ENVIRONMENTAL ASSESSMENT OF UPGRADES TO THE PERIMETER ROAD AT DOVER AIR FORCE BASE, DELAWARE

APRIL 2004

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
APR 2004		**00-00-2004 to 00-00-2004**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Environmental Assessment of Upgrades to the Perimeter Road at Dover Air Force Base, Delaware	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) **436th Civil Engineer Squadron ,Environmental Flight,600 Chevron Ave,Dover AFB,DE,19902**	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	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**96**	

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 436TH AIRLIFT WING (AMC)

MEMORANDUM FOR 436 CES/CEV

FROM: 436 MSG/CD

SUBJECT: Finding of No Significant Impact (FONSI) - Upgrades to the Perimeter Road Dover Air Force Base, Delaware

1. The 436th Airlift Wing of the United States Air Force has proposed to accomplish upgrades to the perimeter road at Dover Air Force Base, Delaware. Dover AFB proposes to widen and repave the perimeter road. The Proposed Action, Alternative Action, and the No Action Alternative were assessed in an Environmental Assessment. Dover AFB is a USAF base under the Air Mobility Command and is headquarters to the 436 AW. The 436 AW provides support for Dover AFB including financial, personnel, housing, maintenance, legal, recreational, medical, fire protection, base security and chaplain services.

2. The perimeter road at Dover AFB is the only vehicular route around the North and Northeast portion of the base. The existing road is extremely deteriorated and is a single lane in some places. The proposed repair/construction is needed to improve operations and safety at Dover AFB.

3. This project entails repairing the perimeter road by widening the road to ensure a lane in both directions and repaving the entire surface. Under the Proposed Action, the perimeter road would be widened to a width of 22 feet for a total length of 8.5 miles. A total of 128,700 sq ft of road pavement would be constructed and a total of 869,660 square feet of roadway would be repaved. Work includes demolition of any existing asphalt, reconstruction of a sub-base, application of a new wearing surface, and other associated work. Construction is expected to begin in Calendar Year 2004. The Proposed Construction is a phased project dependent on funding.

4. This Alternative entails widening the single lane sections of the road to two lanes and constructing a road surface in the area where the road is not paved. A total of 55,000 sq ft of road pavement would be constructed and a total of 44,000 sq ft of roadway would be repaved.

5. Under the No Action Alternative, the perimeter road would not be widened or repaired. Sections of the perimeter road would continue to be a single lane. The perimeter road would continue to deteriorate and remain unsafe. There would be no change from the existing conditions at the installation. This alternative would not address the safety requirements of AMC and Dover AFB.

6. Analysis of the Proposed Action and Alternative Action indicates that the affected environment would not be significantly impacted by proceeding with the proposed construction activities.

7. Based on the provisions set forth in the Proposed Action, all activities were found to comply with the criteria or standards of environmental quality and coordinated with the appropriate Federal,

state, and local agencies. The EA and FONSI was made available to the public from 11 April through 24 April 2004. No comments were received.

8. After review of the EA prepared in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and Environmental Impact Analysis Process, 32 Code of Federal Regulations Part 989, as amended, I have determined that the Proposed Action would not have a significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement does not need to be prepared. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that would meet project requirements and are within the legal authority of the USAF.

ROBERT J. KING, Colonel, USAF
Deputy Commander, 436th Mission Support Group

Attachments:
1. AF Form 813
2. Environmental Assessment

Abbreviations and Acronyms

°F	Degrees Fahrenheit
436 AW	436th Airlift Wing
436 CES/CEV	436th Civil Engineering Squadron, Environmental Flight
ACM	Asbestos Containing Material
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AFM	Air Force Manual
AMC	Air Mobility Command
AQCR	Air Quality Control Region
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CRM	Cultural Resources Manager
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
CY	Calendar Year
DERP	Defense Environmental Restoration Program
DNHI	Delaware Natural Heritage Inventory
DNREC	Delaware Department of Natural Resources and Environmental Control
DOD	Department of Defense
DSWA	Delaware Solid Waste Authority
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FFA	Federal Facilities Agreement
FONSI	Finding of No Significant Impact
HAP	Hazardous Air Pollutant
IAP	Initial Accumulation Point
kV	kilovolts
LBP	Lead Based Paint
MFH	Military Family Housing
mg/m^3	milligrams per cubic meter
MSL	mean sea level
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide(s)
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
P.L.	Public Law
Pb	Lead
PM_{10}	Particulate Matter ≤ 10 microns in diameter
$PM_{2.5}$	Particulate Matter ≤ 2.5 microns in diameter
POL	Petroleum, Oil, and Lubricants
PSD	Prevention of Significant Deterioration
QD	safe-quantity distance
RAPCON	RADAR Approach Control
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendment and Reauthorization Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
sq ft	square feet
SO_2	Sulfur Dioxide
SR	State Route
tpy	tons per year
TSP	Total Suspended Particulate
USC	United States Code
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compound
$\mu g/m^3$	micrograms per cubic meter

COVER SHEET

ENVIRONMENTAL ASSESSMENT OF UPGRADES TO THE PERIMETER ROAD AT DOVER AIR FORCE BASE, DELAWARE

Responsible Agencies: U.S. Air Force (USAF), Air Mobility Command (AMC), and 436th Airlift Wing (436 AW), Dover Air Force Base (AFB), Delaware (DE).

Affected Location: Dover AFB, Kent County, Delaware

Report Designation: Environmental Assessment (EA)

Proposed Action: Upgrades to the perimeter road are being proposed by 436 AW to support the efficiency and safety of Dover AFB missions.

This EA has been prepared to evaluate the Proposed Action, the Alternative Action, and the No Action Alternative. Resources that are considered in the impact analysis are: air quality, safety, geological resources, water resources, biological resources, cultural resources, infrastructure, and hazardous materials and wastes. The EA will be made available to the public upon completion.

Written comments and inquiries regarding this document should be directed to: Mr. Steve Seip, 436 CES/CEV, 600 Chevron Avenue, Dover AFB, DE 19902-5600.

PRIVACY ADVISORY

Your comments on this EA are requested. Letters or other written comments provided may be published in the EA. Comments will normally be addressed in the EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed; personal home addresses and phone numbers will not be published in the EA.

ENVIRONMENTAL ASSESSMENT OF UPGRADES TO THE PERIMETER ROAD AT DOVER AIR FORCE BASE, DELAWARE

436th Airlift Wing
436th Civil Engineering Squadron/Environmental Flight
600 Chevron Avenue
Dover Air Force Base, Delaware 19902-5600

APRIL 2004

ENVIRONMENTAL ASSESSMENT OF UPGRADES TO THE PERIMETER ROAD FOR DOVER AIR FORCE BASE, DELAWARE

TABLE OF CONTENTS

APPENDICES

FIGURES

FIGURE

TABLES

TABLE

THIS PAGE INTENTIONALLY LEFT BLANK

1. Purpose of and Need for the Proposed Action

1.1 Background

Dover Air Force Base (AFB) is a U.S. Air Force (USAF) Base under the Air Mobility Command (AMC). The 436th Airlift Wing (436 AW) is the active duty wing and senior military organization at Dover AFB. The 436 AW provides command and staff supervision, along with support functions, for assigned airlift aircraft providing worldwide movement of outsized cargo and personnel on scheduled, special assignment, exercise, and contingency airlift missions. The 436 AW consists of the operations, logistics, support, and medical groups, in addition to 12 divisions and two detachments. Dover AFB employs a total of over 8,000 military, civilian, and reserve personnel.

The 436 AW is proposing to widen and repair the perimeter road. These upgrades would support the efficiency and safety of Dover AFB missions.

This Environmental Assessment (EA) analyzes 436 AW's Proposed Action, an Alternative Action, and the No Action Alternative. If the analyses presented in this EA indicates that implementation of the Proposed Action would not result in significant environmental impacts, a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents why a Proposed Action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) is unnecessary. If significant environmental issues result that cannot be mitigated to insignificance, an EIS will be required, or the Proposed Action would be abandoned and no action would be taken.

Based on the analysis in the EA, the USAF, as the decision-maker, will decide whether there are significant adverse environmental impacts associated with the upgrades to the perimeter road. Based on the review of the analysis, the USAF will either prepare a FONSI or recommend the analysis proceed to an EIS.

1.2 Purpose of the Proposed Action

The purpose of the Proposed Action is to widen and repair the perimeter road to support the efficiency and safety of missions at Dover AFB, Delaware. The perimeter road is the only vehicular route around the North and Northeast portion of Dover AFB.

1.3 Need for the Proposed Action

The perimeter road at Dover AFB is extremely deteriorated and is a single lane at some places. The proposed repair/construction is needed to improve operations and safety at Dover AFB. The

implementation of the Proposed Action would allow vehicles to access the North and Northeast portion of Dover AFB safely.

1.4 Location

Dover AFB is located partially within the corporate limits of the City of Dover and unincorporated areas of Kent County, Delaware (see Figure 1-1). The Base occupies approximately 3,300 acres with an additional 595 acres under grants or easement and another 11 acres that are managed under lease agreements. Principal routes that define the Base boundary include South Little Creek Road, State Route (SR)-9, and U.S. Route 113/SR-1 (DAFB 2001).

Dover AFB has two active airfields. The north-south airfield at Dover AFB divides the main Base into two primary sections. Open space, recreational areas, and limited amounts of industrial uses are located east of the airfield. The land uses west of the airfield and east of U.S. Route 113 are industrial, airfield operations, administrative, community, medical, and some unaccompanied personnel housing. Eagle Heights Military Family House (MFH), temporary lodging quarters, a golf course, and additional unaccompanied personnel housing are located west of U.S. Route 113 and east of St. Jones River. Eagle Meadows MFH (approximately 76 acres) is located 3.5 miles west of the main gate (west of the St. Jones River) along SR-26 and SR-362 near the town of Lebanon (DAFB 2001).

1.5 Summary of Key Environmental Compliance Requirements

1.5.1 National Environmental Policy Act

The National Environmental Policy Act, commonly known as NEPA, is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that is charged with the development of implementing regulations and ensuring agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that may affect the environment. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

The process for implementing NEPA is codified in Title 40 Code of Federal Regulations (CFR) Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental*

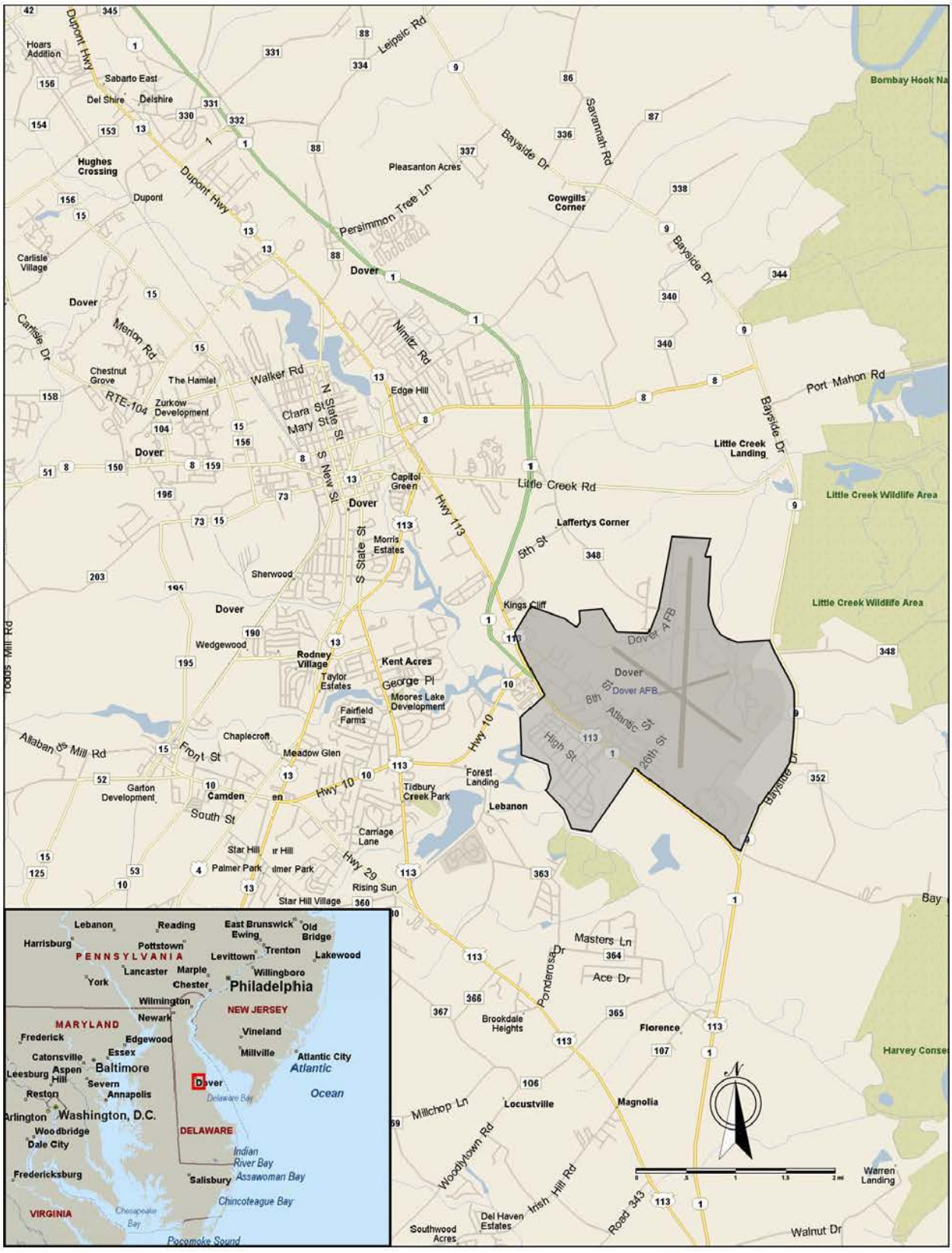

Figure 1-1. Dover AFB and Surrounding Area

Policy Act. The CEQ was established under NEPA to implement and oversee Federal policy in this process. CEQ regulations specify the following must be accomplished when preparing an EA:

- Briefly provide evidence and analysis for determining whether to prepare an EIS or a FONSI
- Aid in an agency's compliance with NEPA when an EIS is unnecessary
- Facilitate preparation of an EIS when one is necessary

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is *The Environmental Impact Analysis Process (EIAP)*, 32 CFR Part 989, as amended.

1.5.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decision-making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decision-maker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

The EA examines potential effects of the Proposed Action and alternatives on eight resource areas including air quality, safety, geological resources, water resources, biological resources, cultural resources, infrastructure, and hazardous materials and wastes. Three resource areas that have been omitted from analysis include noise, land use, and socioeconomics and environmental justice. The basis for the omissions is described in section 3.0. The following paragraphs present examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis.

Noise

Federal Aviation Administration (FAA) Part 150, *Airport Noise Compatibility Planning,* provides guidance to measure noise at airports and surrounding areas and determine exposure of individuals to noise that result from the operations of an airport. FAA Part 150 identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. It also provides technical

assistance to airport operators, in conjunction with other local, state, and Federal authorities, to prepare and execute appropriate noise compatibility planning and implementation programs (14 CFR 150).

Air Quality

The Clean Air Act (CAA) establishes Federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. The CAA requires that adequate steps be implemented to control the release of air pollutants and prevent significant deterioration in air quality. The 1990 amendments to the CAA require Federal agencies to determine the conformity of proposed actions with respect to State Implementation Plans (SIPs) for attainment of air quality goals.

Safety

Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFPD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program (AFI 91-202), these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

Water Resources

The Clean Water Act (CWA) of 1977 (33 United States Code [USC] 1344) and the Water Quality Act of 1987 (33 USC 1251, et seq., as amended) establish Federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters, and where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water.

Executive Order (EO) *11988, Floodplain Management*, requires Federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains. Where information is unavailable, agencies are encouraged to delineate the extent of floodplains at their site.

Biological Resources

The Endangered Species Act (ESA) requires Federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed threatened or endangered species, or

destroying or adversely affecting their critical habitat. Federal agencies must evaluate the effects of their actions through a set of defined procedures, which can include preparation of a Biological Assessment and formal consultation with the U.S. Fish and Wildlife Service (USFWS).

EO 11990, Protection of Wetlands, requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

The CWA, under Section 404, contains provisions for protection of wetlands and establishes a permitting process for activities having potential effects in wetland areas. Wetlands, riverine, and open water systems are considered waters of the United States and, as such, fall under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE).

Cultural Resources

The National Historic Preservation Act of 1966 (NHPA) provides the principal authority used to protect historic properties, establishes the National Register of Historic Places (NRHP), and defines, in Section 106, the requirements for Federal agencies to consider the effect of an action on properties on or eligible for the NRHP.

Protection of Historic and Cultural Properties (36 CFR 800 [1986]) provides an explicit set of procedures for Federal agencies to meet their obligations under the NHPA, including inventorying of resources and consultation with State Historic Preservation Office (SHPO).

The Archeological Resources Protection Act of 1979 ensures that Federal agencies protect and preserve archeological resources on Federal or Native American lands and establishes a permitting system to allow legitimate scientific study of such resources.

EO 13007, Indian Sacred Sites, requires that, to the extent practicable, Federal agencies accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

EO 13084, Consultation and Coordination with Indian Tribal Governments, requires that each Federal agency shall have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies or matters that uniquely affect their communities.

Socioeconomics and Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to assess the effects of their actions on minority and low-income populations within their region of influence. Agencies are encouraged to include demographic information related to race and income in their analysis of the environmental and economic effects associated with their actions.

Infrastructure

Infrastructure consists of the systems and physical structures that enable a population in a given area to sustain itself. Consideration of infrastructure is applicable to a proposed action or alternative where there may be an issue with respect to local capacities (e.g., utilities, transportation networks, energy) to provide the required support.

1.5.3 Public Review

NEPA requirements help ensure that environmental information is made available to the public during the decision-making process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process. An advertisement was published in the *Delaware State News* on April 11, 2004, announcing the availability of this EA and Draft FONSI (see Appendix A). Dover AFB will accept comments on this Proposed Action until throughout the EA process.

THIS PAGE INTENTIONALLY LEFT BLANK

2. Description of Proposed Action and Alternatives

2.1 Introduction

This section describes the Proposed Action and the No Action Alternative.

2.2 Proposed Action

The Proposed Action entails repairing the perimeter road by widening the road to two lanes to ensure a lane in both directions and repaving the entire surface. Under the Proposed Action, the perimeter road would be widened to a width of 22 feet for a total length of 8.5 miles. A total of 128,700 square feet (sq ft) of road pavement would be constructed and a total of 869,660 sq ft of roadway would be repaved. The locations of the proposed upgrades on perimeter road are presented in Figure 2-1. The estimated lengths, widths, and areas of roadway that would be constructed or repaved are presented in Table 2-1. Work includes demolition of any existing asphalt, reconstruction of a sub-base, application of a new wearing surface, and other associated work. Construction is expected to begin in calendar year (CY) 2004. The Proposed Action would be a phased project that would be dependent on funding.

Table 2-1. Proposed Upgrades to the Perimeter Road at Dover AFB (Proposed Action)

Location	Widened			Repaved		
	Length (ft)	Width (ft)	Area (sq ft)	Length (ft)	Width (ft)	Area (sq ft)
Runway 32 Approach End	5,000	5	25,000	5,000	17	85,000
Munitions Storage Area	3,000	3	9,000	3,000	19	57,000
Hazard Cargo Area	500	22	11,000	0	0	0
Explosive Ordnance Detonation (EOD) Area	4,000	11	44,000	4,000	11	44,000
Runway 19 Approach End	1,500	5	75,000	1,500	5	25,500
North Perimeter Road	9,200	3.5	32,200	9,200	3.5	170,200
South Gate Parking Lot to Skeet Range	0	0	0	38,850	22	854,700
Additional	0	0	0	22,180	22	487,960
Total			**128,700**			**1,724,360**

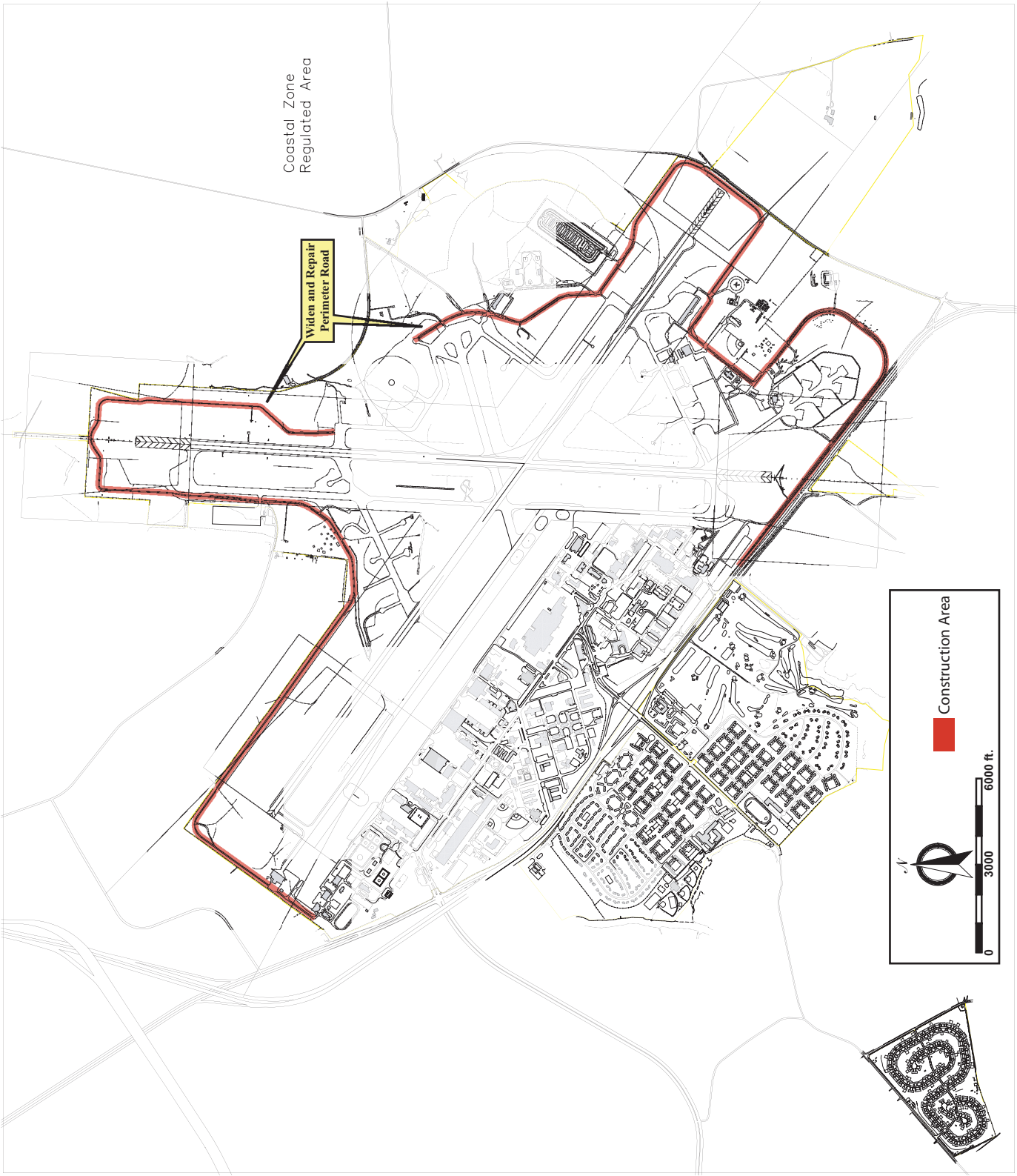

Figure 2-1. Proposed Action - Location of Upgrades to Perimeter Road

2.3 Alternative Action

This Alternative entails widening only the single lane sections of the road to two lanes in the Hazard Cargo and EOD areas, constructing a road surface in the area where the road is not paved, and repaving the road from the South Gate to Skeet Range. A total of 55,000 sq ft of road pavement would be constructed and a total of 44,000 sq ft of roadway would be repaved. The location of the proposed upgrades under this alternative is presented in Figure 2-2. The estimated lengths, widths, and areas of roadway that would be constructed or repaved are presented in Table 2-2. Work includes demolition of any existing asphalt, reconstruction of a sub-base, application of a new wearing surface, and other associated work. Construction is expected begin in CY 2004. The Proposed Action would be a phased project that would be dependent on funding.

2.4 No Action Alternative

Under the No Action Alternative, the perimeter road would not be widened or repaired. Sections of the perimeter road would continue to be a single lane. The perimeter road would continue to deteriorate and remain unsafe. There would be no change from the existing conditions at the Base. This alternative would not address the safety requirements of USAF, AMC, and Dover AFB.

Table 2-2. Proposed Upgrades to the Perimeter Road at Dover AFB (Alternative Action)

Location	Widened			Repaved		
	Length (ft)	Width (ft)	Area (sq ft)	Length (ft)	Width (ft)	Area (sq ft)
Runway 32 Approach End	0	0	0	0	0	0
Munitions Storage Area	0	0	0	0	0	0
Hazard Cargo Area	500	22	11,000	0	0	0
Explosive Ordnance Detonation (EOD) Area	4,000	11	44,000	4,000	11	44,000
Runway 19 Approach End	0	0	0	0	0	0
North Perimeter Road	0	0	0	0	0	0
South Gate Parking Lot to Skeet Range	0	0	0	38,850	22	854,700
Additional	0	0	0	0	0	0
Total			**55,000**			**898,700**

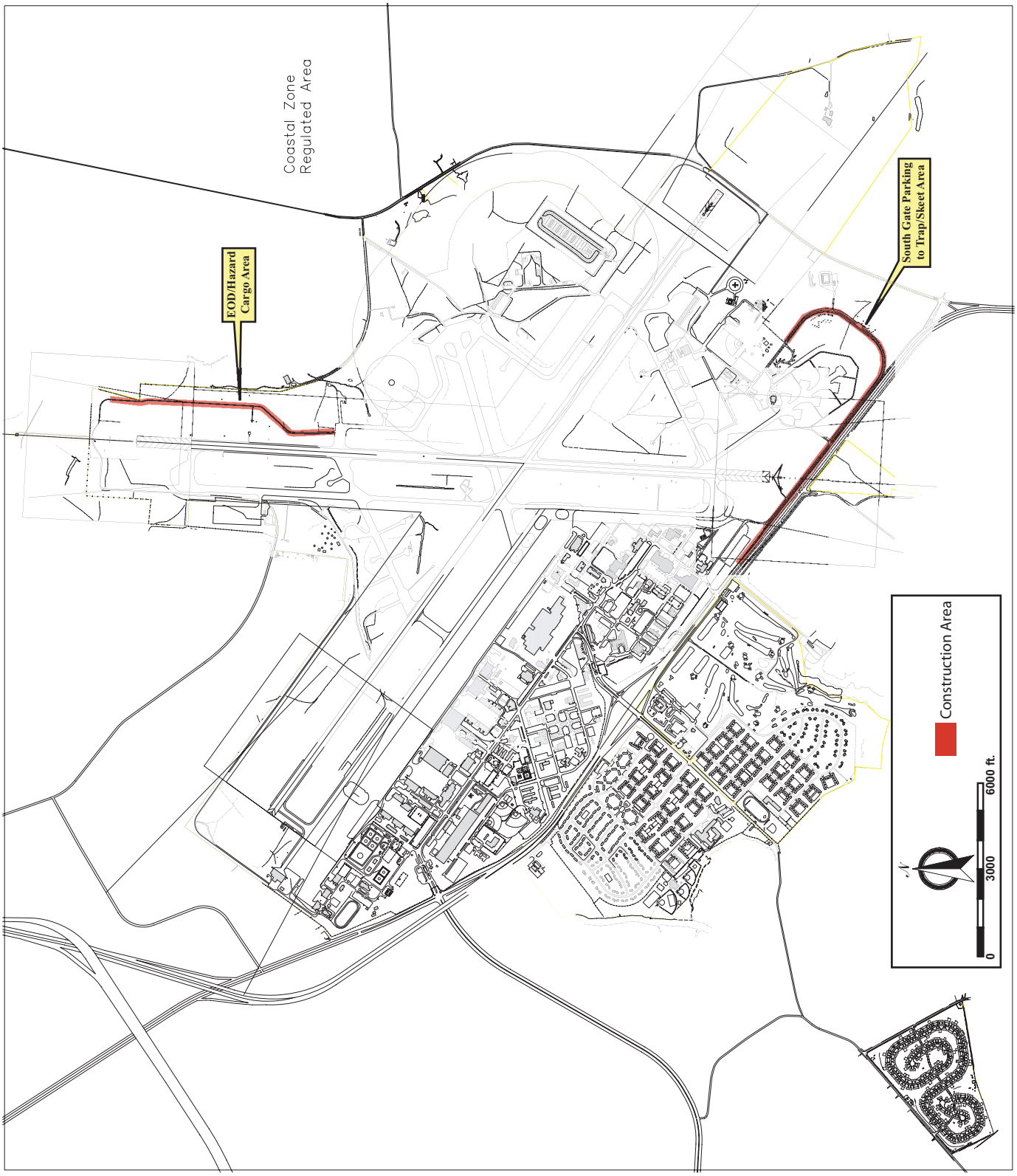

Figure 2-2. Alternative Action - Location of Upgrades to Perimeter Road

3. Affected Environment

Section 3.0 describes the environmental and socioeconomic resources and conditions most likely to be affected by the construction activities associated with the Proposed Action. This section provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action and Alternative Action. Baseline conditions represent current conditions. The potential environmental and socioeconomic impacts of the Proposed Action, the Alternative Action, and No Action Alternative on the baseline conditions are described in Section 4.0.

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, as amended, the description of the affected environment focuses on those resources and conditions potentially subject to impacts. Some environmental resources and conditions that are often analyzed in an EA have been omitted from this analysis. The following details the basis for such exclusions:

- ***Noise.*** Implementation of the Proposed Action or the Alternative Action would not involve permanent alterations to aircraft inventories, operations, or missions. No new permanent ground-based heavy equipment operations would be included in the Proposed Action or the Alternative Action. No activity included in the Proposed Action or the Alternative Action would result in a situation where residences would be impacted by an increase in present ambient noise levels. Furthermore, noise produced by construction activities associated with the Proposed Action or the Alternative Action would be temporary and would not significantly affect sensitive receptors. Accordingly, the USAF has omitted detailed examination of noise.
- ***Land Use.*** All activities associated with the Proposed Action or the Alternative Action would be consistent with present and foreseeable land use patterns at Dover AFB. Implementation of the Proposed Action or the Alternative Action would not alter the existing land use at Dover AFB. Accordingly, the USAF has omitted detailed examination of land use.
- ***Socioeconomics and Environmental Justice.*** The Proposed Action or the Alternative Action would not involve any activities that would contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Dover AFB, therefore there would be no changes in area population or associated changes in demand for housing and services. Accordingly, the USAF has omitted detailed examination of socioeconomics. There would be no environmental justice concerns associated with the Proposed Action or the Alternative Action. Accordingly, the USAF has omitted a detailed examination of environmental justice.

3.1 Air Quality

3.1.1 Definition of Resource

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the U.S. Environmental Protection

Agency (USEPA) for "criteria pollutants," including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns in diameter (PM_{10}), particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). NAAQS represent maximum levels of background pollution in the ambient air that are considered safe, with an adequate margin of safety to protect public health and welfare (see Table 3-1).

Table 3-1. National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
Carbon Monoxide (CO)			
8-hour Average	9 ppm	(10 mg/m^3) [2]	Primary & Secondary
1-hour Average	35 ppm	(40 mg/m^3) [2]	Primary
Nitrogen Dioxide (NO_2)			
Annual Arithmetic Mean	0.053 ppm	(100 $\mu g/m^3$) [2]	Primary & Secondary
Ozone (O_3)			
1-hour Average[1]	0.12 ppm	(235 $\mu g/m^3$) [2]	Primary & Secondary
8-hour Average[1]	0.08 ppm	(157 $\mu g/m^3$) [2]	Primary & Secondary
Lead (Pb)			
Quarterly Average		1.5 $\mu g/m^3$	Primary & Secondary
Particulate < 10 micrometers (PM_{10})			
Annual Arithmetic Mean		50 $\mu g/m^3$	Primary & Secondary
24-hour Average		150 $\mu g/m^3$	Primary & Secondary
Particulate < 2.5 micrometers ($PM_{2.5}$)			
Annual Arithmetic Mean		15 $\mu g/m^3$	Primary & Secondary
24-hour Average		65 $\mu g/m^3$	Primary & Secondary
Sulfur Dioxide (SO_2)			
Annual Arithmetic Mean	0.03 ppm	(80 $\mu g/m^3$) [2]	Primary
24-hour Average	0.14 ppm	(365 $\mu g/m^3$) [2]	Primary

Notes:

[1]In July 1997, the 8-hour O_3 standard was promulgated and the 1-hour O_3 standard was remanded for all areas, except areas that were designated nonattainment with the 1-hour standard when the O_3 8-hour standard was adopted. In July 2000, the O_3 1-hour standard was reinstated as a result of the Federal lawsuits that were preventing the implementation of the new 8-hour O_3 standard. USEPA estimates that the revised 8-hour O_3 standard rules will be promulgated in 2003 - 2004. In the interim, no areas can be deemed to be definitively nonattainment with the new 8-hour standard.

[2]Parenthetical value is an approximately equivalent concentration.

ppm – parts per million

mg/m^3 – milligrams per cubic meter

$\mu g/m^3$ – micrograms per cubic meter

The CAA places most of the responsibility to achieve compliance with the NAAQS on the individual states and/or local agencies that have been delegated CAA authority by USEPA. This is achieved through a SIP, which is required under the CAA. The SIP is a compilation of goals, strategies, schedules, permitting programs, and enforcement actions that lead the state into compliance with all NAAQS. Any changes to the compliance schedule or plan must be incorporated into the SIP and approved by USEPA. Areas not in compliance with a standard can be declared "nonattainment areas" by USEPA or the appropriate state or local agency. Based on the severity of an area's nonattainment (i.e., number of times that ambient air quality exceeds the NAAQS), USEPA also categorizes nonattainment areas (e.g., marginal, serious, severe, extreme). Areas designated by USEPA as being in nonattainment for one or more of the seven NAAQS may petition USEPA for re-designation as a maintenance area if they are able to demonstrate they have met the national standard for the three years preceding the re-designation request. At the time the state petitions USEPA for redesignation, it must also submit a revision of its SIP to provide for the maintenance of the applicable NAAQS for at least 10 years after redesignation ("maintenance plan") pursuant to Section 175(A) of the CAA.

Under the General Conformity Rule, the CAA prohibits Federal agencies from performing projects that do not conform to a USEPA-approved SIP. In 1993, USEPA developed final rules for how Federal agencies must determine air quality conformity prior to implementing a proposed Federal action. Under these rules, certain actions are exempted from conformity determinations, while others are assumed to be in conformity if total project emissions are below *de minimis* levels established under 40 CFR 93.153. Total project emissions include both direct and indirect emissions caused by the Federal action.

The CAA and the CAA Amendments of 1990 also require states to permit "major" stationary sources. A major stationary source is a facility (i.e., plant, Base, or activity) that emits more than 100 tons annually of any one criteria air pollutant, 10 tons per year (tpy) of a single hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs. There are 188 listed HAPs regulated under the CAA. The purpose of the permitting rule is to establish regulatory control over large facilities or processes that routinely emit significant amounts of pollutants and to assess and monitor their impact upon local and regional air quality.

3.1.2 Existing Conditions

Climate

Dover AFB has a humid continental climate. The Atlantic Ocean, the Delaware Bay, and Chesapeake Bay influence the region's climate and well-defined seasons. Prevailing winds are from the

west/northwest most of the year. Easterly summer winds off the ocean tend to raise temperature in the area. The average annual wind speed is about 6 knots; however, winds upward of 50 knots may accompany severe thunderstorms. The latter part of July is the warmest part of the year with maximum afternoon temperatures averaging 85 degrees Fahrenheit (ºF). Temperatures of 90 ºF and above occur on an average of 19 days a year. Late January to early February represent the coldest part of the year when early morning temperatures average 27 ºF (DAFB 2001).

Mean annual precipitation recorded in the area of Dover AFB is 42.7 inches. Precipitation occurs throughout the year. Approximately 20 inches of rain fall during the growing season. However, the uneven distribution of summer showers results in occasional dry periods, making crop irrigation necessary. The region's frost-free growing season extends about 163 days, from late April to the end of September. The annual snowfall period at Dover AFB is between October and April. Snowfall during this period at Dover AFB averages 17.1 inches per year (DAFB 2001). Thunderstorms occur 34 days per year, on average. The majority of these storms occur during the summer. Tropical storms or hurricanes occasionally impact the Dover AFB area between August and October (DAFB 2001).

Regional Air Quality

USEPA classifies the air quality in an air quality control region (AQCR) or in subareas of an AQCR according to whether the concentration of criteria pollutants in ambient air exceeds the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either "attainment," "nonattainment," or "unclassified" for each of the seven criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS, nonattainment indicates that air quality exceeds NAAQS, and an unclassifiable air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is assured when a Federal action *does not*:

- Cause a new violation of a NAAQS
- Contribute to an increase in the frequency or severity of violations of NAAQS
- Delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS

The conformity rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions. The rule applies only to Federal actions that are considered "regionally significant" or where the total emissions from the action meet or exceed the *de minimis* thresholds. An

action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the AQCR's total emissions inventory for that nonattainment pollutant. If a Federal action meets the *de minimis* threshold requirements and is not considered regionally significant, then a full Conformity Determination is not required.

Dover AFB

Dover AFB is located in southern Kent County, Delaware. Kent County is located in the Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45. The District has been designated by USEPA as a "severe" nonattainment area for O_3, like much of the Mid-Atlantic coastal area and the Northeast, running from Richmond, Virginia to Maine. Kent County is in attainment for the other five priority air pollutants: CO, Pb, particulate matter (PM_{10} and $PM_{2.5}$), NO_2, and SO_2. Volatile organic compounds (VOC) and nitrogen oxides (NO_x) are precursors for ozone and are the emissions of concern in an area of severe nonattainment for O_3, such as Kent County (436 SPTG/CEV 2001).

Two sources of emissions serve as the baseline for Kent County and Dover AFB. Kent County emissions (in tons per day for the peak ozone season) are found in the Base Year Ozone SIP Emissions Inventory. Dover AFB emissions inventories are calculated annually. These inventories of emission sources and associated estimates of pollutant quantities generated serve as a baseline to track and plan future changes in Base pollutant emission quantities (436 SPTG/CEV 2001).

The estimated emissions (tons per day for 1990 peak ozone season) for Kent County are: 65.233 tons per day of VOC and 25.843 tons per day of NO_x (436 SPTG/CEV 2001). The estimated 2000 emissions (436 SPTG/CEV 2001) from Dover AFB were 3.15 tpy of PM_{10}, 19.43 tpy of CO, 78.85 tpy of NO_x (which includes NO_2), 34.13 tpy of SO_2, 25.53 tpy of VOCs, and 6.27 tpy of HAPs. Not included in the Dover AFB figures are VOCs and NO_x from commuter traffic at Dover AFB, estimated at 36.83 tpy and 24.01 tpy, respectively (436 SPTG/CEV 2001).

Dover AFB received a Title V air permit from the State of Delaware on July 4, 2001. The Title V permit includes sources such as the central heat plant, other boilers, emergency generators, solvent cleaners, stage I and II vapor recovery systems, among other items. Although the Title V permit is active, Dover AFB still maintains other air permits as required by the State of Delaware's air regulations (DAFB 2001).

The major sources of air emissions at Dover AFB are VOCs. VOC emissions associated with aircraft and vehicle maintenance and repair are the most significant HAP sources on Dover AFB. These emission sources primarily include the storage and handling of jet propellant-8, gasoline, and diesel fuels.

Secondary emission sources include solvent use, paints, thinners, and coatings. Jet engine test cells, reciprocating engines, and electric generators are additional air pollutant sources (DAFB 2001).

3.2 Safety

3.2.1 Definition of Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury, illness, or property damage. Human health and safety addresses: (1) workers' health and safety during construction activities and facilities construction and (2) public safety during construction activities and during subsequent operations of those facilities.

Construction work site safety is a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations designed to comply with standards issued by the Occupational Safety and Health Administration and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

3.2.2 Existing Conditions

All contractors performing construction activities at Dover AFB are responsible for following ground safety regulations and worker compensation programs, and they are required to conduct construction activities in a manner that does not pose any risk to its workers or Base personnel. An industrial hygiene program addresses exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

Explosive safety-quantity distance (QD) zones are designated areas designed to safeguard the Base population and civilian community from potential explosions. These clear zones include the area within a safety arc surrounding an explosive storage facility. The QD zones at Dover AFB encompass explosives

storage facilities, hazardous cargo parking, suspect vehicle parking areas, and build-up and pre-load areas. The QD zones cover a significant portion of the airfield and adjacent lands; existing land uses in the arcs are mission necessary functions generally consisting of industrial and maintenance operations.

USAF has established standards to define imaginary surfaces for navigational airspace surrounding the airfield. These standards identify additional criteria that control development within these areas. Applicable airfield safety clearance criteria are defined in Air Force Manual (AFM) 32-1123, *Airfield and Heliport Planning and Design Criteria*. AFM 32-1123 outlines detailed planning and design criteria and standards for airfields; these criteria and standards include dimensions, clearances, and grades for airfield operational areas including the primary surface, clear zones, accident potential zones, and approach and departure clearance surfaces.

3.3 Geological Resources

3.3.1 Definition of Resource

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography.

The term soil generally refers to unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support human-made structures and facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints in regard to particular construction activities and types of land use.

Topography is defined as the relative position and elevations of the natural and/or human-made features of an area that describe the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, physiographic features (i.e., mountains, ravines, or depressions), and their influence on human activities.

3.3.2 Existing Conditions

Physiography

Dover AFB is located entirely within the Atlantic Coastal Plain Physiographic province which consists of a wide, wedge-shaped belt of Cretaceous to Recent layered sedimentary deposits of sand, gravel silt, clay limestone, chalk, and marl dipping to the southeast (DAFB 2001).

Topography

The local relief at Dover AFB is typically associated with stream channel development and erosion. Surface elevations range from a low of approximately 10 feet above mean sea level (MSL) along the banks of the St. Jones River to approximately 30 feet above MSL in the northwest portion of the Base, in the vicinity of Buildings 919 and 946. The Dover AFB airfield elevation is approximately 30 feet above MSL (DAFB 2001).

Geology

From youngest to oldest, the near-surface stratigraphic units underlying Dover AFB are recent sediments deposited by local rivers, the Pleistocene Columbia Formation, the Miocene Chesapeake Group (which contains only the Calvert Formation in this area), and the Eocene Piney Point Formation (DAFB 2001).

Soils

According to Dover AFB's General Plan (undated), the U.S. Department of Agriculture's (USDA), Soil Conservation Service (renamed Natural Resources Conservation Service) 1971 Kent County Soil Survey does not identify specific soil types located on Dover AFB. However, the soil survey does provide descriptions of the three soil associations that are found on Dover AFB, namely, the Sassafras/Fallsington, Othello-Metapeake-Mattapex, and Tidal Marsh associations (DAFB undated).

Because of a history of extensive construction-related soil disturbances on much of Dover AFB, the exact nature of existing soil types on many parts of the Base is not known and would likely be characterized as "Urban Complex." The Sassafras/Fallsington Association comprises approximately 50 percent of Dover AFB. The Othello-Metapeake-Mattapex Association comprises approximately 40 percent of the Base and lies mainly in the northeastern portion of the Base. The Tidal Marsh Association is found on the floodplain of the St. Jones River along the southern Base boundary and in the tidal flat where the Port Mahon Petroleum, Oil, and Lubricants (POL) Annex is located. Approximately 10 percent of Dover AFB is covered by this association (DAFB 2001).

3.4 Water Resources

3.4.1 Definition of Resource

Water resources include surface water, groundwater, and floodplains. Evaluation identifies the quantity and quality of the resource and its demand for potable, irrigation, and industrial purposes.

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Storm water flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to management of surface water. Storm water also is important to surface water quality because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically may be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Floodplains are areas of low-level ground present along a river or stream channel. Such lands may be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency, which evaluates the floodplain for 100- and 500-year flood events. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities in order to reduce the risks to human health and safety.

3.4.2 Existing Conditions

Surface Water

Storm water runoff is discharged into the Dover AFB drainage network, which is comprised of a series of inlets, manholes, pipes, culverts, and ditches. Runoff is transmitted to natural low-lying areas that surround Dover AFB. Water leaves the Base at several key locations. Base property situated near both Atlantic Street and Taxiway E drains to the Morgan and Pipe Elm Branches of the Little River. A small area on the east side of the Base, in the vicinity of the ammunition storage area, drains to the Lewis Ditch. The remainder of the Base drains to an unnamed stream that crosses the golf course, ultimately

discharging to the St. Jones River. All of the surface streams eventually drain to the Delaware Bay (DAFB 2001).

Dover AFB is divided into nine drainage sub-basins based on topography and the storm water collection system: Morgan Branch, Pipe Elm Branch, Pipe Elm Branch North, Lewis Ditch, Sand Ditch, Dickinson Ditch, Radio Tower Ditch, St. Jones River, and St. Jones River West.

The Morgan Branch Drainage Area drains 96 acres into Morgan Branch. Approximately 25 percent of this drainage area is covered by buildings, parking areas, and the northwest-southeast runway. Nearly 75 percent is frequently maintained grass intermixed with early successional vegetation.

The Pipe Elm Branch Drainage Area drains about 1,394 acres into Pipe Elm Branch. The north-south runway divides this drainage area into two halves. Approximately 75 percent of this drainage area is comprised of impervious surface. Drainage on the west side flows east before entering ditches leading to Pipe Elm Branch. East side drainage flows directly into Pipe Elm Branch. About 168 acres drain from the Pipe Elm Branch North Drainage Area. Fifty percent of this drainage area is covered by the north-south runway and the other 50 percent by intermixed grasses.

The Lewis Ditch, Sand Ditch, Dickinson Ditch, and Radio Tower Ditch Drainage Areas drain 481 acres with between 50 and 80 percent of these drainage areas being pervious.

The St. Jones River and St. Jones River West Drainage Areas receive drainage from 907 acres including Base buildings, parking areas, and the golf course. Approximately 75 percent of the St. Jones River Drainage Area is impervious, while the majority of the western drainage area is covered by residential landscape (DAFB 2001).

Groundwater

Water for domestic and other purposes in the vicinity of Dover AFB is derived entirely through groundwater withdrawals from underlying aquifers. Water-bearing units of particular importance at Dover AFB include the Columbia Aquifer of the upper Chesapeake Group, the Frederica Aquifer of the upper Chesapeake Group, the Cheswold Aquifer of the lower Chesapeake Group, and the Piney Point Aquifer of the Piney Point Formation (DAFB 2001). Water supply of the Base is drawn from the Cheswold and Piney Point Aquifers. Currently, groundwater contamination at Dover AFB is confined to the Columbia Aquifer, which is not used for drinking water (DAFB undated).

Floodplains

There are areas of Dover AFB that lie within the 100-year floodplain. These areas are located on the golf course along the unnamed drainage into the St. Jones River, immediately along the St. Jones River where it borders Dover AFB, and near Outfall 003 (DAFB undated).

3.5 Biological Resources

3.5.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (i.e., wetlands, forests, and grasslands) in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by USFWS.

Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future.

The USFWS also maintains an updated list of species considered as candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA in the future.

Wetlands are important natural systems and habitats because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat and unique flora and fauna niche provisions, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deep-water aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR 328).

It is important to distinguish between wetland "functions" and the societal or economic "values" associated with these functions. Wetland functions are the natural properties and actions performed by various wetland ecosystems, while wetland values are expressed in terms of the relative economic and/or

intrinsic worth of the functions as perceived by society. For example, storm water storage is a typical function noted in many wetland systems. The volume of storage available in the wetland and the ability of the wetland to slow or detain storm water flows are the measurable or estimable metrics that allow for the quantification of the storm water storage function. The fact that wetlands frequently store storm water and slow runoff is of importance to society because these functions can have the effect of lessening the severity and duration of downstream flooding. Hence, the value of storm water storage to society is expressed as the lessening of flood severity or the alteration of flooding and flood flows.

The *1987 Corps of Engineers Wetlands Delineation Manual* outlines the protocols and procedures for wetlands identification and delineation. The protocols presented in the *1987 Corps of Engineers Wetlands Delineation Manual* require the presence of three basic parameters to field identify and delineate wetlands: predominance (more than 50 percent) of hydrophytic vegetation (plant species that commonly occur in wetlands); presence of hydric soils (soils developed under reducing conditions); and evidence of wetlands hydrology (the inundation or saturation by surface or groundwater periodically to support hydrophytic vegetation and develop hydric soils). In undisturbed field conditions, all three of these diagnostic criteria must be present to fulfill wetland classification criteria. The *1987 Corps of Engineers Wetlands Delineation Manual* further describes protocols to be used in the delineation of wetlands in disturbed areas (USACE 1987).

3.5.2 Existing Conditions

Vegetation

Historic agricultural practices, vegetation management, and development have altered the vegetation at the Base. At present, the vast majority of grounds at Dover AFB are intensively maintained, resulting in landscaped property and a predominance of short turf grasses. Approximately 130 acres of native woodland and wetland remain, with the rest being semi-improved and improved lawns, open fields, and impervious surfaces. A biological inventory of Dover AFB was conducted by the Delaware Natural Heritage Inventory (DNHI) (DAFB undated). DNHI identified several areas on Base that continue to support native vegetation, though some have been disturbed or degraded to various degrees. The highest quality natural areas include the salt marsh and palustrine forested wetlands associated with the St. Jones River and upland terrestrial forested areas situated near MFH and the golf course and on the eastern side of the Base (DAFB undated).

Dover AFB is within the Oak-Pine Forest Region, Atlantic Slope Section. The original forests in this region were dominated in upland areas by canopy species such as loblolly pine (*Pinus taeda)*, scrub pine

(*P. virginiana*), tulip tree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia)*, a number of hickory species (*Carya* spp.), and several species of oaks (*Qercus* spp.). Poorly drained and lowland areas were dominated by species such as sweetgum *(Liquidambar styraciflua)*, willow oak (*Q. phellos*), pin oak (*Q. palustis*), red maple (*Acer rubrum*), and sour gum (*Nyssa sylvatica*). Isolated areas of permanent inundation were often dominated by pure stands of Atlantic white cedar (*Chamaecyparis thyoides*) or bald cypress (*Taxodium distichum*) (DAFB undated).

Prior to establishment of the Base, much of the forest had been cleared for agriculture, with limited areas of woodland remaining. It is likely that remnant woodlands underwent some form of logging. Original stand timber may exist east of the hazardous cargo storage area (DAFB undated).

Wetlands

An initial jurisdictional wetland survey of Dover AFB was performed in conjunction with an Ecological Risk Assessment Phase I Site Characterization in 1992. This survey was performed at only three locations on the Base—areas within and immediately adjacent to Pipe Elm Branch in the northeastern portion of the Base, around Environmental Restoration Program (ERP) site LF-13 (rubble fill) east of the airfield, and adjacent to the golf course and the St. Jones River. Several additional wetland areas were observed as part of a DNHI survey in 1991 and 1992. However, these areas were not delineated; they were identified mainly as general locations where certain obligate or facultative wetland plants occurred along with other vegetation (DAFB undated).

An additional Base-wide delineation survey was performed in 1998 which included a background evaluation of soils, vegetation, hydrology, land use history, and an on-site wetland survey using methodology described in the *USACE Wetland Delineation Manual* (USACE 1987). A total of 74.11 acres of regulated waters were delineated. A re-survey of the wetlands was performed in 2003 and Dover AFB is awaiting final jurisdictional approval from USACE.

Threatened and Endangered Species

There are no federally listed species know to inhabit Dover AFB.

The Upland sandpiper (*Bartramia longicauda*) is a state endangered species that has been identified at Dover AFB. The Northern harrier (*Circus cyaneus*) and the Short-eared owl (*Asio flammeus*) are state endangered species for breeding only. These species been identified at Dover AFB during migration and not during the breeding season.

Species of State Concern that have been identified at Dover AFB are the eastern Meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorous*), Fourspine stickleback (*Apeltes quadratus*), Mud sunfish (*Acantharcus pomotis*), Fog-fruit (*Phyla lanceolata*), and Hysop-leaf hedge-nettle (*Stachys hyssopifolia*), and Yellow passionflower (*Passiflora lutea*).

The American redstart (*Setophaga ruticilla*), Broad-winged hawk (*Buteo platypterus*), Cliff swallow (*Petrochelidon pyrrhonota*), Bank swallow (*Riparia riparia*), Black vulture (*Coragyps atratus*), Great blue heron (*Ardea herodias*), American kestrel (*Falco sparverius*), Black and white warbler (*Mniotilta varia*), Common moorhen (*Gallinula chloropus*), and Grasshopper sparrow (*Ammodramus savannarum*) are species of State Concern for breeding only. These species been identified at Dover AFB during migration and not during the breeding season.

Species being monitored for State Concern that were identified during the 1993 study by DNHI include the Tickseed sunflower (*Bidens coronata)* and Tiny-headed goldenrod (*Euthamia microcephala)* (DNHI 1993).

3.6 Cultural Resources

3.6.1 Definition of the Resource

Cultural resources may include prehistoric and historical archaeological sites, buildings, structures, districts, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Depending on their condition and historic use, such resources may provide insight into living conditions of previous existing civilizations, and/or may retain cultural and religious significance to modern groups. Under 36 CFR Part 800, Federal agencies must take into consideration the potential effect of an undertaking on "historic properties," which refers to cultural resources listed in, or eligible for inclusion in, the NRHP. In order to be determined a "historic property," the resource must meet one or more of the criteria established by the National Park Service, and outlined in 36 CFR 60.4, that make the resource eligible for inclusion in the NRHP.

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no above-ground structures remain standing) or architectural resources (buildings or other structures or groups of structures that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has

measurably altered the earth or intact deposits of physical remains are found (i.e., prehistoric or historic habitation remains).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered potentially eligible for nomination to the NRHP, as stated in National Register Bulletin 15. More recent structures, such as Cold War-era resources, may warrant protection if they are associated with exceptionally significant events or persons, represent remains that are so fragile that examples of any kind are extremely rare, or they have the potential to gain significance in the future, as stated in National Register Bulletin 22.

Traditional Cultural Properties or sacred sites can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, or areas where particular plants, animals, or minerals exist that Native Americans or other cultural groups consider to be essential for the preservation of traditional cultural practices, as stated in National Register Bulletin 38.

Cultural resources management at USAF bases is established in AFI 32-7065, *Cultural Resources Management.* The AFI details the compliance requirements for protecting cultural resources including the preparation of a Cultural Resources Management Plan (CRMP). The CRMP must include an inventory and evaluation of all known cultural resources; identification of the likely presence of other significant cultural resources; description of Base strategies for maintaining cultural resources and complying with related resource statutes, regulations, policies, and procedures; standard operating procedures and action plans that include budget, staffing and scheduling activities; clear identification and resolution of the mission impact on cultural resources; and conformance with local, state, and Federal preservation programs. In accordance with AFI 32-7065, Dover AFB developed the *Dover Air Force Base Cultural Resource Management Plan* (DAFB 2000a).

3.6.2 Existing Conditions

Cultural resources at Dover AFB are managed in accordance with applicable environmental laws including AFI 32-7064, *Cultural Resources Management*; 32 CFR Part 989; the NHPA of 1966, as amended, and its implementing regulations 36 CFR Part 800; EO 11593, *Protection and Enhancement of the Cultural Environment,* of 1971; NEPA of 1969, as amended, and its implementing regulation 42 USC; the Archaeological and Historic Preservation Act *of 1974* (Public Law [P.L.] 93-291); the American Indian Religious Freedom Act of 1978 (P.L. 95-341); the Archaeological Resources Protection Act of

1979 (P.L. 96-95); and the Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601).

The individual responsible for the management of cultural resources on a day-to-day basis is the Base Cultural Resources Manager (CRM). This individual is assigned to the 436th Civil Engineering Squadron, Environmental Flight (436 CES/CEV). Civil Engineering personnel evaluate proposed projects for their potential impact as part of the environmental review process. In the event that unanticipated human remains or archaeological materials are found during a project, work in the area of the find would stop, and the individual responsible for implementing the work (e.g., the non-commissioned officer in charge or the job foreman) would notify the CRM immediately. Various cultural resources studies have been conducted on Dover AFB in compliance with Section 106 and Section 110 of the NHPA (DAFB 2000a).

Archaeological Resources

In fulfillment of its requirements under Section 110 of the NHPA, Dover AFB has surveyed or assessed all of its property for archaeological resources (DAFB 2000b). Surveys have recorded six archaeological sites areas where undiscovered archaeological resources may be anticipated. Five of these are potentially eligible for the NRHP. The eligibility of the remaining site is unknown. Any ground disturbing activities in these six locations, or in the vicinity of potentially NRHP eligible sites will be reviewed by the SHPO before work begins (DAFB 2000a). No American Indian graves or other culturally sensitive areas have been identified on Dover AFB.

Historical Resources

Dover AFB has completed its identification requirements under Section 110 of the NHPA of 1966, as amended. Dover AFB has inventoried all of its buildings. Hangar 1301 is listed in the NRHP. The Strategic Air Command alert facility (Building 1303), was declared eligible for listing on the NRHP with concurrence of the SHPO, as recommended by the *Inventory of Cold War Properties* (Weitz 1996).

3.7 Infrastructure

3.7.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth

of an area. The infrastructure information provided below was obtained from the *General Plan Delaware Air Force Base Delaware* (DAFB undated) and provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include transportation systems, utilities (electrical power, natural gas, and water supply), solid waste, and sanitary systems.

Solid waste management primarily concerns itself with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal may involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance of landfills for disposal.

3.7.2 Existing Conditions

Utilities

The Proposed Action or the Alternative Action would not result in changes to Dover AFB electrical power, natural gas systems, central heat plant and cooling systems, communications, sanitary systems, or water supply utilities. Therefore, detailed examination of utilities at Dover AFB has been omitted.

Pollution Prevention

AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act; Pollution Prevention Act of 1990; EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities*. AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The 436 AW fulfills this requirement with the *Pollution Prevention Management Action Plan*, the H*azardous Waste and Used Petroleum Management Plan* (436 AW 2001), and the *Solid Waste Management Plan*. These plans ensure that Dover AFB maintains a waste reduction program and meets the requirements of the CWA, the National Pollution Discharge Elimination System (NPDES) permit program and Federal, state, and local laws and regulations for spill prevention, control, and countermeasures.

Solid Waste

Solid waste management at Dover AFB includes the collection and disposal of non-hazardous solid wastes; recycling efforts; and contract disposal of overseas waste, infectious waste, and pathological

waste. There are no active landfills on Base, and the majority of solid wastes from Dover AFB are transported to the Central Delaware Solid Waste Authority (DSWA) landfill in Sandtown (DAFB undated).

Recycling receptacles owned and maintained by DSWA are at one site on Base. DSWA removes recyclables (including magazines) from the Base to their own recycling center off Base. The basewide recycling program includes aluminum cans, paper, glass, and plastic. Recycling activities at Base industrial facilities are conducted by a 436 CES/CEV contractor and include the recycling of scrap metal, cardboard, and scrap wood.

Infectious medical waste is red-bagged or placed in sharps containers, collected by housekeeping staff, and placed in locked storage pending removal by a contractor to a permitted disposal facility (DAFB undated).

Pathological wastes from the mortuary are handled and disposed in a similar manner. All overseas wastes, including infectious and food wastes, are steam-sterilized, bagged, offloaded from aircraft, and refrigerated at the aerial port by Fleet Services personnel. A contractor removes the wastes, which are then disposed of off-Base following USDA guidelines (DAFB undated).

Transportation Systems

The Dover AFB roadway system safely handles and distributes vehicular movements with a minimum amount of congestion and delay. This includes traffic movements on and off of the Base, as well as movement within the Base. Pavement conditions do not inhibit these movements (DAFB undated).

Access to Dover AFB is currently achieved by two entrance gates, the Main and North Gates (Figure 2-1). The North Gate is accessed from Route 10, SR-1, and US 113. The Main Gate is accessed from SR-1 and from Lebanon Road. Lebanon Road provides direct access from the Eagle Heights MFH community into the Main Gate by way of an overpass bridging SR-1 (DAFB undated).

A diamond intersection at SR-1 and Lebanon Road provides for all the required turning movements at that intersection from off and on ramps, which enables motorists to access the Main Gate and the Eagle Heights MFH community. The North Gate is accessed directly from Route 10, northbound SR-1, and southbound US 113. Traffic signals control movements at the North Gate. The Main Gate overpass provides for a grade-separated entrance to the Base. Traffic signals provide control of traffic movements at the on and off ramps at this intersection (DAFB undated).

3.8 Hazardous Materials and Wastes

3.8.1 Definition of Resource

AFPD 32-70, *Environmental Quality*, establishes the policy that USAF is committed to environmentally-sound practices:

- Cleaning up environmental damage resulting from its past activities
- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Managing responsibly the irreplaceable natural and cultural resources it holds in public trust, and
- Eliminating pollution from its activities wherever possible.

AFPD 32-70 and the AFI 32-7000 series incorporate the requirements of all Federal regulations, other AFIs, and DOD Directives for the management of hazardous materials, hazardous wastes and special hazards.

Hazardous material is defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act, as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous waste is defined by the Resource Conservation and Recovery Act (RCRA), which was amended by the Hazardous and Solid Waste Amendments, as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment.

Evaluation of hazardous materials and wastes focuses on underground storage tanks and aboveground storage tanks and the storage, transport, and use of pesticides and herbicides, fuels, and POL. Evaluation may also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of hazardous materials or wastes, the extent of contamination varies based on the type of soil, topography, and water resources.

Special hazards are those substances that may pose a risk to human health but are not regulated as contaminants under the hazardous waste statutes. Special hazards include asbestos containing materials (ACM) and lead-based paint (LBP). The presence of special hazards or controls over them may affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, Department of Defense (DOD) has dictated that all facilities develop and implement Hazardous Material Emergency Planning and Response Plans or Spill Prevention, Control, and Countermeasure Plans. Also, DOD has developed the ERP (formerly the Installation Restoration Program), intended to facilitate thorough investigation and cleanup of contaminated sites located on military bases. These plans and programs, in addition to established legislation (i.e., CERCLA and RCRA) effectively form the "safety net" intended to protect the ecosystems on which most living organisms depend.

The ERP is a subcomponent of the Defense Environmental Restoration Program (DERP) that became law under SARA. The ERP requires each DOD base to identify, investigate, and cleanup hazardous waste disposal or release sites. The ERP provides a uniform, thorough methodology to evaluate past disposal sites to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up the environment. Description of ERP activities provides a useful gauge of the condition of the soils, water resources, and other resources that may be affected by contaminants. It also aids in the identification of properties and their usefulness for given purposes.

3.8.2 Existing Conditions

The generating location and the 436 CES/CEV are responsible for overseeing hazardous material and waste management for the Base. In conformance with the policies established by AFPD 32-70, the 436 CES/CEV has developed plans to manage hazardous materials, hazardous wastes, and special hazards on the Base.

Hazardous Materials

AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who mange, monitor, or track any of those activities. The 436 AW manages hazardous materials in accordance with AFI 32-7086.

Hazardous Wastes

The 436 AW maintains a Hazardous Waste and Used Petroleum Management Plan as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*. The Hazardous Waste and Used Petroleum Management Plan provides guidance to Dover AFB personnel on handling, storage, and disposal of hazardous materials and implements the "pharmacy" system to control hazardous waste (436 AW 2001). Wastes generated at Dover AFB include used antifreeze, contaminated fuels, flammable solvents, waste paint-related materials, and other miscellaneous wastes (DAFB undated).

Hazardous waste management activities at Dover AFB are performed by generating location and the 436 CES/CEV. The CEV has designated locations as 90-day accumulation points and initial accumulation points (IAPs). Each organization appoints accumulation point managers and alternate managers to ensure the proper identification, handling storage and record keeping for hazardous wastes. Used oil and fuels are accumulated and recycled through the Base recycling/resale contract. Wastes are periodically collected and transported from the storage facility by a contractor. Because hazardous wastes must be transferred outside of Building 1306 (a 90 day accumulation point) in an area unprotected from precipitation, the Base is required to monitor storm water from this site entering the St. Jones River via Dover AFB Outfall 008 as part of the Dover AFB storm water permit (DAFB undated).

Asbestos Containing Materials

AFI 32-1052, *Facilities Asbestos Management,* provides direction for asbestos management at USAF bases. AFI 32-1052 requires bases to develop an Asbestos Management Plan for the purpose of maintaining a permanent record of the status and condition of ACM in base facilities, as well as documenting asbestos management efforts. In addition, the instruction requires bases to develop an asbestos-operating plan detailing how the base accomplishes asbestos-related projects. Asbestos is regulated by USEPA with the authority promulgated under the Occupational Safety and Health Act. Section 112 of the CAA regulates emission of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

To fulfill the requirements of AFI 32-1052, Dover AFB has an asbestos management program in place which addresses ACM on the Base. The asbestos management plan is based on an asbestos survey of the Base that was originally performed in 1988-1989, and was revised in 2003. Suspect ACM is addressed on an as-needed basis prior to disturbance of the material. Materials to be disturbed that have been confirmed to contain asbestos are handled by qualified outside contractors (DAFB 2003).

Lead-Based Paint

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), passed by Congress on October 28, 1992, regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws and regulations relating to LBP activities and hazards.

USAF policy and guidance establishes lead-based paint management at USAF facilities (USAF 1993). Additionally, the policy requires each base to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards. Dover AFB has in place a LBP management program. As with asbestos, all suspect or confirmed LBP is addressed prior to any activities that may disturb it, such as renovation, construction, or demolition. LBP abatement is performed by outside contractors when required (DAFB undated).

Environmental Restoration Program

Some fuels, hazardous materials, and hazardous wastes are stored and handled along the flight line in the northwestern area of the Base. Most surface drainage from this portion of the Base is to Morgan Branch and Pipe Elm Branch both of which flow into the Little River. Historic hazardous materials and waste handling and disposal in this same area of the Base have resulted in contamination within these drainages (DAFB undated).

Dover AFB was placed on the National Priorities List in March 1989. A Federal Facilities Agreement (FFA) was signed in August 1989 to address the environmental cleanup of hazardous substances, pollutants, or contaminants present at Dover AFB. The FFA is pursuant to CERCLA, RCRA, EO 12580, DERP, National Contingency Plan, and applicable State of Delaware Statutes (DAFB undated).

Site inspections conducted in the early 1990s identified fifty-nine ERP sites at Dover AFB. The principal site types are underground storage tanks, oil-water separators, industrial waste collection drains, fire training areas, landfills, fuel spills, fuel leaks, and a hydrant fuel system. Fifty-two of the ERP sites are governed by CERCLA regulations, six sites fall under the State Underground Storage Tank Program, and one site is governed by RCRA Subtitle C (DAFB undated).

A Base-wide remedial investigation conducted in the mid-1990s was approved by USEPA in 1997. As a result of the remedial investigation, 23 of the 59 sites were shown to require no cleanup action and were categorized as “no further action” sites. The remaining 36 sites were carried forward for further evaluation and cleanup (DAFB undated).

4. Environmental Consequences

This section of the EA assesses potential environmental consequences associated with the Proposed Action. Potential impacts are addressed in the context of the scope of the Proposed Action as described in Section 2.0 and in consideration of the potentially affected environment as characterized in Section 3.0.

4.1 Air Quality

4.1.1 Significance Criteria

The potential impacts to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action resulted in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of ten percent or more in an affected AQCR emissions inventory

Impacts to air quality in NAAQS nonattainment areas are considered significant if the net changes in project-related pollutant emissions result in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Exceed any significance criteria established in a SIP
- Delay the attainment of any standard or other milestone contained in the SIP

With respect to the General Conformity Rule, impacts to air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emission inventory by ten percent or more for one or more nonattainment pollutants, or if such emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been designated as a nonattainment or maintenance area.

The *de minimis* threshold emission rates were established by the USEPA in the General Conformity Rule in order to focus analysis requirements on Federal actions with the potential to have "significant" air quality impacts. Table 4-1 presents these thresholds, by regulated pollutant. These *de minimis* thresholds

are similar, in most cases, to the definitions for major stationary sources of criteria and precursors to criteria pollutants under the CAA's New Source Review (NSR) Program (CAA Title I). As shown in Table 4-1, *de minimis* thresholds vary depending upon the severity of the nonattainment area designation by USEPA.

Table 4-1. General Conformity Rule *de minimis* Emission Thresholds

Pollutant	Status	Nonattainment Classification	*de minimis* Threshold (tpy)
Ozone (measured as – "precursors": NO_x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
Carbon Monoxide (CO)	Nonattainment/ Maintenance	All	100
Particulate Matter <10 microns (PM_{10})	Nonattainment/ Maintenance	Serious	70
		Moderate	100
		Not Applicable	100
Sulfur Dioxide (SO_2)	Nonattainment/ maintenance	Not Applicable	100
Nitrogen Dioxide (NO_2)	Nonattainment/ maintenance	Not Applicable	100

Source: 40 CFR 93.153(b)

4.1.2 Proposed Action

Since a USEPA-designated nonattainment area is affected by this Proposed Action, the USAF must comply with the Federal General Conformity Rule (40 CFR 93). To do so, an analysis has been completed to ensure that, given the changes in direct and indirect emissions of the O_3 precursors (NO_x and VOCs), PM_{10}, and CO, the Proposed Action would be in conformity with applicable CAA requirements. The Conformity Determination requirements specified in this rule can be avoided if the project-related nonattainment pollutant emission rate increases are below *de minimis* thresholds levels for each pollutant and are not considered regionally significant. For purposes of determining conformity in this nonattainment area, projected regulated pollutant emissions associated with the Proposed Action were estimated using available construction emissions and other non-permitted emission source information.

The emissions calculations and *de minimis* threshold comparisons are collectively presented in Appendix B.

Construction Activities

The Proposed Action is a phased project and includes repaving and widening various sections of the perimeter road on Dover AFB. A description of the proposed construction is provided in Section 2.2. The construction projects would generate total suspended particulates (TSP) and PM_{10} emissions as fugitive dust from ground disturbing activities (e.g., grading, demolition, soil piles) and combustion of fuels in construction equipment.

Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day-to-day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Fugitive dust emissions for various construction activities were calculated using emission factors and assumptions published in USEPA's AP-42 Section 11.9 dated July 1998 and Section 13.2 dated September 1998. These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays). Using Climate Prediction Center information for the State of Delaware, the average soil percent moisture was estimated to be an average of 85 percent (CPC NOAA 2003). Wind speeds of greater than 12 mph are recorded 31.5 percent of the time during ozone season (April 1-October 31), which is based on average wind rose data and measured speed for the Philadelphia-Wilmington-Trenton District of USEPA Region III AQCR No. 45 (USEPA 2003).

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment as well as evaporative emissions from asphalt paving operations. These emissions would be of a temporary nature. The emission factors and estimates were generated based on guidance provided in USEPA's Compilation of Air Pollutant Emission Factors (AP-42).

Information on the affected project site area to be disturbed in Section 2.2 was used to estimate fugitive dust and all other criteria pollutant emissions. For the purposes of this analysis it was assumed that all

Table 4-2. Annual Proposed Construction Emissions Estimates for the Proposed Action

Calendar Year	NO_x[1]	VOC[1]	CO	SO_2	PM_{10}
2004	0.54	1.37	0.12	0.04	3.75

Note: [1] Denotes nonattainment pollutant in Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45.

eight phases would occur in CY 2004. The construction emissions presented in Table 4-2 include the estimated annual construction PM_{10} emissions associated with the Proposed Action at Dover AFB. These emissions would produce slightly elevated short-term PM_{10} ambient air concentrations. However, the effects would be temporary, and would fall off rapidly with distance from the proposed construction site.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for construction and experience with similar types of construction projects. Combustion by-product emissions from construction equipment exhausts were estimated using USEPA's AP-42 emissions factors for heavy-duty diesel-powered construction equipment.

The construction emissions presented in Table 4-2 include the estimated annual emissions from construction equipment exhaust associated with the Proposed Action. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. Early stages of construction projects involve greater use of heavy diesel equipment and earthmoving, resulting in higher NO_x and PM_{10} emissions. Later stages of construction projects involve greater use of light gasoline equipment and surface coating, resulting in more CO and VOC emissions. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in any long-term impacts.

As mentioned earlier, the Philadelphia-Wilmington-Trenton District of USEPA Region III AQCR No. 45 is currently classified as being severe "nonattainment" for O_3 and is in attainment for all other criteria pollutants. As shown in Table 4-2, the Proposed Action would generate emissions well below conformity *de minimis* limits as specified in 40 CFR 93.153. Because the emissions generated would be below *de minimis* levels, it is reasonable to assume that the temporary construction emissions caused by the Proposed Action would not cause a violation of the NAAQS. Therefore, no significant impact on regional or local air quality would result from implementation of the Proposed Action. Appendix B details the emission factors, calculations, and estimates of construction-related emissions for the Proposed Action.

According to 40 CFR Part 81, no Class I areas are located in the State of Delaware or in the vicinity of Dover AFB. Therefore, Federal Prevention of Significant Deterioration (PSD) regulations would not apply to the Proposed Action.

Local and regional pollutant impacts resulting from direct and indirect emissions from stationary emission sources under the Proposed Action are addressed through Federal and state permitting program requirements under NSR regulations (40 CFR Parts 51 and 52). As noted previously, Dover AFB has appropriate permits in place and has met all applicable permitting requirements and conditions for specific stationary devices.

4.1.3 Alternative Action

The projected regulated pollutant emissions associated with the Alternative Action were estimated using the same methodologies as the Proposed Action. The emission calculations and *de minimis* threshold comparisons for the Alternative Action are provided in Appendix B.

Construction Activities

A description of the Alternative Action is provided in Section 2.3.

As with the Proposed Action, construction operations under the Alternative Action would result in emissions of criteria pollutants from fugitive dusts and combustion products from construction equipment, as well as evaporative emissions from asphalt paving operations. Emissions would be of a temporary nature. The construction emissions that would result from the Action Alternative are presented in Table 4-3. A smaller quantity of pollutants would be generated from the Alternative Action than from the Proposed Action (Table 4-2).

Fugitive dust emissions would produce slightly elevated short-term PM_{10} ambient air concentrations and would fall off rapidly from with distance from the proposed construction site. As with fugitive dust emissions, combustion emissions would produce slightly elevated air pollutant concentrations. Early stages of construction projects involve greater use of heavy diesel equipment and earthmoving, resulting in higher NO_x and PM_{10} emissions. Later stages of construction projects involve greater use of light gasoline equipment and surface coating, resulting in more CO and VOC emissions.

Table 4-3. Annual Proposed Construction Emissions Estimates for the Proposed Action

Calendar Year	NO_x[1]	VOC[1]	CO	SO_2	PM_{10}
2004	0.23	0.70	0.05	0.02	1.60

Note: [1] Denotes nonattainment pollutant in Philadelphia-Wilmington-Trenton District of the USEPA Region III AQCR No. 45.

As with the Proposed Action, the Alternative Action would generate emissions well below conformity *de minimis* limits as specified in 40 CFR 93.153. Because the emissions generated would be below *de minimis* levels, it is reasonable to assume that the temporary construction emissions caused by the Alternative Action would not cause a violation of the NAAQS. Therefore, no significant impact on regional or local air quality would result from implementation of the Alternative Action. Appendix B details the emission factors, calculations, and estimates of construction-related emissions for the Alternative Action.

4.1.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on air quality.

4.2 Safety

4.2.1 Evaluation Criteria

If implementation of the Proposed Action were to increase substantially risks associated with the safety of Dover AFB personnel, contractors, or the local community, or substantially hinder the ability to respond to an emergency, it would represent a significant impact. Furthermore, if implementation of the Proposed Action would result in incompatible land use with regard to safety criteria (e.g., height restrictions), impacts to safety would be significant. Impacts were assessed based on the potential effects of construction activities and proposed upgrades to the perimeter road.

4.2.2 Proposed Action

Short-term, minor adverse effects would be expected as a result of the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with contractors performing work at Dover AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to Base personnel or activities at the Base.

The Proposed Action would result in a beneficial effect on the Base. The widening and repaving of the perimeter road would improve the safety of operations at Dover AFB and enable 436 AW to meet future mission objectives at the Base and conduct or meet mission requirements in a safe operating environment.

Upon completion of the proposed construction the perimeter road would be completely resurfaced with a lane in both directions.

4.2.3 Alternative Action

Short-term, minor adverse effects on safety under the Alternative Action would be similar to the effects under the Proposed Action. These effects include a slight increase in the short-term risk associated with contractors performing work at Dover AFB during the normal workday because the level of such activity would increase.

The Alternative Action would result in beneficial effects by improving the safety of operations at Dover AFB by widening the single lane sections of the road to two lanes and constructing a road surface in the area where the road is not paved. However, portions of the perimeter road that are in a state of disrepair would not be repaired/repaved and would continue to deteriorate under the Alternative Action.

4.2.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. Sections of the perimeter road would remain a single lane and the roadway would not be resurfaced. The only vehicular route around the North and Northeast portion of the Base would continue to deteriorate and missions would not be able to be conducted safely or efficiently at Dover AFB. If the No Action Alternative were carried forward, there would be an adverse effect on the safety of Dover AFB.

4.3 Geological Resources

4.3.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Analysis of potential impacts on geological resources typically includes the following evaluation tools:

- Identification and description of resources that could potentially be affected
- Examination of a proposed action and the potential effects this action may have on the resource
- Assessment of the significance of potential impacts
- Provision of mitigation measures in the event that potentially significant impacts are identified

Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

4.3.2 Proposed Action

Under the Proposed Action, construction activities, such as grading, excavation, and re-contouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit potential impacts resulting from construction activities. Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce potential impacts related to those characteristics. Additionally, construction would meet the Delaware Department of Natural Resources and Environmental Control (DNREC) Sediment and Erosion Control regulations. Therefore, adverse effects on soils at the Base would not be significant.

The Proposed Action would not cause or create significant changes to the topography of the Dover AFB area. If any soil needed to be removed from base it would be tested and disposed of accordingly. The proposed construction is in a previously disturbed area. Therefore, no effects on regional or local topography or physiographic features would result from implementation of the Proposed Action.

4.3.3 Alternative Action

The Alternative Action would result in similar ground disturbing activities as the Proposed Action. However, less soil would be disturbed under the Alternative Action than under the Proposed Action because the construction area is smaller. The same best management practices and standard erosion control measures would be implemented under the Alternative Action as under the Proposed Action. Construction under the Alternative Action would also meet the DNREC Sediment and Erosion Control regulations. Therefore, adverse effects on soils at the Base would not be significant as a result of the Alternative Action.

The Alternative Action would not cause or create significant changes to the topography of the Dover AFB area. If any soil needed to be removed from base it would be tested and disposed of accordingly. The proposed construction is in a previously disturbed area. Therefore, no effects on regional or local topography or physiographic features would result from implementation of the Alternative Action.

4.3.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on geological resources.

4.4 Water Resources

4.4.1 Evaluation Criteria

Significance criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. A potential impact on water resources would be significant if it were to reduce water availability to existing users or interfere with the supply; create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources; adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; threaten or damage unique hydrologic characteristics; or violate established laws or regulations that have been adopted to protect or manage water resources of an area. The impact of flood hazards on a proposed action is significant if such an action is proposed in an area with a high probability of flooding.

4.4.2 Proposed Action

Implementation of the Proposed Action is expected to have minor adverse effects on water quality. Adherence to proper engineering practices and applicable codes and ordinances would reduce storm water runoff-related impacts to a level of insignificance. Erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. Construction would meet the requirements of would meet the DNREC Sediment and Erosion Control regulations. Furthermore, the proposed construction activities would not occur within the 100-year floodplain. As a result, the Proposed Action would not affect the 100-year floodplain. Activities associated with the Proposed Action would not affect groundwater quality.

4.4.3 Alternative Action

Implementation of the Alternative Action is expected to have minor adverse effects on water quality. The area impacted by construction activities would be smaller than under the Proposed Action. Engineering practices, erosion and sediment controls, and applicable codes and ordinances would be adhered to, thereby reducing storm water runoff-related impacts. Construction would meet the DNREC Sediment and Erosion Control regulations. Furthermore, the proposed construction activity would not occur within

the 100-year floodplain. As a result, the Alternative Action would not affect the 100-year floodplain. Activities associated with the Alternative Action would not affect groundwater quality.

4.4.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on water resources.

4.5 Biological Resources

4.5.1 Evaluation Criteria

Determination of significance potential impact on biological resources is based on the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; the percentage of the resource that would be affected relative to its occurrence in the region; the sensitivity of the resource to proposed activities; and the duration of ecological ramifications. Impacts on biological resources are significant if species or habitats of high concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or impact the distribution of a species of high concern.

The significance of impacts on wetland resources is proportional to the functions and values of the wetland complex. Wetlands function as habitat for plant and wildlife populations, including threatened and endangered species that depend on wetlands for their survival. Wetlands are valuable to the public for flood mitigation, storm water runoff abatement, aquifer recharge, water-quality improvement, and aesthetics. On a global scale, wetlands are significant factors in the nitrogen, sulfur, methane, and carbon dioxide cycles. These parameters vary from year to year and from season to season. Quantification of wetlands functions and values, therefore, is based on the ecological quality of the site as compared with similar sites, and the comparison of the economic value of the habitat with the economic value of the proposed activity that would modify it. A significant adverse impact on wetlands would occur should either the major function or value of the wetland be significantly altered.

4.5.2 Proposed Action

Vegetation

The Proposed Action would occur in areas of Dover AFB that are improved and where there are no mature trees or shrubs.

Wetlands

The proposed upgrades to perimeter road would be located in previously disturbed areas. Culverts have previously been installed where drainages cross the perimeter road (see Figure 4-1). These culverts would be undisturbed by construction activities. Measures would be taken to avoid any indirect impacts to wetlands. Therefore, the Proposed Action would not result in adverse effects on wetlands on Dover AFB.

Threatened and Endangered Species

There are no known occurrences of federally listed threatened and endangered species on Dover AFB. Therefore, the Proposed Action is not likely to adversely affect threatened or endangered species on Dover AFB.

The proposed upgrades to the perimeter road are in areas where state endangered species including the Upland sandpiper and Short-eared owl (for breeding only) and species of State Concern including the Broad-winged hawk (for breeding only), Fourspine stickleback, and Great blue heron have (for breeding only) been identified at Dover AFB (see Figure 4-1). Avoidance measures and best management practices would be used to avoid direct and indirect impacts to these species. Therefore, the Proposed Action would have no effects on state threatened, endangered, species of State Concern, or species being monitored for State Concern.

4.5.3 Alternative Action

Vegetation

The Alternative Action would occur in areas of Dover AFB that are improved and where there are no mature trees or shrubs.

Wetlands

The proposed upgrades to perimeter road under the Alternative Action would be located in previously disturbed areas. As with the Proposed Action, culverts would be undisturbed by construction activities under the Alternative Action and measures would be taken to avoid any direct or indirect impacts to wetlands. Therefore, the Alternative Action would not result in adverse effects on wetlands on Dover AFB.

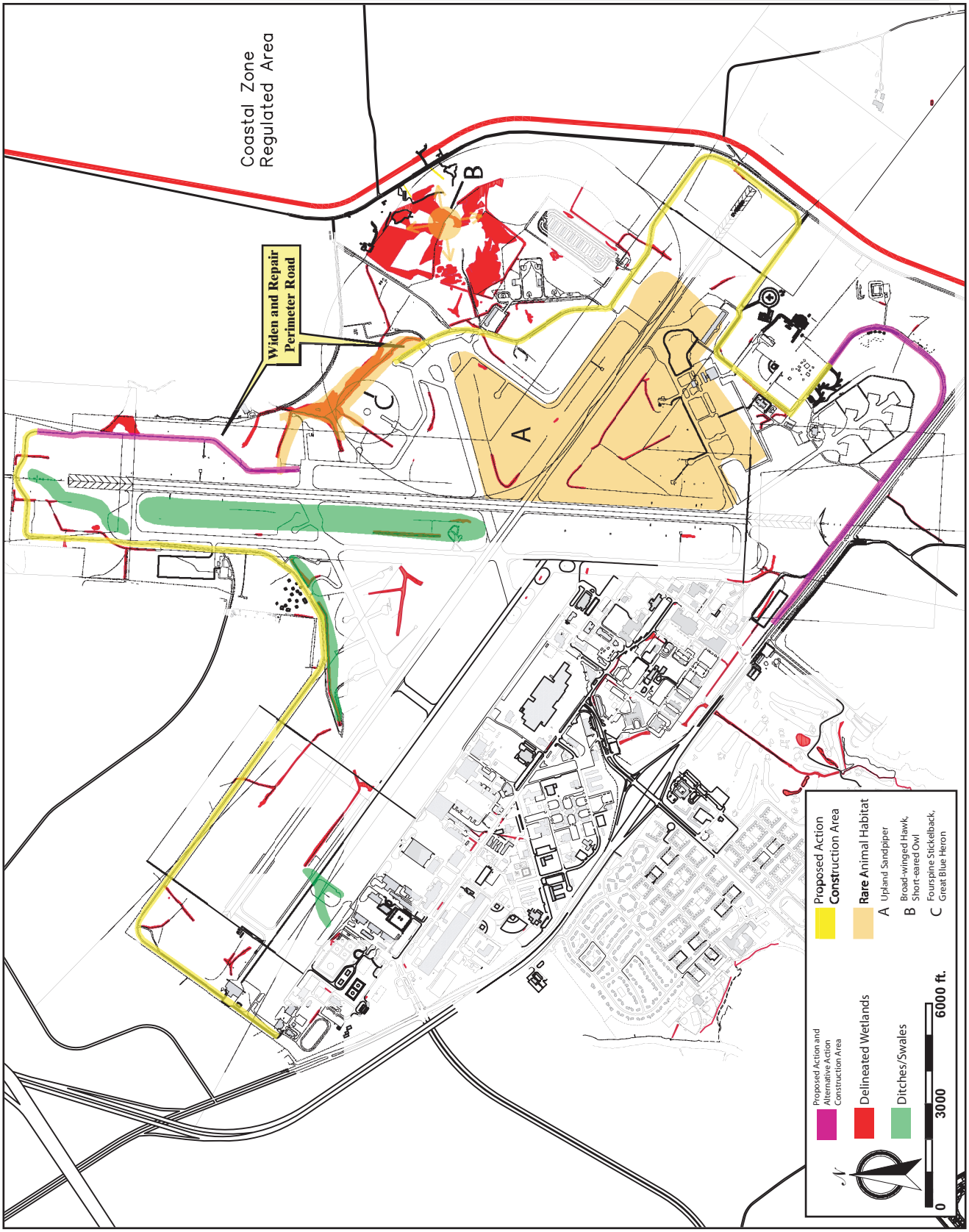

Figure 4-1. Natural Resources Constraints at Dover AFB

Threatened and Endangered Species

The proposed upgrades to the perimeter road under the Alternative Action are not in areas where state endangered species have been identified at Dover AFB (see Figure 4-1). If state species of concern were sighted prior to proposed construction, avoidance measures and best management practices would be used to avoid direct and indirect impacts to these species. Therefore, the Alternative Action would have no effects on state threatened, endangered, species of State Concern, or species being monitored for State Concern.

4.5.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on biological resources.

4.6 Cultural Resources

4.6.1 Evaluation Criteria

Potential impacts of the Proposed Action are assessed by: (1) identifying the nature and potential significance of cultural resources in potentially affected areas, and (2) identifying activities that could directly or indirectly affect cultural resources classified as historic properties. Historic properties, under 36 CFR Part 800, are defined as cultural resources included in, or eligible for inclusion in the NRHP. The term "eligible for inclusion" includes both listed and eligible properties, which meet NRHP listing criteria as outlined by 36 CFR 60.4. Therefore, cultural resources not yet evaluated are considered potentially eligible for the NRHP and are afforded the same regulatory consideration as nominated historic properties.

4.6.2 Proposed Action

The Proposed Action would have no effect on cultural resources at Dover AFB.

Archaeological Resources

The proposed upgrades to the perimeter road are in previously disturbed areas and are not located near identified archaeological sites or sites requiring further archaeological investigation (DAFB 2000a). If unanticipated American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony were found on Dover AFB, the CRM would contact the SHPO to determine the appropriate American Indian groups to consult (DAFB 2000a).

In case of inadvertent discovery of archaeological artifacts during construction, all construction activities would cease, as required by Federal and USAF regulations and 36 CFR 800.13(b). Procedures outlined in Dover AFB's CRMP would be followed. All construction would cease, and the CRM would be notified. Work would not resume until a full archaeological investigation is completed. Therefore, the Proposed Action would have no effect on archaeological resources.

Historical Resources

The proposed upgrades to the perimeter road are in previously disturbed areas and are not located near historic resources (DAFB 2000a). Therefore, the Proposed Action would have no effects on historic properties. Pursuant to 800.4(d)(1), Dover AFB determined that the Proposed Action would not affect historic properties.

4.6.3 Alternative Action

As with the Proposed Action, the Alternative Action would have no effect on cultural resources, including archaeological and historical resources at Dover AFB. Pursuant to 800.4(d)(1), Dover AFB determined that the Alternative Action would not affect historic properties.

4.6.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on cultural resources at Dover AFB.

4.7 Infrastructure

4.7.1 Evaluation Criteria

Impacts to infrastructure are evaluated on their potential for disruption or improvement of existing levels of service and additional needs for energy and water consumption, wastewater systems, and transportation patterns and circulation. Impacts may arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to Base activities.

4.7.2 Proposed Action

Pollution Prevention

It is anticipated that the Proposed Action would not affect the pollution prevention program at Dover AFB. Quantities of hazardous material and chemical purchases, off-Base transport of hazardous waste, disposal of municipal solid waste (MSW), and energy consumption would remain unchanged under with implementation of the Proposed Action. The Pollution Prevention Program at Dover AFB would accommodate the Proposed Action.

Solid Waste

In considering the basis for evaluating the significance of impacts on solid waste, several items are considered. These items include evaluating the degree to which the proposed upgrades to the perimeter road could affect the existing solid waste management program and capacity of the area landfill.

Solid waste generated from the proposed construction activities would consist of debris. All materials that can be recycled would be sent to the Resource Reuse and Recovery Program building on Base. All materials that cannot be recycled would be sent to the Sandtown landfill. The landfill space required at the DSWA landfill in Sandtown, DE or another approved landfill used by the contractor would increase during the implementation of the Proposed Action. The DSWA landfill has the capacity to handle the additional demolition solid waste stream from the Proposed Action. Therefore, implementation of the Proposed Action at Dover AFB would not impact the solid waste management program at the Base or the capacity of the DSWA landfill in Sandtown, DE.

Transportation Systems

The construction activities associated with the Proposed Action would require delivery of materials to and removal of debris from the proposed construction sites. Traffic associated with the Proposed Action would comprise a small percentage of the total existing traffic over the phases of construction and many of the vehicles would be driven to and kept on-site for the duration of construction, resulting in relatively few additional trips. Furthermore, potential increases in traffic volume associated with proposed activity would be temporary. Heavy vehicles are frequently on Base roads. Therefore, the vehicles necessary for the proposed construction are not expected to have a heavy impact on Base roads. All road and lane closures would be coordinated with emergency personnel and would be temporary in nature; therefore, no adverse impacts on transportation systems would be expected. The primary vehicular route around the North and Northeast portions of the Base would be safer as a result of the Proposed Action. Therefore, beneficial effects on transportation would result from the Proposed Action.

4.7.3 Alternative Action

Pollution Prevention

As with the Proposed Action, the Alternative Action would not impact the pollution prevention program at Dover AFB. The Pollution Prevention Program at Dover AFB would accommodate the Alternative Action.

Solid Waste

As with the Proposed Action, a short-term increase in construction debris would be expected as a result of the Alternative Action. There would be less of an increase than under the Proposed Action because the construction area would be smaller under the Alternative Action. As with the Proposed Action, all materials that can be recycled would be sent to the Resource Reuse and Recovery Program building on Base. All materials that cannot be recycled would be sent to the Sandtown landfill. The landfill space required under the Alternative Action would be less than the Proposed Action. The DSWA landfill has the capacity to handle the additional demolition solid waste stream from the Alternative Action. Therefore, implementation of the Alternative Action at Dover AFB would not impact the solid waste management program at the Base or the capacity of the DSWA landfill in Sandtown, DE.

Transportation Systems

Because of delivery of materials to and removal of debris from the proposed construction sites, a short-term increase in traffic would occur as a result of the Alternative Action. These increases would be similar to those discussed under the Proposed Action. However, the increase under the Alternative Action would be smaller than under the Proposed Action because construction area would be smaller. The primary vehicular route around the North and Northeast portions of the Base would be safer as a result of the Alternative Action. Therefore, beneficial effects on transportation would result from the Alternative Action.

4.7.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. Sections of the perimeter road would remain a single lane and the roadway would not be resurfaced. The only vehicular route around the North and Northeast portion of the Base would continue to deteriorate. If the No Action Alternative were carried forward, there would be a minor adverse effect on infrastructure.

4.8 Hazardous Materials and Wastes

4.8.1 Evaluation Criteria

Numerous local, state, and Federal laws regulate the storage, handling, disposal, and transportation of hazardous material and wastes. The primary purpose of these laws is to protect public health and the environment. Potential impacts associated with hazardous material and waste would be significant if the storage, use, transportation, or disposal of these substances were to substantially increase the risk to human health or exposure to the environment.

4.8.2 Proposed Action

Hazardous Materials

The Proposed Action would require the use of hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Contractors would be responsible for the management of hazardous materials. All hazardous materials would be handled in accordance with Federal and state regulations. Therefore, hazardous materials management at Dover AFB would not be impacted by the proposed construction activities.

Hazardous Waste

It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible. Dover AFB would coordinate with the contractors for the handling and disposal of hazardous wastes generated by the proposed project. Typically, hazardous waste is given a Dover AFB generator number and is disposed of directly by the Base. If any soil needed to be removed from base it would be tested prior to disposal. All hazardous wastes would be disposed in accordance with Federal and state laws and regulations. Therefore, proposed construction activities would have negligible impacts on Dover AFB hazardous waste management program.

Asbestos Containing Materials and Lead-based Paint

ACM or LBP are not expected to be encountered during the proposed upgrades to the perimeter road.

Environmental Restoration Program

ERP groundwater monitoring wells may be located within the proposed construction area. The 436 CES/CEV would take necessary precautions to ensure that the monitoring wells would not be damaged during construction activities. If a well were damaged, the necessary procedures to properly plug and

abandon the well would be followed. An equivalent replacement well would also be installed. Access would be provided to any monitoring wells that occur within the construction impact area.

No other ERP management impacts would be expected. It is unlikely that contamination would be encountered during construction activities; however, should contamination be encountered, the handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations, AFIs, and Dover AFB.

4.8.3 Alternative Action

Hazardous Materials

The Alternative Action would require the use of the same hazardous materials as the Proposed Action. However, because the construction area under the Alternative Action is would be smaller than under the Proposed Action, the Alternative Action would require the use of fewer hazardous materials. Management of hazardous materials would be handled the same as under the Proposed Action. Therefore, hazardous materials management at Dover AFB would not be impacted by the proposed construction activities under the Alternative Action.

Hazardous Waste

It is anticipated that the quantity of hazardous wastes generated from proposed construction activities under the Alternative Action would be negligible. Additionally, less hazardous waste would be generated under the Alternative Action than under Proposed Action because the construction area would be smaller. Hazardous wastes generated under the Alternative Action would be handled the same as under the Proposed Action. Therefore, the Alternative Action would have negligible impacts on Dover AFB hazardous waste management program.

Asbestos Containing Materials and Lead-based Paint

ACM or LBP are not expected to be encountered during the proposed upgrades to the perimeter road under the Alternative Action.

Environmental Restoration Program

As with the Proposed Action, ERP groundwater monitoring wells may be located within the proposed construction area under the Alternative Action. Groundwater monitoring wells would be handled in the same manner under the Alternative Action, as with the Proposed Action. As such, no other ERP management impacts would be expected.

4.8.4 No Action Alternative

Under the No Action Alternative, existing conditions would remain the same and the proposed upgrades to the perimeter road would not occur. If the No Action Alternative were carried forward, there would be no change in or effects on hazardous materials and wastes at Dover AFB.

4.9 Comparison of Alternatives

Under the Proposed Action and the Alternative Action, minor adverse effects on air quality, geological resources, water resources, biological resources, cultural resources, hazardous materials and waste, and infrastructure at Dover AFB may occur (Table 4-4). Although any effects would be minor under both the Proposed Action and the Alternative Action, these effects would be less under the Alternative Action. However, portions of the perimeter road that are in a state of disrepair would not be repaired/repaved under the Alternative Action. Under the No Action alternative, the only vehicular route around the North and Northeast portion of the Base would continue to deteriorate. There would be minor adverse effects on safety and infrastructure.

Table 4-4. Summary of Environmental Consequences

Resource	Proposed Action	Alternative Action	No Action Alternative
Noise	Temporary noise from construction activities with no significant impact.	Temporary noise from construction activities with no significant impact.	No change from the baseline conditions as described in Section 3.0.
Land use	Existing land use patterns would remain the same as the baseline conditions.	Existing land use patterns would remain the same as the baseline conditions.	No change from the baseline conditions as described in Section 3.0.
Air Quality	Potential construction emissions, well below conformity *de minimis.*	Potential construction emissions, well below conformity *de minimis* (potential emissions lower than the Proposed Action).	No change from the baseline conditions as described in Section 3.1.
Safety	Temporary decrease in safety associated with construction activities (not significant). Positive long-term impact by improving the deteriorating condition of perimeter road and improving safety and efficiency of mission at Dover AFB.	Temporary decrease in safety associated with construction activities (not significant). Positive long-term impact by improving the deteriorating condition of perimeter road and improving safety and efficiency of mission at Dover AFB (less of a positive impact than the Proposed Action).	The perimeter road would continue to deteriorate; missions would not be conducted safely.
Geological Resources	Grading, excavating, and recontouring of the soil would result in minor soil disturbance (not significant).	Grading, excavating, and recontouring of the soil would result in minor soil disturbance (less soil disturbed than under Proposed Action).	No change from the baseline conditions as described in Section 3.3.
Water Resources	Potential sedimentation from construction activities (not significant), increase in impervious surface area.	Potential sedimentation from construction activities (not significant), increase in impervious surface area.	No change from the baseline conditions as described in Section 3.4.
Biological Resources	No expected impacts on wetlands or vegetation. Proposed construction near areas where state species of concern occur, no expected impact.	No expected impacts on wetlands or vegetation. No construction proposed near areas where state species of concern occur, no expected impact.	No change from the baseline conditions as described in Section 3.5.
Cultural Resources	No effect on historic properties, archaeological or cultural resources.	No effect on historic properties, archaeological or cultural resources.	No change from the baseline conditions as described in Section 3.6.
Socioeconomics and Environmental Justice	No change in personnel, no environmental justice concern.	No change in personnel, no environmental justice concern.	No change from the baseline conditions as described in Section 3.0.
Infrastructure	Minor increase in debris and required landfill space (not significant), minor, temporary increase in traffic (not significant).	Minor increase in debris (not significant) (smaller increase than the Proposed Action), minor, temporary increase in traffic (not significant).	The perimeter road would continue to deteriorate; there would be minor adverse effects on infrastructure described in 3.
Hazardous Materials and Wastes	Would require the use of hazardous materials, would not impact hazardous waste or hazardous materials management.	Would require the use of hazardous materials (fewer hazardous materials used than under the Proposed Action), would not impact hazardous waste or hazardous materials management.	No change from the baseline conditions as described in Section 3.8.

5. Cumulative and Adverse Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

During the timeframe of the Proposed Action, 436 AW is proposing additional construction and demolition activities. Construction and demolition activities that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future and total square footage for each project (if available) are presented in Table 5-1. Cumulative impacts include an increase in total impervious surface, soil disturbance, hazardous material and wastes, solid waste, and temporary increased air emissions during constructions. No significant impacts to the environment are anticipated from the Proposed Action in conjunction with these projects. However, all projects are necessary to support the efficiency and safety of missions at Dover AFB. Additionally, the projects collectively would not significantly alter existing land use at Dover AFB.

5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Geological Resources

Under the Proposed Action, construction activities associated with the proposed construction, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit potential impacts resulting from construction activities. Standard erosion control means would also reduce potential impacts related to these characteristics. Additionally, proposed construction would meet the DNREC Sediment and Erosion Control regulations. Although unavoidable, impacts on soils at the Base are not considered significant.

Hazardous Materials and Waste

The generation of hazardous materials and wastes are unavoidable conditions associated with the Proposed Action. However, the potential for these unavoidable situations would not significantly increase over baseline conditions and, therefore, are not considered significant.

Table 5-1. Proposed Construction and Demolition Projects and Total Square Footage

Project Title	Total Square Feet
Proposed Construction	
Entry Control Point Upgrades	Unknown
Addition to Facility 778	420
New Air Freight Terminal	355,000
Addition to Facility 206	400
Addition to Fire Station[1]	2,500
Addition to Kennel Facility[1]	2,000
Addition to Facility 119	1,200
Temporary Lodging Facility	23,295
New Youth Center	20,884
New Cryogenics Facility	1,008
Defense Courier Service Facility	3,600
Air Traffic Control Facility including:	
Tower	4,306
Radar Approach Control (RAPCON)	7,998
Liquid Oxygen (LOX) Facility	2,000
C-17 Beddown	
Flight Simulator	13,579
Life Support	20,638
Proposed Pavement Repair/Construction	
Runway 14/32 shoulder	448,500
Entry Control Point Upgrades	127,350
Proposed Demolition	
Demolition of 8 facilities for new Air Freight Terminal	457,300

Notes: [1] Currently in progress

Energy

The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

5.2 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Polices, and Controls

Impacts as a result of the Proposed Action would occur entirely within the boundaries of Dover AFB. The proposed upgrades to the perimeter road would not result in any significant or incompatible land use

changes on or off Base. The proposed projects have been sited according to existing land use zones. Consequently, construction activities would not be in conflict with Base land use policies or objectives. The Proposed Action would not conflict with any applicable off-Base land use ordinances or designated clear zones.

5.3 Relationship Between Short-term Use and Long-term Productivity

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than five years. Long-term uses of man's environment include those impacts occurring over a period of more than five years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in an intensification of land use at Dover AFB or in the surrounding area. Development of the Proposed Action would not represent a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts. Long-term productivity of these sites would be increased by the development of the Proposed Action.

5.4 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals).

Material Resources

Material resources utilized for the Proposed Action include materials including concrete and asphalt (for roadway upgrades). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources

Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Biological Habitat

The Proposed Action would result in a minimal loss of vegetation and wildlife habitat on proposed construction sites. Proposed construction is mostly occurring on already disturbed land.

Human Resources

The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

6. List of Preparers

This EA has been prepared under the direction of Dover AFB. The individuals who contributed to the preparation of this document are listed below.

Suanne Collinsworth
engineering-environmental Management, Inc. (e^2M)
M.S. Environmental Sciences and Engineering
B.S. Geology
Certificate of Water Quality Management
Years of Experience: 7

Brian Davis
e^2M
B.S. Landscape Architecture/Planning
Years of Experience: 22

Tim Demorest
e^2M
A.M. Classical Studies
B.A. Classical Studies
Years of Experience: 2

Brian Hoppy–Program Manager
e^2M
B.S. Biology
Certificate of Environmental Management
Years of Experience: 14

Sean McCain
e^2M
M.B.A. Business Administration
B.S. Forestry and Natural Resources Management
Years of Experience: 8

Valerie Whalon
e^2M
M.S. Fisheries Science
B.S. Marine Science
Years of Experience: 10

Mary Young
e^2M
B.S. Environmental Science
Years of Experience: 2

THIS PAGE INTENTIONALLY LEFT BLANK

7. References

436 AW 2001	436 Airlift Wing OPLAN 32-3 (436 AW). 2001. *Hazardous Waste and Used Petroleum Management Plan*. November 2001.
436 SPTG/CEV 2001	436 SPTG/CEV. 2001. Eagle Heights Military Family Housing Rowhouse Replacement Environmental Assessment. Dover Air Force Base, Dover, DE. December 2001.
CPC NOAA 2003	Climate Prediction Center, National Oceanic and Atmospheric Administration (CPC NOAA). 2003. Calculated Soil Moisture Ranking Percentile. Available online: <*http://www.cpc.noaa.gov/products/soilmst/CSMRP*>. Site visited on October 9, 2003.
DAFB 2000a	Dover Air Force Base (DAFB). 2000. *Cultural Resources Management Plan*. October 2000.
DAFB 2000b	DAFB. 2000. *Archaeological Survey of Dover Air Force Base, Delaware*. June 2000.
DAFB 2001	DAFB. 2001. *Integrated Natural Resources Management Plan for Dover Air Force Base, Delaware*. August 2001.
DAFB 2003	DAFB. 2003. *Asbestos Management Plan for Dover Air Force Base, Delaware.*
DAFB undated	DAFB. Undated. *General Plan*. Prepared by Parsons Harland Bartholomew & Associates, Inc.
DNHI 1993	Delaware Natural Heritage Inventory, Department of Natural Resources and Environmental Control (DNHI). 1993. Biological and Ecological Inventory of Dover Air Force Base, Dover, Delaware. November 1993.
USACE 1987	U.S. Army Corps of Engineers (USACE). 1987. *Wetland Delineation Manual*.
USEPA 2003	U.S. Environmental Protection Agency (USEPA). 2003. Available online: <*http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13739.gif*>. Site visited on October 9, 2003.
Weitz 1996	Weitz, Karen J. 1996. *Dover Air Force Base, Dover, Delaware—Inventory of Cold War Properties*. United States Air Force Air Mobility Command Cold War Series Report of Investigations, No. 3. Prepared for Headquarters, Air Mobility Command, Scott AFB, IL and U.S. Army Corps of Engineers, Plano, TX under contract with Geo-Marine, Inc. October 1996.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

PUBLIC REVIEW

Delaware State
Maryland State News

State of Delaware:
:ss.
County of Kent :

PUBLIC NOTICE

Notice of Availability
Draft Finding of No Significant Impact
for the Environmental Assessment of
Upgrades to the Perimeter Road
at Dover Air Force Base, DE

Dover AFB, Delaware - An Environmental Assessment (EA) of upgrades to the perimeter road at Dover Air Force Base, Delaware has been prepared. The 436th Airlift Wing is proposing to issue a Finding of No Significant Impact (FONSI) based on this EA. The analysis considered potential effects of the Proposed Action, Alternative Action, and the No Action Alternative. The results, as found in the EA, show that the Proposed Action would not have an adverse impact on the environment - indicating that a FONSI would be appropriate. An Environmental Impact Statement should not be necessary to implement the Proposed Action.

Copies of the Draft FONSI and EA showing the analysis are available for review at the Dover AFB within the 436 Civil Engineer Squadron Environmental Office located at 600 Chevron Avenue, Dover AFB, Delaware 19902-5600. Requests to review the Draft FONSI and EA should be directed to Mr. Steven Seip at (302) 677-6839 to arrange for access to Dover AFB.

Public comments on the Draft FONSI and EA will be accepted through April 26, 2004.
460985 DSN 4/11,14/04

Before me, a Notary Public, for the County and State aforesaid, personally appeared Tamra Brittingham, known to me to be such, who being sworn according to law deposes and says that she is Publisher of the Delaware State News, a daily newspaper published at Dover, County of Kent and State of Delaware, and that the notice, a copy of which is hereto attached, was published in the Delaware State News in its issue of

April 11 & 14, 2004

Tamra Brittingham

Publisher

Sworn to and subscribed before me this _____

day of _____ A.D. _____

_____
Notary Public

PUBLIC NOTICE

Notice of Availability
Draft Finding of No Significant Impact
for the Environmental Assessment of
Upgrades to the Perimeter Road
at Dover Air Force Base, DE

Dover AFB, Delaware – An Environmental Assessment (EA) of upgrades to the perimeter road at Dover Air Force Base, Delaware has been prepared. The 436th Airlift Wing is proposing to issue a Finding of No Significant Impact (FONSI) based on this EA. The analysis considered potential effects of the Proposed Action, Alternative Action, and the No Action Alternative. The results, as found in the EA, show that the Proposed Action would not have an adverse impact on the environment – indicating that a FONSI would be appropriate. An Environmental Impact Statement should not be necessary to implement the Proposed Action.

Copies of the Draft FONSI and EA showing the analysis are available for review at the Dover AFB within the 436 Civil Engineer Squadron Environmental Office located at 600 Chevron Avenue, Dover AFB, Delaware 19902-5600. Requests to review the Draft FONSI and EA should be directed to Mr. Steven Seip at (302) 677-6839 to arrange for access to Dover AFB.

Public comments on the Draft FONSI and EA will be accepted through April 26, 2004.

APPENDIX B

AIR QUALITY EMISSIONS CALCULATION SPREADSHEETS

Appendix B - Clean Air Act - General Conformity Analysis

Proposed Action

Emissions Estimates for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE - Construction

This workbook contains

Summary (this worksheet) Summarizes total emissions by calendar year.

Combustion (one sheet for each calendar year) Estimates emissions from non-road equipment exhaust as well as painting.

Grading (one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions)

Fugitive (one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.

Summary of Construction Emissions

		NOx (ton)	HC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2004	Combustion	0.54	0.17	0.12	0.04	0.10
	Fugitive Dust					3.66
	TOTAL CY2004	0.54	0.17	0.12	0.04	3.75

Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE
Includes:

Construction of 32 Approach End 5 foot Road Extention	25,000	ft^2
Construction of Munitions Storage Area 3 foot Road Extention	9,000	ft^2
Construction of Haz Cargo Area 22 foot Road Extention	11,000	ft^2
Construction of EOD Area 11 foot Road Extention	44,000	ft^2
Construction of 19 Approach End 5 foot Road Extention	7,500	ft^2
Construction of North Perimeter Road 3.5 foot Road Extention	32,200	ft^2

Construction Site Air Emissions
Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	0	ft^2	(None)
Total Paved Area:	128,700	ft^2	(Construction of Runway 14/32 Shoulders)
Total Disturbed Area:	2.95	acres	(Construction of Runway 14/32 Shoulders)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	1.51	4.73	0.31	1.02	0.83
Emissions, tons/yr	0.17	0.54	0.04	0.12	0.10

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	2.95	2.95	2.95	2.95	2.95
Total new acres paved:	2.95	2.95	2.95	2.95	2.95
Total new building space, ft^2:	0.00	0.00	0.00	0.00	0.00
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	2.95	2.95	2.95	2.95	2.95
Area paved, acres in 1 yr:	2.95	2.95	2.95	2.95	2.95
Building space, ft^2 in 1 yr:	0.00	0.00	0.00	0.00	0.00

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	0.74	4.73	0.31	1.02	0.83
Asphalt Paving	0.77	0.00	0.00	0.00	0.00
Stationary Equipment	0.00	0.00	0.00	0.00	0.00
Mobile Equipment	0.00	0.00	0.00	0.00	0.00
Architectural Coatings (Non-Res)	0.00	0.00	0.00	0.00	0.00
Total Emissions (lbs/day):	**1.51**	**4.73**	**0.31**	**1.02**	**0.83**

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

	SMAQMD Emission Factor				
Source	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft^2	1.37E-04 lbs/day/ft^2	9.11E-06 lbs/day/ft^2	2.97E-05 lbs/day/ft^2	8.00E-06 lbs/day/ft^2
Mobile Equipment	1.60E-04 lbs/day/ft^2	1.61E-03 lbs/day/ft^2	7.48E-05 lbs/day/ft^2	0.0016 lbs/day/ft^2	1.20E-04 lbs/day/ft^2
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 2.95 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 0.4 (calculated based on acres disturbed)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	3	4.92
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	3	1.44
022 242 5220	Excavation	Bulk, open site, common earth, 150' hau	800	cu. yd/day	0.99	1.01	1	1.49
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1	0.61
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	3	1.22
TOTAL								9.69

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 9.69
Qty Equipment: 0.35
Grading days/yr: 9.69

Round to	10 grading days/yr

Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	2.95	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	10	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP
			Soil moisture within Delaware averages between 70 to 100 percent so 85% was u
Annual rainfall days, p:	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	31.5	%	Ave. wind speed > 12 mph witihin Philadelphia-Wilmington-Trenton District
			http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13739.gif
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	0	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	27.1	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	2	VMT/day	
Construction VMT per acre	6	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^{a} (W/3)^{b}/(M/0.2)^{c}] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	27.1 hr/acre	1.1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	6 VMT/acre	3.6 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = 1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 10.5 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 1.05 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1.1 lbs/acre	2.95	NA	3	0.00
Grading	0.8 lbs/acre	2.95	NA	2	0.00
Vehicle Traffic	3.6 lbs/acre	2.95	NA	11	0.01
Erosion of Soil Piles	1.1 lbs/acre/day	2.95	90	279	0.14
Erosion of Graded Surface	26.4 lbs/acre/day	2.95	90	7,020	3.51
TOTAL				7,315	3.66

Soil Disturbance EF: 5.5 lbs/acre
Wind Erosion EF: 27.45 lbs/acre/day

Back calculate to get EF: 247.6 lbs/acre/grading day

Appendix B - Clean Air Act - General Conformity Analysis

Alternative to the Proposed Action
Emissions Estimates for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE - Construction

This workbook contains

Summary (this worksheet) Summarizes total emissions by calendar year.

Combustion (one sheet for each calendar year) Estimates emissions from non-road equipment exhaust as well as painting.

Grading (one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions)

Fugitive (one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.

Summary of Construction Emissions (Alternative to the Proposed Action)

		NOx (ton)	HC (ton)	CO (ton)	SO2 (ton)	PM10 (ton)
CY2004	Combustion	0.23	0.07	0.05	0.02	0.04
	Fugitive Dust					1.56
	TOTAL CY2004	0.23	0.07	0.05	0.02	1.60

Alternative to the Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE

Includes:

Construction of 32 Approach End 5 foot Road Extention	-	ft^2
Construction of Munitions Storage Area 3 foot Road Extention	-	ft^2
Construction of Haz Cargo Area 22 foot Road Extention	11,000	ft^2
Construction of EOD Area 11 foot Road Extention	44,000	ft^2
Construction of 19 Approach End 5 foot Road Extention	-	ft^2
Construction of North Perimeter Road 3.5 foot Road Extention	-	ft^2

Construction Site Air Emissions
Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	0	ft^2	(None)
Total Paved Area:	55,000	ft^2	(Construction of Runway 14/32 Shoulders)
Total Disturbed Area:	1.26	acres	(Construction of Runway 14/32 Shoulders)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	0.65	2.02	0.13	0.44	0.35
Emissions, tons/yr	0.07	0.23	0.02	0.05	0.04

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	1.26	1.26	1.26	1.26	1.26
Total new acres paved:	1.26	1.26	1.26	1.26	1.26
Total new building space, ft^2:	0.00	0.00	0.00	0.00	0.00
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	1.26	1.26	1.26	1.26	1.26
Area paved, acres in 1 yr:	1.26	1.26	1.26	1.26	1.26
Building space, ft^2 in 1 yr:	0.00	0.00	0.00	0.00	0.00

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	0.32	2.02	0.13	0.44	0.35
Asphalt Paving	0.33	0.00	0.00	0.00	0.00
Stationary Equipment	0.00	0.00	0.00	0.00	0.00
Mobile Equipment	0.00	0.00	0.00	0.00	0.00
Architectural Coatings (Non-Res)	0.00	0.00	0.00	0.00	0.00
Total Emissions (lbs/day):	**0.65**	**2.02**	**0.13**	**0.44**	**0.35**

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

	SMAQMD Emission Factor				
Source	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft^2	1.37E-04 lbs/day/ft^2	9.11E-06 lbs/day/ft^2	2.97E-05 lbs/day/ft^2	8.00E-06 lbs/day/ft^2
Mobile Equipment	1.60E-04 lbs/day/ft^2	1.61E-03 lbs/day/ft^2	7.48E-05 lbs/day/ft^2	0.0016 lbs/day/ft^2	1.20E-04 lbs/day/ft^2
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

Alternative to the Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	1.26	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	4	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP
			Soil moisture within Delaware averages between 70 to 100 percent so 85% was us
Annual rainfall days, p:	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	31.5	%	Ave. wind speed > 12 mph witihin Philadelphia-Wilmington-Trenton District
			http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13739.gif
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	0	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	25.3	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	1	VMT/day	
Construction VMT per acre	2.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^{a} (W/3)^{b}/(M/0.2)^{c}] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	25.3 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	2.4 VMT/acre	1.5 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = 1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 10.5 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 1.05 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission	Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1	lbs/acre	1.26	NA	1	0.00
Grading	0.8	lbs/acre	1.26	NA	1	0.00
Vehicle Traffic	1.5	lbs/acre	1.26	NA	2	0.00
Erosion of Soil Piles	1.1	lbs/acre/day	1.26	90	119	0.06
Erosion of Graded Surface	26.4	lbs/acre/day	1.26	90	3,000	1.50
TOTAL					3,123	1.56

Soil Disturbance EF: 3.3 lbs/acre
Wind Erosion EF: 27.45 lbs/acre/day

Back calculate to get EF: 618.5 lbs/acre/grading day

Alternative to the Proposed Action
Conformity Emission Calculations for EA of Proposed Repaving and Widening of Perimeter Roads at Dover AFB, DE

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 1.26 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 0.2 (calculated based on acres disturbed)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	1	2.10
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	1	0.62
022 242 5220	Excavation	Bulk, open site, common earth, 150' hau	800	cu. yd/day	0.99	1.01	1	0.64
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	1	0.26
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	1	0.52
TOTAL								4.14

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 4.14
Qty Equipment: 0.15
Grading days/yr: 4.14

Round to	4	grading days/yr