IV. Affected Environment

The environmental resources likely to be affected by the Proposed Action and past, present, and reasonably foreseeable future actions are described in this section. Past, present, and reasonably foreseeable future actions are identified in Section 5.18, wherein the cumulative impacts of these actions and the Proposed Action are discussed.

4.1 Description and Identification of the Study Area

The general study area includes the immediate environs of the Airport. Resource-specific study areas vary depending on the resource category being considered.

The LOPD for resource categories that would be directly affected by implementing the Proposed Action is illustrated on Exhibit IV-1. Other resource categories within the immediate environs of the Airport may also be affected, not involving physical disturbance, within the area potentially affected by aircraft noise or within the Metropolitan Washington region (the area potentially affected by air pollutant emissions, which includes Washington, D.C., and the surrounding areas of Maryland and Virginia). Exhibit IV-2 illustrates the Airport environs for reference in this section. The specific areas that would be affected are discussed by resource category below.

4.2 Resources Not Present in the Study Area

Resources that are not present and that would, therefore, not be affected by implementation of the Proposed Action include:

- **Farmlands:** Land within the LOPD is considered Airport developed area, within the airside of the Airport. This land does not support agricultural uses nor is it undeveloped. Offshore areas within the LOPD would not be considered important farmland. Therefore, no prime, unique, or state significant farmlands are present within the LOPD.

- **Wild and Scenic Rivers:** The three rivers in the vicinity of the Airport—the Potomac River, Four Mile Run, and the Anacostia River—are not designated under the National Wild and Scenic River System as having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values. Furthermore, the segments of these rivers located in the Airport vicinity are not listed in the National Rivers Inventory as having “outstandingly remarkable” natural or cultural values judged to be of more than local or regional significance.

4.3 Human Environment

The existing human environmental conditions and activities that may be affected by the Proposed Action are discussed in this section.

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Final Environmental Assessment
Runway 4-22 and Runway 15-33 RSA Enhancements
Affected Environment

March 2012

Ronald Reagan Washington National Airport

Exhibit IV-1

Limits of Physical Disturbance


LEGEND
- Limits of Physical Disturbance
- Airfield Pavement to be Demolished
- Future Runway Pavement
- Future Taxiway Pavement
- Potomac River Infill
- Relocated Service Road
- Future EMAS Bed

0 1,200 ft. north
Final Environmental Assessment
Runway 4-22 and Runway 15-33 RSA Enhancements
Affected Environment
4.3.1 Local Jurisdictions

The Airport occupies approximately 733 acres on land and 127 acres of water situated along the western shore of the Potomac River in the Commonwealth of Virginia. The Airport is located in Arlington County, Virginia, immediately north of the City of Alexandria, and across the Potomac River from Washington, D.C.

Several properties administered by the NPS are located within a one-mile radius of the Airport, as identified in Section 4.3.4. Additionally, the waters of the Potomac River up to the mean high-water line are under the jurisdiction of the District of Columbia as the west bank of the river serves as the District’s border with Virginia. No local agency in the District manages public lands; however, the NPS provides management assistance for land in the public domain. Therefore, the Potomac River bottom is managed by the NPS.

4.3.2 Existing Land Use

The generalized existing land use pattern in the Airport environs is depicted on Exhibit IV-3. The existing land use plan drawing was developed using geographic information system (GIS) data obtained from the following government agencies and their web sites: City of Alexandria Department of Planning and Zoning, Arlington County Department of Environmental Services, the District of Columbia Office of Planning, and the Maryland Department of Planning. Land parcels on the generalized land use map are coded by general land use category, such as residential, commercial, institutional/government, and the like. The locations of individual facilities, such as schools and day care sites that are relevant to evaluating children’s health and safety risks, are also identified.

Land use in the Airport environs is a mix of commercial, industrial, governmental, parks and recreation, and residential. The Pentagon and Arlington National Cemetery are located northwest of the Airport. Areas directly north of the Airport consist of parks/recreation and open space land uses, and lands associated with the George Washington Memorial Parkway on the west bank of the Potomac River and the nation’s Monumental Core on the east bank of the river. Land on the east bank of the Potomac River in Washington, D.C., supports several institutional and government facilities, such as the Anacostia Naval Station, Bolling Air Force Base, and the Naval Research Laboratory. Arlington County and the City of Alexandria are located west and south, respectively, of the Airport and are dominated by residential land uses interspersed with mixed uses and parks/recreation uses. The mixed-use corridor directly west of the Airport is Crystal City, and the parks/recreation uses west and south of the Airport are on lands that are part of the George Washington Memorial Parkway, including the Mount Vernon Trail and Daingerfield Island.

The City of Alexandria’s Master Plan, updated on an ongoing, as-needed basis, consists of 15 Small Area Plans (SAPs) and element chapters on topics applicable citywide. Landbays D through M, shown in Exhibit IV-4, plus the neighborhoods on Exhibit IV-4 labeled “Potomac Greens” and “Old Town Greens” to the east of the highlighted landbays, comprised the area covered under the Potomac Yard/Potomac Greens SAP in the City’s 1992 Master Plan (updated in 2008). This area was zoned as Coordinated Development District (CDD) No. 10.3 The paragraphs below summarize recent changes to the City’s Master Plan and Zoning Ordinance pertaining to the Potomac Yard landbays.

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3 CDDs are established for areas of a significant size or located such that the area can have significant development related impacts on the city and are established to promote development consistent with the master plan. CDD zoning is intended for a mixture of office, residential, retail, hotel, other uses, and appropriate open space and recreational amenities.
The City of Alexandria, Virginia, has begun the process of developing and evaluating alternatives for the redevelopment of the existing 70 acre retail center (Landbay F) which is occupied by Target, Best Buy, Barnes & Noble, Regal Cinemas and others, and the 17 acre Landbay L at Potomac Yard. Potomac Yard comprises a total of 295 acres at the Gateway to Alexandria and is bound by Route 1, The George Washington Memorial Parkway/railroad tracks, and Four Mile Run. Existing Alexandria residential neighborhoods surround the Potomac Yard properties. Potomac Yard is divided up into a series of phases (or landbays).

A More Urban Mixed-Use Development is Being Explored

The 70 acre retail center at Landbay F represents one of largest blocks of land left in Alexandria to be planned. The City envisions an urban, mixed-use environment that is pedestrian and transit oriented. Landbay L at the southern end of Potomac Yard is also included in this planning effort. Currently zoned for residential and street retail, this parcel may offer additional opportunities for community desired amenities and open space.

Public Input Will Be Used to Shape the Plan, Led by the Potomac Yard Planning Advisory Group (PYPAG)

The PYPAG consists of 20 area community and business members representing a diverse range of interests. This group was selected from community nominations and began meeting in October 2008 to provide direct input to the City on community and business needs, concerns, and ideas. Through public meetings, subcommittees, communication with other groups and individuals, and a series of public workshops, the PYPAG and City will ensure that broad public participation is obtained at each stage of the planning process.

Sources:
• **Landbay F:** Through mid-2010, this area was zoned for a maximum height of 77 feet above ground level (AGL). With the rezoning to CDD No. 19 (June 12, 2010) and adoption of the *North Potomac Yards SAP* (May 15, 2010), maximum building heights were increased (at the block-level) up to a maximum of 250 feet AGL in the center of the landbay.

• **Landbay H:** The maximum height in the western portion of this landbay was increased from 65 feet AGL to 82 feet AGL in 2008 and again from 82 feet AGL to 100 feet AGL in November 2010 under the City Council’s November 10, 2010 approval of Potomac Yard CDD No. 10 height limits map.

• **Landbay I:** The maximum height in the northwestern portion of this landbay was increased from 65 feet AGL to 82 feet AGL in 2008. An increase in maximum building heights within Landbay I was noted in the November 13, 2010 City Council meeting notes, but because it is difficult to correlate the landbay delineations in this Landbay with the graphic cited in the City Council meeting notes, this EA does not clearly define where the maximum building height increases occurred within this Landbay.

• **Landbay J:** An increase in maximum buildings heights within Landbay J was noted in the November 13, 2010 City Council meeting notes, but because it is difficult to correlate the landbay delineations in this Landbay with the graphic cited in the City Council meeting notes, this EA does not clearly define where the maximum building height increases occurred within this Landbay.

In Chapter 4 of the *North Potomac Yard SAP*, Figure 16⁴ illustrates the FAA height restrictions and Section F of the SAP chapter notes that the

> . . . FAA flight path limits the building heights to approximately 100 feet (Figure 16). Despite the limitation, the majority of the density in North Potomac Yard is located within ¼ mile of the planned Metrorail station. A recommendation of the Plan is that the City work with the FAA to explore the possibility of eliminating or revising the flight path height restrictions to permit additional height and density near the proposed Metrorail station.⁵

The *North Potomac Yard SAP* includes a comment in the “Staff Recommendations” section, which was subsequently approved by City Council in June 2010 that:

> The Applicant shall obtain approval(s) from the Federal Aviation Administration (FAA) and all other applicable Federal and/or State agencies for all block(s), building(s), or portions thereof subject to the applicable FAA height restrictions prior to the release of the final site plan... If the FAA and all other applicable Federal and/or State agencies

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⁴ Figure 16 is included in Appendix J, Attachment J-6. The Figure is depicted on a page of the North Potomac Yard Small Area Plan that was attached to a Memorandum dated February 16, 2011 from Lisa Reznar to Charley Baummer.

⁵ The Authority reserves the right to object to eliminating or revising the flight path height restrictions over Potomac Yard. The Authority’s objection(s) could be based on one or more of the following concerns: a) the potential interference with navigation aids (nav aids); b) potential obstructions under the standards of the Code of Federal Regulations (CFR), Title 14 Aeronautics and Space, Part 77 Objects Affecting Navigable Airspace as applied to the Airport; c) potential impacts to Terminal Instrument Procedures (TERPS procedures) at the Airport; d) concern about creating potential noise issues associated with the occupants/users of the proposed buildings; and, e) other concerns.
require revisions and/or modifications, the modifications may require subsequent approval by the City Council, if the Director of P&Z determines that the amendments are substantively different than what was approved by City Council. 6

The City of Alexandria’s Zoning Ordinance includes two references to maximum building heights in the Potomac Yard cover the North Potomac Yard (Landbay F) and other areas of Potomac Yard (Potomac Yards/Greens):

- North Potomac Yard (Landbay F) – Heights shall be as shown in the North Potomac Yard Design Standards, dated May 24, 2010
- Potomac Yard/Greens (Potomac Yard Landbays other than Landbay F) – Heights shall be as shown on the map entitled “Predominate Height Limits of CDD” (Map No. 24 Potomac Yard/Potomac Greens Small Area Plan, as approved by City Council on November 13, 2010).

A more detailed overview of the City of Alexandria’s land use planning and zoning is included in Appendix J, Attachment J-6. 7

### 4.3.3 Demographics and Socioeconomic Profile

Demographic and socioeconomic data for Arlington County and the City of Alexandria in Virginia, Prince George’s County in Maryland, and Washington, D.C., are presented in Table IV-1.

#### Table IV-1

Demographic and Socioeconomic Data by Jurisdiction

<table>
<thead>
<tr>
<th></th>
<th>Arlington County</th>
<th>City of Alexandria</th>
<th>Prince George’s County</th>
<th>District of Columbia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Residents</td>
<td>209,970</td>
<td>136,970</td>
<td>820,850</td>
<td>591,830</td>
</tr>
<tr>
<td>Percent Change vs. 2000</td>
<td>+10.8%</td>
<td>+6.8%</td>
<td>+2.4%</td>
<td>+3.5%</td>
</tr>
<tr>
<td>Percent by Ethnicity Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>80.3%</td>
<td>71.0%</td>
<td>28.1%</td>
<td>40.1%</td>
</tr>
<tr>
<td>African-American</td>
<td>8.1%</td>
<td>21.7%</td>
<td>65.6%</td>
<td>54.4%</td>
</tr>
<tr>
<td>Asian/Pacific Islander/Native Hawaiian</td>
<td>9.1%</td>
<td>5.4%</td>
<td>4.0%</td>
<td>3.4%</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>0.5%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Reporting Two or More Races</td>
<td>1.9%</td>
<td>1.5%</td>
<td>1.8%</td>
<td>1.4%</td>
</tr>
<tr>
<td><strong>Socioeconomic Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Household Income, 2004</td>
<td>$97,871</td>
<td>$60,715</td>
<td>$71,696</td>
<td>$58,553</td>
</tr>
<tr>
<td>Persons Below Poverty Level, 2004</td>
<td>6.7%</td>
<td>8.3%</td>
<td>6.7%</td>
<td>16.9%</td>
</tr>
</tbody>
</table>

Notes:
- a/ The U.S. Department of Commerce, Bureau of the Census periodically updates demographic and socioeconomic characteristics for states and counties. The data for Arlington County, Prince George’s County, and the District of Columbia are for 2008; data for the City of Alexandria are for 2006.
- b/ Columns may not add to 100 percent because of rounding.


6 Docket Item #12A-F, Rezoning #2009-0001, page 50.
The existing aircraft noise conditions are discussed in Section 4.3.6. For the purposes of this EA, the area within the DNL\textsuperscript{8} 65 contour for existing conditions as depicted on Exhibit IV-6 was used as the study area for impacts on populations including, but not limited to:

- Minority and low-income populations as defined by Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Department of Transportation Order 5610.2, Environmental Justice in Minority and Low-Income Populations; and,
- Children as defined by Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.

As reported in Table IV-5, no populations, dwelling units, religious facilities, convalescent homes, libraries, day care centers, schools or hospitals are located in the area within the DNL 65 contour. Therefore, there are no minority, low-income or children populations in the study area.

4.3.4 U.S. DOT Act of 1966, Section 4(f) and Land and Water Conservation Fund Act, Section 6(f) Resources

4.3.4.1 Regulatory Background

Section 4(f) of the DOT Act of 1966\textsuperscript{9} is the applicable law regarding the protection of public land resources. This law prohibits the use of publicly owned parks or recreation areas, wildlife or waterfowl refuges, or significant historic sites for transportation purposes unless there is no feasible and prudent alternative to the use of such land and the action includes all possible planning to minimize harm resulting from such use. Furthermore, any parks or other sites that have been the subject of Land and Water Conservation Fund (LWCF) grants are designated as Section 6(f) resources. The purpose of the LWCF Act\textsuperscript{10} is to protect federal investments in Section 6(f) resources.

4.3.4.2 Methodology

To determine the existence and extent of public lands within and adjacent to the LOPD, readily available maps were collected and reviewed and a field reconnaissance was conducted (see Appendix A for a list of the preparers of this EA). The information gathered was evaluated for applicability to Section 4(f) of the DOT Act and for relevance to the Proposed Action and associated LOPD. The evaluation of impacts on historic and archeological sites protected under Section 4(f) of the U.S. DOT Act of 1966 is discussed in Section 4.3.5.

4.3.4.3 Affected Environment

The locations of the Section 4(f) resources that border the Airport are identified on Exhibit IV-3. There are no Section 6(f) resources in the immediate vicinity of the Airport.\textsuperscript{11}

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\textsuperscript{8} Day-night average sound level, expressed in A-weighted decibels. More detailed information is provided in Section E.2.1.

\textsuperscript{9} Section 4(f) of the DOT Act of 1966 (49 USC 303(c)).

\textsuperscript{10} Section 6(f)(3) of the Land and Water Conservation Fund Act (36 CFR 59.1-59.4).

The Airport is bordered to the north and west by publicly owned parks; recreation areas; wildlife or waterfowl refuges; and portions of historic sites of national, state, or local significance. The locations of these public lands are illustrated on Exhibit IV-3.

The NPS owns, maintains, and operates the GWMP, which consists of a north-south roadway and landscaped right-of-way immediately west of the Airport that links a series of historic sites and parks that preserve the natural scenery along the Potomac River from Mount Vernon to the Great Falls of the Potomac. In the immediate vicinity of the Airport, the GWMP includes Gravelly Point, Roaches Run Waterfowl Sanctuary, and Lady Bird Johnson Park to the north; Mount Vernon Trail (along the GWMP) to the west, forming the western boundary of the Airport; and Daingerfield Island, including the Washington Sailing Marina, to the south. These components of the GWMP are discussed below.

- Gravelly Point is a park located north of the Airport and Roaches Run. The park provides a view of the Potomac River and the District of Columbia skyline, and serves as an observation area for aircraft landing at and taking off from the Airport. The parking area is used by bicyclists and pedestrians accessing the Mount Vernon Trail. The park also contains a public boat launch.

- Roaches Run Waterfowl Sanctuary is a tidal wetland off the Potomac River. Popular activities include bass fishing and bird watching.

- Lady Bird Johnson Park is located on Columbia Island about 0.75 miles northwest of the Airport. The park includes the Lyndon Baines Johnson Memorial Grove (a setting to enjoy views of the Potomac River and Washington, D.C.), the Navy-Merchant Marine Memorial, and the Columbia Island Marina.

- The Mount Vernon Trail is an 18.5-mile trail for pedestrians and bicyclists. The trail is adjacent to and follows the western boundary of the Airport, connecting Mount Vernon, the home of George Washington, located south of the Airport, with Theodore Roosevelt Island, located north of the Airport. At its northern extent, the trail connects to the Arlington County trail system.

- Daingerfield Island is a peninsula located south of the Airport on the west bank of the Potomac River. Public facilities include the Washington Sailing Marina and an NPS concession that rents boats and bicycles.

The NPS also owns, maintains, and operates East Potomac Park, located on the east shore of the Potomac River, across from and northeast of the Airport. The park is part of the National Mall and Memorial Parks. East Potomac Park includes a golf course, aquatics center, and tennis center facilities, and includes paths and roads used by bicyclists, walkers, runners, and skaters.

The NPS and the Arlington County Department of Parks, Recreation and Cultural Resources are cooperating on an Arlington County proposal to improve public facilities on NPS property near the Airport, as follows:

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- **Gravelly Point** – Expand the parking lot; install gated access; and construct permanent restrooms, a larger picnic area, wayside exhibits, and playing fields.

- **Roaches Run Waterfowl Sanctuary** – Preserve natural resources and provide visitors the opportunity to observe and learn about the sanctuary’s natural resources through wayside exhibits and ranger-led talks. Appropriate types of facilities include viewing platforms, benches, trails, waysides, observation areas, and brochure holders.

- **Long Bridge Park** – Transform what was once a light industrial area into an environmentally sound park, showcasing attractive public green spaces, quality outdoor recreation facilities, and environmentally sensitive structures; the new amenities (construction began in March 2010 and is scheduled to be complete in 2011) will include an aquatics center, health and fitness center, and open space/athletic fields with views of Washington, D.C. and transportation mode operations (airplanes and trains).\(^\text{15}\)

- **Mount Vernon Trail** – Construct facilities such as benches, waysides, and signs.\(^\text{16}\)

Arlington County’s 2010-11 capital improvement program includes funding for the construction of Long Bridge Park, whereas other planned park improvements are still in conceptual planning stages. There are no national forests, wilderness areas, or wild and scenic rivers on or adjacent to Airport property.

There are no Section 6(f) resources in the immediate vicinity of the Airport.\(^\text{17}\)

### 4.3.5 Historic, Archaeological, Architectural, and Cultural Resources

Cultural resources dating to the early colonial period and historic transportation resources associated with development of the nation’s capital are located within and adjacent to Airport property.

#### 4.3.5.1 Regulatory Background

Applicable laws include:

- National Historic Preservation Act of 1966, Sections 106 and 110
- Archaeological and Historic Preservation Act of 1974, as amended
- Archaeological Resources Protection Act of 1979, as amended
- Native American Graves Protection and Repatriation Act (1990)\(^\text{18}\)

Historic properties eligible for, or listed on, the National Register of Historic Places are protected by Section 106 of the National Historic Preservation Act (NHPA).\(^\text{19}\) Under the NHPA, the FAA is required to consult with the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and other interested parties on the potential effects that any FAA-sponsored undertaking would have on historic properties listed or eligible for listing on the NRHP. The

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Authority consultation procedures regarding the NHPA are outlined in a 1987 *Programmatic Memorandum of Agreement* among the U.S. DOT, the Virginia State Historic Preservation Officer, and the Advisory Council on Historic Preservation. The Archaeological and Historic Preservation Act and the Archaeological Resources Protection Act protect both known and as yet unidentified archaeological resources located on publicly owned land or resources that could be affected by federally funded actions. The Native American Graves Protection and Repatriation Act protects Native American human remains and cultural artifacts.

### 4.3.5.2 Methodology

To determine the existence of historic, archaeological, architectural, and cultural resources within or near the LOPD, available documentation was reviewed and the appropriate local and national historic preservation agencies were contacted. Consideration was also given to historic resources elsewhere on and adjacent to Airport property, such as the GWMP, for potential viewshed-related concerns. Information was obtained from the following sources:

- Virginia Department of Historic Resources (2010 archive research for terrestrial resources within Airport property)
- City of Alexandria archives (for terrestrial resources within Virginia, near Daingerfield Island, where aircraft noise could affect resources, but outside of the LOPD)
- District of Columbia’s Historic Preservation Office (for underwater archaeological sites)
- NPS site files (for underwater archaeological sites)
- Metropolitan Washington Airports Authority documents

### 4.3.5.3 Affected Environment

Identified resources in the study area are shown on Exhibit IV-5. The Airport contains a complex of buildings, six of which are considered historic and are either individually listed on the NRHP or are considered NRHP-eligible. The Airport terminal and the South Hangar Line (VDHR File Number 000-0045) are both listed on the NRHP. These structures are significant “as milestones in aviation technology and as symbols of the broad pattern of New Deal government initiatives,” and were considered by the Civil Aeronautics Administration (the predecessor of the FAA) to be the model for how airports should be designed.

Historic structures that have been determined eligible for but are not listed on the NRHP include the Jet Engine Test Cell (presently the Ogden-Allied Equipment Storage and Maintenance Building) and the DOT Abingdon Research Station (presently the Authority Engineering Complex). All listed and eligible structures are located within the terminal complex area.

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Sources: US Department of Agriculture, 2005 (Aerial photo); File, 2006, Virginia Department of Historic Resources Archive (archaeological and architectural resources).

Exhibit IV-5

Archaeological and Architectural Resources

Legend
- Archaeological Site
- Architectural Resource
- Limits of Physical Disturbance

Not to Scale  north

Sources: US Department of Agriculture, 2005 (Aerial photo); File, 2006, Virginia Department of Historic Resources Archive (archaeological and architectural resources).
Ronald Reagan Washington National Airport

The Airport shares a boundary with the GWMP, which is a listed resource on the NRHP (also known as the Mount Vernon Memorial Highway, VDHR File Number 029-0218). The GWMP is significant as the first parkway constructed and maintained by the U.S. government and as the first such road with a commemorative function explicit in its name and alignment. The GWMP is generally separated from the airfield by the terminal complex; however, at the northwest and southwest edges of the airfield, the GWMP right-of-way abuts the airfield.

One archaeological site, a portion of the Abingdon Plantation (VDHR File No. 44AR0018), has been identified on Airport property. Another portion of the Abingdon Plantation is identified as an architectural site (VDHR File No. 000-0041). The site is located within the terminal complex and is eligible for listing in the NRHP. Some portions of the site have been excavated and others, including the plantation house foundation, have been preserved.

Most of the Airport is located on fill, including the entire airfield, and, therefore, has low potential to contain additional intact archaeological resources. There is, however, the potential for archaeological sites to be located in portions of the Airport that were not filled or otherwise disturbed by previous Airport construction. Natural landforms that existed before the Airport was constructed are confined to western areas of the Airport property. Some are under varying depths of fill and can contain intact archaeological remains. Of the natural landform, or original shoreline, only limited portions have not been disturbed for construction of Airport facilities (terminals, hangars, transportation facilities, etc.). These limited areas are generally located in the area of the terminal complex west of the airfield. Another intact area near the Runway 4 end at the former Jet Engine Test Cell is just outside of the LOPD. The original shoreline is more than 1,500 feet west of the threshold of Runway 33. A portion of the Runway 15 end lies on land atop the original shoreline of the Potomac River, but disturbance and lesser amounts of fill are certain in the area of the Runway 15 end. In general terms, the LOPD would occur in areas with a low potential to contain intact archaeological remains and information, and the LOPD would be entirely limited to areas with prior disturbance and/or fill.

No underwater archaeological sites were identified during the archival search. The dredging operation associated with construction of the airfield was a massive, year-long project that included some of the world’s largest dredges, clearing 11 feet of sediment from the future airfield and then removing an additional 11 million cubic yards of bottom sediments from the surrounding Potomac River bottom to raise the runways 20 feet above the river. This operation would likely have destroyed any sites that once existed in these borrow areas on the river bottom.

### 4.3.6 Aircraft Noise

An overview of aircraft noise analysis requirements and existing aircraft noise exposure in the Airport environs is provided in this section. Appendix E, “Aircraft Noise Analysis,” provides detailed information related to aircraft operations and associated runway use and routing assumptions. Appendix E also provides a brief overview of the basics of sound and metric definitions, including use of the DNL 65 noise exposure contour to evaluate aircraft noise exposure.

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The DNL 65 noise exposure contour was used to establish the relevant study area for evaluating potential aircraft noise impacts in the Airport environs.

4.3.6.1 Regulatory Background

The applicable laws and regulations related to aircraft noise exposure include:

- Aviation Safety and Noise Abatement Act of 1979, as amended (49 USC 47501-47507)
- Federal Aviation Act of 1958 (49 USC 40101 et seq., as amended by PL 103-305), August 23, 1994
- Control and Abatement of Aircraft Noise and Sonic Boom Act of 1968
- Airport and Airway Improvement Act of 1982 (49 USC 47101 et seq., as amended by PL 103-305), August 23, 1994
- Airport Noise and Capacity Act of 1990 (49 USC 2101 et seq.)
- Noise Control Act of 1972 (49 USC 44715)
- FAA Advisory Circular 150/5020-1, Noise Control and Compatibility Planning for Airports, August 5, 1983

4.3.6.2 Methodology

The Integrated Noise Model (INM) is an FAA computer model used to develop aircraft noise exposure maps. Version 7.0b of the INM was used for the noise analysis. A discussion of the INM and specifics of the noise analysis process are provided in Appendix E. The most critical data required to develop noise exposure maps using FAA INM Version 7.0b are:

- Existing number of aircraft operations by time of day, aircraft type, and stage length (nonstop departure distance from the Airport).
- Operational information, including runway use, flight track (the path that pilots fly to arrive at and depart from the Airport) locations and use, departure profiles, existing noise abatement procedures, and other similar data.

In accordance with current FAA guidelines, aircraft noise exposure was analyzed for 2009 (i.e., existing conditions). Estimates of total noise exposure resulting from aircraft operations, as expressed in DNL, were used to determine probable effects on land uses. Three ranges of aircraft noise exposure were used: (a) DNL 65 to 70, (b) DNL 70 to 75, and (c) DNL 75 and higher. The guidelines for evaluating land use compatibility in aircraft noise exposure areas were developed by the FAA and are shown in Table IV-2. The guidelines reflect the statistical variability of the responses of large groups of people to noise. Therefore, any particular noise level might not accurately reflect an individual’s perception of or reaction to an actual noise environment. Compatible or incompatible land use is determined by comparing the predicted or measured DNL at a site and the type of land use with the information provided in the table.

The population and numbers of dwelling units, and other noise-sensitive facilities—including religious facilities, convalescent homes, libraries, day care centers, schools, parks, and hospitals—exposed to the various ranges of aircraft noise were estimated for existing conditions. Because the population and dwelling units within the noise exposure areas are not uniformly distributed, the population per dwelling unit is not expected to be constant in each noise exposure range.
Table IV-2  
Suggested Land Use Compatibility Guidelines in Aircraft Noise Exposure Areas

<table>
<thead>
<tr>
<th>Land use</th>
<th>DNL 65 to 70</th>
<th>DNL 70 to 75</th>
<th>DNL 75+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Residential other than mobile homes and transient lodgings</td>
<td>Incompatible</td>
<td>Incompatible</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Mobile homes</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Transient lodgings</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Public use</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Schools, hospitals, and nursing homes</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Churches, auditoriums, and concert halls</td>
<td>NLR required (a)</td>
<td>NLR required (a)</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Governmental services</td>
<td>Compatible</td>
<td>NLR required</td>
<td>NLR required</td>
</tr>
<tr>
<td>Transportation</td>
<td>Compatible</td>
<td>Compatible (b)</td>
<td>Compatible (b)</td>
</tr>
<tr>
<td>Parking</td>
<td>Compatible</td>
<td>Compatible (b)</td>
<td>Compatible (b)</td>
</tr>
<tr>
<td>Commercial use</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Offices – business and professional</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Wholesale and retail – building materials, hardware, and farm equipment</td>
<td>Compatible</td>
<td>Compatible (b)</td>
<td>Compatible (b)</td>
</tr>
<tr>
<td>Retail trade – general</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required</td>
</tr>
<tr>
<td>Utilities</td>
<td>Compatible</td>
<td>Compatible (b)</td>
<td>Compatible (b)</td>
</tr>
<tr>
<td>Communication</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required</td>
</tr>
<tr>
<td>Manufacturing and production</td>
<td>Compatible</td>
<td>Compatible (b)</td>
<td>Compatible (b)</td>
</tr>
<tr>
<td>Manufacturing – general</td>
<td>Compatible</td>
<td>NLR required</td>
<td>NLR required</td>
</tr>
<tr>
<td>Photographic and optical</td>
<td>Compatible</td>
<td>NLR required</td>
<td>NLR required</td>
</tr>
<tr>
<td>Agriculture (except livestock) and forestry</td>
<td>Compatible</td>
<td>Compatible</td>
<td>Compatible</td>
</tr>
<tr>
<td>Livestock farming and breeding</td>
<td>Compatible</td>
<td>Compatible</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Mining and fishing resources production and extraction</td>
<td>Compatible</td>
<td>Compatible</td>
<td>Compatible</td>
</tr>
<tr>
<td>Recreational</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Outdoor sports arenas and spectator sports</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Outdoor music shells, amphitheaters</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Nature exhibits and zoos</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Amusements, parks, resorts, and camps</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
<tr>
<td>Golf courses, riding stables, and water recreation</td>
<td>NLR required</td>
<td>NLR required</td>
<td>NLR required (b)</td>
</tr>
</tbody>
</table>

Notes:

DNL = Day-night average sound level, in A-weighted decibels.

Compatible = Generally, no special noise-attenuating materials are required to achieve an interior noise level of DNL 45 in habitable spaces, or the activity (whether indoors or outdoors) would not be subject to a significant adverse effect by the outdoor noise level.

Incompatible = Generally, the land use, whether in a structure or an outdoor activity, is considered to be incompatible with the outdoor noise level even if special attenuating materials were to be used in the construction of the building.

NLR = Noise Level Reduction. NLR is used to denote the total amount of noise transmission loss in decibels required to reduce an exterior noise level in habitable interior spaces to DNL 45. In most places, typical building construction automatically provides an NLR of 20 decibels. Therefore, if a structure is located in an area exposed to aircraft noise of DNL 65, the interior noise level would be about DNL 45. If the structure is located in an area exposed to aircraft noise of DNL 70, the interior noise level would be about DNL 50, so an additional NLR of 5 decibels would be required if not afforded by the normal construction. This NLR can be achieved through the use of noise-attenuating materials in the construction of the structure.

(a) The land use is generally incompatible with aircraft noise and should only be permitted in areas of infill in existing neighborhoods or where the community determines that the use must be allowed.

(b) NLR required in offices or other areas with noise-sensitive activities.

(c) Provided that special sound reinforcement systems are installed.


Each generalized land use listed in Table IV-2 includes a wide range of human activities resulting in various sensitivities to noise intrusions. DNLs in the table should be interpreted only as indications of potential aircraft noise effects on people living and working in areas surrounding an airport. Although specific DNLs are obtained from a noise analysis, they do not dictate specific reactions that individuals exposed to those noise levels may have, nor do they require specific mitigation. The information is intended only as a guide for land use development.

Designations used in this table do not constitute a federal determination that any use of land is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise exposure rests with local authorities.

4.3.6.3 Affected Environment

As discussed in Appendix E, approximately 274,160 aircraft operations were accommodated at the Airport in 2009, or approximately 751 average daily aircraft operations (arrivals and departures). The types of aircraft (the fleet mix) and the average daily number of operations by time of day at the Airport in 2009 are presented in Appendix E, Table E-6. Operational information regarding flight track use, operational profiles, and runway use and flight track exhibits are also included in Appendix E. Noise exposure contours associated with aircraft operations on an average day in 2009 are shown on Exhibit IV-6.

In 2009, just over 1,400 acres of land and water on Airport property in the Airport environs were exposed to aircraft noise of DNL 65 and higher, as shown in Table IV-3.

Table IV-3

<table>
<thead>
<tr>
<th>DNL</th>
<th>Area (acreage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-70</td>
<td>895.92</td>
</tr>
<tr>
<td>70-75</td>
<td>287.38</td>
</tr>
<tr>
<td>75+</td>
<td>222.83</td>
</tr>
<tr>
<td>Total 65 and higher</td>
<td>1,406.13</td>
</tr>
</tbody>
</table>

Source: Ricondo & Associates, Inc., based on noise exposure contours depicted on Exhibit IV-5 calculated using FAA INM 7.0b and data described in Appendix E. Area was calculated using ArcGIS version 9.3, April 2010.

Table IV-4 shows the areas exposed to DNL 65 and higher in 2009 by land use. Of the DNL 65 and higher noise exposure area, 83 percent is over water and Airport property. The next highest predominant land uses exposed to aircraft noise of DNL 65 and higher are parks (Daingerfield Island, Lady Bird Johnson Park, and Gravelly Point) and government land uses.
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Table IV-4
Area Exposed to Aircraft Noise by Land Use Category – 2009 (in acres)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>DNL 65-70</th>
<th>DNL 70-75</th>
<th>DNL 75+</th>
<th>DNL 65 and higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Commercial</td>
<td>1.65</td>
<td>0.00</td>
<td>0.00</td>
<td>1.65</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Government</td>
<td>38.45</td>
<td>0.00</td>
<td>0.00</td>
<td>38.45</td>
</tr>
<tr>
<td>Parks and Recreation</td>
<td>84.15</td>
<td>40.80</td>
<td>0.00</td>
<td>124.95</td>
</tr>
<tr>
<td>Water</td>
<td>608.47</td>
<td>88.92</td>
<td>4.99</td>
<td>702.38</td>
</tr>
<tr>
<td>The Airport</td>
<td>139.49</td>
<td>155.98</td>
<td>217.48</td>
<td>512.95</td>
</tr>
<tr>
<td>Roadways/Rights-of-Way</td>
<td>23.71</td>
<td>1.68</td>
<td>0.37</td>
<td>25.75</td>
</tr>
<tr>
<td>Total</td>
<td>895.92</td>
<td>287.38</td>
<td>222.83</td>
<td>1,406.13</td>
</tr>
</tbody>
</table>

Note: Totals may not add due to rounding.

Sources: Ricondo & Associates, Inc., plan drawings developed based on land use data from Arlington County Department of Environmental Services; the City of Alexandria Department of Planning & Zoning, 2008; the Maryland Department of Planning; the District of Columbia Office of Planning, 2002 (existing land use); Ricondo & Associates, Inc., calculated using FAA INM Version 7.0b and data described in Appendix E, April 2010 (aircraft noise exposure).

GIS software was used to estimate the number of people exposed to various levels of aircraft noise in 2009 based on U.S. Department of Commerce, Bureau of the Census 2000 data. Table IV-5 summarizes that the estimated numbers of people, dwelling units, religious facilities, convalescent homes, libraries, day care centers, schools, parks, and hospitals exposed to aircraft noise of DNL 65 and higher in 2009. No people, dwelling units, religious facilities, convalescent homes, libraries, day care centers, schools, or hospitals were exposed to aircraft noise of DNL 65 and higher in 2009. Daingerfield Island (southwest of the Airport) was exposed to aircraft noise between DNL 65 and DNL 70. Gravelly Point, just north of the Airport, was exposed to aircraft noise between DNL 70 and DNL 75. Northwest of Gravelly Point is Lady Bird Johnson Park, which was exposed to aircraft noise between DNL 65 and DNL 70.

Table IV-5
Population, Dwelling Units, and Noise-Sensitive Facilities Exposed to Aircraft Noise – 2009

<table>
<thead>
<tr>
<th>Population or Noise-Sensitive Facility</th>
<th>DNL 65-70</th>
<th>DNL 70-75</th>
<th>DNL 75+</th>
<th>Total DNL 65 and higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dwelling Units</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Religious Facilities</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Convalescent Homes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Libraries</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Day Care Centers</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Schools</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Parks</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Hospitals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Sources: Ricondo & Associates, Inc., plan drawings developed based on land use data from the Arlington County Department of Environmental Services; the City of Alexandria Department of Planning & Zoning, 2008; the Maryland Department of Planning; the District of Columbia Office of Planning, 2002 (existing land use); Ricondo & Associates, Inc., calculated using FAA Version INM 7.0b and data described in Appendix E, April 2010 (aircraft noise exposure); U.S. Department of Commerce, Bureau of the Census, Census 2000, September 2008 (population data).
4.3.7 Light Emissions and Visual Impacts

4.3.7.1 Regulatory Background

No Federal regulations govern light emissions or visual intrusions, although the FAA must consider potential effects on properties, and the use of properties, as covered by Section 4(f) of the U.S. DOT Act, Section 6(f) of the NPS Land and Water Conservation Fund Act, and Section 106 of the National Historic Preservation Act (please refer to Sections 4.3.4 and 4.3.5). Therefore, the potential for the lighting facilities and activities related to the Proposed Action to visually affect nearby light-sensitive areas and the potential visual impacts of the Proposed Action in contrast with the existing environment, architecture, historical and cultural setting, and land use planning were considered in this EA.

To facilitate a better mutual understanding of the Authority’s plans and the relationship of these plans to Federal activities and interests in the region of the nation’s capital, the National Capital Planning Commission and the Authority entered into a Memorandum of Understanding,25 which established the need for coordination of any development at the Airport that would alter the skyline when viewed from the opposing shoreline of the Potomac River or from the GWMP.

4.3.7.2 Methodology

Areas that would potentially be sensitive to light emissions from the airfield were identified.

4.3.7.3 Affected Environment

Areas and facilities potentially sensitive to light emissions and the viewshed within the vicinity of the Airport include:

- GWMP and related sites
  - Daingerfield Island (south of the Airport)
  - Indigo Landing Restaurant (NPS concession on the north side of Daingerfield Island)
  - Washington Sailing Marina (NPS concession on the north side of Daingerfield Island)
  - Mount Vernon Trail (paralleling GWMP west of the Airport)
  - Roaches Run Waterfowl Sanctuary
  - Gravelly Point (north of the Airport)

- Monumental Core of the nation’s capital
  - East Potomac Park
  - West Potomac Park
  - Jefferson Memorial
  - Franklin Delano Roosevelt Memorial Park

These areas and facilities all include views of the airfield and are located in an urban, high-ambient-light environment.

4.3.8 Solid Waste

Solid waste concerns related to the development and operation of an airport include the ability of the local waste management agencies and facilities to accept and process solid waste generated at the airport. The location of solid waste disposal sites and landfills in relation to an airport’s Air

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Operations Area (AOA) and the potential for these sites to attract wildlife are also of concern. Hazardous materials are addressed in Section 4.4.4 of this EA.

4.3.8.1 Regulatory Background

Applicable laws and regulations related to solid waste disposal include:

- Solid Waste Disposal Act of 1965[^26]

The Solid Waste Disposal Act provides safeguards to reduce the danger of solid waste disposal on human health and the environment. Overseeing and implementing these safeguards are the responsibility of the Virginia Department of Environmental Quality and the Arlington County Department of Environmental Services. In conjunction with FAA AC 150/5200-33, *Hazardous Wildlife Attractants on or near Airports*, 40 CFR Part 258.10 addresses and restricts the proximity of landfills to the AOA.

4.3.8.2 Methodology

To identify solid waste disposal practices at the Airport, the Authority was consulted.[^27] Additionally, readily available mapping sources and information on the Arlington County Department of Environmental Services’ website[^28] were reviewed to identify the location of nearby landfills.

4.3.8.3 Affected Environment

Solid waste managed by the Authority is collected and removed from the Airport by an offsite contractor (Metro Waste) and disposed of at approved regional facilities. In 2008, the Authority assumed responsibility for all waste disposal on the Airport except for retail concessions. Total solid waste tonnage will fluctuate commensurate with operations.

According to the *Arlington County Solid Waste Management Plan*,[^29] the County does not own or operate a landfill for municipal solid waste. In addition, no landfills or major transfer stations are located in Arlington County. The nearest landfill is the I-95 Sanitary Landfill in Lorton, Virginia, which is more than 18 miles from the Airport.

4.4 Physical Environment

The existing physical environmental conditions and activities that may be affected by the Proposed Action are discussed below.