

# ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT DOVER AIR FORCE BASE, DELAWARE



## HEADQUARTERS AIR MOBILITY COMMAND



September 2007

| Report Documentation Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      | Form Approved<br>OMB No. 0704-0188                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------|
| Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. |                      |                                                     |
| 1. REPORT DATE<br><b>SEP 2007</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2. REPORT TYPE       | 3. DATES COVERED<br><b>00-00-2007 to 00-00-2007</b> |
| 4. TITLE AND SUBTITLE<br><b>Environmental Assessment of Installation Development at Dover Air Force Base, Delaware</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      | 5a. CONTRACT NUMBER                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | 5b. GRANT NUMBER                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      | 5c. PROGRAM ELEMENT NUMBER                          |
| 6. AUTHOR(S)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5d. PROJECT NUMBER   |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5e. TASK NUMBER      |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5f. WORK UNIT NUMBER |                                                     |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br><b>Air Mobility Command,Community Planning Branch,507 Symington Drive,Scott AFB,IL,62225</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      | 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<br><b>Approved for public release; distribution unlimited</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                     |
| 13. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                                                     |

## 14. ABSTRACT

Dover AFB uses numerous approved plans to project installation development requirements. These plans propose demolition, construction, and infrastructure improvement activities intended to ensure that the installation can sustain its current and future national security operations and mission readiness status. These projects include installation development projects contained in the Dover AFB General Plan and the community of all existing Wing-approved development plans. Dover AFB seeks to improve the continuing installation development process by evaluating in a single EA all actions proposed in the Dover AFB Wing-approved community of plans for installation development, called the Installation Development EA (IDEA). The Proposed Action includes numerous projects, such as demolition of aging facilities, new facility construction, facility upgrades, facility repair and renovation utilities upgrades, community living upgrades, infrastructure upgrades, and recreational upgrades that would be completed or implemented during the next 5 years. The intent of this IDEA is to address the Proposed Action of implementing installation development actions as found in the community of all existing approved plans concerning continuing development on Dover AFB. The scope of the IDEA includes an evaluation of alternatives for the various projects and analysis of the cumulative effects on the natural and man-made environments. Through this IDEA, Dover AFB provides a constraints-based environmental impact analysis of installation development actions projected for the installation over the next 5 years. A constraints-based approach enables Dover AFB to evaluate environmental concerns that exist throughout the installation and those unique to specific areas of the installation. The analysis draws from the knowledge gained from extensive recent evaluations for similar types of projects to determine the direct, indirect, and cumulative effects of projects that would be completed as part of the installation's development. This EA has been prepared to evaluate the Proposed Action and alternatives, including the No Action Alternative. If potentially significant impacts are determined to be associated with the Proposed Action during the course of preparing this IDEA, it might be necessary to prepare an Environmental Impact Statement. Resource areas addressed in the EA include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and waste management. The EA has been made available to the public for comments during development and upon completion. One response letter was received during the public review period.

## 15. SUBJECT TERMS

## 16. SECURITY CLASSIFICATION OF:

a. REPORT  
**unclassified**

b. ABSTRACT  
**unclassified**

c. THIS PAGE  
**unclassified**

17. LIMITATION OF  
ABSTRACT

**Same as  
Report (SAR)**

18. NUMBER  
OF PAGES

**184**

19a. NAME OF  
RESPONSIBLE PERSON

## ABBREVIATIONS AND ACRONYMS

|             |                                                                       |                 |                                                                           |
|-------------|-----------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------|
| 436 AW      | 436th Airlift Wing                                                    | DNHESP          | Delaware Natural Heritage and Endangered Species Program                  |
| 436 CES/CEV | 436th Civil Engineering Squadron/Environmental Flight                 | DNL             | day-night average sound level                                             |
| 436 MAW     | 436th Military Airlift Wing                                           | DNREC           | Department of Natural Resources and Environmental Control                 |
| 512 AW      | 512th Airlift Wing                                                    | DOD             | Department of Defense                                                     |
| AAQS        | Ambient Air Quality Standard                                          | EA              | Environmental Assessment                                                  |
| ACM         | Asbestos-Containing Material                                          | EIAP            | Environmental Impact Analysis Process                                     |
| AFB         | Air Force Base                                                        | EIS             | Environmental Impact Statement                                            |
| AFI         | Air Force Instruction                                                 | EO              | Executive Order                                                           |
| AFPD        | Air Force Policy Directive                                            | ERP             | Environmental Restoration Program                                         |
| AFRC        | Air Force Reserve Command                                             | ESA             | Endangered Species Act                                                    |
| AGE         | aerospace ground equipment                                            | FAA             | Federal Aviation Administration                                           |
| AICUZ       | Air Installation Compatible Use Zone                                  | FEMA            | Federal Emergency Management Administration                               |
| AMC         | Air Mobility Command                                                  | FONPA           | Finding of No Practicable Alternative                                     |
| AMOP        | Asbestos Management and Operations Plan                               | FONSI           | Finding of No Significant Impact                                          |
| APE         | Area of Potential Effect                                              | ft <sup>2</sup> | square feet                                                               |
| AQCR        | Air Quality Control Region                                            | FUB             | Facility Utilization Board                                                |
| AST         | above ground storage tank                                             | FUDS            | Formerly Used Defense Sites                                               |
| AT/FP       | Anti-Terrorism/Force Protection                                       | FY              | Fiscal Year                                                               |
| BD/DR       | Building Demolition/Debris Removal                                    | GIS             | Geographic Information System                                             |
| BMP         | best management practice                                              | GOV             | government-owned vehicle                                                  |
| BRAC        | Base Realignment and Closure                                          | HAZMART         | Hazardous Materials Pharmacy                                              |
| CAA         | Clean Air Act                                                         | HAZWOPER        | Hazardous Waste Operations and Emergency Response                         |
| CEQ         | Council on Environmental Quality                                      | HQ              | Headquarters                                                              |
| CERCLA      | Comprehensive Environmental Response, Compensation, and Liability Act | HUD             | U.S. Department of Housing and Urban Development                          |
| CFR         | Code of Federal Regulations                                           | ICRMP           | Integrated Cultural Resources Management Plan                             |
| CO          | carbon monoxide                                                       | IDEA            | Installation Development Environmental Assessment                         |
| CWA         | Clean Water Act                                                       | IICEP           | Interagency and Intergovernmental Coordination for Environmental Planning |
| dB          | decibels                                                              | IRP             | Installation Restoration Program                                          |
| dba         | A-weighted decibels                                                   |                 |                                                                           |
| Del. C.     | Delaware Code                                                         |                 |                                                                           |
| DERP        | Defense Environmental Restoration Program                             |                 |                                                                           |

*continued on inside back cover →*



← continued from inside front cover

|                   |                                                               |
|-------------------|---------------------------------------------------------------|
| kV                | kilovolt                                                      |
| LBP               | Lead-Based Paint                                              |
| MAP               | Management Action Plan                                        |
| MATS              | Military Air Transport Service                                |
| MFH               | Military Family Housing                                       |
| mg/m <sup>3</sup> | milligrams per cubic meter                                    |
| mgd               | million gallons per day                                       |
| MMRP              | Military Munitions Response Program                           |
| MOA               | Memorandum of Agreement                                       |
| MOGAS             | unleaded gasoline                                             |
| MSDS              | Material Safety Data Sheet                                    |
| MSL               | mean sea level                                                |
| NAAQS             | National Ambient Air Quality Standards                        |
| NAGPRA            | Native American Graves Protection and Repatriation Act        |
| NEPA              | National Environmental Policy Act                             |
| NHPA              | National Historic Preservation Act                            |
| NO <sub>2</sub>   | nitrogen dioxide                                              |
| NO <sub>x</sub>   | nitrogen oxides                                               |
| NPDES             | National Pollutant Discharge Elimination System               |
| NRCS              | Natural Resources Conservation Service                        |
| NRHP              | National Register of Historic Places                          |
| NWI               | National Wetlands Inventory                                   |
| NZ                | Noise Zone                                                    |
| O <sub>3</sub>    | ozone                                                         |
| OSHA              | Occupational Safety and Health Administration                 |
| Pb                | lead                                                          |
| PCB               | Polychlorinated biphenyl                                      |
| pCi/L             | picocuries per liter                                          |
| PM <sub>10</sub>  | particulate matter equal or less than 10 microns in diameter  |
| PM <sub>2.5</sub> | particulate matter equal or less than 2.5 microns in diameter |
| PMP               | Pest Management Plan                                          |

|                   |                                                         |
|-------------------|---------------------------------------------------------|
| POL               | Petroleum, Oil, and Lubricants                          |
| POV               | privately owned vehicle                                 |
| ppm               | parts per million                                       |
| PSD               | Prevention of Significant Deterioration                 |
| QD                | quantity-distance                                       |
| RCRA              | Resource Conservation and Recovery Act                  |
| ROI               | Region of Influence                                     |
| SARA              | Superfund Amendments and Reauthorization Act            |
| SDIAQCR           | Southern Delaware Intrastate Air Quality Control Region |
| SHPO              | State Historic Preservation Office                      |
| SIP               | State Implementation Plan                               |
| SO <sub>2</sub>   | sulfur dioxide                                          |
| SR                | State Route                                             |
| SWPPP             | Storm Water Pollution Prevention Plan                   |
| tpy               | tons per year                                           |
| U.S.C.            | United States Code                                      |
| UFC               | Unified Facilities Criteria                             |
| US                | U.S. Route                                              |
| USACE             | U.S. Army Corps of Engineers                            |
| USAF              | U.S. Air Force                                          |
| USEPA             | U.S. Environmental Protection Agency                    |
| USFWS             | U.S. Fish and Wildlife Service                          |
| UXO               | Unexploded Ordnance                                     |
| VAQ               | Visiting Airmen's Quarters                              |
| VOC               | volatile organic compound                               |
| µg/m <sup>3</sup> | micrograms per cubic meter                              |



**FINDING OF NO SIGNIFICANT IMPACT (FONSI)**  
**ENVIRONMENTAL ASSESSMENT (EA)**  
**OF INSTALLATION DEVELOPMENT AT**  
**DOVER AIR FORCE BASE, DELAWARE**

---

**INTRODUCTION**

In an effort to improve installation planning, streamline compliance with the National Environmental Policy Act (NEPA), and accomplish installation development, the 436th Airlift Wing (436 AW) and Headquarters Air Mobility Command have initiated an environmental assessment (EA) of all reasonably foreseeable projects, planned and programmed for the next five years. Since the establishment of Dover AFB, installation development has been a continuing activity. Each year, structures are demolished, facilities are constructed, and infrastructure is upgraded. This decision document is based on an installation development environmental assessment (IDEA) attached to and incorporated herein by reference. The intent of the IDEA is to analyze the proposed action of implementing all the installation development projects on Dover AFB that would avoid environmentally sensitive areas.

The proposed action includes projects scheduled to be executed during the next five years including facility construction, repair or renovation, upgrades to utilities and infrastructure, and the demolition of unneeded facilities. The scope of the IDEA includes an evaluation of alternatives for the projects and an analysis of their direct, indirect and cumulative effects on the natural and man-made environments.

**PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

The purpose of the proposed action is to implement the wing-approved installation development projects found within all community plans for Dover AFB including the base general plan. All plans for Dover AFB were examined to produce a consolidated list of projects to accomplish the planned and programmed development of the installation over the next five years. The proposed action does not include any projects identified to have a potential impact in wetlands, floodplains, or areas where threatened and endangered species are known to occur.

The need for the proposed action is to support air mobility and unified command missions associated with Dover AFB. This need involves meeting ongoing mission requirements while supporting the morale and welfare of the warfighter and preparing the installation to accept additional missions in the future.

**DESCRIPTION OF THE PROPOSED ACTION**

The proposed action is to implement the installation development projects found in the community plans for Dover AFB. The projects in the proposed action analyzed by the IDEA fall under three categories: demolition; construction, including renovations, alterations and repairs; and infrastructure projects. The IDEA used information obtained from other environmental impact analysis process documents for similar actions to determine the direct, indirect and cumulative impacts of the projects proposed for installation development at Dover AFB.

**Demolition Projects.** Dover AFB proposes eight demolition projects over the next five years to achieve efficiency and support growth associated with its mission requirements. The facilities scheduled for demolition have been deemed too costly to repair or renovate, and no longer meet the mission needs of Dover AFB. The demolition of these facilities would provide approximately 114,850 square feet of usable land space and reduce the need to construct new facilities on undeveloped land.

**Construction Projects.** Dover AFB proposes four facility construction, renovation, repair, and alteration projects over the next five years to support mission requirements and comply with anti terrorism/force protection criteria. The construction of these facilities would occupy approximately 99,500 square feet. Some of this construction would occur on vacant land cleared by the demolition of unneeded structures. It is estimated that the construction projects on Dover AFB would add approximately 70,800 square feet of impervious surface. New facilities would be constructed in areas zoned to ensure compatible land use.

**Infrastructure Projects.** Dover AFB proposes six infrastructure projects over the next five years. These projects include upgrades to or development of utilities, parking facilities and energy management systems. The improvement to infrastructure would increase impervious surfaces by approximately 107,300 square feet.

#### **SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS ASSOCIATED WITH THE PROPOSED ACTION**

Minor, short-term, direct adverse effects resulting from construction and demolition activities would impact the noise environment, air quality, geological resources, water resources, biological resources, safety, and hazardous materials and wastes. Adverse effects associated with construction and demolition activities would be localized to the immediate area of work and would subside following the end of construction and demolition activities in each affected area.

Construction and demolition would cause a minor, short-term benefit to the socioeconomics of the local community due to construction employment and the purchase of local goods and services.

Minor, long-term, adverse effects on air quality, water resources, biological resources, geological resources, land use and safety would be expected from the construction of new facilities and demolition of unneeded facilities.

Minor, long-term, beneficial effects on air quality, land use, safety, infrastructure, and hazardous materials and wastes would be expected from the demolition of unneeded facilities and the construction of modern, efficient infrastructure.

No direct or indirect effects on archaeological resources or traditional cultural properties are anticipated because no project having a potential to affect these resources was included in the proposed action. Dover AFB would adhere to the Integrated Cultural Resources Management Plan in the event of an unanticipated discovery of archeological material or human remains. No adverse effects on architectural resources would be expected. There are no National Register of Historic Places-eligible buildings or structures at or near the projects associated with the proposed action, except for building 1301, which has received extensive exterior renovations since its listing. Recordation for the Historic American Buildings Survey/Historic American Engineering Record was completed as part of the mitigation for the alterations to building 1301. Because of extensive renovations to building 1301, implementation of the proposed action would not be considered an impact to either its viewshed or its structural integrity.

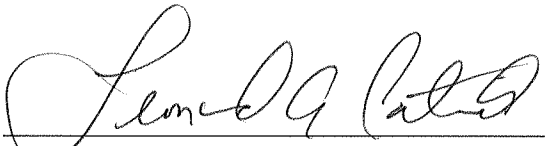
The proposed action does not include siting projects in wetlands, floodplains, or areas where threatened and endangered species are known to occur. Construction activities determined to have the potential to affect federally-listed threatened or endangered species, state-protected species, or their habitat would involve separate consultation with the appropriate federal and state agencies. Similarly, any project analyzed by this IDEA, which is subsequently identified to impact a wetland or floodplain, would be coordinated with the appropriate federal and state regulatory authorities to obtain necessary approval and ensure best management practices are used to minimize erosion and sedimentation. Additional environmental analysis would be required if the potential to adversely impact wetlands, threatened or endangered species, or other protected natural resources is identified during project design or execution.

## **PUBLIC REVIEW AND INTERAGENCY AND INTERGOVERNMENTAL COORDINATION**

The Interagency and Intergovernmental Coordination for Environmental Planning process was conducted from 10 April to 10 May 2007 on the description of proposed action and alternatives. Public review of the draft IDEA was conducted from 5 August to 4 September 2007. No comments were received from the public review period.

## **FINDING OF NO SIGNIFICANT IMPACT**

I conclude that the environmental effects of the proposed installation development at Dover AFB are not significant, that preparation of an environmental impact statement is unnecessary, and that a finding of no significant impact is appropriate. The preparation of the IDEA is in accordance with the NEPA; the regulations of the Council on Environmental Quality; and Title 32, Code of Federal Regulations, Part 989, as amended.



LEONARD A. PATRICK

Brigadier General (Sel), USAF  
Director, Installations & Mission Support

30 Nov 07

Date

Attachment: Environmental Assessment



**COVER SHEET**  
**ENVIRONMENTAL ASSESSMENT OF INSTALLATION DEVELOPMENT AT**  
**DOVER AIR FORCE BASE, DELAWARE**

**Responsible Agencies:** U.S. Air Force (USAF), Headquarters Air Mobility Command, Scott Air Force Base (AFB), Illinois, and Dover AFB, Delaware.

**Affected Location:** Dover AFB, Kent County, Delaware.

**Proposed Action:** Implementation of approved installation development plans.

**Report Designation:** Environmental Assessment (EA).

**Written comments and inquiries regarding this document should be directed to** Mr. Louis Lombard, 436 CES/CECP, 600 Chevron Avenue, Dover AFB, DE 19902-5600.

**Abstract:** Dover AFB uses numerous approved plans to project installation development requirements. These plans propose demolition, construction, and infrastructure improvement activities intended to ensure that the installation can sustain its current and future national security operations and mission-readiness status. These projects include installation development projects contained in the Dover AFB General Plan and the community of all existing Wing-approved development plans. Dover AFB seeks to improve the continuing installation development process by evaluating in a single EA all actions proposed in the Dover AFB Wing-approved community of plans for installation development, called the Installation Development EA (IDEA). The Proposed Action includes numerous projects, such as demolition of aging facilities, new facility construction, facility upgrades, facility repair and renovation, utilities upgrades, community living upgrades, infrastructure upgrades, and recreational upgrades that would be completed or implemented during the next 5 years. The intent of this IDEA is to address the Proposed Action of implementing installation development actions as found in the community of all existing approved plans concerning continuing development on Dover AFB. The scope of the IDEA includes an evaluation of alternatives for the various projects and analysis of the cumulative effects on the natural and man-made environments.

Through this IDEA, Dover AFB provides a constraints-based environmental impact analysis of installation development actions projected for the installation over the next 5 years. A constraints-based approach enables Dover AFB to evaluate environmental concerns that exist throughout the installation and those unique to specific areas of the installation. The analysis draws from the knowledge gained from extensive recent evaluations for similar types of projects to determine the direct, indirect, and cumulative effects of projects that would be completed as part of the installation's development.

This EA has been prepared to evaluate the Proposed Action and alternatives, including the No Action Alternative. If potentially significant impacts are determined to be associated with the Proposed Action during the course of preparing this IDEA, it might be necessary to prepare an Environmental Impact Statement. Resource areas addressed in the EA include noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and waste management. The EA has been made available to the public for comments during development and upon completion. One response letter was received during the public review period.





**ENVIRONMENTAL ASSESSMENT  
OF  
INSTALLATION DEVELOPMENT AT  
DOVER AIR FORCE BASE, DELAWARE**

---

**HEADQUARTERS AIR MOBILITY COMMAND  
COMMUNITY PLANNING BRANCH  
507 SYMINGTON DRIVE  
SCOTT AIR FORCE BASE, ILLINOIS 62225-5022**

**SEPTEMBER 2007**



**ENVIRONMENTAL ASSESSMENT  
OF INSTALLATION DEVELOPMENT AT  
DOVER AIR FORCE BASE, DELAWARE**

**TABLE OF CONTENTS**

**ABBREVIATIONS AND ACRONYMS ..... INSIDE FRONT AND BACK COVERS**

|                                                                                      |            |
|--------------------------------------------------------------------------------------|------------|
| <b>1. PURPOSE, NEED, AND SCOPE.....</b>                                              | <b>1-1</b> |
| 1.1 Background .....                                                                 | 1-1        |
| 1.2 Purpose of and Need for the Proposed Action .....                                | 1-1        |
| 1.3 Scope of the Analysis .....                                                      | 1-3        |
| 1.4 Summary of Key Environmental Compliance Requirements .....                       | 1-4        |
| 1.4.1 National Environmental Policy Act .....                                        | 1-4        |
| 1.4.2 Integration of Other Environmental Statutes and Regulations .....              | 1-4        |
| 1.4.3 Interagency Coordination and Public Involvement .....                          | 1-5        |
| 1.5 Organization of the IDEA .....                                                   | 1-5        |
| <b>2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES .....</b>                  | <b>2-1</b> |
| 2.1 Proposed Action .....                                                            | 2-1        |
| 2.1.1 Major Installation Constraints .....                                           | 2-4        |
| 2.1.2 Demolition Projects .....                                                      | 2-6        |
| 2.1.3 Construction Projects .....                                                    | 2-7        |
| 2.1.4 Infrastructure Projects .....                                                  | 2-7        |
| 2.1.5 Summary of Proposed Activities .....                                           | 2-8        |
| 2.2 Alternatives .....                                                               | 2-9        |
| 2.2.1 Alternative 1 – Acquire Additional Land Surrounding Dover AFB .....            | 2-9        |
| 2.2.2 Alternative 2 – Lease Additional Facilities in the Surrounding Community ..... | 2-9        |
| 2.2.3 No Action Alternative .....                                                    | 2-9        |
| 2.3 Decision to be Made and Identification of the Preferred Alternative .....        | 2-10       |
| <b>3. AFFECTED ENVIRONMENT .....</b>                                                 | <b>3-1</b> |
| 3.1 Noise .....                                                                      | 3-1        |
| 3.1.1 Definition of the Resource .....                                               | 3-1        |
| 3.1.2 Existing Conditions .....                                                      | 3-3        |
| 3.2 Land Use .....                                                                   | 3-4        |
| 3.2.1 Definition of the Resource .....                                               | 3-4        |
| 3.2.2 Existing Conditions .....                                                      | 3-4        |
| 3.3 Air Quality .....                                                                | 3-5        |
| 3.3.1 Definition of the Resource .....                                               | 3-5        |
| 3.3.2 Existing Conditions .....                                                      | 3-7        |
| 3.4 Safety .....                                                                     | 3-8        |
| 3.4.1 Definition of the Resource .....                                               | 3-8        |
| 3.4.2 Existing Conditions .....                                                      | 3-9        |
| 3.5 Geological Resources .....                                                       | 3-10       |
| 3.5.1 Definition of the Resource .....                                               | 3-10       |
| 3.5.2 Existing Conditions .....                                                      | 3-10       |
| 3.6 Water Resources .....                                                            | 3-12       |
| 3.6.1 Definition of the Resource .....                                               | 3-12       |
| 3.6.2 Existing Conditions .....                                                      | 3-13       |
| 3.7 Biological Resources .....                                                       | 3-14       |

|           |                                                                                                                                                                 |            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 3.7.1     | Definition of the Resource .....                                                                                                                                | 3-14       |
| 3.7.2     | Existing Conditions .....                                                                                                                                       | 3-15       |
| 3.8       | Cultural Resources .....                                                                                                                                        | 3-17       |
| 3.8.1     | Definition of the Resource .....                                                                                                                                | 3-17       |
| 3.8.2     | Existing Conditions .....                                                                                                                                       | 3-18       |
| 3.9       | Socioeconomics and Environmental Justice .....                                                                                                                  | 3-20       |
| 3.9.1     | Definition of the Resource .....                                                                                                                                | 3-20       |
| 3.9.2     | Existing Conditions .....                                                                                                                                       | 3-21       |
| 3.10      | Infrastructure .....                                                                                                                                            | 3-23       |
| 3.10.1    | Definition of the Resource .....                                                                                                                                | 3-23       |
| 3.10.2    | Existing Conditions .....                                                                                                                                       | 3-23       |
| 3.11      | Hazardous Materials and Wastes.....                                                                                                                             | 3-26       |
| 3.11.1    | Definition of the Resource .....                                                                                                                                | 3-26       |
| 3.11.2    | Existing Conditions .....                                                                                                                                       | 3-27       |
| <b>4.</b> | <b>ENVIRONMENTAL CONSEQUENCES .....</b>                                                                                                                         | <b>4-1</b> |
| 4.1       | Introduction .....                                                                                                                                              | 4-1        |
| 4.2       | Environmental Consequences of the No Action Alternative.....                                                                                                    | 4-6        |
| 4.3       | General Environmental Consequences of the Proposed Action by Resource Area .....                                                                                | 4-7        |
| 4.3.1     | Noise.....                                                                                                                                                      | 4-7        |
| 4.3.2     | Land Use .....                                                                                                                                                  | 4-8        |
| 4.3.3     | Air Quality.....                                                                                                                                                | 4-8        |
| 4.3.4     | Safety.....                                                                                                                                                     | 4-10       |
| 4.3.5     | Geological Resources .....                                                                                                                                      | 4-11       |
| 4.3.6     | Water Resources.....                                                                                                                                            | 4-12       |
| 4.3.7     | Biological Resources.....                                                                                                                                       | 4-13       |
| 4.3.8     | Cultural Resources .....                                                                                                                                        | 4-14       |
| 4.3.9     | Socioeconomic Resources and Environmental Justice.....                                                                                                          | 4-15       |
| 4.3.10    | Infrastructure .....                                                                                                                                            | 4-15       |
| 4.3.11    | Hazardous Materials and Wastes .....                                                                                                                            | 4-17       |
| 4.4       | Detailed Environmental Consequences of the Proposed Action .....                                                                                                | 4-18       |
| 4.4.1     | Representative Demolition Projects .....                                                                                                                        | 4-18       |
| 4.4.2     | Representative Construction Projects.....                                                                                                                       | 4-26       |
| 4.4.3     | Representative Infrastructure Projects.....                                                                                                                     | 4-34       |
| 4.4.4     | Analysis of All Proposed Projects.....                                                                                                                          | 4-41       |
| <b>5.</b> | <b>CUMULATIVE EFFECTS .....</b>                                                                                                                                 | <b>5-1</b> |
| 5.1       | Projects Identified with the Potential for Cumulative Effects .....                                                                                             | 5-1        |
| 5.2       | Cumulative Effects Analysis .....                                                                                                                               | 5-1        |
| 5.3       | Reasonable and Prudent Measures and Best Management Practices .....                                                                                             | 5-4        |
| 5.4       | Unavoidable Adverse Impacts.....                                                                                                                                | 5-4        |
| 5.5       | Compatibility of the Proposed Action and Alternatives with the Objectives of Federal,<br>Regional, State, and Local Land Use Plans, Policies, and Controls..... | 5-6        |
| 5.6       | Relationship Between the Short-term Use of the Environment and Long-term<br>Productivity .....                                                                  | 5-6        |
| 5.7       | Irreversible and Irretrievable Commitments of Resources.....                                                                                                    | 5-7        |
| <b>6.</b> | <b>PREPARERS.....</b>                                                                                                                                           | <b>6-1</b> |
| <b>7.</b> | <b>REFERENCES .....</b>                                                                                                                                         | <b>7-1</b> |

## APPENDICES

- A. Proposed Dover AFB Installation Development Projects**
- B. Applicable Laws, Regulations, Policies, and Planning Criteria**
- C. Interagency Coordination and Public Involvement**
- D. Air Quality Emissions Calculations**

## FIGURES

|                                                                                  |      |
|----------------------------------------------------------------------------------|------|
| 1-1. Location of Dover AFB .....                                                 | 1-2  |
| 2-1. Dover AFB Existing Land Uses .....                                          | 2-2  |
| 2-2. Representative Project Locations Relative to Constraints at Dover AFB ..... | 2-3  |
| 3-1. Typical Noise Levels .....                                                  | 3-2  |
| 4-1. Dover AFB Future Land Uses .....                                            | 4-9  |
| 4-2. All Proposed Projects on Dover AFB Relative to Known Constraints .....      | 4-45 |

## TABLES

|                                                                                                                                             |      |
|---------------------------------------------------------------------------------------------------------------------------------------------|------|
| 2-1. Representative Demolition Projects .....                                                                                               | 2-7  |
| 2-2. Representative Construction Projects .....                                                                                             | 2-7  |
| 2-3. Representative Infrastructure Projects .....                                                                                           | 2-8  |
| 2-4. Change in Impervious Surface .....                                                                                                     | 2-8  |
| 3-1. Predicted Noise Levels for Construction Equipment .....                                                                                | 3-3  |
| 3-2. National and State Ambient Air Quality Standards .....                                                                                 | 3-6  |
| 3-3. Annual Stationary and Area Source Emissions for Dover AFB (2005) .....                                                                 | 3-8  |
| 3-4. Recorded and Nonrecorded Archeological Sites at Dover AFB .....                                                                        | 3-19 |
| 3-5. Employment Type of Residents in ROI, Kent County, and the State of Delaware .....                                                      | 3-22 |
| 3-6. Race and Poverty Characteristics .....                                                                                                 | 3-23 |
| 4-1. Conformity <i>de minimis</i> Emissions Thresholds .....                                                                                | 4-4  |
| 4-2. Expected Criteria Pollutant Emissions Resulting from Demolition of Covered Storage Facility 1315 .....                                 | 4-19 |
| 4-3. Expected Criteria Pollutant Emissions Resulting from Demolition of VAQ Facility 802 .....                                              | 4-22 |
| 4-4. Expected Criteria Pollutant Emissions Resulting from Demolition of Youth Center Facility 3499 .....                                    | 4-24 |
| 4-5. Expected Criteria Pollutant Emissions Resulting from Construction of Visitor's Quarters .....                                          | 4-27 |
| 4-6. Expected Criteria Pollutant Emissions Resulting from Construction of Security Forces Complex .....                                     | 4-29 |
| 4-7. Expected Criteria Pollutant Emissions Resulting from Construction of Chapel Center .....                                               | 4-32 |
| 4-8. Expected Criteria Pollutant Emissions Resulting from Construction of Chapel Center Parking Lot .....                                   | 4-34 |
| 4-9. Expected Criteria Pollutant Emissions Resulting from Storm Water BMP/Spill Prevention at Transient Aircraft Parking Ramp .....         | 4-37 |
| 4-10. Expected Criteria Pollutant Emissions Resulting from Demolition of Central Heating Plant Facility 617 .....                           | 4-39 |
| 4-11. Potential Environmental Consequences Associated with Constraints to Development from All Proposed Projects Listed in Appendix A ..... | 4-42 |
| 4-12. Total Construction, Demolition, and Infrastructure Emissions at Dover AFB .....                                                       | 4-46 |
| 4-13. Anticipated Generation of Construction and Demolition Debris as a Result of All Proposed Projects .....                               | 4-47 |
| 5-1. Projects with Separate EIAP Analysis That Are Not Included in This IDEA .....                                                          | 5-2  |

***THIS PAGE INTENTIONALLY LEFT BLANK***

# 1. Purpose, Need, and Scope

The 436th Airlift Wing (436 AW) at Dover Air Force Base (AFB), Delaware, and Headquarters (HQ) Air Mobility Command (AMC) believe a comprehensive U.S. Air Force (USAF) Environmental Impact Analysis Process (EIAP) document would improve the continuing activity of installation development and streamline the National Environmental Policy Act (NEPA) compliance process. As a result, 436 AW and HQ AMC have initiated an evaluation in this Environmental Assessment (EA) of all foreseeable and reasonable planned and programmed projects identified for the next 5 years. Since the establishment of Dover AFB, as with all other USAF installations, installation development has continuously occurred. Every year in the history of the installation, structures have been demolished, new facilities constructed, and infrastructure upgraded. This document constitutes an Installation Development EA (IDEA). The intent of the IDEA is to address the Proposed Action of implementing installation development actions as found in the community of all existing Wing-approved plans on Dover AFB. These projects are a compilation of installation development activities as described in the Dover AFB General Plan (436 AW 2001) and all other known and Wing-approved base plans. This IDEA coordinates land use planning and infrastructure projects, expedites project execution by using early planning, and encourages agency coordination. In addition to evaluating the projects as described, this EA will serve as a baseline for future environmental analysis of mission and training requirements.

This section of the document includes five subsections: background information on the location and mission of Dover AFB, a statement of the purpose of and the need for the Proposed Action, an overview of the scope of the analysis, a summary of key environmental compliance requirements, and an introduction to the organization of this IDEA.

## 1.1 Background

Dover AFB is partly in the City of Dover and in Kent County, Delaware, approximately 2 miles southeast of downtown Dover, Delaware (see **Figure 1-1**). This military installation is an approximately 3,827-acre USAF base under the command and control of AMC. Dover AFB is bounded by agricultural and conservation areas to the north, south, and east; the City of Dover to the northwest; and residential areas to the west and southwest. It is headquarters to the 436 AW and is also home to several other tenant units. Major tenant units at the installation include the 512th Airlift Wing (512 AW) of the Air Force Reserve Command (AFRC), Detachment 3 – 373rd Training Squadron, and the Civil Air Patrol. The 436 AW provides worldwide air refueling and strategic airlift in support of the USAF's Global Reach, Global Power mission. The 436 AW also provides administrative, medical, and logistical support to 436 AW units, tenant organizations, and the Dover AFB community.

## 1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to implement installation development projects on Dover AFB as found in the community of all existing 436 AW-approved plans for development on the installation. The community of installation development plans is linked to individual funding programs, such as Military Construction, Operations and Maintenance, Anti-Terrorism/Force Protection (AT/FP), Nonappropriated Funds, and others. The Dover AFB community of plans was examined to provide a consolidated list of projects that are planned and programmed over the next 5 years for the continued physical development of the installation to support air mobility missions and other readiness training and operational assignments. These plans provide a vision for future development of the installation to accommodate future mission and facility requirements. These plans include projects for the installation's future facility development, transportation improvements, airfield and utility infrastructure enhancements, development constraints and opportunities, and land use relationships.



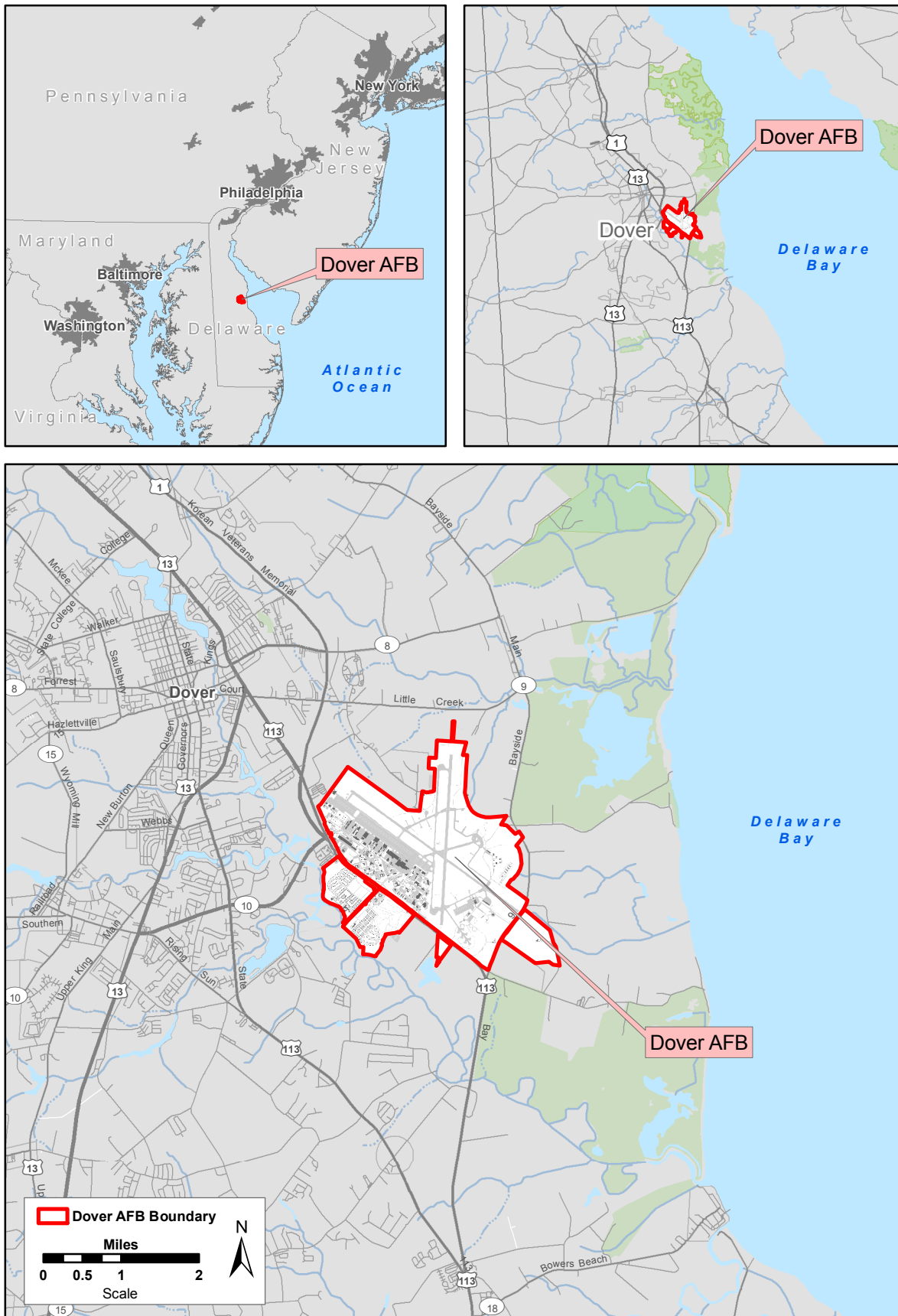


Figure 1-1. Location of Dover AFB

The need for the Proposed Action is to meet current and future mission requirements and national security objectives associated with Dover AFB. This involves meeting ongoing mission requirements that necessitate repairing and upgrading of installation utilities, pavements, and facilities; improving the efficiency and effectiveness of forces with the capability to expand; replacing older, substandard facilities with new buildings that are on a par with workplaces outside the gate; and providing reliable utilities and an efficient transportation system to support Dover AFB. In addition, morale and welfare projects that are a critical part of supporting the warfighter are included. Continued development of infrastructure at Dover AFB must take into account future facilities construction, demolition, renovation, transportation needs, airfield alterations and enhancements, systems improvements, utilities improvements, land use planning, and development constraints and opportunities. Contributions by Dover AFB to national security, as well as prospects for the assignments of additional missions in the future, dictate that the installation implement planning for the next 5 years. To ensure the complete usefulness of the installation for any tasks assigned, infrastructure projects must take into account—and be capable of supporting—all functions inherent to a USAF installation. These include aircraft operations and maintenance activities, security, administration, communications, billeting, supply and storage, training, transportation, and community quality of life.

### 1.3 Scope of the Analysis

Dover AFB seeks to improve the continuing installation development process by evaluating in a single EA all actions proposed in the Dover AFB Wing-approved community of plans for installation development. A compilation of all projects addressed in this IDEA is presented in **Appendix A**. Some of the projects identified in the Dover AFB community of installation development plans are appropriate for the application of Categorical Exclusions and therefore are not analyzed in this IDEA. The scope of the IDEA includes an evaluation of alternatives for the various projects and analysis of the cumulative effects on the natural and man-made environments. The Proposed Action includes numerous projects, such as demolition of aging facilities, new facility construction, facility upgrades, facility repair and renovation, utilities upgrades, community living upgrades, infrastructure upgrades, and recreational upgrades that would be completed or implemented during the next 5 years. The assessment compiles information on constraints that might inhibit development or dictate courses of actions affecting development, improve the facility planning process, and capture the Wing Commander's vision of what facilities and infrastructure improvements are necessary to support the installation's ongoing mission.

This IDEA evaluates the impacts of a Proposed Action that encompasses the continuing activities of demolition, construction, and infrastructure improvements inherent to Dover AFB adapting to ever-evolving mission requirements. This IDEA identifies, documents, and evaluates the effects of all activities involved in modernizing and upgrading Dover AFB to meet future requirements. The IDEA presents and analyzes potentially adverse direct, indirect, and cumulative environmental impacts resulting from implementation of Dover AFB's installation development (the Proposed Action) with emphasis on avoiding impacts on environmentally sensitive areas.

The scope of this IDEA includes an evaluation of the Proposed Action and alternatives, including the No Action Alternative, and an analysis of the cumulative effects on the natural and man-made environments of Dover AFB and surrounding areas. None of the projects contained in this IDEA, as part of the Proposed Action, would be sited in sensitive areas such as wetlands, floodplains, threatened or endangered species habitat, or known archeological sites. Projects that impact such areas or other sensitive environmental or socioeconomic resources would be the subject of separate NEPA analysis.

The Proposed Action, as described in **Section 2**, contains three categories of installation development: demolition, construction, and infrastructure projects. These three categories were identified for use in this document because they allow the grouping of development initiatives by generally common elements of

their activity and the nature of their potential environmental impacts. Within each category, the IDEA analyzes in detail the environmental impacts resulting from the activities for a subset of representative projects that are described in **Sections 2.1.2, 2.1.3, and 2.1.4** ranging in size, acreage disturbed, air emissions, impervious surface increase, vegetation disturbed, and other relevant resources. This IDEA also analyzes the siting of construction activities based on environmental constraints. All other projects are analyzed using the same methodology as the representative projects and their impacts are summarized in tabular form in **Section 4** of the IDEA. The categorized lists of proposed projects that compose the Proposed Action can be found in **Appendix A**.

The collective analysis of all appropriate projects in a single EA will streamline the NEPA review process; eliminate project fractionation and segmentation; facilitate coordination of land use planning; reduce installation, reviewing agency, and major command workloads; provide cost savings; help better evaluate potential cumulative environmental impacts; assist in maintaining a baseline for future analysis; and meet the USAF's EIAP goals.

## **1.4 Summary of Key Environmental Compliance Requirements**

### **1.4.1 National Environmental Policy Act**

NEPA (42 United States Code [U.S.C.] Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

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 Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI) or whether the preparation of an Environmental Impacts Statement (EIS) is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

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 its EIAP, 32 CFR Part 989, as amended.

### **1.4.2 Integration of Other Environmental Statutes and Regulations**

To comply with NEPA, the planning and decisionmaking 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 decisionmaker 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 IDEA examines potential effects of the Proposed Action and alternatives on 11 areas: noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and waste management. These resources were identified as being potentially affected by the Proposed Action and include applicable critical elements of the human environment that are mandated for review by Executive Order (EO), regulation, or policy. **Appendix B** contains examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis. Where useful to provide the reader with better understanding, key provisions of the statutes and EOs are discussed in more detail in the text of the IDEA.

### 1.4.3 Interagency Coordination and Public Involvement

NEPA ensures that environmental information is made available to the public during the decisionmaking 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 on their actions to state and local governments and the public and involve them in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning* (IICEP), requires the USAF to implement the IICEP process, which is used for the purpose of facilitating agency coordination and implements scoping requirements under NEPA.

On 10 April 2007, HQ AMC initiated the IICEP process by notifying relevant Federal, state, and local agencies of the Proposed Action. These agencies were provided a 30-day period to review and comment on the Proposed Action. One response was received from the U.S. Army Corps of Engineers (USACE). **Appendix C** includes the IICEP correspondence letter, distribution list, and the USACE’s response letter.

On 5 August 2007, HQ AMC initiated a public review of the Draft IDEA and Draft FONSI by notifying the public and relevant Federal, state, and local agencies of the availability of the Draft IDEA and Draft FONSI. A Notice of Availability was published in the *Delaware State News* on 5 August 2007. Hardcopies of the Draft IDEA, Draft FONSI, and Notice of Availability were also submitted to the Dover Public Library and agencies identified on the IICEP list. The public and agencies were provided a 30-day period to review and comment on the Draft IDEA and Draft FONSI. One letter from the Delaware State Historic Preservation Officer was received indicating concurrence with the Proposed Action. The Notice of Availability and comment letter are included in **Appendix C**.

## 1.5 Organization of the IDEA

This IDEA is organized into seven sections. **Section 1** contains background information on Dover AFB and the location of the Proposed Action, the purpose of and the need for the Proposed Action, the scope of the IDEA analysis, a summary of applicable regulatory requirements, and an introduction to the organization of the EA. **Section 2** provides a detailed description of the Proposed Action, alternatives to the Proposed Action that were considered, the No Action Alternative, and a description of the decision to be made and identification of the Preferred Alternative. **Section 3** contains a general description of the environmental and socioeconomic resources and baseline conditions that potentially could be affected by the Proposed Action, alternatives to the Proposed Action, or the No Action Alternative. **Section 4** presents an analysis of the environmental consequences for a range of activities (i.e., demolition, construction, and infrastructure projects to provide upgrades/replacements of facilities) covering future

installation development. **Section 5** includes an analysis of the potential cumulative impacts on Dover AFB. **Section 6** lists the preparers of the document. **Section 7** lists the sources of information used in the preparation of the document.

**Appendix A** presents a listing of proposed Dover AFB installation development projects compiled from the community of all existing approved plans for the installation. **Appendix B** includes descriptions of applicable laws, regulations, policies, and planning criteria. **Appendix C** includes a copy of the IICEP letter mailed to the agencies for this action, the IICEP distribution list, and agency responses. **Appendix D** contains example spreadsheets to illustrate the air quality emissions calculations.

## 2. Description of the Proposed Action and Alternatives

This section presents information on the Proposed Action related to the implementation of installation development, as described in the Dover AFB Wing-approved installation development plans. **Section 2.1** describes the Proposed Action at Dover AFB. **Section 2.2** identifies alternatives to the Proposed Action, including the No Action Alternative. **Section 2.3** identifies the decision to be made and the Preferred Alternative.

### 2.1 Proposed Action

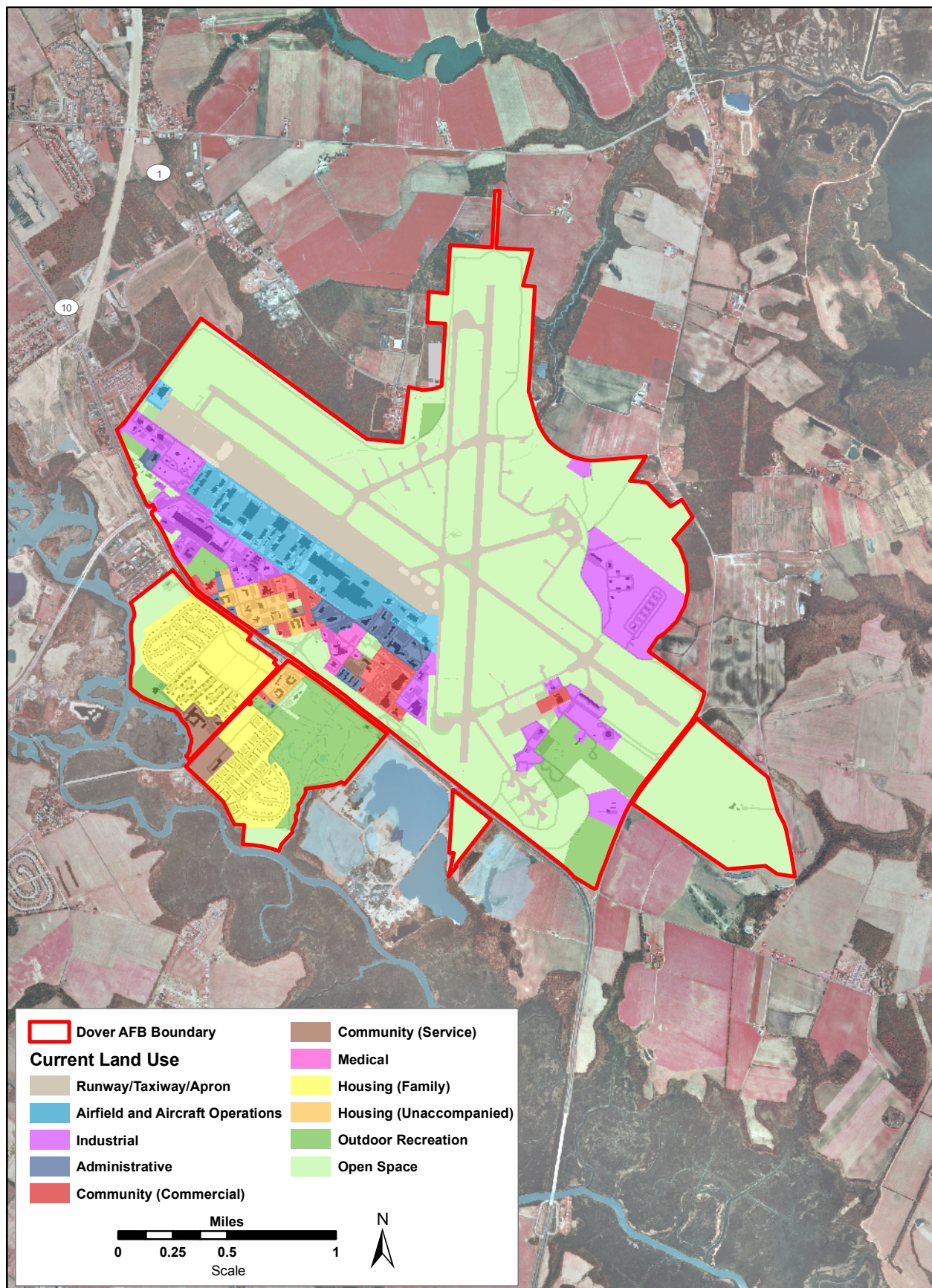
The Proposed Action is to implement continuing installation development actions as found in the community of existing Wing-approved development plans for Dover AFB. This action would enable Dover AFB to meet installation development requirements and therefore ensure readiness for future national defense missions. The Proposed Action consists of numerous projects related to installation development. It is intended that the projects contained in this IDEA will be reviewed during a 5-year rotational basis and this document might be updated to accommodate changes. If during the course of the next 5 years any of the projects listed in **Appendix A** change enough to be outside the scope of the analysis provided in this IDEA, the specified project would be excluded from the IDEA without affecting other projects originally included in the IDEA.

This IDEA has been prepared using a constraints-based analysis (see **Section 2.1.1**). This approach enables a comprehensive evaluation of environmental concerns throughout the installation and also those concerns unique to specific areas of Dover AFB. This analysis uses the information obtained from extensive recent EIAP evaluations for similar types of projects to determine the direct, indirect, and cumulative impacts of projects that would be completed as part of the installation's development plan.

The projects analyzed in the IDEA are categorized as demolition, construction, or infrastructure projects. For the purposes of describing the specific types of projects included as the Proposed Action, representative projects from each of the categories are listed in **Sections 2.1.2, 2.1.3, and 2.1.4**. These projects are considered to have the potential for the greatest impacts on the natural and man-made environments. The total suite of projects that make up the Proposed Action is listed in **Appendix A**. Several of the proposed projects involve more than one of the installation development categories (e.g., Project FJXT10300 includes the demolition of the current 13,993-square-foot [ft<sup>2</sup>] Security Forces Complex and the construction of a new 39,826-ft<sup>2</sup> Security Forces Complex). In such cases, the various portions of the project are separated into their respective installation development categories. The potential impacts associated with implementation of each of the projects in **Appendix A** are evaluated in this EA. Implementation of the Proposed Action would allow Dover AFB to properly plan for their future planning and budgeting cycles and ensure their readiness for future national defense and homeland security requirements.

Each project would be sited in a manner compatible with surrounding land uses (see **Figure 2-1**) and would avoid sensitive or constrained areas (see **Figure 2-2**). Siting facilities with similar functions together and avoiding potential conflicts with already identified operational and environmental constraints supports the concept of sustainable installation development. Some categories of land use are inherently functional for certain types of facilities, while others are inherently incompatible. The Dover AFB General Plan identifies 11 existing land use categories (not including water): Administrative, Aircraft Operations and Maintenance, Community (Commercial), Community (Service), Housing (Family), Housing (Unaccompanied), Industrial, Medical, Open Space, Outdoor Recreation, and Runway/Taxiway/Apron (436 AW 2001). **Figure 2-1** shows the existing land uses that have been defined for Dover AFB.

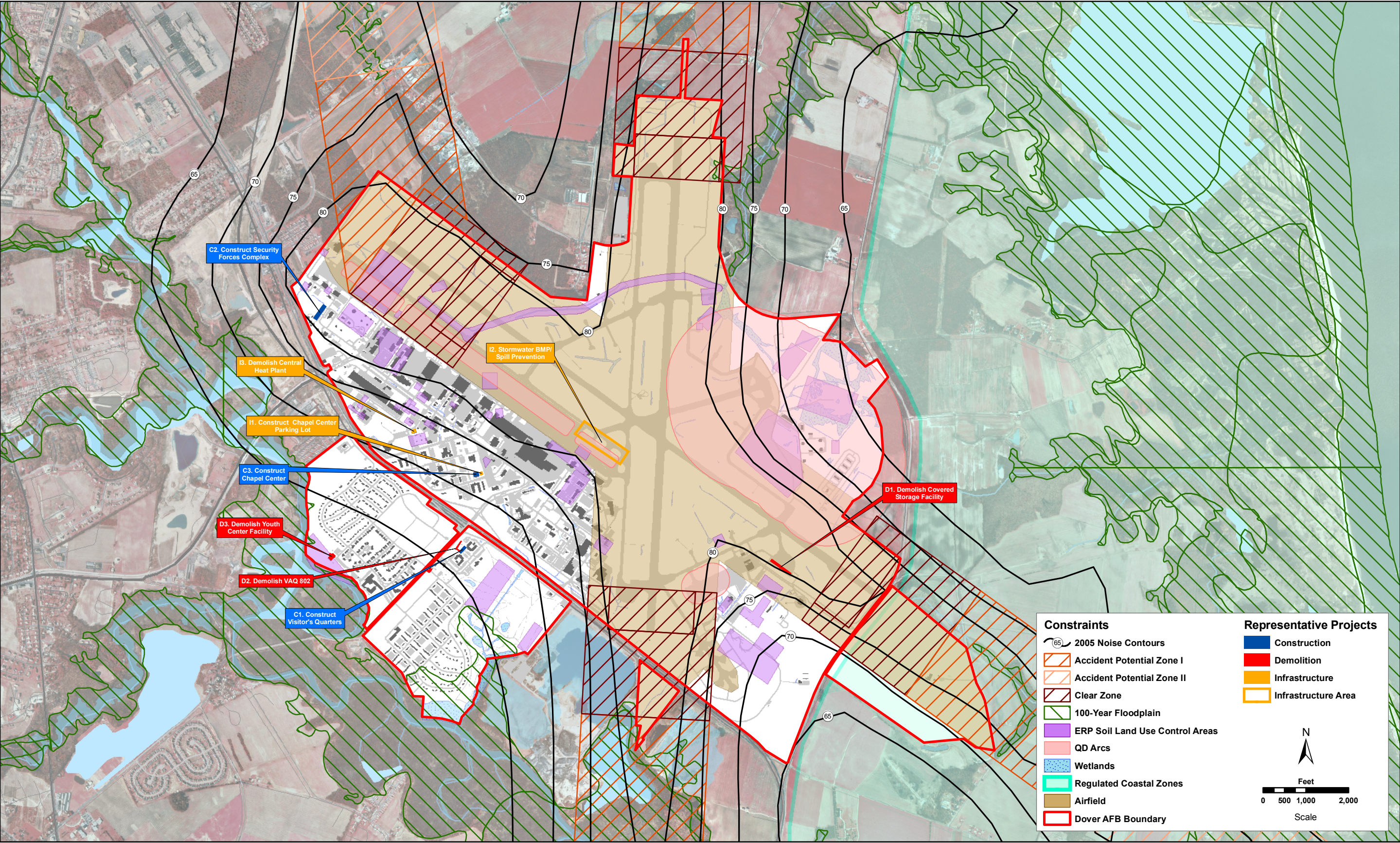




Source of Land Use Data: Dover AFB

Figure 2-1. Dover AFB Existing Land Uses





Source of Project Areas: eM, Inc. 2007

Figure 2-2. Representative Project Locations Relative to Constraints at Dover AFB



The exterior and interior design of the new facilities would follow the design guidelines outlined in the *Air Mobility Command Civil Engineering Squadron Design Guide* and the *Dover AFB Architectural Compatibility Guide*. This guidance helps to ensure a consistent and coherent architectural character throughout Dover AFB. Landscaping would be used to provide an attractive and professional-looking installation by using plants, shrubs, and trees to blend with the surrounding environment. Native vegetation would be used as much as practical. AT/FP measures would be incorporated in accordance with the *Department of Defense Minimum Antiterrorism Standards for Buildings* and the *USAF Installation Force Protection Guide*. All construction would comply with applicable building, fire, and safety codes. The proposed construction projects would be implemented using sustainable design concepts. Sustainable design concepts emphasize state-of-the-art strategies for site development, efficient water and energy use, and improved indoor environmental quality.

All projects identified as part of the Proposed Action in this IDEA would avoid sensitive areas. Proposed locations of each representative project in relation to environmental constraints are shown in **Figure 2-2**. The precise layout and design of these projects are in the early planning stages and, therefore, exact surveyed locations and layouts are not finalized. Should locations and final layouts of the projects differ substantially from those anticipated (in location, layout, or potential environmental consequences), additional environmental analysis would be completed. If it is determined that future projects outside the scope of this IDEA would impact sensitive resources, then separate environmental analysis of those projects would be required.

### 2.1.1 Major Installation Constraints

There are a number of land use, regulatory, and mission-related constraints within the boundaries of Dover AFB that would influence and could limit future development at the installation. The major constraints on Dover AFB are depicted in **Figure 2-2** and discussed in the bulleted list below. The electronic mapping data from Dover AFB's Geographic Information System (GIS) database (also called the GeoBase system) was used to quantify the major known constraints to installation development. The acreages for each constraint were calculated using the assumptions identified by the source notes to this bulleted list and relied on the data from the GeoBase system, unless another source document is indicated. Some constraint areas overlap and therefore the acreages shown do not add up to the total acreage constrained at Dover AFB. The acreage calculations do not include the portions of the constraint areas that extend off the installation.

- **Noise Zones (2,907 acres).** Aircraft operations are a dominant component of the noise environment at Dover AFB. USAF, Federal Aviation Administration (FAA), and the U.S. Department of Housing and Urban Development criteria specify that noise levels in noise-sensitive land use areas are normally considered unacceptable where noise levels exceed a day-night average sound level (DNL) of 65 A-weighted decibels (dBA). Dover AFB restricts development to compatible uses when noise levels exceed a DNL of 65 dBA.
- **Airfield Infrastructure, Airfield Safety Clearances, and Imaginary Surfaces (1,703 acres).** Airfield infrastructure includes runways, overruns, taxiways, aprons, ramps, and hazardous cargo areas. Airfield safety clearances and imaginary surfaces are areas where non-airfield development is constrained or discouraged. The airfield infrastructure, safety clearances, and imaginary surfaces at Dover AFB are based on the USAF Class B airfield design criteria in Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*. Dover AFB has a number of approved airfield and airspace waivers. Permanent waivers must be approved by HQ AMC, whereas temporary construction waivers for less than 12 months can be granted by the Wing Commander (436 AW 2001).

- ***Munitions and Other Safety Criteria (542 acres).*** There are several areas that are constrained for safety reasons at Dover AFB. The quantity-distance (QD) zones at Dover AFB encompass the following areas: explosives storage facilities, hazardous cargo parking, suspect vehicle parking areas, and build-up and pre-load areas. The QD zones range in size from 115-foot to a proposed 1,800-foot radii surrounding individual sites; variations in a QD zone's radius depend upon the type and quantity of explosives. Areas around radiating antennas at Dover AFB have associated electromagnetic field safety zones that must also be avoided during development activities (436 AW 2001).
- ***Environmental Restoration Program (ERP) Soil Land Use Control Areas (230 acres).*** Dover AFB has 59 on-installation ERP sites. Land and groundwater restrictions and controls associated with these 59 ERP sites are documented in the September 2006 *Environmental Appendix to the Base General Plan*. It is HQ AMC policy that construction projects are not normally sited on contaminated ERP sites. In accordance with a 7 January 2004 policy memo entitled *Implementation Policy for Environmental Restoration Program (ERP) Requests for Waiver to Construct*, the installation must obtain HQ AMC approval on a Waiver to Construct, as well as appropriate Federal, state, and local regulatory approval, prior to any construction activities on contaminated ERP sites. Installation development projects must be coordinated with 436th Civil Engineering Squadron/Environmental Flight (436 CES/CEV) to determine project-specific soil and groundwater constraints (Deramo 2006).
- ***Coastal Zones (177 acres).*** All of Dover AFB is within the state's Coastal Zone area; however, only the far eastern portion of the installation lies within the heavily regulated enforcement area. All development within this area is subject to the State Coastal Zone Management Plan (436 AW 2001).
- ***Wetlands (73.2 acres).*** It is USAF policy to avoid constructing new facilities within areas containing wetlands, where practicable. To construct within areas containing wetlands, appropriate permits from county, state, and Federal regulatory agencies must be obtained. In addition, in accordance with EO 11990, a Finding of No Practicable Alternative (FONPA) must be prepared and approved by HQ AMC. There are approximately 73.2 acres of jurisdictional wetlands at Dover AFB (DAFB 2004, USACE 2004). This IDEA does not analyze installation development that would require a FONPA.
- ***100-Year Floodplain (67 acres).*** It is USAF policy to avoid constructing new facilities within the 100-year floodplain in order to protect the functions of floodplains, minimize the potential damage to facilities, and ensure the safety of working personnel. Should construction within the 100-year floodplain be considered, a FONPA must be obtained and the project must be approved by HQ AMC. This IDEA does not analyze installation development that would require a FONPA.
- ***Threatened and Endangered Species and Sensitive Habitats.*** There are no known federally listed threatened and endangered animal or plant species at Dover AFB. However, there are 3 state-endangered species and 14 species of state concern at Dover AFB. Of these species, 6 are Tier 1 and 5 are Tier 2 animal Species of Greatest Conservation Need. See **Section 3.7.2** for additional information.
- ***Cultural Resources, Historic Buildings, and Archeological Sites.*** Dover AFB has many resources that are listed on, eligible for, or potentially eligible for the National Register of Historic Places (NRHP). Dover AFB has one NRHP-listed building, seven potentially NRHP-eligible Cold War era structures, two NRHP-eligible archeological sites (one prehistoric and one historic), three potentially NRHP-eligible archeological sites that are recommended for further evaluation, six NRHP-ineligible archeological sites, and three nonrecorded potential

archeological sites. Activities that would potentially affect cultural resources sites must be coordinated with the State Historic Preservation Office (SHPO)<sup>1</sup>, Facilities Utilization Board (FUB), and 436 CES/CEV.

- **AT/FP Setback Requirements.** Minimum AT/FP design standards for new construction have been specified by the Department of Defense (DOD) and increase the land area required for individual facilities. Design standards for new construction are contained in UFC 4-010-01, *Department of Defense Minimum Antiterrorism Standards for Buildings*, October 2003, and augmented by USAF instructions. The *USAF Force Protection Design Guide*, published by the Air Force Center for Engineering and the Environment, supplements the DOD standards and must also be consulted during the planning and design processes. Dover AFB has numerous existing road, parking, and perimeter setback issues that do not meet current AT/FP standards (436 AW 2001).

As a general practice, Dover AFB would seek to avoid, wherever possible, disturbance to sensitive areas such as wetlands, areas where sensitive species reside, ERP sites, floodplains, and areas designated as historic or culturally sensitive. However, as future mission activities dictate, and due to the expanse of constrained areas on Dover AFB, avoiding or restricting future development within this acreage might not be practical and would limit the installation's ability to successfully accomplish its missions. When these resources cannot be avoided, separate and additional NEPA documentation would occur and coordination with the appropriate regulatory agencies would be completed prior to initiating the action. All construction and other activities that would occur in these areas would comply with the requirements of the various local, state, and Federal policies and regulations that govern such resources.

### 2.1.2 Demolition Projects

Dover AFB proposes eight facility demolition projects, which would disturb an estimated 114,851 ft<sup>2</sup> of land, over the next 5 years to support its future mission requirements (see **Table A-1** in **Appendix A**). These facilities have been deemed too costly to repair or renovate to meet the future mission requirements of Dover AFB. The demolition of these facilities would minimize the area of undisturbed land required for new facilities. **Table 2-1** identifies projects that would be representative of the types of demolition projects proposed for implementation. These demolition projects have been selected for further analysis because they would have the highest potential to impact the natural and man-made environments, and therefore are representative of the upper limits for potential impacts that reasonably could be expected from the other projects in the demolition projects category. All demolition activities would result in air emissions with the larger projects having the greatest potential for impacts. Additionally, the demolition of Covered Storage Facility 1315 would have the potential for safety impacts because it is within the runway lateral clearance area. Potential impacts associated with the demolition of Visiting Airmen's Quarters (VAQ) Facility 802 include noise, traffic, and safety impacts from its proximity to Lebanon Road and the housing area. The demolition of the Youth Center Facility 3499 would have the potential for impacts on noise due to its proximity to the housing area and ERP soil land use controls associated with Site LF26. The locations for these proposed projects in relation to known constraints are shown in **Figure 2-2**.

---

<sup>1</sup> Section 106 consultation with the SHPO under the provisions of the National Historic Preservation Act would occur prior to commencement of site-specific construction or demolition activities. This IDEA is not intended to initiate or be a substitute for formal Section 106 consultations.

**Table 2-1. Representative Demolition Projects**

| <b>Project Identification Number and Title</b> | <b>Fiscal Year</b> | <b>Area Demolished (ft<sup>2</sup>)</b> |
|------------------------------------------------|--------------------|-----------------------------------------|
| D1. Demolish Covered Storage Facility 1315     | 2011               | 49,916                                  |
| D2. Demolish VAQ Facility 802                  | 2008               | 22,984                                  |
| D3. Demolish Youth Center Facility 3499        | 2008               | 17,857                                  |

Note: Demolition of pavements is considered an Infrastructure project.

### 2.1.3 Construction Projects

Dover AFB proposes four facility construction projects, which would disturb an estimated 70,810 ft<sup>2</sup> of land, over the next 5 years to support its future mission requirements and to comply with AT/FP criteria (see **Table A-2** in **Appendix A**). The construction of new facilities would be zoned in accordance with appropriate land use areas in order to continue or enhance compatibility with currently designated land use areas. **Table 2-2** identifies projects that would be representative of the types of construction projects proposed for development. These construction projects have been selected for analysis in the IDEA because they are believed to be representative of the upper range of such projects and would have the highest potential to impact the natural and man-made environments, and therefore are representative of the upper limits for potential impacts that reasonably could be expected from the other projects in the construction projects category. All construction activities would result in air emissions, with the larger projects having the greatest potential for impacts. Potential impacts associated with the construction of Visitor's Quarters include soil impacts due to its large footprint, traffic impacts because of its proximity to Lebanon Road, and safety and noise impacts from its proximity to the housing area. Construction of the Security Forces Complex would have impacts on soil from its large footprint and noise due to its proximity to off-installation housing areas. The construction of the Chapel Center would be expected to have traffic impacts. The proposed locations for these projects in relation to known constraints are shown in **Figure 2-2**.

**Table 2-2. Representative Construction Projects**

| <b>Project Identification Number and Title</b> | <b>Fiscal Year</b> | <b>Area Constructed (ft<sup>2</sup>)</b> |
|------------------------------------------------|--------------------|------------------------------------------|
| C1. Construct Visitor's Quarters               | 2010               | 43,056                                   |
| C2. Construct Security Forces Complex          | 2011               | 39,826                                   |
| C3. Construct Chapel Center                    | 2011               | 13,132                                   |

Note: Construction of pavements is considered an Infrastructure project.

### 2.1.4 Infrastructure Projects

Dover AFB proposes six facility infrastructure projects, which would disturb an estimated 149,478 ft<sup>2</sup> of land, over the next 5 years to support future mission requirements and to comply with AT/FP criteria (see **Table A-3** in **Appendix A**). Facility infrastructure projects include the removal, installation, or upgrades to paved roadways, sidewalks, parking lots, utilities, storm water systems, fences, and recreational facilities. **Table 2-3** identifies projects that are believed to be representative of the types of infrastructure upgrade projects proposed. These representative facility infrastructure projects have been selected for

**Table 2-3. Representative Infrastructure Projects**

| <b>Project Identification Number and Title</b>                          | <b>Fiscal Year</b> | <b>Project Size (ft<sup>2</sup>)</b> |
|-------------------------------------------------------------------------|--------------------|--------------------------------------|
| 11. Construct Chapel Center Parking Lot                                 | 2011               | 43,056                               |
| 12. Storm Water BMP/Spill Prevention at Transient Aircraft Parking Ramp | 2010               | 43,560                               |
| 13. Demolish Central Heat Plant Facility 617                            | 2009               | 16,171                               |

further analysis in the IDEA because they are believed to be representative of the upper range of potential impacts on the natural and man-made environment from such projects and thus frame the upper limits for potential impacts that reasonably could be expected from other projects in the infrastructure category. Most infrastructure projects would require the use of heavy machinery, which would result in air emissions; larger projects would likely have the greatest potential to impact air quality. Construction of the Chapel Center parking lot has the potential for impacts on biological resources and traffic. Potential impacts associated with the storm water best management practice (BMP)/spill prevention at the transient aircraft parking ramp project include impacts on soil, taxiway and runway lateral clearance areas, and QD arcs. The demolition of the Central Heat Plant has the potential for impacts on traffic and hazardous materials. The proposed locations for these projects in relation to known constraints are shown in **Figure 2-2**.

### 2.1.5 Summary of Proposed Activities

As a result of full implementation of the Proposed Action (including all projects identified in **Appendix A**), there would be approximately 126,343 ft<sup>2</sup> of buildings demolished, resulting in a decrease of impervious surface of approximately 114,851 ft<sup>2</sup>. Over the course of the next 5 years, there would be approximately 99,514 ft<sup>2</sup> of new facilities constructed, resulting in an anticipated increase of 70,810 ft<sup>2</sup> of impervious surface (some of the facilities would be multiple levels). Additionally, there would be infrastructure upgrades and improvements. These infrastructure projects would disturb approximately 149,478 ft<sup>2</sup> of area and increase impervious surfaces by approximately 107,296 ft<sup>2</sup>. **Table 2-4** summarizes these anticipated changes.

**Table 2-4. Change in Impervious Surface**

| <b>Project Type</b> | <b>Total Project Area</b>                     | <b>Change in Impervious Surface</b>           |
|---------------------|-----------------------------------------------|-----------------------------------------------|
| Demolition          | 126,343 ft <sup>2</sup>                       | -114,851 ft <sup>2</sup>                      |
| Construction        | 99,514 ft <sup>2</sup>                        | +70,810 ft <sup>2</sup>                       |
| Infrastructure      | 149,478 ft <sup>2</sup>                       | +107,296 ft <sup>2</sup>                      |
| <b>Total</b>        | <b>375,335 ft<sup>2</sup><br/>(8.6 acres)</b> | <b>+63,255 ft<sup>2</sup><br/>(1.5 acres)</b> |

Note:

Change in impervious surface is not necessarily equivalent to the project area square footage because some facilities proposed for demolition are multiple stories, and some new facilities would be multiple stories. Furthermore, some infrastructure projects would include removal of pavements, or would disturb area but not add impervious surfaces.

## **2.2 Alternatives**

During development of the Dover AFB installation development plans and during the project siting phase, alternative locations for construction and infrastructure projects were evaluated and the best possible solution for project siting was selected based on numerous criteria (e.g., functional requirements, collocation of like services, and availability of sites). Based on this evaluation, the proposed locations for each of the construction and infrastructure projects were determined to be optimal (see **Figure 2-2**). With respect to alternatives for the demolition projects, each of these were also evaluated for potential reuse options and none were considered suitable for reuse.

All of the IDEA projects are evaluated individually and cumulatively in this EA to determine if the consequences of implementation would cause substantive impacts on the human and natural environments of Dover AFB and surrounding areas. Subsets of projects, as alternatives, were not carried forward for further independent analysis based on the determination that subsets would not cause any additional impacts beyond that of the Proposed Action.

The individual projects would be prioritized and implemented as funding becomes available. The Proposed Action encompasses all the current priority projects and the analysis describes the specific and cumulative consequences of implementing the IDEA plan. Because project phasing is expected to occur, based on availability of funding, no phasing alternatives were carried forward for independent analysis.

### **2.2.1 Alternative 1 – Acquire Additional Land Surrounding Dover AFB**

Under this alternative, Dover AFB would purchase suitable land outside of its present boundaries to construct some of the facilities needed for future mission requirements. The DOD discourages installations from acquiring more land through purchases. In fact, the DOD is attempting to dispose of many acres of underutilized acreage at many installations in the United States. There are extreme limits to the availability of additional land to the west of the installation due to private development. Additionally, use of the land to the north, south, and east of the installation is curtailed by highways, conservation areas, and waterbodies (436 AW 2001). For these reasons, this alternative is not considered viable and is eliminated from further detailed analysis in the IDEA.

### **2.2.2 Alternative 2 – Lease Additional Facilities in the Surrounding Community**

Under this alternative, Dover AFB would lease office and warehouse space in the surrounding private sector community to house personnel and provide space for mission operations. This alternative would result in an insufficient span of control for the command and control function. The leased facilities would have great limitations in their ability to meet the DOD force protection requirements, resulting in high additional costs or noncompliance with force protection requirements. This alternative is not considered viable and is eliminated from further detailed analysis in the IDEA.

### **2.2.3 No Action Alternative**

CEQ regulations require consideration of the No Action Alternative for all proposed actions. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential alternatives can be compared and is therefore carried forward for evaluation in this IDEA.

Under the No Action Alternative, the 436 AW would not implement the projects proposed in the installation's community of plans. In general, implementation of the No Action Alternative would require



that the 436 AW continue to operate under substandard, inefficient, and, in some cases, unsafe conditions. Under the No Action Alternative, these deficiencies would impair the 436 AW's future ability to successfully conduct their mission.

Through implementation of the No Action Alternative, future installation development projects would continue to be evaluated for potential effects on an individual project basis. The preparation of separate NEPA documents would be required for each project to evaluate potential environmental consequences. This alternative is carried forward for analysis as a baseline against which the impacts of the Proposed Action and potential alternatives can be evaluated.

## **2.3 Decision to be Made and Identification of the Preferred Alternative**

In this IDEA, Dover AFB evaluates whether the Proposed Action would result in any significant impacts. If such impacts are predicted, Dover AFB would provide mitigation to reduce impacts to below the level of significance, undertake the preparation of an EIS addressing the Proposed Action, or abandon the Proposed Action. The EA will also be used to guide Dover AFB in implementing the Proposed Action in a manner consistent with USAF standards for environmental stewardship. The Preferred Alternative for the Proposed Action is set forth in **Section 2.1**.

### 3. Affected Environment

This section describes the environmental and socioeconomic resources and conditions most likely to be affected by the Proposed Action and provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic consequences likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions. 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.

#### 3.1 Noise

##### 3.1.1 Definition of the Resource

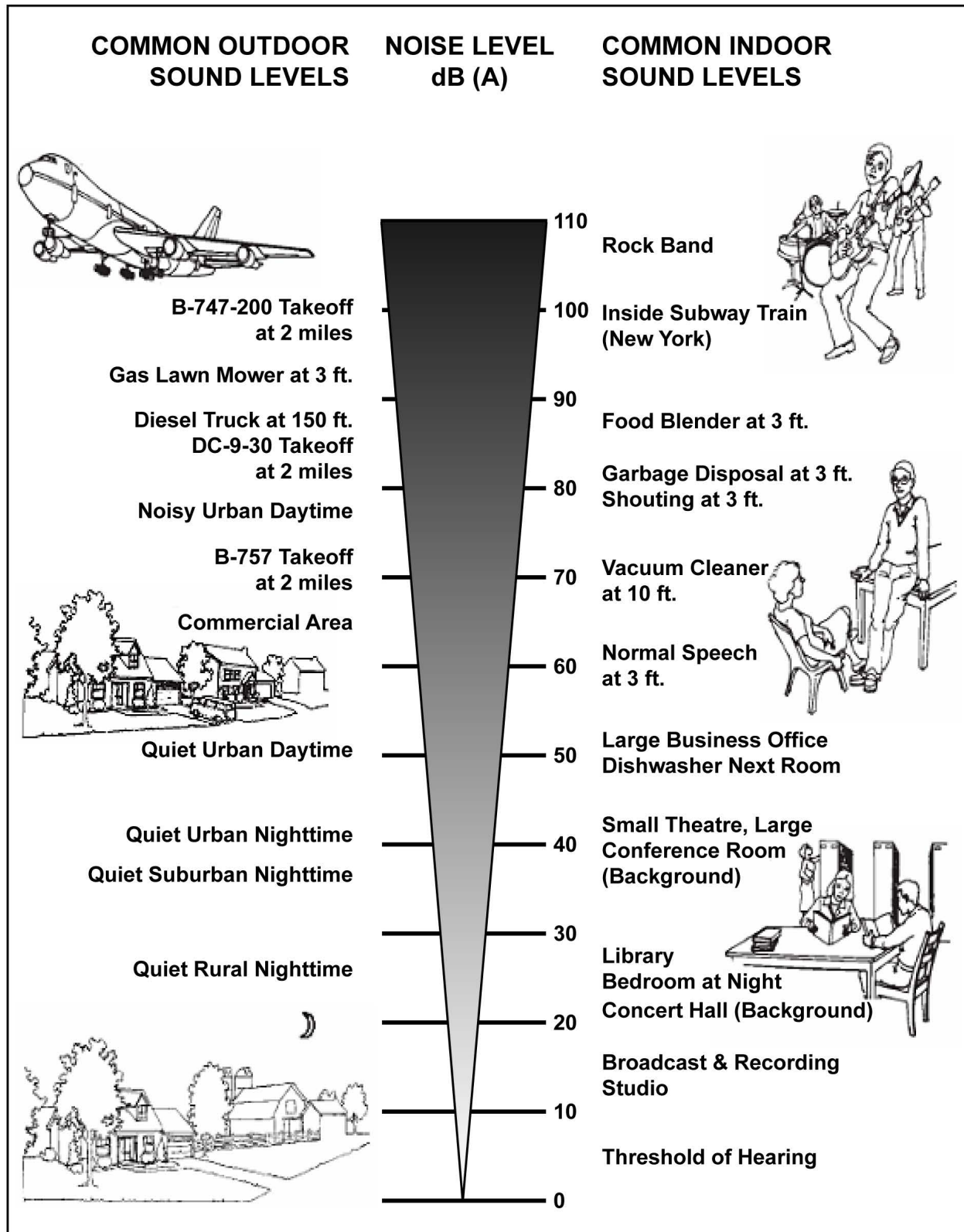
Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to increased noise levels varies according to the source type, characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). dBA are used to characterize sound levels that can be sensed by the human ear. “A-weighted” denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise event. All sound levels analyzed in this EA are A-weighted.

Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis. Noise levels in residential areas vary depending on the housing density and location. As shown in **Figure 3-1**, a normal suburban area is about 55 dBA, which increases to 60 dBA for an urban residential area and 80 dBA in the downtown section of a city.

Noise levels, which result from multiple single-events, are used to characterize community noise effects from aircraft operations and are measured in the DNL. This noise metric incorporates a “penalty” for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure level values for a given 24-hour period. DNL is the preferred noise metric of the U.S. Department of Housing and Urban Development (HUD), FAA, U.S. Environmental Protection Agency (USEPA), and DOD for modeling airport environs.

**Construction Sound Levels.** Building construction, modification, and demolition work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from graders, pavers, trucks, welders, and other work activities and processes. **Table 3-1** lists noise levels associated with common types of construction equipment that are likely to be used under the Proposed Action. These noise levels were predicted for receptors 50 feet from the source of the noise. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.



Source: Landrum &amp; Brown 2002

Figure 3-1. Typical Noise Levels

**Table 3-1. Predicted Noise Levels for Construction Equipment**

| <b>Construction Category and Equipment</b> | <b>Predicted Noise Level at 50 feet (dBA)</b> |
|--------------------------------------------|-----------------------------------------------|
| <b>Grading</b>                             |                                               |
| Bulldozer                                  | 87                                            |
| Grader                                     | 85                                            |
| Water Truck                                | 88                                            |
| <b>Paving</b>                              |                                               |
| Paver                                      | 89                                            |
| Roller                                     | 74                                            |
| <b>Demolition</b>                          |                                               |
| Loader                                     | 85                                            |
| Haul Truck                                 | 88                                            |
| Backhoe                                    | 83                                            |
| <b>Building Construction</b>               |                                               |
| Generator Saw                              | 81                                            |
| Industrial Saw                             | 83                                            |
| Welder                                     | 74                                            |
| Truck                                      | 80                                            |
| Forklift                                   | 67                                            |
| Crane                                      | 83                                            |

Source: COL 2001

### 3.1.2 Existing Conditions

The ambient noise environment around Dover AFB is affected mainly by automobile traffic and aircraft operations. Dover AFB is 2 miles south of the city of Dover.

Principal routes that define the base boundary include South Little Creek Road, State Route (SR) 9, and SR 1/U.S. Route (US) 113. SR 9 runs north and south and travels along the eastern boundary of Dover AFB. SR 1/US 113 runs northwest and southeast through Dover AFB. SR 10 travels east and west and provides entry to the installation via the North Gate.

Aircraft operations at Dover AFB are the largest contributor to the ambient noise environment around the installation. An Air Installation Compatible Use Zone (AICUZ) study was completed for Dover AFB in December 2005 (HQ AMC 2005). Existing property within the land area associated with the DNL noise levels of 65 to 80+ dBA encompasses 2,907 acres on-installation property and 17,900 acres on- and off-installation property. Noise contours associated with the aircraft operations at Dover AFB extend north, southeast, and south of the airfield. Noise-abatement procedures at the installation include modified flight tracks to reduce noise northwest of the airfield and procedures advising pilots to avoid, to the maximum extent possible, flying over beach towns, the Town of Little Creek, and various housing units (HQ AMC 2005).

## 3.2 Land Use

### 3.2.1 Definition of the Resource

The term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, “labels,” and definitions vary among jurisdictions.

Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its “permanence.”

### 3.2.2 Existing Conditions

**On Installation.** Dover AFB is partially within the corporate limits of the city of Dover and unincorporated areas of Kent County, Delaware. Land uses on Dover AFB are divided by SR 1/US 113. Areas north and east of SR 1/US 113 include the airfield and the main base cantonment area. Open space, recreational areas, and limited amounts of industrial uses are east of the airfield. The land uses west of the airfield and east of SR 1/US 113 are industrial, airfield operations, administrative, community, medical, and some unaccompanied personnel housing (436 AW 2001). Areas southwest of SR 1/US 113 include the former Eagle Heights Military Family Housing (MFH), temporary lodging quarters, the Eagle Creek Golf Course, and installation lodging facilities.

Existing land use categories (not including water) at Dover AFB have been defined as Administrative, Aircraft Operations and Maintenance, Community (Commercial), Community (Service), Housing (Family), Housing (Unaccompanied), Industrial, Medical, Open Space, Outdoor Recreation, and Runway/Taxiway/Apron (436 AW 2001). **Figure 2-1** shows the existing land uses at Dover AFB.

**Off Installation.** Dover AFB was established in a relatively undeveloped area in Kent County. However, development and outward growth of the city of Dover have encroached upon the installation. Land uses surrounding the installation are largely commercial and industrial, and areas to the north, south, and east of the installation are largely agricultural and conservation areas. Dover AFB and Kent County are active in helping to preserve compatible uses adjacent to the installation. The Delaware Farmland preservation law has helped preserve farmland adjacent to the installation, and Kent County has passed a zoning ordinance to help ensure compatibility with aircraft use on-installation and off-installation. Some residential pockets exist in the municipalities of Magnolia, Frederica, Little Creek, and Bowers Beach.

According to the 2005 noise analysis, there are three incompatible land uses that border Dover AFB property (HQ AMC 2005). These areas are north and northwest of Dover AFB property.

**Coastal Zone Management.** According to the State of Delaware's Coastal Zone Management Plan, the entire state falls within the state's Coastal Zone area (436 AW 2001). However, the portion of the state where coastal regulations are strictly enforced lies east of SR 9. Currently, only the far eastern portion of the installation lies within the heavily regulated coastal zone enforcement area, as shown on **Figure 2-2**.

### 3.3 Air Quality

#### 3.3.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ), or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone ( $\text{O}_3$ ), carbon monoxide (CO), nitrogen dioxide ( $\text{NO}_2$ ), sulfur dioxide ( $\text{SO}_2$ ), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [ $\text{PM}_{10}$ ] and particulate matter equal to or less than 2.5 microns in diameter [ $\text{PM}_{2.5}$ ]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety, to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-2** presents the primary and secondary USEPA NAAQS and state Ambient Air Quality Standards (AAQS) (USEPA 2007a). The State of Delaware has the same primary and secondary AAQS as the Federal NAAQS for the six criteria pollutants. However, the State of Delaware has added AAQS for hydrocarbons and hydrogen sulfide.

Although  $\text{O}_3$  is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because  $\text{O}_3$  is typically not emitted directly from most emissions sources. Ozone is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or " $\text{O}_3$  precursors." These  $\text{O}_3$  precursors consist primarily of nitrogen oxides ( $\text{NO}_x$ ) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric  $\text{O}_3$  concentrations by controlling VOC pollutants (also identified as reactive organic gases) and  $\text{NO}_2$ .

As authorized by the CAA, USEPA has delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all

**Table 3-2. National and State Ambient Air Quality Standards**

| Pollutant                           | Standard Value |                            | Standard Type         |
|-------------------------------------|----------------|----------------------------|-----------------------|
| CO                                  |                |                            |                       |
| 8-hour Average <sup>a</sup>         | 9 ppm          | (10 mg/m <sup>3</sup> )    | Primary and Secondary |
| 1-hour Average <sup>a</sup>         | 35 ppm         | (40 mg/m <sup>3</sup> )    | Primary               |
| NO <sub>2</sub>                     |                |                            |                       |
| Annual Arithmetic Mean              | 0.053 ppm      | (100 µg/m <sup>3</sup> )   | Primary and Secondary |
| O <sub>3</sub>                      |                |                            |                       |
| 8-hour Average <sup>b</sup>         | 0.08 ppm       | (157 µg/m <sup>3</sup> )   | Primary and Secondary |
| 1-hour Average <sup>c</sup>         | 0.12 ppm       | (240 µg/m <sup>3</sup> )   | Primary and Secondary |
| Pb                                  |                |                            |                       |
| Quarterly Average                   |                | 1.5 µg/m <sup>3</sup>      | Primary and Secondary |
| PM <sub>10</sub>                    |                |                            |                       |
| 24-hour Average <sup>a</sup>        |                | 150 µg/m <sup>3</sup>      | Primary and Secondary |
| PM <sub>2.5</sub>                   |                |                            |                       |
| Annual Arithmetic Mean <sup>d</sup> |                | 15 µg/m <sup>3</sup>       | Primary and Secondary |
| 24-hour Average <sup>e</sup>        |                | 35 µg/m <sup>3</sup>       | Primary and Secondary |
| SO <sub>2</sub>                     |                |                            |                       |
| Annual Arithmetic Mean              | 0.03 ppm       | (80 µg/m <sup>3</sup> )    | Primary               |
| 24-hour Average <sup>a</sup>        | 0.14 ppm       | (365 µg/m <sup>3</sup> )   | Primary               |
| 3-hour Average <sup>a</sup>         | 0.5 ppm        | (1,300 µg/m <sup>3</sup> ) | Secondary             |
| Hydrocarbons                        |                |                            |                       |
| 3-hour period (0600—0900)           | 0.24 ppm       | 160 µg/m <sup>3</sup>      | State Primary         |
| Hydrogen Sulfide                    |                |                            |                       |
| 3 minutes                           | 0.06 ppm       | --                         | State Primary         |
| 60 minutes                          | 0.03 ppm       | --                         | State Primary         |

Sources: USEPA 2007a and DNREC Regulation No. 3

Notes: Parenthetical values are approximate equivalent concentrations.

<sup>a</sup> Not to be exceeded more than once per year on average over 3 years.

<sup>b</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

<sup>c</sup> (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

<sup>d</sup> To attain this standard, the 3-year average of the annual arithmetic mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

<sup>e</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup>.

NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.



In 1997, USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour O<sub>3</sub>, PM<sub>2.5</sub>, and regional haze standards that were promulgated in that year. The 1-hour O<sub>3</sub> standard will no longer apply to an area 1 year after the effective date of the designation of that area for the 8-hour O<sub>3</sub> NAAQS. The effective designation date for most areas was June 15, 2004. USEPA designated PM<sub>2.5</sub> nonattainment areas in December 2004, and finalized the PM<sub>2.5</sub> implementation rule in January 2005. Only New Castle County, Delaware, was identified as being nonattainment for the PM<sub>2.5</sub> standard.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General 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 presented in 40 CFR 93.153. An action is regionally significant when the total nonattainment pollutant emissions exceed 10 percent of the Air Quality Control Region’s (AQCR) total emissions inventory for that nonattainment pollutant. If a Federal action does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, base, or activity) that can emit more than 100 tons per year (tpy) of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. However, lower pollutant-specific “major source” permitting thresholds apply in nonattainment areas. For example, the Title V permitting threshold for an “extreme” O<sub>3</sub> nonattainment area is 10 tpy of potential VOC or NO<sub>x</sub> emissions. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be “significant” if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 µg/m<sup>3</sup> or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area’s baseline air contaminant concentrations, based on the area’s designation as Class I, II, or III [40 CFR 52.21(c)]. Because Dover AFB is not within 10 kilometers of a Class I area, PSD regulations do not apply and are not discussed further in this EA.

### 3.3.2 Existing Conditions

Dover AFB is within Kent County, Delaware. Kent County is within the Southern Delaware Intrastate Air Quality Control Region (SDIAQCR). The SDIAQCR consists of the counties of Kent and Sussex, Delaware. The SDIAQCR, including Dover AFB, is classified as being in a moderate nonattainment area for 8-hour O<sub>3</sub> and in attainment with all criteria pollutants (USEPA 2004).

The Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Air and Waste Management is responsible for implementation of the CAA and has adopted the Federal primary and secondary NAAQS. DNREC has developed a USEPA-approved SIP and works with Dover AFB in monitoring and implementing the installation’s stationary source permits and emissions

inventory. As required by DNREC permitting requirements, Dover AFB routinely calculates annual criteria pollutant emissions from stationary emissions sources and provides this information to the state on a yearly basis. However, there is no routine requirement to calculate pollutant emissions for aircraft operations, government-owned and privately owned vehicles (GOVs and POVs), aircraft engine testing, aerospace ground equipment (AGE), and other sources of emissions not included in the state's stationary source permitting program. The purpose of this annual emissions inventory is to estimate and document air pollutant emissions from stationary sources. Stationary source categories include external combustion sources, internal combustion sources, fuel transfer/dispensing, storage tanks, surface coating operations, degreasers/solvent cleaners, aircraft fuel cell maintenance, off-aircraft engine testing, miscellaneous chemical usage, and dust collectors.

Dover AFB is classified as a major source and has been issued a Title V permit (AQM-001/00001) (DNREC 2005). There are various stationary combustion sources on installation that have the potential to emit, including the installation's boilers and generators. VOCs are emitted primarily from handling of organic liquids (i.e., refueling activities). Miscellaneous particulate matter sources at Dover AFB include abrasive blasting units and woodworking equipment (DNREC 2005). Other stationary sources of emissions at Dover AFB include paint booths, wash racks, and the Corrosion Control Facility.

The Dover AFB's annual emissions for Calendar Year 2005 from stationary and area sources are shown in **Table 3-3**. Dover AFB does not track emissions from mobile sources.

**Table 3-3. Annual Stationary and Area Source Emissions for Dover AFB (2005)**

| Year                                     | NO <sub>x</sub><br>(tpy) | VOC<br>(tpy) | SO <sub>x</sub><br>(tpy) | CO<br>(tpy) | PM <sub>10</sub><br>(tpy) |
|------------------------------------------|--------------------------|--------------|--------------------------|-------------|---------------------------|
| 2005                                     | 63.713                   | 33.941       | 14.171                   | 26.490      | 1.598                     |
| Delaware Title V<br>Permitting Threshold | 100                      | 100          | 100                      | 100         | 100                       |

Source: DAFB 2006a

Key: tpy = tons per year

## 3.4 Safety

### 3.4.1 Definition of the Resource

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

Construction site safety is largely 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 (OSHA) 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.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with a potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

### 3.4.2 Existing Conditions

**Construction Site Safety.** Demolition, construction, and infrastructure upgrade projects are a continuing activity on Dover AFB. All contractors performing construction activities are responsible for following ground safety and OSHA regulations and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of Material Safety Data Sheets (MSDSs). Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work.

**Explosive Safety.** Explosive safety QD zones are designated areas designed to safeguard the installation population and civilian community from potential explosions. The QD zones at Dover AFB encompass explosives storage facilities, hazardous cargo parking areas, suspect vehicle parking areas, and build-up and pre-load areas. The installation's QD zones are primarily located east of the flightline, away from the main cantonment area, and cover a significant portion of the airfield and adjacent lands (see **Figure 2-2**). The existing land uses in the QD zones are mission-necessary functions generally consisting of industrial and maintenance operations. The QD zones range in size from 115-foot to a proposed 1,800-foot radii surrounding individual sites (436 AW 2001).

**Airfield Safety.** The USAF has established standards to define airfield safety clearances and imaginary surfaces for navigational airspace surrounding the airfield. These standards identify additional criteria that control development within these areas. Applicable airfield safety clearance criteria and imaginary surfaces at Dover AFB are based on the USAF Class B airfield design criteria in UFC 3-260-01, *Airfield and Heliport Planning and Design*. UFC 3-260-01 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/departure clearance surfaces. Selected airfield safety clearance areas are presented in **Figure 2-2**. Dover AFB has several approved airfield and airspace waivers (436 AW 2001).

## 3.5 Geological Resources

### 3.5.1 Definition of the Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography, geology, soils, and, where applicable, geologic hazards and paleontology.

Topography is defined as the relative positions and elevations of the natural 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, and physiographic features (i.e., mountains, ravines, or depressions).

Geology typically consists 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), topography, and soil stability.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act of 1981 (7 U.S.C. 4201–4209). It is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the Farmland Protection Policy Act is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Farmland Protection Policy Act also ensures that Federal programs are administered in a manner that, to the extent practicable, is compatible with private, state, and local government programs and policies to protect farmland. The Natural Resources Conservation Service (NRCS) is responsible for overseeing compliance with the Farmland Protection Policy Act and has developed the rules and regulations for implementation of the act (7 CFR Part 658).

### 3.5.2 Existing Conditions

**Topography.** Dover AFB is entirely within the Atlantic Coastal Plain Physiographic province. 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 northwestern portion of the installation, in the vicinity of Buildings 919 and 946. The Dover AFB airfield elevation is approximately 30 feet above MSL (436 SPTG/CEV 2001).

**Geology.** 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 underlies the Atlantic Coastal Plain (436 SPTG/CEV 2001). The near-surface geologic layers that underlie Dover AFB, from youngest to

oldest, are recent sediments, the Pleistocene Columbia Formation (which contains only the Calvert Formation in this area), the Miocene Chesapeake Group, and the Eocene Piney Point Formation. The Columbia Formation consists of fluvial deposits and is the dominant surficial formation in Delaware. The Calvert Formation consists of three silty layers (known as the upper, middle, and lower units) that are separated by two sand layers (known as the upper and lower sands). The Piney Point Formation consists of fine to medium glauconitic (from the mica group) sand with shells (436 SPTG/CEV 2001). The Tertiary Rancocas Formation (glauconitic sand and silt) lies beneath the Piney Point Formation, followed by Cretaceous sands, silts, and clays. These layers are not exposed.

**Soils.** Specific soil types have not been identified at Dover AFB. However, a 2001 soil survey provides descriptions of the three soil associations that are found on the installation: Sassafras/Fallsington, Othello-Metapeake-Mattapex, and Tidal Marsh (436 AW 2001). However, because of a history of extensive construction-related soil disturbances, the exact nature of existing soil types on many parts of the installation is not known and would likely be characterized as “Urban Complex.”

The Sassafras/Fallsington Association composes approximately 50 percent of the soils at Dover AFB and lies primarily in the main installation area. This association is 60 percent Sassafras soils and 25 percent Fallsington soils, which have the following characteristics:

- *Sassafras Soils* – well-drained and generally level to gently sloping, few limitations for development
- *Fallsington Soils* – moderately erodible, poorly drained with a water table at or near the surface for most of the year, severely limited as building sites.

The Othello-Metapeake-Mattapex Association composes approximately 40 percent of the installation and lies mainly in the northeastern portion of the installation. This association is 10 percent minor soils, 40 percent Othello soils, 35 percent Metapeake soils, and 15 percent Mattapex soils, which have the following characteristics:

- *Othello Soils* – poorly drained, development is constrained
- *Metapeake soils* – well-drained, few limitations for development
- *Mattapex soils* – moderately well-drained, slight to moderate development limitations associated with excessive wetness or dryness.

Approximately 10 percent of the installation is covered by the Tidal Marsh Association. These soils are found on the floodplain of the St. Jones River along the southern installation boundary and in the tidal flat where the Port Mahon Petroleum, Oil, and Lubricants (POL) Annex is located. These soils consist of organic silts, clays, and peats; are regularly subject to flooding by saltwater; and are not suited for development (436 SPTG/CEV 2001).

Some of the soils within the Metapeake, Mattapex, Sassafras, Fallsington, and Othello series are prime farmland soil or farmland soils of statewide importance. However, a letter from the U.S. Department of Agriculture, Soil Conservation Service, dated 12 March 1982, notes that all land within Dover AFB, as it existed in 1982, is urban land and does not contain prime farmlands. The letter also notes that any existing farmland that is added to Dover AFB in the future, after 12 March 1982, could be prime farmland (USDA-SCS 1982).

## 3.6 Water Resources

### 3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

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

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 is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Storm water flows, which can be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to the management of surface water. Storm water systems convey storm water runoff away from developed sites to appropriate receiving surface waters. Various systems and devices might be used to slow the movement of water. For instance, a large, sudden flow could scour a streambed and harm biological resources. Storm water systems provide the benefit of reducing sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding. Higher densities of development, such as those found in urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban areas.

The Clean Water Act (CWA) (33 U.S.C. 1251 et seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters to restore and maintain the chemical, physical, and biological integrity of the water. An NPDES permit is required for any change in the quality or quantity of wastewater discharge or storm water runoff from construction sites where 1 or more acres would be disturbed. Section 404 of the CWA regulates the discharge of fill material into waters of the United States.

DNREC serves as the umbrella agency for administering the state's NPDES storm water management program under the Delaware Sediment and Stormwater Law (Delaware Code [Del. C.], Chapter 40, Title 7, et seq.) and regulations. DNREC is responsible for plan review and inspection of state and Federal projects. Delaware's storm water program includes the following components:

- Sediment control during construction and post-construction
- Storm water quantity
- Water quality control.

A project proponent is required to submit, obtain approval, and implement a Sediment and Stormwater Plan if it meets or exceeds 5,000 ft<sup>2</sup> of land disturbance. The plan would control storm water from the time construction begins through the project's lifespan, in order to prevent existing flooding or water quality from worsening.

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Such lands might 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 (FEMA), which defines the 100-year floodplain. The 100-year floodplain is the area that has a one percent or greater chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk from flooding to be located in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988. The process is outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*. As a planning tool, the NEPA process incorporates floodplain management through analysis and through coordination with applicable regulatory agencies that will review this EA.

### 3.6.2 Existing Conditions

**Surface Water.** The primary water features at Dover AFB include an unnamed stream that crosses the golf course and drains into the St. Jones River, three ponds on the golf course, and another pond south of the Bergold house (436 AW 2001). The St. Jones River flows along the southern boundary of the installation. The Little River flows through the northern portion of the installation. A drainage system consisting of ditches and belowground pipes diverts surface water runoff from the installation into these two rivers (436 SPTG/CEV 2001).

Storm water runoff is discharged into the Dover AFB drainage network, which is composed 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 installation at several key locations. Installation property situated near 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 installation, in the vicinity of the ammunition storage area, drains to the Lewis Ditch. The remainder of the installation 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 (436 SPTG/CEV 2001).

Dover AFB received a site-specific NPDES permit in January 2005 and developed a Storm Water Pollution Prevention Plan (SWPPP) in November 2005. The NPDES permit includes provisions for storm water control planning, characterization, monitoring, and reporting for specific industrial sectors. The SWPPP controls storm water through an active management plan that includes good housekeeping practices, preventative maintenance, sediment and erosion control, and spill prevention (436 CES/CEV 2005).

**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 (436 SPTG/CEV 2001). The water supply of the installation is drawn from the Cheswold Aquifer. Currently, groundwater contamination at Dover AFB is confined to the Columbia Aquifer, which is not used for drinking water (436 AW 2001).

**Floodplains.** Areas of Dover AFB that lie within the 100-year floodplain are on the golf course along the unnamed drainage into the St. Jones River and immediately along the river where it borders Dover AFB (436 AW 2001).

## 3.7 Biological Resources

### 3.7.1 Definition of the Resource

Biological resources include wildlife (fauna), vegetation (flora), and the ecosystems in which these resources occur. Specific concerns relating to biological resources consist of declines in species diversity, impacts on threatened and endangered species, and degradation of wetlands and riparian zones.

**Vegetation and Wildlife.** Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist.

**Protected and Sensitive Species.** Sensitive and protected biological resources include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat; species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

The Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure an action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species, unless the agency has been granted an exception. The Secretary of the Interior, using the best available scientific data, determines which species are officially threatened or endangered.

Delaware prohibits the importation, transportation, possession, or sale of any part, of an endangered species of fish or wildlife. The only lawful way to take an endangered species is by a license or permit from the Division of Fish and Wildlife and violation of this statute is a Class A environmental misdemeanor (7 Del. C. §§ 601 – 605).

**Wetlands.** Wetlands are an important natural system and habitat 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 erosion protection. Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the CWA. The term “waters of the United States” has a broad meaning under the CWA and incorporates deepwater 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 Part 328).

The USACE is responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. The USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. The NRCS has developed procedures for identifying wetlands for

compliance with the Food Security Act of 1985, and the National Wetlands Inventory (NWI) has developed a classification system for identifying wetlands. Through the NWI, the USFWS is the principal Federal agency that provides information to the public on the extent and status of wetlands.

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. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

### 3.7.2 Existing Conditions

**Vegetation.** Historic agricultural practices, vegetation management, and development have altered the vegetation at the installation. 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 and Endangered Species Program (DNHESP) in 1993 and was supplemented in 1998 (436 SPTG/CEV 2001). These surveys identified several areas on the installation that continue to support native vegetation. However, 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 of limited extent situated near MFH and the golf course, and on the eastern side of the installation (436 AW 2001).

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 (*Pinus virginiana*), tulip tree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), a number of hickory species (*Carya* spp.), and several species of oaks (*Quercus* spp.). Poorly drained and lowland areas were dominated by species such as sweetgum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), 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*) (436 AW 2001).

Prior to establishment of the installation, 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 might exist east of the hazardous cargo storage area (436 AW 2001).

**Wildlife.** Because Dover AFB is extensively developed and natural habitat is degraded, wildlife abundance and diversity are low. Most wildlife that occurs at Dover AFB is adapted to a suburban and urban environment. A 1990–1991 wildlife survey recorded 45 species of fish (22 freshwater species and 23 tidal species), 51 species of birds (23 neotropical migrants), and 9 species of butterflies. Pest species include mosquitoes (Family: Culcidae), groundhog (*Marmota monax*), skunk (*Mephitis mephitis*), fox (*Vulpes vulpes*, *Urocyon cinereoargenteus*), deer (*Odocoileus virginianus*), Canada geese (*Branta canadensis*), gulls (Family: Laridae), and pigeons (*Columba livia*) (436 AW 2001).

Sections of the St. Jones River bordering Dover AFB provide suitable habitat for fish such as striped killifish (*Fundulus majalis*), brown bullhead (*Ictalurus nebulosus*), carp (*Cyprinus carpio*), pumpkinseed (*Lepomis gibbosus*), and American eel (*Anguilla rostrata*). The river and Pipe Elm Branch also provide habitat for amphibians and reptiles such as bullfrog (*Rana catesbeiana*), northern water snake (*Nerodia sipedon*), and common snapping turtle (*Chelydra serpentina*); mammals such as muskrat (*Ondatra*

*zibethicus*); and birds such as green heron (*Butorides striatus*) and belted kingfisher (*Ceryle alcyon*). Additionally, salt marsh areas along the St. Jones River can provide habitat for sharp-tailed sparrow (*Ammodramus caudacuta*) or seaside sparrow (*A. maritima*) (436 AW 2001).

Areas of open water ponds, freshwater marshes, wet meadows, swales, and drainages provide appropriate habitats for species such as southern leopard frog (*Rana utricularia*), spring peeper (*Pseudacris crucifer*), painted turtle (*Chrysemys picta*), muskrat, beaver (*Castor canadensis*), willow flycatcher (*Empidonax traillii*), common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*) (436 AW 2001).

Upland meadow and grassland habitats, including airfield areas, provide breeding habitat for common species such as American toad (*Bufo americanus*), eastern garter snake (*Thamnophis sirtalis*), eastern cottontail (*Sylvilagus floridanus*), eastern meadowlark (*Sturnella magna*), and grasshopper sparrow (*Ammodramus savannarum*) (436 AW 2001).

Woodland habitat is highly fragmented on Dover AFB. Wildlife species that are adaptable to small and degraded wooded areas and that could occur on the installation, include gray treefrog (*Hyla versicolor*), gray squirrel (*Sciurus carolinensis*), downy woodpecker (*Picoides pubescens*), eastern pewee (*Contopus virens*), and Carolina chickadee (*Parus caroliniana*) (436 AW 2001).

**Wetlands.** The 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 installation—areas within and immediately adjacent to Pipe Elm Branch in the northeastern portion of the installation, around 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 the DNHESP 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 (436 AW 2001).

An additional installationwide jurisdictional wetland delineation was performed in 1998 that included a background evaluation of soils, vegetation, hydrology, land use history, and an onsite wetland survey using methodology described in the *USACE Wetland Delineation Manual* (USACE 1987). The 1998 wetland delineation identified 120 wetlands that totaled 74.11 acres of regulated waters (436 AW 2001, DAFB 2004). A 2003/2004 jurisdictional wetland delineation determined that ten of those wetlands were no longer exhibiting required wetland characteristics and were eliminated. Forty additional wetlands were eliminated because they are isolated features. The 2003/2004 delineation identified 78 wetlands that totaled 73.2 acres (DAFB 2004).

**Threatened and Endangered Species.** No federally threatened or endangered species occur at Dover AFB. In 2006, Dover AFB was determined to be a Category II installation under the Sikes Act (32 CFR 190.7[B][3][h][2]) based on the known inventory information on rare, threatened, and endangered species; unique natural communities; and other significant natural resources (DNREC-DFW 2006). As such, Dover AFB is not required to maintain an Integrated Natural Resources Management Plan.

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 and have also been identified at Dover AFB (436 SPTG/CEV 2001).

Species of state concern that have been identified at Dover AFB are the eastern meadowlark (*Sturnella magna*), bobolink (*Dolichonyx oryzivorus*), fourspine stickleback (*Apeltes quadratus*), mud sunfish (*Acantharcus pomotis*), green frog-fruit (*Phylla lanceolata*), and hyssop-leaf hedge-nettle (*Stachys hyssopifolia*); however, the green frog-fruit and the hyssop-leaf hedge-nettle are no longer considered extant at Dover AFB (DNHESP 2007). 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 state concern species for breeding only and have been identified at Dover AFB (436 SPTG/CEV 2001).

In 2007, the state of Delaware implemented the *Delaware Wildlife Action Plan 2007–2017*, a comprehensive strategy for conserving the full array of native wildlife and habitats, common and uncommon, as vital components of the state's natural resources (DNHESP 2006). The plan is not meant to replace the DNHESP's ranking and cataloging of Delaware's rare species, but to complement it. The *Delaware Wildlife Action Plan* Species of Greatest Conservation Need list is based on DNHESP species' ranks. Under the *Delaware Wildlife Action Plan*, the upland sandpiper, northern harrier, short-eared owl, mud sunfish, American redstart, and broad-winged hawk are Tier 1 species and bobolink, fourspine stickleback, bank swallow, great blue heron, and black vulture are Tier 2 species. Tier 1 species are those that are most in need of conservation action in order to sustain or restore their populations. Tier 2 species are also in need of conservation action, although not with the urgency of Tier 1 species (DNHESP 2006).

## 3.8 Cultural Resources

### 3.8.1 Definition of the Resource

Cultural resources is an umbrella term for many heritage-related resources, including prehistoric and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on the condition and historic use, such resources might provide insight into the cultural practices of previous civilizations or they might retain cultural and religious significance to modern groups.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) (1990). NAGPRA requires consultation with interested Native American tribes for the disposition of human remains and artifacts recovered from archeological sites.

Typically, cultural resources are subdivided into archeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing), architectural resources (buildings or other structures or groups of structures), or resources of traditional, religious, or cultural significance to Native American tribes.

Archeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles).

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

for the NRHP. More recent structures, such as Cold War-era resources, might warrant protection if they are of exceptional importance or if they have the potential to gain significance in the future.

Resources of traditional, religious, or cultural significance to Native American tribes can include archeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans consider essential for the preservation of traditional culture.

The EA process and the consultation process prescribed in Section 106 of the NHPA require an assessment of the potential impact of an undertaking on historic properties that are within the proposed project's Area of Potential Effect (APE), which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to locate and inventory all resources under their purview that are recommended as eligible for inclusion in the NRHP on owned, leased, or managed property. In accordance with EO 12372, *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects of an undertaking on historic properties are presented to the SHPO.

### **3.8.2 Existing Conditions**

***Regional Prehistory and History.*** A summary of the regional prehistory and history of the area surrounding Dover AFB can be found in Sections 3.1.1 and 3.1.2 of the Integrated Cultural Resources Management Plan (ICRMP) for Dover AFB (DAFB 2006b).

***Installation History.*** The history of Dover AFB began in 1940 when the city of Dover started construction of a public airport on a 587-acre agricultural area 3.5 miles southeast of the city. Construction ceased because of lack of funds after two runways were completed. On 17 December 1941, the U.S. Government leased the airport from the city of Dover to create Dover Army Airfield, and the airfield was assigned to the Eastern Defense Command.

In 1942, runways were modified to accommodate heavier aircraft and the 39th Bombardment Squadron was subsequently stationed at the airfield to conduct antisubmarine patrols. In February 1943, runway and apron construction was completed and, in August of the same year, the airfield was reopened under the First Air Force as a training location for P-47 fighter pilots. The airfield also became the site for the development of air-launched rockets, which were later identified as of key importance in bringing World War II to a close.

After World War II, the airfield was deactivated. It was reopened in 1951, assigned to the Air Defense Command, and renamed Dover AFB. On 1 April 1952, the Military Air Transport Service (MATs) assumed command of the installation, and Dover became the home of the MATs Atlantic Division and the 1607th Air Transport Wing. Dover AFB remained a MATs installation until 1966 when the 1607th was redesignated the 436th Military Airlift Wing (436 MAW) under Military Airlift Command.

In 1991, the 436th MAW was redesignated the 436 AW and, in 1992, Military Airlift Command was redesignated as AMC. Besides the 436 AW, Dover AFB is home to the 512th Airlift Wing Reserve and, together, the two units form the "Dover Team." The Dover Team provides the airlift of troops, cargo, military equipment, and passengers; and participates in airland and airdrop of troops and supplies for augmented tactical forces.

Numerous tenant units are stationed at Dover AFB and include the Air Force Office of Special Investigations Detachment 306; the U.S. Army Escort Detachment; the Civil Engineering Maintenance,

Inspection, and Repair Team; the Armstrong Laboratory Groundwater Remediation Field Laboratory; the Defense Reutilization and Marketing Office; Defense Courier Service Station Dover; the Civil Air Patrol; and the Army Air Force Exchange Service (436 SPTG/CEV 2001).

**Status of Archeological Investigations.** Since 1965, there have been numerous archeological investigations at Dover AFB, including several basewide surveys and predictive models (DAFB 2006b). The installation Cultural Resources Manager reports that these surveys have completed Dover AFB's requirements for archeological inventory under Section 110 of the NHPA (Benner 2007a). Survey results have been sent to the SHPO for review and concurrence; however, in several instances, no official reply has been provided to Dover AFB from the SHPO. The lack of communication from the SHPO has been documented by Dover AFB and, in lieu of any correspondence to the contrary, concurrence with survey recommendations has been presumed.

Eleven archeological sites have been recorded within the boundaries of Dover AFB. Two sites have been determined eligible for listing on the NRHP, three sites have been determined potentially NRHP-eligible and recommended for further evaluation, and six sites have been determined ineligible for listing on the NRHP (DAFB 2006b, DDHCA 2006). Dover AFB also contains the following three nonrecorded potential archeological sites: Location 21, Cemetery 1, and Cemetery 2 (Benner 2007b). **Table 3-4** lists all recorded and nonrecorded archeological sites on Dover AFB and their eligibility status. None of the sites are within the APE of the Proposed Action.

**Table 3-4. Recorded and Nonrecorded Archeological Sites at Dover AFB**

| Site No.    | NRHP Status                                                                    |
|-------------|--------------------------------------------------------------------------------|
| 7K-D-2      | Potential - requires further evaluation                                        |
| 7K-D-5      | Potential - requires further evaluation                                        |
| 7K-D-26     | Eligible - prehistoric component only                                          |
| 7K-D-125    | Ineligible                                                                     |
| 7K-D-126    | Potential - requires further evaluation                                        |
| 7K-D-129    | Eligible, will be nominated to NRHP in 2008 after completion of rehabilitation |
| 7K-D-132    | Ineligible                                                                     |
| 7K-D-133    | Ineligible                                                                     |
| 7K-D-134    | Ineligible                                                                     |
| 7K-D-135    | Ineligible                                                                     |
| 7K-D-136    | Ineligible                                                                     |
| Location 21 | Nonrecorded potential site                                                     |
| Cemetery 1  | Nonrecorded potential site                                                     |
| Cemetery 2  | Nonrecorded potential site                                                     |

Sources: DAFB 2006b, DDHCA 2006, Benner 2007b

**Status of Architectural Investigations.** Several studies examining the NRHP eligibility of architectural resources have been completed at Dover AFB. Building 1301 is listed on the NRHP. Building 1303 was

determined eligible for listing on the NRHP but was later demolished after a Memorandum of Agreement (MOA) between the Delaware SHPO and Dover AFB was signed on 24 August 2004 (DAFB 2006b).

Buildings 1269, 1270, 1272, 1274, 1275, 1276, and 1277 (munitions-related buildings) were evaluated in 1996 to determine their potential Cold War association, but were deemed not eligible for NRHP listing under Criterion Consideration G (exceptional significance for resources less than 50 years in age). Buildings 1274, 1275, 1276, and 1277 (Building Category Code 42253) are resources covered under the recently implemented *Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities*; as such, alterations to these buildings or demolition can be completed without further review under Section 106 of the NHPA (ACHP 2006). Buildings 1269, 1270, and 1272 are not addressed by the Program Comment, so they require reevaluation in the future (Benner 2007c).

The SHPO concurred with the statement in the Dover AFB ICRMP, dated November 2005, that no buildings at Dover AFB constructed prior to the completion of the ICRMP (November 2005) are NRHP-eligible or need to be evaluated for the NRHP in the future, except those specifically noted as NRHP-eligible or requiring evaluation on Table 3.11 of the ICRMP. Dover AFB buildings noted as NRHP-eligible or requiring evaluation in Table 3.11 of the ICRMP that have not been demolished or determined ineligible since completion of the INRMP include Buildings 1269, 1270, 1272, 1274, 1275, 1276, 1277, and 1301. Any buildings constructed at Dover AFB after November 2005 could be NRHP-eligible in the future (DDHCA 2007).

**Status of Native American Consultation.** Although no federally recognized Native American tribes currently are resident in Delaware, the federally recognized Delaware Nation and Delaware Tribe of Indians have potential historical and cultural ties to the land now occupied by Dover AFB. These two tribes are currently in Oklahoma. Two other Native American groups now resident in Delaware but without Federal recognition, the Lenape Tribe of Delaware and the Nanticoke Indian Association, also have potential cultural interests at Dover AFB. The Nanticoke Indian Association has been actively consulting on Native American issues within Delaware (Benner 2007a).

Dover AFB has sent letters to the four tribes to initiate consultation with them. The two federally recognized tribes have not responded. The Nanticoke Indian Association has reviewed the 2006 ICRMP (DAFB 2006b) and commented on it. Dover AFB and the Nanticoke Indian Association have agreed to continue to consult as projects arise. According to the head of the Nanticoke Indian Association, the Lenape Tribe of Delaware is actually affiliated with the State of New Jersey, not the State of Delaware (Benner 2007a). IICEP letters were sent to the Delaware Nation, the Delaware Tribe of Indians, and the Nanticoke Indian Association regarding this environmental analysis, but no responses were received by Dover AFB.

Currently, the USAF is not aware of any resources of traditional, religious, or cultural significance to Native American tribes within Dover AFB.

## 3.9 Socioeconomics and Environmental Justice

### 3.9.1 Definition of the Resource

**Socioeconomics.** Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators are typically accompanied by changes in other components, such

as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Data in three areas provide key insights into socioeconomic conditions that might be affected by a proposed action. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the “before” and “after” effects of any jobs created or lost as a result of a proposed action. Data on industrial or commercial growth or growth in other sectors provide baseline and trend line information about the economic health of a region.

In appropriate cases, data on an installation’s expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and jobs base.

Demographics identify the population levels and changes to population levels of a region. Demographics data might also be obtained to identify a region’s characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators.

Socioeconomic data shown in this chapter are presented at census tract, county, municipality, and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends. Data have been collected from previously published documents issued by Federal, state, and local agencies; and from state and national databases (e.g., U.S. Bureau of Economic Analysis’ Regional Economic Information System).

***Environmental Justice.*** EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (11 February 1994) requires Federal agencies’ actions substantially affecting human health or the environment to not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

### **3.9.2 Existing Conditions**

Dover AFB is partially within the corporate limits of the City of Dover and unincorporated areas of Kent County, Delaware. The installation occupies approximately 3,300 acres with an additional 589 acres under grants or easement and another 11 acres that are managed under lease agreements (436 AW 2001).

Dover AFB has an estimated annual economic impact of \$470 million in salaries, retiree pay, local contracts, and local area expenditures within a 50-mile radius of the installation. Dover AFB ranks as Delaware’s third largest industry and currently employs approximately 4,300 active-duty personnel, 1,900 reservists, and 1,800 civilians. The installation also supports approximately 5,100 family members and generates roughly 2,275 secondary jobs (DAFB undated a). As of March 2007, the State of Delaware has an unemployment rate of 3.4 percent, while the Dover Metropolitan Statistical Area has a 3.6 percent unemployment rate (BLS 2007).



For the purposes of this EA, census tracts directly adjacent to Dover AFB were selected as part of the Region of Influence (ROI). Tracts 404, 410, 411, 412, and 422.01 were evaluated. The ROI for economic activities at Dover AFB is in Kent County and tract 411 contains Dover AFB. Employment data relevant to the ROI, Kent County, and the State of Delaware are provided in **Table 3-5**. The largest employment type in the ROI, Kent County, and Delaware is educational, health, and social services (15.1, 19.3, and 19.4 percent, respectively). As would be expected, there is a larger percentage of persons employed in the armed services in the ROI because of Dover AFB (12.8 percent) (see **Table 3-5**).

**Table 3-5. Employment Type of Residents in ROI, Kent County, and the State of Delaware**

| Economic and Social Indicators *                                                    | Percentage of Total Population |             |                   |
|-------------------------------------------------------------------------------------|--------------------------------|-------------|-------------------|
|                                                                                     | ROI                            | Kent County | State of Delaware |
| Employed Persons in Armed Forces                                                    | 12.8                           | 3.2         | 0.6               |
| <b>Employed Persons in Civilian Labor Force (by industry)</b>                       |                                |             |                   |
| Agriculture, forestry, fishing and hunting, and mining                              | 0.8                            | 1.6         | 1.1               |
| Construction                                                                        | 8.5                            | 8.7         | 7.4               |
| Manufacturing                                                                       | 11.9                           | 12.2        | 13.2              |
| Wholesale trade                                                                     | 2.3                            | 2.8         | 2.8               |
| Retail trade                                                                        | 14.4                           | 12.8        | 11.6              |
| Transportation and warehousing, and utilities                                       | 6.1                            | 5.3         | 4.8               |
| Information                                                                         | 1.8                            | 1.6         | 1.9               |
| Finance, insurance, real estate, and rental and leasing                             | 5.9                            | 6.4         | 11.6              |
| Professional, scientific, management, administrative, and waste management services | 7.1                            | 6.6         | 9.3               |
| Educational, health and social services                                             | 15.1                           | 19.3        | 19.4              |
| Arts, entertainment, recreation, accommodation and food services                    | 9.7                            | 7.9         | 7.7               |
| Other services (except public administration)                                       | 4.1                            | 4.0         | 4.2               |
| Public administration                                                               | 12.4                           | 10.8        | 5.2               |

Source: U.S. Census Bureau 2000

\* Census 2000 data are the most recent comprehensive employment data for the ROI.

**Environmental Justice.** Census tracts are designed to be relatively homogenous units with respect to population characteristics, economic status, and living conditions. They average about 4,000 inhabitants. There are five census tracts that have the potential to be affected by the Proposed Action. For the purposes of the environmental justice analysis for this EA, the residents of the five census tracts were evaluated. According to Census 2000 data, the population within the ROI was 19,115.

The population of Kent County in 2000 was 126,697 and increased by 13.6 percent to 143,968 in 2005 (U.S. Census Bureau 2006). Residents living in the ROI have a lower median household income (\$36,484) and per capita income (\$16,161) than Kent County and Delaware (see **Table 3-6**) (U.S. Census Bureau 2000). The percent of residents in the ROI living below the poverty level is higher (11.0 percent)

than Kent County (8.1 percent) or the State of Delaware (6.5 percent). The ROI has a higher percentage of Black or African American residents (25.8 percent) than Kent County (20.7 percent) or the State of Delaware (19.2 percent) (see **Table 3-6**).

**Table 3-6. Race and Poverty Characteristics**

| <b>Economic and Social Indicators</b>              | <b>ROI *</b> | <b>Kent County</b> | <b>Delaware</b> |
|----------------------------------------------------|--------------|--------------------|-----------------|
| Total Population                                   | 19,115       | 126,697            | 783,600         |
| Percent White                                      | 65.9%        | 73.5%              | 74.6%           |
| Percent Black or African American                  | 25.8%        | 20.7%              | 19.2%           |
| Percent American Indian Alaska Native              | 0.5%         | 0.6%               | 0.3%            |
| Percent Asian                                      | 2.1%         | 1.7%               | 2.1%            |
| Percent Native Hawaiian and Other Pacific Islander | 0.1%         | 0.0%               | 0.0%            |
| Percent reporting some other race                  | 2.0%         | 1.3%               | 2.0%            |
| Percent reporting 2 or more races                  | 3.5%         | 2.2%               | 1.7%            |
| Percent families below poverty                     | 11.0%        | 8.1%               | 6.5%            |
| Per Capita Income                                  | \$16,161     | \$18,662           | \$23,305        |
| Median Household Income                            | \$36,484     | \$40,950           | \$47,381        |

Source: U.S. Census Bureau 2000

\* Census 2000 data are the most recent comprehensive employment data for the ROI.

## 3.10 Infrastructure

### 3.10.1 Definition of the Resource

Infrastructure consists of the physical structures and systems 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 the economic growth of an area. The infrastructure information contained in this section provides a brief overview of each infrastructure component and comments on its existing general condition.

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 might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and are limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance on landfills for disposal.

### 3.10.2 Existing Conditions

**Airfield.** Dover AFB airfield infrastructure encompasses approximately 1,703 acres and includes runways, overruns, taxiways, aprons, ramps, and hazardous cargo areas. Dover AFB follows USAF Class B airfield design criteria in UFC 3-260-01 when making airfield design improvements. Dover AFB has two runways: Runway 01/19 and Runway 14/32. The primary runway, 01/19, runs north-south, and is

9,601 feet in length. Runway 14/32 runs northwest-southeast and is 12,902.5 feet long. The main aircraft parking apron is 600 feet wide and more than 1 mile in length. Warm-up ramps, taxiways, and a Hazardous Cargo area are also included in the airfield infrastructure acreage. Most pavements at Dover AFB are asphalt concrete.

Structures that violate the criteria identified in UFC 3-260-01 must be waived by the HQ AMC. Currently, Dover AFB has 11 corrected airfield and airspace waivers, 21 permanent waivers, 8 exempted waivers, and 6 permissible deviations for various infrastructures near clear zones, lighting, and transitional surfaces (436 AW 2001).

**Transportation Network.** Transportation to and from Dover AFB in Dover, Delaware, is provided by Bay Road (Highway 1) and Bayside Drive (Highway 9). The main roads on the installation include Bay Road, which generally separates the housing areas from the industrial portion of the installation, and Atlantic Street. The installation Transportation Plan provides for upgrades to pavements and improvements to minimize congestion and delay. In general, roadways and parking lots at Dover AFB are maintained on a regular basis.

The installation is served by a state highway system that is adequate to handle the present and prospective transportation needs of Dover AFB. The major and minor collector streets on the installation represent the backbone of the transportation system. As such, on-street parking is prohibited wherever possible. Off-street parking at the installation is generally adequate except for a few locations such as the Base Exchange, Buildings 300 and 520, and along the flight line (436 AW 2001).

**Electrical System.** The City of Dover supplies 138 kilovolts (kV) of power to Dover AFB through two, 3-phase transmission lines. Both lines come directly from the Dover power plant and connect to either the North or South substation at Dover AFB. Each substation has a 10-megavolt transformer that steps power down to 12,470 volts. Seven feeder lines power the installation from the two substations. The Bergold Farm facilities and the Golf Course are also serviced by the City of Dover through a separate system that comes into the installation at Building 827. Most power lines are currently aboveground, except for the runway and airfield areas. The Dover AFB General Plan includes plans to replace overhead lines with underground service and to build additional redundancy by providing additional loops and upgrading the lines (436 AW 2001).

**Natural Gas.** Natural gas is supplied to Dover AFB by Chesapeake Utilities Corporation via three metering stations. Dover AFB uses natural gas for space heating and water heating. The Dover AFB natural gas distribution infrastructure includes more than 32,000 linear feet of pipeline laterals ranging from 3/4 inch to 6 inch in diameter. All piping is made from polyethylene and is fairly new. Dover AFB began replacing fuel oil with natural gas in 1997 (436 AW 2001). The natural gas system is fairly new and in good condition.

**Liquid Fuel.** Dover AFB stores and distributes many types of fuel and cryogenics including jet fuel (JP-8), unleaded gasoline (MOGAS), diesel fuel, liquid oxygen, and liquid nitrogen. The liquid fuels system consists of seven storage tanks with a total capacity of 4.3 million gallons. The Defense Energy Support Center is responsible for the management, control, handling, and storage of petroleum and cryogenics on the installation. JP-8 is off-loaded from the Port Mahon facility through a pipeline owned and operated by Delaware Storage and Pipeline Company. Some sections of the off-base JP-8 distribution lines are more than 40 years old. JP-8 is piped to Dover AFB and stored in the POL bulk storage area in five floating roof aboveground storage tanks (ASTs). The ASTs all have concrete secondary containment and cathodic protection. Three pumphouse facilities distribute fuel to refueling hydrants at the flightline through underground pipelines (436 AW 2001).

Dover AFB has approximately 134 liquid fuel ASTs with a total capacity of more than 5,300,000 gallons. The ASTs contain kerosene, gasoline, diesel, JP-8, and heating oil (DAFB 2007).

Due to the privatization of its MFH, the quantity of underground storage tanks at Dover AFB has decreased to only four (Seip 2007).

**Water Supply.** The drinking water for Dover AFB comes from four groundwater wells (A, B, C, and F). Well D is only used in emergencies. Well E has been capped but not abandoned. Wells A, B, C, and F draw water from the Cheswold Aquifer, which occurs at a depth of approximately 125 feet below the ground surface at Dover AFB. They are at various locations of the installation and therefore have a limited susceptibility to external sources of contamination. Water from the wells is treated with fluoride and disinfected with chlorine. The fluoride is added to promote strong teeth and chlorine is added to protect personnel against microbial contaminants (436 AW 2001, Seip 2007).

Water demands currently average approximately 1.15 million gallons per day (mgd), with maximum daily demands of 2.89 mgd. The wells providing water to Dover AFB appear to be adequate to meet these demands. The existing wells produce an excess water production capacity of approximately 1.9 mgd. System pressures appear to be adequate for domestic uses throughout Dover AFB. However, the adequacy of fire flows varies throughout the installation. In general, the water supply, treatment, and distribution systems are adequate (436 AW 2001).

**Sanitary Sewer and Wastewater Systems.** All sanitary and industrial wastewater is discharged to the Kent County Sewage Disposal District Pumping Station No. 6 and treated by the Kent County Regional Treatment Plant. Industrial Wastewater Discharge Permit No. 6 allows for the discharge of 1.5 mgd of sanitary sewage (KCDPW 2005). The installation sewer system includes 114,060 linear feet of collection piping, 402 manholes, and 8 lift stations. Recent improvements have been the addition and replacement of pipe laterals. Piping ranges in age and consists of vitrified clay, cast iron, polyvinyl chloride, and asbestos concrete. A recent infiltration and inflow study indicated that large volumes of water enter the sanitary sewer through deteriorated and leaking manholes, cracked or broken pipes, and storm drains. The average wastewater flow at Dover AFB averaged 0.85 mgd for the years 1996 to 1998. Dover AFB currently purchases more than 1.15 mgd of sewage treatment for industrial and housing from the Kent County Regional Sewerage System, which runs at near capacity. System expansion might be required to meet the growing needs at Dover AFB (436 AW 2001).

**Heating System.** The Dover AFB central heating system provides heat for many of the installation buildings. The remaining buildings have been converted to natural gas heat. There are significant problems with the central heat plant distribution system and many of the laterals are failing. The central heating plant has four boilers. All four boilers can burn fuel oil No. 6, but only two of the boilers can burn natural gas. The central heating plant has the capacity to store 1.1 million gallons of fuel oil No. 6 in three ASTs. The overall central heating system is considered to be in poor to fair condition (436 AW 2001). The central heating plant is scheduled to be demolished.

**Communications.** The Dover AFB communications systems include the information transfer infrastructure, voice switching systems, the base Network Control Center, long-haul communications, and radio systems. The main telephone switching system was upgraded and expanded to accommodate more than 8,000 lines in 1997. Dover AFB's communications system is adequate to meet the immediate needs of the base; however, the existing, limited fiber optic connectivity is incomplete and the backbone components and technology currently used are dated (436 AW 2001).

**Solid Waste Management.** Solid Waste at Dover AFB is managed through their onsite program outlined in 436 AW OPLAN 32-4, Solid Waste Management Plan. In accordance with the plan, solid waste is transported to an off-base waste facility by a private contractor. There are no on-base landfills or hardfills in operation at the installation. Most solid wastes are transported to the Central Delaware Solid Waste Authority in Sandtown, Delaware. Recycling of construction and demolition debris is handled by the contractor. Biohazardous medical waste produced by the medical group and infectious waste and food waste generated by aircraft arriving from overseas is transported to a permitted facility following U.S. Department of Agriculture guidelines (436 AW 2001).

The Dover AFB recycling program includes the collection of aluminum cans, paper, glass, plastic, scrap metal, cardboard, scrap wood, used batteries, and spent fluorescent lamps (DAFB undated b). These items are recycled off-base by an outside contractor (436 AW 2001).

## 3.11 Hazardous Materials and Wastes

### 3.11.1 Definition of the Resource

Hazardous materials are defined by 49 CFR 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions” in 49 CFR 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 U.S.C. §6903(5), as amended by the Hazardous and Solid Waste Amendments, as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.” Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Evaluation of hazardous materials and wastes focuses on the storage, transport, handling, use, and disposal of pesticides and herbicides, fuels, and POL. Evaluation might 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 might pose a risk to human health but are not regulated as contaminants under the hazardous wastes statutes. Special hazards include asbestos-containing material (ACM) and lead-based paint (LBP). The presence of special hazards or controls over them might 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.

DOD has developed the ERP, intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through the ERP, DOD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed).

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

### 3.11.2 Existing Conditions

**Hazardous Materials.** AFI 32-7086, Hazardous Materials Management, establishes procedures and standards to 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 manage, monitor, or track any of those activities. The *Oil and Hazardous Spill Prevention and Response Plan*, 436 AW OPLAN 32-7, outlines procedures to be followed in the event of an accidental spill or discharge of POL or other hazardous substances at Dover AFB. Basic information and guidance for the prevention of spills is also provided in this plan (436 AW 2005a). The *Integrated Contingency Plan* provides direction for the prevention, containment, and response to discharges of hazardous materials. It replaces the Facility Response Plan; Spill Prevention, Control, and Countermeasures Plan; and the Hazardous Materials Plan (436 AW 2005b).

To reduce hazardous and toxic material procurements at Dover AFB, materials are approved and tracked by the hazardous materials pharmacy (HAZMART), which serves as a centralized distribution point in accordance with AFI 32-7086. The HAZMART at Dover AFB includes two buildings. Building 630 is the main warehouse that stores corrosives and flammables and Building 634 stores compressed gas cylinders (436 AW 2001).

**Hazardous Wastes.** Dover AFB produces a variety of wastes from aircraft maintenance, base transportation, and civil engineering activities. Wastes include spent solvents, contaminated fuels, stripping chemicals, waste paint, oils and lubricants, and medical biohazardous waste. AFI 32-7042, *Solid and Hazardous Waste Compliance*, identifies requirements for handling hazardous wastes at USAF installations. The *Dover AFB Hazardous Waste, Universal Waste and Used Petroleum Management Plan*, 436 AW OPLAN 32-3, deals with key points in implementing the complex area of hazardous waste management required by RCRA. The plan covers the control and management of hazardous materials from the time they become hazardous wastes at the point of generation to the point of ultimate disposal. The scope of the plan is implementation of the USEPA's philosophy of "cradle to grave" management and control of hazardous waste (436 AW 2006a).

Dover AFB generates hazardous waste but stores it for less than 90 days; therefore, a RCRA Part B permit is not necessary. The USEPA identification number for Dover AFB is DE8570024010 (436 AW 2006a).

Hazardous wastes are stored in waste containers at the accumulation points set up at buildings where wastes are generated. Individual waste-generating units and 436 CES/CEV are responsible for managing the hazardous wastes. Each generating organization appoints an accumulation point manager and an alternate manager to ensure the proper identification, handling, storage, and recordkeeping related to the

hazardous waste pursuant to AFI 32-7005. The generating organization is responsible for transporting the hazardous wastes to the less than 90-day accumulation site (Building 1306). Used oils and fuels are managed by the 436 CES/CEV and picked up at Building 650 for off-site recycling (436 AW 2001, Seip 2007).

***Asbestos-Containing Material.*** Asbestos is a naturally occurring mineral found in nature. It has historically been used in building materials because asbestos is fire-resistant, has high tensile strength and low heat and electrical conductivity, and is generally impervious to chemical attack. Asbestos can be easily broken down, inhaled, and trapped in the lungs. Once trapped in the lungs, asbestos has been determined to cause lung cancer.

In accordance with USEPA guidelines for maintaining and removing ACM, the USAF developed AFI 32-1052, Facility Asbestos Management. This comprehensive plan provides the direction for asbestos management at USAF installations. AFI 32-1052 incorporates by reference the applicable requirements of 29 CFR Part 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires each installation to develop an asbestos management plan to maintain a permanent record of the status and condition of all ACM in installation facilities, record asbestos management efforts, and detail asbestos removal plans.

The Asbestos Management and Operations Plan (AMOP) is designed to protect personnel who live and work on Dover AFB from exposure to airborne asbestos fibers as well as to ensure the installation remains in compliance with Federal, state, and local regulations pertaining to asbestos. It specifies procedures for the testing, removal, encapsulation, enclosure, and repair activities associated with ACM-abatement projects (436 AW 2006b).

The Dover AFB AMOP is based on an ACM survey completed in 1988–1989. Suspect ACM is addressed on an as-needed basis prior to disturbance of the material. ACMs are removed and transported by qualified outside contractors (436 AW 2001).

***Lead-Based Paint.*** In October 1992, Congress passed The Residential Lead-Based Paint Hazard Reduction Act of 1992, as promulgated in 40 CFR Part 745, and 24 CFR Part 35 which requires disclosure by persons selling or leasing housing constructed before the phaseout of residential LBP use in 1978 if known LBP or LBP hazards exist. This act, commonly called Title X, requires Federal agencies to comply with Federal, state, and local laws relating to LBP activities and hazards.

USAF policy requires that installations have specific procedures for managing facilities with LBP and protecting personnel from the hazards associated with deteriorated LBP. The USAF LBP Plans were designed to establish management and organizational responsibilities and procedures for ensuring that personnel in installation facilities and contractor personnel are not exposed to excessive levels of lead. The plan's focus is on taking positive action to deal with current and near-term lead management needs, as well as planning for removal of LBP from installation facilities. The LBP Management Plan focuses on protecting children from LBP and preventing facility occupants from exposure to LBP. At Dover AFB, the most prevalent source of lead is from LBP. LBP was used to paint several buildings at the installation. Though exposure to LBP is not expected to occur because of current management practices and the minimal use of LBP, exposure from LBP could occur from deteriorating LBP previously applied or during occupational operations (sanding or other type of disturbance to paint containing lead). Therefore, all suspect or confirmed LBP is addressed prior to any activities that might disturb it such as renovation or demolition. LBP abatement is performed by outside contractors when required (436 AW 2001).

**Radon.** Radon is a naturally occurring radioactive gas that develops in soils and rocks as uranium decays. Radon has the tendency to accumulate in enclosed spaces that are generally below ground and have poor ventilation (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. USEPA has established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences; however, there have been no standards established for commercial structures.

According to the USEPA Radon Zone map for Kent County, Delaware, the radon potential at the installation is in a zone of low potential. Based on this assessment, USEPA has assessed that Kent County has a predicted average indoor radon screening level less than 2 pCi/L (USEPA 2007b). A radon survey was completed for Dover AFB in 1988. All samples resulted in radon concentrations below the levels that require remediation (436 AW 2001).

**PCBs.** All oil-containing equipment at Dover AFB was tested for polychlorinated biphenyls (PCBs). Eight transformers with PCB concentrations of 50 ppm or greater and 8 transformers with PCB levels between 40 and 49 ppm were removed and replaced. There is no known PCB contamination of surface water on the installation (436 AW 2001).

As PCB-containing capacitors and fluorescent light ballasts are removed, they are transported to Building 1306 for storage until transported off-base for disposal by a contractor. Several sites at Dover AFB contain PCBs in soils and sediments from past PCB disposal practices (436 AW 2001).

**Pesticides.** The Dover AFB Pest Management Plan (PMP) was developed in accordance with DOD Instruction 4150.7, Pest Management Program. The purpose of the PMP is to define the pests of concern, establish preferred methods of control for each, and identify the organizations responsible for implementing those controls (436 CE 2005).

Currently, the major areas of pest management include golf course maintenance, installation facilities, food service facilities, vegetation control, and the mosquito abatement program. Golf course maintenance personnel are responsible for all pesticide/herbicide applications on the course. Mosquito abatement, termite treatment, and all other pest control operations are performed in-house by the 436 CES/CEV Pest Management Section (436 CE 2005).

**Environmental Restoration Program.** The Defense Environmental Restoration Program (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD property at active installations, Base Realignment and Closure (BRAC) installations, and formerly used defense sites (FUDS) throughout the United States and its territories. The three restoration programs under the DERP are the Installation Restoration Program (IRP), Military Munitions Response Program (MMRP), and Building Demolition/Debris Removal (BD/DR). The IRP requires each installation to identify, investigate, and clean up contaminated sites. The MMRP addresses nonoperational military ranges and other sites that are suspected or known to contain unexploded ordnance (UXO), discarded military munitions, or munition constituents. BD/DR involves the demolition and removal of unsafe buildings and structures. Eligible DERP sites include those contaminated by past defense activities that require cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and certain corrective actions required by RCRA. Non-DERP sites are remediated under the Compliance-Related Cleanup Program.

According to the Dover AFB Management Action Plan (MAP), 59 contaminant-release locations or sites have been identified. Fourteen sites are petroleum exclusion sites regulated under the State Tank



Management Program. Forty-five sites are regulated under CERCLA. As of 1 October 2006, remedies are in place at all 59 sites, and 34 sites are response-complete (DAFB 2006c). Digging or disturbing soil on ERP sites is constrained by land use restrictions and controls. The contaminated groundwater is controlled by a Groundwater Management Zone. The 436 CES/CEV must give approval for all activities on or near ERP sites. There are no known MMRP sites at Dover AFB.

**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; and EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. In part, these mandates require the USAF to procure, to the greatest extent practical, recycled or energy-efficient goods for administrative and construction activities. AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The Dover AFB *Pollution Prevention Management Plan* complies with AFI 32-7080 (436 AW 2006b).

## 4. Environmental Consequences

The section contains four subsections. **Section 4.1** provides a general introduction to the environmental consequences analysis, including significance criteria for each resource area. **Section 4.2** presents the No Action Alternative, which is prescribed by CEQ regulations. **Section 4.3** provides a general analysis of the environmental consequences by resource area. **Section 4.4** provides the detailed analysis of the Proposed Action, as presented in **Section 2.1**. Potential cumulative effects that could occur as a result of implementing the Proposed Action and other past, present, and reasonably foreseeable projects are in **Section 5**.

### 4.1 Introduction

The intention of this section of the IDEA is to present both a general analysis of the environmental effects of installation development activities (see **Section 4.3**), as well as a summary of site-specific environmental effects of individual installation development projects (see **Section 4.4**). The general analysis identifies the general environmental effects on each resource area of the ongoing demolition, construction, and infrastructure upgrade activities, with a focus on avoiding those areas that are constraints to development. However, a general analysis of potential development activities alone does not provide the framework to adequately assess the potential environmental consequences of a single proposed project. Therefore, **Section 4.4** presents a detailed analysis of the representative demolition, construction, and infrastructure upgrades introduced in **Sections 2.1.2, 2.1.3, and 2.1.4**, respectively, to provide a range of potential consequences that could be expected from implementing the proposed projects with the greatest potential for adverse environmental effects. The representative projects were selected for detailed analysis because they are large in scale or have a unique aspect (e.g., proposed location or operational characteristics) with the potential to result in adverse environmental effects. In addition, **Section 4.4** contains a summary, in tabular form, of the environmental effects associated with all projects identified over the next 5 years at Dover AFB (refer to **Appendix A**). The analysis presented in **Sections 4.3 and 4.4** provides the basis for the cumulative effects analysis in **Section 5**. The No Action Alternative is presented in **Section 4.2** before the Proposed Action in order to provide a comparison of the potential environmental consequences of implementing the Proposed Action against no action.

The specific criteria for evaluating potential environmental effects of the No Action Alternative or the Proposed Action are described in the following text, identified by resource area. The significance of an action is also measured in terms of its context and intensity. The context and intensity of potential environmental effects are described as follows in terms of duration, whether they are direct or indirect, the magnitude of the impact, and whether they are adverse or beneficial:

- **Short-term or long-term.** In general, short-term effects are those that would occur only with respect to a particular activity, for a finite period, or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.
- **Direct or indirect.** A direct effect is caused by an action and occurs around the same time at or near the location of the action. An indirect effect is caused by an action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.
- **Minor, moderate, or significant.** These relative terms are used to characterize the magnitude or intensity of an impact. A minor effect is slight, but detectable. A moderate effect is readily apparent. Significant effects are those that, in their context and due to their magnitude (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for

mitigation in order to fulfill the policies set forth in NEPA. Significance criteria by resource area are presented in the following text.

- **Adverse or beneficial.** An adverse effect is one having unfavorable or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment.

The following text presents the criteria that would constitute a significant environmental effect resulting from implementation of the No Action Alternative (see **Section 4.2**), or the Proposed Action (either general demolition and construction activities as presented in **Section 4.3**, or any specific project as presented in **Section 4.4**). The same significance criteria are also applied to potential cumulative effects (see **Section 5**) of implementing the Proposed Action in conjunction with past, present, or reasonably foreseeable future actions.

## Noise

Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). Projected noise effects are evaluated quantitatively and qualitatively. An action would be considered significant if it resulted in increased noise levels that were incompatible with Federal regulations, state regulations, or local ordinances.

## Land Use

The significance of potential land use effects is based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use effect would be significant if the following were to occur:

- Be inconsistent or in noncompliance with existing land use plans or policies
- Preclude the viability of existing land use
- Preclude continued use or occupation of an area
- Be incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

As discussed in **Section 3.1.1**, DNL is the preferred noise metric of the FAA, HUD, USEPA, and DOD for modeling airport environs. According to USAF, FAA, and HUD criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds a DNL of 75 dBA, “normally unacceptable” in regions exposed to noise between a DNL of 65 to 75 dBA, and “normally acceptable” in areas exposed to noise where the DNL is 65 dBA or less (USDOT 1984).

## Air Quality

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions compared 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 would result in any 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 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP.

Effects on air quality in NAAQS “nonattainment” areas are considered significant if the net changes in project-related pollutant emissions result in any 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
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, effects on air quality would be considered significant if a proposed action would result in an increase of a nonattainment or maintenance area’s emissions inventory by 10 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 redesignated as a maintenance area.

The *de minimis* threshold emissions rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those 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 Program (CAA Title I). As shown in **Table 4-1**, *de minimis* thresholds vary depending upon the severity of the nonattainment area classification. No *de minimis* threshold emissions rate has been established by USEPA for PM<sub>2.5</sub>; regardless, the Proposed Action would not cause a significant increase in fine particulate emissions.

In addition to the *de minimis* emissions thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 µg/m<sup>3</sup> or more (40 CFR 52.21(b)(23)(iii)). As stated in **Section 3.3.1**, there are no Class I areas within 10 kilometers of Dover AFB, so this significance criterion was not used for this analysis.

## Safety

Any increase in safety risks would be considered an adverse effect on safety. An effect would be significant if an action were to substantially increase risks associated with the safety of construction personnel, contractors, or the local community; substantially hinder the ability to respond to an emergency; or introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

## Geological Resources

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 effects of a proposed action on geological resources. Generally, adverse effects can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

**Table 4-1. Conformity *de minimis* Emissions Thresholds**

| <b>Pollutant</b>                                        | <b>Status</b>                 | <b>Classification</b>                                                                           | <b><i>de minimis</i> Limit (tpy)</b>                      |
|---------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| O <sub>3</sub><br>(measured as NO <sub>x</sub> or VOCs) | Nonattainment                 | Extreme<br>Severe<br>Serious<br>Moderate/marginal (inside ozone transport region)<br>All others | 10<br>25<br>50<br>50 (VOCs)/100 (NO <sub>x</sub> )<br>100 |
|                                                         | Maintenance                   | Inside ozone transport region<br>Outside ozone transport region                                 | 50 (VOCs)/100 (NO <sub>x</sub> )<br>100                   |
| CO                                                      | Nonattainment/<br>maintenance | All                                                                                             | 100                                                       |
| PM <sub>10</sub>                                        | Nonattainment/<br>maintenance | Serious<br>Moderate<br>Not Applicable                                                           | 70<br>100<br>100                                          |
| SO <sub>2</sub>                                         | Nonattainment/<br>maintenance | Not Applicable                                                                                  | 100                                                       |
| NO <sub>x</sub>                                         | Nonattainment/<br>maintenance | Not Applicable                                                                                  | 100                                                       |

Source: 40 CFR 93.153

Effects on geology and soils would be significant if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function (including prime farmland and other unique soils) within the environment.

### Water Resources

Evaluation criteria for effects on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant effects on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially affect water quality adversely
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

## **Biological Resources**

The significance of effects on biological resources is based on

- The importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource
- The proportion of the resource that would be affected relative to its occurrence in the region
- The sensitivity of the resource to proposed activities
- The duration of ecological ramifications.

Effects on biological resources would be significant if species or habitats of high concern are adversely affected over relatively large areas. Effects would also be considered significant if disturbances cause reductions in population size or distribution of a species of high concern.

Ground disturbance and noise associated with construction can directly or indirectly cause adverse effects on biological resources. Direct effects from ground disturbance are evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Habitat removal and damage or degradation of habitats might be adverse effects associated with ground-disturbing activities.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions will not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid “taking” threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with the U.S. Fish and Wildlife Service (USFWS) that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project. The “take” of a federally protected species under the ESA would be considered significant.

The significance of effects on wetland resources is proportional to the functions and values of the wetland complex. 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 effect on wetlands would occur should either the major function or value of the wetland be substantially altered.

## **Cultural Resources**

Under Section 106 of the NHPA, adverse effects on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource’s significance; introducing visual or audible elements that are out of character with the property or that alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property’s historic significance.

For assessing the impacts of the Proposed Action on archeological resources, the APE is confined to the footprint of the facilities to be renovated or constructed, as well as the adjacent roads, parking areas, and related utilities. The APE for architectural resources involves buildings and structures that will be renovated or demolished but also includes the viewshed of surrounding buildings and structures, the structural integrity of the existing buildings (caused by vibrations during construction), and the buildings’ settings and locations. The APE for analysis of impacts on resources of traditional, religious, or cultural significance to Native American tribes includes both those areas that will be impacted directly by ground disturbance as well as the viewshed and general setting of those resources.

Under Section 106 of the NHPA, the Proposed Action might have no effect, no adverse effect, or an adverse effect on historic properties.

### **Socioeconomics and Environmental Justice**

Construction expenditures are assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates ten employment positions might go unnoticed in an urban area, but could have considerable impacts in a rural region. If potential socioeconomic changes were to result in substantial shifts in population trends or a decrease in regional spending or earning patterns, those effects would be considered adverse. A proposed action could have a significant effect with respect to the socioeconomic conditions in the surrounding ROI if it were to result in any of the following:

- Change the local business volume, employment, personal income, or population that exceeds the ROI's historical annual change
- Adversely affect social services or social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates
- Disproportionately impact minority populations or low-income populations.

### **Infrastructure**

Effects on infrastructure are evaluated based on their potential for disruption, excessive use, or improvement of existing levels of service and additional needs for energy and water consumption, sanitary sewer and wastewater systems, and transportation patterns and circulation. Impacts might 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 installation activities. In considering the basis for evaluating the significance of impacts on infrastructure resources, several items are considered. These items include, for example, evaluating the degree to which the proposed construction projects could affect the existing solid waste management program and capacity of the area landfill. An effect might be considered adverse if a proposed action exceeded the capacity of a utility.

### **Hazardous Materials and Wastes**

Effects on hazardous materials and waste management would be considered significant if the Federal action resulted in noncompliance with applicable Federal and state regulations, or increased the amounts generated or procured beyond current Dover AFB waste management procedures and capacities. Effects on pollution prevention would be considered significant if the Federal action resulted in worker, resident, or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capability of current management procedures. Effects on the ERP would be considered significant if the Federal action disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment. Effects on fuels management would be significant if the established management policies, procedures, and handling capacities could not accommodate the proposed activities.

## **4.2 Environmental Consequences of the No Action Alternative**

Under the No Action Alternative, Dover AFB would not implement the projects proposed in the installation's community of plans, which would result in the continuation of existing conditions as described in **Section 3**. No direct environmental effects would be expected on the noise environment,

land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, and hazardous materials and wastes. It is anticipated that future development would occur under the No Action Alternative, but those development projects would be analyzed through preparation of individual NEPA documents, as appropriate.

### **4.3 General Environmental Consequences of the Proposed Action by Resource Area**

#### **4.3.1 Noise**

Intermittent short-term minor adverse impacts from noise would be expected from the implementation of the Proposed Action.

**Construction Noise.** Noise from construction activities varies depending on the type of construction equipment being used, the area that the project would occur in, and the distance from the source. Projects under the Proposed Action would require grading, paving, demolition, and building construction. All of the projects under the Proposed Action would occur on Dover AFB property. Some of these would occur close to housing areas. To predict how these activities would impact adjacent populations, noise from the proposed construction was estimated. For example, as shown on **Table 3-1**, building construction usually involves several pieces of equipment (e.g., saws and haul trucks) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected construction noise during daytime hours are as follows:

- Residents living on the southwest side of the installation (i.e., approximately 500 feet away) could experience noise levels of 70 dBA from demolition of the Youth Center Facility.
- Residents living on the southwest side of the installation (i.e., approximately 1,100 feet away) could experience noise levels of 63 dBA during the demolition of the VAQ. These residents would also be approximately the same distance from construction of the Visitors Quarter's and could experience noise levels of 58 dBA during construction activities.
- Residents off-installation to the northwest (i.e., approximately 1,500 feet away) could experience noise levels of 56 dBA during the construction of the Security Forces Complex.

Given the extent of the projects under the Proposed Action and the proximity to residents on the installation, adverse effects from construction noise are unavoidable. However, noise generation would last only for the duration of construction activities, and could be reduced through the use of equipment exhaust mufflers and restriction of construction activity to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). It is not anticipated that the short-term increase in ambient noise levels from the Proposed Action would cause significant adverse effects on the surrounding populations.

**Operational Impacts.** Once the projects under the Proposed Action are completed, the ambient noise levels would return to existing levels. It is not anticipated that vehicle traffic or aircraft operations would increase under the Proposed Action. No long-term effects on the ambient noise environment are anticipated as a result of the Proposed Action.



### 4.3.2 Land Use

**On Installation.** Long-term, minor, beneficial and adverse effects would be expected under the Proposed Action. Each of the demolition, construction, and infrastructure projects would be sited in accordance with the existing and future land use categories in Dover AFB's General Plan. The existing and future land use areas are shown in **Figures 2-1** and **4-1**, respectively. Proposed demolition projects would make some land available for proposed construction projects (see **Appendix A**). With respect to noise, some of the construction projects would be sited in incompatible areas.

Specific area improvements have the potential of either increasing or decreasing the amount of area available for future development. None of the projects associated with the Proposed Action are anticipated to change land use designations at Dover AFB.

The proposed demolition projects would open up land for future construction projects. As a result of the Proposed Action, there would be approximately 131,022 ft<sup>2</sup> of land made available due to the demolition of obsolete facilities (Projects D1–D8) and infrastructure (Project I3). Projects C1 and C3 would be constructed in formerly disturbed areas made available by demolition of outdated facilities.

Several construction projects are proposed within land areas impacted by noise levels in the DNL of 65 to 80+ dBA range that is associated with aircraft operations at Dover AFB. Construction projects within the 65 to 80+ dBA noise contour include Projects C1, C2, C3, and C4. As discussed in **Section 4.1**, noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds a DNL of 75 dBA, “normally unacceptable” in regions exposed to noise between a DNL of 65 to 75 dBA, and “normally acceptable” in areas exposed to noise where the DNL is 65 dBA or less. In addition, according to AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the placement of buildings.

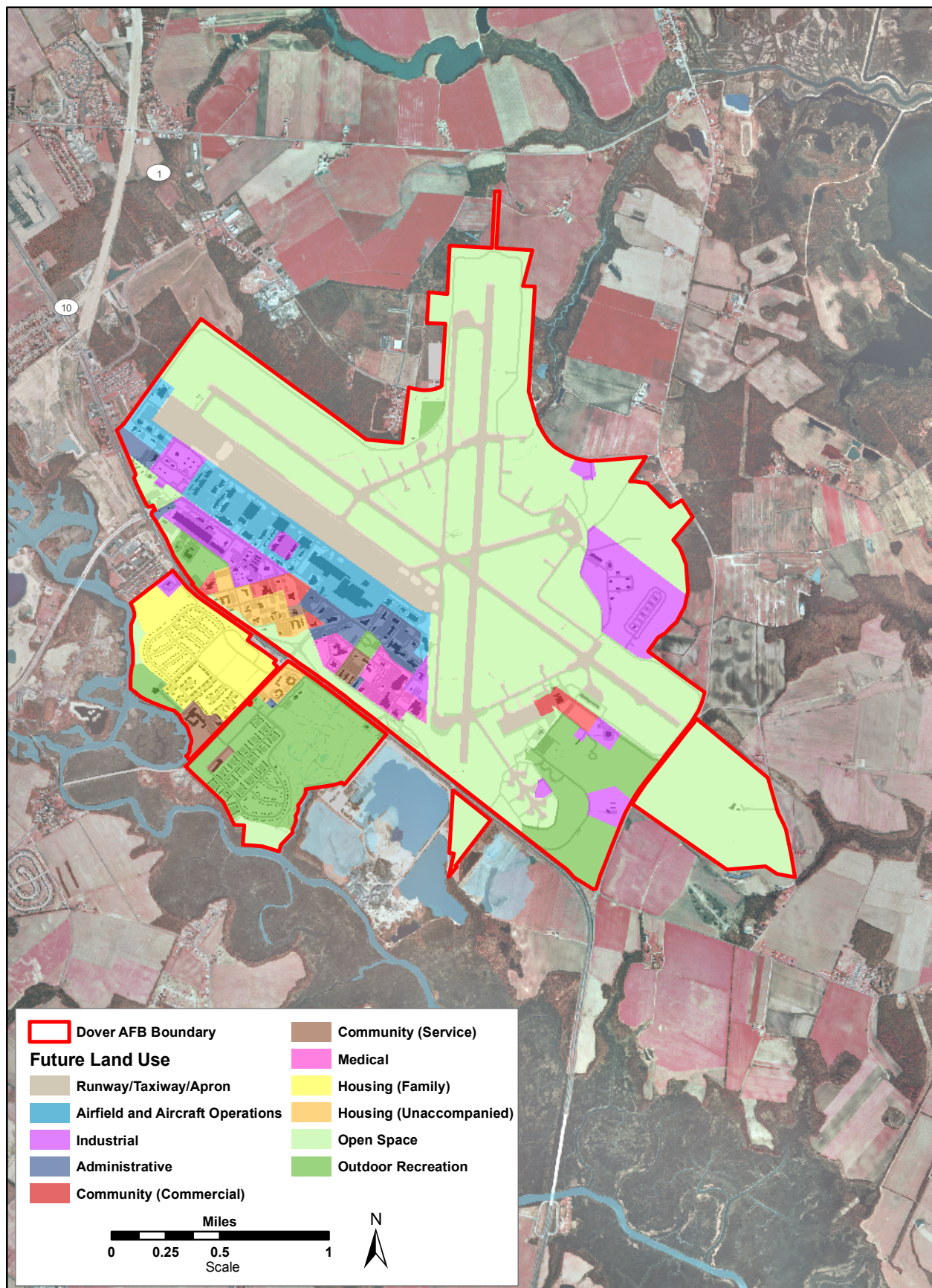
**Off Installation.** No off-installation areas would be permanently affected in a significant manner, nor would any other incompatible land use. None of the land use significance criteria would be met by the Proposed Action, and no significant effects would be expected.

**Coastal Zone Management Plan.** No impacts are expected on the Coastal Zone Management Plan under the Proposed Action. Potential demolition, construction, and infrastructure improvements would not encroach on the regulated coastal zone area on the installation.

### 4.3.3 Air Quality

The Proposed Action would generate both temporary and long-term air pollutant emissions. The construction, demolition, and infrastructure projects related to the Proposed Action would generate air pollutant emissions as a result of grading, filling, compacting, trenching, demolition, and construction operations, but these emissions would be temporary and would not be expected to generate any off-site effects. The Proposed Action does not include a net increase in personnel or commuter vehicles. Therefore, the Proposed Action's emissions from existing personnel and commuter vehicles would not result in an adverse impact on regional air quality. Regulated pollutant emissions from the Proposed Action would not contribute to or affect local or regional attainment status with the NAAQS.

The construction projects would generate total suspended particulate and PM<sub>10</sub> emissions as fugitive dust from ground-disturbing activities (e.g., grading, demolition, soil piles) and from 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



Source of Land Use Data: Dover AFB

Figure 4-1. Dover AFB Future Land Uses

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 emissions factors and assumptions published in USEPA's AP-42 (USEPA 2006). These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays).

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment, as well as evaporative emissions from architectural coatings and asphalt paving operations. These emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in USEPA AP-42 (USEPA 2006).

Because Dover AFB is classified as a nonattainment area for 8-hour ozone, General Conformity Rule requirements are applicable. However, the Proposed Action would generate emissions well below *de minimis* level. In addition, the Proposed Action would generate emissions well below 10 percent of the emissions inventories for the SDIAQCR and the emissions would be short-term. Therefore, the demolition, construction, and infrastructure activities associated with the Proposed Action would not have significant effects on air quality at Dover AFB or on regional or local air quality. **Appendix D** shows an example of how air emissions are calculated. **Section 4.4** discusses project-specific emissions in more detail.

Operational emissions associated with the Proposed Action would not be expected to result in adverse effects on air quality. Day-to-day operations associated with the Proposed Action would generate emissions of criteria pollutants as combustion products from the burning of natural gas by boilers used to provide comfort heating as well as the combustion of fuel oil by emergency generators to produce electrical power, but these emissions would typically be offset by the removal of older and more emissive equipment. In addition, local and regional pollutant effects resulting from direct and indirect emissions from stationary emissions sources under the Proposed Action would result in no new impacts on air quality as the same quantities of hazardous emitting chemicals used under the existing procedures would be the same for new facilities and procedures. Any other project for the future out-years that would involve new or additional emissions would be addressed through Federal and state permitting program requirements under New Source Review regulations (40 CFR Parts 51 and 52).

#### **4.3.4 Safety**

**Construction Site Safety.** Short-term, minor, adverse effects would be expected from the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at Dover AFB during the normal workday because the level of such activity would increase. Although all contractors are required to follow and implement OSHA standards to establish and maintain safety procedures, there would be an increased risk of accidents with increased demolition, construction, and infrastructure activities. Projects associated with the Proposed Action would not pose a safety risk to installation personnel or activities at the installation. The proposed projects would enable 436 AW to meet future mission objectives at the installation and conduct or meet mission requirements in a safe operating environment. No long-term effects would be expected.

Construction workers could encounter contamination as a result of an ERP site or ACM and LBP. Demolition, construction, and infrastructure activities would be accomplished in accordance with Federal, state, and local regulations to minimize hazards associated with hazardous materials, wastes, and substances. These hazards are discussed in more detail in **Section 4.3.11**.

**Explosive Safety.** Short-term, minor, adverse effects on explosive safety would be expected as a result of the implementation of the Proposed Action. Contractors working in a QD arc would be exposed to an increased risk of potential explosions. All projects located within QD arcs would be mission-necessary and consistent with current land uses inside the arc.

**Airfield Safety.** Short-term, negligible, adverse effects and long-term, negligible, beneficial effects on airfield safety clearance would be expected as a result of the implementation of the Proposed Action. Demolition projects in the airfield safety clearance areas (see **Figure 2-2**) would cause short-term, negligible, adverse impacts on airfield safety during the demolition. Contractors working in or near the flightline must be aware of and follow flightline safety procedures. Once demolition is complete and the buildings are removed from the airfield safety clearance areas, long-term, negligible, beneficial effects on airfield safety clearance would occur. There are no construction or infrastructure projects proposed in the airfield safety clearance areas.

### 4.3.5 Geological Resources

**Topography.** Long-term, negligible to minor, direct, adverse effects on the natural topography would be expected as a result of demolition, site preparation (i.e., grading, excavating, and recontouring), and construction under the Proposed Action. The majority of the Proposed Action project sites would occur in areas that were disturbed as a result of past installation activities.

**Geology.** Long-term, negligible to minor, direct, adverse effects on geological resources resulting from demolition, site preparation (i.e., grading, excavating, and recontouring), and construction activities would be expected as a result of implementing the Proposed Action. The majority of the Proposed Action project sites would occur in areas that were disturbed as a result of past installation activities.

**Soils.** Short-term and long-term, negligible to minor, direct, adverse effects on soils would be expected as a result of the demolition of old facilities and construction of new facilities under the Proposed Action. Demolition and construction activities would be expected to directly affect the soils as a result of grading, excavation, placement of fill, compaction, mixing, or augmentation necessary to prepare the sites for development. Additional adverse effects could occur as a result of erosion and associated sedimentation during construction, especially in areas where vegetative cover was removed during site development. Construction projects would add impervious land mass, which would increase the risk for storm water runoff. However, implementation of erosion and sediment control and storm water BMPs during and after construction that are consistent with NPDES Phase II permit requirements, the installation SWPPP (436 CES/CEV 2005), and other applicable codes and ordinances (including the Delaware Sediment and Stormwater Program) would minimize the potential for adverse effects resulting from erosion and transport of sediments in storm water runoff.

All construction projects would implement BMPs to limit potential effects resulting from construction activities. Fugitive dust from construction activities could be minimized by watering and soil stockpiling, which would reduce the total amount of soil exposed to potential suspension and wind erosion. Implementation of standard erosion-control practices (e.g., silt fencing, sediment traps, application of water sprays, phased construction, and prompt revegetation of disturbed areas) would also reduce potential impacts related to soil erosion and associated sedimentation.

No effects on prime farmland or farmland of statewide importance would occur as a result of implementing the Proposed Action. All of the proposed demolition, construction, and infrastructure projects would occur on areas of the installation that are considered urban land.



### 4.3.6 Water Resources

Short-term, minor, direct, adverse effects on groundwater and surface water would be expected as a result of construction activities associated with the Proposed Action. Long-term, minor, indirect, adverse effects on groundwater and surface water quality would be expected as a result of the increase of impervious surfaces. Increases in impervious surfaces would change peak flow runoff, divert runoff to storm drains, and reduce runoff and infiltration of natural surfaces, which reduce shallow groundwater recharge over time. However, the water supply is sufficient for the Dover AFB population and the Proposed Action would not result in any increase in installation population (see **Section 4.3.10**) (436 AW 2001). Water quality and human health would not be adversely affected by the Proposed Action.

**Groundwater.** The activities associated with the Proposed Action would have short-term and long-term, negligible, adverse effects on groundwater quality and recharge. Implementation of storm water and spill prevention BMPs developed consistent with the installation SWPPP and other applicable plans would minimize potential runoff or spill-related impacts on groundwater.

**Surface Water.** Implementation of the Proposed Action would be expected to have short-term, negligible, adverse effects on surface water and surface water quality. The size of each project is presented in **Tables A-1, A-2, and A-3** in **Appendix A**. Overall, the Proposed Action would result in land disturbance of 292,957 ft<sup>2</sup> (6.7 acres). Proper engineering practices, erosion and sediment control, and storm water BMPs would be implemented during and after construction and would be consistent with the Phase II NPDES permit requirements; the installation SWPPP; and all applicable Federal, state, and local regulations and policies. These BMPs would minimize runoff-related impacts and the potential for adverse effects on surface water quality. A negligible increase in the conveyance of nonpoint source pollutants in runoff to the tributaries on the installation could occur in association with construction and demolition activities.

Proposed demolition projects and some infrastructure projects have the potential to result in long-term, negligible to minor, beneficial effects on surface water due to a reduction in the velocity and volume of storm water discharged to surface water that results from a decrease in impervious surface. **Tables A-1 and A-3** in **Appendix A** detail the decreases in impervious surface associated with each demolition and applicable infrastructure project.

Proposed construction projects and some infrastructure projects would result in long-term, negligible, adverse effects on surface water due to increases of impervious surfaces associated with individual projects, including the development of access roads and parking areas to accommodate the new facilities. The increases in impervious surface associated with each project are detailed in **Tables A-2 and A-3** in **Appendix A**. Overall, the Proposed Action would result an increase of 63,255 ft<sup>2</sup> (1.5 acres) of impervious surface. Storm water BMPs would be implemented during and after construction and be consistent with the Phase II NPDES permit requirements; the installation SWPPP; and all applicable Federal, state, and local regulations and policies. These BMPs would minimize potential adverse effects on surface waters associated with the increase in impervious surfaces.

A letter dated 3 March 2007 from the USACE indicates that the Proposed Action has little potential for impacts on the waters of the United States (see **Appendix C**).

**Floodplain.** In accordance with EO 11988, construction activities in the 100-year floodplain must be avoided. The 100-year floodplain is located on the golf course along the unnamed drainage into the St. Jones River and immediately along the river where it borders Dover AFB (436 AW 2001). Any construction activities within the 100-year floodplain at Dover AFB, should it be delineated in the future,

would require approval from HQ AMC and separate NEPA analysis. The Proposed Action would not impact any areas of the 100-year floodplain.

### 4.3.7 Biological Resources

The Proposed Action would result in short-term and long-term, negligible to minor, adverse effects on biological resources. Dover AFB is largely disturbed and does not contain rare, threatened, and endangered species; unique natural communities; or other significant natural resources (DNREC-DFW 2006). Dover AFB is not required to maintain an Integrated Natural Resources Management Plan.

**Vegetation.** Short-term and long-term, negligible to minor, adverse effects on vegetation could occur as a result of construction associated with the Proposed Action. The majority of projects associated with the Proposed Action would occur in the improved areas of Dover AFB, which would primarily affect landscaped species. The possible removal of trees and native vegetation would result in long-term, minor, adverse effects on vegetation. Following construction, disturbed areas would be landscaped with native plants as practicable (as requested by the USACE [see **Appendix C**]) and in accordance with Dover AFB standards.

**Wildlife.** Short-term, negligible to minor, adverse effects on wildlife could occur as a result of construction noise and minor loss of habitat associated with the Proposed Action. The majority of the projects associated with the Proposed Action would occur in improved areas of Dover AFB that are not considered valuable wildlife habitat. Birds, mammals, and reptiles that occur at the installation might visit these areas, but are likely to spend the majority of their time in the undeveloped portions. Most wildlife that occurs at Dover AFB is adapted to a suburban and urban environment; therefore, the effects of construction noise and heavy equipment use would be slightly adverse in the short-term. However, wildlife affected by noise would quickly recover once the construction noise ceased.

**Protected and Sensitive Species.** No adverse effects on federally listed species would be expected to occur as a result of implementing the Proposed Action. There are no federally listed species documented at Dover AFB. State-endangered species that occur at Dover AFB include the upland sandpiper, northern harrier, and the short-eared owl (436 SPTG/CEV 2001). There would be no adverse effects on listed avian species that are passing through Dover AFB, protected under the Migratory Bird Treaty Act, because no construction activities would occur in areas that are considered unique habitat. BMPs would be used to avoid impacts on state-endangered and migratory species.

**Wetlands.** In accordance with EO 11990, *Protection of Wetlands*, the USAF must demonstrate that there are no practicable alternatives to construction within wetlands. There are approximately 73.2 acres of wetlands on Dover AFB (see **Figure 2-2**). The USAF avoids military operations in wetlands, where possible.

There are no demolition, construction, or infrastructure activities proposed near wetlands. Construction activities adjacent to wetlands could result in adverse effects because of erosion and sedimentation. These types of impacts would be minimized using BMPs (as described under **Section 4.3.6**, Water Resources) and would not require mitigation. If a proposed project is relocated into a wetland, then that project would require approval from HQ AMC and additional NEPA analysis.

A letter dated 3 March 2007 from the USACE indicates that wetlands would not be affected by the Proposed Action (see **Appendix C**). However, if project limits or project impacts should change, a USACE permit might be required pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the CWA and would require prior approval from the USACE regulatory office.

### 4.3.8 Cultural Resources

**Archeological Resources.** As previously noted, all undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no known NRHP-eligible archeological sites in the areas where ground-disturbing activities associated with the Proposed Action would occur on Dover AFB.

There is the possibility that during any building construction, demolition, or infrastructure project, there could be an inadvertent discovery of archeological materials or human remains. Impacts on such materials could be direct or indirect, range from minor to major, and have an adverse or no adverse effect, depending on the nature of the deposit and how it is encountered and subsequently treated. The Dover AFB ICRMP (DAFB 2006b) outlines procedures to be followed in the event of inadvertent discoveries, and Dover AFB is committed to following those procedures for all projects outlined in the Proposed Action. Where there is a greater potential for encountering archeological materials or human remains, use of a professional archeologist to monitor construction activities might also be warranted.

In the event of an inadvertent discovery on Dover AFB, all work in the immediate vicinity of the discovery would be halted until the materials are identified and documented and an appropriate mitigation strategy is developed in consultation with the SHPO and other consulting parties. In compliance with NAGPRA, tribal representatives would be notified and consulted about the proposed treatment of human remains and funerary and sacred objects should these be discovered during implementation of the Proposed Action. Accordingly, the Proposed Action would have no impact on archeological resources.

**Architectural Resources.** A survey was conducted of Cold War-era properties at Dover AFB, during which 23 buildings were evaluated for NRHP eligibility. Only a portion of the installation's Cold War-era buildings and structures were included in the survey. Three of the buildings in the survey, Buildings 1301, 1315, and 1350, are within the area associated with projects under the Proposed Action. Building 1301 is listed on the NRHP, but Buildings 1315 and 1350 have been determined ineligible for listing on the NRHP. The Proposed Action would need to avoid, minimize, or mitigate any impacts on Building 1301.

In 2007, the SHPO concurred that no buildings at Dover AFB constructed prior to the completion of the ICRMP, dated November 2005, are NRHP-eligible or require evaluation for NRHP eligibility in the future, except those buildings specifically noted as NRHP-eligible or requiring evaluation in Table 3.11 of the ICRMP (DDHCA 2007). Dover AFB buildings noted as NRHP-eligible or requiring evaluation in Table 3.11 of the ICRMP that have not been demolished or determined ineligible since completion of the INRMP include Buildings 1269, 1270, 1272, 1274, 1275, 1276, 1277, and 1301. As noted in **Section 3.8**, Buildings 1274, 1275, 1276, and 1277 (Building Category Code 42253) have been evaluated and documented under the recently implemented *Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities*. Accordingly, alterations to these buildings or demolition can be completed without further review under Section 106 of the NHPA. Buildings 1269, 1270, and 1272 are not addressed by the Program Comment, so they would require reevaluation prior to implementation of the Proposed Action (Benner 2007c). If any of these buildings are determined NRHP-eligible, the Proposed Action would need to avoid, minimize, or mitigate impacts on those buildings.

**Resources of Traditional, Religious, or Cultural Significance to Native American Tribes.** Because the projects associated with the Proposed Action would involve ground-disturbing activities during demolition and construction, they have the potential to impact resources of traditional, religious, or cultural significance to Native American tribes, if present. Currently, there are no known resources of significance to Native American tribes at Dover AFB (DAFB 2006b). Dover AFB has attempted to initiate consultation with interested Native American tribes and will continue consultation efforts in

conjunction with the planning for specific projects outlined in the Proposed Action. If resources of traditional, religious, or cultural significance to Native American tribes are identified within a project APE, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources. Given that there would be removal of some buildings during demolition, man-made features would be removed from the landscape, and the impact of demolition could be considered beneficial to the setting of resources of traditional, religious, or cultural significance to Native American tribes.

### 4.3.9 Socioeconomic Resources and Environmental Justice

**Socioeconomic Resources.** Short-term minor direct beneficial impacts would be expected under the Proposed Action. Construction costs of the Proposed Action would have a direct, beneficial impact on the local economy. In 2005, Dover AFB had \$18 million budgeted for construction, which would account for 3.8 percent of the \$470 million total economic impact from Dover AFB (USAF 2006). Assuming the budgeted amount for construction at Dover AFB remains approximately the same, the economic impact of the Proposed Action over 5 years would be minor on the ROI.

The Proposed Action does not involve a change of personnel at Dover AFB and the proposed construction and demolition activities would be temporary and short-term in nature. Planned construction and demolition activities would include 100,000 ft<sup>2</sup> of new facilities, 149,000 ft<sup>2</sup> of infrastructure improvements, and 126,000 ft<sup>2</sup> of demolition over the next 5 years. Therefore, no permanent or long-term effects on population, personal income, school enrollment, poverty levels, or other demographic or employment indicators in the ROI would be expected.

**Environmental Justice.** No impacts are expected on environmental justice issues. The proposed construction and demolition activities under the Proposed Action would occur principally on-installation. Construction and demolition activities at Dover AFB would be dispersed throughout the installation over the next 5 years. Off-base minority and low-income populations, limited in size and proximity to the installation, would not be affected by the Proposed Action. Therefore, no disproportionate impacts on minority or low-income populations from the Proposed Action are expected.

### 4.3.10 Infrastructure

The Proposed Action would not result in any long-term, adverse, effects on the installation's infrastructure. Long-term, beneficial, effects would be realized from improved infrastructure and proposed projects. Most routine infrastructure improvements are categorically excluded from detailed analysis under Appendix B to 32 CFR Part 989 (i.e., A2.3.8, A2.3.9, A2.3.10, A2.3.11, A2.3.12, A2.3.13, or A2.3.14), unless a particular project is unusually large or traverses a sensitive area of the installation. Infrastructure projects that would normally be categorically excluded from analysis in an EA or EIS are not included in this IDEA (see **Appendix A** for a complete list of projects that are analyzed in this IDEA).

**Airfield.** No adverse effects on the airfield would be expected from the Proposed Action. Dover AFB proposed several airfield upgrades such as firefighting improvements and lighting repairs. Planned pavement repairs include the addition of shoulders and surface repairs to taxiway Charlie, and surface repairs to taxiway Echo and taxiway "A." These improvements, along with other planned maintenance, will keep the Dover AFB airfield in good working order (HQ AMC 2006).

**Transportation Network.** Increased traffic associated with demolition and construction vehicles would be expected to have a short-term, minor, adverse effect on the transportation network at Dover AFB. The construction and demolition phase of the Proposed Action at Dover AFB would require delivery of materials to and removal of debris from construction sites. Construction traffic would compose a small



percentage of the total existing traffic and many of the vehicles would be driven to and kept on-site for the duration of construction and demolition, resulting in relatively few additional trips. The proposed installation development activities would occur at different times and locations on Dover AFB which would further reduce construction traffic. Any potential increases in traffic volume associated with proposed demolition and construction activity would be temporary.

No long-term, adverse effects would be expected to the transportation network at Dover AFB, which is maintained by proactive repair and replacement projects. The Proposed Action would provide additional parking on Dover AFB.

**Electrical System.** Minor, long-term, beneficial effects on electrical systems would be expected from the Proposed Action by demolishing old buildings with outdated electrical systems and constructing new buildings. Due to the growth on the base, and technological advancements, the electrical system is continually improved to meet growing needs at Dover AFB. The Proposed Action would create a negligible increase in electrical demands on the installation.

**Natural Gas.** No adverse effects on natural gas systems would be expected from the Proposed Action. Dover AFB continually increases infrastructure as needed. Natural gas service at Dover AFB is continually added and upgraded as current buildings switch over to natural gas for heating service. The Proposed Action would create a negligible increase in natural gas demands at the installation.

**Liquid Fuel.** No adverse effects on liquid fuel systems would be expected from the Proposed Action. Planned improvements for storage, which include the installation of a Type III hydrant system, would create beneficial effects on the liquid fuel system by increasing the efficiency of the system.

**Water Supply.** No adverse effects on the water supply system would be expected from the Proposed Action. The proposed projects would require the use of water; however, it would be well within the current capacity of the system. Dover AFB continually implements projects to improve the water supply system on the installation.

**Sanitary Sewer and Wastewater Systems.** No adverse effects on sanitary sewer systems would be expected from the Proposed Action. The sanitary sewer system is continually upgraded to meet increasing demands at the installation. The Proposed Action would create a negligible increase in sanitary sewer demands.

**Heating System.** No adverse effects on the central heating system would be expected from the Proposed Action. New construction would be heated via natural gas.

**Communications.** No adverse effects on communications systems would be expected from the Proposed Action. Dover AFB plans to upgrade the installation communications system as needed to support future development.

**Solid Waste Management.** Short-term, minor, direct, adverse effects would result from increased construction and demolition debris production. Solid waste generated from the proposed construction and demolition activities would consist of building materials such as solid pieces of concrete, metals (conduit, piping, and wiring), and lumber. Contractors would be required to recycle construction and demolition debris to the greatest extent possible as part of installation policy, thereby diverting it from landfills. The contractor would dispose of nonrecyclable construction and demolition debris at an off-site permitted landfill facility. As described in **Section 2.1**, construction and demolition activities would occur over an estimated 5-year timeframe.

### 4.3.11 Hazardous Materials and Wastes

The Proposed Action would not result in long-term, adverse effects on hazardous materials use or hazardous waste generation. Short-term, minor, adverse effects resulting from use of hazardous materials during construction, such as sealants and solvents, would be minimal.

New facilities and procedures for the fuels storage facility would result in increased quantities of hazardous materials. Procedures would remain the same for the quantities of chemicals (i.e., paints, solvents, and fuels) used under the existing procedures. These proposed projects would conform to existing management plans.

**Hazardous Materials.** Short-term, minor, adverse effects on hazardous materials would be expected. Products containing hazardous materials would be procured and used during the proposed construction and demolition. It is anticipated that the quantity of products containing hazardous materials would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal, state, and USAF regulations. The increase in hazardous materials would not affect overall management plans or capacities for handling these materials.

**Hazardous Wastes.** No adverse effects on hazardous wastes would be expected. Hazardous wastes generated during construction and demolition activities would be negligible. Contractors would be required to turn in hazardous wastes to Dover AFB for proper disposal. Contractors would also be required to follow the Dover AFB *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*. Waste produced would not be expected to affect the management plans or capacities for handling this waste. Therefore, the Proposed Action would contribute negligibly to the installation's hazardous waste management program and result in no adverse effects.

**Asbestos-Containing Materials and Lead-Based Paint.** Short-term, minor, adverse and long-term, minor, beneficial effects on ACMs and LBP could occur. Specifications for proposed construction activities (as discussed in **Section 3.11**) and USAF regulations prohibit the use of ACM and LBP for new construction. Buildings scheduled for demolition could contain ACM and LBP, and therefore, would need to be surveyed by the contractor prior to demolition activities. Dover AFB keeps records on ACM and LBP maintenance and abatement. Sampling and abatement of ACM or LBP would occur prior to demolition activities and would be handled in accordance with the Dover AMOP (436 AW 2006b) and USAF policy. The removal of any ACMs and LBP would result in long-term beneficial effects by reducing the quantities of these materials that must be managed.

**Radon.** No adverse effects due to radon would be expected. Dover AFB is within an area of low potential for radon gas (USEPA 2007b). Therefore, no exposure to radon gas would be anticipated from the Proposed Action.

**PCBs.** Short-term, minor, adverse and long-term, minor, beneficial effects on PCBs would be expected. Any PCB-containing capacitors and fluorescent light ballasts would be removed and properly disposed prior to demolition. Removal of the PCB-containing equipment would be a long-term, beneficial effect.

**Pesticides.** No adverse effects on pesticides would be expected. The demolition of older buildings with failing infrastructure such as leaking pipes or wood rot would reduce the likelihood of pests. New construction would require pest management services as needed. No pesticides would be mixed, stored, or disposed of at any areas of the Proposed Action. Future pesticide applications would be conducted in adherence with the existing Dover AFB PMP.

**Environmental Restoration Program.** Short-term, minor, adverse effects from exposure to ERP sites could occur. There is a potential for workers to encounter contamination from ERP sites during construction. Therefore, it is recommended that a health and safety plan be prepared in accordance with OSHA requirements prior to commencement of construction activities. Workers performing soil removal activities within ERP sites are required to have OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. In addition to this training, supervisors are required to have an OSHA Site Supervisor certification. Should contamination be encountered, then handling, storage, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFI; and Dover AFB programs and procedures.

**Pollution Prevention.** Negligible effects on pollution prevention would be expected. Quantities of hazardous material purchases, off-installation of hazardous wastes, disposal of solid wastes, and energy consumption would increase during demolition and construction. Operations associated with the Proposed Action would require procurement of products containing hazardous materials, generation of hazardous waste, and consumption of energy consistent with the baseline condition. The Dover AFB Pollution Prevention Program would accommodate the Proposed Action.

## 4.4 Detailed Environmental Consequences of the Proposed Action

The section presents the potential environmental consequences that could occur as a result of the Proposed Action. **Sections 4.4.1, 4.4.2, and 4.4.3** analyze in detail those projects identified in **Section 2** as representative of potential environmental consequences because of size or other sensitive aspects of these projects.

### 4.4.1 Representative Demolition Projects

#### 4.4.1.1 D1. Demolish Covered Storage Facility 1315

**Figure 2-2** shows the location of this proposed demolition project and the surrounding area. Facility 1315 (49,916 ft<sup>2</sup>) is currently used as covered storage. This structure is aging (approximately 50 years old) and poorly configured. Demolition of this facility would create approximately 49,916 ft<sup>2</sup> of open space and decrease safety hazards by eliminating a structure from the runway lateral clearance area.

**Noise.** Intermittent, short-term, minor, adverse impacts from noise would be expected from the demolition of Covered Storage Facility 1315. On-installation employees working at the commercial facility approximately 400 feet away from the demolition could experience noise levels of approximately 74 dBA while outside the building and an estimated exposure of 60 dBA inside the building. It is not anticipated that the short-term increase in ambient noise levels from the demolition of Facility 1315 would cause significant adverse effects on the surrounding populations.

**Land Use.** Long-term, minor, beneficial effects would be expected. The demolition of the Covered Storage Facility, which is currently within the Industrial land use category, would make land available for the construction of new facilities; however, due to its proximity in the runway lateral clearance area, this area would likely remain undeveloped. The future land use of this area is Open Space. This project would be compatible with present and future land uses, and no changes in land use functions would be expected.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the demolition of the Covered Storage Facility 1315. Demolition activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying

water over the demolition area. Demolition of this facility would be expected to result in air emissions comparable to those indicated in **Table 4-2**.

**Table 4-2. Expected Criteria Pollutant Emissions Resulting from Demolition of Covered Storage Facility 1315**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| D1. Demolish Covered Storage Facility 1315                   | 49,916                          | 0.180                 | 0.031     | 0.262    | 0.004                 | 1.941    |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.0007%               | 0.0002%   | 0.0002%  | 0.00001%              | 0.0114%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Demolishing the Covered Storage Facility 1315 would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the demolition of Covered Storage Facility 1315 because it is within the runway lateral clearance area. Contractors working in or near the flightline must be aware of and follow flightline safety procedures. Once demolition is complete and the building is removed from the airfield safety clearance area, long-term, negligible, beneficial effects on airfield safety clearance would occur.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 49,916 ft<sup>2</sup> (1.15 acres) of soil would be disturbed. Soils in the vicinity of Covered Storage Facility 1315 have been heavily disturbed (soils are not mapped) by previous activities. The proposed demolition would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after demolition would be required. Therefore, impacts on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** The demolition of Covered Storage Facility 1315 has the potential to result in short-term, negligible, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities (49,916 ft<sup>2</sup> [1.15 acres]) during demolition. The proposed demolition would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after demolition would be required. Therefore, impacts on surface water would be minimized. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005), and all applicable Federal, state, and local regulations and policies.

The demolition of Covered Storage Facility 1315 has the potential to result in long-term, negligible, beneficial effects on water resources associated with a decrease in impervious surface. The demolition of these buildings would result in a decrease of approximately 49,916 ft<sup>2</sup> (1.15 acres) of impervious surface (see **Table A-1** in **Appendix A**). This decrease of impervious surface would result in a negligible reduction in the velocity and volume of storm water.

**Biological Resources.** Short-term, minor, adverse effects on biological resources would occur as a result of demolition of Covered Storage Facility 1315. The vicinity of Covered Storage Facility 1315 is heavily disturbed. There is minimal existing vegetation and no wetlands. Covered Storage Facility 1315 is near an area where the upland sandpiper (a state endangered species) has been identified at Dover AFB. The upland sandpiper habitat is composed of large, flat tracts of land, and is most likely found along taxiways, runways, and open fields. The most important time to look for the upland sandpipers is from May 1 through July 15 (436 SPTG/CEV 2001). If upland sandpipers were identified in the vicinity of Covered Storage Facility 1315 prior to demolition, the DNHESP office would be contacted and measures would be taken to avoid impacts on the upland sandpiper. There are no known Federal threatened or endangered species that occur at Dover AFB. Some minor, adverse effects could occur on the few animals that might be at the project area during the demolition. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Covered Storage Facility 1315 was included in the survey of Cold War properties and was determined to be ineligible for listing on the NRHP under Criterion Consideration G. In the same study, the building was recommended as not requiring evaluation once it has reached 50 years of age, and the SHPO concurred. The closest building to 1315 is Building 1301, a World War II-era NRHP-listed building that has received extensive exterior renovations since its listing. Recordation for the Historic American Buildings Survey/Historic American Engineering Record was completed as part of the mitigation for the alterations to the building (DAFB 2006b). Because of its extensive renovations, neither its viewshed nor its structural integrity would be impacted by the demolition of Covered Storage Facility 1315. Therefore, Project D1 would have no impact on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project D1. Accordingly, Project D1 would have no impact on archeological resources.

Project D1 would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB will continue to consult with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes in the vicinity of the project. If resources of traditional, religious, or cultural significance to Native American tribes are identified, the installation would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources. Given that removal of the building would remove a man-made feature from the landscape, the impact of demolition could be considered beneficial to the setting of resources of traditional, religious, or cultural significance to Native American tribes.

**Socioeconomics and Environmental Justice.** Negligible effects on socioeconomic resources would be expected from the proposed demolition of Covered Storage Facility 1315. The demolition activities would provide temporary employment for contractors in the area. Demolition would occur entirely on Dover AFB and have little potential to affect off-installation resources.

**Infrastructure.** Negligible effects on infrastructure resources would be expected from the demolition of Covered Storage Facility 1315. Removal of this building would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term, adverse

effects would be expected as a result of the generation of approximately 3,868 tons of demolition debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

**Hazardous Materials and Wastes.** No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of Covered Storage Facility 1315. However, because of its age, the building should be assumed to contain both ACM and LBP. Sampling for ACM and LBP would occur prior to any demolition activities so that these materials can be properly characterized, handled, and disposed of in accordance with the Dover AFB AMOP and USAF policy. The demolition of Building 1315 would not affect or be affected by ERP sites.

#### 4.4.1.2 D2. Demolish VAQ 802

**Figure 2-2** shows the location of this proposed demolition project and the surrounding area. VAQ 802 (22,984 ft<sup>2</sup>) is currently used as lodging for visitors. It is approximately 53 years old, contains inefficient utilities, and does not meet current building codes. Demolition would remove approximately 11,492 ft<sup>2</sup> of inadequate facility space, which would provide much of the necessary area to construct a new Visitor's Quarters (see **Section 4.4.2.1**).

**Noise.** Intermittent, short-term, minor, adverse impacts from noise would be expected from the demolition of the VAQ 802. Populations in the adjacent outdoor recreation area, approximately 600 feet away from the demolition, could experience noise levels of approximately 68 dBA. It is not anticipated that the short-term increase in ambient noise levels from the demolition of the VAQ 802 would cause significant adverse effects on the surrounding populations.

**Land Use.** Long-term, minor, beneficial effects would be expected. The demolition of VAQ 802, which is currently within the Housing (Unaccompanied) land use category, would make land available for the construction of new community facilities. The construction of new facilities in previously disturbed areas reduces the amount of undisturbed land required for future development. The future land use of this area is Housing (Unaccompanied). Project D2 would be compatible with the present and future land uses, and no changes in land use functions would be expected.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the demolition of the VAQ 802. Demolition activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the demolition area. Demolition of this facility would be expected to result in air emissions comparable to those indicated in **Table 4-3**.

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Demolishing the VAQ 802 would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety could be expected from the demolition of VAQ 802 because of its proximity to the housing area. Signs and barriers would be installed during demolition to prevent the public from entering the demolition site. Demolition activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Table 4-3. Expected Criteria Pollutant Emissions Resulting from Demolition of VAQ Facility 802**

| <b>Proposed Project</b>                                      | <b>Project Size (ft<sup>2</sup>)</b> | <b>NO<sub>x</sub> (tpy)</b> | <b>VOC (tpy)</b> | <b>CO (tpy)</b> | <b>SO<sub>x</sub> (tpy)</b> | <b>PM (tpy)</b> |
|--------------------------------------------------------------|--------------------------------------|-----------------------------|------------------|-----------------|-----------------------------|-----------------|
| D2. Demolish VAQ Facility 802                                | 22,984                               | 0.0216                      | 0.0037           | 0.0312          | 0.0004                      | 0.6550          |
| SDIAQCR <i>de minimis</i> threshold                          |                                      | 100                         | 100              | NA              | NA                          | NA              |
| Regional Emissions Inventory (SDIAQCR)                       |                                      | 25,722                      | 18,379           | 120,181         | 34,742                      | 17,053          |
| Project Percentage of Regional Emissions Inventory (SDIAQCR) |                                      | 0.0001%                     | 0.00002%         | 0.00003%        | 0.000001%                   | 0.0038%         |

Note: NA = not applicable

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 11,492 ft<sup>2</sup> (0.26 acres) of soil would be disturbed. Soils in the vicinity of VAQ 802 have been heavily disturbed by previous activities. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after demolition would be required. Therefore, impacts on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** The demolition of VAQ 802 has the potential to result in short-term, negligible, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities (11,492 ft<sup>2</sup> [0.26 acres]) during demolition. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment and erosion-control plan with BMPs to manage storm water runoff during and after demolition would be required. Therefore, impacts on surface water would be minimized. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

The demolition of VAQ 802 has the potential to result in long-term, negligible, beneficial effects on water resources associated with a decrease in impervious surface. The demolition of this building would result in a decrease of approximately 11,492 ft<sup>2</sup> (0.26 acres) of impervious surface (see **Table A-1** in **Appendix A**). This decrease of impervious surface would result in a negligible reduction in the velocity and volume of storm water.

**Biological Resources.** Short-term, negligible, adverse effects on biological resources would occur from the noise associated with the demolition of VAQ 802. VAQ 802 is in an area that is heavily disturbed. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. However, some negligible, adverse effects could occur on the few animals that might be at the project area during the demolition. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** VAQ 802 (constructed in 1954) was not included in the survey of Cold War-era properties; however, the SHPO has concurred that it is not NRHP-eligible and does not require evaluation

(DDHCA 2007). Buildings within the immediate vicinity include Buildings 800, 801, and 809, all of which were constructed since 2000. Therefore, Project D2 would have no impact on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project D2. Accordingly, Project D2 would have no impact on archeological resources.

Project D2 would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources. Given that removal of the building would remove man-made features from the landscape, the impact of demolition could be considered beneficial to the setting of resources of traditional, religious, or cultural significance to Native American tribes.

***Socioeconomics and Environmental Justice.*** Negligible effects on socioeconomic resources would be expected from the proposed demolition of VAQ 802. The demolition activities would provide temporary employment for contractors in the area. Demolition would occur entirely on Dover AFB and have little potential to affect off-installation resources.

***Infrastructure.*** Negligible effects on infrastructure resources would be expected from the demolition of VAQ 802. Removal of this facility would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term, adverse effects would be expected as a result of the generation of approximately 1,781 tons of demolition debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

***Hazardous Materials and Wastes.*** No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of VAQ 802. VAQ 802 was constructed in 1954, and should be assumed to contain both ACM and LBP. Sampling for ACM and LBP would occur prior to any demolition activities so that these materials can be properly characterized, handled, and disposed of in accordance with the Dover AFB AMOP and USAF policy. The demolition of VAQ 802 would not affect or be affected by ERP sites.

#### **4.4.1.3 D3. Demolish Youth Center Facility 3499**

**Figure 2-2** shows the location of this proposed demolition project and the surrounding area. Facility 3499 (17,857 ft<sup>2</sup>) is currently used as a Youth Center, but is aging (approximately 33 years old) and has surpassed its useful lifetime. It is on a former landfill and a new Youth Center is currently being constructed. Demolition of this structure would remove approximately 17,857 ft<sup>2</sup> of facility space and create open space for a future facility.

***Noise.*** Intermittent, short-term, minor, adverse impacts from noise would be expected from the demolition of the Youth Center Facility. Populations in the adjacent outdoor recreation area, approximately 50 feet away from the demolition, could experience noise levels of approximately 90 dBA. It is not anticipated that the short-term increase in ambient noise levels from the demolition of the Youth Center Facility would cause significant adverse effects on the surrounding populations.



**Land Use.** Long-term, minor, beneficial effects would be expected. The demolition of the Youth Center Facility, which is currently within the Outdoor Recreation land use category, would make land available for the construction of new community facilities. The construction of new facilities where land has been made available by demolition reduces the amount of undisturbed land required for future development. The future land use of this area is Outdoor Recreation. This project would be compatible with the present and future land uses, and no changes in land use functions would be expected.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the demolition of the Youth Center Facility 3499. Demolition activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the demolition area. Demolition of this facility would be expected to result in air emissions comparable to those indicated in **Table 4-4**.

**Table 4-4. Expected Criteria Pollutant Emissions Resulting from Demolition of Youth Center Facility 3499**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| D3. Demolish Youth Center Facility 3499                      | 17,857                          | 0.0133                | 0.0023    | 0.0192   | 0.0003                | 0.5088   |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.0001%               | 0.00001%  | 0.00002% | 0.000001%             | 0.0030%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Demolishing the Youth Center Facility 3499 would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the demolition of the Youth Center Facility 3499 due to its proximity to the housing area. Signs and barriers would be installed during demolition to prevent the public from entering the demolition site. Additionally, this area is within an ERP soil land use control area associated with Site LF26. Construction activities would be accomplished in accordance with Federal, state, and local regulations to minimize hazards associated with hazardous materials, wastes, and substances. These hazards are discussed in more detail in the subsection addressing *Hazardous Materials and Wastes*. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 17,857 ft<sup>2</sup> (0.41 acres) of soil would be disturbed. Soils in the vicinity of Youth Center Facility 3499 have been heavily disturbed by previous activities. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after demolition would be required. Therefore, impacts on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The demolition project would

also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** The demolition of Youth Center Facility 3499 has the potential to result in short-term, negligible, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities (17,857 ft<sup>2</sup> [0.41 acres]) during demolition. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after demolition would be required. Therefore, impacts on surface water would be minimized. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

The demolition of Youth Center Facility 3499 has the potential to result in long-term, negligible, beneficial effects on water resources associated with a decrease in impervious surface. The demolition of these buildings would result in a decrease of approximately 17,857 ft<sup>2</sup> (0.41 acres) of impervious surface (see **Table A-1** in **Appendix A**). This decrease would result in a negligible reduction in the velocity and volume of storm water.

**Biological Resources.** Short-term, negligible, adverse effects on biological resources would occur as a result of the demolition of Youth Center Facility 3499. Youth Center Facility 3499 is in an area that is heavily disturbed. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. However, some negligible, adverse effects could occur on the few animals that might be at the project area during the demolition. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Youth Center Facility 3499 (constructed in 1974) was not included in the survey of Cold War-era properties; however, the SHPO has concurred that it is not NRHP-eligible and does not require evaluation (DDHCA 2007). No other buildings or structures occur within the APE for this project. Therefore, Project D3 would have no impact on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project D3. Accordingly, Project D3 would have no impact on archeological resources.

Project D3 would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources. Given that removal of the building would remove man-made features from the landscape, the impact of demolition could be considered beneficial to the setting of resources of traditional, religious, or cultural significance to Native American tribes.

**Socioeconomics and Environmental Justice.** Negligible effects on socioeconomic resources would be expected from the proposed demolition of the Youth Center Facility 3499. The demolition activities would provide temporary employment for contractors in the area. Demolition would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

**Infrastructure.** Negligible effects on infrastructure resources would be expected from the demolition of the Youth Center Facility 3499. Removal would result in less demand for certain utilities, but this reduction would be negligible when compared with total installation usage. Short-term, adverse effects would be expected as a result of the generation of approximately 1,384 tons of demolition debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during the demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

**Hazardous Materials and Wastes.** No long-term effects on hazardous materials management or hazardous waste generation would be expected as a result of the proposed demolition of the Youth Center Facility 3499. The Youth Center is partially in the soil land use control area (see **Figure 2-2**) for ERP site LF26, which is a former landfill that has been closed and is in long-term monitoring. Because the building is partially on an ERP site, demolition would likely affect the monitoring of that site and could be affected by contamination. Short-term, minor, adverse effects from possible contamination by the ERP site would be expected. If contamination is encountered, it would be handled, stored, transported, and disposed of in accordance with applicable Federal, state, and local regulations; AFIs; and Dover AFB's MAP.

## 4.4.2 Representative Construction Projects

### 4.4.2.1 C1. Construct Visitor's Quarters

**Figure 2-2** shows the location of this proposed construction project and the surrounding area. A new, modern Visitor's Quarters is needed to provide adequate lodging for visitors and meet AT/FP requirements. This project would provide adequate facility space (43,056 ft<sup>2</sup>) for visitor lodging. The proposed location for the Visitor's Quarters is in the footprint of Building 802 (Project D2, see **Section 4.4.1.2**) and the pavements around this building.

**Noise.** Intermittent, short-term, minor adverse impacts from noise would be expected from the construction of the Visitor's Quarters. Populations on the adjacent outdoor recreation area, approximately 600 feet away from the construction, could experience noise levels of approximately 64 dBA. It is not anticipated that the short-term increase in ambient noise levels from the construction of the Visitor's Quarters would cause significant adverse effects on the surrounding populations.

**Land Use.** Long-term, minor, adverse effects would be expected. The Visitor's Quarters would be constructed in a previously disturbed area, which would allow undisturbed land to remain open for future development. The existing and future land use category of this area is Housing (Unaccompanied). The proposed facility would be compatible with the existing and future land use category, and no changes in land use functions would be expected. It would be constructed on land within the DNL of 65 to 69 dBA noise contour, which is considered normally unacceptable. As discussed in **Section 4.3.2**, AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the location of buildings.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the construction of the Visitor's Quarters. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-5**.

**Table 4-5. Expected Criteria Pollutant Emissions Resulting from Construction of Visitor's Quarters**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| C1. Construct Visitor's Quarters                             | 43,056                          | 0.773                 | 0.284     | 0.896    | 0.023                 | 1.252    |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.0030%               | 0.0015%   | 0.0007%  | 0.0001%               | 0.0073%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Construction of the Visitor's Quarters would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the construction of the Visitor's Quarters as a result of increased risk associated with construction-type activities. Construction activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Soils in the vicinity of the proposed construction site have been heavily disturbed by previous activities; currently, the site proposed for construction is impervious. Prior to construction, those impervious surfaces would be removed for the construction of the Visitors' Quarters. The proposed construction of the Visitors' Quarters would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after construction would be required. Therefore, impacts on soils would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** Short-term, negligible, adverse effects could occur from grading, excavating, and recontouring of the soil and use of hazardous materials during construction. These activities have the potential to result in runoff from the construction site into receiving water bodies. The proposed construction of the Visitors' Quarters would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment and erosion control plan with BMPs to manage storm water runoff during and after construction would be required. Therefore, impacts on surface water would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

Long-term, negligible, adverse effects would be expected on water resources. The proposed Visitors' Quarters would add approximately 14,352 ft<sup>2</sup> (0.33 acres) of impervious surface (see **Table A-2** in **Appendix A**). The area proposed for construction is largely impervious and heavily disturbed.

Additionally, the site-specific SWPPP would manage storm water after construction, minimizing long-term impacts.

Dover AFB is committed to managing water resources in accordance with the installation's SWPPP and all applicable Federal, state, and local regulations and policy.

**Biological Resources.** No adverse effects on biological resources would occur as a result of construction of the Visitors' Quarters. The proposed construction is in an area that is heavily disturbed. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Implementation of Project C1 would have no impact on architectural resources, as the only buildings within or in the immediate vicinity of the project APE are of recent construction.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project C1. Accordingly, Project C1 would have no impact on archeological resources.

The proposed project would not involve disturbance of any previously undisturbed land, and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

**Socioeconomics and Environmental Justice.** Minor, beneficial effects on socioeconomic resources would be expected from the proposed construction of the Visitor's Quarter. The cost of construction for this facility is \$10 million and it is assumed that local materials and contractors would be used for this facility. Construction would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

**Infrastructure.** Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed Visitor's Quarters. The increased demand for utility services such as water supply, electricity, natural gas, and sanitary sewer would be offset by the demolition of other community buildings. This change in utility demand would be negligible when compared with total installation usage. Short-term, negligible, adverse effects would be expected as a result of the generation of approximately 94 tons of construction debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect. Construction debris is generally composed of clean materials, so most of this waste would be recycled or ground into gravel for reuse.

**Hazardous Materials and Wastes.** Short-term, minor, adverse effects would be expected from the use of hazardous materials during the construction process. The proposed Visitor's Quarters would not generate new waste streams, and therefore, no modifications to Dover AFB hazardous materials or hazardous wastes would be expected. The proposed facility is not near any ERP sites; therefore, construction workers would not be expected to encounter contamination during groundbreaking activities.

#### 4.4.2.2 C2. Construct Security Forces Complex

**Figure 2-2** shows the location of this proposed construction project and the surrounding area. A new, modern Security Forces Complex is needed to provide sufficient space and facilities for the Dover AFB security forces, as well as meet AT/FP and armory requirements. This project would provide adequate facility space (39,826 ft<sup>2</sup>) for security forces operations, support, and administration needs. The proposed location for the Security Forces Complex is in the footprint of the parking lot immediately west of the existing Security Forces Complex Building 910.

**Noise.** Intermittent, short-term, minor, adverse impacts from noise would be expected from the construction of the Security Forces Complex. Populations in the adjacent outdoor recreation area, approximately 50 feet away, could experience noise levels of approximately 85 dBA. It is not anticipated that the short-term increase in ambient noise levels from the construction of the Security Forces Complex would cause significant adverse effects on the surrounding populations.

**Land Use.** Long-term, minor, adverse effects would be expected. The Security Forces Complex would be constructed in a previously disturbed area, which would allow undisturbed land to remain open for future development. The existing and future land use category of this area is Administrative. The proposed facility would be compatible with the existing and future land use category, and no changes in land use functions would be expected. It would be constructed on land within the DNL of 80+ dBA noise contour, which is considered clearly unacceptable. According to AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the location of buildings.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the construction of the Security Forces Complex. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-6**.

**Table 4-6. Expected Criteria Pollutant Emissions Resulting from Construction of Security Forces Complex**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| C2. Construct Security Forces Complex                        | 39,826                          | 0.715                 | 0.269     | 0.829    | 0.021                 | 1.158    |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.0028%               | 0.0015%   | 0.0007%  | 0.0001%               | 0.0068%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Construction of the Security Forces Complex would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the construction of the Security Forces Complex as a result of increased risk associated with construction-type activities. Construction activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 39,826 ft<sup>2</sup> (0.91 acres) of soil would be disturbed. Soils in the vicinity of the proposed construction site have been heavily disturbed by previous activities. The proposed construction of the Security Forces Complex would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after construction would be required. Therefore, impacts on soils would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** Short-term, negligible, adverse effects could occur from grading, excavating, and recontouring of the soil and use of hazardous materials during construction. These activities have the potential to result in runoff from the construction site into receiving water bodies. The proposed construction of the Security Forces Complex would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after construction would be required. Therefore, impacts on surface water would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

Long-term, negligible, adverse effects would be expected on water resources. The proposed Security Forces Complex would add approximately 39,826 ft<sup>2</sup> (0.91 acres) of impervious surface (see **Table A-2** in **Appendix A**). The area proposed for construction is largely impervious and heavily disturbed. Additionally, the site-specific SWPPP would manage storm water after construction, minimizing long-term impacts.

Dover AFB is committed to managing water resources in accordance with the installation's SWPPP and all applicable Federal, state, and local regulations and policy.

**Biological Resources.** No adverse effects on biological resources would occur as a result of construction of the Security Forces Complex. The proposed construction area is an existing asphalt parking lot. No vegetation, habitat suitable for wildlife, or wetlands occur in this project area. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Implementation of Project C2 would have no impact on architectural resources, because there are no buildings at or near the site.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project C2. Accordingly, Project C2 would have no impact on archeological resources.

The proposed project would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover

AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

***Socioeconomics and Environmental Justice.*** Minor, beneficial effects on socioeconomic resources would be expected from the proposed construction of a Security Forces Complex. The cost of construction for this facility is \$10 million and it is assumed that local materials and contractors would be used for this facility. Construction would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

***Infrastructure.*** Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed Security Forces Complex. The increased demand for utility services such as water supply, electricity, natural gas, and sanitary sewer would be offset by the demolition of other community buildings. This change in utility demand would be negligible when compared with total installation usage. Short-term, negligible, adverse effects would be expected as a result of the generation of approximately 87 tons of construction debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect. Construction debris is generally composed of clean materials, so most of this waste would be recycled or ground into gravel for reuse.

***Hazardous Materials and Wastes.*** Short-term, minor, adverse effects would be expected from the use of hazardous materials during the construction process. The proposed Security Forces Complex would not generate new waste streams, and therefore, no modifications to Dover AFB hazardous materials and wastes would be expected. There are no known ERP sites near the project location; therefore, the potential for construction workers to encounter contamination during groundbreaking activities would be negligible.

#### **4.4.2.3 C3. Construct Chapel Center**

**Figure 2-2** shows the location of this proposed construction project and the surrounding area. A new, modern Chapel Center is needed to provide sufficient space and facilities for Dover AFB's religious services and associated activities. This project would provide adequate facility space (13,132 ft<sup>2</sup>) for religious services and meet AT/FP requirements. The proposed location for the new Chapel Center is in vicinity of the footprint of the existing Chapel Center Facility 419 (Project D5, see **Section 4.4.4**).

***Noise.*** Intermittent, short-term, minor, adverse impacts from noise would be expected from the construction of the Chapel Center. Residences approximately 200 feet away could experience noise levels of approximately 73 dBA. It is not anticipated that the short-term increase in ambient noise levels from the construction of the Chapel Center would cause significant adverse effects on the surrounding populations.

***Land Use.*** Long-term, minor, adverse effects would be expected. The Chapel Center would be constructed in a previously disturbed area, which would allow undisturbed land to remain open for future development. The existing and future land use category of this area is Community (Service). The proposed facility would be compatible with the existing and future land use category, and no changes in land use functions would be expected. It would be constructed on land within the DNL of 70 to 74 dBA noise contour, which is considered normally unacceptable. According to the AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the location of buildings.



**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the construction of the Chapel Center. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Construction of the facility would be expected to result in air emissions comparable to those indicated in **Table 4-7**.

**Table 4-7. Expected Criteria Pollutant Emissions Resulting from Construction of Chapel Center**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| C3. Construct Chapel Center                                  | 13,132                          | 0.236                 | 0.128     | 0.273    | 0.007                 | 0.382    |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.0009%               | 0.0007%   | 0.0002%  | 0.00002%              | 0.0022%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Construction of the Chapel Center would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this facility would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the construction of the Chapel Center as a result of increased risk associated with construction-type activities. Construction activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 13,132 ft<sup>2</sup> (0.30 acres) of soil would be disturbed. Soils in the vicinity of the proposed construction site have been heavily disturbed by previous activities; currently, the site proposed for construction is impervious. Prior to construction, those impervious surfaces would be removed for the construction of the Chapel Center. The proposed construction of the Chapel Center would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after construction would be required. Therefore, impacts on soils would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** Short-term, negligible, adverse effects could occur from grading, excavating, and recontouring of the soil and use of hazardous materials during construction. These activities have the potential to result in runoff from the construction site into receiving water bodies. The proposed construction of the Chapel Center would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after construction would be required. Therefore, impacts on surface water would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

Long-term, negligible, adverse effects would be expected on water resources. The proposed Chapel Center would add approximately 13,132 ft<sup>2</sup> (0.30 acres) of impervious surface (see **Table A-2** in **Appendix A**). The area proposed for construction is largely impervious and heavily disturbed. Additionally, the site-specific SWPPP would manage storm water after construction, minimizing long-term impacts.

Dover AFB is committed to managing water resources in accordance with the installation's SWPPP and all applicable Federal, state, and local regulations and policy.

**Biological Resources.** Short-term and long-term, negligible, adverse effects on biological resources would occur as a result of construction of the Chapel Center. The proposed construction is in an area that is heavily disturbed. There is minimal existing vegetation, no suitable habitat for wildlife, and no wetlands. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. However, some negligible, adverse effects could occur on the few animals that might be at the project area during construction. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Once Project D5 has been implemented, there would be no buildings or structures within the construction footprint for Project C3; however, Building 428 (constructed in 1958) is within the APE of the proposed project. The SHPO has concurred that Building 428 is not NRHP-eligible and does not require evaluation (DDHCA 2007). Therefore, Project C3 would have no impact on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project C3. Accordingly, Project C3 would have no impact on archeological resources.

The proposed project would not involve disturbance of any previously undisturbed land, and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

**Socioeconomics and Environmental Justice.** Minor, beneficial effects on socioeconomic resources would be expected from the proposed construction of a Chapel Center. The cost of construction for this facility is \$2.9 million and it is assumed that local materials and contractors would be used for this facility. Construction would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

**Infrastructure.** Overall, negligible effects on infrastructure resources would be expected from the construction of the proposed Chapel Center. The increased demand for utility services such as water supply, electricity, natural gas, and sanitary sewer would be negligible when compared with total installation usage. Short-term, negligible, adverse effects would be expected as a result of the generation of approximately 29 tons of construction debris (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect. Construction debris is generally composed of clean materials, so most of this waste would be recycled or ground into gravel for reuse.

**Hazardous Materials and Wastes.** Short-term, minor, adverse effects would be expected from the use of hazardous materials during the construction process. The proposed Chapel Center would not generate new waste streams, and therefore, no modifications to Dover AFB hazardous materials and wastes would be expected. There are no known ERP sites near the project location; therefore, the potential for construction workers to encounter contamination during groundbreaking activities is negligible.

### 4.4.3 Representative Infrastructure Projects

#### 4.4.3.1 I1. Construct Chapel Center Parking Lot

**Figure 2-2** shows the location of this proposed construction project and the surrounding area. A new, modern Chapel Center parking lot is needed to provide sufficient parking space for the proposed Chapel Center. This project would provide adequate facility space (43,056 ft<sup>2</sup>) for parking. The proposed location for the new Chapel Center parking lot is in the footprint of the existing Chapel Center parking lot and adjacent grassy areas.

**Noise.** Construction noise impacts from paving of the parking lot would be similar to those impacts discussed in **Section 4.3.1**.

**Land Use.** No adverse effects would be expected from construction of a Chapel Center parking lot. The existing and future land use category of this area is Community (Service). The proposed facility would be compatible with the existing and future land use category, and no changes in land use functions would be expected. This area would be used as a parking lot and not regularly occupied, so the existing noise levels would not be a concern.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the construction of the Chapel Center parking lot. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Construction of the new pavements for the Chapel Center would be expected to result in air emissions comparable to those indicated in **Table 4-8**.

**Table 4-8. Expected Criteria Pollutant Emissions Resulting from Construction of Chapel Center Parking Lot**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| I1. Construct Chapel Center Parking Lot                      | 43,056                          | 0.0062                | 0.0010    | 0.0082   | 0.0001                | 1.2261   |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.00002%              | 0.00001%  | 0.00001% | 0.0000004%            | 0.0072%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Construction of the Chapel Center parking lot would not exceed *de minimis*

threshold levels. In addition, the criteria pollutants generated by the construction of this infrastructure would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the construction of the Chapel Center parking lot as a result of increased risk associated with construction-type activities. Construction activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Soils in the vicinity of the proposed construction site have been heavily disturbed by previous activities. The proposed construction of the Chapel Center Parking Lot would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after construction would be required. Therefore, impacts on soils would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** Short-term, negligible, adverse effects could occur from grading, excavating, and recontouring of the soil and use of hazardous materials during construction. These activities have the potential to result in runoff from the construction site into receiving water bodies. The proposed construction of the Chapel Center Parking Lot would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after construction would be required. Therefore, impacts on surface water would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

Long-term, negligible, adverse effects would be expected on water resources. The proposed Chapel Center Parking Lot would add approximately 43,056 ft<sup>2</sup> (0.99 acres) of impervious surface (see **Table A-3**). The area proposed for construction is heavily disturbed. Additionally, the site-specific SWPPP would manage storm water after construction, minimizing long-term impacts.

Dover AFB is committed to managing water resources in accordance with the installation's SWPPP and all applicable Federal, state, and local regulations and policy.

**Biological Resources.** Long-term, negligible, adverse effects on biological resources would occur as a result of construction of the Chapel Center Parking Lot. The proposed construction would require the removal of some landscaped grass from a developed area. Wildlife that would occur in this area would be adapted to the suburban/urban environment. No wetlands occur in this project area. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** As discussed earlier, Building 428 is not NRHP-eligible and does not require evaluation (DDHCA 2007). Therefore, Project II would have no impact on architectural resources.

The project would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on archeological resources or resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native

American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

**Socioeconomics and Environmental Justice.** Negligible to minor, beneficial effects on socioeconomic resources would be expected from the proposed construction of a Chapel Center Parking Lot. The cost of construction for this facility is \$1.3 million and it is assumed that local materials and contractors would be used for this facility. Construction would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

**Infrastructure.** Negligible effects on infrastructure resources would be expected from the proposed construction of a new parking lot. Short-term, negligible, adverse effects would be expected as a result of the generation of as much as 22 tons of debris from construction (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

**Hazardous Materials and Wastes.** Short-term, minor, adverse effects would be expected from the use of hazardous materials during the pavement construction process. No long-term effects would be expected. Dover AFB is committed to managing hazardous wastes according to the installation's *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*; *Oil and Hazardous Substance Spill Prevention and Response Plan*; and all applicable Federal, state, and local regulations and policies.

#### **4.4.3.2 12. Implement Storm Water BMP/Spill Prevention at Transient Aircraft Parking Ramp**

**Figure 2-2** shows the location of this proposed construction project and the surrounding area. An expanded paved area is needed to provide sufficient storm water BMP/spill prevention at the transient aircraft parking ramp next to Taxiway Alpha. This project would provide adequate storm water BMP/spill prevention space (43,560 ft<sup>2</sup>) for the transient aircraft parking ramp. The proposed location for the expanded paved area is currently not paved.

**Noise.** Construction noise impacts from paving of the transient aircraft parking ramp would be similar to those impacts discussed in **Section 4.3.1**.

**Land Use.** No adverse effects would be expected from implementing the storm water BMP/spill prevention at the transient aircraft parking ramp. The existing and future land use category of this area is Runway/Taxiway/Apron. The proposed project would be compatible with the existing and future land use category, and no changes in land use functions would be expected.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of constructing the storm water BMP/spill prevention at the transient aircraft parking ramp. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Construction of the storm water BMP/spill prevention at the transient aircraft parking ramp would be expected to result in air emissions comparable to those indicated in **Table 4-9**.

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Construction of the storm water BMP/spill prevention at the transient aircraft parking ramp would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the construction of this infrastructure project would not exceed 10 percent of the regional emissions values.

**Table 4-9. Expected Criteria Pollutant Emissions Resulting from Storm Water BMP/Spill Prevention at Transient Aircraft Parking Ramp**

| <b>Proposed Project</b>                                                 | <b>Project Size (ft<sup>2</sup>)</b> | <b>NO<sub>x</sub> (tpy)</b> | <b>VOC (tpy)</b> | <b>CO (tpy)</b> | <b>SO<sub>x</sub> (tpy)</b> | <b>PM (tpy)</b> |
|-------------------------------------------------------------------------|--------------------------------------|-----------------------------|------------------|-----------------|-----------------------------|-----------------|
| I2. Storm Water BMP/Spill Prevention at Transient Aircraft Parking Ramp | 43,560                               | 0.782                       | 0.286            | 0.907           | 0.023                       | 1.267           |
| SDIAQCR <i>de minimis</i> threshold                                     |                                      | 100                         | 100              | NA              | NA                          | NA              |
| Regional Emissions Inventory (SDIAQCR)                                  |                                      | 25,722                      | 18,379           | 120,181         | 34,742                      | 17,053          |
| Project percentage of Regional Emissions Inventory (SDIAQCR)            |                                      | 0.0030%                     | 0.0016%          | 0.0008%         | 0.0001%                     | 0.0074%         |

Note: NA = not applicable

**Safety.** Short-term, minor, adverse effects on safety would be expected from implementation of storm water BMP/spill prevention at the transient aircraft parking ramp. Safety risks would increase due to additional construction-type activities, intrusions of the taxiway and runway lateral clearance areas, and construction activities in a QD arc. Contractors working in or near the flightline must be aware of and follow flightline safety procedures. Munitions transport in the project area would not occur during construction activities. No groundbreaking activities would occur in or near areas where munitions are stored or handled. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Soils in the vicinity of the proposed construction site have been heavily disturbed by previous activities. The proposed construction of storm water BMP/spill prevention at transient aircraft parking ramp would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after construction would be required. Therefore, impacts on soils would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** Short-term, negligible, adverse effects could occur from grading, excavating, and recontouring of the soil and use of hazardous materials during construction. These activities have the potential to result in runoff from the construction site into receiving water bodies. The proposed construction of storm water BMP/spill prevention at the transient aircraft parking ramp would require an NPDES construction permit and an approved Delaware Sediment and Stormwater Plan. The development of a site-specific- sediment and erosion-control plan with BMPs to manage storm water runoff during and after construction would be required. Therefore, impacts on surface water would be minimized. The construction project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

Long-term, minor, beneficial effects on water resources would be expected as a result of storm water BMP/spill prevention at the transient aircraft parking ramp. The proposed project would protect groundwater and surface water from future, potential hazardous material spills, in accordance with the installation's SWPPP (436 CES/CEV 2005).

**Biological Resources.** Long-term, negligible, adverse effects on biological resources would occur as a result of construction of the storm water BMP/spill prevention at the transient aircraft parking ramp. The proposed construction would require the removal of landscaped grass from a developed area. Wildlife that would occur in this area would be adapted to the suburban/urban environment. No wetlands occur in this project area. Furthermore, there are no known federally protected species that occur at Dover AFB. No state endangered or rare species would be affected by this project. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

Long-term, minor, beneficial effects on biological resources would occur as a result of storm water BMP/spill prevention at the transient aircraft parking ramp. The proposed project would protect biological resources from the potential adverse effects from hazardous materials spills.

**Cultural Resources.** There are no NRHP-eligible buildings or structures in the APE of this project; therefore, Project I2 would have no impacts on architectural resources.

The implementation of storm water BMP/spill prevention at the transient aircraft parking ramp would have no impact on archeological resources. All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a) and there are no NRHP-eligible archeological sites in the APE for Project I2.

The project would not involve disturbance of any previously undisturbed land, and therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

**Socioeconomics and Environmental Justice.** Negligible to minor, beneficial effects on socioeconomic resources would be expected from the proposed implementation of a storm water BMP/spill prevention at the transient aircraft parking ramp. Implementation would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

**Infrastructure.** Long-term, minor, beneficial and short-term, negligible, adverse effects on infrastructure resources would be expected from implementing the storm water BMP/spill prevention at the transient aircraft parking ramp. The beneficial effects include a reduction of storm water streams with erosion on the airfield. The short-term, adverse effect would include the generation of as much as 22 tons of debris from construction (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during construction activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

**Hazardous Materials and Wastes.** Short-term, minor, adverse effects would be expected from the use of hazardous materials from implementing the BMP/spill prevention at the transient aircraft parking ramp. No long-term effects would be expected. Dover AFB is committed to managing hazardous materials and wastes according to the installation's *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*; *Oil and Hazardous Substance Spill Prevention and Response Plan*; and all applicable Federal, state, and local regulations and policies.

#### 4.4.3.3 I3. Demolish Central Heating Plant Facility 617

**Figure 2-2** shows the location of this proposed demolition project and the surrounding area. Facility 617 (16,171 ft<sup>2</sup>) is used to heat and cool several buildings at the installation; however, this facility is more than 50 years old and will be unnecessary once the existing natural gas system is extended across the entire installation. Demolition of this facility would create approximately 16,171 ft<sup>2</sup> of open space that could be used to construct a new facility in the future.

**Noise.** Intermittent, short-term, minor, adverse impacts from noise would be expected from the demolition of the Central Heating Plant Facility. Residences approximately 250 feet away could experience noise levels of approximately 76 dBA. It is not anticipated that the short-term increase in ambient noise levels from the demolition of the Central Heating Plant Facility would cause significant adverse effects on the surrounding populations.

**Land Use.** Long-term, minor, beneficial effects would be expected from demolition of the Central Heating Plant Facility. The demolition of this facility would increase the quantity of land available for future development. The existing and future land use category of this area is Industrial. The proposed project would be compatible with the existing and future land use category, and no changes in land use functions would be expected.

**Air Quality.** Short-term, minor, adverse effects would be expected as a result of the demolition of Central Heating Plant Facility 617. Construction activities would result in air emissions from the operation of heavy machinery. As a BMP, fugitive particulate matter could be minimized by continually spraying water over the construction area. Demolition of the Central Heating Plant Facility 617 would be expected to result in air emissions comparable to those indicated in **Table 4-10**.

**Table 4-10. Expected Criteria Pollutant Emissions Resulting from Demolition of Central Heating Plant Facility 617**

| Proposed Project                                             | Project Size (ft <sup>2</sup> ) | NO <sub>x</sub> (tpy) | VOC (tpy) | CO (tpy) | SO <sub>x</sub> (tpy) | PM (tpy) |
|--------------------------------------------------------------|---------------------------------|-----------------------|-----------|----------|-----------------------|----------|
| I3. Demolish Central Heating Plant Facility 617              | 16,171                          | 0.0110                | 0.0019    | 0.0158   | 0.0002                | 0.4608   |
| SDIAQCR <i>de minimis</i> threshold                          |                                 | 100                   | 100       | NA       | NA                    | NA       |
| Regional Emissions Inventory (SDIAQCR)                       |                                 | 25,722                | 18,379    | 120,181  | 34,742                | 17,053   |
| Project percentage of Regional Emissions Inventory (SDIAQCR) |                                 | 0.00004%              | 0.00001%  | 0.00001% | 0.000001%             | 0.0027%  |

Note: NA = not applicable

Dover AFB is classified as a nonattainment area for 8-hour O<sub>3</sub>, so the General Conformity Rule applies to the Proposed Action. Demolition of the Central Heating Plant Facility 617 would not exceed *de minimis* threshold levels. In addition, the criteria pollutants generated by the demolition of this infrastructure would not exceed 10 percent of the regional emissions values.

**Safety.** Short-term, minor, adverse effects on safety would be expected from the demolition of the Central Heating Plant as a result of increased risk associated with construction-type activities.



Demolition activities would be accomplished in accordance with Federal, state, and local regulations to minimize public safety hazards. No long-term effects would be expected.

**Geological Resources.** Short-term, minor, adverse effects would be expected from grading, excavating, and recontouring of the soil. Approximately 16,171 ft<sup>2</sup> (0.37 acres) of soil would be disturbed. Soils in the vicinity of the Central Heating Plant Facility have been heavily disturbed by previous activities. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs and erosion-control techniques (such as silt-fencing, sediment traps, and application of water sprays) to manage runoff and erosion during and after demolition would be required. Therefore, impacts on soils would be minimized. Disturbed areas would be replanted with native vegetation, as necessary. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

**Water Resources.** The demolition of the Central Heating Plant Facility has the potential to result in short-term, negligible, adverse effects on water resources as a result of erosion and sedimentation associated with ground-disturbing activities (16,171 ft<sup>2</sup> [0.37 acres]) during demolition. The proposed demolition would require an approved Delaware Sediment and Stormwater Plan. The development of a site-specific sediment- and erosion-control plan with BMPs to manage storm water runoff during and after demolition would be required. Therefore, impacts on surface water would be minimized. The demolition project would also comply with the installation's SWPPP (436 CES/CEV 2005) and all applicable Federal, state, and local regulations and policies.

The demolition of the Central Heating Plant Facility has the potential to result in long-term, negligible, beneficial effects on water resources associated with a decrease in impervious surface. The demolition of these buildings would result in a decrease of approximately 16,171 ft<sup>2</sup> (0.37 acres) of impervious surface (see **Table A-3** in **Appendix A**). This decrease would result in a negligible reduction in the velocity and volume of storm water.

**Biological Resources.** Short-term, negligible, adverse effects on biological resources would occur as a result of the demolition of the Central Heating Plant Facility. The Central Heating Plant Facility is in an area that is heavily disturbed; however, some negligible, adverse effects could occur on the few animals that might be at the project area during the demolition. Long-term, negligible, beneficial effects on biological resources would occur because this area would be revegetated after the demolition. Dover AFB is committed to managing biological resources in accordance with all applicable Federal, state, and local regulations and policies.

**Cultural Resources.** Building 617, the Central Heating Plant Facility constructed in 1956, was not included in the survey of Cold War-era properties; however, the SHPO has concurred that it is not NRHP-eligible and does not require evaluation (DDHCA 2007). The Cold War-era buildings in the vicinity of the plant have been demolished; therefore, the building's demolition would not affect the viewshed of any other resources. Thus, Project I3 would have no impact on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APE for Project I3. Accordingly, Project I3 would have no impact on archeological resources.

The demolition of Building 617 would not involve the disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native

American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

***Socioeconomics and Environmental Justice.*** Minor, beneficial effects on socioeconomic resources would be expected from the demolition of the Central Heating Plant Facility. The cost of demolition of this facility would be \$1.0 million. The demolition activities would provide temporary employment for contractors in the area. Demolition would occur entirely on Dover AFB and would have little potential to affect off-installation resources.

***Infrastructure.*** Negligible effects on infrastructure resources would be expected from the demolition of the Central Heating Plant Facility 617. Short-term, negligible, adverse effects would be expected as a result of the generation of as much as 1,253 tons of debris from demolition (USEPA 1998). This is a short-term, adverse effect in that debris would only be generated during demolition activities; however, debris that is not recycled would be landfilled, which would be considered a long-term, adverse effect.

***Hazardous Materials and Wastes.*** Short-term, minor, adverse effects would be expected from the use and removal of hazardous materials during the demolition process. No long-term effects would be expected. The building is near an ERP site, and therefore could affect the monitoring of that site. If contamination is encountered, it would be handled, stored, transported, and disposed of in accordance with the installation's *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*; *Oil and Hazardous Substance Spill Prevention and Response Plan*; and all applicable Federal, state, and local regulations and policies.

#### 4.4.4 Analysis of All Proposed Projects

**Table 4-11** summarizes the potential environmental consequences associated with the remainder of the installation development projects that are identified in **Appendix A** but not analyzed as representative projects in **Sections 4.4.1, 4.4.2, and 4.4.3**. The proposed locations for these projects are identified in **Figure 4-2**. The intent of **Table 4-11** is to focus on those potential environmental consequences that would be expected as a result of location- or operation-specific activities, as opposed to standard environmental consequences due to construction-related activities. All demolition and construction activities generally would be expected to result in some increased noise, increased air emissions, potential for erosion and transport of sediment into surface water bodies, generation of small amounts of hazardous materials and wastes, and generation of construction and demolition waste. All demolition and construction activities generally would be expected to result in minor, beneficial effects on socioeconomics as a result of job creation and materials procurement. Furthermore, it should be assumed that demolition of older buildings has the potential to disturb ACMs or LBP, and the appropriate identification, handling, removal, and disposal of those materials would occur in accordance with existing Dover AFB management plans and Federal, state, DOD, and USAF regulations and guidance. These types of typical, short-term, construction-related effects are identified in **Section 4.3** in the general analysis and **Sections 4.4.1, 4.4.2, and 4.4.3** in the detailed analyses of the representative projects; therefore, they are not identified as potential environmental consequences in **Table 4-11**. It is assumed that, in the absence of unique constraints, the potential environmental effects associated with the size of a demolition or construction project would be similar to or less than those described in **Sections 4.4.1, 4.4.2, and 4.4.3**.

All construction and demolition activities would adhere to Dover AFB's existing plans and policies that have been identified and referenced throughout **Sections 2, 3, 4, and 7** of this IDEA. **Table 4-11** is not meant to substitute for or initiate coordination that might be required as a result of the proposed activities;

**Table 4-11. Potential Environmental Consequences Associated with Constraints to Development from  
All Proposed Projects Listed in Appendix A**

| Project                                                                                                      | Land Use | Air Quality | Safety | Geological Resources | Water Resources | Biological Resources | Cultural Resources | Hazardous Materials and Wastes |
|--------------------------------------------------------------------------------------------------------------|----------|-------------|--------|----------------------|-----------------|----------------------|--------------------|--------------------------------|
| D4. Demolish Security Forces Complex 910<br>(Demolish 13,993-ft <sup>2</sup> facility.)                      | ⊕        | -           | -      | -                    | -               | -                    | -                  | ⊗                              |
| D5. Demolish Chapel Center Facility 419<br>(Demolish 11,679-ft <sup>2</sup> chapel.)                         | ⊕        | -           | -      | -                    | -               | -                    | -                  | -                              |
| D6. Demolish Administrative Facility 1350<br>(Demolish 4,000-ft <sup>2</sup> facility.)                      | ⊕        | -           | -      | -                    | -               | -                    | -                  | ⊗                              |
| D7. Demolish Facility 439<br>(Demolish 2,986-ft <sup>2</sup> facility.)                                      | ⊕        | -           | -      | -                    | -               | -                    | -                  | -                              |
| D8. Demolish Facility 459<br>(Demolish 2,928-ft <sup>2</sup> facility.)                                      | ⊕        | -           | -      | -                    | -               | -                    | -                  | -                              |
| C4. Construct Environmental Health Building<br>(Construct 3,500-ft <sup>2</sup> facility.)                   | ⊗        | -           | -      | -                    | -               | -                    | -                  | -                              |
| I4. Install Concrete Pad in the Vicinity of Building 914<br>(Construct 22,000-ft <sup>2</sup> concrete pad.) | -        | -           | -      | -                    | -               | ⊗                    | -                  | ⊗                              |

Legend:

- No effects or negligible effects    ⊕ Potential minor beneficial effects    ⊗ Potential minor adverse effects    ■ Potentially significant (greater magnitude than representative projects)

| Project                                                                                                                                                                                     | Land Use | Air Quality | Safety | Geological Resources | Water Resources | Biological Resources | Cultural Resources | Hazardous Materials and Wastes |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|--------|----------------------|-----------------|----------------------|--------------------|--------------------------------|
| I5. Increase Fuels Capacity (Demolish 5,436-ft <sup>2</sup> facility. Construct 80,000-barrel JP-8 AST, and 7,535-ft <sup>2</sup> operations and maintenance facility, and repair roadway.) | -        | ⊗           | -      | -                    | -               | ⊗                    | -                  | ⊗                              |
| I6. Install Type III Hydrant System (Install three fuel hydrants, 1,883-ft <sup>2</sup> pumphouse, two 40,000-gallon JP-8 ASTs, and 1,640 feet of piping.)                                  | -        | ⊕           | ⊕ ⊗    | -                    | -               | ⊗                    | -                  | ⊗                              |

Legend:

- No effects or negligible effects    ⊕ Potential minor beneficial effects    ⊗ Potential minor adverse effects    ■ Potentially significant (greater magnitude than representative projects)

it is meant to identify potential effects on sensitive resources. The potential environmental consequences associated with implementation of all other projects associated with the Proposed Action are summarized in **Table 4-11** and elaborated upon in the following analysis by resource area.

**Noise.** Implementation of all proposed projects would be expected to result in short-term, minor, adverse effects on the noise environment from the various pieces of equipment used during demolition, construction, or infrastructure upgrade activities. The projects identified in **Appendix A** would be implemented at different times and different locations over the next 5 years. It is possible that several projects would occur simultaneously but would not be expected to result in adverse effects beyond those described in **Sections 4.3.1, 4.4.1, 4.4.2, and 4.4.3.**

**Land Use.** Implementation of all proposed projects identified in **Appendix A** would be expected to result in overall beneficial effects on land use. All of the proposed demolition projects on Dover AFB would remove old, obsolete facilities and make land available in previously disturbed areas for the proposed construction projects. Project D6 would result in long-term, beneficial effects by removing that facility from the clear zone, and therefore decreasing airfield safety hazards.

Most construction and infrastructure projects would result in no effects on land use because current use and proposed use under the Proposed Action would be compatible.

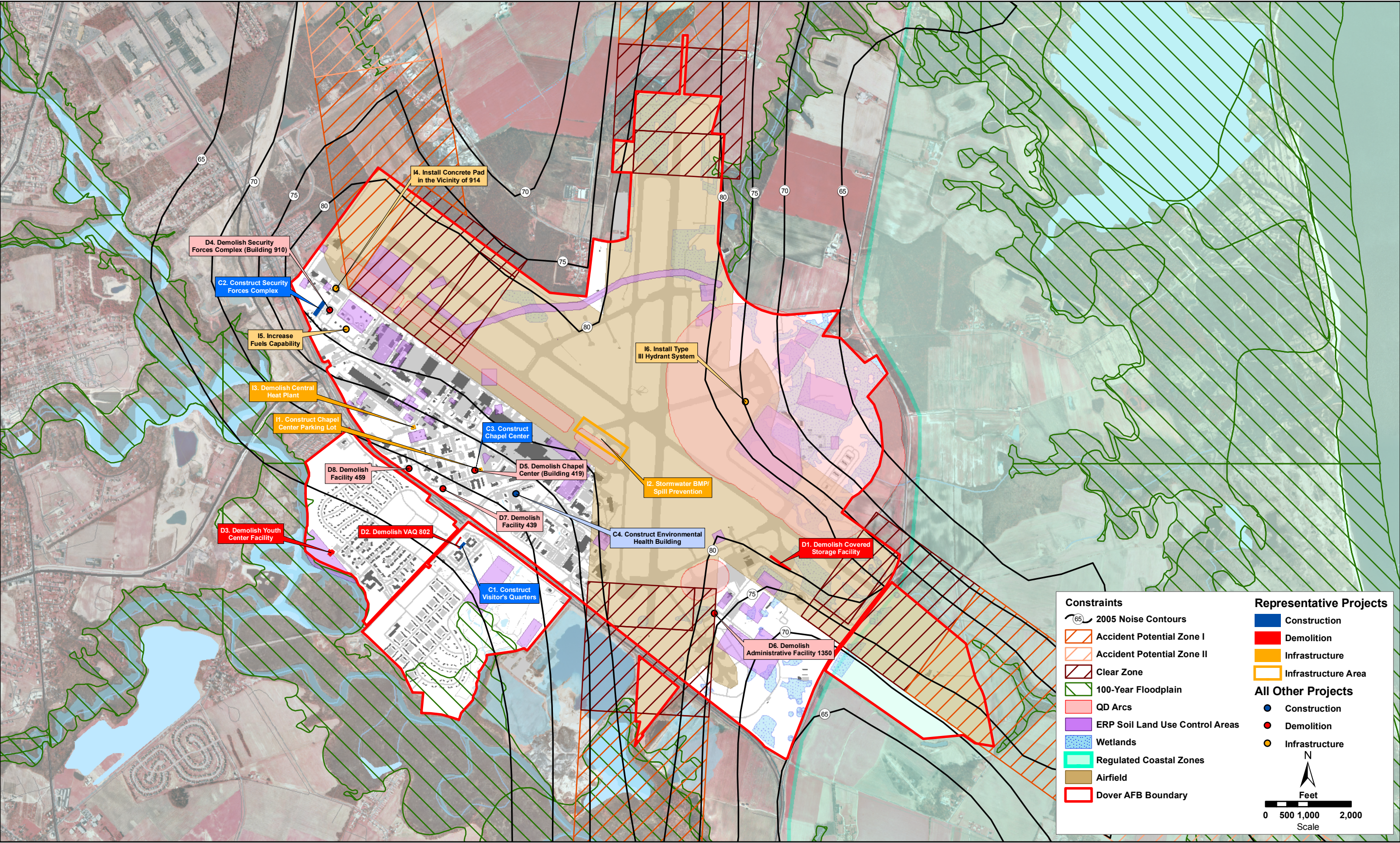
Project C4 would result in an incompatible land use because it would be constructed within the DNL 70 to 74 dBA noise contour, which is considered normally unacceptable. However, noise-level reduction could be achieved through the incorporation of noise attenuation measures into the design and construction of the structure.

**Air Quality.** No projects were identified that would result in modifications to existing air permits or increase in long-term air emissions at Dover AFB. No project would violate the NAAQS or any other air quality rule or regulation. Project I5 would result in long-term, minor, adverse effects on air quality due to vapor emissions from the new storage tank. Project I6 would result in long-term, minor, beneficial effects on air quality by reducing vapor emissions because Type III fuel hydrant systems produce fewer emissions than R-11 refueling vehicles.

To provide an air quality analysis for implementation of all proposed projects, the anticipated emissions (which are based on the pieces of construction equipment used and the project size) were calculated using an assumption that all projects would be implemented in 1 year. As shown in **Table 4-12**, if all these projects were to be implemented simultaneously, the proposed emissions would be well below *de minimis* thresholds and 10 percent of the regional emissions threshold for SDIAQCR; therefore, USEPA air quality standards and regulations would not be violated. **Table 4-12** is meant to be an example if all projects were constructed in one calendar year at Dover AFB. In reality, these projects would not be expected to occur at the same time, and they would occur over multiple years.

**Safety.** **Table 4-11** identifies one project with potential safety concerns. Project I6 would result in short-term, minor, adverse effects on safety because construction would occur well within a QD arc. Munitions transport would not occur during construction activities to minimize construction workers' exposure to explosive safety hazards. No groundbreaking activities would occur in or near areas where munitions are stored or handled. Project I6 would also result in long-term, negligible, beneficial effects on safety because the proposed Type III fuel hydrant system would be safer and more reliable than fueling with R-11 refueling vehicles.





Source of Project Areas: eM, Inc. 2007

Figure 4-2. All Proposed Projects on Dover AFB Relative to Known Constraints



**Table 4-12. Total Construction, Demolition, and Infrastructure Emissions at Dover AFB**

| <b>Proposed Project</b>                                      | <b>NO<sub>x</sub><br/>(tpy)</b> | <b>VOC<br/>(tpy)</b> | <b>CO<br/>(tpy)</b> | <b>SO<sub>x</sub><br/>(tpy)</b> | <b>PM<br/>(tpy)</b> |
|--------------------------------------------------------------|---------------------------------|----------------------|---------------------|---------------------------------|---------------------|
| Total Emissions                                              | 2.644                           | 0.667                | 3.289               | 0.071                           | 11.105              |
| SDIAQCR <i>de minimis</i> threshold                          | 100                             | 100                  | NA                  | NA                              | NA                  |
| Regional Emissions Inventory (SDIAQCR)                       | 25,722                          | 18,379               | 120,181             | 34,742                          | 17,053              |
| Project percentage of Regional Emissions Inventory (SDIAQCR) | 0.0103%                         | 0.0036%              | 0.0027%             | 0.0002%                         | 0.0651%             |

Note: NA = not applicable

Projects D1 and D6 would cause negligible, adverse impacts on airfield safety during demolition, but would result in long-term, minor, beneficial effects due to the removal of structures from airfield safety clearance areas.

**Geological Resources.** Implementation of the remaining proposed installation development projects would be expected to result in short-term and long-term, negligible, adverse effects on geological resources due to soil disturbance and soil erosion. All of these projects would disturb less than 1 acre of soil so they would not require a NPDES permit; however, several of the projects would disturb more than 5,000 ft<sup>2</sup> and thus would require an approved Delaware Sediment and Stormwater Plan.

**Water Resources.** Implementation of the remaining proposed installation development projects would be expected to result in short-term, negligible, adverse effects as a result of ground disturbance during demolition and construction activities and long-term, negligible, adverse and beneficial effects as a result of changes in the area of impervious surface at Dover AFB.

**Biological Resources.** Projects I4 and I5 would require the removal of grass in developed habitat. This is not considered valuable wildlife habitat. Project I6 would disturb Mowed/Airfield Habitat. The majority of this disturbance would be temporary; therefore, effects would be expected to be negligible.

**Cultural Resources.** There are no NRHP-eligible buildings or structures in the APEs for the other projects in the Proposed Action (DDHCA 2007). Thus, none of the other proposed demolition, construction, or infrastructure activities at Dover AFB would be expected to result in adverse effects on architectural resources.

All undeveloped or undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no NRHP-eligible archeological sites in the APEs for the other projects included in the Proposed Action. Accordingly, none of the other proposed demolition, construction, or infrastructure activities on Dover AFB would be expected to result in adverse effects on archeological resources.

The other proposed demolition, construction, and infrastructure projects would not involve disturbance of any previously undisturbed land and, therefore, would not have a direct impact on resources of traditional, religious, or cultural significance to Native American tribes. As previously discussed, Dover AFB is in the process of consulting with appropriate tribes to determine the presence of resources of traditional, religious, or cultural significance to Native American tribes at Dover AFB. If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of the project

area, Dover AFB would avoid, minimize, or mitigate any impacts from the Proposed Action on those resources.

**Socioeconomics and Environmental Justice.** All proposed projects would be expected to result in direct and indirect short-term, minor, beneficial effects as a result of construction costs. No long-term effects would be expected.

**Infrastructure.** Potential infrastructure effects are not identified in **Table 4-11**. The proposed IDEA projects would be expected to result in long-term, beneficial effects on infrastructure systems by providing the required parking lots and utilities upgrades to support existing and future missions.

However, demolition, construction, and infrastructure projects would result in adverse effects as a result of increased solid waste generation. As indicated in **Table 4-13**, approximately 13,819 tons would be generated over the next 5 years. Clean demolition and construction debris (e.g., concrete, asphalt) would be ground, recycled, and used for fill and road work rather than disposed of in a landfill.

**Table 4-13. Anticipated Generation of Construction and Demolition Debris  
as a Result of All Proposed Projects**

| Proposed Project                    | Project Size<br>(ft <sup>2</sup> ) | Multiplier<br>(pounds/ft <sup>2</sup> ) | Total Waste Generated |               |
|-------------------------------------|------------------------------------|-----------------------------------------|-----------------------|---------------|
|                                     |                                    |                                         | Pounds                | U.S. Tons     |
| Proposed IDEA Demolition            | 142,514                            | 155                                     | 22,089,670            | 11,045        |
| Proposed IDEA Construction          | 124,205                            | 4.38                                    | 5,440,179             | 2,720         |
| Proposed IDEA Pavement Construction | 108,616                            | 1                                       | 108,616               | 54            |
| <b>Total</b>                        |                                    |                                         |                       | <b>13,819</b> |

Source: USEPA 1998

**Hazardous Materials and Wastes.** Most buildings planned for demolition as part of the IDEA were constructed before 1972 and would be expected to contain ACM and LBP.

Projects D4, D6, I4, I5, and I6 are proposed near known ERP sites, so soil and groundwater contamination could be present. When there is the potential for construction workers to encounter contamination, a health and safety officer must be present during groundbreaking activities. If contamination is encountered, it would be handled, stored, transported, and disposed of in accordance with applicable Federal, state, and local regulations; AFIs; and the Dover AFB MAP.

Projects I5 and I6 involve fuel or other hazardous materials storage facilities. Appropriate secondary containerization of storage tanks and adherence to the *Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*; *Oil and Hazardous Substance Spill Prevention and Response Plan*; and all other Federal, state, and local laws and regulations would minimize the potential for adverse effects.



***THIS PAGE INTENTIONALLY LEFT BLANK***

## 5. Cumulative Effects

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 time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking 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.

The scope of the cumulative effects analysis involves both timeframe and geographic extent in which effects could be expected to occur, as well as a description of what resources could potentially be cumulatively affected. For the purposes of this analysis, the temporal span of the Proposed Action is 5 years. For most resources, the spatial area for consideration of cumulative effects is Dover AFB, with the exception of effects on air quality, which is in the SDIAQCR and considers the counties of Kent and Sussex, Delaware, as the ROI, and socioeconomics, which has an ROI defined as the census tract containing Dover AFB and the adjacent census tracts.

### 5.1 Projects Identified with the Potential for Cumulative Effects

**Table 5-1** identifies future demolition and construction projects at Dover AFB that have either already been analyzed in EIAP documents or are outside the scope of IDEA and will undergo separate EIAP documentation. These projects have not been implemented, but would be implemented as funding for them becomes available in the future.

The actions identified for cumulative effects analysis also include those pertaining to the BRAC 2005 recommendations. BRAC recommendations include a gain of 115 military personnel and 133 civilian personnel, or a total gain of 148 people. The recommendations also include receiving the flying-related Expeditionary Combat Support unit (aerial port and firefighters) from New Castle Air Guard Station and relocating the Armed Forces Medical Examiner, DNA Registry, and Accident Investigation units from Walter Reed Medical Center Armed Forces Institute of Pathology to Dover AFB.

### 5.2 Cumulative Effects Analysis

The following summarizes the potential cumulative effects on resources from the Proposed Action when combined with other past, present, and reasonably foreseeable future projects.

**Noise.** No significant cumulative effects on noise would be expected. There would not be an increase in vehicle traffic under the IDEA. However, the net gain of 148 people under the BRAC action could result in long-term, negligible, adverse effects on ambient noise from increased vehicle traffic. There would be a short-term, minor, increase in noise from demolition and construction projects. These effects could affect the on-installation population, but would be temporary.

**Land Use.** No cumulative effects on land use would be expected. The Proposed Action and the projects identified in **Section 5.1** would not result in land use changes.

**Air Quality.** No significant cumulative effects on air quality would be expected. The construction associated with the Proposed Action and projects identified in **Section 5.1** would cause short-term, minor increases in air pollution. The increase in personnel associated with the BRAC action would increase mobile source emissions from automobiles. Air emissions modeling data are not available for the proposed BRAC action at this time; however, the effects would be expected to be negligible.

**Table 5-1. Projects with Separate EIAP Analysis That Are Not Included in This IDEA**

| <b>Project Number</b> | <b>Project Title</b>                            | <b>Project Description</b>                                                                                                                                                                                 | <b>Total Change in Impervious Surface</b> |
|-----------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| FJXT023004            | Precision Measurement Equipment Laboratory      | Demolish existing 5,113-ft <sup>2</sup> facility. Construct 9,956-ft <sup>2</sup> facility and 21,526-ft <sup>2</sup> pavement.                                                                            | +26,369 ft <sup>2</sup>                   |
| FJXT025001            | Add to Family Campground                        | Construct bathroom/laundry facility, sewage lift station, and 15 recreational vehicle sites with utilities.                                                                                                | +624 ft <sup>2</sup>                      |
| FJXT033003            | Consolidated Communications Facility            | Demolish five facilities (28,050 ft <sup>2</sup> ), construct new facility (45,747 ft <sup>2</sup> ) and pavement (43,055 ft <sup>2</sup> ).                                                               | +60,752 ft <sup>2</sup>                   |
| FJXT043012            | C-17 Aircrew Life Support                       | Demolish 32,550-ft <sup>2</sup> facility and construct 21,442-ft <sup>2</sup> facility.                                                                                                                    | -11,108 ft <sup>2</sup>                   |
| FJXT061043            | Stabilize Banking along Cultural Resources Site | Provide stabilization of 80,000-ft <sup>2</sup> area along St. Jones River.                                                                                                                                | +80,000 ft <sup>2</sup>                   |
| FJXT063000            | Dormitory                                       | Construct 144-room 53,820-ft <sup>2</sup> dormitory.                                                                                                                                                       | +17,940 ft <sup>2</sup>                   |
| FJXT063010            | C-17 Add to/Alter Composite Maintenance Shop    | Construct 10,763-ft <sup>2</sup> addition, make alteration, and demolish 1,000-ft <sup>2</sup> paint bead blaster facility.                                                                                | +9,763 ft <sup>2</sup>                    |
| FJXT063013            | C-17 Engine Storage Facility                    | Construct an engine storage area, classroom, and administrative space.                                                                                                                                     | +11,000 ft <sup>2</sup>                   |
| FJXT071049            | Additional Air Maintenance Shop 794             | Construct Air Maintenance Shop 794.                                                                                                                                                                        | +1,200 ft <sup>2</sup>                    |
| FJXT935002            | Aero Club Facility                              | Construct Aero Club Facility.                                                                                                                                                                              | +5,900 ft <sup>2</sup>                    |
| FJXT993002            | Fitness Center                                  | Demolish existing facility (38,750 ft <sup>2</sup> ), except gym. Renovate gym (9,688 ft <sup>2</sup> ). Construct new fitness center (67,328 ft <sup>2</sup> ) and parking lot (43,055 ft <sup>2</sup> ). | +71,633 ft <sup>2</sup>                   |
| FJXT998003            | Medical Facility Parking Complex                | Construct parking complex.                                                                                                                                                                                 | +42,000 ft <sup>2</sup>                   |
| FJXT00100810          | Administrative Facility 447                     | Demolish Administrative Facility 447.                                                                                                                                                                      | -3,853 ft <sup>2</sup>                    |

**Safety.** No significant cumulative effects on safety would be expected. The Proposed Action and projects presented in **Section 5-1** would result in a short-term, minor, adverse effect on construction safety risks. Long-term, minor, beneficial effects on safety would be expected from replacing older

structures with modern facilities, removing structures from the airfield lateral safety clearance areas, and consolidating similar operations.

**Geological Resources.** No significant cumulative effects on geological resources would be expected. The Proposed Action and projects in **Section 5-1** would result in localized, short-term, adverse effects on soil. These activities would be associated with soil disturbance, increased soil runoff, and sedimentation. Because the effects associated with individual projects would be short-term and localized, cumulative impacts are not expected. The gain in personnel associated with BRAC would not be expected to affect geological resources.

**Water Resources.** No significant cumulative effects on water resources would be expected. The Proposed Action and projects in **Section 5-1** would result in short-term, minor, adverse effects associated with increased soil runoff and sedimentation, and long-term, minor, adverse effects associated with the increase in impervious surfaces. However, implementation of erosion and sediment control and storm water BMPs during and after construction that are consistent with NPDES Phase II permit requirements, the installation SWPPP, and other applicable codes and ordinances (including the Delaware Sediment and Stormwater Program) would minimize the potential for adverse effects resulting from erosion and transport of sediments in storm water runoff.

**Biological Resources.** No significant cumulative effects on biological resources would be expected. Negligible to minor, adverse effects on biological resources would be expected from the Proposed Action and projects listed in **Section 5-1**. Many of the proposed projects would occur in areas that are previously disturbed and do not contain important biological habitats.

**Cultural Resources.** No cumulative effects on cultural resources would be expected. In 2007, the SHPO concurred that no buildings at Dover AFB constructed prior to the completion of the 2005 ICRMP are NRHP-eligible or require evaluation for NRHP eligibility in the future, except those buildings specifically noted as NRHP-eligible or requiring evaluation in Table 3.11 of the ICRMP (DDHCA 2007). Therefore, any of these buildings that would be impacted by demolition or alteration, or that could be indirectly impacted by noise, vibration, or introduction of elements into their viewshed, would need to be evaluated prior to implementation of the Proposed Action. If any of these buildings are determined eligible, projects would need to avoid, minimize, or mitigate the impacts.

If archeological resources or resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of any of the project areas, Dover AFB would avoid, minimize, or mitigate any impacts on the sites. The gain in personnel associated with BRAC would not be expected to affect cultural resources.

**Socioeconomics and Environmental Justice.** Minor, beneficial, cumulative effects would be expected. Construction expenditures associated with the Proposed Action and additional projects in **Section 5-1** would result in short-term, minor, beneficial effects. The proposed gain in personnel would stimulate the local economy in the long-term. The influence of gaining 148 people would be minor in the community surrounding Dover AFB.

**Infrastructure.** No significant cumulative effects on infrastructure would be expected. Long-term, minor, beneficial effects would be expected from upgraded utilities, parking lots, and fuel capability at Dover AFB. Under BRAC actions, the net gain of personnel would slightly increase the demand on the potable water and sanitary sewer systems. The proposed demolition, construction, and infrastructure projects would not be expected to increase long-term potable water consumption.

**Hazardous Materials and Wastes.** No significant cumulative effects on hazardous materials and wastes would be expected. Short-term, minor, adverse effects could occur as a result of increases in hazardous materials and wastes associated with the Proposed Action and the additional projects in **Section 5-1**. The additional personnel associated with the BRAC action would result in long-term, minor, adverse effects on solid wastes and biohazardous wastes due to increased waste disposal needs.

### **5.3 Reasonable and Prudent Measures and Best Management Practices**

The Proposed Action would not result in significant adverse effects on the land or the surrounding area. However, BMPs and other minimization measures would be implemented to eliminate or reduce the impacts of adverse effects.

General BMPs that might be included as part of the Proposed Action are summarized as follows:

- Clearing and grubbing would be timed with construction to minimize the exposure of cleared surfaces. Such activities would not be conducted during periods of wet weather. Construction activities would be staged to allow for the stabilization of disturbed soils.
- Fugitive dust-control techniques such as watering and stockpiling would be used to minimize adverse effects. All such techniques would conform to the applicable regulations.
- Soil erosion-control measures such as mats, silt fences, straw bales, diversion ditches, riprap channels, water bars, water spreaders, and hardened stream crossings would be utilized as appropriate.
- Existing vegetation, trees, and topography would be integrated into site design to minimize the disturbance of environmental resources and topography.
- Where feasible, areas of impervious surface would be minimized through shared parking, decked or structured parking, increased building height, and other measures as appropriate.
- Provisions would be taken to prevent pollutants from reaching the soil, groundwater, or surface water. During project activities, contractors would be required to perform daily inspections of equipment, maintain appropriate spill-containment materials onsite, and store all fuels and other materials in appropriate containers. Equipment maintenance activities would not be conducted on the construction site.
- Physical barriers and “no trespassing” signs would be placed around the demolition and construction sites to deter children and unauthorized personnel. All construction vehicles and equipment would be locked or otherwise secured when not in use.
- Construction equipment would be used only as necessary during the daylight hours and would be maintained to the manufacture’s specifications to minimize noise impacts.

### **5.4 Unavoidable Adverse Impacts**

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

**Noise.** Demolition and construction activities and vehicle operations associated with the Proposed Action would result in intermittent, short-term, minor increases in noise. Although unavoidable, increases in noise would not be considered significant.

**Air Quality.** The construction, demolition, and infrastructure projects related to the Proposed Action would generate air pollutant emissions as a result of grading, filling, compacting, trenching, demolition, and construction operations, but these emissions would be temporary and would not be expected to generate any off-site effects. The construction projects would generate total suspended particulate and PM<sub>10</sub> emissions as fugitive dust emissions from ground-disturbing activities and combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during initial site preparation and vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. Fugitive dust emissions would produce slightly elevated short-term PM<sub>10</sub> ambient air concentrations. The effects would be temporary and would fall off rapidly with distance from the proposed construction site.

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment. However, the effects would be temporary and would fall off rapidly with distance from the proposed construction site. Although unavoidable, adverse effects on air quality at the installation would not be considered significant.

**Safety.** Implementation of the Proposed Action would slightly increase the short-term risk associated with demolition and construction contractors performing work at the chosen project sites during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Demolition projects in the airfield safety clearance areas (see **Figure 4-2**) would cause negligible, adverse impacts on airfield safety during the demolition. Contractors working in or near the flightline must be aware of and follow flightline safety procedures. Although unavoidable, adverse effects on safety at the installation would not be considered significant.

**Geological Resources.** Under the Proposed Action, activities such as excavating, grading, and recontouring would result in some minor soil disturbance. Many of these areas are previously disturbed. Implementation of BMPs during construction would limit the effects from construction activities. Although unavoidable, adverse effects on soils at the installation would not be considered significant.

**Water Resources.** Under the Proposed Action, BMPs would confine runoff to the project areas and reduce the potential for contamination. Therefore, impacts on surface water quality would be negligible. Long-term, minor, adverse effects on groundwater could also result from an increase in impermeable surface areas. Although unavoidable, adverse effects on water resources at the installation would not be considered significant.

**Biological Resources.** The Proposed Action would result in the minor loss of vegetation. Additionally, noise associated with construction and demolition could result in the disturbance of wildlife. Although unavoidable, adverse effects on biological resources at the installation would not be considered significant.

**Cultural Resources.** There are no NRHP-eligible buildings or structures in the APEs of the Proposed Action, except for Building 1301, which has received extensive exterior renovations since its listing. Recordation for the Historic American Buildings Survey/Historic American Engineering Record was completed as part of the mitigation for the alterations to Building 1301 (DAFB 2006b). Because of Building 1301's extensive renovations, neither its viewshed nor its structural integrity would be considered impacted. Therefore, no unavoidable adverse impacts would be expected on the architectural resources at Dover AFB.

All undeveloped and undisturbed acreage at Dover AFB has been subjected to archeological survey (Benner 2007a). There are no known NRHP-eligible archeological sites in the areas where ground-disturbing activities associated with the Proposed Action would occur on Dover AFB.

If resources of traditional, religious, or cultural significance to Native American tribes are identified in the vicinity of any of the project areas, Dover AFB would avoid, minimize, or mitigate any impacts of the resources of traditional, religious, or cultural significance to Native American tribes. Therefore, impacts would not be considered significant.

**Infrastructure.** Direct, short-term, minor, adverse effects would result from increased construction and demolition waste production during construction and demolition. Contractors would be required to recycle construction and demolition debris to the greatest extent possible, thereby diverting it from landfills. This would be an unavoidable but minor, adverse effect, as this amount of solid waste generated is not significant in proportion to other sources of solid waste generation at Dover AFB.

The proposed demolition and construction activities would impact vehicular traffic flows both on- and off-installation due to construction vehicles and construction worker POVs. Construction and demolition efforts might create localized disruptions to the potable water, sanitary sewer, storm water, electrical, natural gas, and communications systems.

**Hazardous Materials and Waste.** Products containing hazardous materials would be procured and used during the demolition and construction projects. There would be no new chemicals or toxic substances used or stored at Dover AFB. It is anticipated that the quantity of hazardous materials used would be minimal. Contractors would be responsible for hazardous materials management, which would be handled in accordance with Federal and state regulations.

It is anticipated that the quantity of hazardous wastes generated from proposed demolition and construction projects would be minor, primarily consisting of used hazardous substances, ACMs, and LBP. Contractors would be required to turn in hazardous wastes to Dover AFB for proper disposal.

Quantities of hazardous materials, hazardous wastes, chemical purchases, and off-base transport of hazardous wastes would increase. However, the Dover AFB Pollution Prevention Management Plan can accommodate the Proposed Action. Although unavoidable, adverse effects on hazardous materials and wastes at the installation would not be considered significant.

## **5.5 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls**

Effects on the ground surface as a result of the Proposed Action would occur within the boundaries of Dover AFB. The proposed demolition and construction projects would not result in any significant or incompatible land use changes on or off the installation. The proposed projects were sited according to existing land use zones. Consequently, proposed demolition and construction projects would not be in conflict with the installation's land use policies or objectives. The Proposed Action would not conflict with any applicable off-installation land use ordinances or designated clear zones.

## **5.6 Relationship Between the Short-term Use of the Environment and Long-term Productivity**

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct effects associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of man's environment include those effects occurring over a period of more than 5 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. Implementation of the Proposed Action would not result in changes in land use or a significant loss of open space. Therefore, it is anticipated that the Proposed Action would not result in adverse cumulative land use or aesthetic effects. Long-term productivity would not be affected by carrying out the Proposed Action.

## **5.7 Irreversible and Irretrievable Commitments of Resources**

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of those 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 timeframe (e.g., energy and minerals).

The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, land, and biological habitat. The use of these resources is considered to be permanent.

**Material Resources.** Material resources utilized for the Proposed Action include building materials, concrete and asphalt, and various material supplies. 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 demolition and construction, gasoline and diesel would be used for the operation of construction vehicles, construction equipment, and the construction workers' POVs. Natural gas and electricity would be used during operation of the new facilities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

**Biological Habitat.** The Proposed Action would result in the minor loss of vegetation. Because these areas are landscaped, this loss is not considered significant. No loss of important wildlife habitat would occur.



***THIS PAGE INTENTIONALLY LEFT BLANK***

## 6. Preparers

This EA has been prepared by e<sup>2</sup>M under the direction of the HQ AMC at Scott AFB and the 436 AW at Dover AFB. The individual preparers of this document are listed below.

**Domenick Alario**

B.A. Geography  
Years of Experience: 2

**Louise Baxter**

M.P.A. Public Administration  
B.S. Political Science  
Years of Experience: 7

**Dr. Susan Goodfellow, Ph.D.**

Ph.D. Anthropology  
B.A. Anthropology and Archaeology  
Years of Experience: 21

**Stuart Gottlieb**

B.A. Geography  
GIS Professional Certificate  
Years of Experience: 5

**Shawn Gravatt**

M.S. Environmental Studies  
B.S. Earth Science and Geography  
Years of Experience: 10

**George Greczmiel**

B.A. Economics  
Years of Experience: 2

**Megan Griffin**

M.S. Biology  
B.S. Environmental Science  
Years of Experience: 2

**Christopher Holdridge**

M.S. Environmental Assessment  
B.S. Environmental Science/Chemistry  
Years of Experience: 11

**Brian Hoppy**

B.S. Biology  
Certificate of Environmental Management  
Years of Experience: 15

**Daniel Koenig**

B.S. Environmental Policy and Planning  
Years of Experience: 2

**Ronald E. Lamb, CEP**

M.S. Environmental Science  
M.A. Political Science/International Economics  
B.A. Political Science  
Years of Experience: 20

**Sean McCain**

M.B.A. Business Administration  
B.S. Forestry and Natural Resources  
Management  
Years of Experience: 12

**Dr. Michael Moran, Ph.D.**

Ph.D. Biochemistry  
B.S. Chemistry  
Registered Environmental Manager  
Years of Experience: 24

**Cheryl Myers**

A.A.S. Nursing  
Years of Experience: 17

**Tanya Perry**

B.S. Environmental Science  
B.A. Communications  
Years of Experience: 7

**Andrea Poole**

B.A. Environmental Science  
B.A. Business Administration  
Years of Experience: 7

**Allison Ross**

M.S. Historic Preservation  
B.S. Interior Design  
Years of Experience: 6

**Daniel Savercool**

M.S. Biological Oceanography  
B.A. Zoology/Marine Biology  
A.A.S. Natural Resources Conservation  
Certified Senior Ecologist  
Years of Experience: 25

**Jeffrey Weiler**

M.S. Resource Economics/Environmental  
Management

B.A. Political Science

Years of Experience: 32

**Mary Young**

B.S. Environmental Science

Years of Experience: 5

**Valerie Whalon**

M.S. Fisheries Science

B.S. Marine Science

Years of Experience: 10

## 7. References

- ACHP 2006      Advisory Council on Historic Preservation. 2006. *Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities*. 18 August 2006.
- 436 AW 2001      436 Airlift Wing (436 AW). 2001. *Dover Air Force Base General Plan*. Prepared by Parsons Harland Bartholomew & Associates, Inc.
- 436 AW 2005a      436 Airlift Wing (436 AW). 2005. *436 AW OPLAN 32-7 Oil and Hazardous Substance Spill Prevention and Response Plan*. September 2005.
- 436 AW 2005b      436 Airlift Wing (436 AW). 2005. *Integrated Contingency Plan*. Volume II. December 2005.
- 436 AW 2006a      436 Airlift Wing (436 AW). 2006. *436 AW OPLAN 32-3 Hazardous Waste, Universal Waste, and Used Petroleum Management Plan*. March 2006.
- 436 AW 2006b      436 Airlift Wing (436 AW). 2006. *436 AW OPLAN 32-10 Asbestos Management and Operations Plan*. March 2006.
- 436 CE 2005      436 Civil Engineering (436 CE). 2005. *Pest Management Plan for 2006 and 2007*. August 2005.
- 436 CES/CEV 2005      436 Civil Engineering Squadron/Environmental Flight (CES/CEV). 2005. *Stormwater Pollution Prevention Plan*. November 2005.
- 436 SPTG/CEV 2001      436 Support Group/Environmental Flight (SPTG/CEV). 2001. *Integrated Natural Resources Management Plan (INRMP)*. August 2001.
- Benner 2007a      Benner, Rayanne. 2007. Personal communication between Ms. Rayanne Benner (Dover AFB Natural and Cultural Resources Manager) and Ms. Alison Ross (e<sup>2</sup>M) regarding archeological inventories and consultation with Native American Tribes completed to date on Dover AFB. 25 April 2007.
- Benner 2007b      Benner, Rayanne. 2007. Reviewer comment by Ms. Rayanne Benner (436 CES/CEV, Dover AFB Natural and Cultural Resources Manager) for Dover AFB Preliminary Draft IDEA Comment Response Matrix. 2007.
- Benner 2007c      Benner, Rayanne. 2007. Personal communication between Ms. Rayanne Benner (Dover AFB Natural and Cultural Resources Manager) and Mr. Chris Holdridge (e<sup>2</sup>M) regarding potentially eligible buildings at Dover AFB. 10 July 2007.
- BLS 2007      Bureau of Labor Statistics (BLS). 2007. "Local Area Unemployment Statistics." Available online. <<http://data.bls.gov/cgi-bin/surveymost?la+10>>. Accessed on 24 April 2007.

|                |                                                                                                                                                                                                                                                                                                               |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COL 2001       | City of Lodi (COL). 2001. <i>City of Lodi Community Development Department ProStyle Sports Complex Draft Environmental Impact Report</i> . Prepared by Parsons. December 2001. Available online. < <a href="http://www.lodi.gov/eir/index.htm">http://www.lodi.gov/eir/index.htm</a> >. Accessed 23 May 2007. |
| DAFB undated a | Dover Air Force Base (DAFB). Undated. "Frequently Asked Questions." Available online: < <a href="http://public.dover.af.mil/questions/topic.asp?id=491">http://public.dover.af.mil/questions/topic.asp?id=491</a> >. Accessed on 25 April 2007.                                                               |
| DAFB undated b | Dover Air Force Base (DAFB). Undated. "Breakdown of Recyclables."                                                                                                                                                                                                                                             |
| DAFB 2004      | Dover Air Force Base (DAFB). 2004. Final Wetland Delineation Report (includes surface water drainage). Prepared by Potomac-Hudson Engineering, Inc. May 2004.                                                                                                                                                 |
| DAFB 2006a     | Dover Air Force Base (DAFB). 2006. <i>2005 Annual Emission Inventory and Emission Statement Report for Dover Air Force Base, Delaware</i> . 1 May 2006.                                                                                                                                                       |
| DAFB 2006b     | Dover Air Force Base (DAFB). 2006. <i>Integrated Cultural Resources Management Plan (ICRMP) 2006-2010</i> .                                                                                                                                                                                                   |
| DAFB 2006c     | Dover Air Force Base (DAFB). 2006. <i>Management Action Plan</i> . October 2006.                                                                                                                                                                                                                              |
| DAFB 2007      | Dover Air Force Base (DAFB). 2007. Spreadsheet of all aboveground storage tanks at Dover AFB. Provided by Ms. Rayanne Benner. 2007.                                                                                                                                                                           |
| DDHCA 2006     | Delaware Division of Historic and Cultural Affairs (DDHCA). 2006. Letter from Ms. Joan Larrivee (DDHCA) to Mr. Michael Perza (Dover AFB) regarding sites 7K-D-125 and 7K-D-126. 26 May 2006.                                                                                                                  |
| DDHCA 2007     | Delaware Division of Historic and Cultural Affairs (DDHCA). 2007. Letter from Ms. Joan Larrivee (DDHCA) to Mr. Michael Perza (Dover AFB) regarding National Register of Historic Places eligibility of buildings at Dover AFB. 6 July 2007.                                                                   |
| Deramo 2006    | Deramo, JoAnne. 2006. Written information provided to e <sup>2</sup> M from Ms. JoAnne Deramo (Dover AFB ERP Manager) in response to request from comments on the Draft DOPAA for the IDEA. 9 December 2006.                                                                                                  |
| DNHESP 2006    | Delaware Natural Heritage and Endangered Species Program (DNHESP). 2006. <i>Wildlife Action Plan 2007 – 2017</i> .                                                                                                                                                                                            |
| DNHESP 2007    | Delaware Natural Heritage and Endangered Species Program (DNHESP). 2007. E-mail from Mr. William McAvoy (DNHESP) to Ms. Rayanne Benner (Dover AFB) regarding the occurrence of plant species at the installation. 16 March 2007.                                                                              |
| DNREC 2005     | Delaware Department of Natural Resources and Environmental Control (DNREC). 2005. <i>Regulation 30 (Title V) Operating Permit Renewal Application for Dover AFB, Delaware</i> . April 2005.                                                                                                                   |

|                         |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DNREC-DFW 2006          | Delaware Department of Natural Resources & Environmental Control, Division of Fish & Wildlife (DNREC-DFW). 2006. <i>Category II Determination of the Dover AFB</i> . January 2, 2006.                                                                                                                                                                         |
| HQ AMC 2005             | HQ AMC. 2005. <i>Air Installation Compatible Use Zone Study (AICUZ)</i> . December 2005.                                                                                                                                                                                                                                                                      |
| HQ AMC 2006             | Headquarters Air Mobility Command (HQ AMC). 2006. Comprehensive Plan "Future Installation Layout" 2006-2010 AutoCad maps.                                                                                                                                                                                                                                     |
| KCDPW 2005              | Kent County Department of Public Works (KCDPW). 2005. <i>Industrial Wastewater Discharge Permit No. 6</i> . 14 September 2005.                                                                                                                                                                                                                                |
| Landrum & Brown 2002    | Landrum & Brown, Inc. 2002. "Common Noise Sources." Available online: < <a href="http://www.landrum-brown.com/env/PVD/EIS/Jan%202002%20Chapter%204/4%201-1%20%20common_noise_sources.pdf">http://www.landrum-brown.com/env/PVD/EIS/Jan%202002%20Chapter%204/4%201-1%20%20common_noise_sources.pdf</a> >. Accessed 23 May 2007.                                |
| Seip 2007               | Seip, Steven. 2007. Reviewer comment by Mr. Steven Seip (436 CES/CEV, Dover AFB Environmental Quality Chief) for Dover AFB Preliminary Draft IDEA Comment Response Matrix. 2007.                                                                                                                                                                              |
| USACE 1987              | U.S. Army Corps of Engineers (USACE). 1987. <i>Corps of Engineers Wetlands Delineation Manual</i> . Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A176 912. January 1987.                                                                                                                              |
| USACE 2004              | U.S. Army Corps of Engineers (USACE). 2004. <i>Philadelphia District, Corps of Engineers Jurisdictional Wetland Determination</i> . 12 July 2004.                                                                                                                                                                                                             |
| USAF 2006               | U.S. Air Force (USAF). 2006. "Dover AFB Snap Shot <i>A Summary of facts and figures representative of Dover Air Force Base</i> ." 17 October 2006.                                                                                                                                                                                                            |
| U.S. Census Bureau 2000 | U.S. Census Bureau. 2000. American Fact Finder. Available Online: < <a href="http://factfinder.census.gov/servlet/QTGeoSearchByListServlet?ds_name=DEC_2000_SF1_U&amp;_lang=en&amp;_ts=195562485458">http://factfinder.census.gov/servlet/QTGeoSearchByListServlet?ds_name=DEC_2000_SF1_U&amp;_lang=en&amp;_ts=195562485458</a> >. Accessed on 24 April 2007. |
| U.S. Census Bureau 2006 | U.S. Census Bureau. 2006. American Fact Finder Glossary. < <a href="http://quickfacts.census.gov/qfd/states/10/10001.html">http://quickfacts.census.gov/qfd/states/10/10001.html</a> >. Accessed 24 April 2007.                                                                                                                                               |
| USDA-SCS 1982           | U.S. Department of Agriculture, Soil Conservation Service (USDA-SCS). 1982. Letter to Mr. Don Witmer (Dover AFB) from Mr. Frederick Mott (USDA-SCS) regarding prime farmland at Dover AFB. 12 March 1982.                                                                                                                                                     |
| USDOT 1984              | U.S. Department of Transportation (USDOT). 1984. <i>Airport Noise Compatibility Planning; Development of Submission of Airport Operator's Noise Exposure Map and Noise Compatibility Program; Final Rule and Request for Comments</i> . 14 CFR Parts 11 and 150, Federal Register 49(244). December 1984.                                                     |

- USEPA 1998      United States Environmental Protection Agency (USEPA). 1998. *Characterization of Building-Related Construction and Demolition Debris in the United States*. Prepared by Franklin Associates. June 1998.
- USEPA 2004      U.S. Environmental Protection Agency (USEPA). December 2004. "Green Book Nonattainment Areas for Criteria Pollutants." Available online: <<http://www.epa.gov/oar/oaqps/greenbk/>>. Accessed 27 April 2007.
- USEPA 2007a      U.S. Environmental Protection Agency (USEPA). 2007. *National Ambient Air Quality Standards*. Available online: <<http://epa.gov/air/criteria.html>>. Accessed 19 July 2007.
- USEPA 2007b      U.S. Environmental Protection Agency (USEPA). 2007. "Map of Radon Zones, Delaware." Available at <http://www.epa.gov/radon/zonemap/delaware.htm>. Accessed 25 April 2007.

## **APPENDIX A**

### **PROPOSED DOVER AFB INSTALLATION DEVELOPMENT PROJECTS**





## Appendix A

### Proposed Dover AFB Installation Development Projects

**Table A-1. Proposed Facilities Demolition Projects**

| <b>Installation Project Number</b>        | <b>Project Identification Number and Title</b> | <b>Fiscal Year</b> | <b>Existing Land Use</b> | <b>Building Area Removed (ft<sup>2</sup>)</b> | <b>Change in Impervious Surface (ft<sup>2</sup>)</b> |
|-------------------------------------------|------------------------------------------------|--------------------|--------------------------|-----------------------------------------------|------------------------------------------------------|
| <b>Representative Demolition Projects</b> |                                                |                    |                          |                                               |                                                      |
| FJXT 0510143                              | D1. Demolish Covered Storage Facility 1315     | 2011               | IND                      | 49,916                                        | -49,916                                              |
| FJXT 081018                               | D2. Demolish VAQ 802                           | 2008               | HOU-U                    | 22,984                                        | -11,492                                              |
| FJXT 081005                               | D3. Demolish Youth Center Facility 3499        | 2008               | OR                       | 17,857                                        | -17,857                                              |
| <b>All Other Demolition Projects</b>      |                                                |                    |                          |                                               |                                                      |
| FJXT 103000                               | D4. Demolish Security Forces Complex 910       | 2011               | ADM                      | 13,993                                        | -13,993                                              |
| FJXT 093000                               | D5. Demolish Chapel Center Facility 419        | 2011               | COM-S                    | 11,679                                        | -11,679                                              |
| FJXT 0510141                              | D6. Demolish Administrative Facility 1350      | 2009               | IND                      | 4,000                                         | -4,000                                               |
| FJXT 9910101                              | D7. Demolish Facility 439                      | 2007               | ADM                      | 2,986                                         | -2,986                                               |
| FJXT 9910102                              | D8. Demolish Facility 459                      | 2010               | ADM                      | 2,928                                         | -2,928                                               |
| <b>Total</b>                              |                                                |                    |                          | <b>126,343</b>                                | <b>-114,851</b>                                      |

Notes: ADM = Administrative, AIR = Aircraft Operations and Maintenance, COM-S = Community (Service), HOU-U = Housing (Unaccompanied), IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, RUN = Runway/Taxiway/Apron

**Table A-2. Proposed Facilities Construction Projects**

| <b>Installation Project Number</b>          | <b>Project Identification Number and Title</b> | <b>Fiscal Year</b> | <b>Existing Land Use</b> | <b>Building Area Constructed (ft<sup>2</sup>)</b> | <b>Change in Impervious Surface (ft<sup>2</sup>)</b> |
|---------------------------------------------|------------------------------------------------|--------------------|--------------------------|---------------------------------------------------|------------------------------------------------------|
| <b>Representative Construction Projects</b> |                                                |                    |                          |                                                   |                                                      |
| FJXT 043000                                 | C1. Construct Visitor's Quarters               | 2010               | HOU-U                    | 43,056                                            | +14,352                                              |
| FJXT 103000                                 | C2. Construct Security Forces Complex          | 2011               | ADM                      | 39,826                                            | +39,826                                              |
| FJXT 093000                                 | C3. Construct Chapel Center                    | 2011               | COM-S                    | 13,132                                            | +13,132                                              |
| <b>All Other Construction Projects</b>      |                                                |                    |                          |                                                   |                                                      |
| FJXT 088000                                 | C4. Construct Environmental Health Building    | 2008               | MED                      | 3,500                                             | +3,500                                               |
| <b>Total</b>                                |                                                |                    |                          | <b>99,514</b>                                     | <b>+70,810</b>                                       |

Notes: ADM = Administrative, AIR = Aircraft Operations and Maintenance, COM-S = Community (Service), HOU-U = Housing (Unaccompanied), IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, RUN = Runway/Taxiway/Apron

**Table A-3. Proposed Infrastructure Projects**

| <b>Installation Project Number</b>            | <b>Project Identification Number and Title</b>                                        | <b>Fiscal Year</b> | <b>Existing Land Use</b> | <b>Project Size (ft<sup>2</sup>)</b> | <b>Change in Impervious Surface (ft<sup>2</sup>)</b> |
|-----------------------------------------------|---------------------------------------------------------------------------------------|--------------------|--------------------------|--------------------------------------|------------------------------------------------------|
| <b>Representative Infrastructure Projects</b> |                                                                                       |                    |                          |                                      |                                                      |
| FJXT 093000                                   | I1. Construct Chapel Center Parking Lot                                               | 2011               | COM-S                    | 43,056                               | +43,056                                              |
| FJXT 001019                                   | I2. Implement Storm Water BMP/Spill Prevention at the Transient Aircraft Parking Ramp | 2010               | RUN                      | 43,560                               | +43,560                                              |
| FJXT 0510142                                  | I3. Demolish Central Heat Plant Facility 617                                          | 2009               | IND                      | 16,171                               | -16,171                                              |
| <b>All Other Infrastructure Projects</b>      |                                                                                       |                    |                          |                                      |                                                      |
| FJXT 031091                                   | I4. Install Concrete Pad in the Vicinity of 914                                       | 2008               | IND                      | 22,000                               | +22,000                                              |
| FJXT 093020                                   | I5. Increase Fuels Capability                                                         | 2011               | IND                      | 12,971                               | +12,971                                              |
| FJXT 073020                                   | I6. Install Type III Hydrant System                                                   | 2011               | OS                       | 11,720                               | +1,880                                               |
| <b>Total</b>                                  |                                                                                       |                    |                          | <b>149,478</b>                       | <b>+107,296</b>                                      |

Notes: ADM = Administrative, AIR = Aircraft Operations and Maintenance, COM-S = Community (Service), HOU-U = Housing (Unaccompanied), IND = Industrial, MED = Medical, OR = Outdoor Recreation, OS = Open Space, RUN = Runway/Taxiway/Apron

## **APPENDIX B**

### **APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANNING CRITERIA**



## Appendix B

### Applicable Laws, Regulations, Policies, and Planning Criteria

---

When considering the affected environment, the various physical, biological, economic, and social environmental factors must be considered. In addition to the National Environmental Policy Act (NEPA), there are other environmental laws as well as Executive Orders (EOs) to be considered when preparing environmental analyses. These laws are summarized below.

NOTE: This is not a complete list of all applicable laws, regulations, policies, and planning criteria potentially applicable to documents, however, it does provide a general summary for use as a reference.

#### Airspace

Airspace management in the USAF is guided by Air Force Instruction (AFI) 13-201, *Air Force Airspace Management*. This AFI provides guidance and procedures for developing and processing special use airspace (SUA). It covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support USAF flight operations. It applies to activities that have operational or administrative responsibility for using airspace and establishes practices to decrease disturbances from flight operations that might cause adverse public reaction and provides flying unit commanders with general guidance for dealing with local problems.

#### Noise

The Air Installation Compatible Use Zone (AICUZ) Program, (AFI 32-7063), provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near U.S. Air Force (USAF) installations.

#### Land Use

Land use planning in the USAF is guided by *Land Use Planning Bulletin, Base Comprehensive Planning* (HQ USAF/LEEVX, August 1, 1986). This document provides for the use of 12 basic land use types found on a USAF installation. In addition, land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) are used to recommend acceptable levels of noise exposure for land use.

#### Air Quality

The Clean Air Act (CAA) of 1970, and Amendments of 1977 and 1990, recognizes that increases in air pollution result in danger to public health and welfare. To protect and enhance the quality of the Nation's air resources, the CAA authorizes the U.S. Environmental Protection Agency (USEPA) to set six National Ambient Air Quality Standards (NAAQSs) which regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source, and designates this responsibility to state and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the USEPA as being in attainment or nonattainment to pollutants in relation to their compliance with NAAQS. Geographic regions established for air quality planning purposes are

designated as Air Quality Control Regions (AQCR). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area with insufficient monitoring data is designated as unclassifiable. Section 309 of the CAA authorizes USEPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action might have on NAAQS due to short-term increases in air pollution during construction as well as long-term increases resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency could also be subject to USEPA's Prevention of Significant Deterioration (PSD) regulations. These regulations apply to new major stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from a change in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states all Federal agencies will comply with all Federal- and state-approved requirements.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

The General 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 presented in 40 CFR 93.153. 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 does not meet or exceed the *de minimis* thresholds and is not considered regionally significant, then a full Conformity Determination is not required.

## **Safety**

AFI 91-202, *USAF Mishap Prevention Program*, implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel.

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, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

## **Geological Resources**

Recognizing that millions of acres per year of prime farmland are lost to development, Congress passed the Farmland Protection Policy Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland (7 CFR Part 658). Prime farmland are soils that have a combination of soil and landscape properties that make them highly suitable for cropland, such as high inherent fertility, good water-holding capacity, deep or thick effective rooting zones, and are not subject to periodic flooding. Under the Farmland Protection Policy Act, agencies are encouraged to conserve prime or unique farmlands when alternatives are practicable. Some activities that are not subject

to the Farmland Protection Policy Act include Federal permitting and licensing, projects on land already in urban development or used for water storage, construction for national defense purposes, or construction of new minor secondary structures such as a garage or storage shed.

## **Water Resources**

The Clean Water Act (CWA) of 1977 is an amendment to the Federal Water Pollution Control Act of 1972, is administered by USEPA, and sets the basic structure for regulating discharges of pollutants into U.S. waters. The CWA requires USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits are issued by USEPA or the appropriate state if it has assumed responsibility. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands that are used for commerce, recreation, industry, sources of fish, and other purposes. The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still be in compliance with state water-quality standards. After determining TMDLs for impaired waters, states are required to identify all point and nonpoint sources of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source to meet the state standards. The TMDL program is currently the Nation's most comprehensive attempt to restore and improve water quality. The TMDL program does not explicitly require the protection of riparian areas. However, implementation of the TMDL plans typically calls for restoration of riparian areas as one of the required management measures for achieving reductions in nonpoint source pollutant loadings.

The Coastal Zone Management Act (CZMA) of 1972 declares a national policy to preserve, protect, and develop, and, where possible, restore or enhance the resources of the Nation's coastal zone. The coastal zone refers to the coastal waters and the adjacent shorelines including islands, transitional and intertidal areas, salt marshes, wetlands, and beaches, and includes the Great Lakes. The CZMA encourages states to exercise their full authority over the coastal zone, through the development of land and water use programs in cooperation with Federal and local governments. States may apply for grants to help develop and implement management programs to achieve wise use of the land and water resources of the coastal zone. Development projects affecting land or water use or natural resources of a coastal zone, must ensure the project is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Safe Drinking Water Act (SDWA) of 1974 establishes a Federal program to monitor and increase the safety of all commercially and publicly supplied drinking water. Congress amended the SDWA in 1986, mandating dramatic changes in nationwide safeguards for drinking water and establishing new Federal enforcement responsibility on the part of USEPA. The 1986 amendments to the SDWA require USEPA to establish Maximum Contaminant Levels (MCLs), Maximum Contaminant Level Goals (MCLGs), and Best Available Technology (BAT) treatment techniques for organic, inorganic, radioactive, and microbial contaminants; and turbidity. MCLGs are maximum concentrations below which no negative human health effects are known to exist. The 1996 amendments set current Federal MCLs, MCLGs, and BATs for organic, inorganic, microbiological, and radiological contaminants in public drinking water supplies.



The Wild and Scenic Rivers Act of 1968 provides for a wild and scenic river system by recognizing the remarkable values of specific rivers of the Nation. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of state legislature, or by the Secretary of the Interior upon the recommendation of the governor of the state(s) through which the river flows.

EO 11988, *Floodplain Management* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in floodplains. An agency may locate a facility in a floodplain if the head of the agency finds there is no practicable alternative. If it is found there is no practicable alternative, the agency must minimize potential harm to the floodplain, and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

## **Biological Resources**

The Endangered Species Act (ESA) of 1973 establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (USFWS) maintain the list. A list of Federal endangered species can be obtained from the Endangered Species Division, USFWS (703-358-2171). States might also have their own lists of threatened and endangered species which can be obtained by calling the appropriate State Fish and Wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties and conventions between the United States, Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA also makes it unlawful to ship, transport or carry from one state, territory, or district to another, or through a foreign country, any bird, part, nest, or egg that was captured, killed, taken, shipped, transported, or carried contrary to the laws from where it was obtained; and import from Canada any bird, part, nest, or egg obtained contrary to the laws of the province from which it was obtained. The U.S. Department of the Interior has authority to arrest, with or without a warrant, a person violating the MBTA.

EO 11514, *Protection and Enhancement of Environmental Quality* (March 5, 1970), states that the President, with assistance from the Council on Environmental Quality (CEQ), will lead a national effort to provide leadership in protecting and enhancing the environment for the purpose of sustaining and enriching human life. Federal agencies are directed to meet national environmental goals through their policies, programs, and plans. Agencies should also continually monitor and evaluate their activities to protect and enhance the quality of the environment. Consistent with NEPA, agencies are directed to share information about existing or potential environmental problems with all interested parties, including the public, in order to obtain their views.

EO 11990, *Protection of Wetlands* (May 24, 1977), directs agencies to consider alternatives to avoid adverse effects and incompatible development in wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands.

EO 13186, *Conservation of Migratory Birds* (January 10, 2001), creates a more comprehensive strategy for the conservation of migratory birds by the Federal government. EO 13186 provides a specific framework for the Federal government's compliance with its treaty obligations to Canada, Mexico, Russia, and Japan. EO 13186 provides broad guidelines on conservation responsibilities and requires the development of more detailed guidance in a Memorandum of Understanding (MOU). EO 13186 will be coordinated and implemented by the USFWS. The MOU will outline how Federal agencies will promote conservation of migratory birds. EO 13186 requires the support of various conservation planning efforts already in progress; incorporation of bird conservation considerations into agency planning, including NEPA analyses; and reporting annually on the level of take of migratory birds.

## **Cultural Resources**

The American Indian Religious Freedom Act of 1978 and Amendments of 1994 recognize that freedom of religion for all people is an inherent right, and traditional American Indian religions are an indispensable and irreplaceable part of Indian life. It also recognized the lack of Federal policy on this issue and made it the policy of the United States to protect and preserve the inherent right of religious freedom for Native Americans. The 1994 Amendments provide clear legal protection for the religious use of peyote cactus as a religious sacrament. Federal agencies are responsible for evaluating their actions and policies to determine if changes should be made to protect and preserve the religious cultural rights and practices of Native Americans. These evaluations must be made in consultation with native traditional religious leaders.

The Archaeological Resource Protection Act (ARPA) of 1979 protects archaeological resources on public and American Indian lands. It provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, defined as material remains of past human life or activities which are at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

The National Historic Preservation Act (NHPA) of 1966 sets forth national policy to identify and preserve properties of state, local, and national significance. The NHPA establishes the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and the National Register of Historic Places (NRHP). ACHP advises the President, Congress, and Federal agencies on historic preservation issues. Section 106 of the NHPA directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the NRHP. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the act is implemented by regulations of the ACHP, 36 CFR Part 800. Agencies should coordinate studies and documents prepared under Section 106 with NEPA where appropriate. However, NEPA and NHPA are separate statutes and compliance with one does not constitute compliance with the other. For example, actions which qualify for a categorical exclusion under NEPA might still require Section 106 review under NHPA. It is the responsibility of the agency

official to identify properties in the area of potential effects, and whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 establishes rights of American Indian tribes to claim ownership of certain “cultural items,” defined as Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies. Cultural items discovered on Federal or tribal lands are, in order of primacy, the property of lineal descendants, if these can be determined, and then the tribe owning the land where the items were discovered or the tribe with the closest cultural affiliation with the items. Discoveries of cultural items on Federal or tribal land must be reported to the appropriate American Indian tribe and the Federal agency with jurisdiction over the land. If the discovery is made as a result of a land use, activity in the area must stop and the items must be protected pending the outcome of consultation with the affiliated tribe.

EO 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971), directs the Federal government to provide leadership in the preservation, restoration, and maintenance of the historic and cultural environment. Federal agencies are required to locate and evaluate all Federal sites under their jurisdiction or control which might qualify for listing on the NRHP. Agencies must allow the ACHP to comment on the alteration, demolition, sale, or transfer of property which is likely to meet the criteria for listing as determined by the Secretary of the Interior in consultation with the SHPO. Agencies must also initiate procedures to maintain federally owned sites listed on the NRHP.

EO 13007, *Indian Sacred Sites* (May 24, 1996), provides that agencies managing Federal lands, to the extent practicable, permitted by law, and not inconsistent with agency functions, shall accommodate American Indian religious practitioners’ access to and ceremonial use of American Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of such sites. Federal agencies are responsible for informing tribes of proposed actions that could restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites.

EO 13287, *Preserve America* (March 3, 2003), orders Federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the Federal government, and promote intergovernmental cooperation and partnerships for preservation and use of historic properties. EO 13287 established new accountability for agencies with respect to inventories and stewardship.

## **Socioeconomics and Environmental Justice**

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address the adverse human health or environmental effects that its activities have on minority and low-income populations, and develop agencywide environmental justice strategies. The strategy must list “programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health of and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations.” A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with EO 12898 is with each Federal agency.

## Hazardous Materials and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes USEPA to respond to spills and other releases of hazardous substances to the environment, and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal “Superfund” to respond to emergencies immediately. Although the “Superfund” provides funds for cleanup of sites where potentially responsible parties cannot be identified, USEPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters.

The Pollution Prevention Act (PPA) of 1990 encourages manufacturers to avoid the generation of pollution by modifying equipment and processes, redesigning products, substituting raw materials, and making improvements in management techniques, training, and inventory control. Consistent with pollution prevention principles, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007 [revoking EO 13148]) sets a goal for all Federal agencies that promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and use of paper of at least 30 percent post-consumer fiber content. In addition, EO 13423 sets a goal that requires Federal agencies to ensure that they reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of, increase diversion of solid waste as appropriate, and maintain cost effective waste prevention and recycling programs in their facilities. Additionally, in *Federal Register* Volume 58 Number 18 (January 29, 1993), CEQ provides guidance to Federal agencies on how to “incorporate pollution prevention principles, techniques, and mechanisms into their planning and decision making processes and to evaluate and report those efforts, as appropriate, in documents pursuant to NEPA.”

The Resource Conservation and Recovery Act (RCRA) of 1976 is an amendment to the Solid Waste Disposal Act. RCRA authorizes USEPA to provide for “cradle-to-grave” management of hazardous waste and sets a framework for the management of nonhazardous municipal solid waste. Under RCRA, hazardous waste is controlled from generation to disposal through tracking and permitting systems, and restrictions and controls on the placement of waste on or into the land. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by USEPA as being hazardous. With the Hazardous and Solid Waste Amendments (HSWA) of 1984, Congress targeted stricter standards for waste disposal and encouraged pollution prevention by prohibiting the land disposal of particular wastes. The HSWA amendments strengthen control of both hazardous and nonhazardous waste and emphasize the prevention of pollution of groundwater.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong clean-up standards and authorizes USEPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with “hazardous substances” or “extremely hazardous substances” to prepare comprehensive emergency plans and to report accidental releases. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency can also incur liability if it leases a property, as the courts have found lessees liable as “owners.” However, if the agency exercises due diligence by conducting a Phase I Environmental Site Assessment, it can claim the “innocent purchaser” defense under CERCLA. According to Title 42 United States Code (U.S.C.) 9601(35), the current owner/operator must show it undertook “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” before buying the property to use this defense.

The Toxic Substance Control Act (TSCA) of 1976 consists of four titles. Title I established requirements and authorities to identify and control toxic chemical hazards to human health and the environment.

TSCA authorized USEPA to gather information on chemical risks, require companies to test chemicals for toxic effects, and regulate chemicals with unreasonable risk. TSCA also singled out polychlorinated biphenyls (PCBs) for regulation, and, as a result, PCBs are being phased out. PCBs are persistent when released into the environment and accumulate in the tissues of living organisms. They have been shown to cause adverse health effects on laboratory animals and could cause adverse health effects in humans. TSCA and its regulations govern the manufacture, processing, distribution, use, marking, storage, disposal, clean-up, and release reporting requirements for numerous chemicals like PCBs. TSCA Title II provides statutory framework for “Asbestos Hazard Emergency Response,” which applies only to schools. TSCA Title III, “Indoor Radon Abatement,” states indoor air in buildings of the United States should be as free of radon as the outside ambient air. Federal agencies are required to conduct studies on the extent of radon contamination in buildings they own. TSCA Title IV, “Lead Exposure Reduction,” directs Federal agencies to “conduct a comprehensive program to promote safe, effective, and affordable monitoring, detection, and abatement of lead-based paint and other lead exposure hazards.” Further, any Federal agency having jurisdiction over a property or facility must comply with all Federal, state, interstate, and local requirements concerning lead-based paint.

## **APPENDIX C**

### **INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT**





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR MOBILITY COMMAND



MEMORANDUM FOR SEE DISTRIBUTION

FROM: HQ AMC/A7P  
507 Symington Drive  
Scott AFB, IL 62225-5022

APR 10 2007

SUBJECT: Description of Proposed Action and Alternatives (DOPAA) for an Installation Development Environmental Assessment (IDEA) at Dover Air Force Base (AFB), Delaware

The 436th Airlift Wing (436 AW) at Dover AFB, Delaware and Headquarters Air Mobility Command (AMC) are preparing the IDEA as a comprehensive document to improve base planning and streamline the National Environmental Policy Act (NEPA) compliance process. The Proposed Action addressed in this Environmental Assessment (EA) implements installation development actions as established in the community of all wing-approved plans for Dover AFB over the next five years. This comprehensive approach better enables Dover AFB to meet installation development requirements and to ensure readiness for future national defense missions. The projects analyzed in this IDEA fall under three general categories: facilities demolition projects, facilities construction projects (to include renovations, alterations, and repairs), and infrastructure projects. Following this 30-day review, your agency will have an opportunity to review the full IDEA, including section 3 and appendices/figures, prior to final publication and signature.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation and solicit comments on the attached DOPAA for this IDEA. Comments may include any issues related to the IDEA. Please provide any comments or information no later than 30 days from the date of this letter by mail to Mr. Louis Lombard, 436 CES/CECP, 600 Chevron Avenue, Dover AFB, Delaware 19902.

Also enclosed is a copy of the distribution list of other federal, state, and local agencies to be contacted regarding this IDEA. If you feel there are any additional agencies that should review and comment on the proposal, please feel free to share this letter and attached materials with them.

If members of your staff have any questions on this EA approach, our point of contact is Mr. Doug Allbright, HQ AMC/A7PC, at (618) 229-0846, or e-mail to [doug.allbright@scott.af.mil](mailto:doug.allbright@scott.af.mil).

*Efren V. M. Garcia*  
EFREN V. M. GARCIA, Colonel, USAF  
Chief, Plans and Programs Division  
Directorate of Installations & Mission Support

Attachments:

1. DOPAA for IDEA at Dover AFB
2. Distributions List

AMC--Global Reach For America



**Environmental Assessment of Installation Development at  
Dover Air Force Base, Delaware**

**Interagency and Intergovernmental Coordination for Environmental Planning List**

---

**Federal Agency Contacts**

Mr. John Wolfen  
Field Supervisor  
U.S. Fish and Wildlife Service  
177 Admiral Cochrane Drive  
Annapolis, MD 21401

Mr. John Nichols  
National Oceanic and Atmospheric  
Administration, Fisheries Service  
Habitat Conservation Division  
410 Severn Avenue  
Annapolis, MD 21403

Mr. Jerry Pasquale  
U.S. Army Corps of Engineers  
Environmental Resources Branch  
Wanamaker Building  
100 Penn Square East  
Philadelphia, PA 19107-3390

Mr. William Arguto  
U.S. Environmental Protection Agency  
3EA30  
1650 Arch St.  
Philadelphia, PA 19103

**State and Local Agency Contacts**

Ms. Karen Bennett  
Delaware Department of Natural Resources and  
Environmental Control  
Natural Heritage & Endangered Species  
4876 Hay Point Landing Road  
Smyrna, DE 19977

Ms. Joan Larrivee  
Deputy State Historic Preservation Officer  
Delaware Division of Historic and Cultural  
Affairs  
21 The Green  
Dover, DE 19901-3611

**Tribal Contacts**

Mr. Raymond Cline, Trust Board Chairman  
Delaware Trust Board  
220 NW Virginia Avenue  
Bartlesville, OK 74003

Mr. Edgar French, President  
Delaware Nation  
P.O. Box 825  
Anadarko, OK 73005

Mr. William Daisey  
Nanticoke Indian Association Tribal Council  
Member  
215 Pine Street  
Dover, DE 19901



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**PHILADELPHIA DISTRICT, CORPS OF ENGINEERS**  
WANAMAKER BUILDING-100 PENN SQUARE EAST  
PHILADELPHIA, PENNSYLVANIA 19107-3390

Environmental Resources Branch

MAY 03 2007

Mr. Louis Lombard  
436 CES/CECP  
600 Chevron Avenue  
Dover AFB  
Dover, Delaware 19902

Dear Mr. Lombard:

This is in response to your April 10, 2007 letter regarding Intergovernmental Review of Federal Programs under Executive Order 12372 concerning the Description of Proposed Action and Alternatives (DOPAA) for the an Installation Development Environmental Assessment (IDEA). An examination of the DOPAA for the proposed IDEA reveals that there is little potential for impacts to waters of the United States and wetlands due to the location and nature of the projects as described in the DOPAA, especially since none of the projects contained in the IDEA would impact environmentally sensitive areas such as wetlands, floodplains, endangered species sites, or cultural resources.

However, some general comments on the IDEA include:

1. Figure 2-1 shows the Areas of Development (AODs) for Dover AFB and Figure 2-2 shows the environmental constraints for the base. It appears that areas designated for Community and Open Space Recreation on Dover AFB fall within the 100-year floodplain. Based on Executive Order 11988, Floodplain Management 1977, which directs agencies to avoid incompatible development in the floodplains. We suggest that future development in the 100-year floodplain be avoided.
2. Section 2.1 (page 2-4) – In the discussion on the exterior development of new facilities and landscaping plan, we suggest adding the use of native plants for landscaping around new and existing facilities. A guide to native plants in Delaware can be found at the website: <http://www.delawarenativeplants.org/>.

In addition, if project limits or projected impacts should change, pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, a Department of the Army permit is required for work or placement of structures in navigable waters of the United States and the discharge of dredged or fill material into waters of the United States including their adjacent wetlands as identified on the approved jurisdictional determination plans for the Dover

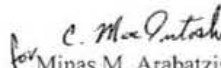
AFB may require a Department of the Army permit prior to performing the work. Discharges of fill material include activities such as: the placement of rock, sand, dirt, or other material for the construction of any structures, impoundment or site development; grading; fill associated with the creation of ponds; and property protection or reclamation devices such as riprap and breakwaters. Any proposal involving the performance of the above activities within the area of Federal jurisdiction, whether the work is permanent or temporary will require the prior approval of the Corps Regulatory office.

Furthermore, if a Department of the Army Permit is necessary for this project, the Corps would be concerned with impacts of the proposed project to water resources, including water quality, impacts to wetlands, and potential alternatives that would minimize and/or eliminate wetlands involvement; proposed handling of excavated material in aquatic and wetland areas; the occurrence, if any, of endangered species within the project area; and potential impacts to cultural resources within the project area.

Please be advised that the presence and extent of waters and wetlands at the proposed site must be identified if any activities associated with the IDEA should impact these resources. If you have any questions regarding the jurisdiction and permitting procedures, please contact the Philadelphia District Regulatory Branch at (215) 656-6726.

If you have any questions regarding this letter or, have additional information to provide on this matter, please contact Mark Eberle of the Environmental Resources Branch at (215) 656-6562.

Sincerely,

  
for C. M. Arabatzis  
Minas M. Arabatzis  
Chief, Planning Division

Copy Furnished:

CENAP-OP-R

The Notice of Availability below was published on page 5 of the *Delaware State News* on 5 August 2007. Publication of the Notice of Availability initiated a 30-day public review period of the Draft EA and Draft FONSI. Copies of these documents were available in the Dover Public Library. Additionally, copies of these documents were distributed for interagency review. One response letter was received and is included on the following page.

**NOTICE OF AVAILABILITY**  
**DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)**  
**FOR THE ENVIRONMENTAL ASSESSMENT (EA) OF INSTALLATION DEVELOPMENT**  
**AT DOVER AIR FORCE BASE (AFB), DELAWARE**

Dover AFB, Delaware, and the U. S. Air Force Air Mobility Command are proposing to issue a FONSI based on the finding of an EA of Installation Development at Dover AFB. The analysis considered potential effects of the Proposed Action on 11 resource areas: noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and waste management. The results, as found in the EA, show that the future proposed installation development projects would not have a significant 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 the EA showing the analysis are available for review until 4 September 2007 at the Dover Public Library, 45 South State Street, Dover, DE 19901. Written comments should be addressed to Mr. Louis Lombard, 436 CES/CECP, 600 Chevron Avenue, Dover AFB, DE 19902-5600.

The following Privacy Advisory appeared on the Cover Sheet of the Draft EA:

---

**PRIVACY ADVISORY**

Your comments on this document are welcome. Letters or other written comments provided to the proponent concerning this document 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.

---

***THIS PAGE INTENTIONALLY LEFT BLANK***

State of Delaware  
Historical and Cultural Affairs

21 The Green  
Dover, DE 19901-3611

Phone: (302) 736.7400

Fax: (302) 739.5660

September 17, 2007

Mr. Louis Lombard  
436 CES/CECP  
600 Chevron Avenue  
Dover Air Force Base  
Dover, DE 19901-5600

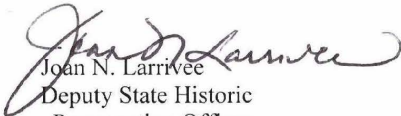
RE: Environmental Assessment of Installation Development at Dover Air Force Base (DAFB)

Dear Mr. Lombard:

Thank you for the opportunity to review and comment on the Environmental Assessment of Installation Development at DAFB dated August 2007. This document has addressed the issue of cultural resources and we find its conclusions and recommendations to be consistent with the Integrated Cultural Resource Management Plan (ICRMP) for DAFB. As it relates to cultural resources, we concur that your finding of no significant impact for the proposed project work is appropriate. In accordance with the regulations implementing Section 106 of the National Historic Preservation Act of 1966, as amended, our finding would be one of no adverse effect. We have no specific recommendations beyond those which are already contained in the environmental assessment.

Please contact me at 302-736-7406 or [joan.larrivee@state.de.us](mailto:joan.larrivee@state.de.us) if you have any questions.

Sincerely,

  
Joan N. Larrivee  
Deputy State Historic  
Preservation Officer



R 21 Sep 2007

***THIS PAGE INTENTIONALLY LEFT BLANK***

## **APPENDIX D**

### **AIR QUALITY EMISSIONS CALCULATIONS**





|                             |                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Summary</b>              | Summarizes total emissions by calendar year.                                                                                                     |
| <b>Combustion</b>           | Estimates emissions from non-road equipment exhaust as well as painting.                                                                         |
| <b>Fugitive</b>             | Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust                                                       |
| <b>Grading</b>              | Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions               |
| <b>AQCR<br/>Tier Report</b> | Summarizes total emissions for the Southern Delaware Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions. |

| Demolition Emissions from Proposed Action |                          |              |             |                          |                           |  |
|-------------------------------------------|--------------------------|--------------|-------------|--------------------------|---------------------------|--|
|                                           | NO <sub>x</sub><br>(ton) | VOC<br>(ton) | CO<br>(ton) | SO <sub>2</sub><br>(ton) | PM <sub>10</sub><br>(ton) |  |
| CY2009                                    |                          |              |             |                          |                           |  |
| Construction Combustion                   | 0.773                    | 0.284        | 0.896       | 0.023                    | 0.026                     |  |
| Construction Fugitive Dust                | 0.000                    | 0.000        | 0.000       | 0.000                    | 1.226                     |  |
| TOTAL CY2009                              | 0.773                    | 0.284        | 0.896       | 0.023                    | 1.252                     |  |

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

#### Southern Delaware Intrastate AQCR

| Year | Point and Area Sources Combined |              |             |                          |                           |
|------|---------------------------------|--------------|-------------|--------------------------|---------------------------|
|      | NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| 2001 | 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>). Site visited on 27 April 2007.

#### Determination Significance (Significance Threshold = 10%) for Demolition Activities

|                   | Point and Area Sources Combined |              |             |                          |                           |
|-------------------|---------------------------------|--------------|-------------|--------------------------|---------------------------|
|                   | NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| Minimum - 2001    | 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |
| CY2009 Emissions  | 0.773                           | 0.284        | 0.896       | 0.023                    | 1.252                     |
| Proposed Action % | 0.0030%                         | 0.0015%      | 0.0007%     | 0.0001%                  | 0.0073%                   |

**Combustion Emissions for CY 2011**Combustion Emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, CO and PM<sub>10</sub> Due to Construction

Includes:

|                                    |                        |        |       |
|------------------------------------|------------------------|--------|-------|
| 100% of Construct Visitor's Center | 43,056 ft <sup>2</sup> | 0.99   | acres |
| Total Building Construction Area:  | 43,056 ft <sup>2</sup> |        |       |
| Total Demolished Area:             | 0 ft <sup>2</sup>      | (None) |       |
| Total Paved Area:                  | 0 ft <sup>2</sup>      | (None) |       |
| Total Disturbed Area:              | 43,056 ft <sup>2</sup> |        |       |
| Construction Duration:             | 1.0 year(s)            |        |       |
| Annual Construction Activity:      | 230 days/yr            |        |       |

## Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

### Grading

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Bulldozer                      | 1                                       | 29.40                       | 3.66                         | 25.09          | 0.59                         | 1.17                         |
| Motor Grader                   | 1                                       | 10.22                       | 1.76                         | 14.98          | 0.20                         | 0.28                         |
| Water Truck                    | 1                                       | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 3                                       | 60.51                       | 9.02                         | 70.69          | 1.21                         | 2.03                         |

### Paving

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Paver                          | 1                                       | 7.93                        | 1.37                         | 11.62          | 0.16                         | 0.22                         |
| Roller                         | 1                                       | 5.01                        | 0.86                         | 7.34           | 0.10                         | 0.14                         |
| Total per 10 acres of activity | 2                                       | 12.94                       | 2.23                         | 18.96          | 0.26                         | 0.36                         |

### Demolition

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Loader                         | 1                                       | 7.86                        | 1.35                         | 11.52          | 0.16                         | 0.22                         |
| Haul Truck                     | 1                                       | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 2                                       | 28.75                       | 4.95                         | 42.14          | 0.58                         | 0.80                         |

### Building Construction

| Equipment <sup>d</sup>         | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| <b>Stationary</b>              |                                         |                             |                              |                |                              |                              |
| Generator Set                  | 1                                       | 11.83                       | 1.47                         | 10.09          | 0.24                         | 0.47                         |
| Industrial Saw                 | 1                                       | 17.02                       | 2.12                         | 14.52          | 0.34                         | 0.68                         |
| Welder                         | 1                                       | 4.48                        | 0.56                         | 3.83           | 0.09                         | 0.18                         |
| <b>Mobile (non-road)</b>       |                                         |                             |                              |                |                              |                              |
| Truck                          | 1                                       | 20.89                       | 3.60                         | 30.62          | 0.84                         | 0.58                         |
| Forklift                       | 1                                       | 4.57                        | 0.79                         | 6.70           | 0.18                         | 0.13                         |
| Crane                          | 1                                       | 8.37                        | 1.44                         | 12.27          | 0.33                         | 0.23                         |
| Total per 10 acres of activity | 6                                       | 67.16                       | 9.98                         | 78.03          | 2.02                         | 2.27                         |

Note: Footnotes for tables are on following page

### Architectural Coatings

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Air Compressor                 | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |
| Total per 10 acres of activity | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- c) The SMAQMD 2004 reference does not provide SO<sub>2</sub> emission factors. For this worksheet, SO<sub>2</sub> emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO<sub>2</sub> factor was found to be approximately 0.04 times the NO<sub>x</sub> emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO<sub>x</sub> emission factor for all other equipment (based on AP-42, Table 3.4-1)
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

### PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

| Source                                   | Equipment<br>Multiplier* | SMAQMD Emission Factors (lb/day) |        |       |                    |                  |
|------------------------------------------|--------------------------|----------------------------------|--------|-------|--------------------|------------------|
|                                          |                          | NO <sub>x</sub>                  | VOC    | CO    | SO <sub>2</sub> ** | PM <sub>10</sub> |
| Grading Equipment                        | 1                        | 5.981                            | 0.892  | 6.987 | 0.120              | 0.201            |
| Paving Equipment                         | 1                        | 0.000                            | 0.000  | 0.000 | 0.000              | 0.000            |
| Demolition Equipment                     | 1                        | 0.000                            | 0.000  | 0.000 | 0.000              | 0.000            |
| Building Construction                    | 1                        | 6.638                            | 0.986  | 7.713 | 0.200              | 0.224            |
| Air Compressor for Architectural Coating | 1                        | 0.675                            | 0.084  | 0.575 | 0.014              | 0.027            |
| Architectural Coating**                  |                          |                                  | 16.911 |       |                    |                  |

\*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

\*\*Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO<sub>x</sub> = (Total Grading NO<sub>x</sub> per 10 ac\*((total disturbed area/43560)/10))\*(Equipment Multiplier)

#### Summary of Input Parameters

|                        | Total Area<br>(ft <sup>2</sup> ) | Total Area<br>(acres) | Total Days |                                                                |
|------------------------|----------------------------------|-----------------------|------------|----------------------------------------------------------------|
| Grading:               | 43,056                           | 0.99                  | 1          | (from "CY2011 Grading" worksheet)                              |
| Paving:                | 0                                | 0.00                  | 0          |                                                                |
| Demolition:            | 0                                | 0.00                  | 0          |                                                                |
| Building Construction: | 43,056                           | 0.99                  | 230        |                                                                |
| Architectural Coating  | 43,056                           | 0.99                  | 20         | (per SMAQMD "Air Quality of Thresholds of Significance", 1994) |

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

#### Total Project Emissions by Activity (lbs)

|                               | NO <sub>x</sub> | VOC           | CO              | SO <sub>2</sub> | PM <sub>10</sub> |
|-------------------------------|-----------------|---------------|-----------------|-----------------|------------------|
| Grading Equipment             | 5.98            | 0.89          | 6.99            | 0.12            | 0.20             |
| Paving                        | -               | -             | -               | -               | -                |
| Demolition                    | -               | -             | -               | -               | -                |
| Building Construction         | 1,526.81        | 226.88        | 1,773.92        | 45.92           | 51.61            |
| Architectural Coatings        | 13.50           | 339.90        | 11.51           | 0.27            | 0.53             |
| <b>Total Emissions (lbs):</b> | <b>1,546.29</b> | <b>567.68</b> | <b>1,792.42</b> | <b>46.31</b>    | <b>52.34</b>     |

#### Results: Total Project Annual Emission Rates

|                                | NO <sub>x</sub> | VOC    | CO       | SO <sub>2</sub> | PM <sub>10</sub> |
|--------------------------------|-----------------|--------|----------|-----------------|------------------|
| Total Project Emissions (lbs)  | 1,546.29        | 567.68 | 1,792.42 | 46.31           | 52.34            |
| Total Project Emissions (tons) | 0.7731          | 0.2838 | 0.8962   | 0.0232          | 0.0262           |

## Fugitive Dust Emissions for CY 2011

Calculation of PM<sub>10</sub> Emissions Due to Site Preparation (Uncontrolled).

### User Input Parameters / Assumptions

|                                      |       |                                                                                              |                                                                                                                                                                             |
|--------------------------------------|-------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acres graded per year:               | 0.99  | acres/yr                                                                                     | (From "CY2011 Combustion" worksheet)                                                                                                                                        |
| Grading days/yr:                     | 0.55  | days/yr                                                                                      | (From "CY2011 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: 0.56 to 23, AP-42 Table 13.2.2-1)                                                                                                       |
| Soil percent moisture, M:            | 85    | %                                                                                            | ( <a href="http://www.cpc.noaa.gov/products/soilmst/w.shtml">http://www.cpc.noaa.gov/products/soilmst/w.shtml</a> )                                                         |
| 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:            | 27.75 | %                                                                                            | Ave. of wind speed at Wilmington, DE<br>( <a href="http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif">http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif</a> ) |
| Fraction of TSP, J:                  | 0.5   | per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99 |                                                                                                                                                                             |
| Mean vehicle speed, S:               | 5     | mi/hr                                                                                        | (On-site)                                                                                                                                                                   |
| Dozer path width:                    | 8     | ft                                                                                           |                                                                                                                                                                             |
| Qty construction vehicles:           | 3.00  | vehicles                                                                                     | (From "CY2011 Grading worksheet")                                                                                                                                           |
| On-site VMT/vehicle/day:             | 5     | mi/veh/day                                                                                   | (Excluding bulldozer VMT during grading)                                                                                                                                    |
| PM <sub>10</sub> Adjustment Factor k | 1.5   | lb/VMT                                                                                       | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor a | 0.9   | (dimensionless)                                                                              | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor b | 0.45  | (dimensionless)                                                                              | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| Mean Vehicle Weight W                | 40    | tons                                                                                         | assumed for aggregate trucks                                                                                                                                                |

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled



## Emissions Due to Soil Disturbance Activities

### Operation Parameters (Calculated from User Inputs)

|                            |              |                                              |
|----------------------------|--------------|----------------------------------------------|
| Grading duration per acre  | 4.5 hr/acre  |                                              |
| Bulldozer mileage per acre | 1 VMT/acre   | (Miles traveled by bulldozer during grading) |
| Construction VMT per day   | 15 VMT/day   |                                              |
| Construction VMT per acre  | 8.4 VMT/acre | (Travel on unpaved surfaces within site)     |

### Equations Used (Corrected for PM<sub>10</sub>)

| Operation                       | Empirical Equation                    | Units   | AP-42 Section (5th Edition) |
|---------------------------------|---------------------------------------|---------|-----------------------------|
| Bulldozing                      | $0.75(s^{1.5})/(M^{1.4})$             | lbs/hr  | Table 11.9-1, Overburden    |
| Grading                         | $(0.60)(0.051)s^{2.0}$                | lbs/VMT | Table 11.9-1,               |
| Vehicle Traffic (unpaved roads) | $[(k(s/12)^a (W/3)^b)] [(365-P)/365]$ | lbs/VMT | Section 13.2.2              |

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

### Calculation of PM<sub>10</sub> Emission Factors for Each Operation

| Operation                       | Emission Factor (mass/ unit) | Operation Parameter | Emission Factor (lbs/ acre) |
|---------------------------------|------------------------------|---------------------|-----------------------------|
| Bulldozing                      | 0.04 lbs/hr                  | 4.5 hr/acre         | 0.20 lbs/acre               |
| Grading                         | 0.77 lbs/VMT                 | 1 VMT/acre          | 0.80 lbs/acre               |
| Vehicle Traffic (unpaved roads) | 2.37 lbs/VMT                 | 8.4 VMT/acre        | 19.90 lbs/acre              |

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

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

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

Soil Piles EF = 9.3 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 = 0.93 lbs/day/acres graded

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

### Calculation of Annual PM<sub>10</sub> Emissions

| Source                    | Emission Factor    | Graded Acres/yr | Exposed days/yr | Emissions lbs/yr | Emissions tons/yr |
|---------------------------|--------------------|-----------------|-----------------|------------------|-------------------|
| Bulldozing                | 0.20 lbs/acre      | 0.99            | NA              | 0                | 0.000             |
| Grading                   | 0.80 lbs/acre      | 0.99            | NA              | 1                | 0.000             |
| Vehicle Traffic           | 19.90 lbs/acre     | 0.99            | NA              | 20               | 0.010             |
| Erosion of Soil Piles     | 0.93 lbs/acre/day  | 0.99            | 90              | 83               | 0.041             |
| Erosion of Graded Surface | 26.40 lbs/acre/day | 0.99            | 90              | 2,349            | 1.174             |
| TOTAL                     |                    |                 |                 | 2,452            | 1.23              |

Soil Disturbance EF: 20.90 lbs/acre

Wind Erosion EF: 27.33 lbs/acre/day

Back calculate to get EF: 4,493.22 lbs/acre/grading day

## Grading Schedule for CY 2011

Estimate of time required to grade a specified area.

### Input Parameters

Construction area: 0.99 acres/yr (from "CY2011 Combustion" Worksheet)  
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

### 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, 19th Ed., R. S. Means, 2005.

| Means Line No. | Operation     | Description                              | Output | Units      | Acres per<br>equip-day) | equip-days<br>per acre | Acres/yr<br>(project-<br>specific) | Equip-days<br>per year |
|----------------|---------------|------------------------------------------|--------|------------|-------------------------|------------------------|------------------------------------|------------------------|
| 2230 200 0550  | Site Clearing | Dozer & rake, medium brush               | 8      | acre/day   | 8                       | 0.13                   | 0.99                               | 0.12                   |
| 2230 500 0300  | Stripping     | Topsoil & stockpiling, adverse soil      | 1,650  | cu. yd/day | 2.05                    | 0.49                   | 0.99                               | 0.48                   |
| 2315 432 5220  | Excavation    | Bulk, open site, common earth, 150' haul | 800    | cu. yd/day | 0.99                    | 1.01                   | 0.49                               | 0.50                   |
| 2315 120 5220  | Backfill      | Structural, common earth, 150' haul      | 1,950  | cu. yd/day | 2.42                    | 0.41                   | 0.49                               | 0.20                   |
| 2315 310 5020  | Compaction    | Vibrating roller, 6 " lifts, 3 passes    | 2,300  | cu. yd/day | 2.85                    | 0.35                   | 0.99                               | 0.35                   |
| TOTAL          |               |                                          |        |            |                         |                        |                                    | 1.66                   |

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

(Equip)(day)/yr: 1.66  
Qty Equipment: 3.00  
Grading days/yr: 0.55

# **Southern Delaware Intrastate Air Quality Control Region (SDIAQCR)**

|             |       |           | Area Source Emissions |        |        |       |       | Point Source Emissions |     |       |       |       |        |     |
|-------------|-------|-----------|-----------------------|--------|--------|-------|-------|------------------------|-----|-------|-------|-------|--------|-----|
| Row #       | State | County    | CO                    | NOx    | PM10   | PM2.5 | SO2   | VOC                    | CO  | NOx   | PM10  | PM2.5 | SO2    | VOC |
| 1           | DE    | Kent Co   | 50,300                | 7,415  | 5,428  | 1,703 | 1838  | 7,419                  | 229 | 1097  | 69.5  | 56.4  | 5286   | 163 |
| 2           | DE    | Sussex Co | 69,142                | 9586   | 7,911  | 2662  | 2257  | 9984                   | 510 | 7623  | 3644  | 2081  | 27361  | 814 |
| Grand Total |       |           | 119,442               | 17,001 | 13,339 | 4,365 | 4,095 | 17,403                 | 739 | 8,720 | 3,714 | 2,137 | 30,647 | 977 |

SOURCE:

<http://www.epa.gov/air/data/geosel.html>

USEPA - AirData NET Tier Report

\*Net Air pollution sources (area and point) in tons per year (2001)

Site visited on 27 April 2007

SDIAQCR : Kent County and Sussex County.

|                             |                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Summary</b>              | Summarizes total emissions by calendar year.                                                                                                     |
| <b>Combustion</b>           | Estimates emissions from non-road equipment exhaust as well as painting.                                                                         |
| <b>Fugitive</b>             | Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust                                                       |
| <b>Grading</b>              | Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions               |
| <b>AQCR<br/>Tier Report</b> | Summarizes total emissions for the Southern Delaware Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions. |

| Demolition Emissions from Proposed Action |                          |              |             |                          |                           |  |
|-------------------------------------------|--------------------------|--------------|-------------|--------------------------|---------------------------|--|
|                                           | NO <sub>x</sub><br>(ton) | VOC<br>(ton) | CO<br>(ton) | SO <sub>2</sub><br>(ton) | PM <sub>10</sub><br>(ton) |  |
| CY2012                                    |                          |              |             |                          |                           |  |
| Construction Combustion                   | 0.180                    | 0.031        | 0.262       | 0.004                    | 0.005                     |  |
| Construction Fugitive Dust                | 0.000                    | 0.000        | 0.000       | 0.000                    | 1.936                     |  |
| TOTAL CY2012                              | 0.180                    | 0.031        | 0.262       | 0.004                    | 1.941                     |  |

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

#### Southern Delaware Intrastate AQCR

| Year | Point and Area Sources Combined |              |             |                          |                           |
|------|---------------------------------|--------------|-------------|--------------------------|---------------------------|
|      | NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| 2001 | 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>). Site visited on 27 April 2007.

#### Determination Significance (Significance Threshold = 10%) for Demolition Activities

| Point and Area Sources Combined |              |             |                          |                           |
|---------------------------------|--------------|-------------|--------------------------|---------------------------|
| NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |
| 0.180                           | 0.031        | 0.262       | 0.004                    | 1.941                     |
| 0.0007%                         | 0.0002%      | 0.0002%     | 0.00001%                 | 0.0114%                   |

Minimum - 2001  
CY2012 Emissions  
Proposed Action %

**Combustion Emissions for CY 2012**Combustion Emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, CO and PM<sub>10</sub> Due to Construction

Includes:

|                                                |                        |        |       |
|------------------------------------------------|------------------------|--------|-------|
| 100% of Demolish Covered Storage Facility 1315 | 68,000 ft <sup>2</sup> | 1.56   | acres |
| Total Building Construction Area:              | 0 ft <sup>2</sup>      | (None) |       |
| Total Demolished Area:                         | 68,000 ft <sup>2</sup> |        |       |
| Total Paved Area:                              | 0 ft <sup>2</sup>      | (None) |       |
| Total Disturbed Area:                          | 68,000 ft <sup>2</sup> |        |       |
| Construction Duration:                         | 1.0 year(s)            |        |       |
| Annual Construction Activity:                  | 230 days/yr            |        |       |

## Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

### Grading

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Bulldozer                      | 1                                                   | 29.40                       | 3.66                         | 25.09          | 0.59                         | 1.17                         |
| Motor Grader                   | 1                                                   | 10.22                       | 1.76                         | 14.98          | 0.20                         | 0.28                         |
| Water Truck                    | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 3                                                   | 60.51                       | 9.02                         | 70.69          | 1.21                         | 2.03                         |

### Paving

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Paver                          | 1                                                   | 7.93                        | 1.37                         | 11.62          | 0.16                         | 0.22                         |
| Roller                         | 1                                                   | 5.01                        | 0.86                         | 7.34           | 0.10                         | 0.14                         |
| Total per 10 acres of activity | 2                                                   | 12.94                       | 2.23                         | 18.96          | 0.26                         | 0.36                         |

### Demolition

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Loader                         | 1                                                   | 7.86                        | 1.35                         | 11.52          | 0.16                         | 0.22                         |
| Haul Truck                     | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 2                                                   | 28.75                       | 4.95                         | 42.14          | 0.58                         | 0.80                         |

### Building Construction

| Equipment <sup>d</sup>         | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| <b>Stationary</b>              |                                                     |                             |                              |                |                              |                              |
| Generator Set                  | 1                                                   | 11.83                       | 1.47                         | 10.09          | 0.24                         | 0.47                         |
| Industrial Saw                 | 1                                                   | 17.02                       | 2.12                         | 14.52          | 0.34                         | 0.68                         |
| Welder                         | 1                                                   | 4.48                        | 0.56                         | 3.83           | 0.09                         | 0.18                         |
| <b>Mobile (non-road)</b>       |                                                     |                             |                              |                |                              |                              |
| Truck                          | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.84                         | 0.58                         |
| Forklift                       | 1                                                   | 4.57                        | 0.79                         | 6.70           | 0.18                         | 0.13                         |
| Crane                          | 1                                                   | 8.37                        | 1.44                         | 12.27          | 0.33                         | 0.23                         |
| Total per 10 acres of activity | 6                                                   | 67.16                       | 9.98                         | 78.03          | 2.02                         | 2.27                         |

Note: Footnotes for tables are on following page



### Architectural Coatings

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Air Compressor                 | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |
| Total per 10 acres of activity | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- c) The SMAQMD 2004 reference does not provide SO<sub>2</sub> emission factors. For this worksheet, SO<sub>2</sub> emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO<sub>2</sub> factor was found to be approximately 0.04 times the NO<sub>x</sub> emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO<sub>x</sub> emission factor for all other equipment (based on AP-42, Table 3.4-1)
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

### PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

| Source                                   | Equipment<br>Multiplier* | SMAQMD Emission Factors (lb/day) |       |        |                    |                  |
|------------------------------------------|--------------------------|----------------------------------|-------|--------|--------------------|------------------|
|                                          |                          | NO <sub>x</sub>                  | VOC   | CO     | SO <sub>2</sub> ** | PM <sub>10</sub> |
| Grading Equipment                        | 1                        | 9.446                            | 1.408 | 11.035 | 0.189              | 0.317            |
| Paving Equipment                         | 1                        | 0.000                            | 0.000 | 0.000  | 0.000              | 0.000            |
| Demolition Equipment                     | 1                        | 4.488                            | 0.773 | 6.578  | 0.090              | 0.125            |
| Building Construction                    | 1                        | 0.000                            | 0.000 | 0.000  | 0.000              | 0.000            |
| Air Compressor for Architectural Coating | 1                        | 0.000                            | 0.000 | 0.000  | 0.000              | 0.000            |
| Architectural Coating**                  |                          |                                  | 0.000 |        |                    |                  |

\*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

\*\*Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO<sub>x</sub> = (Total Grading NO<sub>x</sub> per 10 ac\*((total disturbed area/43560)/10))\*(Equipment Multiplier)

#### Summary of Input Parameters

|                        | Total Area<br>(ft <sup>2</sup> ) | Total Area<br>(acres) | Total Days |                                                                |
|------------------------|----------------------------------|-----------------------|------------|----------------------------------------------------------------|
| Grading:               | 68,000                           | 1.56                  | 1          | (from "CY2012 Grading" worksheet)                              |
| Paving:                | 0                                | 0.00                  | 0          |                                                                |
| Demolition:            | 68,000                           | 1.56                  | 78         | (per SMAQMD "Air Quality of Thresholds of Significance", 1994) |
| Building Construction: | 0                                | 0.00                  | 0          |                                                                |
| Architectural Coating  | 0                                | 0.00                  | 0          |                                                                |

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

#### Total Project Emissions by Activity (lbs)

|                               | NO <sub>x</sub> | VOC          | CO            | SO <sub>2</sub> | PM <sub>10</sub> |
|-------------------------------|-----------------|--------------|---------------|-----------------|------------------|
| Grading Equipment             | 9.45            | 1.41         | 11.04         | 0.19            | 0.32             |
| Paving                        | -               | -            | -             | -               | -                |
| Demolition                    | 350.31          | 60.31        | 513.46        | 7.01            | 9.75             |
| Building Construction         | -               | -            | -             | -               | -                |
| Architectural Coatings        | -               | -            | -             | -               | -                |
| <b>Total Emissions (lbs):</b> | <b>359.75</b>   | <b>61.72</b> | <b>524.50</b> | <b>7.20</b>     | <b>10.06</b>     |

#### Results: Total Project Annual Emission Rates

|                                | NO <sub>x</sub> | VOC    | CO     | SO <sub>2</sub> | PM <sub>10</sub> |
|--------------------------------|-----------------|--------|--------|-----------------|------------------|
| Total Project Emissions (lbs)  | 359.75          | 61.72  | 524.50 | 7.20            | 10.06            |
| Total Project Emissions (tons) | 0.1799          | 0.0309 | 0.2622 | 0.0036          | 0.0050           |

## Fugitive Dust Emissions for CY 2012

Calculation of PM<sub>10</sub> Emissions Due to Site Preparation (Uncontrolled).

### User Input Parameters / Assumptions

|                                      |                      |                                                                                                                                                                             |
|--------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acres graded per year:               | 1.56 acres/yr        | (From "CY2012 Combustion" worksheet)                                                                                                                                        |
| Grading days/yr:                     | 0.87 days/yr         | (From "CY2012 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: 0.56 to 23, AP-42 Table 13.2.2-1)                                                                                                       |
| Soil percent moisture, M:            | 85 %                 | ( <a href="http://www.cpc.noaa.gov/products/soilmst/w.shtml">http://www.cpc.noaa.gov/products/soilmst/w.shtml</a> )                                                         |
| 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:            | 27.75 %              | Ave. of wind speed at Wilmington, DE<br>( <a href="http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif">http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif</a> ) |
| Fraction of TSP, J:                  | 0.5                  | per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99                                                                                |
| Mean vehicle speed, S:               | 5 mi/hr              | (On-site)                                                                                                                                                                   |
| Dozer path width:                    | 8 ft                 |                                                                                                                                                                             |
| Qty construction vehicles:           | 3.00 vehicles        | (From "CY2012 Grading worksheet")                                                                                                                                           |
| On-site VMT/vehicle/day:             | 5 mi/veh/day         | (Excluding bulldozer VMT during grading)                                                                                                                                    |
| PM <sub>10</sub> Adjustment Factor k | 1.5 lb/VMT           | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor a | 0.9 (dimensionless)  | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor b | 0.45 (dimensionless) | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| Mean Vehicle Weight W                | 40 tons              | assumed for aggregate trucks                                                                                                                                                |

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled

## Emissions Due to Soil Disturbance Activities

### Operation Parameters (Calculated from User Inputs)

|                            |              |                                              |
|----------------------------|--------------|----------------------------------------------|
| Grading duration per acre  | 4.5 hr/acre  |                                              |
| Bulldozer mileage per acre | 1 VMT/acre   | (Miles traveled by bulldozer during grading) |
| Construction VMT per day   | 15 VMT/day   |                                              |
| Construction VMT per acre  | 8.4 VMT/acre | (Travel on unpaved surfaces within site)     |

### Equations Used (Corrected for PM<sub>10</sub>)

| Operation                       | Empirical Equation                    | Units   | AP-42 Section (5th Edition) |
|---------------------------------|---------------------------------------|---------|-----------------------------|
| Bulldozing                      | $0.75(s^{1.5})/(M^{1.4})$             | lbs/hr  | Table 11.9-1, Overburden    |
| Grading                         | $(0.60)(0.051)s^{2.0}$                | lbs/VMT | Table 11.9-1,               |
| Vehicle Traffic (unpaved roads) | $[(k(s/12)^a (W/3)^b)] [(365-P)/365]$ | lbs/VMT | Section 13.2.2              |

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

### Calculation of PM<sub>10</sub> Emission Factors for Each Operation

| Operation                       | Emission Factor (mass/ unit) | Operation Parameter | Emission Factor (lbs/ acre) |
|---------------------------------|------------------------------|---------------------|-----------------------------|
| Bulldozing                      | 0.04 lbs/hr                  | 4.5 hr/acre         | 0.20 lbs/acre               |
| Grading                         | 0.77 lbs/VMT                 | 1 VMT/acre          | 0.80 lbs/acre               |
| Vehicle Traffic (unpaved roads) | 2.37 lbs/VMT                 | 8.4 VMT/acre        | 19.90 lbs/acre              |

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

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

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

Soil Piles EF = 9.3 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 = 0.93 lbs/day/acres graded

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

### Calculation of Annual PM<sub>10</sub> Emissions

| Source                    | Emission Factor    | Graded Acres/yr | Exposed days/yr | Emissions lbs/yr | Emissions tons/yr |
|---------------------------|--------------------|-----------------|-----------------|------------------|-------------------|
| Bulldozing                | 0.20 lbs/acre      | 1.56            | NA              | 0                | 0.000             |
| Grading                   | 0.80 lbs/acre      | 1.56            | NA              | 1                | 0.001             |
| Vehicle Traffic           | 19.90 lbs/acre     | 1.56            | NA              | 31               | 0.016             |
| Erosion of Soil Piles     | 0.93 lbs/acre/day  | 1.56            | 90              | 131              | 0.065             |
| Erosion of Graded Surface | 26.40 lbs/acre/day | 1.56            | 90              | 3,709            | 1.855             |
| TOTAL                     |                    |                 |                 | 3,872            | 1.94              |

Soil Disturbance EF: 20.90 lbs/acre  
 Wind Erosion EF: 27.33 lbs/acre/day

Back calculate to get EF: 2,845.00 lbs/acre/grading day

## Grading Schedule for CY 2012

Estimate of time required to grade a specified area.

### Input Parameters

Construction area: 1.56 acres/yr (from "CY2012 Combustion" Worksheet)  
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

### 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, 19th Ed., R. S. Means, 2005.

| Means Line No. | Operation     | Description                              | Output | Units      | Acres per<br>equip-day) | equip-days<br>per acre | Acres/yr<br>(project-<br>specific) | Equip-days<br>per year |
|----------------|---------------|------------------------------------------|--------|------------|-------------------------|------------------------|------------------------------------|------------------------|
| 2230 200 0550  | Site Clearing | Dozer & rake, medium brush               | 8      | acre/day   | 8                       | 0.13                   | 1.56                               | 0.20                   |
| 2230 500 0300  | Stripping     | Topsoil & stockpiling, adverse soil      | 1,650  | cu. yd/day | 2.05                    | 0.49                   | 1.56                               | 0.76                   |
| 2315 432 5220  | Excavation    | Bulk, open site, common earth, 150' haul | 800    | cu. yd/day | 0.99                    | 1.01                   | 0.78                               | 0.79                   |
| 2315 120 5220  | Backfill      | Structural, common earth, 150' haul      | 1,950  | cu. yd/day | 2.42                    | 0.41                   | 0.78                               | 0.32                   |
| 2315 310 5020  | Compaction    | Vibrating roller, 6 " lifts, 3 passes    | 2,300  | cu. yd/day | 2.85                    | 0.35                   | 1.56                               | 0.55                   |
| TOTAL          |               |                                          |        |            |                         |                        |                                    | 2.62                   |

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

(Equip)(day)/yr: 2.62  
Qty Equipment: 3.00  
Grading days/yr: 0.87

# **Southern Delaware Intrastate Air Quality Control Region (SDIAQCR)**

|             |       |           | Area Source Emissions |        |        |       |       | Point Source Emissions |     |       |       |       |        |     |
|-------------|-------|-----------|-----------------------|--------|--------|-------|-------|------------------------|-----|-------|-------|-------|--------|-----|
| Row #       | State | County    | CO                    | NOx    | PM10   | PM2.5 | SO2   | VOC                    | CO  | NOx   | PM10  | PM2.5 | SO2    | VOC |
| 1           | DE    | Kent Co   | 50,300                | 7,415  | 5,428  | 1,703 | 1838  | 7,419                  | 229 | 1097  | 69.5  | 56.4  | 5286   | 163 |
| 2           | DE    | Sussex Co | 69,142                | 9586   | 7,911  | 2662  | 2257  | 9984                   | 510 | 7623  | 3644  | 2081  | 27361  | 814 |
| Grand Total |       |           | 119,442               | 17,001 | 13,339 | 4,365 | 4,095 | 17,403                 | 739 | 8,720 | 3,714 | 2,137 | 30,647 | 977 |

SOURCE:

<http://www.epa.gov/air/data/geosel.html>

USEPA - AirData NET Tier Report

\*Net Air pollution sources (area and point) in tons per year (2001)

Site visited on 27 April 2007

SDIAQCR : Kent County and Sussex County.

|                             |                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Summary</b>              | Summarizes total emissions by calendar year.                                                                                                     |
| <b>Combustion</b>           | Estimates emissions from non-road equipment exhaust as well as painting.                                                                         |
| <b>Fugitive</b>             | Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust                                                       |
| <b>Grading</b>              | Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions               |
| <b>AQCR<br/>Tier Report</b> | Summarizes total emissions for the Southern Delaware Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions. |



| Demolition Emissions from Proposed Action |                          |               |               |                          |                           |
|-------------------------------------------|--------------------------|---------------|---------------|--------------------------|---------------------------|
|                                           | NO <sub>x</sub><br>(ton) | VOC<br>(ton)  | CO<br>(ton)   | SO <sub>2</sub><br>(ton) | PM <sub>10</sub><br>(ton) |
| <b>CY2012</b>                             |                          |               |               |                          |                           |
| Construction Combustion                   | 0.0062                   | 0.0010        | 0.0082        | 0.0001                   | 0.0002                    |
| Construction Fugitive Dust                | 0.0000                   | 0.0000        | 0.0000        | 0.0000                   | 1.2259                    |
| <b>TOTAL CY2012</b>                       | <b>0.0062</b>            | <b>0.0010</b> | <b>0.0082</b> | <b>0.0001</b>            | <b>1.2261</b>             |

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

#### Southern Delaware Intrastate AQCR

| Year | Point and Area Sources Combined |              |             |                          |                           |
|------|---------------------------------|--------------|-------------|--------------------------|---------------------------|
|      | NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| 2001 | 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |

Source: USEPA-AirData NET Tier Report (<http://www.epa.gov/air/data/geosel.html>). Site visited on 27 April 2007.

#### Determination Significance (Significance Threshold = 10%) for Demolition Activities

|                   | Point and Area Sources Combined |              |             |                          |                           |
|-------------------|---------------------------------|--------------|-------------|--------------------------|---------------------------|
|                   | NO <sub>x</sub><br>(tpy)        | VOC<br>(tpy) | CO<br>(tpy) | SO <sub>2</sub><br>(tpy) | PM <sub>10</sub><br>(tpy) |
| Minimum - 2001    | 25,721                          | 18,380       | 120,181     | 34,742                   | 17,053                    |
| CY2012 Emissions  | 0.006                           | 0.001        | 0.008       | 0.000                    | 1.226                     |
| Proposed Action % | 0.00002%                        | 0.00001%     | 0.00001%    | 0.0000004%               | 0.0072%                   |

**Combustion Emissions for CY 2012**Combustion Emissions of VOC, NO<sub>x</sub>, SO<sub>2</sub>, CO and PM<sub>10</sub> Due to Construction

Includes:

|                                             |                        |        |       |
|---------------------------------------------|------------------------|--------|-------|
| 100% of Construct Chapel Center Parking Lot | 43,056 ft <sup>2</sup> | 0.99   | acres |
| Total Building Construction Area:           | 0 ft <sup>2</sup>      | (None) |       |
| Total Demolished Area:                      | 0 ft <sup>2</sup>      |        |       |
| Total Paved Area:                           | 43,056 ft <sup>2</sup> | (None) |       |
| Total Disturbed Area:                       | 43,056 ft <sup>2</sup> |        |       |
| Construction Duration:                      | 1.0 year(s)            |        |       |
| Annual Construction Activity:               | 230 days/yr            |        |       |

## Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

### Grading

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Bulldozer                      | 1                                                   | 29.40                       | 3.66                         | 25.09          | 0.59                         | 1.17                         |
| Motor Grader                   | 1                                                   | 10.22                       | 1.76                         | 14.98          | 0.20                         | 0.28                         |
| Water Truck                    | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 3                                                   | 60.51                       | 9.02                         | 70.69          | 1.21                         | 2.03                         |

### Paving

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Paver                          | 1                                                   | 7.93                        | 1.37                         | 11.62          | 0.16                         | 0.22                         |
| Roller                         | 1                                                   | 5.01                        | 0.86                         | 7.34           | 0.10                         | 0.14                         |
| Total per 10 acres of activity | 2                                                   | 12.94                       | 2.23                         | 18.96          | 0.26                         | 0.36                         |

### Demolition

| Equipment                      | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Loader                         | 1                                                   | 7.86                        | 1.35                         | 11.52          | 0.16                         | 0.22                         |
| Haul Truck                     | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.42                         | 0.58                         |
| Total per 10 acres of activity | 2                                                   | 28.75                       | 4.95                         | 42.14          | 0.58                         | 0.80                         |

### Building Construction

| Equipment <sup>d</sup>         | No. Req <sup>d</sup> . <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| <b>Stationary</b>              |                                                     |                             |                              |                |                              |                              |
| Generator Set                  | 1                                                   | 11.83                       | 1.47                         | 10.09          | 0.24                         | 0.47                         |
| Industrial Saw                 | 1                                                   | 17.02                       | 2.12                         | 14.52          | 0.34                         | 0.68                         |
| Welder                         | 1                                                   | 4.48                        | 0.56                         | 3.83           | 0.09                         | 0.18                         |
| <b>Mobile (non-road)</b>       |                                                     |                             |                              |                |                              |                              |
| Truck                          | 1                                                   | 20.89                       | 3.60                         | 30.62          | 0.84                         | 0.58                         |
| Forklift                       | 1                                                   | 4.57                        | 0.79                         | 6.70           | 0.18                         | 0.13                         |
| Crane                          | 1                                                   | 8.37                        | 1.44                         | 12.27          | 0.33                         | 0.23                         |
| Total per 10 acres of activity | 6                                                   | 67.16                       | 9.98                         | 78.03          | 2.02                         | 2.27                         |

Note: Footnotes for tables are on following page

### Architectural Coatings

| Equipment                      | No. Req'd. <sup>a</sup><br>per 10 acres | NO <sub>x</sub><br>(lb/day) | VOC <sup>b</sup><br>(lb/day) | CO<br>(lb/day) | SO <sub>2</sub> <sup>c</sup> | PM <sub>10</sub><br>(lb/day) |
|--------------------------------|-----------------------------------------|-----------------------------|------------------------------|----------------|------------------------------|------------------------------|
| Air Compressor                 | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |
| Total per 10 acres of activity | 1                                       | 6.83                        | 0.85                         | 5.82           | 0.14                         | 0.27                         |

- a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activity, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.
- b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.
- c) The SMAQMD 2004 reference does not provide SO<sub>2</sub> emission factors. For this worksheet, SO<sub>2</sub> emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO<sub>2</sub> factor was found to be approximately 0.04 times the NO<sub>x</sub> emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NO<sub>x</sub> emission factor for all other equipment (based on AP-42, Table 3.4-1)
- d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

### PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

| Source                                   | Equipment<br>Multiplier* | SMAQMD Emission Factors (lb/day) |       |       |                    |                  |
|------------------------------------------|--------------------------|----------------------------------|-------|-------|--------------------|------------------|
|                                          |                          | NO <sub>x</sub>                  | VOC   | CO    | SO <sub>2</sub> ** | PM <sub>10</sub> |
| Grading Equipment                        | 1                        | 5.981                            | 0.892 | 6.987 | 0.120              | 0.201            |
| Paving Equipment                         | 1                        | 1.279                            | 0.220 | 1.874 | 0.026              | 0.036            |
| Demolition Equipment                     | 1                        | 0.000                            | 0.000 | 0.000 | 0.000              | 0.000            |
| Building Construction                    | 1                        | 0.000                            | 0.000 | 0.000 | 0.000              | 0.000            |
| Air Compressor for Architectural Coating | 1                        | 0.000                            | 0.000 | 0.000 | 0.000              | 0.000            |
| Architectural Coating**                  |                          |                                  | 0.000 |       |                    |                  |

\*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

\*\*Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NO<sub>x</sub> = (Total Grading NO<sub>x</sub> per 10 ac\*((total disturbed area/43560)/10))\*(Equipment Multiplier)

#### Summary of Input Parameters

|                        | Total Area<br>(ft <sup>2</sup> ) | Total Area<br>(acres) | Total Days |                                                                |
|------------------------|----------------------------------|-----------------------|------------|----------------------------------------------------------------|
| Grading:               | 43,056                           | 0.99                  | 1          | (from "CY2012 Grading" worksheet)                              |
| Paving:                | 43,056                           | 0.99                  | 5          |                                                                |
| Demolition:            | 0                                | 0.00                  | 0          | (per SMAQMD "Air Quality of Thresholds of Significance", 1994) |
| Building Construction: | 0                                | 0.00                  | 0          |                                                                |
| Architectural Coating  | 0                                | 0.00                  | 0          |                                                                |

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition. The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

#### Total Project Emissions by Activity (lbs)

|                               | NO <sub>x</sub> | VOC         | CO           | SO <sub>2</sub> | PM <sub>10</sub> |
|-------------------------------|-----------------|-------------|--------------|-----------------|------------------|
| Grading Equipment             | 5.98            | 0.89        | 6.99         | 0.12            | 0.20             |
| Paving                        | 6.40            | 1.10        | 9.37         | 0.13            | 0.18             |
| Demolition                    | -               | -           | -            | -               | -                |
| Building Construction         | -               | -           | -            | -               | -                |
| Architectural Coatings        | -               | -           | -            | -               | -                |
| <b>Total Emissions (lbs):</b> | <b>12.38</b>    | <b>1.99</b> | <b>16.36</b> | <b>0.25</b>     | <b>0.38</b>      |

#### Results: Total Project Annual Emission Rates

|                                | NO <sub>x</sub> | VOC    | CO     | SO <sub>2</sub> | PM <sub>10</sub> |
|--------------------------------|-----------------|--------|--------|-----------------|------------------|
| Total Project Emissions (lbs)  | 12.38           | 1.99   | 16.36  | 0.25            | 0.38             |
| Total Project Emissions (tons) | 0.0062          | 0.0010 | 0.0082 | 0.0001          | 0.0002           |

## Fugitive Dust Emissions for CY 2012

Calculation of PM<sub>10</sub> Emissions Due to Site Preparation (Uncontrolled).

### User Input Parameters / Assumptions

|                                      |       |                                                                                              |                                                                                                                                                                             |
|--------------------------------------|-------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acres graded per year:               | 0.99  | acres/yr                                                                                     | (From "CY2012 Combustion" worksheet)                                                                                                                                        |
| Grading days/yr:                     | 0.55  | days/yr                                                                                      | (From "CY2012 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: 0.56 to 23, AP-42 Table 13.2.2-1)                                                                                                       |
| Soil percent moisture, M:            | 85    | %                                                                                            | ( <a href="http://www.cpc.noaa.gov/products/soilmst/w.shtml">http://www.cpc.noaa.gov/products/soilmst/w.shtml</a> )                                                         |
| 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:            | 27.75 | %                                                                                            | Ave. of wind speed at Wilmington, DE<br>( <a href="http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif">http://www.epa.gov/ttn/naaqs/ozone/areas/windr/13781.gif</a> ) |
| Fraction of TSP, J:                  | 0.5   | per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99 |                                                                                                                                                                             |
| Mean vehicle speed, S:               | 5     | mi/hr                                                                                        | (On-site)                                                                                                                                                                   |
| Dozer path width:                    | 8     | ft                                                                                           |                                                                                                                                                                             |
| Qty construction vehicles:           | 3.00  | vehicles                                                                                     | (From "CY2012 Grading worksheet")                                                                                                                                           |
| On-site VMT/vehicle/day:             | 5     | mi/veh/day                                                                                   | (Excluding bulldozer VMT during grading)                                                                                                                                    |
| PM <sub>10</sub> Adjustment Factor k | 1.5   | lb/VMT                                                                                       | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor a | 0.9   | (dimensionless)                                                                              | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| PM <sub>10</sub> Adjustment Factor b | 0.45  | (dimensionless)                                                                              | (AP-42 Table 13.2.2-2 12/03 for PM <sub>10</sub> for unpaved roads)                                                                                                         |
| Mean Vehicle Weight W                | 40    | tons                                                                                         | assumed for aggregate trucks                                                                                                                                                |

TSP - Total Suspended Particulate

VMT - Vehicle Miles Traveled

## Emissions Due to Soil Disturbance Activities

### Operation Parameters (Calculated from User Inputs)

|                            |              |                                              |
|----------------------------|--------------|----------------------------------------------|
| Grading duration per acre  | 4.5 hr/acre  |                                              |
| Bulldozer mileage per acre | 1 VMT/acre   | (Miles traveled by bulldozer during grading) |
| Construction VMT per day   | 15 VMT/day   |                                              |
| Construction VMT per acre  | 8.4 VMT/acre | (Travel on unpaved surfaces within site)     |

### Equations Used (Corrected for PM<sub>10</sub>)

| Operation                       | Empirical Equation                    | Units   | AP-42 Section (5th Edition) |
|---------------------------------|---------------------------------------|---------|-----------------------------|
| Bulldozing                      | $0.75(s^{1.5})/(M^{1.4})$             | lbs/hr  | Table 11.9-1, Overburden    |
| Grading                         | $(0.60)(0.051)s^{2.0}$                | lbs/VMT | Table 11.9-1,               |
| Vehicle Traffic (unpaved roads) | $[(k(s/12)^a (W/3)^b)] [(365-P)/365]$ | lbs/VMT | Section 13.2.2              |

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

### Calculation of PM<sub>10</sub> Emission Factors for Each Operation

| Operation                       | Emission Factor (mass/ unit) | Operation Parameter | Emission Factor (lbs/ acre) |
|---------------------------------|------------------------------|---------------------|-----------------------------|
| Bulldozing                      | 0.04 lbs/hr                  | 4.5 hr/acre         | 0.20 lbs/acre               |
| Grading                         | 0.77 lbs/VMT                 | 1 VMT/acre          | 0.80 lbs/acre               |
| Vehicle Traffic (unpaved roads) | 2.37 lbs/VMT                 | 8.4 VMT/acre        | 19.90 lbs/acre              |

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

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

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

Soil Piles EF = 9.3 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 = 0.93 lbs/day/acres graded

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

### Calculation of Annual PM<sub>10</sub> Emissions

| Source                    | Emission Factor    | Graded Acres/yr | Exposed days/yr | Emissions lbs/yr | Emissions tons/yr |
|---------------------------|--------------------|-----------------|-----------------|------------------|-------------------|
| Bulldozing                | 0.20 lbs/acre      | 0.99            | NA              | 0                | 0.000             |
| Grading                   | 0.80 lbs/acre      | 0.99            | NA              | 1                | 0.000             |
| Vehicle Traffic           | 19.90 lbs/acre     | 0.99            | NA              | 20               | 0.010             |
| Erosion of Soil Piles     | 0.93 lbs/acre/day  | 0.99            | 90              | 83               | 0.041             |
| Erosion of Graded Surface | 26.40 lbs/acre/day | 0.99            | 90              | 2,349            | 1.174             |
| TOTAL                     |                    |                 |                 | 2,452            | 1.23              |

Soil Disturbance EF: 20.90 lbs/acre

Wind Erosion EF: 27.33 lbs/acre/day

Back calculate to get EF: 4,493.22 lbs/acre/grading day



## Grading Schedule for CY 2012

Estimate of time required to grade a specified area.

### Input Parameters

Construction area: 0.99 acres/yr (from "CY2012 Combustion" Worksheet)  
Qty Equipment: 3.00 (calculated based on 3 pieces of equipment for every 10 acres)

### 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, 19th Ed., R. S. Means, 2005.

| Means Line No. | Operation     | Description                              | Output | Units      | Acres per<br>equip-day) | equip-days<br>per acre | Acres/yr<br>(project-<br>specific) | Equip-days<br>per year |
|----------------|---------------|------------------------------------------|--------|------------|-------------------------|------------------------|------------------------------------|------------------------|
| 2230 200 0550  | Site Clearing | Dozer & rake, medium brush               | 8      | acre/day   | 8                       | 0.13                   | 0.99                               | 0.12                   |
| 2230 500 0300  | Stripping     | Topsoil & stockpiling, adverse soil      | 1,650  | cu. yd/day | 2.05                    | 0.49                   | 0.99                               | 0.48                   |
| 2315 432 5220  | Excavation    | Bulk, open site, common earth, 150' haul | 800    | cu. yd/day | 0.99                    | 1.01                   | 0.49                               | 0.50                   |
| 2315 120 5220  | Backfill      | Structural, common earth, 150' haul      | 1,950  | cu. yd/day | 2.42                    | 0.41                   | 0.49                               | 0.20                   |
| 2315 310 5020  | Compaction    | Vibrating roller, 6 " lifts, 3 passes    | 2,300  | cu. yd/day | 2.85                    | 0.35                   | 0.99                               | 0.35                   |
| TOTAL          |               |                                          |        |            |                         |                        |                                    | 1.66                   |

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

(Equip)(day)/yr: 1.66  
Qty Equipment: 3.00  
Grading days/yr: 0.55

# **Southern Delaware Intrastate Air Quality Control Region (SDIAQCR)**

|             |       |           | Area Source Emissions |        |        |       |       | Point Source Emissions |     |       |       |       |        |     |
|-------------|-------|-----------|-----------------------|--------|--------|-------|-------|------------------------|-----|-------|-------|-------|--------|-----|
| Row #       | State | County    | CO                    | NOx    | PM10   | PM2.5 | SO2   | VOC                    | CO  | NOx   | PM10  | PM2.5 | SO2    | VOC |
| 1           | DE    | Kent Co   | 50,300                | 7,415  | 5,428  | 1,703 | 1838  | 7,419                  | 229 | 1097  | 69.5  | 56.4  | 5286   | 163 |
| 2           | DE    | Sussex Co | 69,142                | 9586   | 7,911  | 2662  | 2257  | 9984                   | 510 | 7623  | 3644  | 2081  | 27361  | 814 |
| Grand Total |       |           | 119,442               | 17,001 | 13,339 | 4,365 | 4,095 | 17,403                 | 739 | 8,720 | 3,714 | 2,137 | 30,647 | 977 |

SOURCE:

<http://www.epa.gov/air/data/geosel.html>

USEPA - AirData NET Tier Report

\*Net Air pollution sources (area and point) in tons per year (2001)

Site visited on 27 April 2007

SDIAQCR : Kent County and Sussex County.

***THIS PAGE INTENTIONALLY LEFT BLANK***