet MIL-STD-188-125-1.

Fuel Farm

A diesel fuel oil system is needed to supply fuel from the tank farm to the diesel engine day tanks for the generators. The system would consist of a main storage tank system with a central pumping system complete with a tank heating system and fuel polisher system. The tank farm would provide a minimum of 30 days of operation at full load (approximately 360,000 gallons total storage). A fuel distribution and final filtering system would be incorporated in the new power plant and would have an external dual compartment day tank of approximately 10,000 gallons (20 hours of run time, full load) and a redundant fuel distribution piping and pumping system to the generator bays. The fuel farm would be HEMP protected. The fuel farm would be a slab on grade with concrete walls that extend to the tops of the fuel tanks. The underground fuel oil piping would be installed with double wall containment piping and leak detection as required by code. Fuel oil storage would be monitored by a central fuel inventory system. The existing fuel unloading station would continue to be used.

Tunnel

A connecting tunnel from the existing power plant to the new power plant would extend from approximately 20 feet below grade at the existing power plant to the new at-grade elevation of the new facility. The tunnel construction would be concrete with a maximum slope of 12 percent to accommodate forklift traffic.

Infrastructure

No parking areas or driveways are required as part of this action. Entry into the facility would be through the existing power plant. New underground utilities for the facility would include a new primary electric line from the substation and a new water main for domestic water and fire suppression. The communications requirements, sanitary sewer, and electrical connections back to the PAR building are expected to be routed through the new connecting tunnel. A storm water infiltration pond would be required to meet the requirements under Section 438 of the Energy Independence and Security Act of 2007. Storm water would be piped out of the area around the new power plant to the infiltration pond and then piped from the infiltration pond to the north and discharged into the existing ditch.

Security Fence

The new power plant and fuel farm are considered PL-1 facilities and would be provided antiterrorism and force protection measures in accordance with AFI 31-101 and UFC's 4-010-01, 4-010-02, and 4-020-01. The power plant and fuel farm would be enclosed with a dual perimeter fence. The interior fence would be crash rated and would be a minimum of 50 feet from the proposed facility. The exterior fence would be a 7 foot high double security fence with an 18-inch outrigger. The fence would have gates for occasional access for ground maintenance. The total enclosed area would be approximately 2.28 acres (see Figure 3). The fence would be a seven-foot high, nine gauge steel wire fabric, chain-link fence with one outrigger (facing outward) with three strands of barbed wire. The overall height of the fence with outrigger would be eight feet. Foundations for line posts, constructed of concrete, would be 12 inches in diameter with a minimum depth of 42 inches below grade. Foundations for terminal and gate posts would be 18 inches in diameter.

2.4 NO ACTION ALTERNATIVE

The No Action Alternative would be to not extend the functional life of the existing backup power generators and not construct a fuel farm.

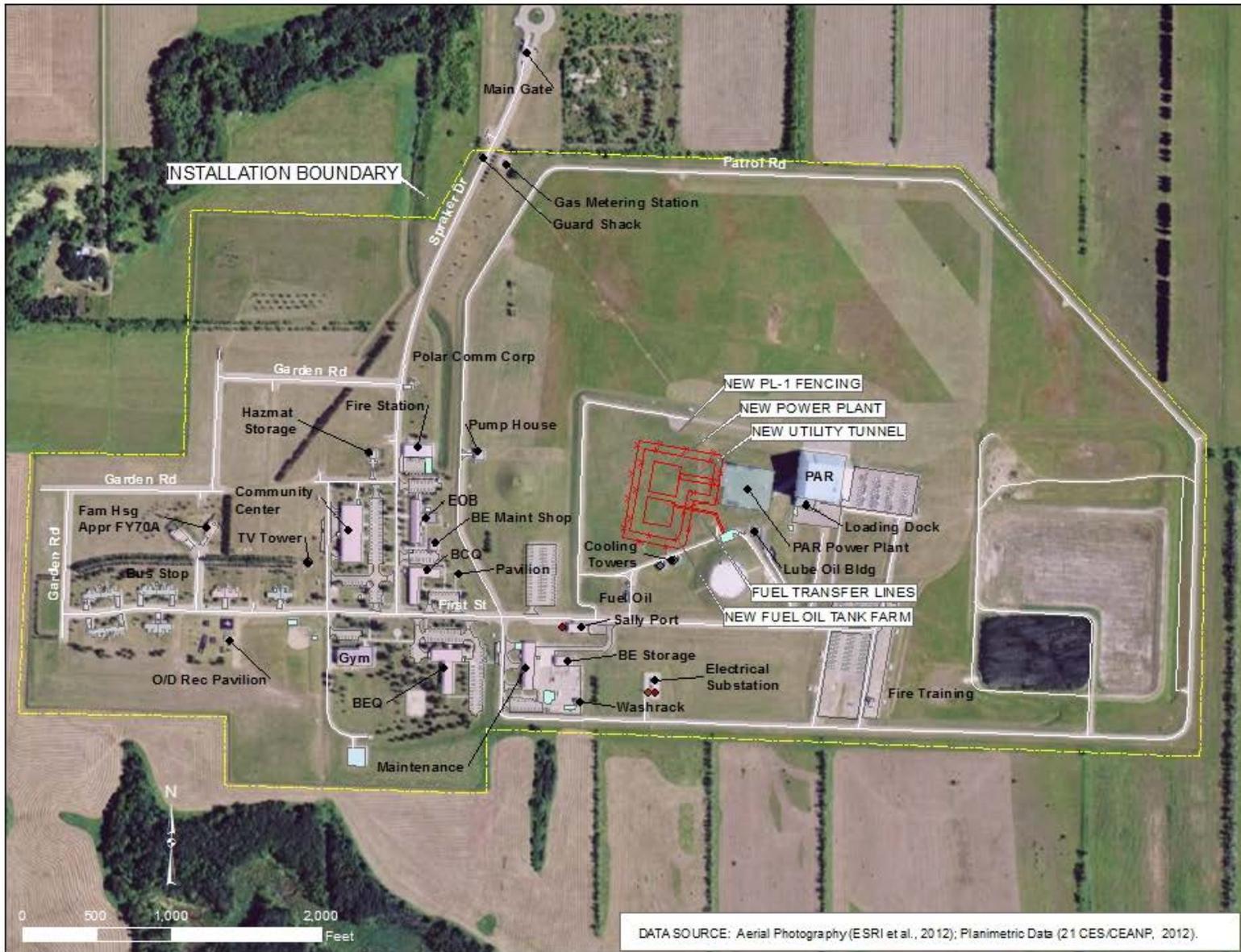


Figure 3. Alternative Action

SECTION 3
AFFECTED ENVIRONMENT

This page intentionally left blank.

3.0 AFFECTED ENVIRONMENT

This Section describes the environment at Cavalier AFS and the area surrounding the Installation that may be affected by implementing the Proposed Action, Alternative Action and No Action Alternative. The existing environmental conditions serve as a baseline from which to identify and evaluate potential environmental changes attributable to the Proposed Action and Alternatives. The intent of NEPA is to focus the analysis on the human (i.e., physical, biological and social) environment potentially affected by the Proposed Action or Alternatives. Resources and areas of the human environment that are not present on or in the vicinity of Cavalier AFS, or that would not be affected by the Proposed Action or Alternatives are not described in this Section. Table 2 lists these resources and provides the rationale for excluding them from further description and from impact analysis in Section 4.

TABLE 2. ENVIRONMENTAL RESOURCES NOT EXAMINED FURTHER IN THIS EA

Environmental Resource	Reason(s) for Not Including in EA Analysis
Airspace	The Installation does not involve a flying mission; therefore, there would be no impacts to airspace from the Proposed Action or Alternatives.
Environmental Justice ¹ Protection of Children ²	There would be no disproportionately high and adverse human health or environmental effects on minority populations or low-income populations. There would be no disproportionate increase in environmental health and safety risks to children because children would not be present in the area of construction or operation of the power plant/fuel farm.
Environmental Restoration Program (ERP) Sites	The Defense Environmental Restoration Program was formally established by Congress in 1986 to provide for the cleanup of DoD property. The ERP requires each installation to identify, investigate, and clean up contaminated sites. All ERP sites at Cavalier AFS have been officially closed and are not within the proposed project area. These sites would not be disturbed as part of this action and therefore will not be discussed further in this EA.
Farmlands	The Farmland Protection Policy Act, 7 USC 4201-4209 as amended by Section 1255 of the Food Security Act of 1985, 16 USC 3801-3862 regulates actions with the potential to convert existing important farmlands to non-agricultural uses. The Proposed Action and Alternative would occur on the Installation, no farmlands adjacent to the Installation would be affected by the proposed construction projects.
Floodplains	No floodplains are present within the construction area for the Proposed Action or Alternatives; therefore, there would be no impacts to floodplains.
Land Use	Land use on the Installation includes airfield, industrial, administrative, commercial, residential, public recreation and open space. The eastern half of the site is dominated by mission-oriented industrial land uses consisting of the power plant, radar, and sewage and water treatment facilities. Addition of the fuel farm in the industrial portion of the Installation would be consistent with the existing land use. Public access to the site is prohibited; therefore, views are limited to passing traffic on ND 5 to the north, ND 32 to the east, and to adjacent land owners.
Noise	Noise levels around military installations result primarily from aircraft operations. Because Cavalier AFS does not have an active runway and there are no sensitive receptors (e.g., chapel, hospital), noise levels will not be analyzed. Noise from construction activities would be short-term and limited to daylight

Environmental Resource	Reason(s) for Not Including in EA Analysis
	hours. There would be no significant impacts to noise levels from the Proposed Action or Alternatives.
Polychlorinated biphenyls (PCB)	Until 1998, the Installation used a variety of electronic and communications equipment that contained PCBs. Most of these items were in the PAR facility. All large transformers, capacitors, and other PCB-containment units were replaced or retro-filled with PCB-free insulating oil. It is possible that fluorescent light ballasts that contain PCBs are still used at the Installation. When these lights fail they are replaced with PCB-free ballasts. PCB ballasts are disposed as PCB waste. PCBs are collected in marked Department of Transportation drums. There would be no change to PCBs as a result of the Proposed or Alternative actions.
Radon	Radon testing at the Installation indicated radon levels at 2.0 picocuries per liter or less which are below the threshold of 4.0 picocuries per liter, as set forth by the USEPA (USAF, 2009a). No impacts from radon are anticipated as a result of the Proposed or Alternative actions.
Energy Management	The use of vehicles and other energy-consuming equipment is monitored by the Air Force for abuse and unnecessary use beyond that needed to maintain the mission. Engines would be turned off when vehicles and equipment are parked unless maintenance operations require the engine to be running. Construction generators would only be used when necessary and turned off when not in use. Energy consumption to complete the or Alternatives would not be considered excessive for the action. No significant impacts are anticipated. To minimize energy consumption and greenhouse gas emissions, when materials are required for the Proposed Action they would be procured from within or close to the project area as practicable to reduce fuel use from transporting materials. Contractors would be requested to use appropriately-sized equipment for the construction and maintain construction equipment and haul trucks in good working order so fuel efficiency is maximized. Impacts to energy use from the Proposed Action or Alternatives would not be significant.
Occupational Safety and Health	Contractor personnel would be responsible for ensuring ground safety and compliance with all applicable occupational health and safety regulations and worker compensation programs. Contractors would also be required to conduct construction activities in a manner that would not pose any risks to personnel in the project areas. The contractor would also be responsible for managing exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. No significant impacts to personnel are anticipated as a result of the Proposed Action.
Hazardous and Solid Waste	Contractor personnel would be responsible for ensuring the management of all wastes as a result of the operation of fuels will be conducted in accordance with all applicable federal, state, local and Air Force regulations and requirements. No significant impacts are anticipated.
Socioeconomics	No changes to local economy, workforce, or demographics would result from the Proposed Action. There would be minor, short-term beneficial economic impacts during construction, but the action would not support substantial increases to the local construction economy. The workers would most likely be hired from the local area.
Transportation	Transportation will not be addressed since traffic volume on the Installation is low and there is no appreciable congestion during peak traffic periods. The additional worker vehicles and construction equipment associated with the construction, delivery of materials, or occasional routine maintenance would not

Environmental Resource	Reason(s) for Not Including in EA Analysis
	result in any noticeable change to the Installation's entry gate or roads.
Visual Resources	The Proposed Action and Alternatives are consistent with existing facility layout and appearance. There would be no change in visual conditions on or near the Installation.
Wetlands	There are no wetlands present on Cavalier AFS (USAF, 2009a).
¹ EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations ² EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	

The resource areas that may be impacted by the Proposed or Alternative Action Alternative include the physical environment (air quality, geology, soils, and water), the natural environment (vegetation and wildlife), the human environment (cultural resources) and concludes with petroleum, oils and lubricants.

3.1 AIR RESOURCES

This Section discusses the climate and meteorology of the area, air quality standards and existing air pollutant sources.

3.1.1 Climate and Meteorology

The climate in northeastern North Dakota is typical of the Northern Great Plains with cold snowy winters, warm summer days and cool summer nights, and a variety of weather systems both in summer and winter. Hot humid days are rare in the summer, but cold waves and blizzards may be expected each winter. In a normal winter there are approximately 60 days with below zero temperatures. July is the warmest month with temperatures averaging 68°F. The annual average precipitation is approximately 20 inches with 50 percent of the precipitation occurring during the months of June, July, and August. The average wind speeds are approximately 12 miles per hour throughout the year. Prevailing winds are from the north or northwest during November through May, and from the south or southwest from June to October.

3.1.2 Air Quality Standards

The National Ambient Air Quality Standards (NAAQS), established by the USEPA define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the Clean Air Act (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate matter, and sulfur dioxide (SO₂). Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM₁₀) and smaller than 2.5 microns in diameter (PM_{2.5}). In addition to the six NAAQS, North Dakota also has standards for hydrogen sulfide (H₂S). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable State Implementation Plan (SIP). Exceeding the concentration levels within a given time period is a violation, and constitutes a nonattainment of the pollutant standard.

North Dakota has adopted a more stringent set of standards, termed the North Dakota Ambient Air Quality Standards (NDAAQS). Emissions of air pollutants from operations in North Dakota are limited to the more restrictive Federal or state standard. Table 3 presents the current NAAQS and the NDAAQS for the six criteria pollutants. Generally, criteria pollutants directly originate from mobile and stationary sources.

**TABLE 3. NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)
AND NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS (NDAAQS)**

<i>Pollutant</i>	<i>Averaging Time</i>	<i>NAAQS</i> $\mu\text{g}/\text{m}^3$ (<i>ppm</i>) ^a		<i>NDAAQS</i> $\mu\text{g}/\text{m}^3$ (<i>ppm</i>) ^a
		<i>Primary</i> ^b	<i>Secondary</i> ^c	
O ₃	1 hr	235 (0.12)	Same	Same
	8 hr	157 (0.08)	Same	
CO	1 hr	40,000 (35)	None	Same
	8 hr	10,000 (9)	None	Same
NO ₂	Annual	100 (0.053 ppb) ^d	Same	Same
	1 hr	188 (100 ppb)	None	Same
SO ₂	1 hr	75 ppb	None	196 (0.075)
	3 hr	None	1,300 (0.5)	1,309 (0.5)
PM ₁₀ ^e	24 hour	150	Same	Same
PM _{2.5} ^f	Annual 24 hr	12	15	15
		35	Same	35
Pb	¼ year	1.5	Same	Same
H ₂ S	1-hour	None	None	280 (0.20)
	24-hour	None	None	140 (0.10)
	3 months	None	None	28 (0.02)
	Instantaneous	None	None	14,000 (10)

^a $\mu\text{g}/\text{m}^3$ — micrograms per cubic meter; ppm — parts per million
^bNational Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.
^cNational Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.
^dppb – parts per billion
^ePM₁₀ is particulate matter equal to or less than 10 microns in diameter
^fPM_{2.5} is particulate matter equal to or less than 2.5 microns in diameter
Source: 40 CFR 50, North Dakota Air Pollution Control Regulations – NDAC 33-15

Tropospheric O₃ is an exception, since it is rarely directly emitted from sources. Most O₃ forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NO_x) reacting with sunlight.

All areas of the country are classified as attainment, nonattainment, or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment. Areas in nonattainment of ambient air quality standards must develop a Nonattainment Plan to

achieve attainment, as outlined in Section 172 of the CAA. These plans are usually a revision of the SIP for achieving air quality standards.

Proposed Federal actions within a nonattainment or maintenance area must conform to the SIP. Conformity thresholds, as defined in 40 CFR 51, Subpart W, are used to determine conformity of an action with a SIP. The thresholds are determined by nonattainment or maintenance status. For nonattainment areas, the thresholds are determined by the severity of nonattainment. For maintenance areas, the thresholds are 100 tons per year of CO, nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter. The threshold for VOCs is 50 tons per year (tpy) if the maintenance area is inside an ozone transport region or 100 tons per year if the maintenance area is outside an ozone transport region. These provisions are known as the General Conformity Rule.

Prevention of significant deterioration (PSD) regulations (40 CFR Section 52.21) define air quality levels that cannot be exceeded by major stationary emission sources in specified geographic areas. Major stationary sources are usually sources that emit more than 100 tpy of a specific pollutant. PSD regulations establish limits on the amounts of SO₂ and total suspended particles (TSP) that may be emitted above a premeasured amount in each of the three class areas. Class I areas are pristine areas, and include national parks and wilderness areas. All other areas in the United States are Class II areas, where moderate, well-controlled industrial growth could be permitted. There are no Class I areas located in the vicinity of Cavalier AFS. Cavalier AFS is located in a PSD Class II area. Any source emitting 100 tpy or more of any criteria pollutant would be considered a major source under PSD regulations. Net emissions would be significant at the following thresholds: CO, 100 tpy; NO_x, SO_x, or VOCs, 40 tpy; or Pb, 0.6 tpy (40 CFR 52.21).

3.1.3 Air Pollutant Sources

Air pollutants include the six criteria pollutants discussed previously. Particulate matter (PM₁₀ and PM_{2.5}) is generated during ground disturbing activities and during combustion. The principal source of CO and SO₂ is combustion. The precursors of O₃ (VOC and NO₂) are also primarily emitted from combustion. Hazardous air pollutants (HAP) include a wide range of materials or chemicals that are toxic or potentially harmful to human health. While HAPs are found in numerous products and used in many processes, few types and small amounts of HAPs are generated during internal combustion processes or earth-moving activities.

The NDDH conducted an Air Quality Monitoring Survey for calendar year 2010 (NDDH, 2011). The NDDH operated seven ambient air quality monitoring sites and industry operated eight source-specific air quality monitoring sites. The data from these sites indicated that the quality of the ambient air in North Dakota is generally good. The entire North Dakota Air Quality Control Region (including Pembina County) is in attainment status for all criteria pollutants.

There were no NO₂, SO_x, O₃, CO, PM_{2.5}, or PM₁₀ exceedances of either the state or Federal ambient air quality standards measured during the year. There were no standards currently in effect for ammonia during 2010. Cavalier AFS conducted an Installation-wide Air Emissions Inventory for the last five calendar years, 2007-2011. All inventories were approved by the State (Dendy, 2012b).

The Installation-wide criteria pollutants from stationary sources, HAPs, and potential to emit for criteria pollutants are shown in Table 4. The Installation has a renewed Title V permit issued by the NDDH valid until January 22, 2017 (USAF, 2012a). Emissions in the last five years were below limits in the permit. Cavalier AFS is a major stationary source, as emissions of criteria pollutants are above 100 tpy and the potential to emit for any criteria pollutant is more than 250 tpy.

TABLE 4. ACTUAL INSTALLATION-WIDE AIR POLLUTANT EMISSIONS (VALUES IN TPY)

<i>Emissions</i>	<i>PM₁₀</i>	<i>NO_x</i>	<i>SO_x</i>	<i>CO</i>	<i>VOC</i>	<i>Total HAP</i>
Actual Emissions	5.21	98.89	0.18	26.13	6.30	0.55
Potential to Emit	40.29	1,232.05	19.59	332.78	77.25	7.13

Sources: USAF, 2010

Facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions (GHGs) are required to submit annual reports to USEPA (40 CFR Part 98). Based on the CY 2010 fuels throughput, the estimated output of CO₂ equivalent from stationary sources (excluding mobile sources) was approximately 6,210 tons. These totals, considered the Cavalier AFS GHG emissions baseline, were well below the USEPA reporting requirements.

The Power Plant has five existing 3,000 kilowatt (kW) generators that would be replaced. The existing generators are without UPS and are currently started whenever an electrical storm is within 100 nautical miles of Cavalier AFS in anticipation of the potential of losing commercial power. The actual 2010 emissions from these five emergency generators is shown in Table 5.

TABLE 5. SUMMARY OF ACTUAL AIR EMISSIONS FROM EMERGENCY GENERATOR OPERATIONS

Emergency Generators (Dual-Fired)								
Generator Size		Hours of Operation	Actual tons/yr					
kW	hp	hr/yr	PM₁₀	SO₂	NO_x	VOC	CO	PM_{2.5}
3000	4095	2,422.09	1.29	0.04	70.39	5.21	17.47	1.25

Source: USAF, 2010

The total VOC emissions for two existing 22,450 gallon diesel tanks at the Power Plant from the was 0.0004 (tons per year for each tank) (USAF, 2010).

3.2 GEOLOGICAL RESOURCES

Geological resources include physiography (features of the physical landscape), topography, geologic layers and potential hazards and soils.

3.2.1 Geology and Topography

Cavalier AFS is situated within the Western Lake Section of the Central Lowlands physiographic province and in the Red River Valley district. The Red River Valley is bordered by the Pembina Escarpment that more or less trends north-south approximately 35 miles west of the Minnesota-North Dakota State Line. Its physical subdivision is within the eastern margin of North Dakota forming a strip 35 to 50 miles wide trending north-south. The valley is a flat, nearly featureless lake plain that has undergone very little erosion (USAF, 2000a). The Pembina Escarpment rises abruptly 500 to 700 feet above the valley bottom forming (in conjunction with the Pembina delta) the Pembina Mountains. Elevations on the Installation range from 1,130 feet above mean sea level in the eastern portion to 1,180 feet in the western part. The regional gradient is to the northeast, away from the Pembina Escarpment, which lies about one mile to the west of the AFS (USGS, 1964).

The surface geology of the region is strongly influenced by glacial Lake Agassiz that formed when the north-flowing Red River was dammed by the retreating glacier in the Red River Valley. Cavalier AFS is located within a region of sand and gravel deposits that were formed in nearshore and offshore environments of Lake Agassiz. Wave action was the dominant factor producing the landforms of this area. Sand and gravel were reworked in this near-shore area and were deposited as vast beaches. This area is gentle and rolling with a nearly flat to gently undulating surface (USAF, 2009a).

There are no major faults in northeastern North Dakota. The entire state is included within Seismic Zone 0 on the seismic probability map of the United States (USAF, 2000a). Zone 0 is an area where earthquakes do not occur, but major distant earthquakes could produce slight damage. There are no specific seismic design requirements for Zone 0 (USAF, 1992).

3.2.2 Soils

Soils on Cavalier AFS consist of three soil series – Brantford loam, Binford sandy loam, and Vang loam. These series are well drained and formed in sand, silt, and gravel (USDA, 1977, 2012). The Brantford loam occurs only along an unnamed intermittent tributary of Tongue River and the Vang loam occurs on the western portion of the Installation. The Brantford loam and Vang loam are not in the area potentially impacted by the Proposed Action. Soils in the proposed project area are Binford sandy loam with one to three percent slopes (see Table 6). The Binford soil consists of sandy loam to a depth of 12 inches and gravelly sand to a depth of 60 inches. This soil is underlain by sand and gravel. Permeability is moderately rapid to rapid. Runoff is very slow and the hazard of wind erosion is high. The Binford sandy loam is difficult to revegetate due to droughty conditions (USDA, 1977, 2012). Figure 4 shows the soils in the project area. None of the soils on Cavalier AFS are listed as hydric soils (a potential indicator of wetlands).

TABLE 6. CAVALIER AFS SOIL PROPERTIES

Soil Series	Wind Erosion	Shrink-Swell ¹	Excavation	Piping	Compaction
Binford	high	low	severe – cutbanks cave	susceptible	fair-good
¹ Shrink-swell is the change in volume in a soil when soil moisture changes markedly (the tendency to swell when wet and shrink when dry). Sources: USDA, 1977, 2012					

3.3 WATER RESOURCES

Water resources include surface and groundwater sources, quantity and quality, drainage conditions and subsurface movements. The hydrologic cycle results in the transport of water into various media such as the air, the ground surface, and subsurface. Natural and human-induced factors determine the quality of water resources.

3.3.1 Groundwater

Two types of aquifers provide groundwater in northeastern North Dakota—bedrock aquifers and glacial drift aquifers. There are three major aquifers located in the vicinity of Cavalier AFS. The Dakota Aquifer is the major bedrock aquifer while the Icelandic Aquifer is the largest glacial-drift aquifer. The Pembina Delta Aquifer is underlain by shale bedrock and by glacial till and thick deposits of lake clay and silt. Small aquifers within the Niobrara Formation and in Lake Agassiz beach deposits are also a source of groundwater.



LEGEND:

- Pond/Lake
- River/Stream
- Soil Map Unit

KEY TO SOIL MAP UNITS:

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>I161A: Vang loam, 0 to 2 percent slopes</p> <p>I242A: Ryan-Fargo silty clays, 0 to 1 percent slopes</p> <p>I318A: Borup silt loam, 0 to 1 percent slopes</p> <p>I360A: Hamar fine sandy loam, 0 to 1 percent slopes</p> <p>I370A: Rauville silty clay loam, 0 to 1 percent slopes, frequently flooded</p> | <p>I472A: Perella silty clay loam, 0 to 1 percent slopes</p> <p>I574A: Maddock loamy sand, 0 to 2 percent slopes</p> <p>I578A: Brantford loam, 0 to 2 percent slopes</p> <p>I578B: Brantford loam, 2 to 6 percent slopes, occasionally flooded</p> <p>I587A: Rolette clay loam, 0 to 3 percent slopes</p> | <p>I589B: Olga silty clay loam, 3 to 6 percent slopes</p> <p>I590F: Olga-Kloten complex, wooded, 9 to 35 percent slopes</p> <p>I595E: Coe-Binford complex, 6 to 25 percent slopes</p> <p>I659A: Binford sandy loam, 0 to 3 percent slopes</p> <p>I659B: Binford sandy loam, 3 to 6 percent slopes</p> <p>I661A: Colvin silt loam, very poorly drained, 0 to 1 percent slopes</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 4. Soil Properties in Project Area

The Dakota Aquifer underlies all of North Dakota, except parts of the Red River Valley. The western half of Pembina County is underlain by the Dakota Aquifer. This aquifer is located in the Dakota Group (shale and sandstone), generally from about 175 feet to 300 feet below the surface in western Pembina County, and is composed of quartzose, sandstone, and shale. The Dakota Aquifer is overlain and confined by the Greenhorn and Belle Fourche Formations (both composed of shale). Recharge of the Dakota Aquifer is to the west of the installation. Water from the Dakota Aquifer is generally not used because it is moderately saline, with greater than 5,000 milligrams per liter (mg/L) total dissolved solids (TDS), primarily sodium chloride and iron (USGS, 1977).

The Niobrara Aquifer yields small to moderately large quantities of water in large interconnected joints and fractures in shale. Well depths in this aquifer in the vicinity of Cavalier AFS range from 35 to 45 feet below the surface (NDSWC, 2010). Water quality is generally good, with TDS ranging from 390 to 2,500 mg/L, primarily sodium bicarbonate (USGS, 1977). Recharge is generally from overlying glacial drift aquifers.

The Carlile Formation is a potential source of limited amounts of water. The water is highly mineralized with poor water quality.

Two shallow glacial drift aquifers are near Cavalier AFS – the Icelandic Aquifer and the Pembina Delta Aquifer. The Icelandic Aquifer is more than 20 miles long, as much as 9 miles wide, and underlies about 82 square miles. The aquifer consists mostly of very fine to medium sand and gravel interbedded with silt and clay. The aquifer is unconfined at the top and underlain by clay but generally becomes finer grained with increasing depth from west to east. To the east of Cavalier AFS, the aquifer is saturated from 8 to 35 feet below the surface on average, and is approximately 15 to 30 feet thick. This aquifer has a maximum thickness of 70 feet. Recharge is mainly from precipitation that is received on the surface of the aquifer. Water from this aquifer is predominantly very hard (TDS is about 250 mg/L), fresh, and a calcium magnesium bicarbonate type that is acceptable for most domestic and public uses (USGS, 1977). The Icelandic Aquifer is about three miles east of Cavalier AFS and is a source of water for domestic use and irrigation.

Groundwater movement through the aquifer is generally from west to east. The Pembina Delta Aquifer is about 71 square miles in area and consists of clay, silt, sand, and gravel. To the north of Cavalier AFS, the aquifer is saturated from 4 to 31 feet below the surface on average, and is approximately 27 feet thick. Recharge to the Pembina Delta Aquifer is mainly from precipitation that is received in the immediate area; however, precipitation must percolate through several tens of feet of sediment before reaching the water table in much of the area. Groundwater in the Pembina Delta Aquifer is considered very hard (TDS is about 340 mg/L), with a high dissolved calcium and magnesium content. Iron in the groundwater often exceeds drinking water standards. The Pembina Delta Aquifer is tapped in the Cavalier region for livestock, irrigation, and some domestic use (USGS, 1977). This aquifer is about 1.5 miles north of Cavalier AFS. Groundwater movement through the aquifer is generally from west to east.

Lake Agassiz beach deposits, in long, narrow deposits of sand and gravel, are a source of water in limited areas. These aquifers are usually about 10 feet thick and water quality is generally good. Recharge is from precipitation. The town of Mountain, about 2.5 miles southeast of Cavalier AFS, obtains their municipal water supply from two wells drilled into this aquifer. The wells are about 23 feet deep.

A borehole log from a well drilled about one half mile west of Cavalier AFS indicated a water depth of 13 feet (USGS, 1973), in an unconfined lake deposit aquifer. A borehole near the site of the PARCS Building (Bldg 830) completed for a Geothermal Feasibility Study indicated a water depth of

7.6 feet (USAF, 1999b). This well was drilled into an unconfined aquifer in sand, overlain by silty sand and clayey sand.

Cavalier AFS purchases water from the North Valley Water Association. The water is derived from wells in the Icelandic Aquifer. Overall, water quality in the shallow glacial drift and beach deposit aquifers is good. The water supply is constantly monitored for various contaminants to meet all regulatory requirements of the USEPA and NDDH.

3.3.2 Surface Water

Northeastern North Dakota lies in the Central Lowlands physiographic region, which is primarily drained by the Red River of the North. This river drains 48,000 square miles of the United States, including 29,900 square miles of North Dakota. The Red River of the North forms in southeastern North Dakota, where the Otter Tail and Bois de Sioux Rivers combine. The primary tributaries near Cavalier AFS are the Pembina, Park, and Tongue Rivers.

The tributaries to the Red River of the North drain a large area. The Park River starts in Cavalier County and drains 1,010 square miles. Its waters are used for stock watering, municipal supply, recreation, and irrigation. The Pembina River starts in the Turtle Mountains and enters the Red River of the North at Pembina. It drains 1,960 miles in North Dakota and is used for stock watering, municipal supply, and recreation. The Tongue River is located about one-half mile north of Cavalier AFS and flows northeast, draining into the Pembina River. Although 59 percent of rivers in the Red River Basin fully supports aquatic life, the Tongue River only partially supports aquatic life. This is primarily due to siltation from soil erosion (NDDH, 2010). Runoff from much of Cavalier AFS flows south, off of the installation, into Willow Creek, a tributary of the Park River, which travels southeast from the Installation and empties into the Red River. Some runoff from the northern and western parts of the Installation drains into a small intermittent stream (about 4,000 feet northwest of the project area) which flows north into the Tongue River (USAF, 2000b). Figure 5 shows some of the major tributaries in the area.

The North Dakota Department of Health & Environmental Division of Water Quality is responsible for administering the state's National Pollution Discharge Elimination System (NPDES) storm water management program. North Dakota's storm water program is closely modeled after the federal NPDES program, which requires storm water be treated to the maximum extent practicable. At the state level, all construction sites disturbing more than one acre are required to obtain and meet the requirements of NPDES permit coverage.

3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. The natural communities are closely linked to the climate and topography of the area. There are no known state or federally threatened or endangered species on Cavalier AFS (USAF, 2009a). Biological resources discussed below include wildlife and vegetation.

3.4.1 Wildlife

The great blue heron (*Ardea herodias*), horned lark (*Eremophila alpestris*), and eastern mourning dove (*Zenaidura macroura*) are examples of bird species observed in past surveys at the Installation. Moose (*Alces alces*), deer mice (*Peromyscus maniculatus*), and the Richardson ground squirrel (*Spermophilus richardsonii*) are some of the mammals that have been observed.



Figure 5. Water Features

Most birds are protected by the Migratory Bird Treaty Act (MBTA). The MBTA provides protection of nearly all species of birds from harm by prohibiting the destruction of active nesting habitat. Several species of ground-nesting birds have been observed on Cavalier AFS. As described in the Conservation Management Plan, procedures are in place to mark and protect these nests from disturbance when the nests are active.

3.4.2 Vegetation

Of the 278 land acres at Cavalier AFS, 90 acres are semi-improved grounds that are maintained to prevent erosion and control dust. Maintenance activities include mowing, fertilization, weed control, and plant disease control. Improved grounds total 15 acres and are limited to lawns around the family and unaccompanied personnel housing facilities, and other facilities. Maintenance activities include periodic mowing, water and fertilization, run-off, erosion and dust control, weed control, plant disease control, and tree and shrub maintenance. Unimproved grounds total approximately 115 acres and include management of grassland and the prevention and suppression of fires. Maintenance includes control of excessive or damaging dust, erosion, and poisonous and noxious weeds. The remaining 58 acres are covered by facilities and pavements (USAF, 2009a).

Cavalier AFS is currently naturalized grassland that was cleared and seeded with non-native grasses during its construction. Prior to construction of Cavalier AFS the land was cropland. The Proposed Action site is undeveloped land, an open grassy area that is regularly mowed. Grass species currently at the Installation include June grass, quack grass, and some Kentucky bluegrass (USAF, 2009a). Tree species include aspen, burr oak, and other woody deciduous species.

The North Dakota Department of Agriculture, Noxious Weeds Division, develops and coordinates integrated weed management programs in the state. Weeds declared noxious are weeds that are difficult to control, easily spread, and are injurious to public health, crops, livestock, land, and other property (North Dakota Century Code, Chapter 63-01.1). Noxious weeds that have been identified at Cavalier AFS are Canada thistle, leafy spurge, musk thistle, false chamomile, and perennial sow thistle. The Installation actively manages noxious weeds on site. Weed management is conducted annually with primary emphasis during the spring and summer months.

3.5 CULTURAL RESOURCES

The National Historic Preservation Act (NHPA) of 1966 as amended (16 U.S.C. 470 et seq.) provides for the establishment of the National Register of Historic Places (NRHP) and authorized the establishment of criteria to determine the eligibility of cultural sites for listing on the NRHP. Section 106 of the NHPA requires Federal agencies to evaluate the effects of their activities and programs on potentially eligible cultural resources, which include architectural resources, archaeological resources, and Native American sites. Section 110 of the NHPA directs Federal agencies to undertake actions necessary to minimize harm to cultural resources under their ownership or control, or affected by their activities and programs. Compliance with 16 U.S.C. 470 et seq., NHPA; 36 CFR 800, Protection of Historic Properties; and AFI 32-7065, Cultural Resources Management, is coordinated at Cavalier AFS by the Cultural Resources Manager.

A Programmatic Agreement among Cavalier AFS, The Advisory Council on Historic Preservation and the North Dakota State Historic Preservation Officer (SHPO) regarding Installation Management Activities at Cavalier AFS was signed in 2009 (USAF, 2009c). The Programmatic Agreement lists the PAR Power Plant (Building 820), Utility Tunnel (Building 825), and the Perimeter Acquisition Radar Building (Building 830) as eligible for inclusion on the National Register of Historic Places. These two buildings

and one structure are eligible under Criterion A for their significance in the historical context of the Cold War and under Criteria Consideration G for exceptional significance for properties less than 50 years old. The PARCS Building (Building 830) is also eligible under Criterion C for its unique architecture. Historic American Engineering Record (HAER) documentation was completed and accepted for the three contributing buildings and this HAER documentation satisfies mitigation requirements for any undertaking related to the three historic buildings.

The Air Force conducted a cultural resources survey of Cavalier AFS in 1991 (USAF, 1999a). The survey did not identify any archaeological resources and concluded that disturbance from the construction of Cavalier AFS removed any possibility of finding historic or archaeological remains on the Installation.

The American Indian Religious Freedom Act, Public Law No. 95-341, 92 Stat. 469 (Aug. 11, 1978) (commonly abbreviated to AIRFA), codified at 42 U.S.C. Section 1996, is a federal law and a joint resolution of Congress that was passed in 1978. It was enacted to protect and preserve the traditional religious rights and cultural practices of American Indians. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use and possession of objects considered sacred. Five Native American groups may be associated with resources in North Dakota. They include the three affiliated tribes of the Mandan, Hidatsa, and Arikara; The Spirit Lake Tribe; The Trenton Indian Service Area; The Turtle Mountain Band of Chippewa Indians; and The Standing Rock Sioux Tribe.

3.6 POL MANAGEMENT

AFI 32-7044, Storage Tank Compliance, implements Air Force Policy Directive 32-70, Environmental Quality. The AFI identifies compliance requirements for underground storage tanks (UST), aboveground storage tanks (AST), and associated piping that store petroleum products. USTs are subject to regulation under RCRA, 42 U.S.C. 6901, and 40 CFR 280. A Storage Tank Compliance Plan was developed for the Installation to assist in implementing a program to manage and plan for activities associated with USTs and ASTs.

Guidance on the construction and operation of petroleum storage tanks are governed by UFC 3-460-01, Design: Petroleum Fuels Facilities, UFC 3-460-03, Operation and Maintenance: Maintenance of Petroleum Systems, and DoD standard design AW 78-24-27, Standard Fueling Systems; Aboveground Vertical Fuel Tanks with Floating Pan and Fixed Roofs, and from other sources including some of the national codes and standards.

USTs are regulated in the State of North Dakota under the North Dakota Administrative Code Article 33-24 according to the North Dakota Century Code Chapter 23-20.3 (Hazardous Waste Management Act) and North Dakota Administrative Code Chapter 33-24-08 (Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks) by the NDDH, Division of Waste Management. These regulations apply to USTs with petroleum or hazardous substances.

Bulk petroleum storage at Cavalier AFS includes diesel, gasoline, and engine lubrication oil. These products are stored in ASTs and USTs at the Installation. Bulk fuel storage areas include Buildings 840, 841, and 730 (Industrial Building/Motor Pool) and the vehicle fueling station east of Building 731. The Spill Prevention, Control, and Countermeasures (SPCC) Plan address the management, spill containment, and cleanup of bulk fuel spills at Cavalier AFS.

The SPCC regulations (40 CFR Part 112) specify certain operational criteria that should be met regarding facility transfer operations (piping or pipelines). These would apply to the loading and unloading areas associated with the two petroleum, oil, and lubricants facilities and possibly other areas on the Installa-

tion. All piping for ASTs at Cavalier AFS is aboveground. The Installation conducts weekly and monthly inspections of aboveground piping systems. Installation personnel also observe valves, pipes and pipe supports at the beginning of each shift and throughout the day. Aboveground piping at the Installation is protected against damage from vehicular traffic by three methods. Piping is within secondary containment areas and protected by concrete berms, in below-grade vaults, and behind dispensing pumps in areas too small for access by vehicular traffic.

Associated piping for both USTs to the diesel power generators is underground and constructed of cathodically protected, asphalt-coated steel. The Installation uses the Veeder-Root Leak Detection system as a method of leak detection and automatic inventory control for USTs and piping. A monthly inventory of piping is required using the Veeder-Root System. Line tightness testing is conducted every three years with a certified testing firm and records are maintained in the Environmental Administrator's office.

Corrosion control of the tanks and associated piping is addressed in AFI 32-1054, *Corrosion Control*. This instruction provides responsibilities and general requirements for the corrosion control program at the Installation. It applies to personnel involved in design, construction, acquisition, operations, and maintenance of real property assets and installed equipment at installations and facilities. It implements USEPA, Department of Transportation, and OSHA regulations, and guidelines pertaining to corrosion control activities.

SECTION 4
ENVIRONMENTAL CONSEQUENCES

This page intentionally left blank.

4.0 ENVIRONMENTAL CONSEQUENCES

This Section discusses the potential for significant impacts to the human environment as a result of implementing the Proposed Action or the Alternatives. As defined in 40 CFR 1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and analyzing their potential significance. This Section discusses the effects that the Proposed Action or the Alternatives could generate in the environmental resource areas previously described in Section 3.

The concept of “significance” used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR 1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), and the resilience of the resource. Significant impacts are effects that are most substantial and should receive the greatest attention in decision making. Impacts that are not significant result in little or no effect to the existing environment and cannot be easily detected. If a resource would not be affected by a proposed activity, a finding of no impact was declared. If a resource would be measurably improved by a proposed activity, a beneficial impact was noted.

This Section is organized by resource element in the same order as introduced in Section 3. Each resource section provides a discussion of the environmental impacts to that resource. Best management practices are included, if applicable. No mitigation measures were identified for any of the resource areas. The Section concludes with an evaluation of the relationships between short-term uses of the environment and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

4.1 AIR RESOURCES

The Proposed Action would have short-term adverse impacts on air quality generated by heavy equipment and earth-moving activities during the construction of the fuel farm and upgrade of the PARCS. Impacts to air quality would not be significant. Operational emissions would reduce total operating emissions under both the Proposed Action and Alternative Action due to the use of new stand-by generators. The No Action Alternative would continue to impact air quality at current levels at Cavalier AFS.

The analysis was based on a review of existing air quality in the region, information on Cavalier AFS air emission sources, Title V permit, projections of emissions from the proposed construction and operation of the fuel farm, a review of Federal regulations, and the use of air emission factors from the USEPA or similar sources.

4.1.1 Potential Impacts of the Proposed Action

Impacts for the construction and operational phases are discussed separately in the following sections.

Facility Construction

There would be increased emissions from the use of equipment and worker vehicles during construction of the fuel farm while the upgrade of the PARCS would not significantly contribute to the emissions. Construction equipment and worker vehicles would generate the most emissions, with CO, NO_x, and VOCs as the main constituents of exhaust, and earth-moving operations would generate fugitive dust (measured as PM₁₀). While the entire project would last approximately 18 months, the estimated site grading would last approximately two months. Air quality is considered good in the North Dakota Air

Quality Control Region, being in attainment for all criteria pollutants. The existing meteorological conditions would disperse pollutants generated by the Proposed Action and no air quality standards would be violated. Impacts to air quality would not be significant.

The construction activities would have an unavoidable short-term impact on air quality. Exhaust emissions from construction equipment and personal vehicles would be generated, and fugitive dust would be generated during the construction. These emissions would not be significant, given the short duration of time for site grading, the limited types and quantity of equipment to be used, and the limited area (approximately 2.28 acres) to be disturbed. Best management practices to reduce fugitive dust emissions, such as daily watering of the disturbed ground and replacing ground cover in disturbed areas as quickly as possible, should be implemented to the maximum extent possible to reduce the amount of these emissions, in accordance with NDDH requirements to minimize fugitive dust emissions.

Facility Operation

Facility operations would include replacement of five existing 3,000 kW generators. Overall emissions from current generators (see Table 5) would be reduced from existing levels with generator replacement. Source emissions from operation of four USEPA compliant 2,500 kW permanent emergency stand-by diesel generators that would provide intermittent power supply in the event of power outages are shown in Table 7 and Table 8. Table 7 shows a worst case scenario of a full load of 30 days (720 hours). Table 8 estimates the potential to emit in accordance with USEPA regulations (40 CFR 63.6640(f)(3)) where facilities may operate their emergency engines for the purpose of maintenance checks and readiness testing for 100 hours per year.

TABLE 7. SUMMARY OF ESTIMATED AIR EMISSIONS FROM OPERATION (720 HOURS)

Emergency Generators								
Generator Size		Hours of Operation	Potential to Emit Calculations* tons/yr					
kW	hp	hr/yr	PM ₁₀	SO ₂	NO _x	VOC	CO	PM _{2.5}
2500	3350	720	0.8442	9.75654	28.944	0.85023	6.633	0.59094
TOTAL (4 @ 2,500 kW):			3.3768	39.02616	115.776	3.40092	26.532	2.36376

*Emission factors are from USEPA AP 42, 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines 10/96.

TABLE 8. SUMMARY OF ESTIMATED AIR EMISSIONS FROM OPERATION (100 HOURS)

Emergency Generators								
Generator Size		Hours of Operation*	Potential to Emit Calculations** tons/yr					
kW	hp	hr/yr	PM ₁₀	SO ₂	NO _x	VOC	CO	PM _{2.5}
2500	3350	100	0.16415	1.897105	5.628	0.16532	1.28975	0.11491
TOTAL (4 @ 2,500 kW):			0.6566	7.58842	22.512	0.66129	5.159	0.45962

* Emergency generator hours of operation per 40 CFR 63.6640(f)(3)
 **Emission factors are from USEPA AP 42, 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines 10/96.

The diesel fuel storage, transfer and throughput annual VOC emissions are negligible although the tanks are considered significant sources due to the tank capacity.

Annual emissions diesel storage tank and dispensing are estimated at:

$$\frac{(0.028 \text{ lb VOC/Mgal})(360 \text{ Mgal})}{2,000 \text{ lbs/ton}} = .00504 \text{ ton VOC/year}$$

The fuel farm construction and operation of seven 60,000-gallon fuel storage tanks would be required to meet the Standard of Performance for New Stationary Sources, as defined in 40 CFR 60.110b (Subpart Kb). Construction of these tanks would also require permits to construct (PTC) from NDDH, as specified in NDAC 33-15-14. Upon PTC issuance a modification to the existing Title V Permit (T5-O89001) would become necessary.

4.1.2 Potential Impacts of the Alternatives

There would be similar impacts associated with construction under this alternative.

Facility operations would also be similar but with additional source emissions from construction of five USEPA compliant 2,000 kW permanent emergency stand-by diesel generators that would provide intermittent power supply in the event of power outages. Table 9 shows a worst case scenario of a full load of 30 days (720 hours). Table 10 estimates the potential to emit in accordance with USEPA regulations (40 CFR 63.6640(f)(3)) where facilities may operate their emergency engines for the purpose of maintenance checks and readiness testing for 100 hours per year.

TABLE 9. SUMMARY OF ESTIMATED AIR EMISSIONS FROM OPERATION

Generator Size		Hours of Operation	Potential to Emit Calculations* tons/yr					
kW	hp	hr/yr	PM ₁₀	SO ₂	NO _x	VOC	CO	PM _{2.5}
2000	2680	720	0.67536	7.805232	23.1552	0.680184	5.3064	0.472752
TOTAL (5 @ 2,000 kW):			3.3768	39.02616	115.776	3.40092	26.532	2.36376

*Emission factors are from USEPA AP 42, 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines 10/96 (USEPA, 1996)

TABLE 10. SUMMARY OF ESTIMATED AIR EMISSIONS FROM OPERATION

Generator Size		Hours of Operation*	Potential to Emit Calculations** tons/yr					
kW	hp	hr/yr	PM ₁₀	SO ₂	NO _x	VOC	CO	PM _{2.5}
2000	2680	100	0.938	1.08406	3.216	0.09447	0.737	0.06566
TOTAL (5 @ 2,000 kW):			4.69	5.4203	16.08	0.47235	3.685	0.3283

*Emissions based on worst case scenario, 30 days uninterrupted operation
 **Emission factors are from USEPA AP 42, 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines 10/96 (USEPA, 1996)

Five stand-by generators and seven 60,000 gallon tanks require a PTC for planned significant sources per NDAC 33-15-14. Upon PTC issuance a modification to the existing Title V permit (T5-O89001) would be necessary.

4.1.3 Potential Impacts of the No Action Alternative

The No Action Alternative would not change existing air quality at Cavalier AFS.

4.2 GEOLOGICAL RESOURCES

The geological resources within the proposed project area were studied to determine the potential impacts from implementing the Proposed Action or the Alternatives. Geological studies, a soil survey, previous EAs, and USGS topographical maps were reviewed to characterize the existing environment. Construction activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. For example, soil would be disturbed during construction. The predicted post-construction environment was compared to the existing environment and the change was evaluated to determine if significant changes in any existing conditions would occur.

4.2.1 Potential Impacts of the Proposed Action

Site grading and excavation for the Fuel Farm would impact the underlying geological layers to an estimated depth of about eight feet in an area of approximately 30,057 square feet. The footing would be deep enough to avoid frost problems. The tanks and piping would be above grade. As the Fuel Farm is excavated for the footings, soil would be temporarily stockpiled around the excavation. The soils in this area are sandy loam to a depth of five feet, underlain by gravely sand to a depth of five feet. The Binford soil is highly erodible by wind.

Construction of the security fence would not impact the geology or topography of the Installation but would have minor impacts on soils. Impacts to geological resources would not occur because the soil depths exceed the drilling depth along the entire perimeter of the fence boundary. Soils would be disturbed from boring, grading, and compaction by equipment during construction activities but would not be significant. The soil removed from the holes would be used for grading around the installed posts and along the length of the fence if necessary.

There are no major faults in the vicinity of Cavalier AFS; therefore, impacts to seismicity would not be significant. Impacts to topography would not be significant. During the construction process, excavations would likely reach to a depth of eight feet. The site would be regraded after the Fuel Farm is constructed. This would not significantly affect the topography or drainage of the area.

Best management practices (such as daily watering as needed to control fugitive dust, properly installed site fences, maintaining existing vegetation as much as possible, and revegetating the project area as soon as possible) would be implemented to reduce the risk of erosion.

Given the small construction area and the use of best management practices impacts to geology, topography and soils would not be significant.

4.2.2 Potential Impacts of the Alternative Action

Impacts for the Alternative Action would be similar to those under the Proposed Action; however, a larger area would be impacted. Approximately 2.28 acres of soils would be impacted for construction of the

power plant, fuel farm, tunnel and fencing. With the use of best management practices, impacts to soils would not be significant.

4.2.3 Potential Impacts of the No Action Alternative

No impacts would occur to geological resources from the No Action Alternative.

4.3 WATER RESOURCES

To establish the potential impact of the Proposed Action documents on the hydrology and hydrogeology of the area were reviewed. Maps showing topography, watersheds, and Installation drainage were examined. The review focused on the proximity of the project area and construction activities to surface waters.

4.3.1 Potential Impacts of the Proposed Action

Groundwater

Potential impacts to groundwater could result by spills of diesel fuel or lubricants from construction equipment. The amount of any potential spill would be small and the extent that a spill could potentially travel would be limited by areas of silt and clay deposits, and by shale bedrock at a depth of about 13 feet. Groundwater movement is predominately to the east. A spill is unlikely to occur, but any potential spill would be diluted and filtered by silt and clay sediments to the east of Cavalier AFS. Any spills would be the responsibility of the construction contractor. Clean up would be in compliance with the SPCC Plan. The closest registered domestic and public water supply wells are about three miles north, east, and southeast from Cavalier AFS and would not be impacted by the Proposed Action. The Icelandic Aquifer, an important source of municipal, domestic, and agricultural water, would not be impacted by the Proposed Action due to its distance from Cavalier AFS (about three miles) and the silt and clay deposits between the aquifer and the Installation. Likewise, the Pembina Delta Aquifer (primarily a source of irrigation water) would not be impacted due to distance and the flow of the Tongue River toward the northeast about 0.5 miles north of Cavalier AFS. It is unlikely the Niobrara Aquifer would be impacted by potential spills during construction or long-term operation of the fuel farm. Potential spills would not be significant due to filtering by sandy and silty sediments and dispersion through groundwater. The fuel tank farm would be a slab on grade with concrete walls that extend to the tops of the fuel tanks. The concrete structure would be designed to act as the secondary containment for the fuel storage. There are no registered wells in the Niobrara Aquifer within four miles of Cavalier AFS. The Dakota Aquifer, at a depth of 175 to 300 feet, would not be impacted due to nearly impermeable shale between the Niobrara Formation and the Dakota Group.

Small amounts of water would be used during construction for wetting disturbed areas and for mixing concrete, but these impacts would not be significant. There would be no long-term increase in personnel or water use associated with the Proposed Action, and long-term impacts to the aquifers would not be significant.

Surface Water

Construction activities could potentially impact local surface water. The construction could potentially increase turbidity of nearby surface water due to increased airborne dust and siltation from soil erosion. An intermittent stream, which flows to the Tongue River, heads about 4,000 feet northwest of the project site. Any sediment entering this stream could impact the Tongue River. The use of standard best management practices would reduce the potential for erosion and sedimentation. Practices to reduce potential erosion include silt traps, chemical stabilizers, and watering of disturbed soil when dry to minimize dust.

Since the project would disturb less than one acre a NPDES permit would not be required. Impacts to surface waters would not be significant.

4.3.2 Potential Impacts of the Alternative Action

Impacts to groundwater and surface water from the Alternative Action would be similar to those under the Proposed Action. Since the project would disturb more than one acre a NPDES permit would be required.

4.3.3 Potential Impacts of the No Action Alternative

No impacts would occur to water resources from the No Action Alternative.

4.4 BIOLOGICAL RESOURCES

The assessment of potential impacts to biological resources focused on the proposed location for the Fuel Farm. The existing habitat was evaluated. Documents reviewed included the Cavalier AFS Conservation Management Plan (USAF, 2009a) and past environmental documents and assessments.

4.4.1 Potential Impacts of the Proposed Action

Less than one acre of vegetation (currently a grassy area maintained by mowing) would be disturbed to construct the Fuel Farm and perimeter security fence. The loss of vegetation and temporary displacement of any wildlife during construction activities would be an unavoidable impact, but not significant. Vegetation would be reestablished after the construction is complete.

Excavation of soils and vegetative cover in order to construct the Fuel Farm and security fence would not require the disruption of important habitat or previously undisturbed land. Once the construction is complete, the open area around the Fuel Farm would be landscaped with native vegetation. Other maintained grasses disturbed during digging and grading of the site would be replaced after construction activities are completed. The proposed site for the Fuel Farm is in a grassy area that is not considered critical habitat.

Best management practices and control measures would be implemented to ensure that impacts to biological resources are kept to a minimum. The amount of vegetation disturbed during construction activities would be kept to the minimum amount required. Disturbed areas would be reestablished with native grasses. Additional measures proposed to minimize impacts could include using straw bales, silt fences, silt traps, or diversion structures and covering stockpiles during grading activities to contain waterborne erosion and reduce or prevent sediment from reaching storm sewers or ditches.

The Installation would continue to spray the area for noxious weeds annually and on an as needed basis. As long as noxious weeds are controlled, they would not have an impact on the project area.

Wildlife such as mice and ground squirrels would be displaced as part of the action. Impacts to these species are not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. Once the construction is complete, the contractor would be required to revegetate the open areas. The wildlife species previously displaced would readily return to the area. No long-term impacts to wildlife would occur. Procedures are in place to protect nesting birds, no significant impacts are expected.

Excavation, grading, and associated construction for the Fuel Farm and security fence would occur on previously disturbed land within the built-up portion of the Installation. This area does not include optimal habitat for any of the transient Federal- or state-listed species that may occur in Cavalier County. No

threatened or endangered species are known to occur on Cavalier AFS, so no impacts to these species would occur.

4.4.2 Potential Impacts of the Alternative Action

Impacts from the Alternative Action would be the same as those under the Proposed Action.

4.4.3 Potential Impacts of the No Action Alternative

Under the No Action Alternative, there would be no change to the biological environment at Cavalier AFS.

4.5 CULTURAL RESOURCES

To determine potential impacts, the analysis focused on the types of construction activities that would occur and their location, and the significance of the resource in that location. The Integrated Cultural Resources Management Plan (USAF, 2008), The Conservation Management Plan (USAF, 2009a) and the Programmatic Agreement (USAF, 2009c) were reviewed to provide data on existing cultural resources on the Installation.

4.5.1 Potential Impacts of the Proposed Action

The proposed upgrades would be done within the existing footprint of the PAR and Power Plant with the exception of the Fuel Farm. No known cultural resources have been identified in the area proposed for construction of the Fuel Farm. This area has been previously disturbed due to past Installation operations; therefore, digging at this location is not anticipated to unearth any cultural resources.

The Installation has coordinated with the tribes and tribal organizations shown in Section 5.

The three structures eligible for the NRHP would not be significantly impacted by the Proposed Action. In accordance with the Programmatic Agreement, routine installation maintenance activities associated with infrastructure and building repair and rehabilitation may proceed without Section 106 consultation. The Cultural Resources Manager shall insure that all routine maintenance and changes to the buildings or their settings are completed as required per the Integrated Cultural Resource Management Plan (ICRMP).

Should unknown archaeological resources be uncovered during construction activities, the Air Force would follow procedures described in the Integrated Cultural Resources Management Plan for Cavalier AFS (USAF, 2008) and in AFI 32-7065, Cultural Resource Management, for coordination with the North Dakota State Historic Preservation Officer and Advisory Council on Historic Preservation.

4.5.2 Potential Impacts of the Alternative Action

Impacts from the Alternative Action would be similar to those of the Proposed Action.

4.5.3 Potential Impacts of the No Action Alternative

For the No Action Alternative, current conditions would not change and no impacts to cultural resources would occur.

4.6 POL MANAGEMENT

To assess potential impacts, the analysis focused on issues relating to POL management. Sources of information included the Requirements Document, Final Environmental Baseline Survey (EBS) for Privatization of the Military Family Housing, the SPCC Plan, and state and Federal laws and regulations.

4.6.1 Potential Impacts of the Proposed Action

Some of the causes for storage tank releases are holes from corrosion, failure of piping systems, and spills and overfills, as well as equipment failure and human operational error. Potential impacts of storage tank releases are contamination of soil and drinking water supplies. The tanks at the Fuel Farm would be above ground tanks with secondary containment and have the necessary security protection. The Fuel Farm would be managed in accordance with all federal, state, local, Air Force regulations and requirements that govern USTs and ASTs and the SPCC Plan that address the management, spill containment, and cleanup of bulk fuel spills at the Installation. Standard tank filling practices would be followed when filling tanks to prevent spills and overfills.

All ASTs would have a secondary containment area that contains spills and allows leaks to be more easily detected. The containment area surrounding the tank would hold 110 percent of the contents of the largest tank. All tanks would be routinely monitored to ensure they are not leaking. Inspections would occur and include tank foundations, connections, coatings, tank walls, and the piping system. Integrity testing would be done periodically by a qualified professional and in accordance with applicable standards. The SPCC plan provides contingency plans identifying key personnel, responsibilities, and facility-specific procedures to follow in the event of a hazardous substance spill. Impacts from construction and operation of the storage tanks would not be significant.

4.6.2 Potential Impacts of the Alternative Action

Impacts from the Alternative Action would be similar to those under the Proposed Action.

4.6.3 Potential Impacts of the No Action Alternative

There would be no impacts from the No Action Alternative.

4.7 SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The definitions of short-term and long-term are based on the scope of the Proposed Action. Short-term use of the environment, as it relates to the Proposed Action would encompass the construction period. Long-term productivity would occur after the construction has ended. During construction soil would be excavated and there would be associated dust emissions. Excavation and construction would have no significant effect and impacts would be minimized through best management practices. The fuel farm and fence would have a long useful life and therefore, high long-term productivity.

4.8 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments which would result from the Proposed Action in combination with past, present, and reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant. Most of the future planned projects at Cava-

lier AFS are small in scope and would likely occur during different timeframes. Any future federal actions that may have potentially significant cumulative impacts to the environment would be assessed in separate NEPA documents.

Air Quality: It is possible that future construction projects could overlap with construction of the Fuel Farm and additional short-term cumulative air quality impacts could occur if other construction were taking place outside of the Installation boundaries. Other ongoing or scheduled activities would also generate criteria air pollutants (primarily PM₁₀), but the amounts would not be cumulatively significant with the addition of pollutants from the proposed Fuel Farm. For these reasons, there would be no significant cumulative air quality impacts.

Geology and Soils: Soils at the site are susceptible to short-term wind and water erosion; therefore cumulative construction-related impacts would result in some soil loss. No long-term cumulative impacts to geology and soils would be expected from construction or operation of the Fuel Farm.

Water Resources: Existing activities in combination with proposed construction projects would not expect to create any significant cumulative impacts to groundwater or surface water.

Biological Resources: Removal of vegetation from past, ongoing, and future projects at the Installation would not result in significant cumulative impacts to wildlife since terrestrial and aquatic habitat at the Installation is very limited. Due to the abundance of similar and better quality habitat in the surrounding area little cumulative impact to wildlife is expected from loss of vegetation.

Cultural Resources: Past archaeological surveys on the Installation have not identified any archaeological resources. Present and future activities are proposed for the main built-up portion of the Installation where the probability of finding new archaeological resources is low; therefore, additional cumulative impacts to cultural resources would not be significant.

POL: Existing POL activities in combination with the proposed tank installation would not expect to create any significant cumulative impacts to the storage tank program.

4.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The irreversible and irretrievable commitment of resources would most likely involve the commitment of concrete, energy, fuel, labor, fencing and building materials. The irretrievable resources to be committed are typical for the scale of the proposed project. Implementation of best construction management practices, standard equipment maintenance schedules, and use of energy conservation and recycling measures during construction would minimize the use of irretrievable resources. None of these materials are considered rare and the long-term commitment of these resources would have no substantial effect on their future availability.

This page intentionally left blank.

SECTION 5
CONSULTATION AND COORDINATION

This page intentionally left blank.

5.0 CONSULTATION AND COORDINATION

The Cavalier AFS Commander initiated consultation with Native American tribes. The following tribes and tribal organizations were consulted:

- Cheyenne and Arapaho Tribes of Oklahoma
- Cheyenne River Sioux Tribe
- The Crow Tribe of Indians
- Fort Peck Assiniboine Sioux Tribe
- Leech Lake Chippewa Tribe
- Northern Cheyenne Tribe
- Sisseton-Wahpeton Oyate
- Spirit Lake Sioux Tribe
- Standing Rock Sioux Tribe
- Three Affiliated Tribes of Mandan, Hidatsa & Arikara
- Turtle Mountain Band of Chippewa Indians
- White Earth Band of Minnesota Chippewa
- Yankton Sioux Tribe

The North Dakota Department of Health and State Historic Preservation Office were also sent a copy of the Draft Final EA for review and comment.

Ms. Susan Quinnell
Review and Compliance Coordinator
State Historical Society of North Dakota
North Dakota Heritage Center
612 East Boulevard Avenue
Bismarck, ND 58505-0830

Mr. Dave Glatt
North Dakota Department of Health
Environmental Health Section
918 East Divide Avenue
Bismarck, ND 58501-1947

Public notices were published in three newspapers as follows:

- Grand Forks Herald on April 28, 2013
- Cavalier County Republican on April 29, 2013
- Cavalier Chronicle on May 1, 2013

A copy of the Draft Final EA was made available on the internet at <ftp://ftp.pbainc.com/public> and placed in the following library:

Cavalier Public Library
106a W 2nd Ave South
Cavalier, ND 58220
(701) 265-4746

The public comment period ended June 6, 2013. One comment letter was received from the Leech lake Band of Ojibwe (see Appendix C).

SECTION 6
REFERENCES

This page intentionally left blank.

6.0 REFERENCES

NDDH — *see* North Dakota Department of Health

NDSWC — *see* North Dakota State Water Commission

North Dakota Department of Health, 2012a. Environmental Health Section. Air Pollution Control Title V Permit to Operate, Renewal No. 3 dated January 23, 2012. Permit Number T5-O89001, expires January 22, 2017.

_____, 2012b. Personal communication with Lewis H. Dendy, Environmental Scientist, Division of Air Quality. December 2012.

_____, 2012c. Storm Water Permit Requirements.
2012 <http://www.ndhealth.gov/WQ/Storm/Construction/ConstructionHome.htm>

_____, 2011. Annual Report North Dakota Air Quality Monitoring Survey for Calendar year 2010. November.

_____, 2010. Division of Water Quality. North Dakota Water Quality Assessment, 2010 Section 305b Report to Congress.

North Dakota State Water Commission, 2010. Ground and Surface Water Data, Site Inventory Retrieval System. <http://www.swc.state.nd.us>

USAF — *see* U.S. Air Force

U.S. Air Force, 2012a. AF Form 813, Upgrade of Perimeter Acquisition Radar Characterization System (PARCS), Cavalier Air Force Station, ND. June 20.

_____, 2012b. Requirements Document. Cavalier Air Force Station Power Plant.

_____, 2010 Air Emissions Inventory, Cavalier Air Force Station, North Dakota, Booz Allen Hamilton, Inc. 2010

_____, 2009a. Conservation Management Plan for Cavalier Air Station, Cavalier, North Dakota. April.

_____, 2009b. Environmental Baseline Survey. Supporting the Privatization of Military Family Housing at Cavalier Air Force Station, North Dakota. October.

_____, 2009c. Programmatic Agreement Among Cavalier Air Force Station, The Advisory Council on Historic Preservation, and The North Dakota State Historic Preservation Officer Regarding Installation Management Activities at Cavalier Air Force Station, North Dakota. August.

_____, 2008. Integrated Cultural Resources Management Plan for Cavalier Air Force Station, North Dakota. December.

_____, 2000a. Analysis of Existing Facilities at Cavalier Air Force Station, North Dakota. July.

_____, 2000b. Environmental Protection Plan, Part Ten, Storm Water Pollution Prevention Plan, Cavalier Air Force Station, North Dakota. March.

_____, 1999a. Comprehensive Planning Framework, Cavalier Air Station, North Dakota. October.

_____, 1999b. Final Report, Geothermal Feasibility Study for Cavalier Air Station. June.

_____, 1992. Seismic Design for Buildings, Air Force Manual 88-3. October.

USDA — *see* U.S. Department of Agriculture

U.S. Department of Agriculture, 2012. Natural Resources Conservation Service. Web Soil Survey.
www.websoilsurvey.nrcs.usda.gov

_____, 1977. Soil Survey of Pembina County, North Dakota. July.

USEPA— *see* United States Environmental Protection Agency

USEPA, 1996. Emission Factors from AP 42, 3.3 Gasoline and Diesel Industrial Engines & 3.4 Large Stationary Diesel and All Stationary Dual-Fuel Engines. October.

USGS — *see* U.S. Geological Survey.

U.S. Geological Survey, 2000. *Geologic Hazards, Western States Faults*
<http://ghmaps01.cr.usgs.gov/wsfaults.html#Map>

_____, 1977. Ground Water Resources of Cavalier and Pembina Counties, North Dakota, County Ground Water Studies 20 — Part III.

_____, 1975. Geology of Cavalier and Pembina Counties, County Groundwater Studies 20 — Part I.

_____, 1973. Ground Water Basic Data of Cavalier and Pembina Counties, North Dakota, County Ground Water Studies 20 — Part II.

_____, 1964. Concrete Quadrangle, North Dakota. 7.5 Minute Series (Topographic Map).

SECTION 7
LIST OF PREPARERS

This page intentionally left blank.

7.0 LIST OF PREPARERS

This Environmental Assessment has been prepared for the U.S. Air Force Space Command with contractual assistance from PB&A, Inc. The following personnel were involved in the preparation and review of this EA:

Mary Ellen Richards, PB&A, Inc.
B.S. 1988, Civil Engineer
Years of Experience: 20+

Sheri A. Rivera, PB&A, Inc.
B.S., 1989, Geography,
M.S., 1995, Urban Studies
Years of Experience: 20+

Teresa Stephens, PB&A, Inc.
B.A., 1994, Geography
ERSI® Authorized ArcView GIS® Instructor
Years of Experience: 18

Lynn Tunland, PB&A, Inc.
B.S. Chemical Engineering
Years of Experience: 20+

Andy Weinberg, PB&A, Inc.
B.A. 1982, Geology
M.A. 1987, Geochemistry
Years of Experience: 20+

Air Force Reviewers

Dave Anderson, 21st Environmental Site Support
21 CES/CEIE
Peterson Air Force Base, Colorado

Dawn Hamrick, Contractor USAF AFSPC 10 SWS/EV
Cavalier Air Force Station, North Dakota

This page intentionally left blank.

APPENDIX A

AF FORM 813

This page intentionally left blank.

Appendix A – AF Form 813

This appendix includes a copy of the AF Form 813 for the project.

This page intentionally left blank.

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol
RCS: 35--

INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as Necessary. Reference appropriate item numbers.

SECTION I - PROPONENT INFORMATION

1. TO (Environmental Planning Function) 10 SWS Environmental Function, Cavalier AFS, ND 58220	2. FROM (Proponent organization and functional address symbol) HQ AFSPC/A3SN	2a. TELEPHONE NO. 554-5145
---------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------	--------------------------------------

3. TITLE OF PROPOSED ACTION
Upgrade of Perimeter Acquisition Radar Characterization System (PARCS), Cavalier AFS, ND

4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date)
Upgrade the PARCS radar action to extend functional life of the existing backup power generators. The need date for the completed project is 30 Sep 2015. (See continuation page)

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total section.)
The Proposed Action is to upgrade the aging site infrastructure related to mission power. This includes replacing the mission backup power fuel that was previously removed. It also includes the installation of a new uninterruptible power supply (UPS) to continue mission operations between a primary power outage and bringing the backup generators online. (See continuation page)

6. PROPONENT APPROVAL (Name and Grade) Michael T. Farrell, GS-14, DAFC	6a. SIGNATURE 	15 Jun 2012
----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------	-------------

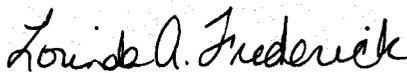
SECTION II PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; O = no effect; - = adverse effect; U = unknown effect)

	+	O	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential encroachment, etc.)				
8. AIR QUALITY (Emission, attainment status, state implementation plan, etc.)				
9. WATER RESOURCES (Quality, quantity, source, etc.)				
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, etc.)				
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)				
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, flora, fauna, etc.)				
13. CULTURAL RESOURCES (Native American burial sites, archeological, historical, etc.)				
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, installation Restoration Program, seismicity, etc.)				
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)				
16. OTHER (Potential impacts not addressed above.)				

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) _____; OR
 PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX, FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED

18. REMARKS
Air Conformity Statement:
 Cavalier AFS, ND, is located in an Area that is in attainment, therefore, a conformity determination is not required.
 Proposed Action component 5 does not qualify for a CATEX. Further Environmental Analysis is required.
 @H 6-19-12

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	19a. SIGNATURE 	19b. DATE 20 JUN 12
--------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------	------------------------

Comments on AF 813

Block 5 - Description of Proposed Action (continued):

The Proposed Action is required to ensure continued support of NSPD-28, DoDD S-5210.81, MIL-STD-188-125-1, CJCSI 6210.02, CJCSI 5991.01A, CJCSI 3222.01, CJCSI 6810.01, CJCSI 6811.01A and USSTRATCOM Instruction 501-2.

Block 5 - Description of Proposed Action (continued):

The major components of this Proposed Action are to:

- (1) Refurbish backup power controls to improve survivability,
- (2) Replace aging power switchgear,
- (3) Install mission system UPS,
- (4) Upgrade mission system infrastructure to ensure it will operate with UPS power,
- (5) Replace previous backup power fuel that was removed without replacement, and
- (6) Installation of commercial power disconnect switches.

Proposed Action component 1 is the refurbishment of the HEMP protection for the electronic control system of the emergency backup generators and supporting infrastructure in the backup power facility to ensure the controls will survive a HEMP event.

Proposed Action component 2 is the replacement of the 40-year old power switchgear with modern, safer switchgear. The current switchgear switches between commercial and generator power. The new switchgear must be capable of switching between commercial, backup and the new UPS power sources.

Proposed Action component 3 is the installation of a new mission UPS system capable of continuing the mission between the loss of commercial power and bringing the backup generators online. This solution may require several smaller UPS at critical locations inside the mission facility. This would require taking those individually UPS'd system and moving them from Critical to Non-Critical power at the switchgear.

Proposed Action component 4 is the upgrade of the PARCS mission system infrastructure to ensure it will operate with the installed maximum capacity of the mission UPS. The largest feasible UPS will not carry the full mission load as it is currently configured. The current configuration has some infrastructure that must be modified in order to remove it from critical UPS power. This will specifically include the upgrade of the water cooling pumps to allow them to be off of critical power. It will also include modifying the mission system to turn off in an over-temperature situation rather than the current "loss of cooling water pressure" configuration.

Proposed Action component 5 is the installation of replacement backup power fuel storage that was removed for environmental compliance but was never replaced. The site has a requirement for 360 gallons of petroleum diesel with a maintenance tank of equal size as the primary tanks (e.g., for an example of using 60,000 gallon tanks: 360,000 gallons requires 12 each 60,000 gallon tanks; so the requirement would be 13 tanks – 12 for storage plus 1 (N+1) for maintenance and polishing).

The tanks should be above ground tanks with secondary containment and have necessary security protection.

Proposed Action component 6 is the installation of commercial power disconnect switches to isolate the mission system from HEMP effects conducted by the commercial long-line power grid. This installation operates on 13.8KVAC. Systems operating at 480VAC or less can be fully protected with HEMP Main Power Filters. Systems at 4160VAC can receive effective but not completely compliant HEMP protection with filters. At voltages greater than 4160VAC it is imperative that the system be capable of being isolated from commercial power with a HEMP compliant commercial power isolation switch.

This page intentionally left blank.

APPENDIX B
NOTICE OF AVAILABILITY

This page intentionally left blank.

APPENDIX B – Notice of Availability

This appendix includes a copy of the Notices of Availability that were published in the Grand Forks Herald on April 28, 2013; Cavalier County Republican on April 29, 2013 and Cavalier Chronicle on May 1, 2013

This page intentionally left blank.

Client:
PB&A INC
Account # 296234 Ad # 1686094
Phone: (402) 960-3775
Fax:
Address: 3306 COMSTOCK AVE
BELLEVUE, NE 68123
Sales Rep.:
0108 Kristoffer Adamson
Phone: (888) 857-1920
Fax:
Email: kadamson@classifiedsfcc.com
Class.: 0020 PUBLIC NOTICE

Requested By:

Start Date: 04/28/2013
End Date: 04/28/2013
Nb. of Inserts: 1
Dimensions: 2 col. x 43.00 7 PT LINES
Publications: Grand Forks Herald

Total Price: \$227.74
Paid Amount: \$227.74 AMERICAN EXPRESS
Balance: \$0.00

Page 1 of 1

**NOTICE OF AVAILABILITY
DRAFT FINAL ENVIRONMENTAL
ASSESSMENT (EA)
UPGRADE POWER PLANT AND
CONSTRUCT FUEL FARM
CAVALIER AIR FORCE STATION,
NORTH DAKOTA**

An EA has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality implementing NEPA to analyze the potential environmental consequences of upgrading the Power Plant and constructing a Fuel Farm at Cavalier AFS. The EA analyzes potential impacts from upgrading the power plant and constructing the fuel farm to air quality, geological resources, water resources, biological resources, cultural resources, and petroleum, oils and lubricants. The EA dated April 2013 is available for review at the library listed below and on the web at <ftp://ftp.pbainc.com/public>.

Cavalier Public Library
106a W 2nd Ave South
Cavalier, ND 58220
(701) 265-4746

Public comments on the EA will be accepted through May 30, 2013. Written comments and inquiries on the EA should be directed to Ms. Dawn Hamrick, 10 SWS/EV, 830 Patrol Road #260, Cavalier AFS, ND 58220 or email: dawn.hamrick.ctr@cavalier.af.mil.

AFFIDAVIT NO.....

AFFIDAVIT OF PUBLICATION

STATE OF NORTH DAKOTA,
COUNTY OF CASS

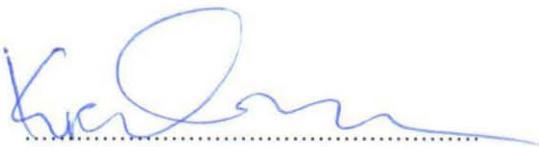
Kris Adamson.....of said
County and state, being first duly sworn,
on oath says: That *THE FORUM* is a daily
newspaper of general circulation printed
and published in the City of Fargo, in said
County and State by FORUM
COMMUNICATIONS COMPANY, and
that *THE FORUM* is the duly elected,
qualified and acting official newspaper in
and for Cass County according to the
provisions of the statute covering official
newspapers, and that I am the clerk of the
publisher of *THE FORUM*, and during all
of such time covering the publication of
this notice have occupied such position on
said newspaper, and have personal
knowledge of all the facts stated in this af-
fidavit; and that the advertisement headed
PUBLIC NOTICE.....a printed copy of
which is hereunto attached, was printed
and published in said newspaper
1 (one).... times to wit:

04-28-13

PUBLICATION FEES

2x43.....lines
.....1.....times.....\$227.74

Total.....\$227.74

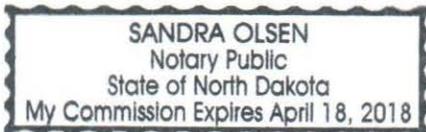


Subscribed and sworn to before me this
29th day of April 2013



Notary Public, Cass Co., N.D.
My commission expires 4-18-18

Received payment for
FORUM PUBLISHING COMPANY
.....



Affidavit of Publication

STATE OF NORTH DAKOTA, }
County of Cavalier } ss.

Michelle Bredeson, being first duly sworn, says that she is a typesetter of that certain newspaper known as Cavalier County Republican, that said newspaper is a paper of general circulation, is printed and published weekly at Langdon, North Dakota, in said county of Cavalier, and is qualified to do legal printing; that the printed copy of

**NOTICE
PB & A INC.**

to which this affidavit is annexed was printed and published in each copy of every issue of said paper for and during the period of ONE successive weeks, the time when publication of such notice was made being as follows, to-wit:

- First Publication _____ April 29, 2013 (.60 per line)
- Second Publication _____ 2013 (.60 per line)
- Third Publication _____ 2013 (.60 per line)
- Fourth Publication _____ 2013 (.60 per line)
- Fifth Publication _____ 2013 (.60 per line)
- Sixth Publication _____ 2013 (.60 per line)

COPY
ON
BACK
SIDE

Michelle Bredeson

Subscribed and sworn to before me this 29th day of April, 2013

Lori Peterson
Notary Public for Cavalier County, N.D.

Publication fee \$ 23.40

My commission expires APRIL 15, 2014.

LORI PETERSON
Notary Public, State of North Dakota
My Commission Expires April 15, 2014

Notice

**NOTICE OF AVAILABILITY
DRAFT FINAL
ENVIRONMENTAL
ASSESSMENT (EA)
UPGRADE POWER PLANT AND
CONSTRUCT FUEL FARM
CAVALIER AIR FORCE
STATION, NORTH DAKOTA**

An EA has been prepared in accordance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality implementing NEPA to analyze the potential environmental consequences of upgrading the Power Plant and constructing a Fuel Farm at Cavalier AFS. The EA analyzes potential impacts from upgrading the power plant and constructing the fuel farm to air quality, geological resources, water resources, bio-

logical resources, cultural resources, and petroleum, oils and lubricants. The EA dated April 2013 is available for review at the library listed below and on the web at <ftp://ftp.pbainc.com/public>.

Cavalier Public Library
106a W 2nd Ave South
Cavalier, ND 58220
(701) 265-4746

Public comments on the EA will be accepted through May 30, 2013. Written comments and inquiries on the EA should be directed to Ms. Dawn Hamrick, 10 SWS/EV, 830 Patrol Road #260, Cavalier AFS, ND 58220 or email: dawn.hamrick.ctr@cavalier.af.mil.

A29

This page intentionally left blank.

APPENDIX C
AGENCY CORRESPONDENCE

This page intentionally left blank.

APPENDIX C – Agency Letters

Scoping letters were sent to tribes and agencies soliciting their concerns regarding the Proposed Action and Alternatives. This appendix includes a copy of the response letter received from the Leech lake Band of Ojibwe.

This page intentionally left blank.



LEECH LAKE BAND OF OJIBWE

Carri Jones, Chairwoman

Donald Finn, Secretary-Treasurer

Robbie Howe, District I Representative

Steve White, District II Representative

LeRoy Staples Fairbanks III, District III Representative

May 8, 2013

Lieutenant Colonel Lorinda A. Frederick
Commander, 10th Space Warning Squadron
830 Patrol Road, P. O. Box 260
Cavalier AFS, ND 58220

RE: **Proposed Power Plant Upgrade and Construction of a Fuel Farm**
Cavalier AFS, Pembina County, North Dakota
LLTHPO No. 13-103-NCRI

Dear Lt. Colonel Frederick:

Thank you for the opportunity to comment on the above-referenced project. It has been reviewed pursuant to the responsibilities given the Tribal Historic Preservation Officer (THPO) by the National Historic Preservation Act of 1966, as amended in 1992 and the Procedures of the Advisory Council on Historic Preservation (38CFR800).

I have reviewed the documentation; after careful consideration of our records, I have determined that the Leech Lake Band of Ojibwe does not have any known recorded sites of religious or cultural importance in these areas.

Should any human remains or suspected human remains be encountered, all work shall cease and the following personnel should be notified immediately in this order: County Sheriff's Office and Office of the State Archaeologist. If any human remains or culturally affiliated objects are inadvertently discovered this will prompt the process to which the Band will become informed.

Please note: The above determination does not "exempt" future projects from Section 106 review. In the event of any other tribe notifying us of concerns for a specific project, we may re-enter into the consultation process.

You may contact me at (218) 335-2940 if you have questions regarding our review of these projects. Please refer to the LL-THPO Number as stated above in all correspondence with this project.

Respectfully submitted,

Gina M. Lemon
Tribal Historic Preservation Officer

This page intentionally left blank.