Washington Dulles International Airport

Final Environmental Assessment Tier 2 and Related Projects and FAA General Conformity Determination

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Metropolitan Washington Airports Authority
One Aviation Circle
Washington, D.C., 20001

Prepared by
EA Engineering, Science, and Technology, Inc.
15 Loveton Circle
Sparks, Maryland 21152

August 2002

13840.02

Washington Dulles International Airport

Final Environmental Assessment Tier 2 and Related Projects and FAA General Conformity Determination

Metropolitan Washington Airports Authority
One Aviation Circle
Washington, D.C., 20001

Prepared by
EA Engineering, Science, and Technology, Inc.
15 Loveton Circle
Sparks, Maryland 21152

This Environmental Assessment becomes a Federal Document when evaluated and signed by the responsible FAA official.

Responsible FAA official

8/21/02
Date

August 2002

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT

LOCATION

Washington Dulles International Airport (IAD)
Fairfax and Loudoun Counties, Virginia

PROPOSED FEDERAL ACTION

The Proposed Action or Build Alternative includes four elements: Tier 2 Concourse, Automated People Mover System (APM), South Utilities, and Support Facilities. The construction activities associated with each element are provided in Table 1. The project elements are more fully described in the Environmental Assessment, which is considered part of this finding. All of these projects are replacement facilities, upgrades, or infrastructure for existing facilities. Collectively, the projects are designed to enhance efficiency, replace temporary structures, or improve the quality of service for passengers using the airport.

TABLE 1. TIER 2 AND RELATED PROJECTS: DULLES DEVELOPMENT PROGRAM, WASHINGTON DULLES INTERNATIONAL AIRPORT

TIER 2 CONCOURSE	**Airport Buildings:**	Tier 2 Concourse Walkback Tunnel (Tier 2 to Tier 1) (Phase II) Baggage Tug Tunnels Baggage Conveyor Tunnels to Tier 2 High Speed Conveyor Baggage System (Main Terminal to Tier 2) Tier 2 Baggage Equipment
	Airfield Facilities:	Demolish Old C/D Concourses, Repave Apron and Taxiways C/D Tier 2 Apron Paving Hydrant Fueling for Tier 2 Apron VII Paving
AUTOMATED PEOPLE MOVER SYSTEM	**Airport Buildings:**	International Arrivals Building (IAB) People Mover Stations, Tunnels and System Concourse B Bldg. Adaptations for IAB People Mover (Tier 1) People Mover – Main Terminal to Concourse B Concourse B Bldg. Adaptations for People Mover People Mover – Maintenance Facility and Service Tunnel People Mover – Tier 1 to Tier 2 APM Shell between Tier 2 and APM Vehicle Maintenance Facility Security Mezzanine & Main Terminal People Mover Station, Pkg. 6
SOUTH UTILITIES	**Airport Buildings:**	South Utility Building (SUB), Phase I
	Utility Systems:	Stormwater Management Facilities, Tier 2 Projects Utility Tunnel Expanded Water Storage Dominion Virginia Power (DVP) Substation and Distribution Center
SUPPORT FACILITIES	**Other:**	Soil Stockpile Area

PURPOSE AND NEED

The purpose of the Tier 2 and related projects is replacement of existing facilities and enhancement of services that are currently provided at IAD. While improving the capabilities of the concourse and the ground transportation system, none of the projects is designed to increase this capability beyond the capacity of the existing system of three runways. These projects will better serve the passenger activity that will occur at IAD based on the existing airfield capacity and expected air services at the airport.

Tier 2 Concourse: Concourse C/D was constructed in six separate segments and has been modified numerous times during the past 15 years as a temporary facility. The facility currently has 47 aircraft gates. The actual number of usable gates at any given time is dependent on the size of the arriving and departing aircraft. The predominant airline tenant of Concourse C/D and other airlines have outgrown the temporary facility.

The C/D Concourse has limited space/capacity for comfortable seating, passenger movement, and food, beverage, and retail concessions. With Tier 2, the Authority will provide a modern, updated facility that will improve customer service to its airline tenants (e.g., United Airlines and Star Alliance partners) and passengers. The new facility will be somewhat similar in design to Concourse B and will provide 44 aircraft gates. The demolition of Concourse C/D will allow for the relocation of Taxiways C and D and allow them to be used by larger aircraft.

As part of the Tier 2 Concourse element, the Pedestrian Walkback Tunnel is intended to increase and ease movement of passengers between the Main Terminal, midfield Concourse B, and the new Tier 2 Concourse. The Pedestrian Walkback Tunnel will be equipped with moving walkways in each direction that will provide easy access and freedom of movement. Currently, the mobile lounge service is the only transportation available to passengers traveling between the Main Terminal and the concourses.

Baggage Tug and Conveyor Tunnels, proposed for connection to the Main Terminal, to existing concourses, and to the new concourse, will substantially reduce surface traffic caused by baggage tugs and will improve baggage handling service between the Main Terminal and the concourses.

Automated People Mover: The mobile lounge service is no longer a practical transport system for the millions of passengers using IAD, particularly given the distances to be served between the Main Terminal and Tier 2, the volume of traffic, and the surface congestion. Two APM systems will be constructed, one for domestic passengers and one for arriving international passengers. The APM will substantially reduce and eventually eliminate the use of the mobile lounge service. The APM system will provide high volume, high speed, convenient and comfortable rides for passengers and will be more efficient than the mobile lounges. In addition, use of electric power for the APM system will result in lower emissions than the diesel-powered mobile lounges. Use of the underground APM system and reduction or elimination of the mobile lounges will reduce surface/ground traffic on the airfield. APM stations in the concourses will be located to minimize walking distance for travelers. After the APM system is constructed, some flights will continue to be served by the mobile lounges/planemates between aircraft and the Main Terminal.

The International Arrivals Automated People Mover System will serve international passengers, who must be maintained in a separate environment, with the same quality of service provided to domestic travelers. The new international arrivals APM will replace mobile lounge service to the International Arrivals Building (IAB). International arriving passengers transferring to domestic flights will be processed at the Tier 2 Federal Inspection Services (FIS). Remaining passengers will go via sterile corridors and the international arrivals APM to the IAB for processing. Train stations will be at the centers of concourses with separate waiting and boarding areas in compliance with Customs and Immigration and Naturalization Service (INS) regulations.

South Utilities: The south utility projects will provide utility services to the Tier 2 projects. The new utility building will be designed to accommodate future airport expansion projects. The North Utility Building serving the Main Terminal and Concourse B cannot be expanded to meet future demands. The stormwater management basin will accommodate stormwater runoff from new impervious surfaces. The South Utility Building units will replace rooftop heating and cooling units on Concourse C/D.

Support Facilities: The support facilities will facilitate construction activities for all projects. The soil stockpile area will provide a temporary centralized location for approximately 3.8 million cubic yards (mcy) of soils excavated from the tunnels and other projects. These materials are planned for re-use on the airport.

DISCUSSION

The Metropolitan Washington Airports Authority (the Authority) is currently undertaking a capital improvement program to replace and upgrade existing aircraft, passenger, and support facilities at IAD. The Capital Construction Program for IAD includes numerous facility improvement projects that must be evaluated under the National Environmental Policy Act (NEPA). One component of the Dulles Development (d2) program, Tier 2 and related projects, is evaluated in the attached Environmental Assessment.

The events of September 11, 2001 and the economic uncertainties facing commercial aviation have affected the proposed timing of the projects discussed in the attached Environmental Assessment. The Authority has elected to phase the implementation of the proposed projects. Some of the projects will begin shortly after completion of the NEPA approval process. These projects include Apron VII, a portion of the domestic people mover system with an interim connection to Concourse C and the utility improvements needed to support these projects. Other projects primarily related to the Tier 2 Concourse, consisting of Tier 2 itself, the International Arrivals APM, portions of the domestic APM to Tier 2, baggage tunnels, the South Utility Building and the demolition of Concourse C/D are being deferred. The Authority expects to proceed with these projects when circumstances, principally economic, are appropriate. For the purposes of this Finding of No Significant Impact (FONSI), all of the projects in the attached Environmental Assessment have been viewed as proposed for construction. Should there be a prolonged interruption of the schedule, the FAA will reevaluate the Environmental Assessment to ensure that it remains valid before proceeding with construction of the deferred portion of the proposed action.

Washington Dulles International Airport (IAD) is located in Fairfax and Loudoun counties in the Commonwealth of Virginia. It is approximately 26 miles west of the center of the District of Columbia. The airport site comprises approximately 11,000 acres. Three thousand acres are located in Fairfax County and 8,000 acres are located in Loudoun County. The original airport parcel consisted of 10,000 acres, and an additional 870 acres (approximately) were acquired between 1989 and 1999. Approximately 5,000 acres are used for existing airport operations.

The airport layout currently includes a Main Terminal and the mid-field concourses (A, B, and C/D). Concourses A, B, and C/D are located south of the Main Terminal and are parallel to and detached from the Main Terminal (Figure 1-2 in the EA). Passengers are shuttled between the Main Terminal and the Concourses via surface vehicles, a mobile lounge ground transportation service run by the Authority. A total of three runways, two north/south runways and one crosswind runway, currently support aircraft activity at IAD.

Vehicular access to IAD is provided by the 16-mile Dulles Airport Access Highway (DAAH) that has two dedicated lanes in each direction and a direct connection to Interstate Route I-66 and the Capital Beltway. The four-lane DAAH extends from Interstate Route I-66 near Falls Church, Virginia inside the Capital Beltway to the terminal area of IAD. This highway serves IAD exclusively. The airport also is accessible via the Dulles Toll Road (Route 267), which runs parallel to and on both sides of the DAAH and serves local, non-airport traffic. There are special exits from the westbound DAAH to the Dulles Toll Road for buses serving the local community. The DAAH is also accessible from State Route 28. The Dulles Greenway is a privately operated toll road 14 miles long that runs northwest from the Dulles Toll Road at Route 28 and extends to Route 15 at Leesburg in Loudoun County.

Aircraft operations at IAD are expected to increase based on the current projections and demand for service. Airport activity data and demand forecasts used the Environmental Assessment are based upon activity forecasts prepared in October 2000 (HNTB 2000) and approved by FAA in November 2000 as the basis for future Federally funded capital improvements, and future benefit-cost and environmental analysis. Aviation forecasting recognizes that temporary downturns and upswings may occur during the forecast period. In the past, aviation activity has undergone significant, although temporary, reductions in response to economic downturns or security events such as the Persian Gulf War, but has recovered. The proposed Tier 2 projects are not driven by forecasts of demand, and they are only designed to provide a quality of service at IAD commensurate with the capacity of the existing airfield. The service efficiency achievable through the APM system is needed even for the existing level of activity.

Total aircraft operations (takeoffs and landings) at IAD were 465,915 in 1999, and have been forecast to increase to 636,092 in 2007, an average annual increase of 4.0%. However, operations actually decreased 2% in 2000, and then fell an additional 13% in 2001. Although the events of September 11, 2001 have caused a slowdown in Dulles activity and in the schedule for project implementation, growth is expected to resume. The level of activity forecast for 2007 may not be realized until 2008 or perhaps later.

ALTERNATIVES

The Tier 2 and related projects (Build Alternative) are replacement facilities, upgrades, or infrastructure for existing facilities. The projects are designed to improve or enhance the quality of service currently provided by the airport. If the Tier 2 projects are not implemented (No Build Alternative), IAD will continue to rely on Concourse C/D and the mobile lounge surface vehicle system. Consequently, IAD will provide a diminishing quality of service to an increasing number of passengers. Concourse C/D presently provides insufficient space and amenities to airlines and their passengers. The aging mobile lounge system will continue to operate, creating surface traffic congestion on the airfield and operational delays. The lounges are diesel powered and contribute air emissions. In addition, the existing mobile lounges and planemates are no longer being manufactured. Contractors can no longer be found to perform the major rehabilitations that would be required to keep this out-dated equipment operating past 2010. The mobile lounge inefficiencies will be magnified as passenger growth continues, and flight departures and arrivals will be increasingly subjected to delays associated with the inability to efficiently transport passengers between their aircraft gates and the Main Terminal. Delays associated with inefficient passenger transport will cause subsequent aircraft arrivals to be delayed, causing aircraft to wait in remote areas of the airfield with their engines idling while awaiting a gate. At-grade transfer of baggage by tug and cart between the concourses and the Main Terminal will also continue with the corresponding surface/ground congestion and air emissions. IAD operations will continue to increase with more passengers, more aircraft, and more automobile traffic. The environmental benefits, efficiencies, and service level of high-volume modern systems will not be realized.

AFFECTED ENVIRONMENT

The attached Environmental Assessment (EA) addresses the effect of the proposed projects on the quality of the human and natural environment and is made a part of this finding. The following Impact Analysis presents the highlights of the more thorough analysis contained in the EA.

IMPACT ANALYSIS

In accordance with the requirements of DOT/FAA Order 5050.4A and Order 1050.1D, the environmental consequences associated with the proposed action were analyzed and evaluated to avoid, minimize, or mitigate potential consequences.

NOISE

The proposed Tier 2 and related projects are not expected to result in an increase in airport operations (type and number of aircraft used, runways layout, and runway utilization) compared to the No Build alternative. The number of people in the surrounding communities that live and work within the area influenced by the noise contours is not anticipated to increase as a result of these projects. The proposed projects will not individually or cumulatively introduce noise to a previously unaffected area or significantly increase noise over a noise sensitive area. Therefore, no noise impacts are expected to occur as a direct result of the implementation of the proposed projects.

COMPATIBLE LAND USE

Zoning ordinances for Loudoun and Fairfax counties implement restricted land uses surrounding the airport to maintain land use practices compatible with the noise contours associated with airport operations. The proposed projects are not anticipated to increase the noise contour envelope and, therefore, the projects will not adversely impact land use surrounding IAD.

SOCIAL IMPACTS

Overall, the proposed projects are not expected to cause adverse social or socioeconomic impacts on the community surrounding the airport. Because the proposed projects involve construction located entirely within the airport proper, the projects will not result in the relocation of residences and businesses or disrupt established communities or planned development.

Because the projects will occur within the IAD property boundary, they are not expected to result in any adverse human health or environmental effects to minority or low-income populations. The median income for households within the Region of Influence (ROI) is higher than the average for the Commonwealth of Virginia, and the percentage of the population living below the poverty level is less than the Virginia average.

While employment at the airport will rise slightly with the onset of construction activity, overall, the proposed projects will not cause an appreciable change in permanent employment levels at IAD or within the ROI compared to the No Build alternative.

Induced social impacts (sometimes called secondary or indirect impacts) are dependent on the scope of the project and include associated shifts in population, public service demands, or changes in the business or economic climate in the community surrounding the airport. The proposed projects at IAD will not have a significant adverse impact on noise, land use, or social factors. Additionally, the proposed projects will not result in a population shift, change the public service demands of the airport, or adversely impact the business and economic climate of the surrounding community. Therefore, there are not expected to be any adverse induced social impacts as a result of Tier 2 and related projects.

AIR QUALITY

IAD is located in the National Capital Interstate Air Quality Control Region (AQCR 47). The area is in "attainment" for all of the National Ambient Air Quality Standards (NAAQS) criteria pollutants, except ozone, for which it is classified as a serious nonattainment area.

Air emission sources at IAD and other airports include aircraft, ground support equipment (GSE), vehicles operating on airport roadways, and stationary sources, such as heating equipment, emergency generators, and fuel tanks. Air emissions from these sources include particulate matter (PM_{10}), nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO), and sulfur dioxide (SO_2).

Stationary Sources.

Overall, a more energy efficient building envelope and appliances for Tier 2 and the termination of space and water heating for the C/D Concourse are predicted to result in no net increases in fuel consumption and associated air emissions for the concourse itself. It is estimated that approximately 50 million cubic feet of natural gas per year would be required to meet the additional heating load associated with the Tier 2 related facilities. This represents an approximate 20 percent increase in NO_X and CO emissions from stationary sources at IAD and an approximate 10 percent increase in VOC emissions when Tier 2 and related facilities become operational. The fuel usage rates are within the limits of the IAD synthetic minor permit and therefore, the associated emissions will not represent an adverse impact.

Mobile Sources.

Under the No Build Alternative, aircraft activity is forecast to increase by approximately 36 percent between 1999 and 2007. Results of air emissions modeling indicated an approximate 74, 58, and 54 percent increase in NO_X, CO, and VOC emissions, respectively, from IAD mobile source emissions between 1999 and 2007. The increased emissions are associated with both forecasted aircraft activity and increased taxi and delay times for aircraft. Under the Build Alternative, more than half of the Mobile Lounges/planemates would be taken out of service when the APM system becomes operational, resulting in somewhat lower total source emissions than under the No Build Alternative.

Conformity.

One of the requirements of the Clean Air Act Amendments (CAAA) of 1990 that applies to areas of the country that are in nonattainment with the National Ambient Air Quality Standards is the Conformity Rule, which may apply to an agency or entity that receives federal funding. The National Capital Interstate AQCR is designated as nonattainment for ground level ozone and is classified as "serious" in this regard. The Conformity Rule distinguishes between facility modifications with "significant" and "insignificant" regional air quality impacts. If the net emissions increase due to a facility modification is less than an allowed level, the modification is considered insignificant and may proceed in "Conformity." The General Conformity-allowed level for the National Capital Interstate AQCR is 50 tons/yr for VOC and NO_X emissions. The estimated air emission increases from the Tier 2 stationary sources are approximately 2.6 tons/yr of NO_X and less than 1 ton/yr of VOCs, which are below the *de minimis* level. The minor differences in mobile source emissions between the 2007 Build and No Build Alternatives are also insignificant.

Construction emissions are addressed below under Construction Impacts.

WATER QUALITY

construction and subsequent operational activities will be under restrictions embodied in IAD's Whereas construction and post-construction runoff from Tier 2 facilities poses potential impacts to the quality of surface and ground water at IAD, these impacts are not expected to be significant. All VPDES stormwater discharge permit, as well as pertinent Commonwealth guidance such as the *Northern Virginia BMP Handbook* and *Virginia Stormwater Management Handbook*. In addition to the management of stormwater runoff via existing and future temporary facilities, each separate construction project will

be required to have individual erosion and sediment control plans approved by the Authority's Building Codes/Environmental Branch. With these various restrictions and controls in place, no adverse effects on water quality are expected.

SOILS AND GEOLOGY

No impacts to geology are anticipated as a result of the implementation of the Tier 2 projects. Impacts to soils will be localized to the IAD property and will not be significant at a regional level. Movement of soils will be required to complete the construction of structures, tunnels, and stormwater management facilities. The excess soil generated by will be stockpiled onsite for later use. During the movement of soil and construction activities, the potential for erosion and sedimentation into nearby stormwater culverts and waterways exists. This potential will be minimized through the use of sediment and erosion control measures as required by local or county regulations.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 303(c)/4(F) LANDS

The Tier 2 projects are not expected to impact public parks and recreation areas that are considered Section 4(f) lands. The projects will occur within the airport boundaries and will conform to the provisions of the Airport Master Plan. In addition, the perimeter buffer zone at IAD will minimize noise or construction-related impacts to parks and recreation areas within the ROI.

Tier 2 and related projects will not cause adverse effects on the historic district at IAD, which is also considered to be 4(f) land. The Authority has agreed with the Virginia State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) to comply with Section 106 of the National Historic Preservation Act as documented in the 1987 Programmatic Memorandum of Agreement (PMOA) [Metropolitan Washington Airports Authority (MWAA) 1987]. This determination of No Adverse Effect has been documented in a coordination letter from the Authority to the Virginia SHPO (dated 22 February 2002) and in a Statement of Concurrence from the SHPO (dated 11 March 2002). The proposed projects will be consistent with the Airport Master Plan that includes planning guidelines taken from the original Saarinen Master Plan for the Airport. The Tier 2 projects include planning to minimize impacts resulting from use as well as ensuring the project will be compatible with the normal activity or aesthetic value of the historic district. The Authority will implement planning and alternatives analysis to comply with section 4(f).

HISTORIC, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that Federal agencies consider the effects of their undertakings on historic properties. Washington Dulles International Airport was declared eligible for the National Register in 1978, but it is not actually listed. Thirteen structures meet National Register criteria as well as the mobile lounges, the runways, terminal area landscaping, and the Dulles Access Highway. IAD was the first airport in the United States to be designed specifically for aircraft flying via jet propulsion, thus conforming to Criterion A of the National Register of Historic Places. Additionally, considered the greatest achievement of master architect Eero Saarinen by his peers and the public, IAD fulfills Criterion C of the National Register of Historic Places.

A Programmatic Memorandum of Agreement (PMOA) was executed on 29 May 1987 by the Authority, the Advisory Council on Historic Preservation, and the Virginia SHPO, which detailed actions to be undertaken to ensure the protection of historic and archaeological resources at IAD (MWAA 1987).

The majority of the Tier 2 and related projects at IAD were addressed in the approved Airport Master Plan, which includes general planning guidelines taken from the original Saarinen Master Plan Report (KPMG Peat Marwick 1985). Many of the Tier 2 and related projects are discussed in the March 17, 1993 Memorandum of Agreement (MOA) for the Midfield Concourse Facilities at IAD (MWAA 1993) and the April 5, 1993 MOA for the Main Terminal Expansion at IAD [Advisory Council on Historic Preservation (ACHP) 1993]. Because of the proximity of the Tier 2 projects to the historic Main Terminal, these projects may have a potential effect on the historic setting and airfield views of the Main Terminal (MWAA 1993). In addition, the demolition of the Concourse C/D will be within the historic district. As a result, the Tier 2 structures will be carefully designed to minimize effects upon and within this historic district. Careful consideration of the effect of the new structures on the views of the Main Terminal will be a central part of the design development and review process (MWAA 1993).

The Section 106 consultation process has resulted in finding that the proposed Tier 2 and related projects do not have the potential to result in unanticipated Adverse Effects on the IAD Historic District. This determination of No Adverse Effect is documented in a coordination letter from the Authority to the Virginia SHPO (dated 22 February 2002), and in a Statement of Concurrence from the SHPO (dated 11 March 2002).

BIOTIC COMMUNITIES

Biotic communities are not expected to be directly impacted by construction and operation of the Tier 2 Concourse, because the proposed project involves an area with buildings or paved surfaces that are already in existence. The SUB, the APM, the DVP substation, stormwater management systems, and the soil stockpile areas could potentially disrupt or displace animal species in the area. The SUB, the DVP substation, and the soil stockpile area will require removal of forest habitat. The loss of forest habitat will be mitigated by re-vegetating and stabilizing the area at the end of the construction period.

ENDANGERED AND THREATENED SPECIES

Threatened and endangered species are not expected to be adversely affected by implementation of the Build Alternative. Formal consultation has been conducted with Virginia Department of Conservation and Recreation, Virginia Department of Game and Inland Fisheries, and U.S. Fish and Wildlife Service. The Virginia threatened upland sandpiper and the northern harrier are regularly observed at IAD by USDA personnel. The USDA observations since 1998 are of casual use and nesting has not been observed. Comparable habitat for the upland sandpiper is found throughout the airport parcel. One state-listed rare plant species, the hairy beardtongue, was found along the proposed alignment of the APM and at the proposed site of a stormwater management facility. Although these individual specimens would be lost as a result of the Build Alternative, this loss does not constitute a significant impact.

WETLANDS

Approximately 26 acres of wetlands at IAD will be altered by implementation of the Build Alternative. The wetland areas at IAD have been delineated, and USACE has issued a jurisdictional determination for all of the wetlands delineated at IAD. The Authority has submitted a Joint Permit Application (JPA) to Virginia DEQ, USACE, and other regulatory agencies for review. Previous applications for permits to alter wetlands have included some of the wetland areas within the Tier 2 and related projects limit of disturbance. Construction activities in wetland areas will not occur prior to approval of the permit application.

Wetlands are located in close proximity to the proposed location for the SUB and the DVP Substation. The site layout plans for these projects have been designed to minimize impacts to the wetlands to the maximum extent possible. The soil stockpile area has been designed to avoid impacts to wetlands. An appropriate buffer between the stockpile and the wetland area will also be maintained.

Loss of wetlands at IAD will be mitigated through the purchase of approximately 28 wetland credits from the Cedar Run Wetland Bank. This bank is approved to provide mitigation credits at IAD. Wetland banking is part of the Authority's Comprehensive Wetland Strategy to mitigate wetlands that could be potentially affected by near-term and future planned airport development. In addition to the wetland credits, approximately 3,070 linear feet of streams impacted will be mitigated either through the purchase of stream credits at an approved mitigation bank or an in-lieu fee contribution to the Virginia Wetlands Restoration Trust Fund.

FLOODPLAINS

The Tier 2 and related projects are not expected to affect the base floodplains located on IAD property.

COASTAL ZONE MANGEMENT PROGRAM

The Tier 2 and related projects are consistent with the Coastal Zone Management Plan of the Commonwealth of Virginia. Correspondence received from the Virginia Department of Environmental Quality stated no objection to the project provided the Authority complies with all applicable state and county of Fairfax Coastal Zone requirements and obtains all required permits. The Authority will design the projects to be consistent with these requirements.

COASTAL BARRIERS

IAD is not located within a Coastal Barriers Resource System (CBRS) and thus the Coastal Barriers Resource Act (CBRA) is not applicable to Tier 2 and related projects.

WILD AND SCENIC RIVERS

No Wild and Scenic Rivers are located in the project area.

FARMLAND

The Farmland Protection Policy Act (FPPA) is not applicable to Tier 2 and related projects at IAD. IAD and the proposed projects are located in areas that are not being

converted from farmland to non-agricultural uses. In addition, no formal consultation is required for land that was purchased prior to August 6, 1984 (FAA 1985).

ENERGY SUPPLY

Overall, a more energy efficient building envelope and appliances for Tier 2 and the termination of space and water heating for Concourse C/D are predicted to result in no net increases in fuel consumption for the concourse facilities when Tier 2 becomes operational, and Concourse C/D is demolished. Based on natural gas consumption by several existing IAD buildings, it was estimated that approximately 50 million cubic feet of natural gas would be required to meet the additional heating load associated with the other Tier 2 related facilities. This represents about a 20 percent increase in total natural gas consumption by the airport relative to the year 2000.

Electrical energy to operate Tier 2 and associated systems would increase the airport's overall electricity demand. Terminating the use of the existing Concourse C/D will reduce part of this increase. The Authority has discussed their proposed increased electricity demand to operate Tier 2, the APM, and other systems with Dominion Virginia Power, and no supply problems are envisioned.

Mitigating energy reduction measures include a goal of reducing energy consumption in the Tier 2 Concourse by 20 percent relative to Concourse B by using a more energy-efficient building envelope and appliances and eliminating the energy requirements of the existing Concourse C/D, which will be demolished. The net increase in demand for natural gas and electricity is not expected to have a significant effect on local supplies.

LIGHT EMMISIONS

None of the proposed projects have the potential to create increased or intrusive light emissions that affect sensitive off-airport land uses or aircraft operations, and additional lighting requirements during construction activities are not anticipated to create a hazardous wildlife attraction or impact aircraft operations. The proposed construction projects will take place within the configuration of the airport. While nighttime construction activity will require additional lighting, the lighting will be appropriate to the activity and will not impact the surrounding community. The existing buffer zone of vegetation around the airport will protect the surrounding communities from potential intrusive and persistent light interference during and after the construction of theTier 2 projects.

VISUAL IMPACTS

Due to the distance of IAD from parks, historic sites, or other public use areas, the buffer zone, and the compliance to the Airport Master Plan, the proposed projects are not expected to have a visual impact on the aesthetic integrity of the area surrounding IAD or the IAD historic district.

SOLID WASTE IMPACTS

The airport currently produces and collects municipal solid waste and hazardous wastes, and the types, collection, and disposal of these wastes are not expected to change appreciably when Tier 2 and related projects become functional. Municipal solid waste

and hazardous wastes will continue to be collected by contractors and removed from the airport for proper disposal.

In-place mitigation measures that reduce the volume of wastes would continue and would include the Tier 2 Concourse and related projects when they become functional. These measures include a recycling program that in 2000 reclaimed approximately 400 tons of paper and ferrous metals.

During construction, excavation and dewatering operations will be monitored for evidence of petroleum products. Contaminated soils, if found, will be hauled offsite for disposal. If necessary, dewater discharge will be processed by means of oil-water separation and two-stage carbon adsorption.

SANITARY WASTE

No impacts to the sanitary sewer system are expected from the Tier 2 projects. Tier 2 is a one-for-one replacement facility that will generate no additional sanitary waste over No Build levels. Tier 2 sanitary waste will go to a Fairfax County interceptor and then to the Occoquan treatment plant.

Recovered deicing fluid of less than 7 percent glycol concentration is routed to the sanitary sewer. These discharges are included in IAD's wastewater discharge permit. Discharge to the sanitary sewer will continue to be coordinated with the Washington DC Water and Sewer Authority (DC WASA) to ensure that the discharge will not exceed the requirements of the sewer use permit.

TOXIC SUBSTANCES

Demolition of Concourse C/D may require removal and disposal of lead-based paint (LBP) and asbestos-containing materials (ACM). These materials will be removed and disposed of following appropriate Federal and Commonwealth regulatory guidelines.

DESIGN, ART, AND ARCHITECTURE

Because IAD was declared eligible for the National Register of Historic Places, the Tier 2 and related projects are planned to be consistent with Eero Saarinen's master plan for the airport. The original architectural and cultural designs of the airport will be adhered to in the design and implementation of the proposed projects. The principles of good design, art, and architectural treatment will also be applied.

CUMULATIVE IMPACTS

No cumulative impacts are expected as a result of the proposed Tier 2 and related projects. Tier 2 and related projects are designed to replace and improve existing services at IAD. Impacts that are associated with these projects are limited to the area of the airport property and will be effectively mitigated. The potential for environmental effects identified in the Environmental Assessment will be managed, minimized, and mitigated. The potential for combined effects with planned development at IAD, planned land use development in the region, and planned ground transportation projects were evaluated in the Environmental Assessment.

Overall, the Tier 2 and related projects comprise a small portion of the current and planned development activity in the Dulles region. Although the region could experience cumulative effects to air quality, water quality (stormwater runoff and increased impervious surface area), and habitat loss due to multiple ongoing roadway and development projects, the Tier 2 projects account for a small fraction of these effects and will not in and of themselves cause impacts that would be expected to exceed thresholds of significance.

It is not expected that the Tier 2 and related projects discussed in the attached Environmental Assessment will produce significant environmental impacts. Nor is it expected that the effects of these projects, when added to the effects of other proposed projects in the region, will cause impacts that otherwise would not be significant to exceed thresholds of significance. Therefore, no significant cumulative impacts are expected from the Tier 2 and related projects.

CONSTRUCTION IMPACTS

The majority of construction-related impacts are expected to be temporary in nature (lasting over the 6-year construction period), minimized by best management practices (BMPs), and limited to the IAD property. Construction activities are expected to have a short-term positive impact on socioeconomic resources due to construction-related employment opportunities. The potential environmental consequences related to construction activities are discussed in the Environmental Assessment and summarized below.

- There will be a short-term, temporary increase in localized noise levels in the vicinity of the project area during construction and demolition activities. The noise disruptions will be temporary in nature, and phasing of construction will minimize the effect on airport services. All construction activities will take place on IAD property, and nearby residents will not be affected.

- With respect to air quality, NO_X and VOC emissions from construction activities are allotted for in the emission budget developed by the Metropolitan Washington Council of Governments (COG) for the Northern Virginia part of the State Implementation Plan (SIP). Fugitive particulate emissions will be controlled by BMPs.

- Impacts to water quality include an increase in runoff from construction areas and potential erosion of disturbed soils and sedimentation into streams. These effects will be managed using BMPs, erosion control measures, and stormwater detention ponds.

- Impacts to soils include disturbance and removal. Excess soils will be stockpiled and re-used, and appropriate BMPs for erosion control will be implemented to minimize offsite transport of stockpiled soils.

- Historic and cultural resources exist in close proximity to the construction areas. The viewsheds and aesthetic value of the historic areas on the airport property may be temporarily disrupted. Construction activities will be coordinated through

consultation with the Virginia SHPO and the ACHP, if necessary, prior to implementation.

- Vegetation will be cleared for some of the construction projects and habitat for terrestrial biota will be removed. Loss of ground vegetation and trees will be mitigated by revegetation after construction is completed. No construction-related impacts to rare, threatened, or endangered (RTE) species are expected.

MITIGATION MEASURES

1. Construction contract specifications shall contain the provisions of FAA Advisory Circular 150/5370-10A titled "Standards for Specifying Construction of Airports", Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control. Virginia Soil and Sedimentation Control Regulations and regional storm water requirements will be enforced to minimize potential water quality impacts.

2. The construction of detention basins to control the discharge of stormwater shall be in place prior to construction. The stormwater management shall comply with Advisory Circular 150/5200-33 "Hazardous Wildlife Attractants on or Near Airports".

3. Loss of wetlands and streams will be mitigated through a banking program. Credits will be purchased from an approved mitigation bank. Stream mitigation may alternately be done by contribution to the Virginia Wetlands Restoration Trust Fund. Impacts to wetlands and other waters will be minimized and avoided where possible.

4. All applicable permits shall be obtained, if required, prior to construction.

CONCLUSION AND APPROVAL

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in section 101(a) of the National Environmental Policy Act of 1969 (NEPA) and that it will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(c) of NEPA. As a result FAA will not prepare an Environmental Impact Statement for this project.

APPROVED: _____ 9/27/02

Date

Terry J. Page, Manager
Washington Airports District Office

REFERENCES

Advisory Council on Historic Preservation (ACHP). 1993a. Memorandum of Agreement – Main Terminal Expansion, Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. To: James A. Wilding, General Manager, MWAA, From: Don Klima, Director, Eastern Office of Review. April 5, 1993.

Federal Aviation Administration (FAA). 1985. *Airport Environmental Handbook.* Order 5050.4A, October 8, 1985.

HNTB Corporation. 2000. *Washington Dulles International Airport Aviation Activity Forecasts*. Submitted to Metropolitan Washington Airports Authority, Washington National Airport, Washington D.C. October.

KPMG Peat Marwick Airport Consulting Services. 1985. *Final Technical Report, Master Plan Update, Washington Dulles International Airport.* Prepared for Federal Aviation Administration, Metropolitan Washington Airports. September.

Metropolitan Washington Airports Authority (MWWA). 1987. Programmatic Memorandum of Agreement Among the Advisory Council on Historic Preservation, the Virginia State Historic Preservation Officer and the Federal Aviation Administration, Metropolitan Washington Airports.

Metropolitan Washington Airports Authority (MWWA). 1993. Midfield Concourse Facilities, Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. Letter to: Mary Harding Sadler, State Historic Preservation Office, From: Frank D. Holly, Manager, Engineering Division MWAA. Dated March 17, 1993.

PUBLIC NOTICE

WASHINGTON DULLES INTERNATIONAL AIRPORT

FINDING OF NO SIGNIFICANT IMPACT, FINAL ENVIRONMENTAL ASSESSMENT, AND GENERAL CONFORMITY DETERMINATION FOR A NEW MIDFIELD CONCOURSE (AND PROJECTS RELATED THERETO)

The Metropolitan Washington Airports Authority announces that the Federal Aviation Administration has approved the Final Environmental Assessment (EA) and General Conformity Determination (GCD), and has issued a Finding of No Significant Impact (FONSI) for the above referenced project known as Tier 2 and Related Projects at Washington Dulles International Airport.

Copies of the Final EA, including the GCD and the FONSI are available for review at the following libraries: Poolesville Library (19633 Fisher Ave., Poolesville, MD), Rust Library (380 Old Waterford Rd., Leesburg, VA), Eastern Loudoun Regional Library, 21030 Whitfield Place, Sterling, VA), Centreville Regional Library (14200 St. Germaine Dr., Centreville, VA), Chantilly Regional Library (4000 Stringfellow Rd., Chantilly, VA), Fairfax City Regional Library (3915 Chain Bridge Rd., Fairfax, VA), Reston Regional Library (11925 Bowman Towne Dr., Reston, VA), and Tysons-Pimmit Regional Library (7584 Leesburg Pike, Falls Church, VA). The documents can also be reviewed at www.mwaa.com.

Copies of the FONSI and GCD are available from the Federal Aviation Administration, Washington Airports District Office, 23723 Air Freight Lane, Suite 210, Dulles, Virginia 20166.

Please note that this notice is for the EA for Tier 2 Improvements at Washington Dulles International Airport, and is not associated with the recently initiated EIS for new runways and associated improvements at the Airport.

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

LIST OF TABLES

LIST OF TABLES
(continued)

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AC	Advisory Circular
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Materials
AGE	Aerospace Ground Equipment
AIP	Airport Improvement Program
ANOIA	Airport Noise and Overflight Impact Area
APM	Automated People Mover
AQCR	Air Quality Control Region
ARFF	Aircraft Rescue and Fire Fighting
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
Btu	British Thermal Unit(s)
CAAA	Clean Air Act Amendments
CBIA	Coastal Barrier Improvement Act
CBPA	Chesapeake Bay Preservation Area
CBRA	Coastal Barriers Resource Act
CBRS	Coastal Barriers Resources System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CO	Carbon Monoxide
COG	Council of Governments
d2	Dulles Development
DAAH	Dulles Airport Access Highway
dBA	A-Weighted Decibels
DCR	Department of Conservation and Recreation
DCWASA	Washington, DC Water and Sewer Authority
DEQ	Department of Environmental Quality
DNL	Day-Night Average Sound Level
DOT	Department of Transportation
DVP	Dominion Virginia Power
E.O.	Executive Order
EA	Environmental Assessment
EDMS	Emissions and Dispersion Modeling System
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQC	Environmental Quality Corridors

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FHWA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FIS	Federal Inspection Services
fpm	Feet Per Minute
FPPA	Farmland Protection Policy Act
ft	Foot/Feet
FTA	Federal Transit Administration
GRV	Glycol Recovery Vehicle
GSE	Ground Support Equipment
HCs	Hydrocarbons
hr	Hour(s)
HTHW	High Temperature Hot Water
IAB	International Arrivals Building
IAD	Washington Dulles International Airport
IDA	Intensely Developed Area
INM	Integrated Noise Model
INS	Immigration and Naturalization Service
JPA	Joint Permit Application
lb	Pound(s)
LBP	Lead-Based Paint
LTO	Landing and Takeoff
mcy	Million Cubic Yards
mgd	Million Gallons Per Day
MOA	Memorandum of Agreement
MWAA	Metropolitan Washington Airports Authority (the Authority)
NAAQS	National Ambient Air Quality Standards
NASM	National Air and Space Museum
NEPA	National Environmental Policy Act
NLR	Noise Level Reduction
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NPIAS	National Plan of Integrated Airport Systems
NRHP	National Register of Historic Places
NVPDC & ESI	Northern Virginia Planing District Commission and Engineers and Surveyors Institute

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

O_3	Ozone
PM_{10}	Particulate Matter
PMC	Parsons Management Consultants
PMOA	Programmatic Memorandum of Agreement
PMSA	Primary Metropolitan Statistical Area
POTW	Publicly Owned Treatment Works
ppb	Parts Per Billion
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
RMA	Resource Management Area
ROI	Region Of Influence
RPA	Resource Protection Area
RTE	Rare, Threatened, and Endangered Species
SES	South Electrical Substation
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPPP	Stormwater Pollution Prevention Plan
SR	State Route
SUB	South Utility Building
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VCP	Virginia Coastal Program
VCRMP	Virginia Coastal Resources Management Program
VDCR	Virginia Department of Conservation and Recreation
VEPCO	Virginia Electric and Power Company
VMF	Vehicle Maintenance and Storage Facility
VOC	Volatile Organic Compound
VPDES	Virginia Pollutant Discharge Elimination System
VWP	Virginia Water Protection
WMATA	Washington Metropolitan Area Transit Authority
yr	Year

EXECUTIVE SUMMARY

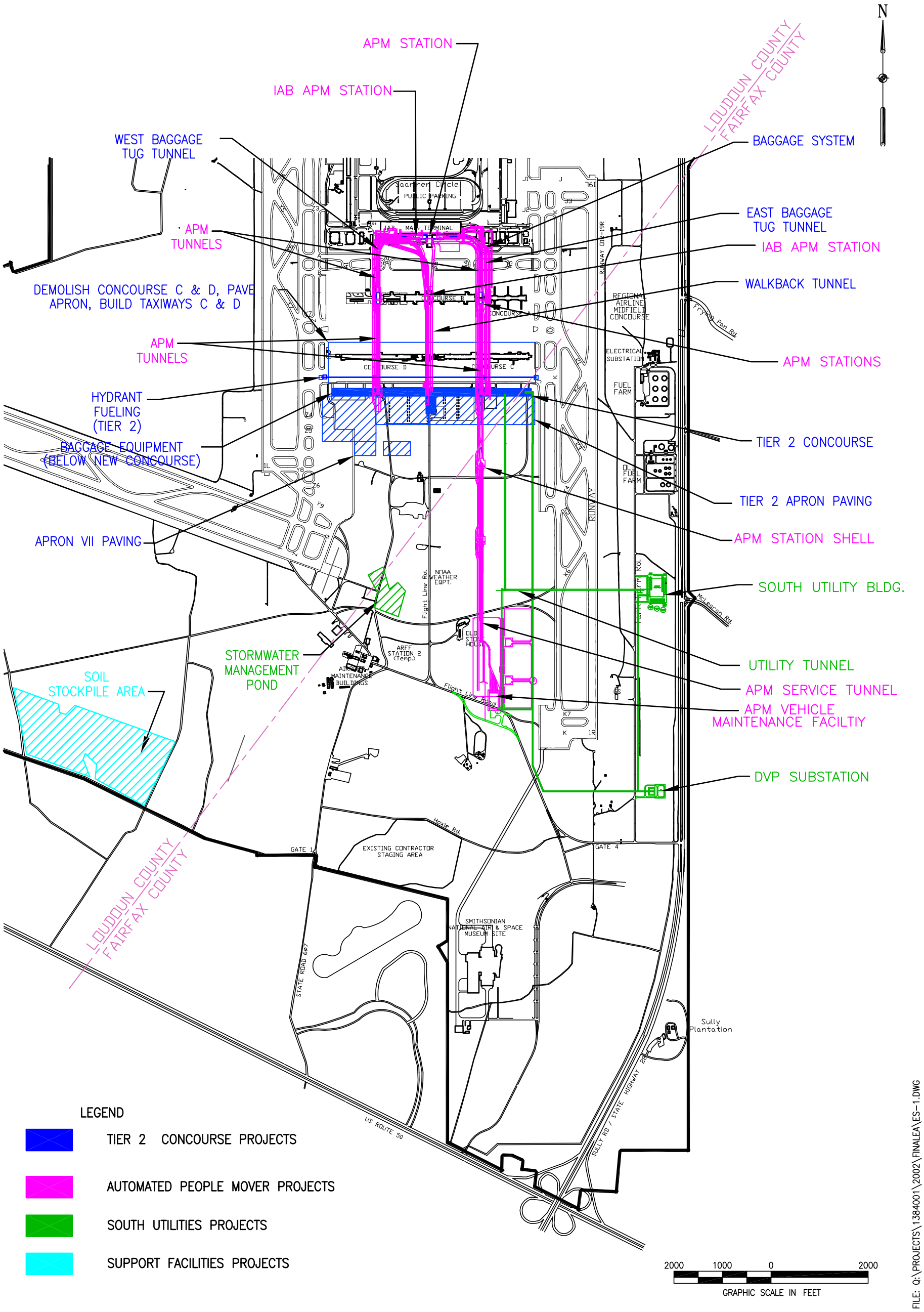
The events of September 11, 2001 and the economic uncertainties facing commercial aviation have affected the timing of the Proposed Action. The Metropolitan Washington Airports Authority has determined that some of the projects in the proposed action will commence shortly after the completion of the NEPA approval processes. Other projects are being deferred, principally for economic circumstances. For the purposes of this environmental assessment all of the projects in the Proposed Action should be viewed as proposed for construction. Therefore, even the deferred projects are being evaluated on environmental grounds in this assessment.

The Metropolitan Washington Airports Authority (the Authority) is currently undertaking a capital improvement program to replace and upgrade existing aircraft, passenger, and support facilities at Washington Dulles International Airport (IAD). The purpose of this Environmental Assessment (EA) is to evaluate existing conditions and environmental effects for one component of the Dulles Development (d2) program: Tier 2 and related projects. The Proposed Action (Build Alternative) includes these four elements: Tier 2 Concourse, Automated People Mover (APM) System, South Utilities, and Support Facilities. The construction activities associated with each element are provided in Table ES-1. The layout plan for Tier 2 and related projects is depicted in Figure ES-1.

In this EA, the environmental consequences or effects of the Proposed Action (Build Alternative) and No Build Alternative were evaluated. Other alternatives were evaluated as planning concepts (i.e., terminal concepts, APM alignment), but were found not to meet the project purpose and need. The features of the Region Of Influence (ROI) that were studied included: noise; compatible land use; social and socioeconomic characteristics; air quality; water quality; geology and soils; Department of Transportation (DOT) Section 4(f) lands; historic, architectural, archaeological, and cultural resources; biotic communities; endangered and threatened species; wetlands; floodplains; coastal zone management; coastal barriers; wild and scenic rivers; prime and unique farmland; energy; light emissions; visual aesthetics; solid waste, hazardous waste, and pollution prevention; and design, art, and architecture.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, the regulations of the President's Council on Environmental Quality (CEQ) for NEPA compliance, and Federal Aviation Administration (FAA) Orders 1050.1D (*Policies and Procedures for Considering Environmental Impacts*) and 5050.4A (*Airport Environmental Handbook*).

ES.1 Description and Need for Proposed Action. The Tier 2 Concourse is the major component of the Proposed Action (Build Alternative). The new concourse will replace the existing Concourse C/D which has neither the necessary space nor appropriate updated passenger amenities to serve present-day or future needs of United Airlines, the largest airline at IAD and the principal tenant on the existing Concourse C/D. The project will consist of the construction of a permanent midfield concourse south of the existing Concourse C/D. In addition, a baggage tunnel containing a baggage conveyor system, a tug tunnel, and a pedestrian walkback tunnel will be constructed as part of the Tier 2 Concourse project. After completion of the new concourse, existing Concourse C/D will be demolished.



FILE: Q:\PROJECTS\1384001\2002\FINALEA\ES-1.DWG

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	AIRPORT LAYOUT PLAN INCLUDING TIER 2 AND RELATED PROJECTS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE ES-1

TABLE ES-1 TIER 2 AND RELATED PROJECTS: DULLES DEVELOPMENT PROGRAM, WASHINGTON DULLES INTERNATIONAL AIRPORT

TIER 2 CONCOURSE	**Airport Buildings:**	• Tier 2 Concourse • Walkback Tunnel (Tier 2 to Tier 1) (Phase II) • Baggage Tug Tunnels • Baggage Conveyor Tunnels to Tier 2 • High Speed Conveyor Baggage System (Main Terminal to Tier 2) • Tier 2 Baggage Equipment
	Airfield Facilities:	• Demolish Old C/D Concourses, Repave Apron and Taxiways C/D • Tier 2 Apron Paving • Hydrant Fueling for Tier 2 • Apron VII Paving
AUTOMATED PEOPLE MOVER SYSTEM	**Airport Buildings:**	• International Arrivals Building (IAB) People Mover Stations, Tunnels and System • Concourse B Bldg. Adaptations for IAB People Mover (Tier 1) • People Mover – Main Terminal to Concourse B • Concourse B Bldg. Adaptations for People Mover • People Mover – Maintenance Facility and Service Tunnel • People Mover – Tier 1 to Tier 2 • APM Tunnel and Station Shell between Tier 2 and APM Vehicle Maintenance Facility • Security Mezzanine & Main Terminal People Mover Station, Pkg. 6
SOUTH UTILITIES	**Airport Buildings:**	• South Utility Building, Phase I
	Utility Systems:	• Stormwater Management Facilities, Tier 2 Projects • Utility Tunnel • Expanded Water Storage • Dominion Virginia Power (DVP) Substation and Distribution Center
SUPPORT FACILITIES	**Other:**	• Soil Stockpile Area

The APM system project will consist of a new underground train system for moving people between concourses and the Main Terminal. The train system will be electric-powered and will substantially reduce the use of the existing mobile lounge service. The project will include 6 miles of tunnels, eight stations, and connections to the Main Terminal, to the concourses, and to a maintenance facility. Two separate APM systems will be constructed: one for domestic passengers and one for arriving international passengers.

The South Utilities project includes a series of utility improvements southeast of the Tier 2 Concourse. These improvements include a new South Utility Building (SUB), expanded water storage, a Dominion Virginia Power (DVP) substation, utility tunnels, and stormwater management facilities. These facilities will serve the new Tier 2 structures and will be designed to allow for expansion to accommodate future airport projects.

The Support Facilities include a soil stockpiling area located in the southern portion of the airport parcel. This will facilitate construction activities for the Tier 2 projects.

The economic slowdown in the aviation industry following the events of September 11, 2001 has made it necessary to phase the implementation of the projects that are the subject of this Environmental Assessment. Some of the projects will begin shortly after completion of the NEPA approval process. These projects include Apron VII, a portion of the domestic people mover system with an interim connection to Concourse C, and the utility improvements needed to support these projects. Other projects primarily related to the Tier 2 Concourse, consisting of Tier 2 itself, the International Arrivals APM, portions of the domestic APM to Tier 2, baggage tunnels, the South Utility Building and the demolition of Concourse C/D are being deferred. The Authority expects to proceed with these projects when circumstances, principally economic, are appropriate.

ES.2 Environmental Consequences of the Proposed Action. A summary of environmental effects for each of the four project components is provided in Table ES-2. A summary of temporary construction-related impacts is provided in Table ES-3. Overall, implementation of Tier 2 and related projects at IAD (Build Alternative) is not expected to have a significant impact on the human environment. Implementation of the Build Alternative is not expected to negatively affect noise, land use, socioeconomics, air quality, DOT Section 4(f) lands, endangered and threatened species, floodplains, coastal zones, coastal barriers, wild and scenic rivers, prime and unique farmland, energy, light emissions, visual aesthetics, solid waste, hazardous waste, pollution prevention, sanitary waste, or design, art, and architecture.

Some impacts to water quality, soils, historic and cultural resources, biotic communities, and wetlands are expected as a result of the Build Alternative. These environmental consequences, however, will be minor in nature, will be minimized through best management practices (BMPs), and/or will be mitigated. The environmental consequences are summarized below.

- Additional air emissions from new boilers are within the existing permitted limitations, and emissions from Mobile Lounges will be reduced under the Build Alternative due to their displacement by the Automated People Mover.

- Impacts to water quality include an increase in stormwater runoff from increased impervious surface area. These effects will be managed using BMPs and stormwater detention ponds.

TABLE ES-2 SUMMARY OF ENVIRONMENTAL CONSEQUENCES FROM TIER 2 AND RELATED PROJECTS

Environmental Consequences	Projects			
	Tier 2 Concourse	**APM**	**South Utilities**	**Support Facilities**
Noise	No Impact	No Impact	No Impact	No Impact
Compatible Land Use	No Impact	No Impact	No Impact	No Impact
Social Impacts Including Environmental Justice, Child Safety	No Impact	No Impact	No Impact	No Impact
Induced Social Impacts	No Impact	No Impact	No Impact	No Impact
Air Quality –Stationary sources	No Impact	No Impact	Emissions from new boilers will be within permitted limitations	No impact
Air Quality–Mobile Sources	No Impact	Reduction of mobile lounge emissions	No Impact	No Impact
Water Quality	Increased runoff managed by stormwater Best Management Practices (BMPs)	No Impact	Increased runoff managed by stormwater BMPs	Runoff managed by stormwater BMPs
Soils and Geology	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used
DOT Action Section 4(f) Lands	No Impact	No Impact	No Impact	No Impact
Historic, Architectural, Archaeological, and Cultural Resources–Buildings	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect
Historic, Architectural, Archaeological, and Cultural Resources–Below grade	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect
Biotic Communities	No Impact	No Impact	Loss of forest habitat	Loss of forest habitat; area will be revegetated after construction
Endangered and Threatened Species	No Impact	No Impact	No Impact	No Impact
Wetlands	Impact to be mitigated by banking	Impact to be mitigated by banking	Impact to be mitigated by banking	No Impact
Floodplains	No Impact	No Impact	No Impact	No Impact
Coastal Zone Management	No Impact	No Impact	No Impact	No Impact
Coastal Barriers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Wild and Scenic Rivers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Prime and Unique Farmland	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Energy	No Impact	No Impact	No Impact	No Impact
Light Emissions	No Impact	No Impact	No Impact	No Impact

Environmental Consequences	Projects			
	Tier 2 Concourse	**APM**	**South Utilities**	**Support Facilities**
Visual Impacts	No Impact	No Impact	No Impact	No Impact
Solid Waste, Hazardous Waste, and Pollution Prevention	No Impact	No Impact	No Impact	No Impact
Sanitary Waste	No Impact	No Impact	No Impact	No Impact
Toxic or Hazardous Substances	Demolition of Concourse C/D asbestos and lead-based paint will be managed in accordance with regulations	No Impact	No Impact	No Impact
Design, Art, and Architecture	No Impact	No Impact	No Impact	No Impact
Cumulative Impacts	No Impact	No Impact	No Impact	No Impact

TABLE ES-3 SUMMARY OF POTENTIAL CONSTRUCTION IMPACTS FOR TIER 2 AND RELATED PROJECTS

Resource	**Environmental Consequences**
Noise	Perimeter buffer mitigates noise impact on ROI; increase in localized noise levels
Compatible Land Use	No Impact
Social Impacts Including Environmental Justice, Child Safety	Increase in construction-related employment opportunities over 5-year period
Induced Social Impacts	No Impact
Air Quality–Stationary sources	No Impact
Air Quality–Mobile Sources	Construction emissions from Tier 2 and related projects are within the SIP budget; fugitive emissions controlled by BMPs
Water Quality	Increased runoff managed by stormwater BMPs; Soil Erosion and Sediment Control Plan
Soils and Geology	Impacts mitigated by soil management program providing conservation by reuse
DOT Action Section 4(f) Lands	No Impact
Historic, Architectural, Archaeological, and Cultural Resources–Buildings	No Adverse Effect
Historic, Architectural, Archaeological, and Cultural Resources–Below grade	No Adverse Effect
Biotic Communities	Approximately 90 acres of forested habitat will be lost to soil stockpile; impact to be mitigated by revegetation after construction
Endangered and Threatened Species	No Impact
Wetlands	Impact to be mitigated by banking
Floodplains	No Impact
Coastal Zone Management	No Impact
Coastal Barriers	Not Applicable
Wild and Scenic Rivers	Not Applicable
Prime and Unique Farmland	Not Applicable
Energy Supply and Resources	No Impact
Light Emissions	No Impact
Visual Impacts	No Impact
Solid Waste	No Impact
Sanitary Waste	No Impact
Toxic or Hazardous Substances	Excavated and stockpiled soils will be tested as part of soil management program
Design, Art, and Architecture	No Impact

- Impacts to soils include disturbance and removal. Excess soils will be stockpiled and re-used, and appropriate BMPs for erosion control will be implemented to minimize offsite transport of stockpiled soils.

- Historic and cultural resources exist in close proximity to the construction areas. Building design will comply with the Airport Master Plan and will be compatible with the design of existing airport structures. Proposed activities are covered under existing memoranda of agreement (MOAs) between the Authority, the Advisory Council on Historic Preservation (ACHP), and the Virginia State Historic Preservation Officer (SHPO). Archaeological surveys have been completed for the Tier 2 and related projects. A conditional determination of "No Adverse Effect" was concluded from the evaluation of the Tier 2 and related projects on the historic and archaeological resources at IAD. This determination of "No Adverse Effect" is documented in a coordination letter from the Authority to the Virginia SHPO dated February 22, 2002, and a Statement of Concurrence from the SHPO dated March 11, 2002 (Appendix D).

- Impacts on biotic communities include clearing of trees and ground vegetation, loss of habitat, and displacement of wildlife. The soil stockpile area will be stabilized and re-vegetated after the construction period.

- Approximately 26 acres of wetlands may be altered as a result of implementation of the Build Alternative. The Authority has submitted a Joint Permit Application (JPA) to the Virginia Department of Environmental Quality (DEQ) for the Tier 2 and related projects. The loss of wetlands will be mitigated through a wetland banking program that will result in no net loss of wetlands. Loss of streams will be mitigated through purchase of stream credits or an in-lieu fee payment to the Virginia Wetlands Restoration Trust Fund.

- Demolition of Concourse C/D may require removal of asbestos-containing materials (ACM), lead-based paint (LBP), and petroleum-containing soils and water. These materials will be removed and disposed of following appropriate guidelines.

ES.3 Construction Impacts. In addition to project-related environmental effects, temporary effects associated with construction activities are expected. The majority of construction-related impacts are expected to be temporary in nature (lasting over the 5-year construction period), minimized by BMPs, and limited to the IAD property. Construction activities are expected to have a short-term positive impact on socioeconomic resources due to construction-related employment opportunities. Construction activities will have potential negative effects on noise, air quality, water quality, soils, historic and cultural resources, biotic communities, and wetlands. The potential environmental consequences related to construction activities are summarized below.

- There will be a short-term, temporary increase in localized noise levels in the vicinity of the project area during construction and demolition activities. The noise disruptions will be temporary in nature, and phasing of construction will minimize effects to airport

services. All construction activities will take place on the IAD property, and nearby residents will not be affected.

- With respect to air quality, NO_X and VOC emissions from construction activities are allotted for in the emission budget developed by the Metropolitan Washington Council of Governments (COG) for the Northern Virginia part of the State Implementation Plan (SIP). Fugitive particulate emissions will be controlled by BMPs.

- Impacts to water quality include an increase in runoff from construction areas and potential erosion of disturbed soils and sedimentation into streams. These effects will be managed using BMPs, erosion control measures, and stormwater detention ponds.

- Impacts to soils include disturbance and removal. Excess soils will be stockpiled and re-used, and appropriate BMPs for erosion control will be implemented to minimize offsite transport of stockpiled soils.

- Historic and cultural resources exist in close proximity to the construction areas. The viewsheds and aesthetic value of the historic areas on the airport property may be temporarily disrupted. Construction activities will be coordinated through consultation with the Virginia SHPO and the ACHP prior to implementation.

- Vegetation will be cleared for some of the construction projects and habitat for terrestrial biota will be removed. Loss of ground vegetation and trees will be mitigated by replanting trees after construction is completed. No construction-related impacts to rare, threatened, or endangered (RTE) species are expected.

ES.4 Cumulative Impacts. Implementation of the Build Alternative is not expected to create negative cumulative effects. The Tier 2 and related projects comprise a small portion of the current and planned development activity in the Dulles region. Although the region could experience cumulative effects to air quality, water quality (stormwater runoff from increased impervious surface area), and habitat loss due to multiple ongoing roadway and development projects, the Tier 2 projects account for a small fraction of these effects. The Tier 2 projects will not cause otherwise insignificant impacts to exceed thresholds of significance.

The Build Alternative is consistent with the long-term objectives of the Airport Master Plan that has been in place and well coordinated with the public since 1985. It is designed to replace and upgrade facilities to enable IAD to efficiently serve to the projected airport level of use.

ES.5 Public and Agency Review. The Draft Environmental Assessment (May 2002) was submitted to the federal, state, and local agencies and made available to the public on June 2, 2002. A notice of availability was published in local newspapers and a public information session was held on June 17, 2002. Comments were received until July 8, 2002. This Final Environmental Assessment incorporates the comments of the public and regulatory agencies and responses.

FEDERAL AVIATION ADMINISTRATION
GENERAL CONFORMITY DETERMINATION

Federal Aviation Administration

GENERAL CONFORMITY DETERMINATION

Proposed Tier 2 and Related Projects at Washington Dulles International Airport

Washington Dulles International Airport (IAD) is located within the Metropolitan Washington DC Non-Attainment Area. The area is designated a serious non-attainment area for ozone, under the Clean Air Act Amendments of 1990, for its failure to meet the National Ambient Air Quality Standard for ozone. As a non-attainment area, the Washington region was required to prepare a State Implementation Plan (SIP) identifying the actions necessary to meet the standard. The current version of the SIP was prepared by the Metropolitan Washington Council of Governments (COG) on February 3, 2000 (*State Implementation Plan (SIP) Revision, Phase II Attainment Plan, for the Washington DC-MD-VA Nonattainment Area*. Prepared by Metropolitan Washington Council of Governments for the District of Columbia Department of Health, Maryland Department of the Environment, and the Virginia Department of Environmental Quality, on behalf of the Metropolitan Washington Air Quality Committee.

In accordance with Section 176 of the Clean Air Act Amendments of 1990, the Federal Aviation Administration (FAA) has assessed whether the emissions that would result from the FAA's action in approving the proposed projects at Washington Dulles International Airport described in the Draft Environmental Assessment, Tier 2 and Related projects, May 2002, proposed by the Metropolitan Washington Airports Authority (Authority) are in conformity with the State Implementation Plan (SIP). The year 2007 was used for completion of the projects in the EA. The 2005 emissions budget was used from the SIP. Therefore this is a conservative assessment of conformity.

In making this General Conformity Determination, the FAA based its emission comparison on a "build versus no-build" scenario. While VOC and NOx emissions from implementing this project will not exceed *de minimis* threshold levels established by the Clean Air Act for determining whether a general conformity determination is required (outlined in 40 CFR Part 93), construction emissions for NOx and VOC would exceed *de minimis* thresholds. Accordingly, the FAA has assessed the conformity of this project with the SIP.

Additional data regarding emissions, calculations and assumptions are found in Appendix C of the EA. Tables and other data used in this document have been excerpted from the Draft Environmental Assessment.

Background

IAD is located in Fairfax County and Loudoun County, Commonwealth of Virginia. Both counties are in the Washington DC-MD-VA Nonattainment Area, which is a serious ozone nonattainment area. In a serious ozone nonattainment area the *de minimis* thresholds for ozone precursor pollutants are 50 tons per year (tons/yr) of VOC and 50 tons/yr of NOx. In addition to the *de minimis* test, a conformity determination is also required if the project is "regionally

significant", that is, emissions increase due to the project would equal or exceed ten percent of the total emission inventory for the entire nonattainment area (40 CFR Part 93).
The Authority, which operates IAD, has initiated a capital construction program, which includes upgrades to the airport's boarding concourses and other passenger handling facilities, and ultimately new runway construction. Federal environmental review of the projects includes a determination of whether they are in conformity with the SIP. Federal agencies, including the Federal Aviation Administration, are prohibited by the Clean Air Act from engaging in, providing financial assistance for, or issuing permits, licenses or approvals for any activity that does not conform to a State Implementation Plan. One means of demonstrating conformity is to show that the increases in emissions caused by the federal action are specifically identified in the SIP.

Construction equipment is classified as a non-road mobile source. COG's current SIP budget for construction emissions was prepared by taking their emissions inventory for 1990 as a base year, multiplying it by a growth factor, and adjusting the result to account for emission reductions required by federal or state regulations.

COG's 1990 emissions inventory was derived from a 1991 EPA contractor's report entitled *Non-Road Engine and Vehicle Emission Inventories for CO and Ozone Nonattainment Boundaries, Washington D.C MSA*. The EPA contractor estimate for the region was adjusted by the Maryland Department of the Environment to correct certain inaccuracies before COG incorporated the result into the emissions inventory for the region.

Construction emissions of VOC, uncontrolled, would be 12.805 tons/day for the region, including 5.602 tons/day from Northern Virginia. Emission controls are expected to reduce the Northern Virginia non-road equipment VOC emissions to 78.9% of the uncontrolled emissions.

From the information presented above it is possible to calculate the emissions of NOx and VOC included in the SIP for construction at IAD.

Emission controls applicable to be in place by 2005 are projected to reduce Northern Virginia NOx emissions from non-road equipment to 92.3% of the uncontrolled emissions. For VOC, the controlled non-road equipment emissions are projected to be 78.9% of the uncontrolled emissions. These reductions relative to uncontrolled emissions are assumed to be applicable to construction equipment, which is part of the non-road equipment category of emission sources.

If uncontrolled, construction equipment in the Northern Virginia portion of the Washington, DC non-attainment area would emit 36.265 tons/day of NOx and 5.602 tons/day of VOC in 2005. Controls will reduce these emissions to 33.471 tons/day of NOx and 4.420 tons/day of VOC.

The SIP uses employment growth as a surrogate for projecting 2005 construction equipment emissions from 1990 emissions. Because IAD accounts for 2.04% of the Northern Virginia employment growth, it is concluded that IAD also is the source of 2.04% of the Northern Virginia construction equipment emissions included in the SIP. It was concluded from this

analysis that the SIP for the Metropolitan Washington, DC nonattainment area includes 0.746 tons of NO_X and 0.106 tons of VOC per ozone season day due to the activities of construction equipment at IAD. On an annual basis, the IAD construction emissions included in the SIP are 272 tons/yr NO_X and 39 tons/yr VOC.

Emissions Inventory Assessment

The FAA's Emissions Dispersion Modeling System (EDMS) program was used to develop the project-related emissions of VOC and NOx for the proposed project during routine operations. Emissions of CO, SO_2, and PM10 were included for this General Conformity evaluation, though this area is in attainment with the Metropolitan Washington and National Ambient Air Quality Standards for each of these pollutants. Emissions from construction activities were also evaluated. These include emissions from on-site construction equipment (backhoes, bulldozers, graders, etc.) and haul vehicles (concrete trucks, dump trucks, etc.).

Stationary Sources - Routine Operations

The new HTHW generators in the proposed South Utility Building will provide heat to several other facilities, in addition to Tier 2. The heating loads of these buildings have been estimated as part of a larger engineering study of the South Utility Building. Based on natural gas consumption by several existing IAD buildings, it was estimated that approximately 50 million cubic feet of natural gas per year would be required to meet the additional heating load associated with the Tier 2 related facilities. As noted in Table 4-3, this represents an approximate 20 percent increase in NO_X and CO emissions from stationary sources at IAD and an approximate 10 percent increase in VOC emissions when Tier 2 and related projects become operational. The fuel usage rates are within the limits of the IAD synthetic minor permit.

TABLE 4-3 PROJECTED 2007 IAD STATIONARY SOURCE AIR EMISSIONS

Emissions (tons/yr)				
NO_X	**SO_2**	**CO**	**VOCs**	**PM_{10}**
Build				
16.18	0.49	13.62	1.61	2.86
No Build				
13.61	0.47	11.46	1.47	2.66

Mobile Sources

Table 4-5 shows emissions attributed to mobile sources. Under the Build Alternative, more than half of the Mobile Lounges/ Planemates would be taken out of service when the APM system becomes operational, resulting in somewhat lower total mobile source emissions than under the No Build Alternative.

TABLE 4-5 PROJECTED 2007 IAD MOBILE SOURCE EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
No Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	152	8	4	7	3
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,681	173	11,880	955	31
Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	9	<1	<1	<1	<1
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,538	166	11,876	948	28

One of the requirements of the Clean Air Act Amendments (CAAA) of 1990 that applies to areas of the country that are nonattainment with the National Ambient Air Quality Standards is the Conformity Rule, which may apply to an agency or entity that receives federal funding. The rule may require an analysis of the regional air quality impact of any changes or modifications at such facilities. The National Capital Interstate AQCR is designated as nonattainment for ground level ozone and is classified as "serious" in this regard. The Conformity Rule distinguishes between facility modifications with "significant" and "insignificant" regional air quality impacts. If the net emissions increase due to a facility modification is less than an allowed level, the modification is considered insignificant and may proceed in "Conformity." The General Conformity allowed level for the National Capital Interstate AQCR is 50 tons/yr for VOC and NO_X emissions. As noted in Table 4-3, the estimated air emission increases from the Tier 2 stationary sources are approximately 2.6 tons/yr of NO_X and less than 1 ton/yr of VOCs, which are below the *de minimis* level. The minor differences in total mobile source emissions between the 2007 Build and No Build Alternatives are also insignificant. However, there is a substantial reduction (NO_X – 143 tons/yr, VOC – 6 tons/yr) in emissions from vehicles getting passengers to and from aircraft when the Mobile lounges/planemates are largely replaced by the APM system.

Construction Activities

Compliance with the General Conformity Rule also requires that VOC and NOx emissions due to construction activities be addressed. While the emissions due to construction activities for this project are already accounted for in the Virginia SIP construction activity emissions budgets for VOC and NOx, emissions due to construction activities are presented below. Construction activities for individual projects are scheduled to begin in 2002 and extend through the end of 2007.

Emissions from construction equipment and airborne dust have the potential to impact air quality. Emissions related to demolition and construction activities will be temporary and limited to the duration of individual demolition and construction projects. Phasing of construction will minimize the quantity of emissions generated in a given year. Dust control is important for airport construction activities, because light reflecting off of dust particles at night jeopardizes aircraft safety. Fugitive dust emissions from surface construction will be controlled by timely applications of water and implementation of BMPs. Dust from the tunneling activities will be controlled throughout the construction phase using a tunnel bag house filter system. Table 4-8 summarizes the air emissions that are estimated to be generated by demolition and construction equipment. Details on these emissions data are provided in Appendix C.

TABLE 4-8 ESTIMATED CONSTRUCTION ACTIVITY AIR QUALITY EMISSIONS

Construction Equipment	**Usage (hr)**	**Emissions (lb)**				
		CO	**NOx**	**VOC**	**PM**	**SOx**
Concrete Pavers	4,443	3,957	8,676	972	779	805
Paving Equipment	4,443	2,364	5,659	531	463	478
Excavators	640	765	1,582	105	212	137
Concrete/Industrial Saw	44,478	36,879	44,134	5,784	5,772	3,728
Cranes	1,217	940	2,305	289	322	208
Graders	4,443	3,905	9,866	1,617	1,028	894
Dump Trucks	117,117	201,510	690,890	62,108	57,574	64,051
Crushing Equipment	1,885	3,787	4,532	594	593	383
Rubber Tired Loaders	69,542	62,788	134,732	11,289	16,874	11,249
Rubber Tired Dozer	41,845	54,255	186,016	16,722	12,789	18,020
Tractor/Loader/Backhoe	87,792	55,738	82,787	11,746	8,607	6,967
Project Total	lbs	426,888	1,171,179	111,757	105,013	106,920
	tons	213	586	56	53	53
Average Annual Total Assuming 6-Year Construction Period	tons	36	98	9	9	9

The Authority conducted an analysis to identify the level of NO_X and VOC emissions from construction emissions that are included in the emission budget developed by the Metropolitan Washington Council of Governments (COG) for the Northern Virginia part of the State Implementation Plan (SIP) (MWAA 2001). It was concluded from this analysis that the SIP for the Metropolitan Washington, DC nonattainment area includes 0.746 tons of NO_X and 0.106 tons of VOC per ozone season day due to the activities of construction equipment at IAD. On an annual basis, the IAD construction emissions included in the SIP are 272 tons/yr NO_X and 39 tons/yr VOC, which compare to the average annual totals of 98 tons NO_X and 9 tons VOC noted in Table 4-8 for this project. Both the Metropolitan Washington COG and the Virginia DEQ have reviewed this analysis and concurred with the methodology and data (see agency letters in Appendix E).

Therefore, because the SIP emissions budget for construction activity emissions is of sufficient size to account for the needs of this project, these emissions are deemed to be in conformity with the SIP emissions budgets and goals to attain the ozone standard.

Conclusion

In determining whether a project is in conformity with the state implementation plan or the base line emission inventory, the emissions from the project are compared to the allowable emissions inventory or the applicable SIP. The air quality analysis has demonstrated that the net annual emissions increases due to the routine operations of this project will be less than the *de minimis* level of 50 tons per year each of VOC and NOx in 2007. In 2002 through 2007, the construction emissions will be below *de minimis* level of 50 tpy of VOC. In 2002 through 2007 the construction emissions will exceed *de minimis* level of 50 tpy of NOx. However, emissions due to construction activities for this project are already accounted for in the Virginia SIP emissions budgets for NOx. In addition, as the changes in emissions will be less than an increase of ten percent of the VOC and NOx emissions inventories for the entire nonattainment area, the project is not regionally significant for purposes of conformity.

As the emission increases due to the projects are less than the *de minimis* levels (and actually represent a net reduction for VOCs and NOx), the project's construction emissions are already accounted for in the SIP, and the project is not regionally significant, FAA has determined under the General Conformity Rule that the changes in emissions due to the project will not:

> Cause or contribute to any new violation of any of the National Ambient Air Quality Standards (NAAQS) in the Airport project area;
>
> Increase the frequency or severity of any existing violation of any NAAQS in the project area; or,
>
> Delay timely attainment of NAAQS or any required interim emission reductions in the project area.

Consequently, no mitigation measures are required with respect to conformity with the SIP.

Therefore, the FAA has determined that the proposed project complies with the requirements of the General Conformity Rule, Section 176 of the 1990 Clean Air Act Amendments and the state requirements under the Commonwealth of Virginia Regulation for General Conformity, 9 VAC 5 Chapter 160, and is in conformity with the applicable SIP.

Approved: _____ Date: 9/27/02

Terry J. Page, Manager
Washington Airports District Office

1.0 INTRODUCTION

The events of September 11, 2001 and the economic uncertainties facing commercial aviation have affected the timing of the Proposed Action. The Metropolitan Washington Airports Authority (the Authority) has determined that some of the projects in the proposed action will commence shortly after the completion of the NEPA approval processes. Other projects are being deferred, principally for economic circumstances. For the purposes of this environmental assessment all of the projects in the Proposed Action should be viewed as proposed for construction. Therefore, even the deferred projects are being evaluated on environmental grounds in this assessment.

Washington Dulles International Airport (IAD) is located in Fairfax and Loudoun counties in the Commonwealth of Virginia (Figure 1-1). It is approximately 26 miles west of the center of the District of Columbia. The Authority is currently undertaking a capital improvement program to replace and upgrade existing aircraft, passenger, and support facilities at IAD. This Environmental Assessment (EA) evaluates the environmental effects for one proposed component of the Dulles Development (d2) program: Tier 2 and related projects. Other potential future development at IAD is discussed in Section 4.25, "Cumulative Impacts."

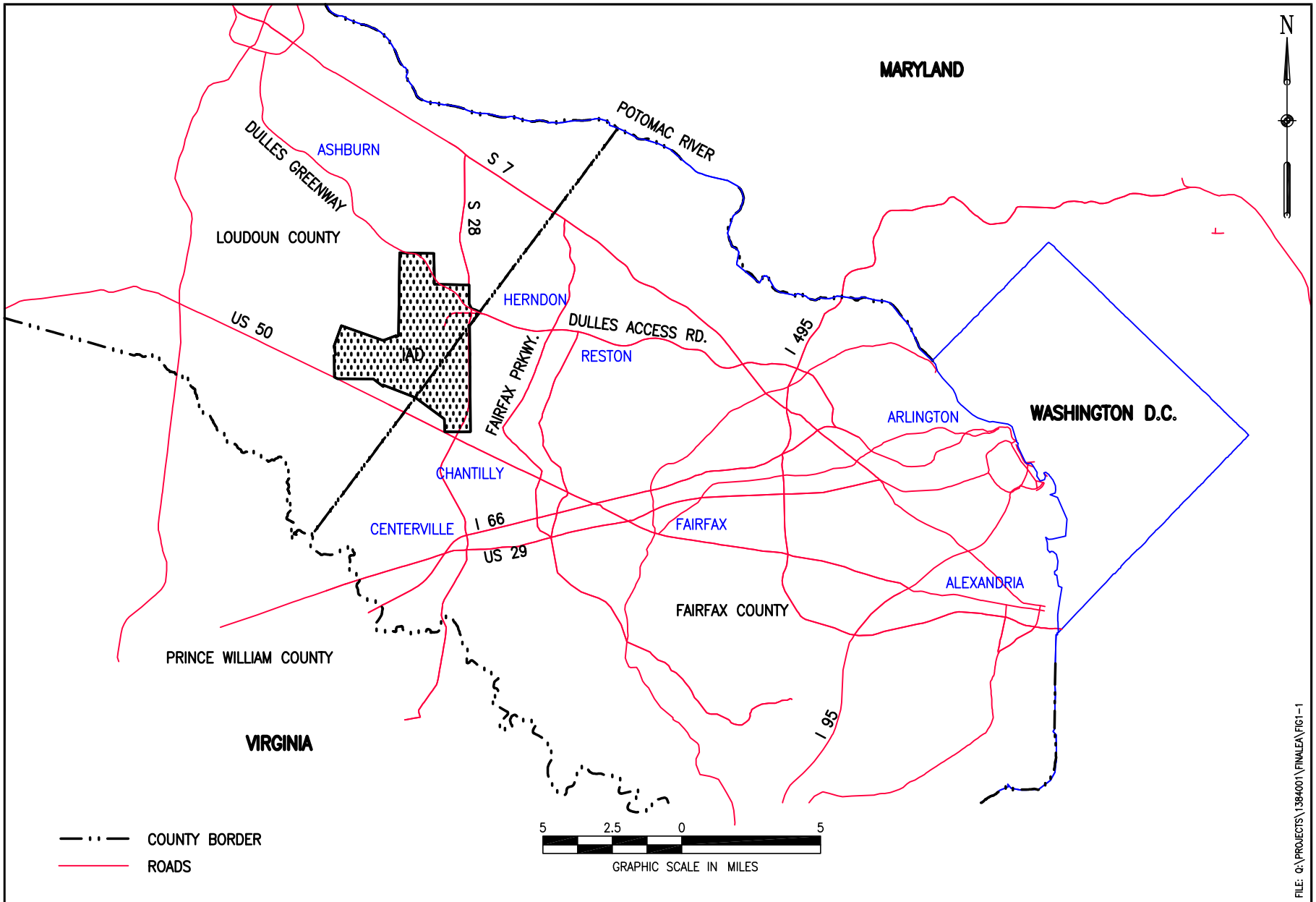
The airport site comprises approximately 11,000 acres. Three thousand acres are located in Fairfax County and 8,000 acres are located in Loudoun County. The original airport parcel consisted of 10,000 acres, and an additional 870 acres (approximately) were acquired between 1989 and 1999. Approximately 5,000 acres are used for existing airport operations.

The location of the proposed action, Tier 2 and related projects, is the area south of Concourse B between the parallel runways (Figure 1-2). The Region Of Influence (ROI) for evaluating impacts related to the proposed action includes the project area and a 2-mile-wide area around the IAD airport boundary (Figure 1-3).

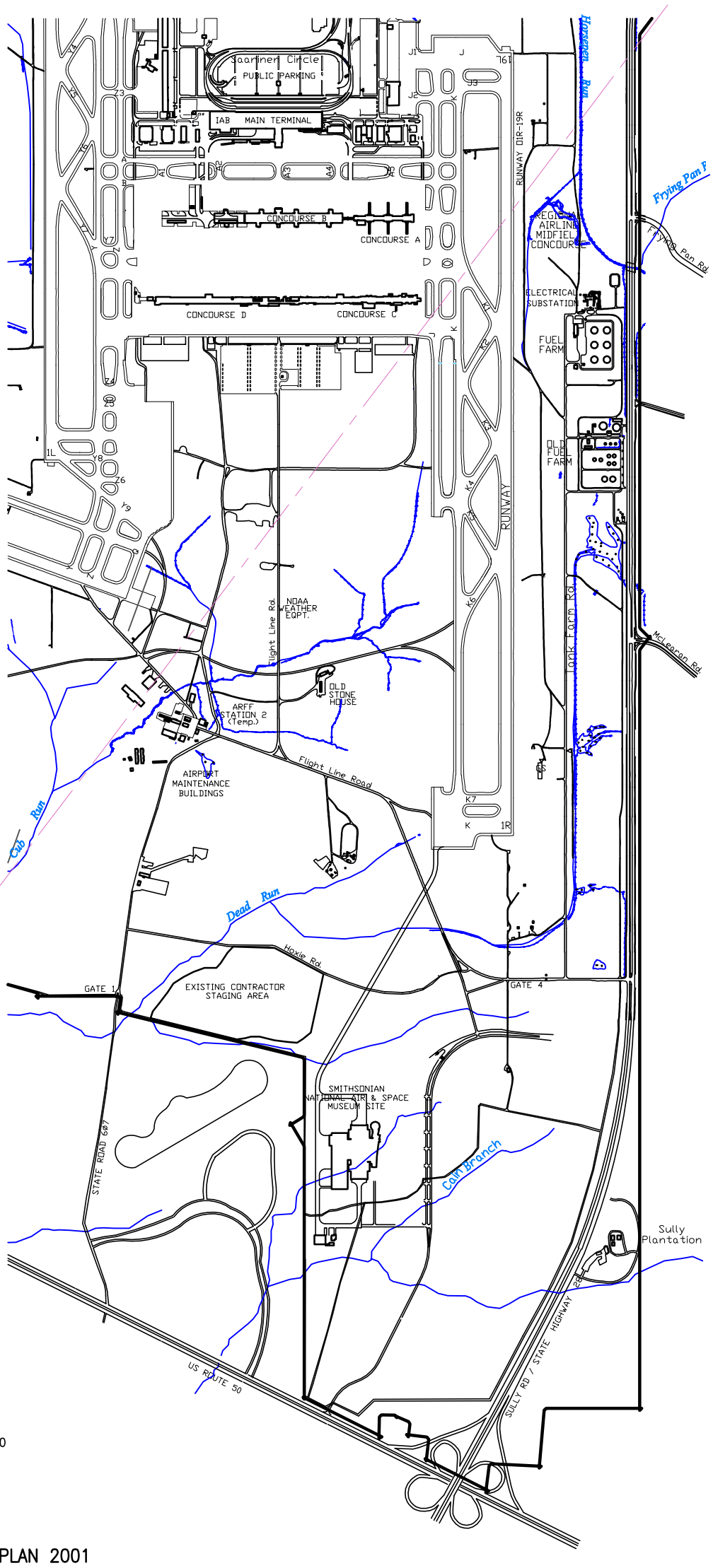
This chapter provides an overview of the planning and management of Washington Dulles International Airport. In addition, it provides a project description, purpose and need, requirements for assessment and proposed federal action, time frame, location and setting, airport activity and forecasts, and applicable statutes and regulations. A glossary of aviation and environmental terminology is provided in Appendix A.

1.1 Overview. Washington Dulles International Airport was opened in 1962. Until June 7, 1987, IAD was operated by the U.S. Department of Transportation (DOT), Federal Aviation Administration (FAA). Under a long-term 50-year lease, the airport was transferred to the Authority. The airport lease with the U.S. Government was authorized by Congress under the Metropolitan Washington Airports Act of 1986.

The preparation of an airport master plan for Washington Dulles International Airport was initiated in 1977 and an update was completed in 1985 while the airport was still federally operated. The Authority assumed the responsibility of implementing the plan in its lease. The Master Plan (KPMG Peat Marwick 1985) provides the Authority with a general written guide for the logical, progressive development of the airport. The recommendations in the Master Plan



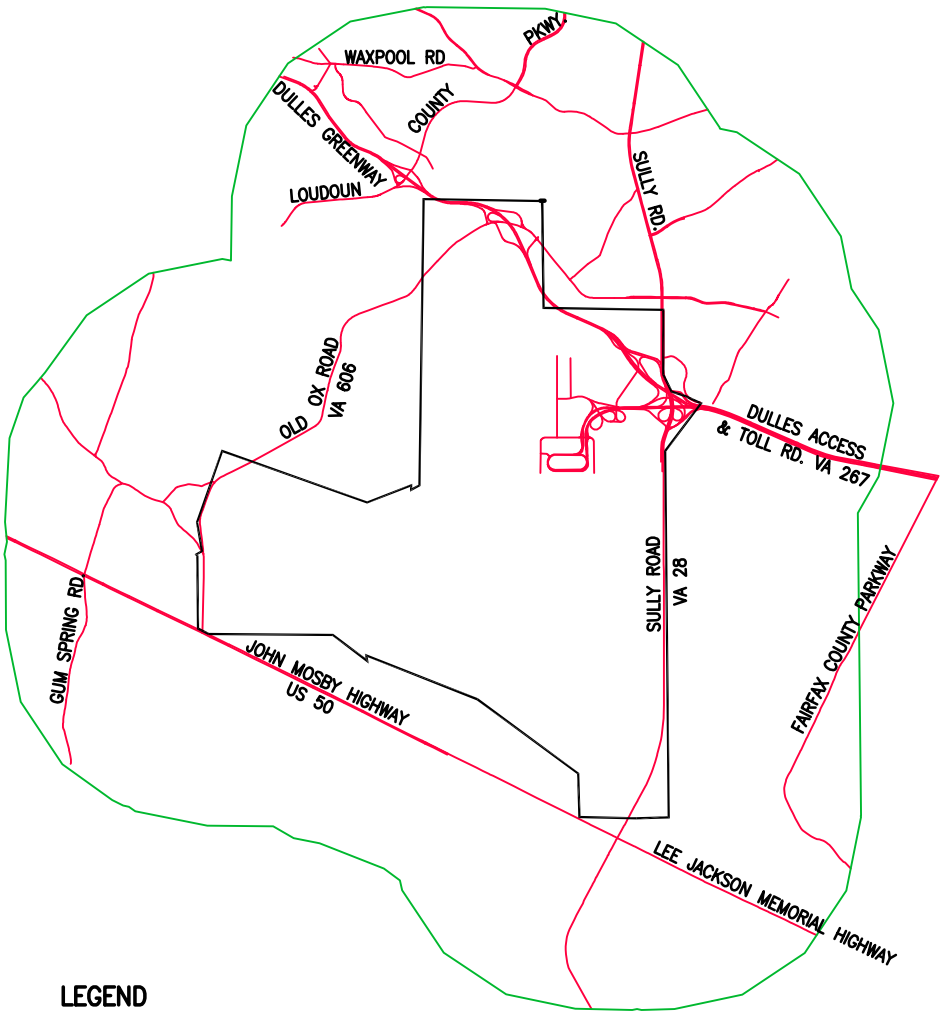
TIER 2 & RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	IAD GENERAL LOCATION MAP	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY WWW	SCALE AS SHOWN	FIGURE 1-1



SOURCE: BASED ON AIRPORT LAYOUT PLAN 2001

FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG1-2

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	TIER 2 PROJECT AREA AT IAD AND EXISTING AIRPORT STRUCTURES	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 1-2



FILE: Q:\PROJECTS\13840011\FINALEA\FIG1-3A

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENTS WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINA	REGION OF INFLUENCE	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 1-3

were influenced by IAD's land envelope, runway configuration and visibility requirements, the presence of the Main Terminal, and future aviation growth and use projections. Recommendations in the Master Plan include development of the midfield terminal/concourse and implementation of an underground people mover system.

The original Main Terminal of the airport was designed by the master architect Eero Saarinen. Thirteen structures on the airport, the mobile lounge system, the runways, the terminal area landscaping, and the Dulles Airport Access Highway meet criteria for listing on the National Register of Historic Places. The Master Plan includes provisions to maintain the architectural quality of the original Saarinen plan.

The airport layout currently includes the Main Terminal and the mid-field concourses (A, B, and C/D). Concourses A, B, and C/D are located south of the Main Terminal and are parallel to and detached from the Main Terminal (Figure 1-2). Passengers are shuttled between the Main Terminal and the concourses via surface vehicles, a mobile lounge ground transportation service run by the Authority. A total of three runways, two north/south runways and one crosswind runway, currently support aircraft activity at IAD.

Vehicular access to IAD is provided by the 16-mile Dulles Airport Access Highway (DAAH) that has two dedicated lanes in each direction and a direct connection to Interstate Route I-66 and the Capital Beltway. The four-lane DAAH extends from Interstate Route I-66 near Falls Church, Virginia inside the Capital Beltway to the terminal area of IAD. This highway serves IAD exclusively. The airport also is accessible via the Dulles Toll Road (Route 267), which runs parallel to and on both sides of the DAAH and serves local, non-airport traffic. There are special exits from the westbound DAAH to the Dulles Toll Road for buses serving the local community. The DAAH is also accessible from State Route 28. The Dulles Greenway is a privately operated toll road 14 miles long that runs northwest from the Dulles Toll Road at Route 28 and extends to Route 15 at Leesburg in Loudoun County.

1.2 Project Description. The Capital Construction Program for IAD includes approximately 67 facility improvement projects which must be evaluated under the National Environmental Policy Act (NEPA). The Tier 2 and related projects that are addressed in this EA are listed in Table 1-1. The projects are grouped into four main categories:

- Tier 2 Concourse
- Automated People Mover (APM) System
- South Utilities
- Support Facilities

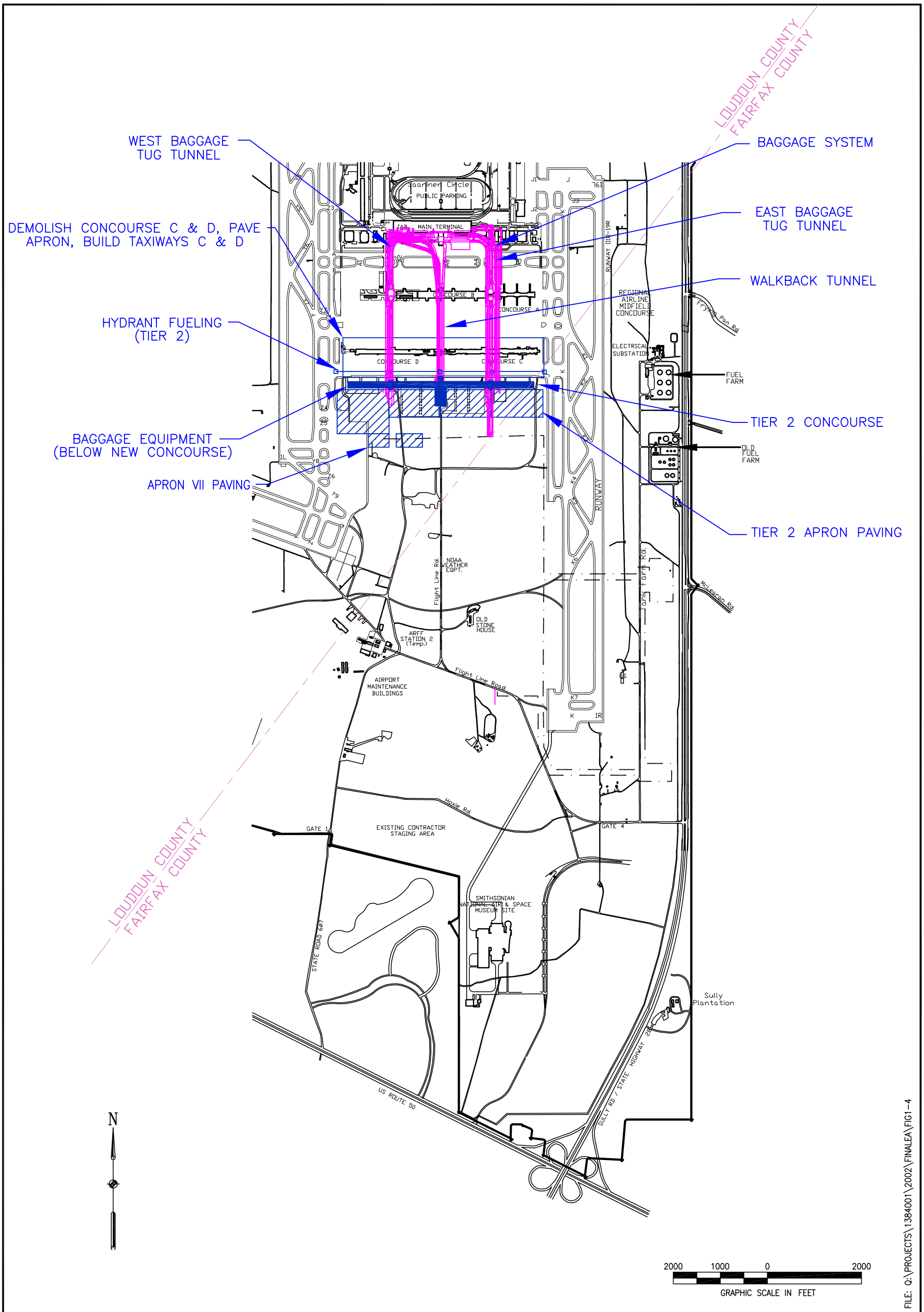
All of these projects are replacement facilities, upgrades, or infrastructure for existing facilities. Collectively, the projects are designed to enhance efficiency, replace temporary structures, or improve the quality of service for passengers using the airport.

TABLE 1-1 TIER 2 AND RELATED PROJECTS: DULLES DEVELOPMENT PROGRAM, WASHINGTON DULLES INTERNATIONAL AIRPORT

TIER 2 CONCOURSE	**Airport Buildings:**	• Tier 2 Concourse • Walkback Tunnel (Tier 2 to Tier 1) (Phase II) • Baggage Tug Tunnels • Baggage Conveyor Tunnels to Tier 2 • High Speed Conveyor Baggage System (Main Terminal to Tier 2) • Tier 2 Baggage Equipment
	Airfield Facilities:	• Demolish Old C/D Concourses, Repave Apron and Taxiways C/D • Tier 2 Apron Paving • Hydrant Fueling for Tier 2 • Apron VII Paving
AUTOMATED PEOPLE MOVER SYSTEM	**Airport Buildings:**	• International Arrivals Building (IAB) People Mover Stations, Tunnels and System • Concourse B Bldg. Adaptations for IAB People Mover (Tier 1) • People Mover – Main Terminal to Concourse B • Concourse B Bldg. Adaptations for People Mover • People Mover – Maintenance Facility and Service Tunnel • People Mover – Tier 1 to Tier 2 • APM Tunnel and Station Shell between Tier 2 and APM Vehicle Maintenance Facility • Security Mezzanine & Main Terminal People Mover Station, Pkg. 6
SOUTH UTILITIES	**Airport Buildings:**	• South Utility Building, Phase I
	Utility Systems:	• Stormwater Management Facilities, Tier 2 Projects • Utility Tunnel • Expanded Water Storage • Dominion Virginia Power (DVP) Substation and Distribution Center
SUPPORT FACILITIES	**Other:**	• Soil Stockpile Area

1.2.1 Tier 2 Concourse and Related Projects. A layout plan for the proposed Tier 2 Concourse and associated systems is provided in Figure 1-4. An architectural rendering of the proposed Tier 2 Concourse after the C/D concourse is removed is depicted in Figure 1-5.

Tier 2 Concourse: The major component of this program is the construction of a new concourse to replace the existing Concourse C/D. The existing C/D midfield concourse was constructed



FILE: Q:\PROJECTS\13840001\2002\FINALEA\FIG1-4

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	TIER 2 CONCOURSE PROJECTS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 1-4

Figure 1-5. Architectural Rendering of Proposed Tier 2 Concourse.

between the 1980s and late 1990s and is leased primarily to United Airlines. It has neither the necessary space nor appropriate updated passenger amenities to serve present-day or future needs of the airlines. The proposed project will be the construction of a permanent midfield concourse in accordance with the Master Plan (known as the Tier 2 Concourse) approximately 700 feet (ft) south of the existing Concourse C/D. Upon completion of Tier 2, existing Concourse C/D will be demolished.

The Tier 2 Concourse will be a three-level structure with full basement, apron, concourse, and partial roof levels. It will be approximately 4,000 ft in length and 140 ft in width. There will be a Sterile Mezzanine corridor with moving sidewalks to carry arriving international passengers who have not cleared customs to the Federal Inspection Services (FIS) area. Also included will be airline roof-level clubs and underground APM stations. The completed structure will have an architectural character and finish compatible with Concourse B, which was opened in 1998.

The Tier 2 Concourse will provide 44 aircraft gates to accommodate up to 22 wide-body aircraft and 22 narrow-body aircraft. The wide-body gates will be connected to the Sterile Mezzanine corridor for international arrival passengers. There will be vertical circulation elements connecting to the three APM stations and pedestrian walkback tunnel below the tier.

Most of the existing gates in Concourse C/D will continue to be used until Tier 2 construction is completed. Following completion of the Tier 2 Concourse, Concourse C/D will be removed and the area repaved as well as repaired to adjust the dual taxilane alignments between Tier 2 and Concourse B. No new structures will be built at the Concourse C/D location.

Tier 2 Baggage Tug Tunnels and Conveyor Systems: The Tier 2 Concourse will include six baggage zones at the apron level where tug trains will pick up baggage to outbound flights and deliver baggage from incoming flights. Two independent tunnels, a conveyor tunnel and a tug tunnel, will be constructed on the east side between the Main Terminal and Tier 2, and a tug tunnel will be constructed on the west side connecting to Concourse B and the Main Terminal. The conveyor tunnel will handle high volumes of baggage on conveyors moving at speeds up to 750 feet per minute (fpm). Eight high-speed (750-fpm) conveyors will be installed connecting baggage rooms in the east basement of the Main Terminal to the basement of the Tier 2 Concourse. The east tunnel alignment will parallel the east loop of the APM and will be threaded around the APM right-of-way at its eastern Tier 2 Concourse station. The design and location of the tunnels will include provisions to allow them to be extended to the south for connection to future concourses. The tunnels will be constructed using mostly tunnel boring equipment beneath operating surfaces and buildings, and by "cut and cover" methods in other areas.

Tier 2 Walkback Tunnels: In addition to the APM tunnels, there will be a separate pedestrian tunnel (Walkback Tunnel) from Concourse B to the Tier 2 Concourse. The Pedestrian Walkback Tunnel from the Main Terminal to Concourse B is now under construction. This project will extend that tunnel from Concourse B to the proposed Tier 2 Concourse between the centers of each concourse. An artist's rendition of the Pedestrian Walkback Tunnel is provided in Figure 1-6.

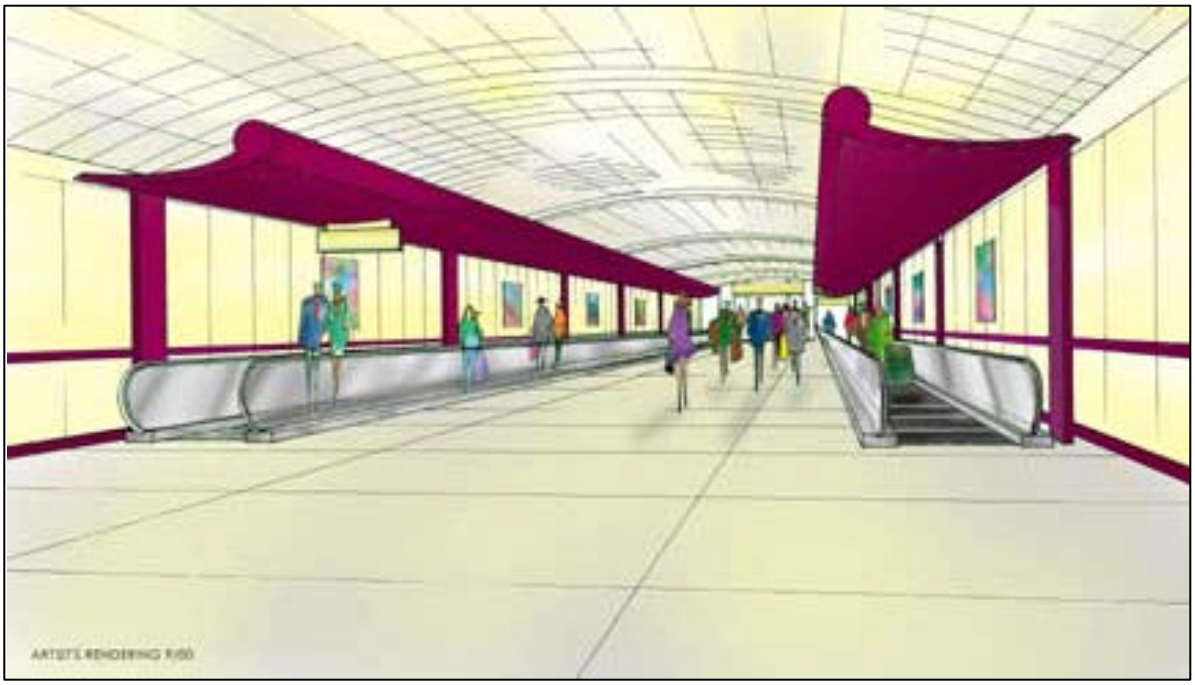


Figure 1-6. Artist's Rendition of Pedestrian Walkback System.

The Walkback Tunnel will provide passengers an alternative to the APM system for reaching or exiting the Tier 2 Concourse. The size of the rough tunnel will be approximately 40 ft in width by 27 ft in height. The finished tunnel will contain a two-way moving sidewalk, signs, lighting, a fresh-air system, and a fire protection system. Vertical circulation to the concourse level of Tier 2 will include two elevators, two sets of escalators, and a stairway. The vertical circulation element will be constructed using cut and cover methods.

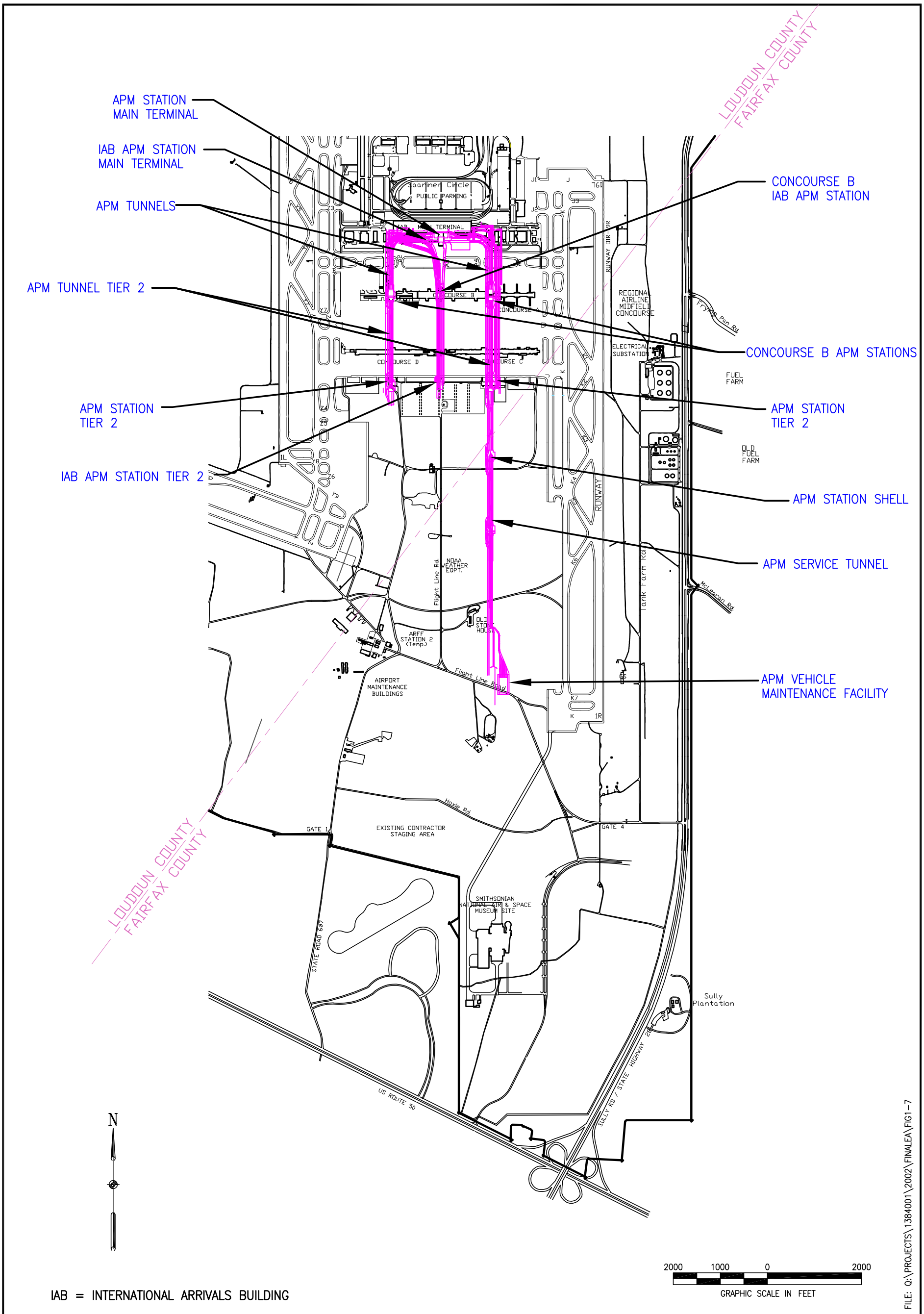
Apron VII Paving: The apron southwest of the new Tier 2 Concourse will be initially used for remote aircraft parking. The apron will be approximately 825 ft long by 225 ft wide (approximately 4 acres). The project includes the placement of underground piping, duct banks, and tunnels beneath the apron to permit potential future extension of utilities, fueling systems, baggage, and other services to the south without having to disturb the apron for construction.

1.2.2 Automated People Mover (APM) System. A new underground system for moving people between concourses and the Main Terminal will be constructed to replace the existing mobile lounge vehicles. This system, known as the Automated People Mover or APM, will consist when complete of a total of 6 miles of new tunnels and associated stations, vertical connections to the Main Terminal and each concourse, and a maintenance facility. Two separate APM systems will be constructed as part of the proposed Tier 2 project: one for domestic passengers and one for arriving international passengers. A layout plan for the proposed APM system is provided in Figure 1-7. The APM will provide passengers a more modern, timesaving, and convenient means of transportation to the airline gates. It will handle higher volumes of passengers more rapidly and directly, and will reduce vehicular traffic on the airfield by substantially reducing the number of mobile lounges in use.

Three APM stations (two domestic and one international arrivals station) will be located at convenient points along the concourses to minimize walking distances to gates. A sketch of a proposed APM station is shown in Figure 1-8. The system will consist of tracks (guideways), trains, support hardware and software. The APM system will be a 750-volt, DC-powered set of trains consisting of four cars for the domestic APM system and two cars for the international APM system. The APM system is designed to allow for services to the existing Concourse C/D, and eventually to Tier 2 and to additional concourses in the future. Before Tier 2 is built, the APM will serve Concourse C on the east side of the Airport.

1.2.2.1 Domestic APM System. The construction phase of the domestic APM system will include the connection from the Main Terminal to Tier 2 and the extension of the eastern track alignment to an APM Vehicle Maintenance and Storage Facility (VMF). It will consist of an underground dual-track system and will be constructed primarily by tunneling under the paved areas between the Main Terminal and Concourses B and C/D. In areas that are not paved south of Tier 2, the system will be constructed using cut and cover methods; where appropriate, tunneling will be used in areas that are currently paved. Ancillary support systems will include escalators, elevators, and stairs to provide connections between the concourse level and the stations.

Concourse B Building Adaptations for the APM at Tier 1 (Concourses A and B): Two expansions will be made at Concourse B above the APM stations. The locations are identified in Figure 1-7. The west expansion will be constructed between a planned four-gate addition and



IAB = INTERNATIONAL ARRIVALS BUILDING

FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG1-7

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	AUTOMATED PEOPLE MOVER (APM) PROJECTS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 1-7

Figure 1-8. Artist's Rendition of Automated People Mover Station.

the planned West Expansion of Concourse B. The other will be constructed between Concourse A and Concourse B. The project includes APM vertical circulation, and escalators, elevators, and stairs to the concourse. There will be concession space and public circulation space.

People Mover Stations and Tunnels:

- Main Terminal to Concourse B

The initial portion of the APM system will be constructed from the Main Terminal to existing Concourses A and B. Four tunnels will be bored or mined underground and will include two stations, power, command and control systems, and vehicles. Each tunnel will have two guideways for trains to carry passengers to and from the Main Terminal. Vertical APM circulation cores will be constructed from the stations, and will include escalators, elevators, stairs, and concession and public circulation space.

- Concourse B to Tier 2 Concourse

The second portion of the APM will be constructed between Concourse A and B (Tier 1) and the proposed Tier 2 Concourse C/D. The two-track train system will be tunneled under the existing pavement and Concourse C/D to carry passengers to and from the Main Terminal and Concourses A and B. Vertical APM circulation cores will be constructed and will include escalators, elevators, stairs, and concession and public circulation space. Each station will be approximately 200 ft long by 160 ft wide by 35 ft high with center and side platforms.

- APM Station Shell between Tier 2 and APM Vehicle Maintenance and Storage Facility (VMF)

An extension of the east leg of the APM system will be constructed between the Tier 2 Concourse and the VMF described below. This project will include a shell for an APM station located between Tier 2 and the VMF. The shell will be constructed to facilitate connection of the APM service to a future concourse without disruption to the APM operation. This extension will be only on the east side of the system from Tier 2.

- Vehicle Maintenance and Storage Facility (VMF) and Service Tunnel

The VMF will consist of an APM car maintenance and servicing building, a storage yard for idle cars along the west side of the building, and a car wash system. There will be an access point for entering and exiting the system at ground level and to introduce the APM cars into the system. There will be approximately nine work bays, each with a below-grade pit. Two of the bays will be equipped with overhead cranes. The car wash will allow for cleaning the inside and outside of up to five cars as well as an exterior area for washing two cars. The VMF will be the southern terminus of the APM system east leg.

1.2.2.2 International Arrivals Building (IAB) APM System. The APM system for international arrivals will include the connection from Tiers 1 and 2 to the IAB. Arriving international passengers will remain separate from domestic passengers and the general airport population until they have completed processing to enter the United States. The IAB APM stations will be located at the center of the concourses, and passenger waiting areas on the station platforms will be separated from the train boarding areas. Elevators, escalators, and stairways will link the IAB APM station with the international arrivals sterile corridor.

Concourse B Building Adaptations for the IAB APM: Concourse B will be modified to provide a direct connection between the international gates on the concourse and IAB next to the Main Terminal. These modifications will include vertical circulation elements at the gates, construction of a roof level sterile corridor, and a vertical circulation core at the middle of the concourse to a new underground IAB APM station.

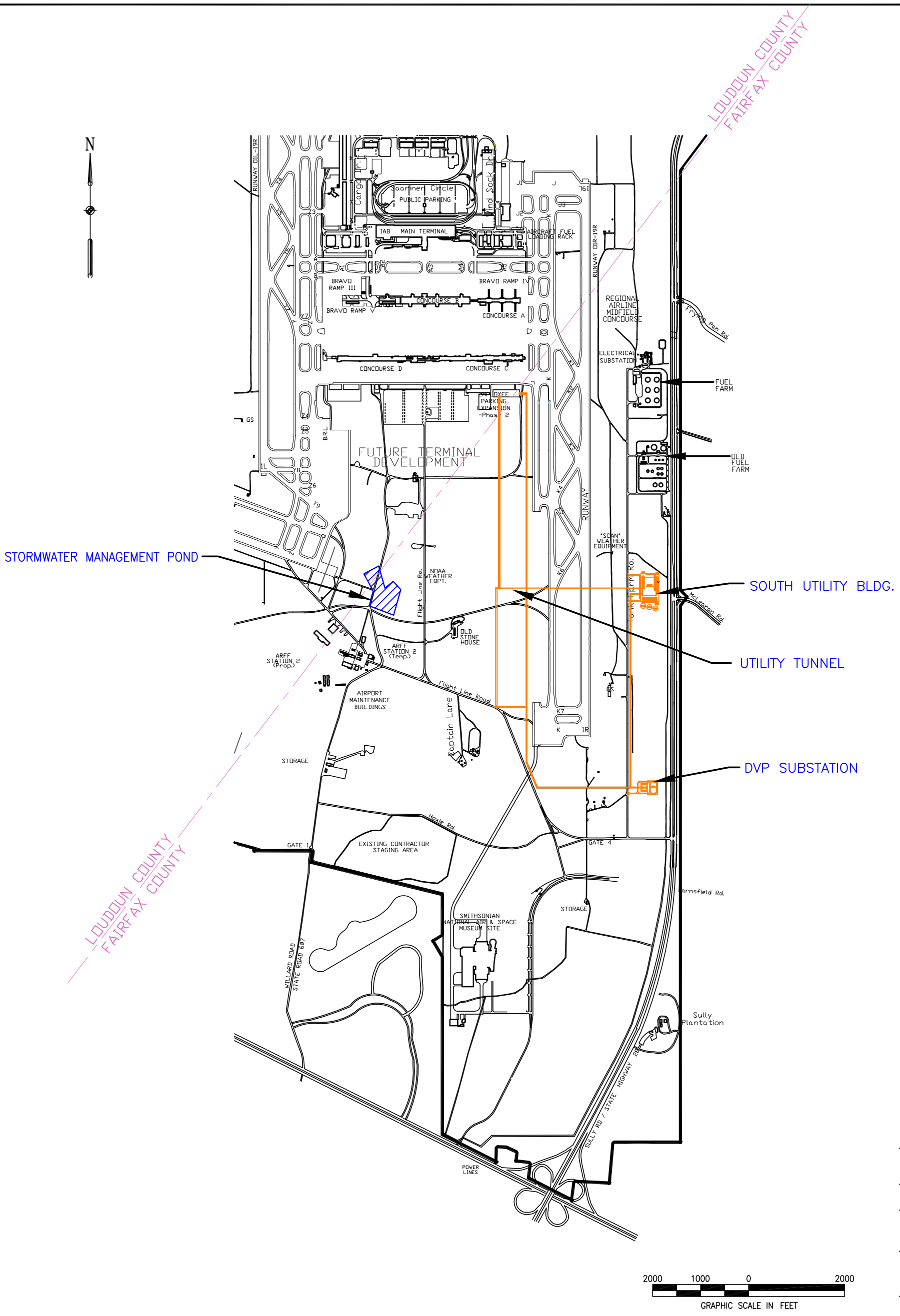
1.2.3 South Utilities. A series of utility improvements and additions will be made southeast of the proposed Tier 2 Concourse. These improvements include a new South Utility Building (SUB), expanded water storage, a Dominion Virginia Power (DVP) substation, utility tunnels, and stormwater management systems. A layout plan for the proposed South Utilities structures and tunnels is provided in Figure 1-9.

South Utility Building: The SUB will be equipped to serve the Tier 2 projects; however, the building itself will be large enough to accommodate equipment necessary to serve future expansion. A 170,000-ft^2 building will be constructed and fitted initially with five 2,500-ton chillers with their associated cooling towers, three high temperature hot water (HTHW) generators with a capacity of 70,000,000 Btu output, and two 5,000,000-gallon above-ground thermal storage tanks. The ultimate build-out of the plant is projected to include 13 chillers and 6 HTHW generators, one of each being standby units. This will supply 30,000-35,000 tons of cooling, including up to 10,000,000 gallons of chilled water thermal storage in two above-ground tanks. The HTHW generators will be natural-gas-fired HTHW generators, each with a capacity of 70,000,000 Btu output. The chilled water and HTHW will be distributed through a new utility tunnel running north from the building up to Tier 2, with planned connection points for future facilities to the south.

Utility Additions and Expansion: A new Dominion Virginia Power (DVP) substation and south airport distribution center will be constructed. Additional transmission conductors from DVP will be provided to meet the demand of the new airport development from Tier 2 south. The new DVP substation will serve the south airport distribution center, which will be located north and adjacent to the South Utility Building. Tier 2 will be supplied with medium voltage via two separate concrete encased ductbanks from the distribution center.

All new facilities will be supplied with sewer, water, gas, electricity, and telecommunication systems. The sewer, gas, and water trunk lines will be extended from near the new Aircraft Rescue and Fire Fighting (ARFF) station. These will be extended to Tier 2 and subsequent development southward as required. A new 24-ft-wide by 15-ft-high underground utility tunnel will be constructed from the SUB west to the Tier 2 projects. This tunnel will contain the heating and cooling piping for Tier 2 and future tiers. A workman's walkway will be included along with ventilation system, lighting, and a fire suppression system.

Expanded Water Storage: A new domestic water supply and distribution system will be constructed adjacent to the SUB for Tier 2 and future development south of Concourse B. The new 4,000,000-gallon storage facility and pump system will be supplied from the ARFF station. This water will be distributed to new development via a new water line parallel to Taxiway J terminating at Tier 2.



FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG1-9

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	SOUTH UTILITIES PROJECTS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 1-9

Stormwater Management Facilities: One stormwater management facility will be constructed to provide capacity for the Tier 2 projects. This facility will be needed to handle the increased volume and pollutant load from the additional impervious areas to be constructed under this phase of airport construction. The structure will be a dry detention pond lined with grass, and will have a capacity of approximately 52 acre-feet. This pond will initially be a temporary structure, but may be converted to a permanent structure at a later date.

1.2.4 Support Facilities. The Support Facilities include an excess soil storage area that will be approximately 90 acres in size. The location for the proposed stockpile area is provided in Figure 1-10.

Soil Stockpile Areas: A temporary storage area for excess soil will be necessary for soils removed during construction. The stockpile will provide storage capacity of 3.8 million cubic yards (mcy).

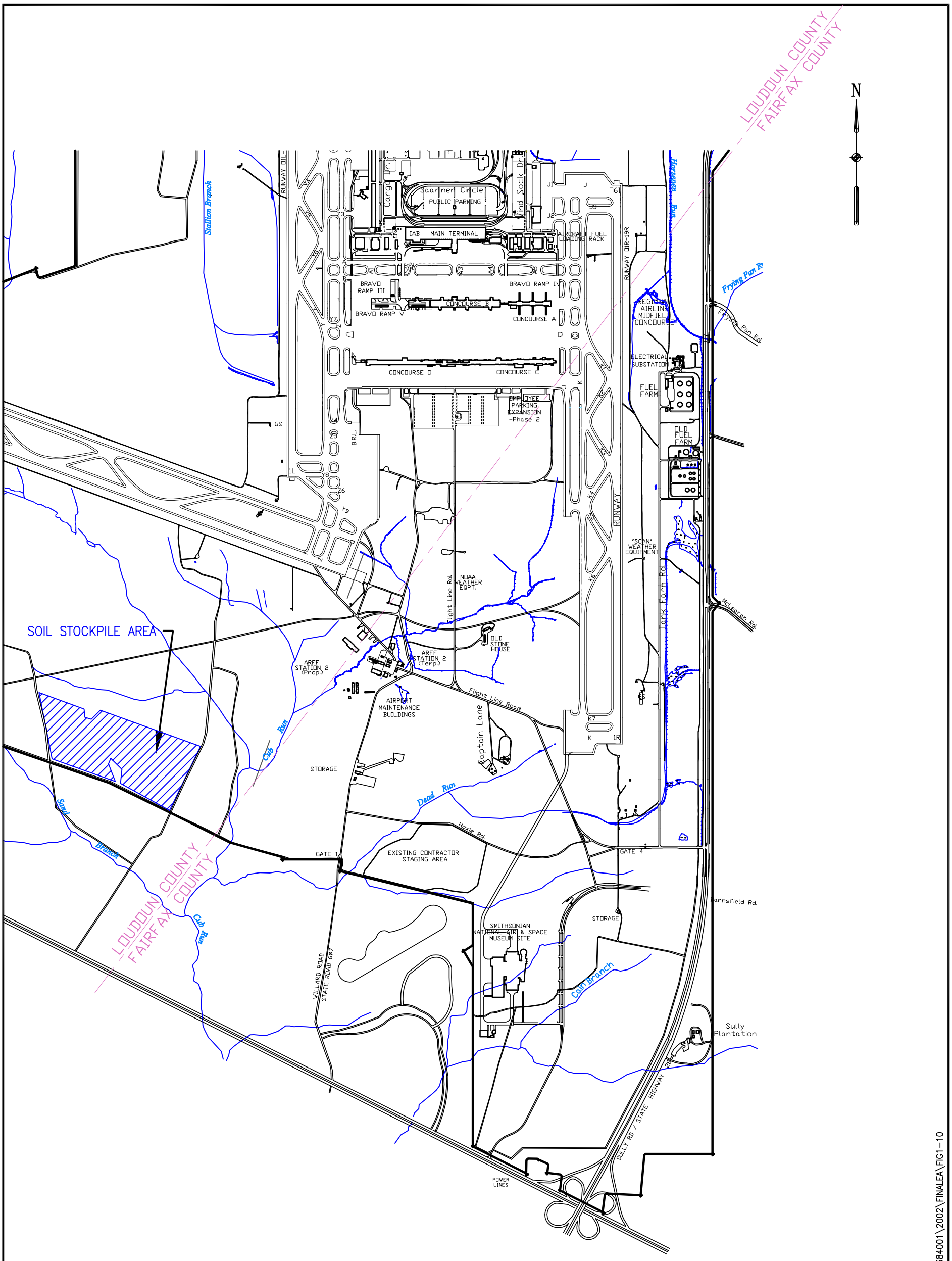
1.3 Purpose And Need. The purpose of the Tier 2 and related projects is replacement of existing facilities and enhancement of services that are currently provided at IAD. While improving the capabilities of the concourse and the ground transportation system, none of the projects is designed to increase this capability beyond the capacity of the existing system of three runways. These projects will better serve the passenger activity that will occur at IAD based on the existing airfield capacity and expected air services at the airport.

Tier 2 Concourse: Concourse C/D was constructed in six separate segments and has been modified numerous times during the past 15 years as a temporary facility. The facility currently has 47 aircraft gates. The actual number of usable gates at a given time is dependent on the size of the arriving and departing aircraft. The predominant airline tenant of Concourse C/D and other airlines have outgrown the temporary facility.

The C/D Concourse has limited space/capacity for comfortable seating, passenger movement, and food, beverage, and retail concessions. With Tier 2, the Authority will provide a modern, updated facility that will improve customer service to its airline tenants (e.g., United Airlines and Star Alliance partners) and passengers. The new facility will be somewhat similar in design to Concourse B, and will provide 44 aircraft gates. The demolition of Concourse C/D will allow for the relocation of Taxiways C and D and will allow them to be used by larger aircraft.

Walkback Tunnel: The Pedestrian Walkback Tunnel is intended to increase and ease movement of passengers between the Main Terminal, midfield Concourse B, and the new Tier 2 Concourse. The Pedestrian Walkback Tunnel will be equipped with moving walkways in each direction that will provide easy access and freedom of movement. The Pedestrian Walkback Tunnel will also provide travelers an alternative to using the automated train system to connect with the concourses and the Main Terminal and allow continued airport operations or a safe passage from the midfield in the event of a breakdown of the APM system. Currently, the mobile lounge service is the only transportation available to passengers traveling between the Main Terminal and the concourses.

Automated People Mover: The mobile lounge service is no longer a practical transport system for the millions of passengers using IAD, particularly given the distances to be served between



FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG1-10

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	SUPPORT FACILITIES	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 1-10

the Main Terminal and Tier 2, the volume of traffic, and the surface congestion. The purpose of the APM is to substantially reduce and eventually eliminate the use of the mobile lounge service. The APM system will provide high volume, high speed, convenient and comfortable rides for passengers and will be more efficient than the mobile lounges. In addition, use of electric power for the APM system will result in lower emissions than the diesel-powered mobile lounges. Use of the underground APM system and reduction or elimination of the mobile lounges will reduce surface/ground traffic on the airfield. APM stations in the concourses will be located to minimize walking distance for travelers. After the APM system is constructed, some flights will continue to be served by the mobile lounges/planemates between aircraft and the main terminal. However, the APM system will serve as the primary passenger transport system at IAD.

IAB Automated People Mover: The purpose of the International Arrivals Automated People Mover System is to provide arriving international passengers who must be kept in a secure environment with the same quality of service provided to domestic travelers. The new international arrivals APM will replace mobile lounge service to the IAB. International arriving passengers transferring to domestic flights will be processed at the Tier 2 Federal Inspection Services (FIS). Remaining passengers will go via sterile corridors and the IAB APM system to the IAB for processing. Train stations will be at the centers of concourses with separate waiting and boarding areas in compliance with Customs and Immigration and Naturalization Service (INS) regulations.

Baggage Tug and Conveyor Tunnels: The purpose of the baggage tug and conveyor tunnels is to substantially reduce surface traffic caused by baggage tugs and to improve baggage handling service between the Main Terminal and the concourses.

South Utilities: The purpose of the south utility projects is to provide utility services to the Tier 2 projects. The new utility building will be designed to accommodate future airport expansion requirements. The North Utility Building serving the Main Terminal and Concourse B cannot be expanded to meet the future demands. The stormwater management basin will accommodate stormwater runoff from new impervious surfaces. The South Utility Building units will replace the rooftop heating and cooling units on Concourse C/D.

Support Facilities: The purpose of the support facilities is to facilitate construction activities for all projects. The soil stockpile area will provide a temporary centralized location for approximately 3.8 mcy of soils excavated from the tunnels and other projects. These materials are planned for re-use on the airport.

1.4 Requirements for Assessment and Proposed Federal Action. This Environmental Assessment has been prepared in accordance with the Council on Environmental Quality "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act of 1969 (NEPA)." NEPA establishes national policy to improve the relationship between humans and their environment, and sets policies and goals to ensure that environmental considerations are given careful attention and appropriate weight in all decisions of the Federal Government.

The Authority's Capital Construction Program includes projects that require an Environmental Assessment in accordance with FAA policy and guidelines. FAA Orders 1050.1D and 5050.4A require the preparation of an Environmental Assessment for the Tier 2 and related projects listed in Table 1-1, including the cumulative effects from these and other projects. Because the Tier 2 projects are replacement facilities, it is not anticipated that the actions will cause significant environmental impacts. However, for facilities that are proposed in areas not previously affected by airport development, there is a potential for impacts to water quality, soils, historic and cultural resources, biotic communities, and wetlands. Thus, preparation of an environmental assessment is required.

1.4.1 Public Review Process For Environmental Assessments. The involvement of the community is a necessary element in the decision-making process of the Environmental Assessment. The public was provided an opportunity to review and comment on the Draft Environmental Assessment.

The comments and recommendations received through state and local review become input to the Environmental Assessment and were reported and appropriately addressed in the FAA's environmental documentation. DOT Order 4600.13 provides for consideration of state and local concerns by either accepting the comments, reaching a mutually agreeable solution with the parties who prepared the recommendations, or providing a timely explanation for not accepting the recommendations or reaching agreement (FAA 1985).

Copies of the Draft Environmental Assessment were distributed to various federal, state, and local agencies and were placed in local libraries and MWAA offices for public review and written comment. A Notice of Availability was issued (via newspaper and local media) to notify the public that the Draft document was available for review and comment. A copy of the public notice is provided in Appendix J. The duration of the public comment period for the draft document was 30 days. The Authority also conducted a public information meeting where project information on the Tier 2 and Related Projects was disseminated to interested parties. Notice of the meeting was issued along with the notice of availability of the Draft Environmental Assessment (Appendix J). The Authority has reviewed, considered, and responded to public and agency comments. Copies of the public and agency comments and responses to the comments for the Draft Environmental Assessment are included in Appendix J.

The Environmental Assessment was revised as necessary as a result of the state and local review process and other input and was submitted to the FAA. Once the FAA has accepted the Environmental Assessment, it will be indicated on the cover page by the signature of the responsible FAA official. The Environmental Assessment will then become a Federal document for which the FAA is responsible (FAA 1985).

1.5 Time Frame. The recent reduction in commercial aviation activity has affected the time that will be needed to implement the proposed action. The Authority has elected to phase the implementation of the proposed action. Some of the projects will begin shortly after completion of the NEPA approval process. These projects include Apron VII, a portion of the domestic people mover system with an interim connection to Concourse C and the utility improvements needed to support these projects. Other projects primarily related to the Tier 2 Concourse,

consisting of Tier 2 itself, the International Arrivals APM, portions of the domestic APM to Tier 2, baggage tunnels, the South Utility Building and the demolition of Concourse C/D are being deferred. The Authority expects to proceed with these projects when circumstances, principally economic, are appropriate. Therefore, all of the projects in the Proposed Action are being retained in this environmental assessment because the Authority expects to proceed with them.

For purposes of impact analysis, an aggressive schedule has been assumed, under which all projects would be completed by 2008. This assumption provides a conservative approach to impact analysis, particularly with regard to the effects of emissions from construction equipment on air quality. It also deals with the eventuality of an early economic recovery in commercial aviation that would enable the Authority to reactivate the projects that are currently on hold. Should there be a prolonged interruption of the schedule, the FAA will reevaluate this environmental assessment to ensure that it remains valid before proceeding with construction of the deferred portion of the proposed action. The approximate project component construction dates corresponding to an aggressive schedule would be as follows:

Tier 2 Concourse (aggressive schedule):
Tier 2 Concourse: 2003-2007
Demolition of Old Concourse C/D: 2008
Apron VII Paving: 2002-2003

Automated People Mover System (aggressive schedule):
Main Terminal People Mover: 2002-2006
Automated People Mover Tunnels: 2003-2005
Automated People Mover System-Wide Installation: 2005-2007
APM Maintenance Facility and Tunnel: 2003-2005

South Utilities (aggressive schedule):
South Utility Building: 2003-2005
Utility Tunnel From South Utility Building: 2003 – June 2005
Electrical Substation and Distribution Center: 2003-2004
Expanded Water Storage: 2003-2004

Support Facilities (aggressive schedule):
Soil Stockpile Area: 2002-2007

1.6 Current Airport Operations. IAD, which occupies 11,000 acres and has three runways, serves primarily medium to long haul markets. Daily nonstop service is provided from IAD to 80 cities nationwide and there is direct service to 28 international destinations. Passenger traffic increased 56 percent from 1996, to 20.1 million passengers in 2000, with more than 4.2 million passengers on international flights. United Airlines maintains a major domestic hub and European international gateway operation and accounted for approximately 42 percent of domestic and international enplanements at IAD in 2000. Airlines serving IAD are noted in Table 1-2.

TABLE 1-2 AIRLINES SERVING IAD[1]

Majors/Nationals	Foreign Flag Carriers	Regional/Commuters	All-Cargo Carriers
AirTran Airways	Aeroflot	Allegheny	Airborne Express
American Airlines	Air Canada	Chautauqua	Emery Worldwide
Atlantic Coast	Air France	Colgan	Federal Express
Continental Airlines	All Nippon	Continental Express	Mountain Air Cargo
Delta Air Lines	Austrian Airlines	Piedmont	United Parcel Service
Midwest Express	British Airways	Skyway	
Northwest Airlines	British Midland	Trans States	
Sun Country	BWIA West Indies		
Trans World Airways	Ethiopian Airlines		
United Airlines	Korean Air		
US Airways	Lufthansa German Airlines		
	Sabena		
	SAS		
	Saudi Arabian Airlines		
	Spanair		
	Swissair		
	TACA International Airlines		
	TransMeridian		
	Virgin Atlantic Airways		

[1] As of May 2001.

The 16-mile Dulles Airport Access Highway provides a four-lane dedicated highway with direct connections to Interstate Route I-66 and the Capital Beltway. Currently, public parking for more than 23,000 vehicles is available in a new garage, and a variety of surface lots. A second new garage under construction will provide an additional 4,800 parking spaces near the Main Terminal. The Washington Flyer Express Bus provides service between IAD and the West Falls Church Metrorail station, and Washington Flyer Taxicabs provide exclusive taxicab service to and from the Main Terminal. Eight rental car companies operate at IAD: Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, and Thrifty.

There are more than 50 shops and restaurants located throughout the Main Terminal and the Concourses. Mobile lounges and planemates transport passengers between the Main Terminal and the concourses, which have 120 airline gates. For general aviation, Signature Flight Support and Piedmont Hawthorne Dulles serve as Fixed Base Operators. Approximately, 15,400 people are employed at IAD, and the airport generates approximately $4.1 billion in business revenues for the regional economy (Source: www.mwaa.com).

1.7 Airport Activity and Forecasts. Aircraft operations are expected to increase based on the current projections and demand for service. Airport activity data and demand forecasts used in this Environmental Assessment are based upon activity forecasts prepared in October 2000 (HNTB 2000) and approved by FAA in November 2000 as the basis for future Federally funded capital improvements, and future benefit-cost and environmental analysis. Aviation forecasting recognizes that temporary downturns and upswings may occur during the forecast period. In the past, aviation activity has undergone significant, although temporary, reductions in response to economic downturns or security events such as the Persian Gulf War, but has recovered. The

proposed Tier 2 projects are not driven by forecasts of demand, and they are only designed to provide a quality of service at IAD commensurate with the capacity of the existing airfield. The service efficiency achievable through the APM system is needed even for the existing level of activity.

Projections for aviation activity in the year 2007 are provided in Tables 1-3 through 1-6. Actual data for 1999 through 2001 are also provided.

An aircraft operation is defined as a takeoff or landing. A summary of actual and projected aircraft operations for commercial aviation (air carriers and cargo), general aviation and military aviation at IAD is presented in Table 1-3. Total aircraft operations were 465,915 in 1999, and have been forecast to increase to 636,092 in 2007, an average annual increase of 4.0%. However, operations actually decreased 2% in 2000, and then fell an additional 13% in 2001. Although the events of September 11, 2001 have caused a slowdown in Dulles activity and in the schedule for project implementation, growth is expected to resume. The level of activity forecast for 2007 may not be realized until 2008 or perhaps later.

TABLE 1-3 SUMMARY OF AIRCRAFT OPERATION PROJECTIONS, WASHINGTON DULLES INTERNATIONAL AIRPORT

	ACTUAL*			**FORECAST***
	1999	**2000**	**2001**	**2007**
COMMERCIAL	393,294	389,314	327,609	570,532
GENERAL AVIATION	64,429	59,417	62,643	57,360
MILITARY	8,192	7,705	6,634	8,200
TOTAL	465,915	456,436	396,886	636,092
notes	a	a	a	b

a. MWAA data.
b. Linear interpolation of forecasts for 2005 and 2010 from HNTB forecast (HNTB 2000).
* Includes arrivals and departures.

Hourly distributions of scheduled passenger aircraft operations are provided in Table 1-4.

A summary of actual and projected passenger volume at IAD is presented in Table 1-5. The number of commercial passengers is projected to increase from 19.7 million in 1999 to 32.5 million in 2007, an average annual increase of 6.5 percent.

Air cargo is defined as metric tons of non-passenger goods that are transported via aircraft. A summary of air cargo projections is provided in Table 1-6. Total domestic and international air freight and air mail is projected to increase from 359,138 metric tons in 1999 to 591,000 metric tons in 2007, an average annual increase of 6.4 percent.

TABLE 1-4 HOURLY DISTRIBUTION OF TOTAL SCHEDULED PASSENGER CARRIER AIRCRAFT OPERATIONS, WASHINGTON DULLES INTERNATIONAL AIRPORT

	Weekday, Actual June 2000[a]			Weekday, Forecast 2007[b]		
Hour	Arrivals	Departures	Total	Arrivals	Departures	Total
0000-0559	10	1	11	12	2	14
0600-0659	8	27	35	5	28	33
0700-0759	11	40	51	20	30	50
0800-0859	59	16	75	75	28	103
0900-0959	15	75	90	24	87	111
1000-1059	44	12	56	67	20	87
1100-1159	16	39	55	25	75	100
1200-1259	57	21	78	77	25	102
1300-1359	25	60	85	36	79	115
1400-1459	39	18	57	80	37	117
1500-1559	38	42	80	40	71	111
1600-1659	80	30	110	103	32	135
1700-1759	21	88	109	34	109	143
1800-1859	41	26	67	84	47	131
1900-1959	27	35	62	29	76	105
2000-2059	66	17	83	72	30	102
2100-2159	21	48	69	25	36	61
2200-2259	17	7	24	18	28	46
2300-2359	9	0	9	13	1	14
Total	604	602	1,206	839	841	1,680

a. From HNTB Aviation Activity Forecast Report (HNTB 2000).
b. Extrapolated from 2000 actual and 2006 forecast.

TABLE 1-5 SUMMARY OF PASSENGER PROJECTIONS, WASHINGTON DULLES INTERNATIONAL AIRPORT

	ACTUAL*			**FORECAST***
	1999	**2000**	**2001**	**2007**
Commercial	19,652,603	19,971,260	17,861,248	32,492,800
General Aviation	81,771	84,257	106,057	**
Military	62,955	49,176	35,014	**
Total	19,797,329	20,104,693	18,002,319	32,492,800
Notes	a	a	a	b

a. MWAA data.
b. Linear interpolation of forecasts for 2005 and 2010 from HNTB forecast (HNTB 2000).
* Includes enplaned and deplaned passengers.
** Not estimated.

TABLE 1-6 SUMMARY OF AIR CARGO PROJECTIONS,
WASHINGTON DULLES INTERNATIONAL AIRPORT
Enplaned and Deplaned Metric Tons

	ACTUAL			FORECAST
	1999	2000	2001	2007
DOMESTIC AIR CARGO				
Air Freight	188,289	189,002	170,170	308,800
Air Mail	55,674	51,963	34,162	93,400
Subtotal	243,963	240,965	204,332	402,200
INTERNATIONAL AIR CARGO				
Air Freight	105,302	132,684	118,025	179,000
Air Mail	9,873	10,199	8,557	9,800
Subtotal	115,175	142,883	126,582	188,800
TOTAL AIR CARGO				
Air Freight	293,591	321,686	288,195	487,800
Air Mail	65,547	62,162	42,719	103,200
Subtotal	359,138	383,848	330,914	591,000
Notes	a	a	a	b

a. MWAA data.
b. Linear interpolation of forecasts for 2005 and 2010 from HNTB forecast (HNTB 2000).

1.8 Applicable Statutes and Regulations.

District of Columbia Regional Airports Authority Act of 1985 and the Virginia Acts of Assembly of 1985 (Chapter 598).
The Metropolitan Washington Airports Authority is a public body politic and corporate, created with the consent of the Congress of the United States by the District of Columbia Regional Airports Authority Act of 1985 (D.C. Law 6-67), as amended, and Ch. 598, Virginia Acts of Assembly of 1985, as amended. Pursuant to a 50-year Agreement and Deed of Lease effective June 7, 1987, as amended, the Authority assumed operating responsibility for Ronald Reagan Washington National Airport and Washington Dulles International Airport upon the transfer of a leasehold interest in the Airports from the federal government to the Authority in accordance with the Metropolitan Washington Airports Act of 1986 (Title VI, P.L. 99-500 as reenacted in P.L. 99-591, effective October 18, 1986, as amended by P.L. 102-240, effective December 18, 1991, and P.L. 104-264, effective October 9, 1996). The purpose of the Authority is to plan, develop, promote, and safely operate both National and Dulles, while striving to improve efficiency, customer satisfaction, and the quality of aviation service.

Airport Improvement Program (AIP) Legislation.
The AIP was initially authorized by the Airport and Airway Improvement Act of 1982. The Act was amended several times and was recodified as Title 49 of the United States Code. The Act's primary objective is to assist with the development of a nationwide system of public-use airports that are adequate to meet the current projected growth of civil aviation. The Act provides funding for airport planning and development projects at airports included in the National Plan of Integrated Airport Systems (NPIAS). The Act also authorizes funds for noise compatibility

planning and for implementation of noise compatibility programs as set forth in the Aviation Safety and Noise Abatement Act of 1979 (P. L. 96-143).

Federal Aviation Administration Regulations.
Title 14, Chapter I – Federal Aviation Administration, Department of Transportation, provides a codification of rules published in the Federal Register by the FAA. The following is a partial listing of Federal Aviation Regulations that relate to the construction and operation of the Airport.

Part 77 – Objects Affecting Navigable Airspace
Part 91 – General Operating and Flight Rules
Part 139 – Certification of Air Carrier Airports
Part 150 – Airport Noise and Compatibility Planning
Part 152 – Airport Aid Program
Part 157 – Notice of Construction, Alteration, Activation, and Deactivation of Airports

The National Environmental Policy Act of 1969.
Public Law 91-190 establishes a broad national policy to improve the relationship between humans and their environment, and sets out policies and goals to ensure that environmental considerations are given careful attention and appropriate weight in all decisions of the Federal Government.

Other relevant statutes and regulations are shown in Table 1-7.

TABLE 1-7 OTHER RELEVANT STATUTES AND REGULATIONS

Federal Aviation Administration (FAA) Orders and Advisory Circulars (AC): • FAA Order 5050.4A – Airport Environmental Handbook • FAA Order 1050.1D – Policies and Procedures for Considering Environmental Impacts • FAA AC 150/5320-5B – Airport Drainage
Federal Regulations and Agreements: • 40 CFR Part 1500 – Council on Environmental Quality Guidelines for the Preparation of Environmental Impact Statements • 1998 Federal Agencies' Chesapeake Ecosystem Unified Plan
Department of Transportation (DOT) Orders: • DOT Order 5660.1 – Preservation of the Nation's Wetlands • DOT Order 5650.2 – Floodplain Management and Protection • DOT Order 5610.1B – Procedures for Considering Environmental Impacts • DOT Order 5610.2 – Environmental Justice in Minority Populations and Low-Income Populations

Executive Orders (E.O.):

- E.O. 11296 – Flood Hazard Evaluation Guidelines
- E.O. 11514 – Protection and Enhancement of Environmental Quality
- E.O. 11593 – Protection and Enhancement of Cultural Environment
- E.O. 11988 – Floodplain Management
- E.O. 11990 – Protection of Wetlands
- E.O. 12088 – Federal Compliance with Pollution Control Standards and the Sikes Act
- E.O. 12898 – Environmental Justice in Minority Populations and Low Income Populations
- E.O. 13045 – Protection of Children from Environmental Health Risks and Safety Risks
- E.O. 13112 – Invasive Species
- E.O. 13123 – Greening the Government Through Efficient Energy Management Energy Conservation and Production Act

Federal Statutes:

- 1990 Clean Air Act Amendments
- Revision to Title 49 U.S.C. 47106(c)(1)(B) (formerly sections 509(B)(5) and (B)(7) of the Airport and Airway Improvement Act
- Airport Noise and Capacity Act of 1990
- Aviation Safety and Noise Abatement Act of 1979
- Noise Control Act of 1972
- The Airport and Airway Improvement Act
- Department of Transportation Act of 1966, Section 4(f) – recodified at 49 U.S.C. 303c
- Farmland Protection Policy Act
- Endangered Species Act of 1973
- Fish and Wildlife Coordination Act
- Sikes Act Amendments of 1974
- Coastal Zone Management Act of 1972, Section 303
- Wild and Scenic Rivers Act
- Clean Water Act of 1977
- Water Quality Act of 1987
- Safe Drinking Water Act
- Floodplains and Floodways Act of 1977
- Pollution Prevention Act of 1990
- Department of Transportation Rules for Transportation of Hazardous Materials
- Resource Conservation and Recovery Act of 1976 (RCRA)
- Historic Sites Act of 1935
- National Historic Preservation Act of 1966, Section 106
- Antiquities Act of 1906
- Archaeological and Historical Preservation Act of 1974
- Archaeological Resources Protection Act of 1979
- 1990 Coastal Zone Management Act Reauthorization
- 1996 Coastal Zone Protection Act

Commonwealth of Virginia Statutes and Regulations:

- Virginia State Water Control Law
- Waste Management Act, Code of Virginia Sections 10.1–1400 et seq.
- Hazardous Waste Management Regulations (9 VAC 20-60)
- Solid Waste Management Regulations (9 VAC 20-80)
- Regulations for the Transportation of Hazardous Materials (9 VAC 20-110)
- Asbestos Removal and Disposal (9 VAC 20-80-640)
- Lead-Based Paint Activities Rules and Regulations (9 VAC 20-60-261)
- Virginia Waterworks Regulations
- Administrative Code for: Fugitive dust emissions (9 VAC 5-50-60 et seq.); Open burning (9 VAC 5-40-5600 et seq.); Cut-back asphalt usage restrictions (9 VAC 5-40-5490 et seq.)
- Erosion and Sediment Control Law and Regulations (VESCL§10.1–5467)
- Stormwater Management Law and Regulations (VSWML§10.1–603.15)
- Chesapeake Bay Preservation Act of 1988
- Chesapeake Bay Preservation Area Designation and Management
- Virginia Coastal Resources Management Program (VCP)
- Regulations for the Control and Abatement of Air Pollution

1.9 Environmental Permits. Permits applicable for construction and operation of the proposed Tier 2 facilities are summarized in Table 1-8. New permits may be issued prior to implementation of the proposed action or existing permits may be modified to include provisions for the proposed facilities.

TABLE 1-8 APPLICABLE ENVIRONMENTAL PERMITS REQUIRED FOR TIER 2 AND RELATED PROJECTS

RESOURCE TYPE	PERMIT TITLE	DATE	STATUS	RESPONSIBLE AGENCY
Wetlands	Virginia Water Protection (VWP) Permit for Activities in Waters and Wetlands of the Commonwealth of Virginia	Application dated March 2002	Draft permit for Tier 2 and Related Projects (July 2002) VWP 02-0249	Virginia DEQ; USACE
Air Emissions	Commonwealth of Virginia Department of Environmental Quality Air Permit	March 2002	New, modified, and revised source permits and State operating permits; includes a Synthetic Minor Permit dated September 23, 1998	Northern Virginia Regional Office of the Virginia DEQ
Stormwater	Virginia Pollutant Discharge Elimination System Permit (VPDES Permit No. VA0089541)	December 1998; expiration date (December 2003)	Pursuant to the Virginia State Water Control Law; a Storm Water Pollution Prevention Plan has been developed and implemented as specified in the permit	Virginia DEQ
Wastewater	Wastewater Discharge Permit (Number 025-5)	December 2000	Specific for industrial wastewater and deicing fluids	District of Columbia Water and Sewer Authority (DCWASA)

2.0 ALTERNATIVES

General. The President's Council on Environmental Quality (CEQ) Regulations require an evaluation of alternatives in documents prepared for NEPA compliance. FAA requirements for the analysis of alternatives are provided in FAA Order 5050.4A (1985) and FAA Order 1050.1D (1986). In general, the greater the degree of impacts, the wider the range of alternatives that should be evaluated. The purpose of the alternatives analysis is to inform decision-makers and the general public of reasonable alternatives that could potentially avoid or minimize impacts or enhance the quality of the environment. Federal regulations also require that the "no action" or "no build" alternative be evaluated. Alternate concourse and people mover configurations were evaluated as planning concepts, but were found not to meet project requirements related to efficiency, passenger convenience, and ultimate capacity. A summary and discussion of the planning concepts for the concourse and people mover alignment is provided in Appendix I-1.

2.1 No Build. IAD continues to rely on Concourse C/D and the mobile lounge surface vehicle system. If the Tier 2 projects are not implemented, IAD will provide a diminishing quality of service to an increasing number of passengers. Concourse C/D presently provides insufficient space and amenities to airlines and their passengers. The aging mobile lounge system will continue to operate, creating surface traffic congestion on the airfield and operational delays. The lounges are diesel powered and contribute air emissions. In addition, the existing mobile lounges and planemates are no longer being manufactured. Contractors can no longer be found to perform the major rehabilitations that would be required to keep this out-dated equipment operating past 2010. The mobile lounge inefficiencies will be magnified as passenger growth continues, and flight departures and arrivals will be increasingly subjected to delays associated with the inability to efficiently transport passengers between their aircraft gates and the Main Terminal. Delays associated with inefficient passenger transport will cause subsequent aircraft arrivals to be delayed, causing aircraft to wait in remote areas of the airfield with their engines idling while awaiting a gate. At-grade transfer of baggage by tug and cart between the concourses and the Main Terminal will also continue with the corresponding surface/ground congestion and air emissions. IAD operations will continue to increase with more passengers, more aircraft, and more automobile traffic. The environmental benefits, efficiencies and service level of high-volume modern systems will not be realized.

United Airlines, in consultation with the Authority, conducted an assessment in early to mid-1999 to determine if existing Concourse C/D could be modified to meet (1) United's then-current needs, and/or (2) United's future needs at IAD. In summary, the assessment determined that modifying existing Concourse C/D to meet even United's 1999 needs was physically and operationally impractical, as well as cost-prohibitive given the relative degree of improvements that could be achieved.

2.2 Proposed Action – Build Alternative. The Proposed Action can be divided into three main interrelated components: (1) Concourses, (2) Automated People Mover, and (3) Utilities. Alternatives for components (1) and (2) have been extensively evaluated in the Airport Master Plan (KPMG Peat Marwick 1985), the Master Plan Update of 1990 and the "Issues Related to the Future People Mover System at Washington Dulles International Airport" (Green Book) 1998 as amended, presented to the Airports Authority Board of Directors – Planning Committee.

The Board of Directors adopted these plans with minor revisions. A complete description of the Build Alternative is provided in Section 1.2.

The minor revisions to these plans include the following:

1. Addition of baggage tug tunnels from the Main Terminal to Tier 2 and Concourse B.
2. Addition of high speed baggage tunnel and equipment from the Main Terminal to Tier 2.
3. Addition of an International Passenger People Mover from Tier 2 to the International Arrivals Building.
4. A single Main Terminal Automated People Mover station instead of two stations.

The baggage tug tunnels were included in the Tier 2 and Related Projects to reduce the surface vehicle traffic from the Main Terminal to the most remote of the tiers. The tunnels are currently being designed to handle diesel tugs. Electric powered and natural gas powered tugs that have lower emissions are also being considered. The high-speed baggage belts from the Main Terminal to Tier 2 will eliminate some tug traffic.

The International Arrivals Automated People Mover will transport international arriving passengers to the International Arrivals Building at the Main Terminal. Combining the international arrival function with the domestic transport function is not practical for the following reasons:

1. International arrival passengers must be kept in a separate environment until they have cleared customs at Federal Inspection Services. Either a car in the APM train or the entire train must be dedicated to the international arriving passenger.
2. The planned domestic APM system does not have the capacity to move both the total number of domestic and international passengers in the peak periods at IAD.
3. If on the same line, the difference in elevation between the IAB people mover station and the Main Terminal people mover station would reduce the overall APM level of service due to the close proximity of the two stations.

The Master Plan presented the concept of two APM stations at the Main Terminal. Subsequent analysis indicated that reaching the platforms through multiple security points would be problematic. A single station platform with a single security mezzanine below the Main Terminal was determined to be the best solution.

2.2.1 Alternative Locations for the South Utility Building. The central feature of the South Utilities projects is the South Utility Building (SUB). The SUB includes three major built components: the building, the cooling towers, and the chilled and domestic water storage tanks. The SUB will provide hot water, chilled water for air conditioning, and a switch gear for electrical distribution and control. Located in close proximity to the SUB will be a new Expanded Water Storage Facility and a new Dominion Virginia Power (DVP) Substation and Distribution Center. A Utility Tunnel will connect the South Utilities to Tier 2.

The purpose of the SUB Phase 1 and associated projects is to provide utility services to Tier 2 projects. The utility system will have the capacity to expand to provide service to subsequent

improvement projects. Four alternative locations were evaluated for the siting of the SUB (Burns and McDonnell 2001) (Figure 2-1).

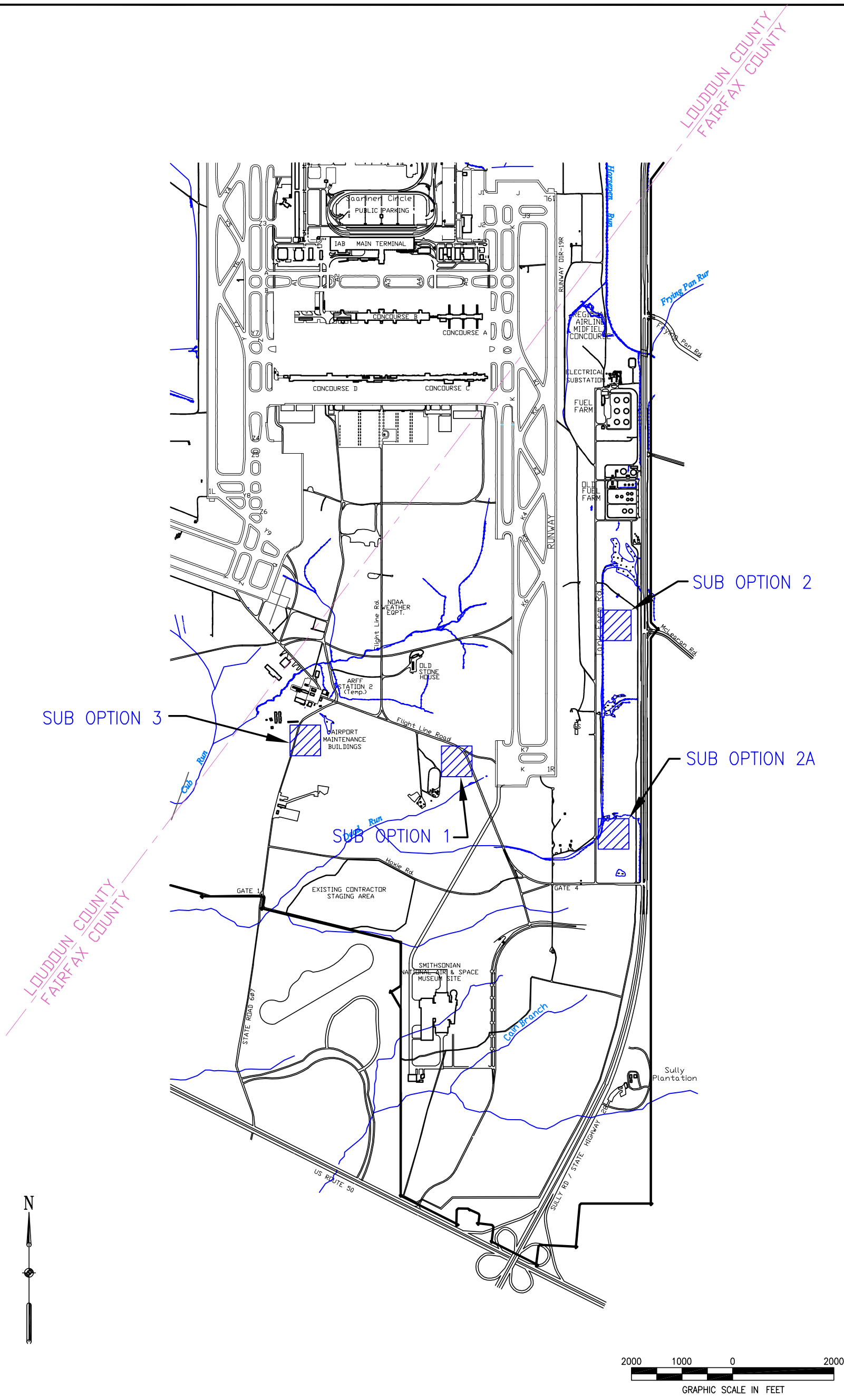
Option 1: The building would be located south of the planned South Employee Parking Lot. This option allowed direct north-south alignment of the utility tunnel to connections with the proposed and potential future concourses. This location could affect prime land area for future airport development. Use of this site could be visually incompatible with future airport development and land use, and would require relocation of a Department of Public Safety training facility. Construction at this site would have minimal impact to air operations. Although the topography is steep and significant grading and earthwork would be required to configure the site, Option 1 was the most cost-effective location for the SUB.

Option 2: The building would be located in the buffer zone approximately 0.4 mile south of the old fuel farm access road on the east side of the airport. This option would require tunneling under the runway and taxiways to minimize impacts to airport operations. Coordination with the planned interchange at Route 28 and McLearan would also be required for this option. This option would result in removal of trees, but would not constrain future airport development. The building footprint would be placed to avoid wetlands on the north side of the site. The trees in this area were planted as a visual buffer and they are harvested for pulp wood on a regular basis. Option 2 is the most expensive location for the SUB.

Option 2A: The building would be located approximately 3/4 mile directly south of Option 2. This option would also require tunneling under the runway and taxiways to minimize impacts to airport operations. Trenching and tunneling could have to be conducted at night when the runway is closed to minimize interference with electronic navigation aids and the runway approach. This option would require removal of woodland. The building footprint would be placed to avoid wetlands on the north side of the site. Option 2A would not constrain future airport development.

Option 3: The building would be located south of the equipment/vehicle storage area and south of the crash/fire rescue station. This option would require construction of an east/west tunnel to join the north/south tunnel of the primary utility tunnel. Use of this site would be expected to have minimal impact on airport operations; however, use of this site could potentially impact future airport land use. Wetland impacts would be expected along several tunnel alignments.

Preferred Alternative: The preferred alternative is to place the South Utility Building at the location of Option 2. A DVP substation would be constructed adjacent to and north of the SUB. This configuration minimizes constraints on future airport development and minimizes wetland impacts associated with utility tunnels and distribution lines.



FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG2-1

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	ALTERNATE LOCATIONS FOR THE SOUTH UTILITIES BUILDING (SUB)	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 2-1

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Noise. Airport noise is dominated by aircraft noise. Airport noise is described by combining information from daily daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) flight operations, types of aircraft using the airport, flight paths and profiles, runway utilization, and information from noise monitoring locations around the airport. This information is used in the Integrated Noise Model (INM) to produce a set of noise contours around the airport that are used to evaluate potential environmental impact and compatible land uses around airports. The INM is distributed by the FAA, and version 6.0a was utilized in this analysis.

The Day-Night Average Sound Level (DNL) measures airport noise exposure levels around airports. The DNL is the annualized 24-hour average sound level, in A-weighted decibels (dBA), obtained after adding a 10 decibel penalty to sound levels occurring between 10 PM and 7 AM. Appendix B contains a detailed description of how DNLs are calculated. Geographic points having the same DNL are connected to form a noise contour, and noise contours of 65, 70, and 75 DNL are mapped. The FAA has defined a significant level of airport noise to be those areas exposed to a DNL of 65 dBA or higher.

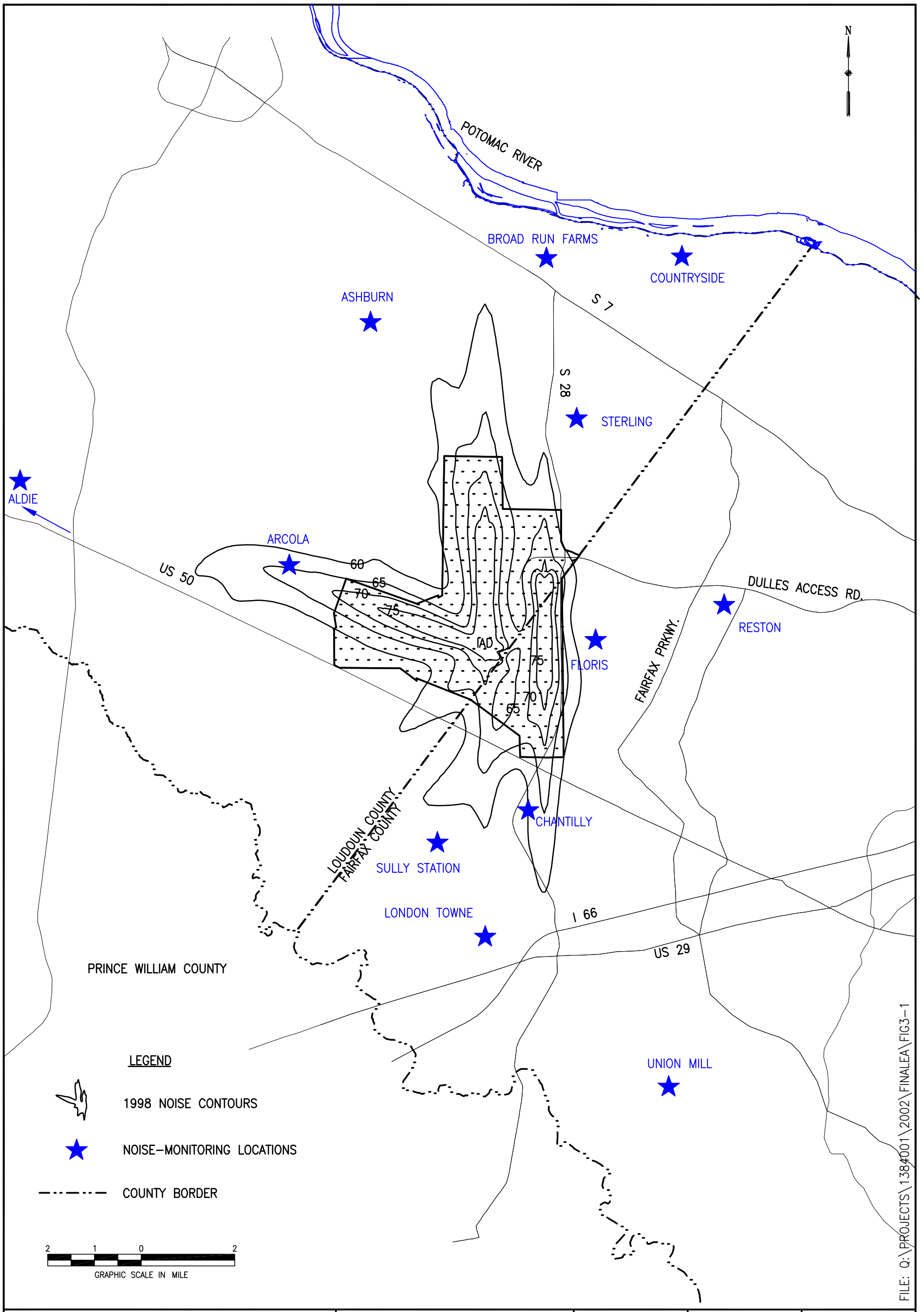
IAD currently operates three runways—runways 1R-19L and 1L-19R, which are parallel and oriented north/south, and runway 12-30, which is oriented northwest/southeast. There are 12 noise monitoring stations that record the sound levels of individual aircraft flying into and out of IAD (Figure 3-1). The noise monitoring stations are located in noise-sensitive areas of the surrounding community and were last changed in 1991 to reflect current flight patterns and population centers (KPMG Peat Marwick 1993b).

A noise analysis was conducted by HNTB (July 2001, Appendix B) in support of the Environmental Assessment for the Tier 2 projects at IAD. The noise contours developed for IAD as part of this study are based on the existing aircraft operations in 1998 and are depicted in Figure 3-2 (HNTB 2001a). The overall acreage of land contained within the 65 DNL contour is 9,197 acres.

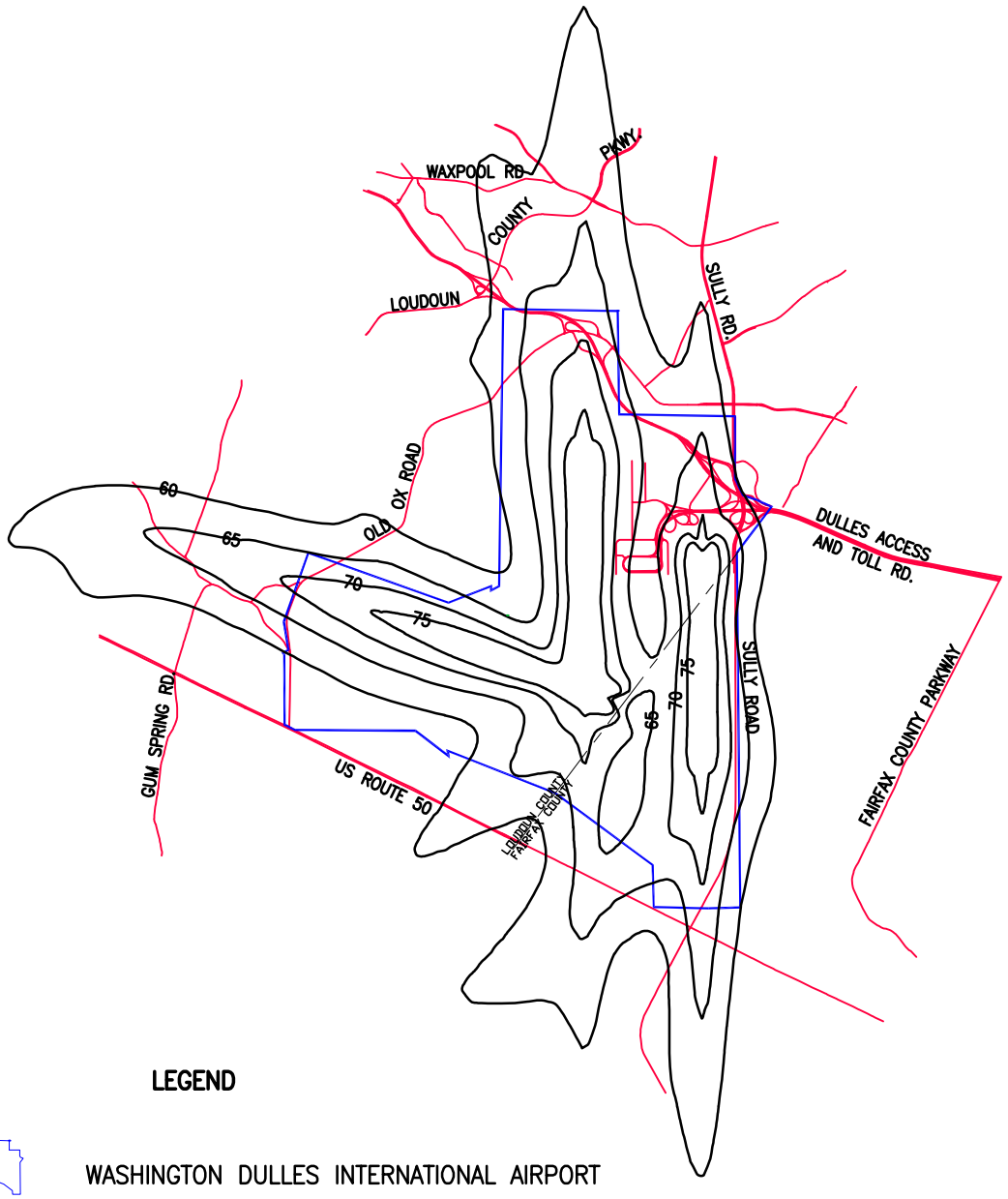
3.2 Compatible Land Use. This section describes the land uses in the Region Of Influence (ROI) around the airport, which encompasses the 65 DNL noise contour and a 2-mile area from the IAD boundaries.

3.2.1 Zoning in Loudoun and Fairfax Counties. The properties adjacent to and surrounding IAD fall under the jurisdiction of Loudoun and Fairfax counties (Figure 1-1). Both counties have recognized the need for heightened awareness of the potential land use conflicts, especially with regard to noise impacts on residential communities, within the immediate vicinity of the airport. Appendix B provides land use compatibility guidelines provided by FAA Order 1050.1D (1986).

Local county authorities retain the jurisdiction to determine land use around the airport. Airport sponsors are encouraged to work with local authorities to ensure that proper zoning and other necessary land use controls are put into place near the airport. This includes the adaptation of zoning laws, to the reasonable extent possible, to restrict the use of land adjacent to or in the



TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT PROJECT LOCATION	LOCATION OF NOISE-MONITORING STATIONS	DRAWN BY WCM	DATE 8-7-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 3-1



LEGEND

WASHINGTON DULLES INTERNATIONAL AIRPORT

1998 NOISE CONTOURS

ROADS

2 1 0 2

GRAPHIC SCALE IN MILES

FILE: Q:\PROJECTS\1384001\FINALEA\FIG3-2

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINA	1998 NOISE CONTOUR MAP	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 3-2

immediate area of the airport to activities compatible with normal airport operations, including the landing and taking off of aircraft.

Both Loudoun and Fairfax counties have implemented specific zoning ordinances that restrict land use in areas around the airport, in order to promote compatibility with airport operations. Development in the immediate area is limited to agriculture, sparse residential, commercial, light industrial, and retail. Therefore, despite the increase in development within the Fairfax/Loudoun county area, that development has occurred largely outside of the areas influenced by the noise contours, as they existed in 1990.

The airport is roughly bounded by U.S. Route 50 to the south, State Route (SR) 606 to the west and north, and Sully Road (Route 28) to the east. The area surrounding the airport is zoned for a variety of uses including agriculture/low density residential, light and heavy industrial, industrial and office parks, and retail/commercial uses as shown in Figure 3-3.

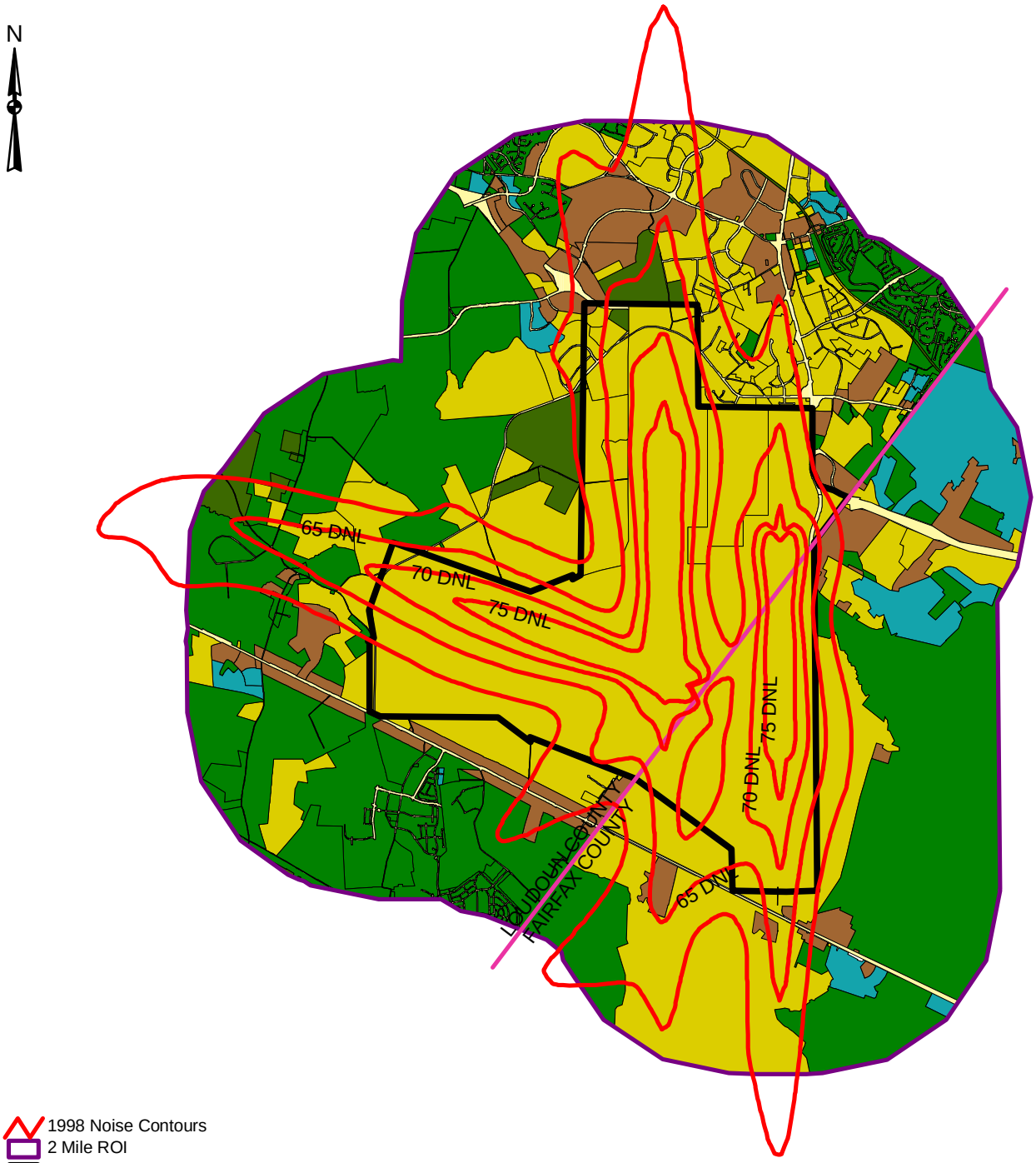
Loudoun County established an Airport Noise Overlay District as part of the Loudoun County Zoning Ordinance. This district defines an Airport Noise and Overflight Impact Area (ANOIA) that imposes development restrictions within specified areas (Loudoun County 2001). These restrictions include public notification of airport impact on residential communities up to 1 mile beyond the DNL 60 contour shown in the Federal Aviation Regulations (FAR) Part 150 Noise Compatibility Program report for 740,000 annual operations (KPMG Peat Marwick 1993a), acoustical treatment of new structures for properties located within the 60-65 DNL range, and the prohibition of new residential and other noise sensitive land uses in areas greater than 65 DNL (Loudoun County 2001).

Fairfax County has also established an Airport Noise Impact Overlay District, largely dictated by the location of the 60 DNL noise contour at IAD. The County's Comprehensive Plan recommends against new residential development inside the County's adopted DNL 60 dBA noise contour. In addition, Fairfax County's Comprehensive Plan recognizes the need to ensure that buildings that will be constructed near the airport will not be so high as to obstruct operations at the airport.

Both Loudoun and Fairfax counties anticipate the future expansion of IAD and continue to discourage future development within areas that may potentially be removed from the 65 DNL if noise contours shrink. Changes in the extent of the noise contours will be considered by the Boards of Supervisors in each county so that appropriate modifications can be made, if necessary, to the applicable planning and zoning documents to reflect the most current definition of the IAD Noise Impact Area to which land use compatibility policies will be applied.

3.2.2 Existing Land Use. The IAD property is owned by the Federal Government and leased to and managed by the Authority.

The area immediately north of the airport is primarily utilized by commercial properties and industrial parks, office buildings, and warehouses. South of and adjacent to the airport property along the Route 50 corridor is the Chantilly Crushed Stone Company, a mining operation that extracts traprock. Agricultural areas are located west of the airport and include a large sod farm



Sources:
Zoning: Loudoun County Office of Mapping and Geographic Information; Fairfax County Office of GIS and Mapping
Noise: HNTB 2001 Draft Report (Based on 1998 Operations)

PROJECTS\13840001\2002\FINALEA\ARCVIEWCD\DULLES.APR

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	NOISE CONTOURS AND ZONING MAP	DRAWN BY WCM	DATE 8-7-02	PROJECT NO. 13840.01
		CHECKED BY --	SCALE AS SHOWN	FIGURE 3-3

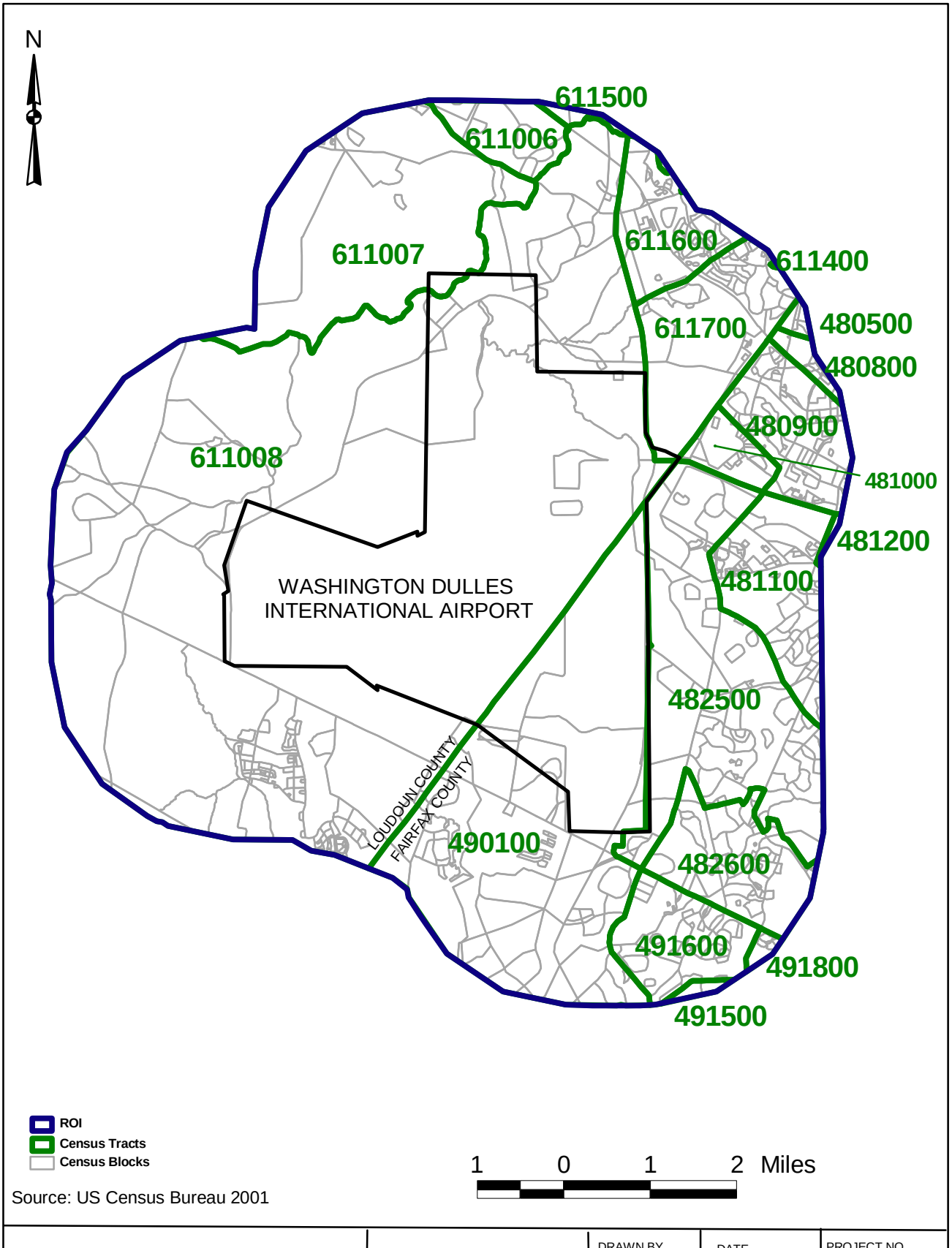
and a few single family residences. High density residential communities and retail centers primarily located east and southeast of the airport include the towns of Reston, Herndon, Chantilly, and Centreville (Figure 1-1). Development is also increasing to the south and west consistent with the noise exposure contours as discussed above.

3.3 Social and Socioeconomic Characteristics. IAD is located in the Metropolitan Washington region. For statistical purposes, the U.S. Census Bureau defines the Metropolitan Washington region as a primary metropolitan statistical area (PMSA). The Washington PMSA includes Loudoun, Fairfax, Prince William, Stafford, King George, Spotsylvania, Culpeper, Fauquier, Warren, and Clarke counties in Virginia, Jefferson and Berkeley counties in West Virginia, and Frederick, Montgomery, Prince George's, Charles, and Calvert counties in Maryland. Overall, the Washington, DC-MD-VA-WV PMSA had a population of 4,923,153 people in 2000, representing a 16.6 percent increase from 1990 (U.S. Census Bureau 2001). The Washington Metropolitan area is forecasted to experience continued population growth and expansion.

3.3.1 Population Demographics. Population demographics to the census block level are available from the U.S. Census Bureau for both Fairfax and Loudoun counties from the 2000 census. Census blocks are the smallest geographic entity for which the Census Bureau collects and tabulates decennial census information. The census blocks and census tracts that are located within the ROI for IAD are located in Figure 3-4. Population data for the portion of each census tract that falls within the IAD ROI are compared in Table 3-1.

According to the 2000 census, the population of Fairfax County, Virginia is 969,749 persons, representing an 18.5 percent increase in population from 1990. Fairfax County is 395 square miles with a population density of approximately 2,455 people per square mile. The population of Loudoun County, Virginia is 169,599 persons, representing a 96.8 percent increase in population from 1990. Loudoun County has a land area of 520 square miles, resulting in a population density of approximately 326 people per square mile.

The area within the ROI has a total population of 95,099 people and is 69.9 percent white; 7.3 percent black; 13.9 percent Asian; 5.6 percent "other," which includes American Indians, Native Alaskans, Native Hawaiians, and Pacific Islanders; and 5.6 percent multi-racial, which includes persons reporting two or more races (U.S. Census Bureau 2001). This is comparable to the demographics of both Fairfax County (67.6 percent white, 7.0 percent black, 15.6 percent Asian, 6.1 percent "other," and 3.7 percent multi-racial) and Loudoun County (76.5 percent white, 8.3 percent black, 8.2 percent Asian, 3.9 percent "other," and 3.2 percent multi-racial).



Source: US Census Bureau 2001

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	CENSUS TRACTS WITHIN THE REGION OF INFLUENCE	DRAWN BY: KAO	DATE: 4-5-02	PROJECT NO.: 13840.01
		CHECKED BY:	SCALE: AS SHOWN	FIGURE: 3-4

TABLE 3-1 POPULATION DEMOGRAPHIC DATA WITHIN THE ROI FOR LOUDOUN AND FAIRFAX COUNTIES AND THE COMMONWEALTH OF VIRGINIA

AREA	TOTAL POPULATION WITHIN ROI (2000)	% WHITE (2000)	% NON-WHITE (2000)	% MULTI-RACIAL (2000)
Fairfax County*	969,749	69.9	26.4	3.7
Tract 480500	1,249	83.4	13.8	2.8
Tract 480800	2,444	49.3	42.4	8.3
Tract 480900	13,422	54.6	39.8	5.6
Tract 481000	3,952	51.7	42.6	5.7
Tract 481100	14,515	68.0	29.1	2.9
Tract 481200	209	64.6	31.1	4.3
Tract 482500	14,703	77.9	19.3	2.8
Tract 482600	7,669	75.9	21.8	2.3
Tract 490100	3,043	84.7	13.5	1.8
Tract 491500	1,844	84.9	13.3	1.7
Tract 491600	8,484	63.6	32.1	4.3
Tract 491800	1,578	61.2	36.8	2.0
Loudoun County*	169,599	82.8	14.8	2.4
Tract 611006	1,419	76.5	20.5	3.0
Tract 611007	2,452	74.6	22.2	3.2
Tract 611008	119	94.1	5.9	0.0
Tract 611400	111	99.1	0.9	0.0
Tract 611500	310	66.8	29.0	4.2
Tract 611600	6,704	71.3	24.6	4.0
Tract 611700	4,870	73.3	23.4	3.3
Tract 611800	6,002	85.4	12.4	2.2
Virginia*	7,078,515	72.3	25.7	2.0

Source: U.S. Census Bureau 2001
*Numbers represent the entire population of each county or the Commonwealth of Virginia

3.3.2 Environmental Justice. On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Executive Order requires Federal agencies to consider the environmental and human health effects of their policies, procedures, and projects on minority and low-income populations. Environmental justice is the fair treatment and meaningful involvement of people of all races, cultures, or incomes, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Each Federal agency was mandated to make environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The DOT issued Order 5610.2 on April 15, 1997 as a statement of the agency's compliance with Executive Order 12898. It stated that it is the "policy of DOT to promote the principles of environmental justice (as embodied in the Executive Order) through the incorporation of those principles in all DOT programs, policies, and activities."

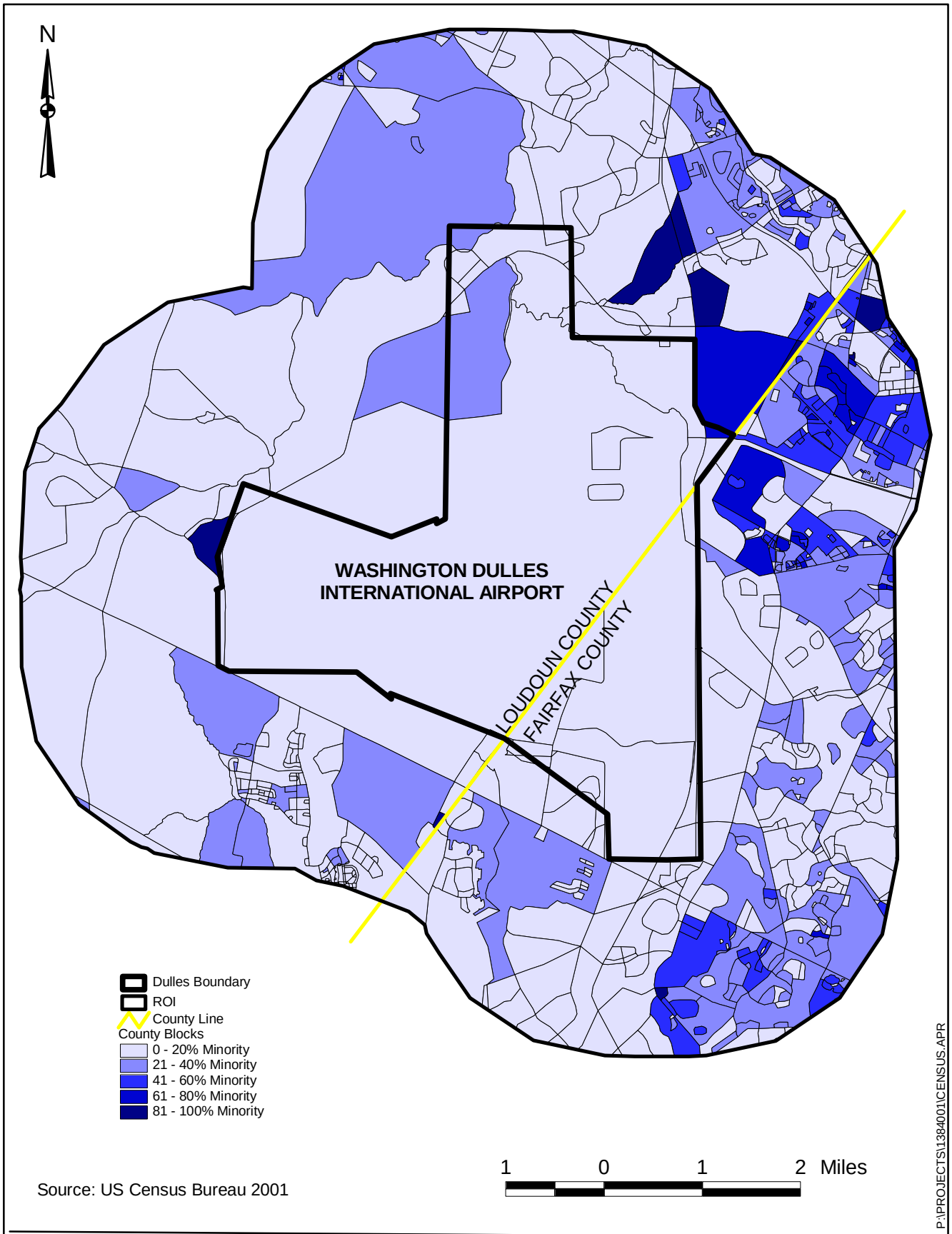
Table 3-2 shows the percentage of the population living in poverty in Fairfax and Loudoun counties (U.S. Census Bureau 1990). Figure 3-5 shows the percentage of minorities within each census block located within the IAD ROI (U.S. Census Bureau 2001). In order to illustrate the overall racial distribution, the minority population is defined as the non-white and multi-racial population of a given area and includes black, Asian, American Indian, Native Alaskan, Native Hawaiian, Pacific Islander, persons reporting some other race, and persons reporting two or more races.

TABLE 3-2 PERCENTAGE OF THE POPULATION LIVING IN POVERTY IN FAIRFAX AND LOUDOUN COUNTIES

AREA	TOTAL POPULATION (1990)	MEDIAN HOUSEHOLD INCOME (1990)	% IN POVERTY (1990)
Fairfax County	818,584	$65,201	3.4
Tract 480500	14,925	$69,539	0.9
Tract 480800	6,661	$59,651	3.0
Tract 480900	9,478	$54,877	3.3
Tract 481000	2,921	$47,019	2.8
Tract 481100	7,846	$73,998	0.2
Tract 481200	6,571	$53,729	11.6
Tract 482500	11,215	$73,839	0.9
Tract 482600	8,697	$70,329	1.5
Tract 490100	8,435	$63,425	0.9
Tract 491500	3,992	$78,203	0.7
Tract 491600	6,961	$59,030	1.0
Tract 491800	7,958	$65,189	1.6
Loudoun County	86,129	$56,006	3.0
Tract 611006*	5,166	$66,496	2.7
Tract 611007*			
Tract 611008*			
Tract 611400	5,094	$58,889	1.4
Tract 611500	3,758	$61,625	0.8
Tract 611600	4,326	$53,289	0.4
Tract 611700	4,349	$60,038	1.6
Tract 611800	1,603	$49,615	1.1

*Tracts 611006, 611007, and 611008 were all part of the same census tract in 1990.
Source: U.S. Census Bureau 1990

For the purpose of evaluating environmental justice for this project, low income populations were defined as people living in poverty, according to the 1990 census data. The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. If a family's total income is less than that family's threshold, then that family, and every individual in it, is considered poor (Dalaker and Proctor 2000). The poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index.



Source: US Census Bureau 2001

P:\PROJECTS\13840001\CENSUS.APR

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	% MINORITY POPULATION IN CENSUS BLOCKS WITHIN THE REGION OF INFLUENCE	DRAWN BY KAO	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY	SCALE AS SHOWN	FIGURE 3-5

Census data to the tract level from 1990 were used to determine the poverty statistics within the ROI because poverty statistics from the 2000 census have not yet been tabulated. Considering the 96 percent population increase in Loudoun County and the 18.5 percent population increase in Fairfax County, the 1990 data are not a complete picture of the current conditions. However, the 1990 numbers will provide a general estimation, and will be updated when more recent numbers from the 2000 census are released. Poverty statistics from the 2000 census are expected to be released in Spring/Summer 2002 .

The U.S. Census Bureau's Small Area Income and Poverty Estimates Program has released model-based income and poverty estimates for both Fairfax and Loudoun counties, based on data from 1997. According to this estimate, 3.9 percent of the people in Loudoun County and 5.3 percent of the people in Fairfax County are living in poverty, representing small increases since the 1990 census for both counties (U.S. Census Bureau 1997). However, both counties have poverty rates lower than the 11.6 percent of the people in the state of Virginia living in poverty (U.S. Census Bureau 1997).

Median household income data were also included in the U.S. Census Bureau's Small Area Income and Poverty Estimates Program report. The median household income for Fairfax County was approximately $71,000 and for Loudoun County was approximately $67,000 (U.S. Census Bureau 1997). Both counties have median household incomes well above the median household income of approximately $40,000 for the state of Virginia (U.S. Census Bureau 1997).

3.3.3 Economic Characteristics. IAD employs more than 15,400 people and served more than 20.1 million passengers in 2000. In 1998, the airport generated approximately 4.1 billion dollars in business revenue for the regional economy and contributed 136 million dollars in state and local taxes. Passenger traffic increased 56 percent between 1996 and 2000, and IAD was named the fastest growing airport in the country [Metropolitan Washington Airports Authority (MWWA) 2000a].

The increase in the number of high technology and telecommunications companies located in Fairfax and Loudoun counties has fueled a corresponding economic expansion in both counties. Table 3-3 shows the top 10 employers in each county. In April 2001, unemployment rates were 1.5 and 1.2 percent for Fairfax and Loudoun county, respectively (Virginia Economic Commission 2001). These figures are below the 2.2 percent unemployment rate for the state of Virginia in April 2001 (Virginia Economic Commission 2001) and the national unemployment rate of 4.4 percent for May 2001 (U.S. Bureau of Labor Statistics 2001).

TABLE 3-3 TOP 10 EMPLOYERS IN FAIRFAX AND LOUDOUN COUNTIES

Fairfax County	Loudoun County
1. Inova Health System	1. United Airlines
2. Science Applications International Corp.	2. MCI Worldcom
3. Booz-Allen Hamilton, Inc.	3. America Online
4. American Management Systems	4. Atlantic Coast Airlines
5. Verizon	5. Loudoun Healthcare, Inc.
6. ExxonMobil	6. Orbital Sciences
7. Federal Home Loan Mortgage Corp.	7. OSP Consultants, Inc.
8. Navy Federal Credit Union	8. Federal Aviation Administration
9. UUNet technologies	9. Dynatram/Dynaelectric
10. Raytheon Company	10. Airline Tariff Publishing Company

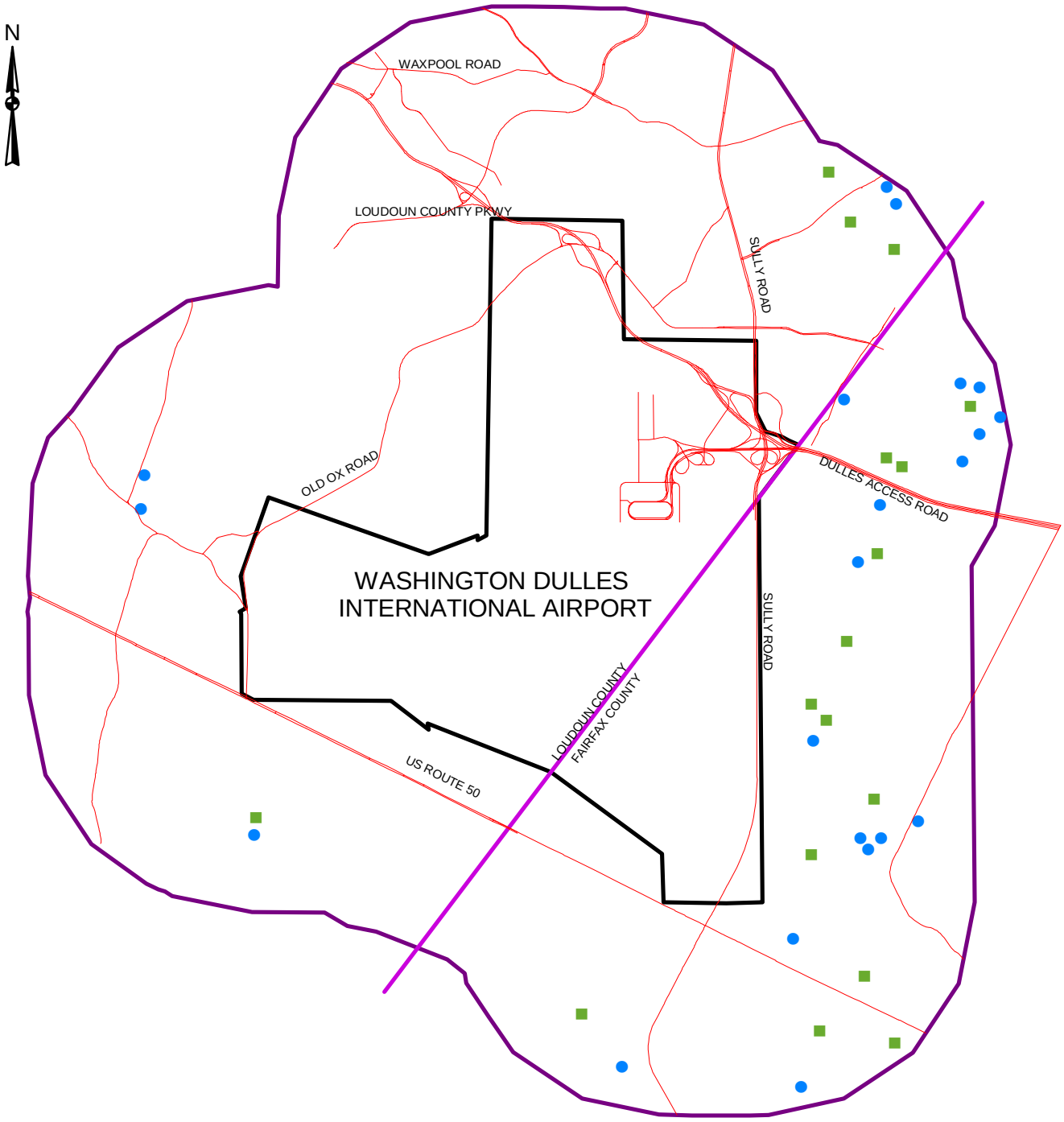
Source: Fairfax County Economic Development Authority and Loudoun County Department of Economic Development

Both Loudoun and Fairfax counties recognize that IAD is a vital and important component of the economic health and viability of each county, evidenced by the fact that United Airlines is the largest single employer in Loudoun County (Loudoun County Department of Economic Development 2001).

3.3.4 Child Safety. On April 23, 1997, President Clinton issued Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks." Under this Executive Order, Federal agencies are required to make it a high priority to identify and assess environmental health risks and safety risks resulting from its policies, programs, activities, and standards that may disproportionately affect children.

Children are particularly prone to potential environmental health and safety risks because a child's bodily systems are still developing and they ingest more in proportion to their body weight than adults do. A child's size and weight may reduce the effectiveness of standard safety features, and children's behavior patterns make them more susceptible to accidents because they are less able to protect themselves.

Schools and daycare centers are locations where the potential for a child to be exposed to environmental health risks is increased, since a higher concentration of children are located in one place during the day. The 14 schools and approximately 21 public daycare centers located within the ROI are shown in Figure 3-6 and listed in Table 3-4. In addition, approximately 272 private family child care providers are also located within the ROI (Loudoun County Department of Social Services 2001, Fairfax County Office for Children 2001). These private family child care providers are licensed by the state and typically located in an individual home.



Sources: Loudoun County Department of Social Services, Fairfax County Office for Children, Loudoun and fairfax County Websites

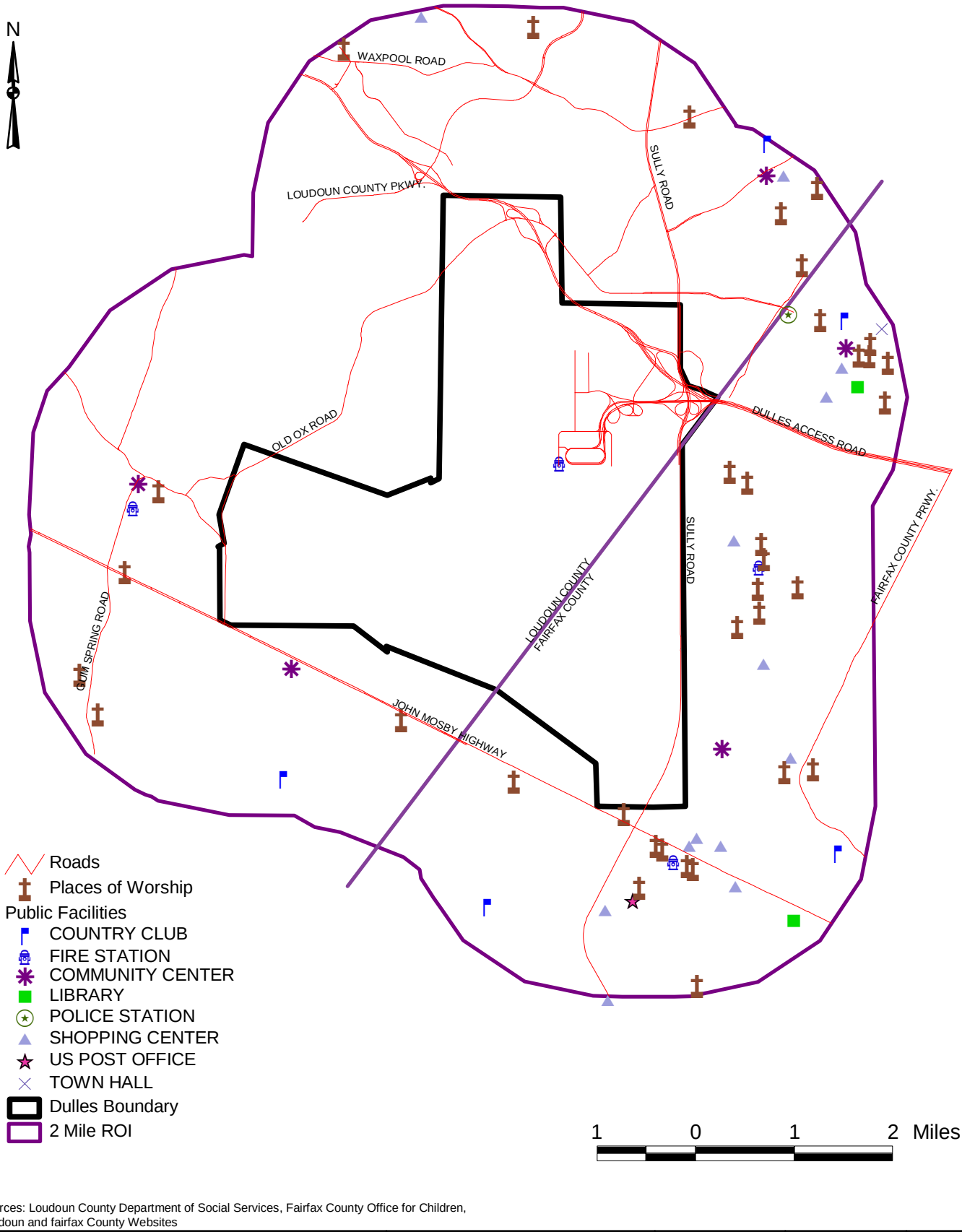
PROJECTS\13840011\2002\FINALEA\ARCVIEWCD\DULLES.APR

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	SCHOOLS AND CHILD CARE CENTERS WITHIN THE REGION OF INFLUENCE	DRAWN BY KAO	DATE 8-7-02	PROJECT NO. 13840.01
		CHECKED BY --	SCALE AS SHOWN	FIGURE 3-6

TABLE 3-4 SCHOOLS AND CHILD CARE CENTERS WITHIN THE IAD ROI

Schools	
Brookfield Elementary	Oak Hill Elementary
Clearview Elementary	Sterling Middle
Floris Elementary	Carson Middle
Hutchison Elementary	Franklin Middle
Guilford Elementary	Herndon Middle
Sully Elementary	Westfield High
Lees Corner Elementary	Saint Joseph
Forest Grove Elementary	Nysmith
	Hutchison Farm Elementary
Child Care Centers	
Beginning Bridges, Inc.	Children's World
Children's World Learning Center #265	Kindercare #1030, Franklin Farm Rd
Community Montessori School	Creative World Learning Center - Sully
Computer Associates Virginia Child Care	Westfields Play & Learn Children's Center
Embassy School	Westfields Play & Learn II
Federal Children's Center of No. VA.	Arcola Community Center
Harding Hall Inc.	Arcola Elementary CASA
Kinder Care Learning Center #800	South Riding Children's Center
Montessori Children's Center II	Sterling Community Center
Nysmith Preschool and Extended Care	Sully Elementary CASA
Saint Timothy's Pre-School	

3.3.5 Places of Public Assembly. Residents in the area of IAD are served by an extensive number of schools and places of public assembly. This Environmental Assessment will limit description of these facilities to those within the ROI. Sources used to compile the schools, child care centers, community centers, places of worship, clubs, and shopping centers included Loudoun and Fairfax counties and ADC maps of Northern Virginia and Loudoun County. There are no hospitals within the ROI. Places of public assembly within the ROI are presented on Figure 3-7 and listed in Table 3-5.



Sources: Loudoun County Department of Social Services, Fairfax County Office for Children, Loudoun and fairfax County Websites

PROJECTS\13840001\2002\FINALEA\ARCVIEW\CD\DULLES.APR

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	PLACES OF PUBLIC ASSEMBLY WITHIN THE REGION OF INFLUENCE	DRAWN BY WCM	DATE 8-7-02	PROJECT NO. 13840.01
		CHECKED BY --	SCALE AS SHOWN	FIGURE 3-7

TABLE 3-5 PLACES OF PUBLIC ASSEMBLY WITHIN THE IAD ROI

Community Centers	
Arcola Community Center Brookfield Center Herndon Meeting Community Center	Franklin Special Center South Riding Visitor Center
Places of Worship	
Guilford Baptist Chinese Church Oak Grove Baptist Community of Faith United Methodist Church of the Epiphany Episcopal Church Floris United Methodist Chantilly Bible Eden Korean Presbyterian Church of Washington Frying Pan Baptist Church of God Mount Pleasant Baptist Saint Timothy's Episcopal First Baptist Church of Jesus Christ Community Church Holy Cross Lutheran LDS Church Arcola United Methodist	Saint Joseph Gilford Baptist Saint Timothy's Catholic Church Ox Hill Baptist Chantilly Wesleyan Church Christ the Redeemer Shepherd Gate Oakton Baptist Community Baptist Pleasant Valley United Methodist Chantilly Baptist Arcola Korean Baptist Second Shiloh Arcola United Baptist Christian Fellowship Heritage Baptist Sterling Baptist Heritage Baptist Korean Presbyterian Church of Centerville
Clubs	
Sterling Park Golf Swim and Tennis Club Herndon Centennial Golf Course International Town and Country Club	Pleasant Valley Golf Course South Riding Golfers Club
Shopping	
Village Centre at Dulles Shopping Center Sterling Plaza Sterling Park Mall Briarcroft Plaza Franklin Farm Village Center McLearen Square Shopping Center Sully Place Shopping Center	Dulles Park Shopping Center Chantilly Plaza Chantilly Place Shopping Center Sully Plaza Sully Centre Shopping Center Ashburn Town Square Shopping Center
Fire Stations	
Sterling Park Safety Center (Rescue Co. 15, Fire Co. 11) Arcola/Pleasant Valley Co. 9	Chantilly Co. 15 IAD Fire Station
Miscellaneous	
Bill Allen Field Herndon Town Hall	Herndon Fortnightly Library Chantilly Library

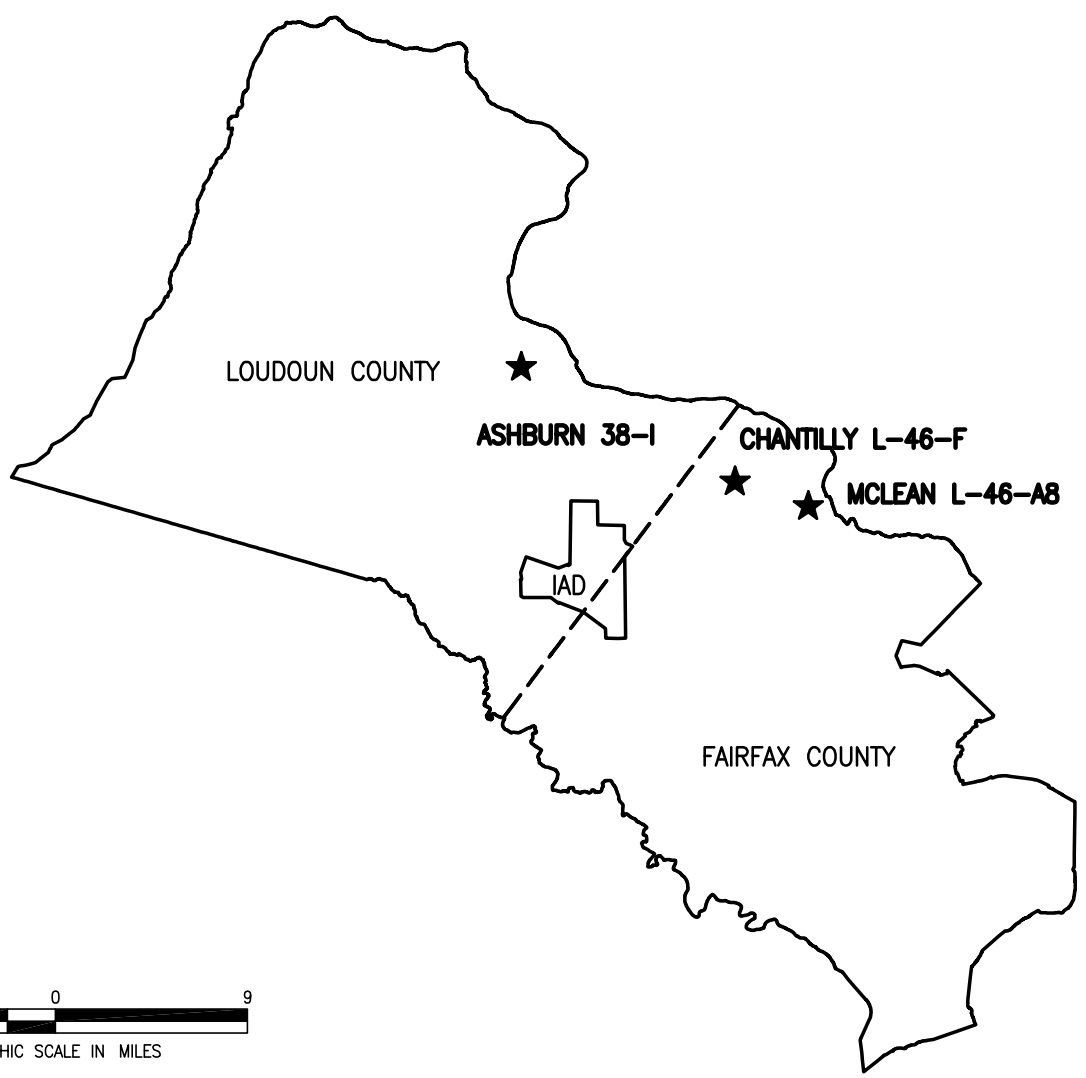
3.4 Air Quality. IAD is located in the National Capital Interstate Air Quality Control Region (AQCR 47). This AQCR includes the District of Columbia, Montgomery and Prince George's counties in Maryland, and Arlington, Fairfax, Loudoun, and Prince William counties in Virginia. The area is in "attainment" for all of the National Ambient Air Quality Standards (NAAQS) criteria pollutants, except ozone, for which it is classified as a serious nonattainment area. A nonattainment area is one that does not meet or that contributes to ambient air quality in a nearby area that does not meet the primary or secondary NAAQS for the pollutant.

Air emission sources at IAD and other airports include aircraft, ground support equipment (GSE), vehicles operating on airport roadways, and stationary sources, such as heating equipment, emergency generators, and fuel tanks. Air emissions from these sources include particulate matter (PM_{10}), nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO), and sulfur dioxide (SO_2). Table 3-6 describes the pollutants produced by these sources.

TABLE 3-6 AIR POLLUTANTS AND THEIR CHARACTERISTICS

Type	Characteristics
Particulates (PM_{10})	• Mixture of solid particles and liquid droplets; fine particles (less than 2.5 micrometers) produced by fuel combustion, power plants, and diesel buses and trucks • Can aggravate asthma, produce acute respiratory symptoms, including aggravated coughing and difficult or painful breathing, and chronic bronchitis • Impairs visibility
Carbon Monoxide (CO)	• Odorless, colorless gas produced by fuel combustion, particularly mobile sources • May cause chest pains and aggravate cardiovascular diseases, such as angina • May affect mental alertness and vision in healthy individuals
Nitrogen Oxides (NO_X)	• High temperature fuel combustion exhaust product • Can be an irritant to humans and participates in the formation of ozone
Volatile Organic Compounds (VOCs)	• Fuel combustion exhaust product • Consists of a wide variety of carbon-based molecules • Participates in the formation of ozone
Ozone (O_3)	• Not directly emitted by mobile, stationary, or area sources • Formed from complex reactions between NO_X and VOC emissions in the presence of sunlight • Occurs regionally due to multiplicity of sources • Can irritate the respiratory system • Can reduce lung function • Can aggravate asthma and increase susceptibility to respiratory infections • Can inflame and damage the lining of the lungs

3.4.1 Air Monitoring Data. The Virginia Department of Environmental Quality (DEQ) operates a network of air monitoring stations throughout the state. Table 3-7 summarizes the monitoring stations located in Fairfax and Loudoun counties that are closest to IAD, and Figure 3-8 illustrates their locations. A summary of the most recent data from these stations is provided in Table 3-8, and the data are compared to the NAAQS.



FILE: Q:\PROJECTS\13840001\FINALEA\FIG3-8.DWG

TIER 2 & RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	AIR QUALITY MONITORING STATIONS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY WWW	SCALE AS SHOWN	FIGURE 3-8

TABLE 3-7 AIR MONITORING STATIONS IN NORTHERN VIRGINIA

County	City/Town	Location	Land Use	Pollutant
Loudoun	Ashburn	Broad Run High School	Residential	NO_2/O_3
Fairfax	Chantilly	Upper Cub Run Road	Agricultural	$CO/NO_2/O_3/PM_{10}$
	McClean	1437 Balls Hill Road	Residential	$CO/NO_2/O_3$

TABLE 3-8 2000 AIR MONITORING VALUES

	Pollutant				
	Ozone		NO_2	CO	
	8-hour Average[1]	1-hour Average	Annual Mean	1-hour Average	8-hour Average
NAAQS [2]	85 ppb	125 ppb	0.053 ppm	35 ppm	9 ppm
Loudoun County					
Ashburn	93 ppb [3]	88 ppb [3]	0.013 ppm	Not sampled	
Fairfax County					
Chantilly	102 ppb [3]	95 ppb [3]	0.010 ppm	2.5 ppm [4]	1.8 ppm [4]
McLean	99 ppb [3]	105 ppb [3]	0.021 ppm	6.5 ppm [4]	3.8 ppm [4]

(1) In 2001, the U.S. Supreme Court upheld the ozone 8-hour standard, which the U.S. Environmental Protection Agency (EPA) originally proposed in 1997, but the court directed U.S. EPA to rework its policy for implementing the standard in nonattainment areas (Whitman et al. v. American Trucking Associations et al.).
(2) National Ambient Air Quality Standard.
(3) Second highest observation for the year.
(4) Highest observation for the year.

3.4.2 Air Emissions – Stationary Sources. Air emissions from IAD are generated by stationary and mobile sources. Stationary sources include boilers, heaters, generators, two incinerators, fire training facility, fuel tanks, and miscellaneous paints and chemicals. The principal fuels used by stationary sources at IAD are natural gas, propane, low sulfur diesel, and No. 2 fuel oil, although the latter fuel is being phased out and replaced by diesel fuel.

The stationary sources are registered with the Virginia DEQ (Registration No. 70003) and are governed by a "Stationary Source Permit to Modify and Operate, New Source Performance Standard Permit" issued by the Northern Virginia Regional Office of the Virginia DEQ. The permit was issued to limit the potential for emissions of NO_X from sources operated by the Authority at the airport to below the 50 tons per year major source threshold. The Authority is participating in the Virginia DEQ "Synthetic Minor" operating program and has accepted Federally enforceable permit conditions such that potential emissions are reduced below Title V major source trigger levels. These permit conditions establish limits on the usage of natural gas, diesel fuel, and heating oil. Table 3-9 summarizes the estimated emissions associated with those fuel use limitations and estimated actual emissions from fuel combustion for the year 2000.

As Table 3-9 indicates, year 2000 emissions from combustion sources are approximately 30 percent and 27 percent of permit-level emissions for NO_X and CO, respectively, while SO_2, VOCs, and PM_{10} are less than 10 percent of permit-level-based emissions. Other sources of air

emissions at IAD include fuel storage tank standing and working losses, painting, and degreasing operations. Although these fugitive VOC emissions are not included in the IAD Synthetic Minor operating permit, they were estimated in 1997 to be 0.75, 22.96, and 1.95 tons/year for fuel storage tanks, painting, and degreasing, respectively (Beatty 2001, personal communication).

TABLE 3-9 SUMMARY OF PERMIT-LEVEL AND YEAR 2000 AIR EMISSIONS

Equipment	Fuel	Emissions Based on Permit Fuel Use Limits (tons/yr)				
		NO_X	SO_2	CO	VOCs	PM_{10}
Boilers and Heaters	No. 2 Fuel Oil	2.10	7.46	0.53	0.02	0.21
Boilers and Heaters	Natural Gas	22.13	0.14	1.24	1.24	1.71
Boilers #3 and #4	Natural Gas	5.40	0.08	0.74	0.74	1.03
Incinerator	Natural Gas	0.01	<0.01	0.09	0.09	0.20
Heaters	Propane	1.75	<0.01	0.06	0.06	0.05
Fire Fighting Training	Propane	1.75	<0.01	12.98	12.98	28.66
Fuel Farm Generator	Diesel	1.62	0.17	0.03	0.03	0.05
Generators	Diesel	11.46	1.51	0.37	0.37	0.
Totals		46.22	9.36	43.26	15.54	32.57
Equipment	**Fuel**	**Emissions Based on Year 2000 Fuel Use (tons/yr)**				
		NO_X	SO_2	CO	VOCs	PM_{10}
Boilers and Heaters	No. 2 Fuel Oil	0.10	0.37	0.03	<0.01	0.01
Boilers and Heaters	Natural Gas	6.07	0.04	5.10	0.33	0.46
Boilers #3 and #4	Natural Gas	6.78	0.04	5.69	0.37	0.52
Incinerator	Natural Gas	<0.01	<0.01	0.02	0.02	0.05
Heaters	Propane	0.40	0.00	0.05	0.01	0.01
Fire Fighting Training	Propane	0.10	0.00	0.53	0.72	1.60
Fuel Farm Generator	Diesel	0.16	0.02	0.04	0.01	0.01
Generators	Diesel					
Totals		13.61	0.47	11.46	1.47	2.66
7% of Permit Level		29.4%	5.0%	26.5%	9.5%	8.2%

3.4.3 Air Emissions – Mobile Sources. Mobile sources at IAD that produce air emissions include aircraft, ground service equipment, and roadway vehicles. Air emissions from these mobile sources were estimated using the Federal Aviation Administration's Emissions and Dispersion Modeling System (EDMS) (FAA 2000), which is the recommended model for air quality impact assessment for civilian airports and U.S. Air Force bases. The FAA model calculates emissions from aircraft based on the aircraft fleet make-up and the airport level of activity expressed as the number of landing and takeoff (LTO) cycles for each aircraft type, using procedures prescribed by EPA. One LTO represents one takeoff and one landing, which constitutes two aircraft operations. As noted in Table 3-10, there were approximately 235,000 LTOs at IAD in 1999. Emissions from the diesel-powered mobile lounges and planemates that operate between the Main Terminal and Concourses A, B, C, and D also were estimated. Emissions from mobile sources operating at IAD are summarized in Table 3-11. Details on the calculation methods and the detailed model inputs and outputs are provided in Appendix C.

EPA has estimated air emissions from road and nonroad mobile sources at the county level (U.S. EPA 2001b). Table 3-12 compares these mobile source emission data in Fairfax and Loudoun counties to mobile source emissions at IAD. These data indicate that IAD accounts for approximately 5.8, 2.9, and 2.6 percent of NO_X, CO, and VOC emissions, respectively, of mobile air emissions in the two counties.

TABLE 3-10 1999 IAD AIRCRAFT OPERATIONS AND LTOs

Aircraft Category	Operations	Landings and Takeoffs
General Aviation		
Single Engine Piston	1,932	966
Twin Engine Piston	6,448	3,224
Turboprop	38,366	19,183
Business Jets	47,684	23,842
Military (C-130)	3,114	1,557
Commercial Turboprop	156,792	78,396
Regional Jet	46,496	23,248
Narrow-Body Jet	139,846	69,923
Wide-Body Jet	29,282	14,641
Total	469,960	234,980

TABLE 3-11 1999 MOBILE SOURCE EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Aircraft	1,463	72	1,726	280	--
Ground Service Equipment	359	9	4,142	113	12
Mobile Lounges/Planemates	122	7	4	6	--
Roadways/Parking Lots*	172	7	1,661	223	8
Total	2,116	94	7,533	622	23

* Vehicles operating on airport property only (HNTB 2001b).

TABLE 3-12 REGIONAL AND IAD MOBILE SOURCE EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Year	1998				
Fairfax County	30,342	NE	226,574	19,965	1,800
Loudoun County	6,387	NE	34,440	3,578	494
Count Total	36,729	NE	261,014	23,543	2,294
Year	1999				
Washington Dulles International Airport	2,116	94	7,533	622	23

NE = Not estimated

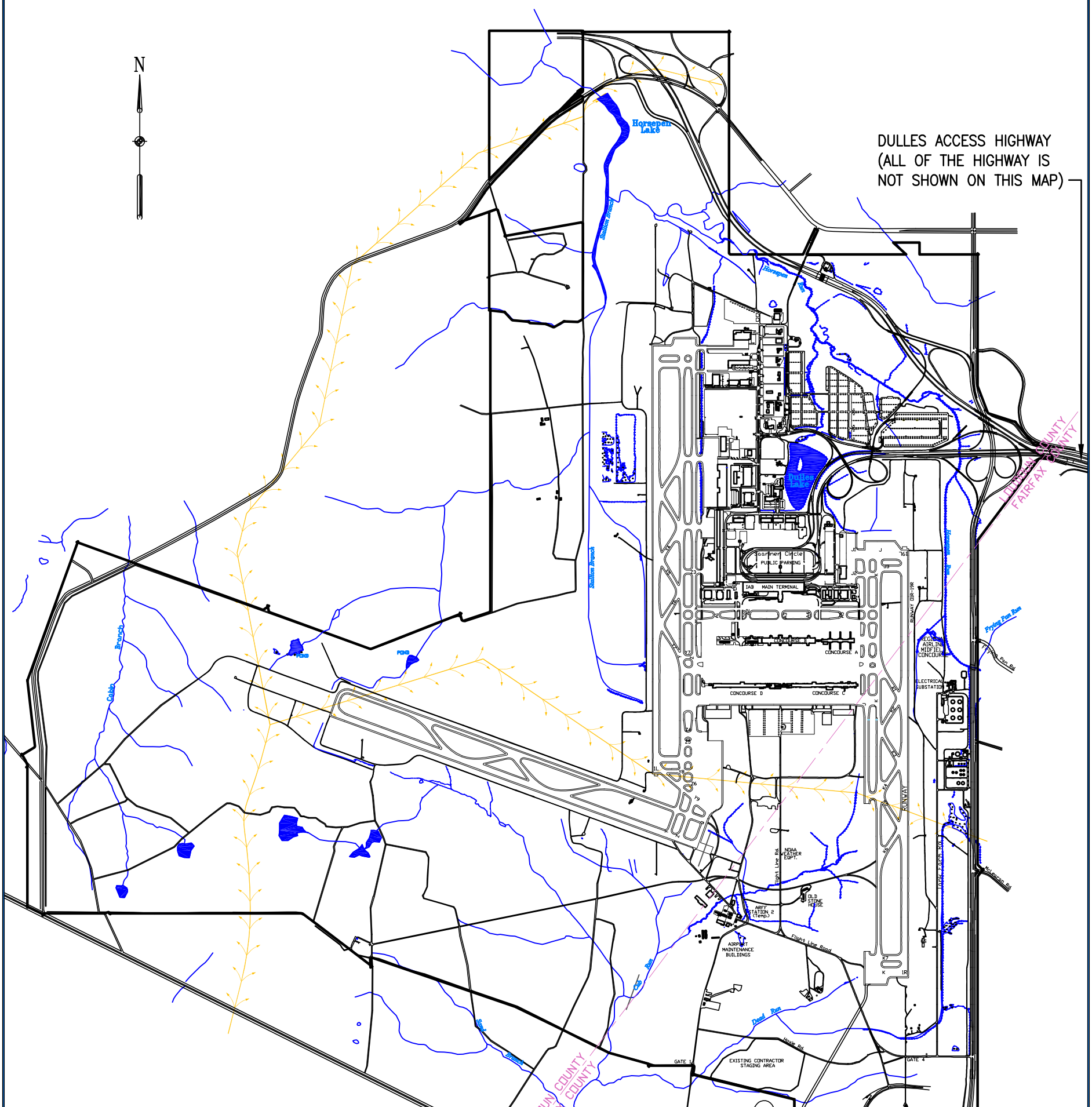
3.5 Water Quality.

3.5.1 Surface Water. Surface-water resources at IAD consist of several stream courses that drain to the north and to the south from a divide in the lower middle portion of the airport property (Figure 3-9). The northern part of the airport drains to Horsepen Run and Stallion Branch, which converge and discharge to Broad Run just outside of IAD property. Broad Run ultimately empties into the Potomac River. Cabin Branch drains the western portion of IAD property and also discharges into Broad Run. Cub Run, Dead Run, and Cain Branch receive drainage from the southern part of the airport (Figure 3-9). These stream courses converge and discharge to Bull Run south of the airport, and ultimately to the Occoquan River and then into the Potomac River. Two of the north-draining streams—an unnamed tributary of Horsepen Run and lower Horsepen Run—are impounded and designated Dulles Lake and Horsepen Lake, respectively (Figure 3-9). These impoundments serve as retention facilities to reduce the potential for downstream flooding and pollutant discharge from runoff from paved areas. The combined surface acreage of these impoundments is approximately 37 acres.

In addition to the impoundments, the streams on IAD represent substantially modified systems owing to their incorporation into IAD's stormwater management system. Numerous storm drains on IAD lead to both piped and open drainageways and ultimately into tributaries and named streams on the site. The stormwater system at IAD includes a total of 51 outfalls (MWAA 2000b).

All surface waters on IAD are classified as Class III Nontidal Waters in the Virginia State Water Control Board Water Quality Standards (9 VAC 25-260-5 et seq.). The designated use of these waters, as with all State waters, is recreational use, e.g., "…swimming and boating; the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources, e.g., fish and shellfish" (9 VAC 25-260-10). These waters are subject to published statewide numerical criteria for dissolved oxygen, pH, water temperature, and many other chemical constituents. The southern-draining streams on IAD are additionally subject to the Occoquan Watershed Policy, which restricts point source discharges from publicly owned treatment works (POTWs). The permitted discharge to the Blue Plains plant has been increased to 1.5 million gallons per day (mgd) from 1.0 mgd.

3.5.2 Wastewater. Wastewater generated at IAD is collected by an extensive sanitary sewer system and is conveyed to the Blue Plains Wastewater Treatment Plant in Washington, DC. The wastewater is discharged under the authority of Wastewater Discharge Permit No. 025-5, issued to the Authority/IAD by the District of Columbia Water and Sewer Authority. The sanitary sewer system includes all areas of the airport except the South Shops Area, which is currently served by an individual septic system. However, this septic system will be deactivated once a planned outfall to the south and the Occoquan treatment plant is completed. Since 1995, the annual sanitary sewage flow at IAD has averaged 255 million gallons, and has increased by more than 40 percent since 1995. The highest annual flow during that period was 333.6 million gallons in 2000.



SOURCE: STORMWATER POLLUTION PREVENTION PLAN (MWAA 2000B)

FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG3-9

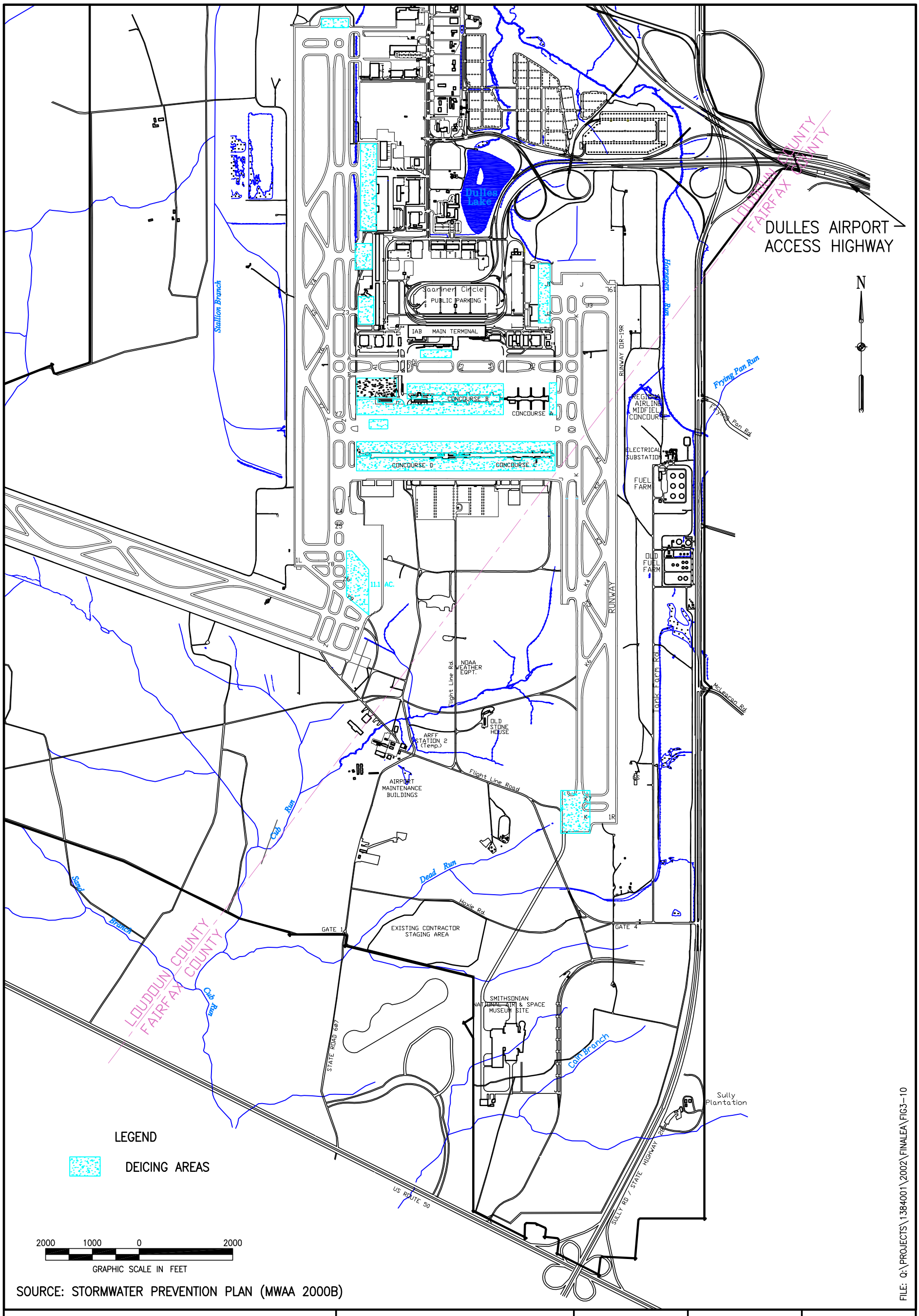
TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	SURFACE WATER DRAINAGE	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 3-9

One component of wastewater generated at IAD is dilute propylene glycol from aircraft deicing operations. Ethylene glycol is not ordinarily used at IAD. The current operation involves plugging selected drains throughout IAD and vacuuming spent deicing fluid into tank trucks (MWAA 2000b), as well as vacuuming deicing locations. Deicing locations are shown in Figure 3-10. If the fluid is determined to be 7 percent or greater concentration of glycol, it is stored in tanks for recycling. Deicing fluid of less than 7 percent glycol is temporarily stored and ultimately discharged to the sanitary sewer at a controlled rate.

3.5.3 Stormwater. There is a potential for release of pollutants to surface water and/or ground water by airport activities. These activities include loading and unloading operations; outdoor storage of chemicals, fuels, and other materials; vehicle and equipment maintenance; vehicle and aircraft fueling; runway and aircraft deicing; runway derubberizing operations; construction/excavation activities; and other activities that could release potential pollutants to surface or ground water (MWAA 2000b). The Fairfax County Water Authority has expressed concern to the Airport about the taste of the public drinking water drawn from the Potomac River. IAD is working with the Water Authority to prevent objectionable concentrations of propylene glycol from entering the water supply.

Pursuant to regulations emanating from the Clean Water Act Amendments of 1987, stormwater discharges at IAD are controlled by a Virginia Pollutant Discharge Elimination System Permit (VPDES Permit No. VA0089541). This permit includes effluent limitations and monitoring requirements and mandates the establishment of a Stormwater Pollution Prevention Plan. The latter includes comprehensive procedures for the control of stormwater at IAD including the designation of a pollution prevention team, description of potential pollutant sources, and measures and controls (e.g., good housekeeping, preventative maintenance, management of runoff, inspections, etc.) (MWAA 2000b). Additional protection of water quality is encompassed in the Consolidated Spill Contingency Plan (MWAA 1998b), which is a consolidation of seven different spill contingency plans at IAD. These various control and contingency protocols provide a level of protection of surface- and ground-water quality commensurate with the industrial nature of airport operations at IAD.

3.5.4 Ground Water. Ground water at IAD occurs in two water-bearing zones, one a shallow perched water table within weathered rock, and a deeper aquifer within fractured bedrock (MWAA 2000b). Depth is generally less than 20 ft below grade, and flow is southeasterly. Ground water is not divided into classes in Virginia, but is subject to numerical standards and criteria that may be either statewide or may differ by physiographic province. There are two private drinking-water wells located in the northwest quadrant outside of the security fenceline. Several wells supply non-potable water for sanitary purposes to the South Shops Area, contractor staging area, and Gate 4. Potable water is supplied to these areas by trucked spring water; the Fairfax County Water Authority supplies potable water to all other areas of IAD (292 million gallons in 2000). Well water and trucked potable water will soon be replaced by new water service from the south.



TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	CURRENT DEICING AREAS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 3-10

3.6 Geology and Soils.

3.6.1 Geology. The description of regional and local geology is largely summarized from Eggleton 1975.

IAD is located in northern Virginia at the eastern edge of the Potomac sedimentary basin in both Fairfax and Loudoun counties. Surface elevations range from 225 to 300 ft above mean sea level. The basin is part of the Piedmont physiographic province and contains Upper Triassic sedimentary rocks classified as the Newark Group along with intrusive and extrusive igneous rocks of basaltic composition. The upper part of the Triassic deposits in these types of basins is generally a red-bed sequence of various mudrocks and sandstone. The middle part of the deposits consists of lithologies such as coal, dark gray mudrocks, varicolored mudrocks, and, locally, limestone. The lower, or basal, part includes partly conglomeratic sandstone with interbedded mudrocks. Intrusive dikes and sub-horizontal sheets of diabase are usually present in this type of basin.

The geology in the Herndon Quadrangle, in which most of IAD is located, contains both representative geologic units of the basal coarse regional unit and middle fine-grained regional unit. The area also includes numerous thin to thick diabase intrusive sheets, apparently of some economic value given a number a small surface mines in these units, and a few small irregular bodies of diorite and quartz diorite. Sedimentary rocks that abut the diabase exhibit a conspicuous contact metamorphism.

The sedimentary rocks fall into two formations, the deeper Manassas Formation and the overlying Bull Run Shale. The Manassas contains a basal conglomerate member. The part of the Bull Run present in the Herndon Quadrangle may be divided into two members.

The basal conglomeratic member of the Manassas is composed mostly of sandstones and conglomerates. The remaining upper member of the Manassas is dominantly made up of red mudrocks and quartz-feldspar sandstones. The lower member of the Bull Run Shale is dominantly composed of red mudrock with minor amounts of varicolored mudrocks and obscure traces of quartz-feldspar sandstones, both in the lowermost part, and obscure traces of varicolored mudrocks in the uppermost part.

The larger bodies of intrusive igneous rocks may be interpreted as irregular sheets that uplifted several blocks of overlying sedimentary rocks by varying amounts. The uplifted blocks are bounded mainly the outcropping edges of the sheets but partly by faults. Part of a roughly triangular body of intrusive rock is near the site in the western part of the Herndon Quadrangle and is probably the basal part of a roughly horizontal sheet. Diabase that underlies the site includes a small section at the extreme northern part of the property and a section on the western limb of the property. The largest areas of diabase in the area are in the region surrounding the site.

Abutting the intrusive igneous rocks are contact-metamorphic rocks that sustained a color-change due to the initial heat of the igneous rocks. Less conspicuous evidence of the metamorphism is the occurrence of epidote, and to an even lesser extent, spotted hornfelses.

Fault lines are present trending in a north-south direction along the western portion of the site. Surface water features are associated with these faults. These faults locally show minor amounts of displacement and broad, gentle, southwesterly plunging folds, strike-slip faults, and high-angle normal faults within the Culpeper basin (Lee and Froelich 1989).

3.6.2 Soils. Soil surveys of Fairfax and Loudoun counties present various soil types at IAD including Calverton silt loam (Ca/Cb), Readington silt loam (Ra/Rb), Croton silt loam (Ck/Czn), Penn fine sandy loam (Pb), and Penn shaly silt loam (Ph) as the dominant soil types. The soils of IAD are moderately well drained to poorly drained. They have developed from shale and sandstone materials in depressions on upland flats, around the heads of drainageways, and along the base of slopes. The parent material is partly residuum, but much of it is local colluvium and alluvium that washed in from surrounding uplands [U.S. Department of Agriculture (USDA) 1951, 1963].

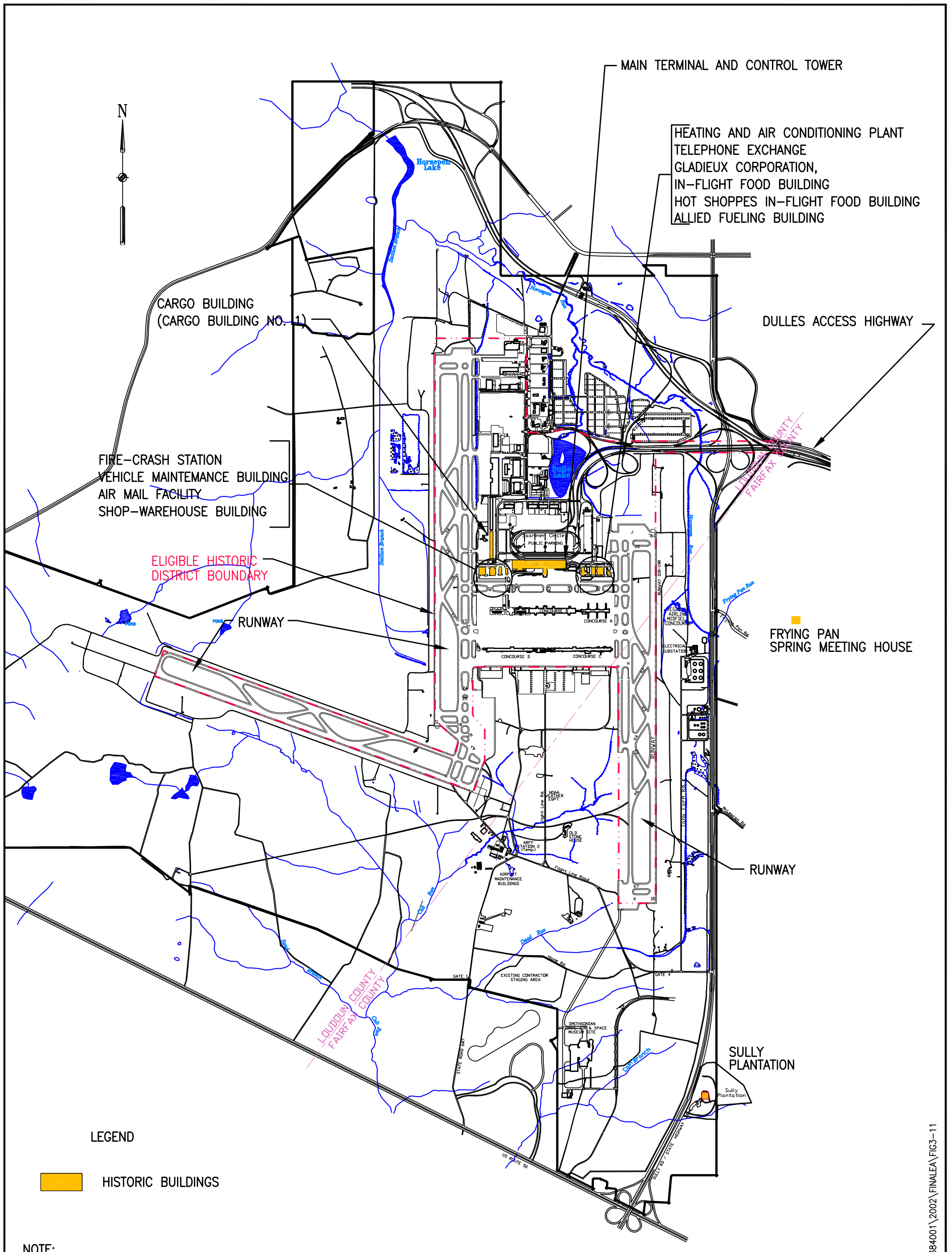
The soils at IAD have a moderately narrow range of moisture content during which they can be cultivated. A large portion of the silt loam at IAD is suitable for crops and pasture. Pasture and hay are commonly planted on these soil types in the region. Erosion is typically not a problem under most circumstances.

Soils that have been designated as Prime Soils in Loudoun and Fairfax counties are present at IAD. These soils are discussed in Section 3.16.

3.7 DOT Act Section 4(f) Lands. Section 4(f) of the DOT Act states that the DOT Secretary shall not approve programs or projects that require the use of certain publicly owned land or historic sites, unless there is no feasible and prudent alternative to the use of the land, and the program or project includes all possible planning to minimize harm resulting from its use. Publicly owned lands that qualify as Section 4(f) lands include public parks, recreation areas, wildlife and waterfowl refuges. Historic sites of national, state, or local significance are also considered section 4(f) lands.

There are no wildlife or waterfowl refuges or recreation areas located within the boundaries of IAD, but Sully Historic Park is located in the southern panhandle of airport property east of Sully Road (Figure 3-11). Sully Historic Park is a public park that was entrusted to the care of the Fairfax County Park Authority. Sully Historic Park is considered 4(f) lands, but no Tier 2 or related improvement projects are located in this Park.

The proposed historic district at IAD is considered section 4(f) lands. Resources that form a historical or architectural unit are generally evaluated as a district [Parsons Management Consultants (PMC) 1989]. Once individual resources have been identified, boundaries of a proposed historic district may be established. The boundaries for the eligible IAD historic district fall within those established by the 1958 Saarinen Master Plan for the airport (Figure 3-11). The proposed boundaries of the historic district are in accordance with the guidelines provided by the National Register of Historic Places, which states that historic district boundaries should include the significant concentration of buildings, sites, structures, or objects making up the district. Within the historic district at IAD, 13 structures, the mobile lounges, the



NOTE:
MOBILE LOUNGES AND TERMINAL AREA LANDSCAPING ARE NOT SHOWN ON THIS MAP.

SOURCE: PARSONS MANAGEMENT CONSULTANTS 1989

FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG3-11

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	HISTORIC STUCTURES AND STRUCTURES THAT MEET NATIONAL REGISTER CRITERIA WITHIN REGION OF INFLUENCE	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 3-11

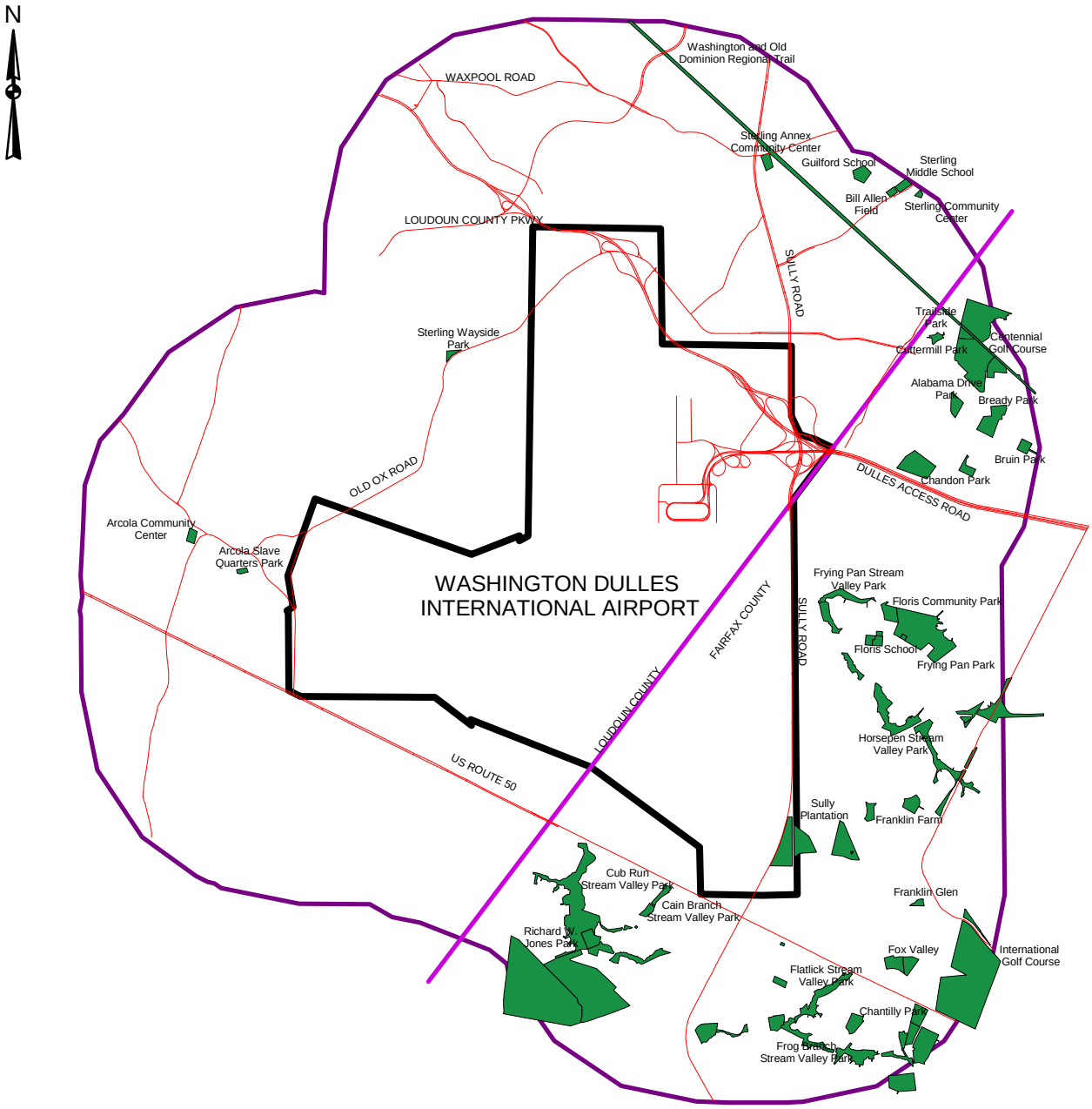
runways, the terminal area landscaping, and the Dulles Airport Access Highway meet National Register criteria. Some of the proposed Tier 2 projects and the APM systems are located within the proposed historic district boundary. The Tier 2 Concourse, most of the South Utilities features, and all of the support facilities are located outside of the historic boundary.

There are eight historic sites potentially eligible for the National Register of Historic Places (NRHP), located within the ROI. The sites are listed in the Virginia Historic Landmarks Commission Survey and are:

- Barn on Route 50 (Survey # 53-966)
- Carter Schoolhouse (Survey # 53-967)
- Pleasant Valley Methodist Church (Survey # 53-965)
- Alexander D. Lee House (Survey # 53-892)
- Arcola School (Survey # 53-982)
- Arcola Methodist Church (Survey # 53-983)
- Stone Slave Quarters (Survey # 53-984)
- Stone Outbuilding on Route 774 (Survey # 53-985)

Section 4(f) does not apply to temporary construction occupancy (including those resulting from a right-of-way-entry, construction and other temporary easements and other short-term arrangements) of publicly owned parks, recreation areas, wildlife or waterfowl refuges, or any historic site. The construction projects must be of short duration; less than the time needed for construction of the project; not change the ownership; not result in any temporary or permanent change to the activities, features, or attributes which are important to the purposes or functions that qualify the resource for protection under Section 4(f); and include only a minor amount of land. The construction projects for Tier 2 and related projects will comply with the temporary construction easements of Section 4(f). At IAD, multiple projects will be undergoing construction at the same time; however, construction will be conducted in a series of phases over a 6-year time period. Site restoration measures will be undertaken at the construction sites. The contractor staging area and soil stockpile area are located outside the boundaries of the proposed historic district.

There are many public parks and recreation areas located in the vicinity of IAD. There are no wildlife or waterfowl refuges in the vicinity of IAD. This Environmental Assessment limits the description of these parks to those included in the ROI. Sources used to compile information on the public parks and recreation areas included the Northern Virginia Planning District Commission and ADC maps of Northern Virginia and Loudoun County. No Federal, State, or regional parks are located in the ROI. The Local and Stream Valley Parks within the ROI for this project are depicted on Figure 3-12 and listed in Table 3-13.



Sources: Northern Virginia Planning Commission, ADC Maps of Northern Virginia and Loudoun County

PROJECTS\13840011\2002\FINALEA\ARCVIEW\CD\DULLES.APR

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	PUBLIC PARK AREAS LOCATED WITHIN REGION OF INFLUENCE	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY --	SCALE AS SHOWN	FIGURE 3-12

TABLE 3-13 LOCAL AND STREAM VALLEY PARKS WITHIN THE IAD ROI

Local Parks	
Arcola Community Center	Sterling Community Center
Arcola Slave Quarters	Sterling Middle School
Sterling Wayside	Guilford School
Chantilly	Sterling Annex Community Center
Fox Valley	Bready
Franklin Glen	Floris Community School Site
Franklin Farms	Richard W. Jones
Frying Pan	Sully
Chandon	Bruin
Alabama Drive	Trailside International Golf Course
Cuttermill	Pleasant Valley Golf Course
Herndon Centennial Golf Course	W&OD Trail
Bill Allen Field	
Stream Valley Parks	
Flatlick	Frying Pan
Frog Branch	Cub Run
Horsepen Run	Cain Branch

Stream Valley Parks include designated Environmental Quality Corridors (EQC). Some or all of a stream valley component may constitute a "genetic corridor" which should be managed primarily to protect and enhance biological diversity and wildlife movement (Fairfax County 1991). Stream Valley Parks also provide a buffer for designated Sensitive Area Corridors and to afford expanded passive recreation opportunities within the EQC or adjacent to it (Fairfax County 1991).

A Stream Valley Park of significance that is located within the ROI of IAD is the Cub Run Stream Valley. The headwaters of Cub Run and Cain Branch are located in the southern portion of IAD. Cub Run Stream Valley contains some of the most extensive and sensitive natural and cultural resources to be found in Fairfax County and is a major wildlife and recreational corridor to the Occoquan River shoreline (Fairfax County 1991). Significant archaeological resources are also known to exist within the Cain Branch tributary (Fairfax County 1991).

3.8 Historic, Architectural, Archaeological, and Cultural Resources. To comply with the National Historic Preservation Act of 1966 and Archeological and Historic Preservation Act of 1974, cultural resources at the project site must be identified. A historic property is defined as one that is listed in, or eligible for, the National Register of Historic Places, the official list of the nation's cultural resources. The acts are defined as follows:

The National Historic Preservation Act of 1966 (as amended) – This act, as amended, establishes the national historic preservation program which includes elements for identification and protection of historic properties. The Act establishes the Advisory Council on Historic

Preservation to advise the President and Congress on historic preservation matters, to recommend measures to coordinate Federal preservation activities, and to comment on Federal actions affecting properties included in or eligible for inclusion in the National Register of Historic Places.

The Archeological and Historic Preservation Act of 1974 – Provides for the survey, recovery, and preservation of significant scientific, prehistoric, historic, or archeological data which may be destroyed or irreparably lost due to a Federally funded, or Federally licensed project.

The National Register of Historic Places has established standards by which individual resources (both archaeological and architectural) are evaluated to determine their eligibility for listing. Resources may include buildings, sites, objects, and structures and are placed on the National Register according to the following summarized criteria:

a) Association with events that have made a significant contribution to the broad patterns of American history; or
b) Association with the lives of persons significant in our past; or
c) Significance for architecture; or
d) Significance for archaeology (36 CFR 60.4).

3.8.1 Programmatic Memorandum of Agreement (PMOA). A Programmatic Memorandum of Agreement (PMOA) was executed on 29 May 1987 by the Authority, the Advisory Council on Historic Preservation, and the Virginia SHPO which detailed actions to be undertaken to ensure the protection of historic and archaeological resources at IAD (MWAA 1987). This PMOA states that MWAA has agreed to comply with the National Historic Preservation Act as regards consultation with the SHPO and Advisory Council on Historic Preservation (ACHP).

3.8.2 Existing Historic Resources at IAD. IAD was declared eligible for the National Register in 1978 but it is not actually listed (PMC 1989). Approximately 61 buildings, plus 41 mobile lounges, are now located at the IAD complex. Thirteen structures meet National Register criteria as well as the mobile lounges, the runways, terminal area landscaping, and the Dulles Airport Access Highway (Figure 3-11). These structures were all constructed as part of the initial 1962 building campaign and are integral parts of Eero Saarinen's original design intent (PMC 1989). IAD was the first airport in the United States to be designed specifically for aircraft flying via jet propulsion, thus conforming to Criterion A of the National Register of Historic Places. Additionally, considered the greatest achievement of master architect Eero Saarinen by his peers and the public, IAD fulfills Criterion C of the National Register of Historic Places.

Within a National Register historic district, buildings may be designated as being either "contributing" or "non-contributing." According to National Register Bulletin 16, Guidelines for Completing National Register of Historic Places Forms, "a contributing building, site, structure, or object adds to the historic architectural qualities, historic associations, or archeological values for which a property is significant." Thirteen structures at IAD were found to be contributing resources that meet National Register Criteria (Figure 3-11) (PMC 1989):

Main Terminal and Airport Traffic Control Tower – The Main Terminal is a 1,240-ft by 181-ft structure located on a visually and physically raised foundation of access road and approach ramps. The current configuration of the Main Terminal includes a 1996 expansion project, which increased the building from 600 ft in length and 500,000 ft^2 to 1,240 ft in length and 1.1 million ft^2. The north and south facades each have 32 piers which are spaced consistently at intervals of 40 ft. The east and west end walls are supported primarily by vertical trussed steel mullions. Each window segment is concave as viewed from the exterior. The colonnaded piers reach 65 ft on the north side and 40 ft on the south side. As originally constructed, the terminal contained 330,000 square feet of space.

The Airport Air Traffic Control Tower is located on the south finger of the Main Terminal. The tower is 193 ft tall consisting of the tower shaft, five levels of cab rooms, and an uppermost level radar structure. An observation deck surrounds the base of the tower, stretching along the south finger to the Main Terminal. The context of the Main Terminal includes the building, the approach roads, the area between the terminal and the apron buildings which includes the path of the mobile lounges, original parking accommodations, and the planned landscaping.

Cargo Building (Cargo Building No. 1) – The Cargo Building was built in 1962 and was the first of four such buildings that were built at IAD. The building is rectangular with steel frame construction divided into a series of long bays that are leased out to different airlines. The context of the structure includes the land it stands on and the adjacent landscaping.

Shop-Warehouse Building – The Shop-Warehouse Building is located just southeast of the Cargo Buildings. This structure is rectangular with a steel frame structure and has low massing. The building is used for warehouse storage, machine shops, and administrative offices. The context of the structure includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part.

Air Mail Facility – The Air Mail Facility is located to the west of the Vehicle Maintenance Building. This structure has a steel frame construction with a rectangular low horizontal massing. This structure facilitates the rapid movement of mail to and from the airport. The context of the structure includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part.

Vehicle Maintenance Building – The Vehicle Maintenance Building is located just west of the Fire-Crash Station and also has a steel frame structure sheathed in dark metal panels. Built in 1963, this building is used for the maintenance of mobile lounges. The context of the structure includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part.

Fire-Crash Station – The Fire-Crash Station, located west of the Main Terminal, was built in 1963 and is utilitarian in form, rectangular in plan, and low in massing. In addition to the fire truck garage, the facility also houses a firefighters' dormitory. The context of the facility includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part.

Heating and Air Conditioning Plant – The Heating and Air Conditioning Plant (Utility Building) is located on the east side of the Main Terminal. The structure is rectangular with a steel frame construction on a concrete slab foundation. Two cooling towers surrounded with a fence are located on the east side of the Plant. The context of the structure includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part. The Heating and Air Conditioning Plant is currently being expanded.

Telephone Exchange – The Telephone Exchange is located east of the Heating and Air Conditioning Plant. The structure is square, low in massing, and has steel frame construction. The context of the structure includes the land it stands on, the adjacent landscaping, and the row of buildings of which it is part.

Former Gladieux Corporation In-Flite Kitchen (LSG/Sky Chefs) – The former Gladieux Corporation In-Flite Food Building is located east of the Telephone Exchange. LSG/Sky Chefs now operates this building. This steel-framed building is rectangular and rests on a concrete foundation. The building is divided into several service areas including those for food preparation, cooking, washing dishes, storage, and office space. The context of the structure includes the land it stands on, the row of buildings of which it is part, and the adjacent landscaping.

Former Hot Shoppes In-Flite Food Building (LSG/Sky Chefs) – The former Hot Shoppes In-Flite Food Building is located east of and adjacent to the former Gladieux Corporation In-Flite Food Building. LSG/Sky Chefs now operates this building. This steel-framed building is rectangular and rests on a concrete slab foundation. The context of the structure includes the land it stands on, the row of buildings of which it is part, and the adjacent landscaping.

Former Allied Fueling Building – The former Allied Fueling Building is the last building to the east. Air BP now operates this building. It is industrial in form, rectangular, has a concrete foundation, and is low in massing. The context of the structure includes the land it stands on, the row of buildings of which it is part, and the adjacent landscaping.

Apron Tower – The Apron Tower is no longer in service and has been removed from its original location. The removal was approved through consultation with the Authority and the SHPO. The Apron Tower was five stories tall, had a concrete foundation, and had steel frame construction. The first floor accommodated the mechanical rooms, the second floor was office space, the third floor was a ready room, the fourth floor was an equipment room and a restroom, and the fifth floor was the control cab. The cab had double glazed windows that provide an uninterrupted view of the apron. Personnel in the Apron Tower were responsible for mobile lounge dispatch and ramp control, which dictated the flow of aircraft that were not on the main runway. A new structure has been constructed in place of the Apron Tower to provide for observation and control of deicing activities.

Triturator Building – The Triturator Building has been demolished and a replicate of the building has been constructed. This process was approved through consultation with the Authority and the SHPO. A Memorandum of Agreement (MOA) was executed and signed by the appropriate authorities. The steel-framed building was located on the far east end of the line

of apron buildings; it was rectangular and rested on a concrete slab foundation. The Triturator Building was used for aircraft sewage disposal.

Mobile Lounges – The Mobile Lounge System was designed to ferry passengers from the terminal to jets waiting out on the apron. Saarinen envisioned a system in which a Mobile Lounge was more than a bus. It was an actual part of the terminal that detached itself to take passengers to their aircraft. Passengers enter the lounge and travel to the aircraft in comfort without stepping outside. Because the Mobile Lounges move between the Main Terminal and the apron buildings, the area between the two, especially the Mobile Lounge pathways, are the context of these vehicles.

3.8.2.1 Sully Plantation. Sully Historic Park is a Virginia landmark located in the southern panhandle of airport property east of Sully Road (Figure 3-11). The Park consists of 38.9 acres of an original 3,311-acre tract granted to Henry Lee in 1725 (PMC 1989). Henry Lee operated a tobacco quarter on Sully Plantation. The main residence, stone dairy, kitchen/laundry, smokehouse, and office make up the park today. The house is furnished with antiques of the Federal Period. Formal and kitchen gardens complement the house. The original tract encompassed the entire southern portion of IAD. Due to the historic significance of the site, it was saved from demolition in 1959 and entrusted to the care of the Fairfax County Park Authority. The Sully Plantation is listed on the National Register of Historic Places as a historic district.

3.8.3 Historic Resources Within the ROI. The only historic site (listed on the National Register of Historic Places) within the ROI outside the airport boundary is the Frying Pan Spring Meeting House located in Frying Pan Park, Herndon, Virginia (Figure 3-11). The Frying Pan Spring Meeting House was built in 1791. It was used for town meetings as well as for religious services.

3.8.4 Previous Historic and Archaeological Investigations. Information from previous archaeological investigations (PMC 1989) performed within IAD and in the vicinity of the airport was reviewed to compile all known information on the archaeological and cultural resources, including archival sources, at IAD. A figure and table of the compiled resource information is provided in Appendix D.

3.8.5 Cultural Resources. The Smithsonian Institution's National Air and Space Museum (NASM) is building a new museum for the display and preservation of its collection of historic aviation and space artifacts. In honor of its major donor, it has been named the "Steven F. Udvar-Hazy Center" (NASM 2001). The Udvar-Hazy Center will be located about 3 miles south of the Main Terminal at IAD near the intersection of Routes 28 and 50 (Figure 1-3). The 760,057-square-foot building will be situated on 176.5 acres. Ground was broken on October 25, 2000 and it is scheduled to open in December 2003 (Air Force 2001).

The design calls for exhibit hangars, an observation tower from which visitors can watch air traffic at IAD, a workshop where the public can watch the restoration and preservation of historic aircraft, collections storage, classrooms, archives, a large-format theater, restaurants, and gift shops. More than 180 aircraft and 100 spacecraft will be on display at the Center. The Center

will provide a field trip destination for Virginia's school children where they will participate in learning laboratories and classrooms.

3.9 Biotic Communities. Biotic communities include both flora (plants) and fauna (animals). Several plant communities exist on the IAD property. These communities include upland hardwood (oak-hickory complex), maintained grassland, old field (red cedars, poison ivy, multiflora rose, and herbaceous species), and floodplain forest. The floodplain forest occurs along well-defined wetland areas and is dominated by oak (*Quercus* sp.), ash (*Fraxinus americana*), and sycamore (*Platanus occidentalis*). No unique habitats exist on the property other than wetland areas (refer to Section 3.11 for further details).

Animal species expected to be observed in the area are typical of those associated with the noted vegetation cover types. Birds that would be expected to occur at IAD include migratory species. Common bird species such as robins (*Turdus migratorius*), cardinals (*Cardinalis cardinalis*), and starlings (*Sturnus vulgaris*) may be observed through all seasons. Mammals that occur at IAD include cottontail rabbits (*Sylvilagus floridanus*), squirrels (*Sciurus carolinensis*), woodchucks (*Marmota monax*), white-tailed deer (*Odocoileus virginianus*), fox (*Vulpes fulva*), American black bear (*Ursus americanus*), and coyote (*Canis latrans*). Common reptiles and amphibians within the area would include garter snakes (*Thamnophis sirtalis*), American toads (*Bufo americana*), and box turtles (*Terrapene carolina*).

3.10 Endangered and Threatened Species. Section 7 of the Endangered Species Act requires that information be collected from the regional director of the U.S. Fish and Wildlife Service (USFWS) on whether any species that is listed or proposed to be listed may be present in the area affected by the proposed action. Consultations with Federal and State resource agencies have been conducted. These resource agencies include:

- U.S. EPA Region III, Environmental Services Division
- U.S. Department of the Interior, Fish and Wildlife Service
- Commonwealth of Virginia, Department of Conservation and Recreation, Division of Natural Heritage
- Commonwealth of Virginia, Department of Game and Inland Fisheries
- Commonwealth of Virginia, Department of Agriculture and Consumer Services
- Virginia Department of Environmental Quality

Agency correspondence letters are included in Appendix E. Tables 3-14 and 3-15 present lists of threatened and endangered species known or suspected to occur in Fairfax and Loudoun counties, respectively. A key to the abbreviations used on Natural Heritage Resource Lists follows these two tables. Several listed plant species included in Tables 3-14 and 3-15 may occur in soil associated with diabase flatrocks present in the northern and western portions of IAD property (see Section 3.6). Diabase flatrocks support a distinct community of drought-tolerant plants species that are typically associated with prairie vegetation and include the earleaf foxglove (*Agalinis auriculata*), white heath aster (*Aster ericoides*), hairy beardtongue (*Penstemon hirsutus*), blue-hearts (*Buchnera americana*), downy phlox (*Phlox pilosa*), stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*), and the marsh hedgenettle (VDCR 2002).

Review of geologic information indicates that diabase glade habitat is not present in the Tier 2 project area.

The Virginia Department of Conservation and Recreation (DCR) responded to a request for endangered and threatened species information, and stated that two state rare plant species, hairy beardtongue (*Penstemon hirsutus*) and white heath aster (*Aster ericoides*), have been documented within IAD. The Virginia Department of Game and Inland Fisheries responded to a request for endangered and threatened species information and stated that the state threatened wood turtle (*Clemmys insculpta*) has been documented within the project area. Additionally, the USFWS has stated that the Federally listed threatened plant, the small whorled pogonia (*Isotria medeoloides*), may be present within IAD if suitable hardwood forest habitat is present. The Virginia threatened upland sandpiper has been observed at IAD by USDA personnel.

Hairy beardtongue was observed during a 5 June 2001 rare, threatened, and endangered (RTE) species field investigation of the mid-field area at IAD. At the time of the 5 June field investigation, the hairy beardtongue was in full bloom and each stand included less than 12 plants. During a 25-27 July 2001 field investigation, three hairy beardtongue plants were observed with intact seed capsules. The locations of the plants were documented using a differential GPS system and are depicted on Figure 3-13. None of these sightings were in diabase glade habitat areas. The second species presented by DCR, white heath aster, was not observed during the field investigations. Two of the observed locations of the hairy beardtongue are adjacent to the proposed route of the APM Tunnel. None of the other Federally or state-listed threatened or rare species were observed during the two independent field surveys. Details of the field surveys are located in Appendix F.

During subsequent surveys of the IAD property, the red-breasted nuthatch, golden crowned kinglet, hermit thrush, and winter wren, all species of state special concern, have been observed in the project area (MWAA, unpublished data 2002). These species were not observed to be nesting. During the 2002 surveys, a Federally and state listed threatened bald eagle was observed flying over the airport but has not been found using the habitat at IAD.

TABLE 3-14 LISTED RTE PLANT AND ANIMAL SPECIES KNOWN OR SUSPECTED TO OCCUR IN FAIRFAX COUNTY, VIRGINIA

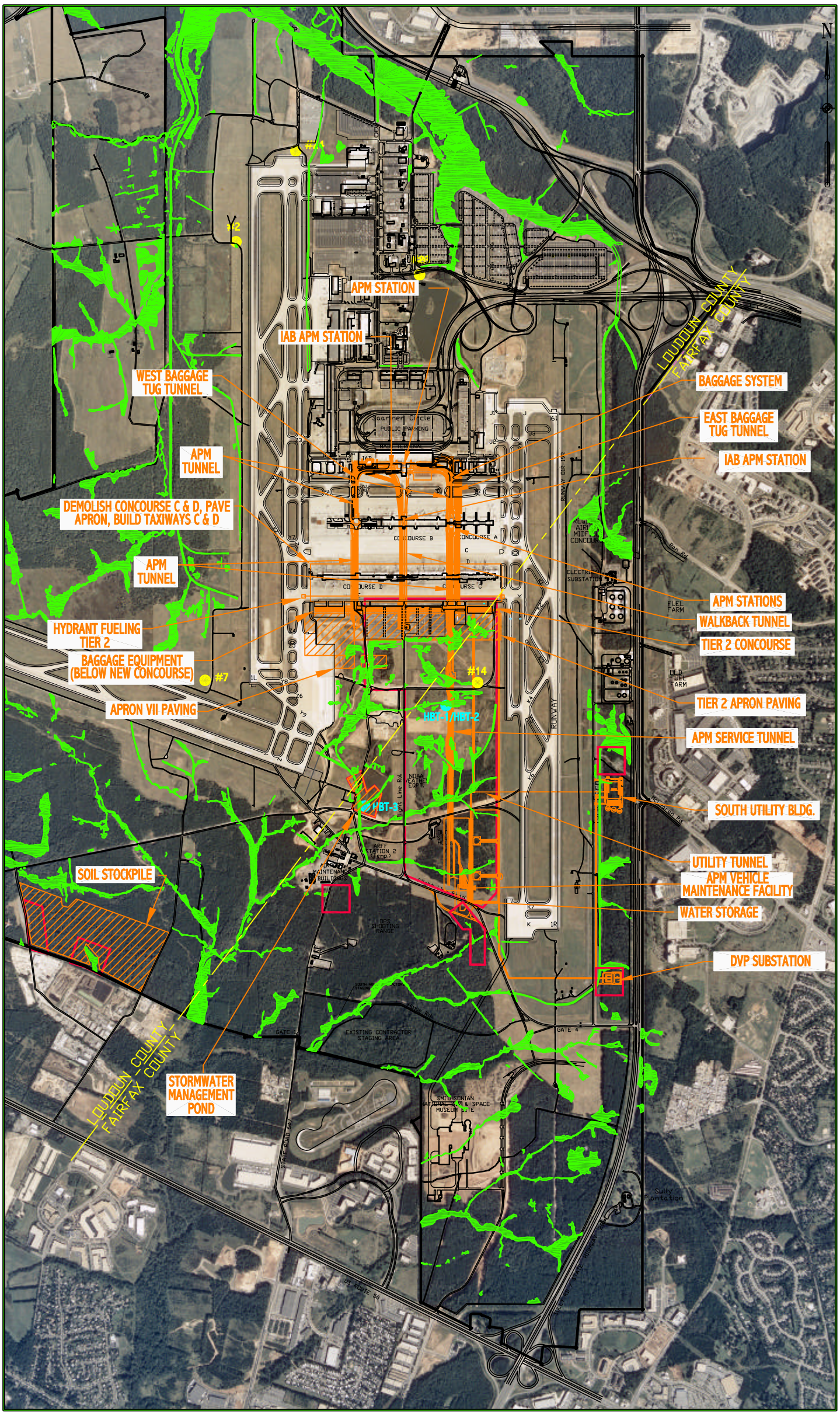
Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Vertebrates							
Birds	*Ammodramus henslowii susurrans*	Henslow's Sparrow	G4	S1	SOC	LT	No Date
Birds	*Botaurus lentiginous*	American Bittern	G4	SU	--	--	Yes
Birds	*Certhia americana*	Brown Creeper	G5	S2S3	--	SC	Yes
Birds	*Gallinula chloropus*	Common Moorhen	G5	S1	--	SC	Yes
Birds	*Haliaeetus leucocephalus*	Bald Eagle	G4	S2	LT	LT	Yes
Birds	*Ixobrychus exilis*	Least Bittern	G5	S2	--	--	Yes
Birds	*Nyctanassa violacea*	Yellow-Crowned Night-Heron	G5	S2	--	SC	Yes
Birds	*Podilymbus podiceps*	Pied-Billed Grebe	G5	S2	--	--	Yes

Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Birds	*Rallus elegans*	King Rail	G4G5	S2	--	--	Yes
Reptiles	*Clemmys insculpta*[1]	Wood Turtle	G4	S2	--	LT	Yes
Plants							
Non-Vascular Plants	*Sphagnum subtile*	Delicate Peatmoss	G5?Q	S1S2	--	--	No
Vascular Plants	*Agalinis auriculata*	Earleaf Foxglove	G3	S1	SOC	--	Yes
Vascular Plants	*Arabis shortii*	Short's Rockcress	G5	S2	--	--	Yes
Vascular Plants	*Asclepias rubra*	Red Milkweed	G4G5	S2	--	--	No
Vascular Plants	*Aster ericoides*	White Heath Aster	G5	S2	--	--	Yes
Vascular Plants	*Aster shortii*	Short's Aster	G4G5	S1	--	--	No
Vascular Plants	*Bolboschoenus fluviatilis*	River Bulrush	G5	S1	--	--	Yes
Vascular Plants	*Buchnera americana*	Blue-Hearts	G5?	S1S2	--	--	No
Vascular Plants	*Cabomba caroliniana*[1]	Carolina Fanwort	G3G5	S1	--	--	Yes
Vascular Plants	*Carex cristatella*	Crested Sedge	G5	S2	--	--	Yes
Vascular Plants	*Carex decomposita*	Epiphytic Sedge	G3	S2	SOC	--	No
Vascular Plants	*Carex lacustris*	Lake-Bank Sedge	G5	S1	--	--	No
Vascular Plants	*Carex straminea*	Straw Sedge	G5	S1	--	--	Yes
Vascular Plants	*Carex tenera*	Slender Sedge	G5	S1?	--	--	Yes
Vascular Plants	*Carex vestita*	A Sedge	G5	S2	--	--	Yes
Vascular Plants	*Cerastium arvense*	Field Chickweed	G5T4?	S2?	--	--	Yes
Vascular Plants	*Cirsium altissimum*	Tall Thistle	G5	SH	--	--	No Date
Vascular Plants	*Cuscuta cephalanthi*	Button-Bush Dodder	G5	S1?	--	--	No
Vascular Plants	*Cuscuta polygonorum*	Smartweed Dodder	G5	S2?	--	--	No
Vascular Plants	*Desmodium canadense*	Showy Tick-Trefoil	G5	S1	--	--	No
Vascular Plants	*Diarrhena obovata*	A Beakgrain	G4G5	S1	--	--	Yes
Vascular Plants	*Echinocystis lobata*	Wild Mock-Cucumber	G5	S1?	--	--	No
Vascular Plants	*Eleocharis compressa*	Flat-Stemmed Spike-Rush	G4	S2	--	--	Yes
Vascular Plants	*Enemion biternatum*	False Rue-Anemone	G5	S1	--	--	Yes
Vascular Plants	*Eriocaulon parkeri*[1]	Parker's Pipewort	G3	S2	--	--	No
Vascular Plants	*Eryngium yuccifolium*	Rattlesnake-Master	G5T?	S2	--	--	No
Vascular Plants	*Erythronium albidum*	White Trout-Lily	G5	S2	--	--	Yes
Vascular Plants	*Geum laciniatum var trichocarpum*	Rough Avens	G5T?	S2	--	--	No Date
Vascular Plants	*Hasteola suaveolens*	Sweet-Scented Indian-Plantain	G3G4	S2	SOC	--	Yes
Vascular Plants	*Helianthus occidentalis*	McDowell Sunflower	G5	S1	--	--	Yes
Vascular Plants	*Hemicarpha micrantha*	Dwarf Bulrush	G4	S1	--	--	Yes
Vascular Plants	*Isotria medeoloides*	Small Whorled Pogonia	G2G3	S2	LT	LE	No Date
Vascular Plants	*Lathyrus palustris*	Vetchling	G5	S1	--	--	Yes
Vascular Plants	*Liparis loeselii*	Loesel's Twayblade	G5	S2	--	--	No
Vascular Plants	*Lythrum alatum*	Winged-Loosestrife	G5	S2	--	--	No
Vascular Plants	*Matteuccia struthiopteris var pensylvanica*	Ostrich Fern	G5T5	S1	--	--	Yes
Vascular Plants	*Micranthemum micranthemoides*	Nuttall's Micranthemum	GH	SH	--	--	No
Vascular Plants	*Moehringia lateriflora*	Grove Sandwort	G5	S1	--	--	Yes

Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Vascular Plants	*Oligoneuron rigidum* var *rigidum*	Stiff Goldenrod	G5T5	S2	--	--	Yes
Vascular Plants	*Onosmodium virginianum*	Virginia False-Gromwell	G4	S2	--	--	Yes
Vascular Plants	*Orthilia secunda*	One-Sided Wintergreen	G5	SH	--	--	No
Vascular Plants	*Packera paupercula*	Balsam Ragwort	G5	S2	--	--	Yes
Vascular Plants	*Paronychia virginica*	Yellow Nailwort	G4T1Q	S1	--	--	No
Vascular Plants	*Penstemon hirsutus*[2]	Hairy Beardtongue	G4	S2	--	--	No
Vascular Plants	*Phacelia covillei*	Blue-Scorpion-Weed	G2	S1	SOC	--	Yes
Vascular Plants	*Phlox pilosa*	Downy Phlox	G5T5	S2	--	--	No
Vascular Plants	*Plantago cordata*	Heart-Leaved Plantain	G4	SH	--	--	No
Vascular Plants	*Platanthera peramoena*	Purple Fringeless Orchis	G5	S2	--	--	Yes
Vascular Plants	*Potamogeton amplifolius*[1]	Large-Leaf Pondweed	G5	S1S2	--	--	No
Vascular Plants	*Potamogeton robbinsii*[1]	Flatleaf Pondweed	G5	SH	--	--	No
Vascular Plants	*Potamogeton zosteriformis*[1]	Flatstem Pondweed	G5	S1	--	--	No
Vascular Plants	*Prunus susquehanae*	Sand Cherry	G5T4	S1	--	--	No
Vascular Plants	*Pycnanthemum torrei*	Torrey's Mountain-Mint	G2	S2?	SOC	--	Yes
Vascular Plants	*Pyrola chlorantha*	Greenish-Flowered Wintergreen	G5	SH	--	--	No
Vascular Plants	*Quercus prinoides*	Dwarf Chinquapin Oak	G5	S2	--	--	No
Vascular Plants	*Ranunculus ambigens*	Water-Plantain Spearwort	G4	S1	--	--	Yes
Vascular Plants	*Ranunculus hederaceus*	Long-Stalked Crowfoot	G5	SH	--	--	No
Vascular Plants	*Rhododendron arborescens*	Smooth Azalea	G4G5	S2	--	--	Yes
Vascular Plants	*Salix exigua*	Sandbar Willow	G5	S1	--	--	No
Vascular Plants	*Sida hermaphrodita*	Virginia Mallow	G2	S1	SOC	--	No
Vascular Plants	*Silene nivea*	Snowy Campion	G4?	S1	--	--	Yes
Vascular Plants	*Solidago racemosa*	Sticky Goldenrod	G5T4?	S1	--	--	Yes
Vascular Plants	*Solidago rupestris*	Rock Goldenrod	G4?	S1	--	--	Yes
Vascular Plants	*Spartina pectinata*	Freshwater Cordgrass	G5	S2	--	--	Yes
Vascular Plants	*Spiranthes ochroleuca*	Yellow Nodding Ladies' Trees	G4	S1	--	--	No
Vascular Plants	*Stachys pilosa* var *arenicola*	Marsh Hedgenettle	G5	S1	--	--	No Date
Vascular Plants	*Valeriana pauciflora*	Large-Flowered Valerian	G4	S2	--	--	Yes
Vascular Plants	*Vitis rupestris*	Sand Grape	G3G4	S1?	SOC	--	Yes
Vascular Plants	*Wolffia columbiana*	Columbia Water-Meal	G5	S1	--	--	No
Vascular Plants	*Xyris caroliniana*	Carolina Yellow-Eyed-Grass	G4G5	S1	--	--	No
Invertebrates							
Amphipods	*Stygobromus kenki*[1]	Rock Creek Groundwater Amphipod	G1G3	SH	SOC	--	No
Amphipods	*Stygobromus phreaticus*[1]	Northern Virginia Well Amphipod	G1	S1	SOC	--	Yes
Amphipods	*Stygobromus pizzini*[1]	Pizzini's Amphipod	G2G4	S1S2	SOC	SC	Yes
Amphipods	*Stygobromus SP 15*[1]	A Groundwater Amphipod	G1	S1	SOC	--	Yes
Beetles	*Cicindela formosa generosa*	A Tiger Beetle	G5T5	SH	--	--	Yes
Beetles	*Lordithon niger*	Black Lordithon Rove Beetle	G1	SH	SOC	--	No Date
Bivalves	*Elliptio lanceolata*[1]	Yellow Lance Mussel	G2G3	S2S3	SOC	SC	No Date
Bivalves	*Lasmigona subviridis*[1]	Green Floater	G3	S2	SOC	SC	Yes

Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Butterflies, Moths, and Skippers	*Callophrys irus*	Frosted Elfin	G3	S2	--	--	No
Butterflies, Moths, and Skippers	*Callophrys polios*	Hoary Elfin	G5	S1S3	--	--	No
Butterflies, Moths, and Skippers	*Erynnis martialis*	Mottled Duskywing	G3G4	SU	--	--	No
Butterflies, Moths, and Skippers	*Erynnis persius*	Persius Duskywing	G5	S?	--	--	Yes
Butterflies, Moths, and Skippers	*Fixsenia favonius ontario*	Northern Hairstreak	G4T4	S2S3	--	--	No Date
Butterflies, Moths, and Skippers	*Pyrgus wyandot*	Appalachian Grizzled Skipper	G2	S2	--	--	No
Butterflies, Moths, and Skippers	*Speyeria idalia*	Regal Fritillary	G3	S1	SOC	--	No Date
Dragonflies and Damselflies	*Celithemis martha*[1]	Martha's Pennant	G4	S2	--	--	No
Dragonflies and Damselflies	*Epitheca costalis*[1]	Stripe-Winged Baskettail	G4	S2	--	--	No
Dragonflies and Damselflies	*Gomphus fraternus*[1]	Midland Clubtail	G5	S1	--	--	Yes
Dragonflies and Damselflies	*Gomphus ventricosus*[1]	Skillet Clubtail	G3	S1	SOC	--	No
Dragonflies and Damselflies	*Nehalennia gracilis*[1]	Sphagnum Sprite	G5	S2	--	--	Yes
Dragonflies and Damselflies	*Stylurus laurae*[1]	Laura's Clubtail	G4	S2	--	--	No
Flatworms	*Procotyla typhlops*[1]	A Groundwater Planarian	G1G2	S1S2	--	--	No Date
Flatworms	*Sphalloplana holsingeri*[1]	Holsinger's Groundwater Planarian	GH	SH	--	--	No
Flatworms	*Sphalloplana subtilis*[1]	Bigger's Groundwater Planarian	GH	SH	--	--	No
Stoneflies	*Acroneuria flinti*[1]	Flint's Common Stonefly	GH	SH	--	--	No

[1] Aquatic species.
[2] Observed during 5 June 2001 field investigation.



2500 1250 0 2500

GRAPHIC SCALE IN FEET

LEGEND

- TIER 2 AND RELATED PROJECTS
- DELINEATED WETLANDS
- SURVEYED AREAS
- EQUIVALENT TO 2 ACRES
- HISTORIC UPLAND SANDPIPER OBSERVATIONS
- HAIRY BEARDTONGUE OBSERVATIONS

FILE: Q:\PROJECTS\13840001\2002\FINALEA\FIG3-13

TIER 2 AND RELATED PROJECTS RARE, THREATENED, OR ENDANGERED SPECIES SURVEYS WASHINGTON DULLES INTERNATIONAL AIRPORT PROJECT LOCATION	LOCATION OF AREAS SURVEYED FOR RTE SPECIES AND LOCATIONS OF WILDLIFE HAZARD MANAGMENT MONITORING STATIONS WITH UPLAND SANDPIPER OBSERVATIONS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY -	SCALE AS SHOWN	FIGURE 3-13

TABLE 3-15 LISTED RTE PLANT AND ANIMAL SPECIES KNOWN OR SUSPECTED TO OCCUR IN LOUDOUN COUNTY, VIRGINIA

Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Vertebrates							
Birds	*Ammodramus henslowii susurrans*	Henslow's Sparrow	G4	S1	SC	LT	No Date
Birds	*Bartramia longicauda*	Upland Sandpiper	G5	S1S2	--	LT	Yes
Birds	*Dolichonyx oryzivorus*	Bobolink	G5	S1	--	--	Yes
Birds	*Rallus elegans*	King Rail	G4G5	S2	--	--	Yes
Reptiles	*Clemmys insculpta*[1]	Wood Turtle	G4	S2	--	LT	Yes
Plants							
Vascular Plants	*Agalinis auriculata*[3]	Earleaf Foxglove	G3	S1	SOC	--	No Date
Vascular Plants	*Arabis shortii*	Short's Rockcress	G5	S2	--	--	Yes
Vascular Plants	*Aster shortii*	Short's Aster	G4G5	S1	--	--	Yes
Vascular Plants	*Carex cristatella*	Crested Sedge	G5	S2	--	--	No Date
Vascular Plants	*Carex decomposita*	Epiphytic Sedge	G3	S2	SOC	--	No Date
Vascular Plants	*Carex polymorpha*[3]	Variable Sedge	G2G3	S2	SOC	LE	No Date
Vascular Plants	*Cerastium arvense*	Field Chickweed	G5T4?	S2?	--	--	Yes
Vascular Plants	*Crataegus pruinosa*	A Hawthorn	G5	S1	--	--	No
Vascular Plants	*Echinocystis lobata*	Wild Mock-Cucumber	G5	S1?	--	--	No
Vascular Plants	*Erythronium albidum*	White Trout-Lily	G5	S2	--	--	Yes
Vascular Plants	*Geum aleppicum*	Yellow Avens	G5	SH	--	--	No
Vascular Plants	*Hasteola suaveclens*	Sweet-Scented Indian Plantain	G3G4	S2	SOC	--	Yes
Vascular Plants	*Isotria medeoloides*	Small Whorled Pogonia	G2G3	S2	LT	LE	No Date
Vascular Plants	*Lythrum alatum*	Winged-Loosestrife	G5	S2	--	--	Yes
Vascular Plants	*Oligoneuron rigidum* var *rigidum*	Stiff Goldenrod	G5T5	S2	--	--	Yes
Vascular Plants	*Penstemon hirsutus*[2]	Hairy Beardtongue	G4	S2	--	--	Yes
Vascular Plants	*Phlox pilosa*	Downy Phlox	G5T5	S2	--	--	No Date
Vascular Plants	*Poa paludigens*[3]	Bog Bluegrass	G3	S2	SOC	--	No Date
Vascular Plants	*Poa palustris*	Fowl Bluegrass	G5	S1S2	--	--	No
Vascular Plants	*Prunus nigra*	Canada Plum	G4G5	S1	--	--	Yes
Vascular Plants	*Quercus prinoides*	Dwarf Chinquapin Oak	G5	S2	--	--	No
Vascular Plants	*Rorippa sessiliflora*	Stalkless Yellowcress	G5	S1	--	--	Yes
Vascular Plants	*Salix exigua*	Sandbar Willow	G5	S1	--	--	No
Vascular Plants	*Stachys pilosa* var *arenicola*	Marsh Hedgenettle	G5	S1	--	--	No Date
Vascular Plants	*Valeriana pauciflora*	Large-Flowered Valerian	G4	S2	--	--	No
Vascular Plants	*Vitis rupestris*	Sand Grape	G3G4	S1?	SOC	--	Yes
Invertebrates							
Bivalves	*Elliptio lanceolata*[1]	Yellow Lance Mussel	G2G3	S2S3	SOC	SC	Yes
Bivalves	*Lasmigona subviridis*[1]	Green Floater	G3	S2	SOC	SC	Yes
Butterflies, Moths, and Skippers	*Hesperia attalus slossonae*	Dotted Skipper	G3G4 T3	SH	SOC	--	No
Butterflies, Moths, and Skippers	*Speyeria idalia*	Regal Fritillary	G3	S1	SOC	--	No Date

Major Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Seen in Co. Since 1980
Dragonflies and Damselflies	*Gomphus abbreviatus*[1]	Spine-Crowned Clubtail	G3G4	S2	SOC	--	No
Dragonflies and Damselflies	*Stylurus notatus*[1]	Elusive Clubtail	G3	S1	SOC	--	No Date

[1] Aquatic species.
[2] Observed during 5 June 2001 field investigation.
[3] Through correspondence with the USFWS, this species has been documented in an adjacent county and may occur in this county.

KEY TO ABBREVIATIONS USED ON NATURAL HERITAGE RESOURCE LISTS

State Rank

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threats.

- **S1** – Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- **S2** – Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- **S3** – Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- **S4** – Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- **S5** – Very common; demonstrably secure under present conditions.
- **SA** – Accidental in the state.
- **S#B** – Breeding status of an organism within the state.
- **SH** – Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- **S#N** - Non-breeding status within the state. Usually applied to winter resident species.
- **SU** – Status uncertain, often because of low search effort or cryptic nature of the element.
- **SX** – Apparently extirpated from the state.
- **SZ** – Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

KEY TO ABBREVIATIONS USED ON NATURAL HERITAGE RESOURCE LISTS

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g., G2/S1) give an instant grasp of a species' known rarity.
These ranks should not be interpreted as legal designations.

FEDERAL STATUS

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE - Listed Endangered	**LT** - Listed Threatened	**PE** – Proposed Endangered	**PT** - Proposed Threatened
C – Candidate (formerly C1 – Candidate category 1)	**E(S/A)** - treat as endangered because of similarity of appearance	**T(S/A)** – treat as threatened because of similarity of appearance	**SOC** – Species of Concern

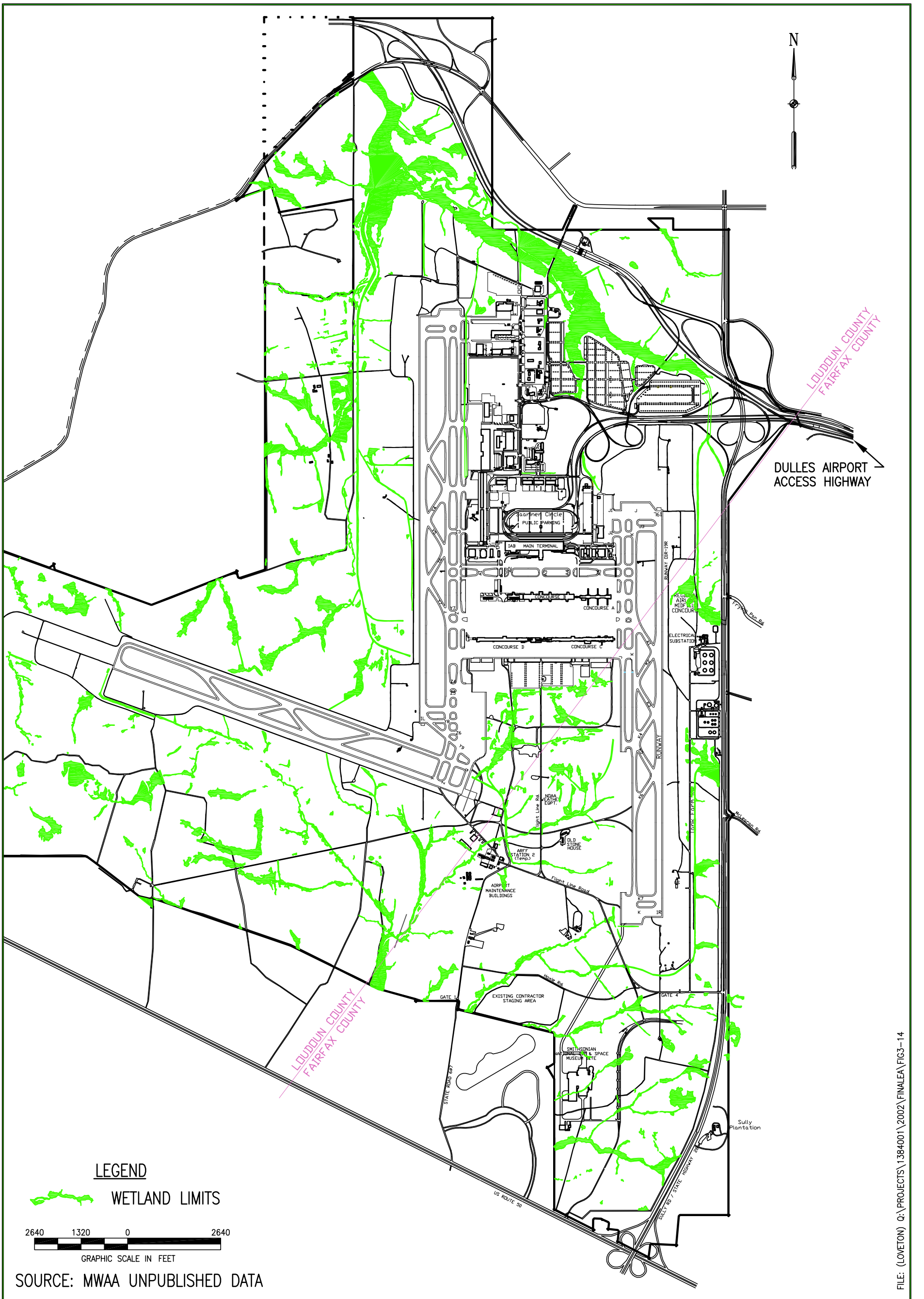
STATE STATUS

The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE - Listed Endangered	**PE** - Proposed Endangered	**SC** – Special Concern - animals that merit special concern according to VDGIF (not a regulatory category)
LT – Listed Threatened	**PT** - Proposed Threatened	**C** - Candidate

For information on the laws pertaining to threatened or endangered species, please contact:
U.S. Fish and Wildlife Service for all **FEDERALLY** listed species;
Department of Agriculture and Consumer Services, Plant Protection Bureau for **STATE listed plants and insects**
Department of Game and Inland Fisheries for all other **STATE listed animals**

3.11 Wetlands. A wetland survey following the procedures of the U.S. Army Corps of Engineers (USACE) Manual (1987) was completed for the IAD property in 1997 and 2000 (MWAA 2000c). Based on this survey and an approved jurisdictional determination by USACE (Appendix E), approximately 748 acres of wetlands were located on IAD property. Most of the wetlands delineated at IAD were adjacent to or associated with surface water features such as streams, drainageways, or ponds. Table 3-16 presents the types of wetlands that occur at IAD and the typical plant species present in each wetland type. Figure 3-14 shows the wetlands in the vicinity of Tier 2 and related projects.



LEGEND

WETLAND LIMITS

2640 1320 0 2640

GRAPHIC SCALE IN FEET

SOURCE: MWAA UNPUBLISHED DATA

FILE: (LOVETON) Q:\PROJECTS\1384001\2002\FINALEA\FIG3-14

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN AND FAIRFAX COUNTIES, VIRGINIA	WETLAND AREAS AT IAD	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY CWL	SCALE AS SHOWN	FIGURE 3-14

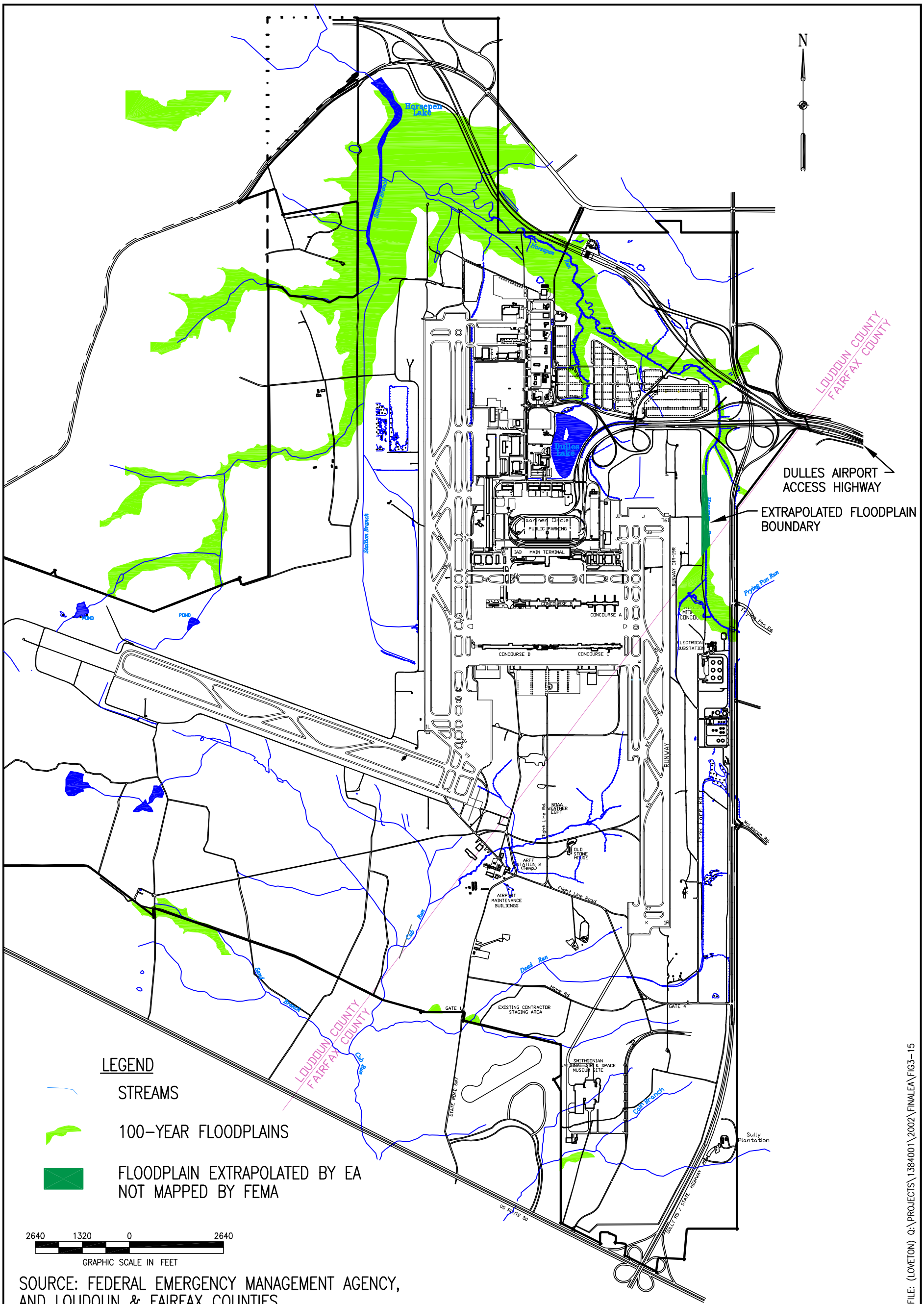
TABLE 3-16 TYPICAL WETLAND TYPES AND DOMINANT SPECIES AT IAD

Wetland Type	Typical Plant Species	
	Scientific Name	**Common Name**
Emergent (Herbaceous)	*Bidens frondosa*	Beggar ticks
	Impatiens pallida	Jewelweed
	Lonicera japonica	Japanese honeysuckle
	Polygonum hydropiper	Smartweed
	Scirpus cyperinus	Wool grass
Scrub-Shrub (Shrubs)	*Cephalanthus occidentalis*	Buttonbush
	Cornus amomum	Silky dogwood
	Diospyros virginiana	Common persimmon
	Rosa multiflora	Multiflora rose
	Viburnum prunifolium	Blackhaw viburnum
Forested Riparian (Trees)	*Acer rubrum*	Red maple
	Fraxinus pennsylvanica	Green ash
	Juniperus virginiana	Eastern redcedar
	Salix nigra	Black willow
	Quercus palustris	Pin oak
Open Water	----	----

3.12 Floodplains. *Floodplain Management*, Executive Order 11988 issued May 24, 1977, directs all Federal agencies to avoid both long- and short-term adverse effects associated with occupancy, modification, and development in the 100-year floodplain, when possible. Floodplains are defined in this order as "the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent greater chance of flooding in any given year." Flooding in the 100-year zone is expected to occur once every 100 years, on average.

IAD property contains four predominant streams. Stallion Branch is located in the northern portion of the property, Horsepen Run is located in the northern and northeastern portion of the property, and Cub Run and Dead Run are located in the southern portion of IAD. The 100-year floodplain as mapped by the Federal Emergency Management Agency is shown in Figure 3-15.

3.13 Coastal Zone Management. The Coastal Zone Management Act of 1972 (CZMA) was enacted by Congress to encourage states to protect, preserve, develop, and, when possible, restore or enhance valuable natural coastal resources. Participation of the CZMA is a voluntary partnership between the federal government and the U.S. coastal states. The Commonwealth of Virginia enacted the Virginia Coastal Resources Management Program (VCRMP) by Executive Order in 1986 as a supplement to existing State laws and policies through the Commonwealth and its coastal localities. The program was approved as part of a National Coastal Zone Management Program authorized by the CZMA of 1972. The Virginia DEQ primarily serves as the lead agency, although the laws and regulations are also administered by a network of core agencies and coastal localities in the Commonwealth. The VCRMP was established to protect



SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY, AND LOUDOUN & FAIRFAX COUNTIES

FILE: (LOVETON) Q:\PROJECTS\13840001\2002\FINALEA\FIG3-15

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN AND FAIRFAX COUNTIES, VIRGINIA	100-YEAR FLOODPLAINS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY CWL	SCALE AS SHOWN	FIGURE 3-15

and manage Virginia's "coastal zone," also referred to as "Tidewater Virginia," which includes 29 counties, 15 cities, and 43 towns of the Commonwealth. Fairfax County in its entirety is part of the VCRMP and Tidewater Virginia; Loudoun County is not considered either part of the VCRMP or Tidewater Virginia. There are nine enforceable programs of the VCRMP: Fisheries Management, Subaqueous Lands Management, Wetlands Management, Dunes Management, Non-Point Source Pollution Control, Point Source Pollution Control, Shoreline Sanitation, Air Pollution Control, and Coastal Land Management.

The Chesapeake Bay Preservation Act of 1988 was passed by the Virginia General Assembly as part of the Coastal Land Management Program, one of the core enforceable programs of the VCRMP and in response to the need to improve the water quality of the Chesapeake Bay and other State waters by limiting pollution associated with development. The Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management regulations, adopted in 1989, require local Tidewater governments (including Fairfax County) to include water quality protection measures in their zoning and subdivision ordinances and in their comprehensive plans in areas known as Chesapeake Bay Preservation Areas (CBPAs). CBPAs are divided into Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). RPAs are protected from most development because they function to improve and protect water quality. RMAs, which include all areas outside of RPAs, are regulated to protect RPAs and water resources from degradation resulting from development and land-disturbing activity. Areas designated as RPAs in Fairfax County include:

- Tidal wetlands and a surrounding 100-ft buffer
- Tidal shores and a surrounding 100-ft buffer
- Tributary streams and a surrounding 100-ft buffer
- Nontidal wetlands connected by surface flow and contiguous to a tidal wetland or tributary stream and a surrounding 100-ft buffer
- A buffer area within a major floodplain

Areas designated as RMAs in Fairfax County include any area not designated as an RPA. If applicable, areas may also be designated as Intensely Developed Areas (IDAs) which include those areas of "existing development and infill sites where development is concentrated and little of the natural environment remains."

The RPAs in Fairfax County include the Potomac River shoreline, major streams and wetlands adjacent to existing streams and shores, and a surrounding 100-ft buffer. There are several areas on IAD property, primarily located in the southern portion of IAD along sections of Cub Run, Dead Run, and Cain Branch, which meet the definition of RPAs. A short portion of the north-drainage of Horsepen Run within IAD and Fairfax County also meets the definition of an RPA.

In July 1993, Fairfax County adopted the "Chesapeake Bay Preservation Ordinance" to protect the environmentally sensitive CBPAs. The Code of the County of Fairfax includes the "Chesapeake Bay Preservation Ordinance" of Fairfax County and includes regulations adopted to "apply to all land located within the unincorporated areas of Fairfax County" (CODE County of Fairfax 2001). Proposed development activities located within Fairfax County must be in compliance with the required criteria in the Code of the County of Fairfax, the VCRMP, and

ultimately the CZMA of 1972. These provisions call for minimization of disturbance, preservation of indigenous vegetation, minimization of impervious cover, and the use of stringent BMPs for stormwater. Development projects at IAD are being planned to be consistent with these criteria.

3.14 Coastal Barriers. The Coastal Barriers Resource Act of 1982 (CBRA), PL 97-348, was enacted to "minimize the loss of human life, wasteful expenditure of Federal revenues, and damage to fish, wildlife, and other natural resources associated with coastal barriers along the Atlantic and Gulf of Mexico coasts." Although the CBRA does not prohibit development that is privately financed, most Federal financial assistance within a Coastal Barriers Resources System (CBRS) is prohibited. In addition, the Coastal Barrier Improvement Act (CBIA), passed in 1990, tripled the size of the established CBRA and prohibited the issuance of new Federal flood insurance within specified areas.

IAD is not located within a CBRS and therefore the CBRA is not applicable to the project.

3.15 Wild and Scenic Rivers. The Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) was passed on October 2, 1968. It declares that certain "selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments, shall be protected for the benefit and enjoyment of present and future generations." There are no designated wild and scenic rivers within the ROI. In addition, there are no streams on the National Park Service's Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways within the region of influence.

3.16 Prime and Unique Farmland. The Farmland Protection Policy Act (FPPA) authorized USDA to develop criteria for identifying the effects of Federal programs on the conversion of farmland to non-agricultural use. USDA Land Use Policy designates prime farmland as land with the definitive combination of both the "physical and chemical characteristics for producing (and its use is available) for food, feed, forage, fiber, and oilseed crops." In general, prime farmland has the necessary and essential combination of soil quality, growing season, and moisture supply needed to produce economically, sustained high yields of crops when treated and managed according to acceptable farming methods. In addition, unique farmlands are classified by USDA as any land other than prime farmland that is used for the "production of specific high-value food and fiber crops." According to the FPPA, farmland (either prime or unique) does not include farmland already "in or committed to urban development." IAD lands fall under this criteria and are not subject to provisions of the FPPA.

Consultation with the USDA Natural Resources Conservation Service office in the County of Fairfax indicated that 32 prime farmland soil types exist in Fairfax County, seven of which are located on IAD property (see Table 3-17) according to the 1963 *Soil Survey of Fairfax County, Virginia*. The USDA Natural Resources Conservation Service office in Loudoun County provided a list of prime soils for the entire County, but not specifically for IAD property (see Table 3-17). The Loudoun County Soil Survey is in the process of being updated, but IAD is not included in the survey.

TABLE 3-17 PRIME FARMLAND SOIL TYPES THAT EXIST ON IAD PROPERTY IN THE COUNTY OF FAIRFAX AND PRIME FARMLAND SOIL TYPES THAT EXIST IN THE COUNTY OF LOUDOUN

Soil Symbol	Soil Name and Description
FAIRFAX COUNTY	
Bh	Brecknock silt loam, undulating phase
Bn	Buck silt loam, eroded undulating phase
Bo	Bucks loam, undulating phase
Ck	Croton silt loam*
Lb	Lindside silt loam
Ma	Manassas silt loam
Rg	Rowland silt loam
LOUDOUN COUNTY	
3A	Comus silt loam
7A	Huntington silt loam
13B	Morven silt loam
17B	Middleburg silt loam
23B	Purcellville silt loam
28B	Eubanks loam
31B	Philomont and Tankerville soils
43B	Myersville-Catoctin Complex
45B	Fauquier silt loam
55B	Glenelg silt loam
70B	Leedsville cobbly silt loam
70C	Leedsville cobbly silt loam
71B	Panorama silt loam
76B	Sudley-Oatlands Complex
90B	Springwood silt loam
93B	Hibler silt loam
94B	Allegheny silt loam
95B	Goresville gravelly silt loam

*only drained areas are considered prime farmland soils

3.17 Energy. Energy sources used to operate IAD include electricity, natural gas, No. 2 fuel oil, propane, diesel fuel, and gasoline. Electricity is supplied by Dominion Virginia Power, formerly known as Virginia Electric and Power Company or VEPCO, and there are approximately a dozen standby emergency generators throughout the airport. Electricity is delivered to the airport at a substation located on airport property adjacent to Route 28. The Authority then provides electricity service to its facilities and airport tenants via underground lines in the northern part of the airport and overhead lines in the southern section.

Natural gas is supplied by Columbia Gas of Virginia, which is a unit of NiSource Inc., a holding company with headquarters in Merrillville, Indiana. Columbia Gas of Virginia, which is headquartered in Richmond, Virginia, provides natural gas service to more than 180,000

residential, commercial, and industrial customers throughout Virginia. They have been providing natural gas service to Virginia since 1947. Natural gas is delivered to the airport property line, and the Authority provides service to its facilities and airport tenants via approximately 16 miles of underground pipeline. The utility building boilers are the largest consumers of natural gas on the airport and can operate on No. 2 fuel oil as a backup.

Consumption of natural gas, No. 2 fuel oil, propane, and diesel fuel by stationary sources at the Authority is limited by the airport's air quality operating permit. A summary of those permit limits and energy consumption by the Authority facilities in the year 2000 is provided in Table 3-18.

TABLE 3-18 METROPOLITAN WASHINGTON AIRPORTS AUTHORITY
FACILITY ENERGY CONSUMPTION IN 2000

Equipment	Fuel	Annual Permit Limit		2000 Actual	
All Boilers and Heaters	No. 2 Fuel Oil	210,000	gallons	10,420	gallons
Boilers #1 and #2, All Small Boilers, and All Heaters	Natural Gas	450,000,000	cubic feet	121,464,730	cubic feet
Boilers #3 and #4	Natural Gas	270,000,000	cubic feet	135,583,360	cubic feet
Incinerator	Natural Gas	4,000,000	cubic feet	998,390	cubic feet
Heaters	Propane	250,000	gallons	56,677	gallons
Live Fire Fighting Training	Propane	562,000	gallons	31,372	gallons
Fuel Farm Generator	Diesel	5,000	gallons	757	gallons
Other Generators	Diesel	55,000	gallons		

Gasoline and diesel fuel are provided by venders and are utilized by vehicles operated by the Authority throughout the airport. Approximately 150,000 and 430,000 gallons of gasoline and diesel fuel, respectively, are consumed by the Authority at IAD yearly. There is an effort underway to replace currently used No. 2 fuel oil with diesel in order to reduce the number of fuel types at the airport. Finally, there are a number of tenants that provide and consume vehicle and aircraft fuel. For example, jet fuel that is purchased by the airlines servicing IAD is provided by an airport tenant who operates a relatively large fuel tank farm on the east side of the airport adjacent to Virginia Highway 28.

3.18 Light Emissions. The primary sources of light emissions from airports are the FAA required lighting for security, obstruction clearance, and navigation. An analysis of the impact of light emissions on the surrounding environment is required when proposed projects include the introduction of new lighting that may affect residential or other sensitive land uses. Only in unusual circumstances, such as when high intensity strobe lights shine directly into a residence, is the impact of light emissions considered sufficient to warrant special study and planning for measures to reduce such impacts (Airport Handbook, FAA 5050.4).

3.19 Visual. Airport improvement activities involving potential disruption of the natural environment or aesthetic integrity of the area or any activities that may affect sensitive locations such as parks, historic sites, or other public use areas are relevant visually. Airport improvement activities should be consistent with the goals and objectives of the Airport Master Plan to preserve the views of the area.

3.20 Solid Waste, Hazardous Waste, and Pollution Prevention.

3.20.1 Solid Waste. Solid waste at IAD is managed in accordance with applicable federal, state, and local environmental regulations. Solid waste is collected and removed from the airport by an offsite contractor. In 2000, approximately 2,975 tons of municipal solid waste were generated at IAD. Most solid waste was disposed of in Fairfax County facilities. Approximately 230 tons of paper products and 160 tons of ferrous metals are collected and recycled. The Authority also operates an incinerator with a rated operating capacity of 120 pounds per hour. The incinerator is a natural-gas-fired, dual chamber unit. Materials that are incinerated include contraband and foreign food, plants, and other prohibited items that are confiscated from passengers arriving on international flights. In 2000, approximately 14,750 pounds of material were destroyed in the incinerator, which was down from 19,000 pounds in 1999.

3.20.2 Hazardous Waste. Hazardous waste and hazardous materials at IAD are managed in accordance with applicable federal, state, and local regulations. The Authority generates hazardous wastes that are typical for airport operations. These include expired shelf-life materials, materials in damaged containers, waste paints and associated materials, waste diesel and gasoline fuels, flammable materials such as mineral spirits, absorbents, filters, and adhesives. The Authority is defined as a small quantity generator under EPA's Resource Conservation and Recovery Act since they generate less than 1,000 kilograms (2,200 pounds) of hazardous wastes a month. They operate a 90-day hazardous waste storage area on the southern area of the airport along Willard Road. Waste materials are stored at this site for a period of less than 90 days and are ultimately removed offsite by a contractor for disposal. The site has a secure building, located on a concrete pad with secondary containment, and is surrounded by a secured chain-link fence. No more than 30 55-gallon drums are typically accumulated at the site.

3.20.3 Pollution Prevention. The Authority recycles and otherwise reuses large quantities of materials throughout IAD. The Authority contracts with recyclers and other end-use marketers to dispose of metals, paper, used waste oil, antifreeze, solvents, and batteries. Table 3-19 summarizes the types and quantities of these materials as reported to Fairfax County for 2000. The materials noted in the source reduction category are either reused onsite or stockpiled onsite for future use.

TABLE 3-19 RECYCLED AND REUSED MATERIALS

Material	Quantity (tons/yr)	Material	Quantity (tons/yr)
Recycling		**Source Reduction**	
Ferrous Metals	160	Concrete	27,725
Paper	230	Fill Material	572,900
Antifreeze	5	Asphalt	5,450
Waste Oil	53	Total	606,075
Solvents	8		
Auto Batteries	2		
Tires	5		
Total	463		

In addition, as indicated in Section 3.5.2, recovered propylene glycol deicing fluid with a 7 percent or greater concentration is recycled.

3.21 Design, Art, and Architecture. According to the *Airport Environmental Handbook,* Order 5050.4A, design, art, and architectural considerations are applicable to: airport actions involving airport location, extensive earthmoving or other disruption of the natural environment or aesthetic integrity of an area, terminal and access road development, and to any development which may affect sensitive locations such as parks, historic sites, or other public use areas.

3.21.1 Architectural Background. Design, art, and architecture are particularly relevant to IAD because of the Saarinen Terminal. Eero Saarinen was the primary and notable architect for the master plan for Dulles International Airport. Saarinen was born in Kirkkonummi, Finland in 1910 and later moved with his family in 1925 to Bloomfield Hills, Michigan. He studied in Paris and at Yale University, after which he joined his father's architecture practice (Great Buildings 2001a). Other work that Saarinen created includes the Ingalls Hockey Rink at Yale; Gateway Arch in St. Louis, Missouri; TWA Terminal at Kennedy Airport; John Deere and Company Office in Moline, Illinois; and Kresge Auditorium in Cambridge, Massachusetts. These buildings express, as does IAD, Saarinen's interest in using new technologies and materials, and combining architecture and sculpture (PMC 1989). Eero Saarinen died in 1961, prior to the completion of IAD.

"At Dulles, Saarinen had a unique series of problems: he was designing a complete new airport, providing a modern gateway to the capital of the nation and building it for the Federal Government. The site was a flat plain. The main terminus is a single, compact structure, not entirely free from formalist tendencies but one which is technically exciting. The final design concept arrived at was a suspended structure, 'high at the front, lower in the middle, slightly higher at the back,' generated by a rectangular plan. The building is thus capable of lateral extension." (Dennis Sharp, Twentieth Century Architecture: a Visual History, p. 252) (Great Buildings 2001a,b).

Construction of IAD began in September 1958, and IAD was scheduled to begin initial operation in January 1961 at a projected cost of 50 million dollars. IAD opened in October 1962 at a cost of 175 million dollars. The Eisenhower administration selected the name of the new airport in honor of John Foster Dulles, upon his death in 1959. Dulles served as President Eisenhower's Secretary of State from 1953 to 1959 (PMC 1989).

3.21.2 Design and Planning. Most of the improvement projects at IAD were contained in the approved Airport Master Plan which includes general planning guidelines taken from the original Saarinen 1964 Master Plan Report (KPMG Peat Marwick 1985). Buildings that are planned for improvement must be carefully designed to minimize effects upon the existing historic properties. The expansion of the Main Terminal is an example of a previous improvement project at IAD where the integrity of the original design was kept and careful design of the planning minimized any effects to the original historic structure.

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

The projected environmental impacts to each resource category due to location, operation, and construction of Tier 2 and related facilities are discussed below. Impacts due to location and operation would be long-term impacts and are discussed under each of the resource headings below. Where impacts are expected, a comparison of the potential impact from alternatives to the proposed action is provided. Measures to mitigate impacts that are due to the proposed action are also described.

Table 4-1 provides an overview of the anticipated net impacts of Tier 2 and related projects.

Section 4.24 provides a synopsis of the temporary impacts that are expected to occur during the construction of Tier 2 and related projects. Table 4-2 provides an overview of projected impacts during construction.

Overview of Environmental Consequences. Implementation of Tier 2 and related projects at IAD is not expected to create significant long-term negative environmental impacts. Some effects to water quality, soils, historic and cultural resources, biotic communities, and wetlands are expected as a result of the Build Alternative. Implementation of the Build Alternative is not expected to negatively impact noise, land use, socioeonomics, air quality, DOT 4(f) lands, RTE, floodplains, coastal zones, coastal barriers, wild and scenic rivers, prime and unique farmland, energy, light emissions, visual aesthetics, solid waste, hazardous waste, pollution prevention, sanitary waste, or design, art, and architecture. Effects to water quality will be minimized through the use of best management practices (BMPs). Effects to historic and cultural resources will be minimized through agency consultation. Excavated soils will be tested and re-used, and loss of woodland and wetland habitat will be mitigated through revegetation and wetland banking, respectively. Revegetation and wetland mitigation will be conducted in accordance with FAA Advisory Circular (AC) 150/5200-33 (Hazardous Wildlife Attractants on or Near Airports). Demolition of Concourse C/D will require removal of asbestos and lead-based paint, but these substances will be disposed in accordance with appropriate regulations. The environmental consequences will be minor or temporary in nature and will be either minimized through BMPs or mitigated. In addition, implementation of the APM system will substantially reduce air emissions associated with the use of the mobile lounges and will result in a positive impact to air quality.

Construction-related impacts are expected to be temporary in nature (lasting over the 5-year construction period), minimized by BMPs, and limited to the IAD property. Construction activities will negatively affect noise, air quality, water quality, soils, historic and cultural resources, and biotic communities. Construction activities will create a short-term positive impact to socioeconomic resources due to construction-related employment opportunities.

TABLE 4-1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES FROM TIER 2 AND RELATED PROJECTS

Environmental Consequences	Projects			
	Tier 2 Concourse	**APM**	**South Utilities**	**Support Facilities**
Noise	No Impact	No Impact	No Impact	No Impact
Compatible Land Use	No Impact	No Impact	No Impact	No Impact
Social Impacts Including Environmental Justice, Child Safety	No Impact	No Impact	No Impact	No Impact
Induced Social Impacts	No Impact	No Impact	No Impact	No Impact
Air Quality—Stationary sources	No Impact	No Impact	Emissions from new boilers will be within permitted limitations	No impact
Air Quality- Mobile Sources	No Impact	Reduction of mobile lounge emissions	No Impact	No Impact
Water Quality	Increased runoff managed by stormwater Best Management Practices (BMPs)	No Impact	Increased runoff managed by stormwater BMPs	Runoff managed by stormwater BMPs
Soils and Geology	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used	Excess soil will be stockpiled and re-used
DOT Action Section 4(f) Lands	No Impact	No Impact	No Impact	No Impact
Historic, Architectural, Archaeological, and Cultural Resources- Buildings	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect
Historic, Architectural, Archaeological, and Cultural Resources- Below grade	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect
Biotic Communities	No Impact	No Impact	Loss of forest habitat	Loss of forest habitat; area will be revegetated after construction
Endangered and Threatened Species	No Impact	No Impact	No Impact	No Impact
Wetlands	Impact to be mitigated by banking	Impact to be mitigated by banking	Impact to be mitigated by banking	No Impact
Floodplains	No Impact	No Impact	No Impact	No Impact
Coastal Zone Management	No Impact	No Impact	No Impact	No Impact
Coastal Barriers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Wild and Scenic Rivers	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Prime and Unique Farmland	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Energy	No Impact	No Impact	No Impact	No Impact
Light Emissions	No Impact	No Impact	No Impact	No Impact

Environmental Consequences	Projects			
	Tier 2 Concourse	**APM**	**South Utilities**	**Support Facilities**
Visual Impacts	No Impact	No Impact	No Impact	No Impact
Solid Waste, Hazardous Waste, and Pollution Prevention	No Impact	No Impact	No Impact	No Impact
Sanitary Waste	No Impact	No Impact	No Impact	No Impact
Toxic or Hazardous Substances	Demolition of Concourse C/D asbestos and lead-based paint will be managed in accordance with regulations	No Impact	No Impact	No Impact
Design, Art, and Architecture	No Impact	No Impact	No Impact	No Impact
Cumulative Impacts	No Impact	No Impact	No Impact	No Impact

TABLE 4-2 SUMMARY OF POTENTIAL CONSTRUCTION IMPACTS FOR TIER 2 AND RELATED PROJECTS

Resource	Environmental Consequences
Noise	Perimeter buffer mitigates noise impact on ROI; increase in localized noise levels
Compatible Land Use	No Impact
Social Impacts Including Environmental Justice, Child Safety	Increase in construction-related employment opportunities over 5-year period
Induced Social Impacts	No Impact
Air Quality—Stationary sources	No Impact
Air Quality- Mobile Sources	Construction emissions from Tier 2 and related projects are within the SIP budget; fugitive emissions controlled by BMPs
Water Quality	Increased runoff managed by stormwater BMPs; Soil Erosion and Sediment Control Plan
Soils and Geology	Impacts mitigated by soil management program providing conservation by reuse
DOT Action Section 4(f) Lands	No Impact
Historic, Architectural, Archaeological, and Cultural Resources – Buildings	No Adverse Effect
Historic, Architectural, Archaeological, and Cultural Resources – Below grade	No Adverse Effect
Biotic Communities	Approximately 90 acres of forested habitat will be lost to soil stockpile; impact to be mitigated through revegetation post-construction
Endangered and Threatened Species	No Impact
Wetlands	Impact to be mitigated by banking
Floodplains	No Impact
Coastal Zone Management	No Impact
Coastal Barriers	Not Applicable
Wild and Scenic Rivers	Not Applicable
Prime and Unique Farmland	Not Applicable
Energy Supply and Resources	No Impact
Light Emissions	No Impact
Visual Impacts	No Impact
Solid Waste	No Impact
Sanitary Waste	No Impact
Toxic or Hazardous Substances	Excavated and stockpiled soils will be tested as part of soil management program
Design, Art, and Architecture	No Impact

4.1 Noise. The proposed Tier 2 and related projects are not expected to result in an increase in airport operations (types and number of aircraft used, runway layout, and runway utilization) compared to the No Build alternative. Therefore, the number of people in the surrounding communities that live and work within the area influenced by the noise contours is not anticipated to increase as a result of these projects. The proposed projects will not individually or cumulatively introduce noise to a previously unaffected area, or significantly increase noise over a noise sensitive area. Therefore, no noise impacts are expected to occur as a direct result of the implementation of the proposed projects.

The forecasted noise contours for 2007 are shown in Figure 4-1. The overall acreage of land within the 65 DNL contour projected for 2007 is 6,367 acres. Even though the number of aircraft using IAD is forecast to increase by approximately 79 percent in 2007 (HNTB 2001a), the 2007 noise contours show a reduction in acres impacted (located within the 65 DNL) of about 30 percent.

The reduction in area impacted is mainly a result of increased number of Stage 3 aircraft in the fleet utilizing IAD, and the corresponding decrease in the number of Stage 2 aircraft. The Airport Noise and Capacity Act of 1990 required a phased elimination of Stage 2 aircraft weighing more than 75,000 pounds in the contiguous United States. The newer Stage 3 aircraft are significantly quieter. At IAD, the impact of the transition to Stage 3 aircraft can be seen in the fact that while the general shape of the 1998 and 2007 contours is similar, the 2007 contours impact a smaller overall area.

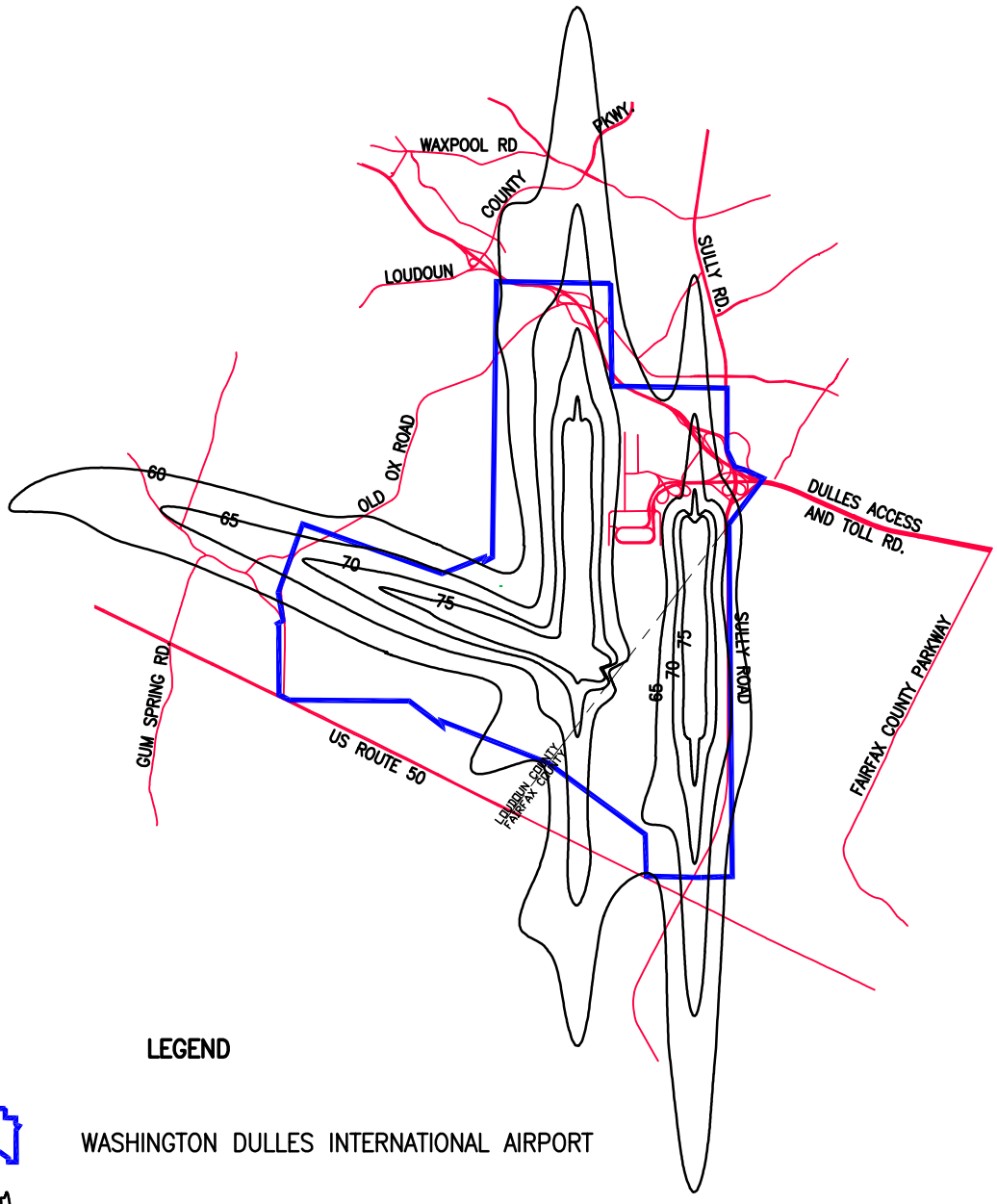
The facilities located near Route 28 (the SUB and DVP substation) are not expected to have noise impacts associated with them. Three boilers and ten chillers in the SUB are the only potential noise sources, and these are not expected to be significant sources of noise at the Airport. Standard building features will include thermal insulation that will suppress noise from the boilers. In addition, a 250-ft-wide strip of trees between the project site and Sully Road will act to reduce noise to sensitive offsite receptors.

4.2 Compatible Land Use. Zoning ordinances for Loudoun and Fairfax counties implement restricted land uses surrounding the airport to maintain land use practices compatible with the noise contours associated with airport operations. The proposed projects are not anticipated to increase the noise contour envelope and, therefore, the projects will not adversely impact land uses surrounding IAD.

4.3 Social and Socioeconomic Characteristics. Overall, the proposed projects are not expected to cause adverse social or socioeconomic impact on the communities surrounding the airport.

4.3.1 Population Demographics. Since the proposed projects involve construction located entirely within the airport proper, the projects will not result in the relocation of residences and businesses or disrupt established communities or planned development.

4.3.2 Environmental Justice. Since the projects will occur within the IAD property boundary, they are not expected to result in any adverse human health or environmental effects



LEGEND

WASHINGTON DULLES INTERNATIONAL AIRPORT

2007 NOISE CONTOURS

ROADS

2 1 0 2

GRAPHIC SCALE IN MILES

FILE: Q:\PROJECTS\13840001\2002\FINALEA\FIG4-1

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINA	PROJECTED 2007 NOISE CONTOUR MAP	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 4-1

to minority or low-income populations. The area within the ROI is 69.6 percent white; 26.8 percent non-white, which includes American Indians, Native Alaskans, Native Hawaiians, Pacific Islanders and persons reporting some other race; and 3.6 percent multi-racial, which includes persons reporting two or more races. This is comparable to average county and state minority populations (Fairfax County – 26.4 percent non-white and 3.7 percent multi-racial; Loudoun County – 14.8 percent non-white and 2.4 percent multi-racial; Commonwealth of Virginia – 25.7 percent non-white and 2.0 percent multi-racial). The percentage of people living in poverty in both counties is lower than the average poverty population in the Commonwealth of Virginia (Fairfax County – 3.4 percent; Loudoun County – 3.0 percent; Commonwealth of Virginia – 11.6 percent). In addition, the median income for households within the ROI is higher than the average for the Commonwealth of Virginia.

4.3.3 Economic Characteristics. While employment at the airport will rise slightly with the onset of construction activity, overall the proposed development projects will not cause an appreciable change in permanent employment levels at IAD or within the ROI compared to the No Build alternative.

4.3.4 Child Safety. While increased noise and air pollution exposure could be harmful to children, the proposed Tier 2 projects will not increase aircraft operations at IAD. Therefore, these projects will not increase existing levels of noise and air pollution exposure to children within the ROI. Existing zoning regulations in both counties require soundproofing in structures that may be exposed to high levels of noise. Tier 2 construction activities may increase particulate matter in the air, but best management practices and the restrictions on access to the airport property will minimize any potential impacts. The proposed Tier 2 development projects at IAD are not anticipated to increase environmental health and safety risks or exposures to children in the surrounding community.

4.3.5 Community Places of Public Assembly. Tier 2 and related projects were investigated to determine whether the proposed actions would directly or indirectly affect nearby schools, hospitals, and places of public assembly. Relative to the No-Build Alternative, the Tier 2 improvement projects will not affect noise levels, and therefore would have no impact on nearby schools, hospitals, and places of public assembly. The Smithsonian National Air and Space Museum is dependent on the IAD facilities for its operation.

4.4 Induced Social Impacts. Induced social impacts (sometimes called secondary or indirect impacts) are dependent on the scope of the project and include associated shifts in population, public service demands, or changes in the business or economic climate in the community surrounding the airport. The induced impacts associated with the Build Alternative will not be significant.

As discussed in previous sections, proposed development projects at IAD will not have a significant adverse impact on noise, land use, or social factors. Additionally, the proposed projects will not result in a population shift, change the public service demands of the airport, or adversely impact the business and economic climate of the surrounding community. Therefore, there are not expected to be any adverse induced social impacts as a result of Tier 2 and related projects.

4.5 Air Quality.

4.5.1 Stationary Sources. Primary new air emission stationary sources that are part of the Tier 2 and related projects are three new high temperature hot water (HTHW) generators that are planned for the new South Utility Building. These units have been sized to serve the new Tier 2 Concourse and new associated facilities, such as the APM maintenance facility. Each planned HTHW unit is rated at 70 million Btu per hour heat output and will use natural gas with diesel fuel backup. There are no backup electrical generators planned for the South Utility Building.

Space heating for the existing Concourse C/D complex is supplied by roof-mounted units, and Concourse C/D also has its own gas-fired water heaters. Use of Concourse C/D will be discontinued when Tier 2 becomes operational, and the concourse will be demolished. The air emissions associated with the existing natural-gas-fired consumption to supply space and water heating to Concourse C/D would cease as well.

The footprint of Tier 2 is estimated to be approximately 20 percent larger than Concourse C/D, and Tier 2 will have an additional floor in the form of the basement that is lacking in Concourse C/D. Tier 2 also will contain more passenger and employee amenities. However, a planning goal for Tier 2 is that it be 20 percent more energy efficient than the newest concourse, Concourse B, which went into operation in 1998. Overall, a more energy-efficient building envelope and appliances for Tier 2 and the termination of space and water heating for Concourse C/D are predicted to result in no net increases in fuel consumption and associated air emissions when Tier 2 becomes operational, and Concourse C/D is demolished.

The new HTHW generators in the proposed South Utility Building will provide heat to several other facilities, in addition to Tier 2. The heating loads of these buildings have been estimated as part of a larger engineering study of the South Utility Building (Burns and McDonnell 2001). Based on natural gas consumption by several existing IAD buildings, it was estimated that approximately 50 million cubic feet of natural gas per year would be required to meet the additional heating load associated with the Tier 2 related facilities. As noted in Table 4-3, this represents an approximate 20 percent increase in NO_X and CO emissions from stationary sources at IAD and an approximate 10 percent increase in VOC emissions when Tier 2 and related projects become operational. The fuel usage rates are within the limits of the IAD synthetic minor permit.

TABLE 4-3 PROJECTED 2007 IAD STATIONARY SOURCE AIR EMISSIONS

Emissions (tons/yr)				
NO_X	**SO_2**	**CO**	**VOCs**	**PM_{10}**
Build				
16.18	0.49	13.62	1.61	2.86
No Build				
13.61	0.47	11.46	1.47	2.66

4.5.2 Mobile Sources. Aircraft operations at IAD are predicted to continue to increase at an average annual rate of approximately 4 percent. This increase in aircraft operations is based on a forecast of future demand that is driven by economic and population changes and not by airport facility replacement or expansion activities. Estimated aircraft landings and takeoffs (LTOs) for the year 2007, the first full year after Tier 2 would become operational, are presented in Table 4-4.

TABLE 4-4 PROJECTED 2007 IAD AIRCRAFT LTOs

Aircraft Category	2007 LTOs
General Aviation	
Single Engine Piston	950
Twin Engine Piston	3,250
Turboprop	4,100
Business Jets	28,710
Military	4,100
Commercial Turboprop	42,482
Regional Jet	115,927
Narrow-Body Jet	95,917
Wide-Body Jet	23,921
Total	319,357

Increased aircraft activity has an associated increase in air emissions from aircraft, ground support equipment, and vehicles operating on the airport. Therefore, air emissions for the year 2007 were estimated for this increase using the FAA EDMS model. For 2007, the estimated taxi and delay time is 35 minutes based on an ongoing runway and alternatives study for IAD.

Other mobile sources include ground support equipment and vehicles operating on airport roadways and parking lots. Emissions from these sources also were calculated using the FAA EDMS model. The estimated emissions from IAD mobile sources for 2007 are summarized in Table 4-5 for both the Build and No Build Alternatives.

Under the No Build Alternative, the increase in aircraft activity is forecast to be approximately 36 percent between 1999 (Table 3-10) and 2007, and the data in Table 4-5 note an approximate 74, 58, and 54 percent increase in NO_X, CO, and VOC emissions from IAD mobile source emissions between 1999 (Table 3-11) and 2007. The latter increases are attributable to both an increase in aircraft operations and an approximate 50 percent increase in estimated taxi and delay times for aircraft. Under the Build Alternative, more than half of the Mobile Lounges/ planemates would be taken out of service when the APM system becomes operational, resulting in somewhat lower total mobile source emissions than under the No Build Alternative.

TABLE 4-5 PROJECTED 2007 IAD MOBILE SOURCE EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
No Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	152	8	4	7	3
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,681	173	11,880	955	31
Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	9	<1	<1	<1	<1
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,538	166	11,876	948	28

4.5.3 Conformity. One of the requirements of the Clean Air Act Amendments (CAAA) of 1990 that applies to areas of the country that are nonattainment with the National Ambient Air Quality Standards is the Conformity Rule, which may apply to an agency or entity that receives federal funding. The rule may require an analysis of the regional air quality impact of any changes or modifications at such facilities. The National Capital Interstate AQCR is designated as nonattainment for ground level ozone and is classified as "serious" in this regard. The Conformity Rule distinguishes between facility modifications with "significant" and "insignificant" regional air quality impacts. If the net emissions increase due to a facility modification is less than an allowed level, the modification is considered insignificant and may proceed in "Conformity." The General Conformity allowed level for the National Capital Interstate AQCR is 50 tons/yr for VOC and NO_X emissions. As noted in Table 4-3, the estimated air emission increases from the Tier 2 stationary sources are approximately 2.6 tons/yr of NO_X and less than 1 ton/yr of VOCs, which are below the *de minimis* level. The minor differences in mobile source emissions between the 2007 Build and No Build Alternatives are also insignificant.

4.6 Water Quality. Whereas construction and post-construction runoff from Tier 2 facilities poses potential impacts to the quality of surface and ground water at IAD, these impacts are not expected to be significant. All construction and subsequent operational activities will be under restrictions embodied in IAD's VPDES stormwater discharge permit, as well as pertinent State guidance such as the *Northern Virginia BMP Handbook* and *Virginia Stormwater Management Handbook*. In addition to the management of stormwater runoff via existing and future temporary facilities, each separate construction project will be required to have individual erosion and sediment control plans approved by the Authority's Building Codes/Environmental Branch. With these various restrictions and controls in place, no adverse effects on water quality are expected.

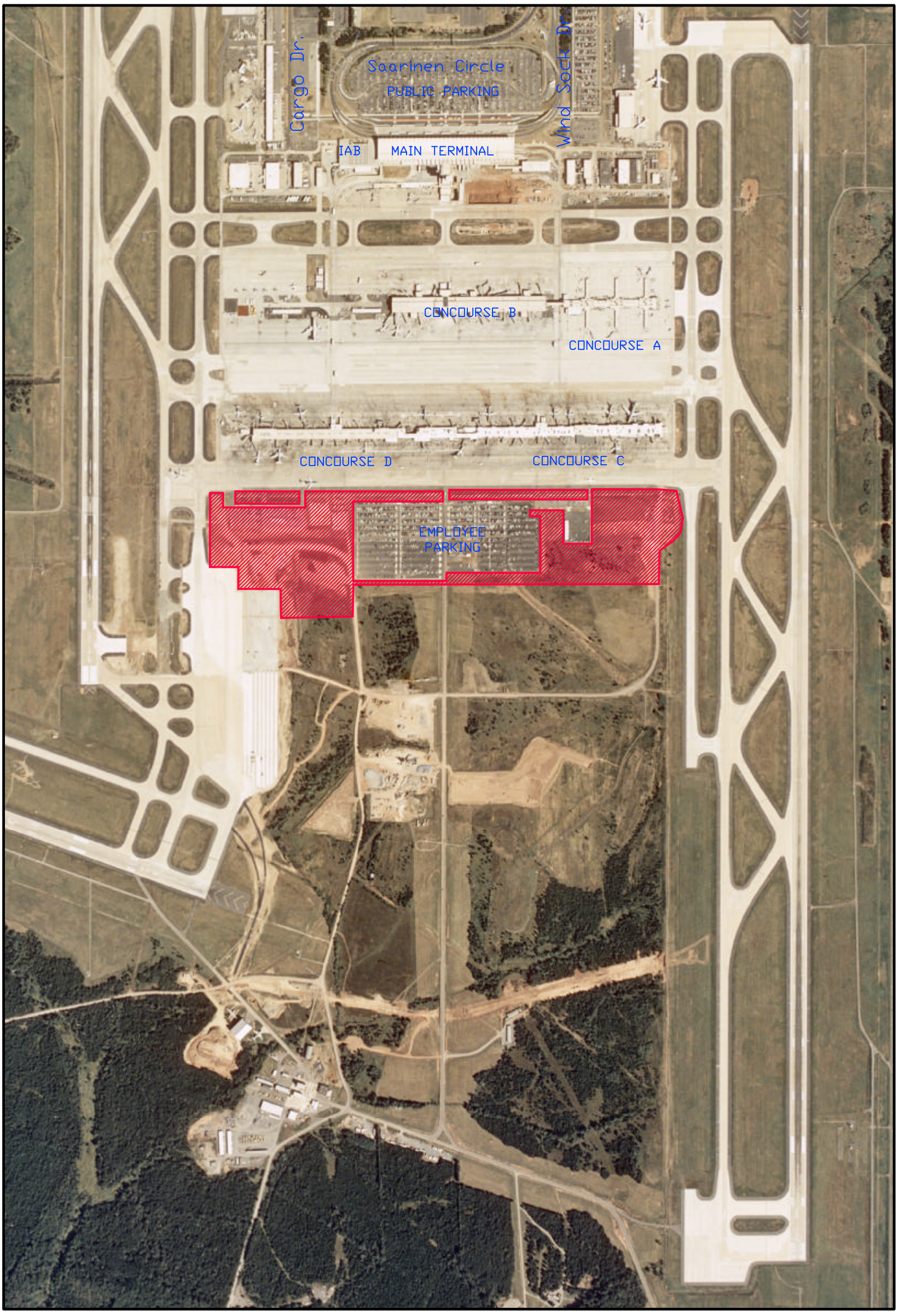
4.6.1 Stormwater. Potential effects on water quality from airport construction and operation are primarily a result of stormwater runoff. Stormwater runoff and associated erosion and sedimentation may result from the actual construction activities and from the excavated soil

stockpile. At project completion, there may be effects of increased stormwater runoff due to an increase in impervious surfaces. Impervious areas and the impervious surface area for the Build and No Build Alternatives are shown in Figure 4-2. The Tier 2 and related projects will require excavation, including tunneling and/or cut and fill, for the various underground baggage, walkback, and people mover tunnels. There will be excavation and construction associated with the new Tier 2 Concourse, as well as demolition of existing Concourse C/D. Other construction projects will be associated with expansion of South Area Utilities. Soil from all excavations will be stockpiled at the south end of IAD property, and this also poses potential impact to water quality due to runoff. These Tier 2 associated activities are discussed below along with related mitigation activities.

Tier 2 construction activity will take place between the Tier 2 Concourse and the Main Terminal to the north. This includes excavation of baggage, walkback, and APM tunnels, as well as expansion of Concourse B, and all associated and support activities and facilities. Runoff from these areas will be accommodated by the existing stormwater management system. In addition, ground water will be pumped from the tunnel excavation sites and routed to the existing stormwater system. Sediment and erosion control plans will be developed for each discrete construction project.

Stormwater runoff from the Tier 2 Concourse construction area will be collected and treated in a temporary detention pond that will ultimately be replaced by a permanent structure during implementation of future projects. The facility may be maintained and operated "semi-permanently" until permanent stormwater facilities for the south area are constructed. A Comprehensive Stormwater Management Plan for Washington Dulles International Airport has been prepared in draft form (HNTB 2002). This document provides design recommendations for stormwater system upgrades to accommodate all planned future expansion or replacement projects at IAD, including the Tier 2 projects. The proposed pond will cover approximately 7 surface acres and will be located south of the Tier 2 Concourse construction area near the eastern end of runway 12-30 (Figure 1-9). The pond was designed to provide BMPs for 50 percent phosphorus reduction, and to provide sufficient capacity for 2-year and 10-year storm event volumes as required by Virginia regulations (Alpha Corporation 2000). The 50 percent phosphorus removal is a requirement of the *Northern Virginia BMP Handbook* [Northern Virginia Planning District Commission and Engineers and Surveyors Institute (NVPDC & ESI) 1992] for stormwater management systems draining to the Occoquan Reservoir in Fairfax County. The capacity of the pond will be 2,755,276 cubic feet, and it is designed to handle the 10-year storm flow of 453 cubic feet per second (cfs) (Alpha Corporation 2000). As an additional mitigation measure, the pond will be lined and be designed to dewater within 30 hours of a storm event to discourage use by waterfowl and wading birds.

Water quality may be potentially affected by excavated soil stockpiled from the Tier 2 construction activities. Much of the soil removed from earlier projects will be used in later projects, but must be temporarily stockpiled. Plans call for a stockpile site at the southern end of IAD property (Figure 1-10). Stormwater, erosion, and sediment control will be managed by a pond, sized at 1 acre for every 10 acres of stockpiled soil (McBride 2001, personal communication).



LEGEND

NEW IMPERVIOUS AREA

1000 500 0 1000

GRAPHIC SCALE IN FEET

DATE OF PHOTOGRAPHY: SEPTEMBER 17, 2000
SOURCE: AIR SURVEY PHOTOGRAPHIC MAPPING SERVICE

FILE: Q:\PROJECTS\13840001\2002\FINALEA\FIG4-2

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT PROJECT LOCATION	IMPERVIOUS SURFACE AREA AFTER THE COMPLETION OF PROPOSED TIER 2 PROJECTS	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 4-2

4.6.2 Ground Water. Construction and operation of the Tier 2 projects pose some potential for impacting ground-water resources. Some construction, particularly of the tunnels for the Automated People Mover, walkback tunnel, and baggage conveyance, requires relatively deep excavation, up to 50 ft below grade (Richardson 2001, personal communication). Such excavations will be likely to intercept ground water (see Section 3.5.4). In such events, the excavations will be dewatered with pumps to allow construction. Depending on the amount of ground water encountered and pumped, this could cause localized changes in ground-water flows. These would be temporary, however, and would not affect ground-water levels outside of IAD property.

The potential for impacts to ground water from contamination—either from construction accidents or disturbance of prior contamination from aircraft fueling and maintenance—will be minimized by extensive monitoring, treatment, and safety protocols. Each construction specification will require the contractor to provide adequate health and safety protocols and personnel to deal with any contamination encountered. In the event of ground-water infiltration in excavations, contractors will be required to route the water through 21,000-gallon oil-water separators and carbon filtration, and then to sample and test the water using a third-party independent laboratory. Because of the amount of petroleum product stored and used at IAD, the facility is required to conduct a ground-water characterization study. This includes a series of shallow and deep monitoring wells distributed over IAD that are frequently monitored for contaminants. Additional protection from ground-water contamination (surface water and soil as well) is afforded by IAD's innovative Leak Protection System, approved by the Commonwealth of Virginia. All underground fuel piping is monitored daily as part of this system (Beatty 2001, personal communication). As a consequence of these extensive controls and safeguards, no impacts to ground water are anticipated from construction and operation of the Tier 2 and related projects.

4.6.3 Wastewater. At any airport, the potential for discharge of aircraft deicing fluid (propylene glycol) to the stormwater system is a significant concern. Deicing fluid discharged to natural streams can exert a substantial Biochemical Oxygen Demand (BOD) that could have deleterious impacts. Currently at IAD, deicing takes place at a combination of at-gate and remote deicing areas (Figure 3-10). Spent deicing fluid is managed through the use of Glycol Recovery Vehicles (GRVs) and a drain management program. Deicing is currently done at gate positions, on taxilanes and taxiways adjacent to gates, and at runway hold aprons if a second application is required. Recovered fluid with a glycol concentration of 7 percent or greater is recycled. Recovered fluid with less than 7 percent glycol is stored onsite, pre-treated, and ultimately discharged to the sanitary sewer. These are interim protocols while a study is being completed on a long-range deicing fluid recovery solution.

A study of comprehensive deicing concepts at IAD is currently under way. Three major location alternatives are being considered: (1) at gates, (2) combination of at-gate and centralized deicing pads, and (3) centralized deicing pads. Within each alternative, three future scenarios are being examined, the first ("Future 1") covering the Tier 2 renovations. Each alternative is being examined for its effect on fluid recovery and storage volumes, treatment options, and cost. While no decision will be made until the study is completed, the centralized deicing pad alternative offers the advantage of a substantial reduction in the volume of deicing fluid required

to be collected. This would result from the reduced size of the area over which the deicing fluid is applied. For example, under the centralized deicing pads Future 1 scenario, the potential yearly spent glycol storage volume (22.7 million gallons) is only about one-third of projected annual volumes for the at-gate or combination alternatives. Any final configuration will include a goal of minimizing discharges to the stormwater system (Wollard 2001, personal communication).

4.7 Geology and Soils. No impacts to geology are anticipated as a result of the implementation of the Proposed Actions.

Soils at IAD will be affected by the implementation of the proposed actions; however, the impact to soils will be localized to the IAD property and will not be significant at a regional level. Movement of soil will take place in order to complete the proposed actions including the construction of structures, tunnels, and stormwater management facilities. The tunnels will be constructed using tunnel boring equipment beneath paved areas and buildings, and by cut and cover in other areas. The excess soil generated by implementation of the proposed actions will be stockpiled onsite for later use.

During the movement of soil and construction activities, the potential for erosion and sedimentation into nearby stormwater culverts and waterways exists. This potential will be minimized through the use of sediment and erosion control measures (described in Section 4.6.1) as required by local or county regulations.

4.8 DOT Act Section 4(f) Lands.

4.8.1 Public Parks and Recreation Areas. The Tier 2 projects are not expected to impact public parks and recreation areas. The projects will occur within the airport boundaries, and will conform to the provisions of the Airport Master Plan. In addition, the perimeter buffer zone at IAD will minimize noise or construction-related impacts to parks and recreation areas within the ROI.

4.8.2 Historic Districts. The proposed Tier 2 and related projects do not have the potential to result in Adverse Effects on the IAD Historic District. The Authority has agreed with the Virginia SHPO and the ACHP to comply with Section 106 of the National Historic Preservation Act as documented in the 1987 Programmatic Memorandum of Agreement (PMOA) (MWWA 1987). This determination of "No Adverse Effect" is documented in a coordination letter from the Authority to the Virginia SHPO dated February 22, 2002, and a Statement of Concurrence from the SHPO March 11, 2002 (Appendix D).

The Tier 2 and related improvement projects will be consistent with the Airport Master Plan that includes planning guidelines taken from the original Saarinen Master Plan for the Airport. The improvement projects include planning to minimize impacts resulting from use as well as ensuring the project will be compatible with the normal activity or aesthetic value of the historic district. None of the historic sites that are located outside the airport boundary and are potentially eligible for the National Register of Historic Places are expected to be affected by

Tier 2 and related projects. The Authority will implement planning and alternatives analysis to comply with Section 4(f).

4.9 Historic, Architectural, Archaeological, and Cultural Resources. The *Airport Environmental Handbook* Federal Aviation Administration Order 5050.4A (Chapter 5, Par. 47e(8)(b)1) states that the area of the proposed projects' potential impact is that geographic area within which direct and indirect impacts generated by the proposed action could reasonably be expected to occur and thus cause a change in the historic, architectural, archaeological, or cultural qualities possessed by the property. Section 106 of the National Historic Preservation Act requires Federal agencies to consider the effects of their actions on historic properties within the area of impact and seek comments from the Advisory Council on Historic Preservation. For this purpose, Section 106 contains a review process that includes steps for identifying and evaluating historic properties, assessing the effects of proposed action on that property, and, if there is an adverse effect, consultation with the SHPO on ways to avoid, reduce, or mitigate the impact.

Section 106 applies to properties listed on the National Register, properties formally determined eligible for listing, and to properties not formally determined eligible, but that meet specific eligibility criteria. The procedures for meeting Section 106 requirements and establishing whether an undertaking will have an impact on an identified property are defined in the regulations of the Advisory Council on Historic Preservation, 36 CFR Part 800, *Protection of Historic Properties.* The regulations state:

> An undertaking has an effect on a historic property when the undertaking may alter characteristics that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered (36 CFR §800.9).

Once the criterion of effect has been applied, a determination of "no adverse effect" or "adverse effect" is made:

> An undertaking is considered to have an "adverse effect" when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

"Adverse effects" include, but are not limited to:

> Physical destruction, damage, or alteration of all or part of the property.
>
> Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register.
>
> Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting.

Neglect of a property resulting in its deterioration or destruction.

Transfer, lease, or sale of the property.

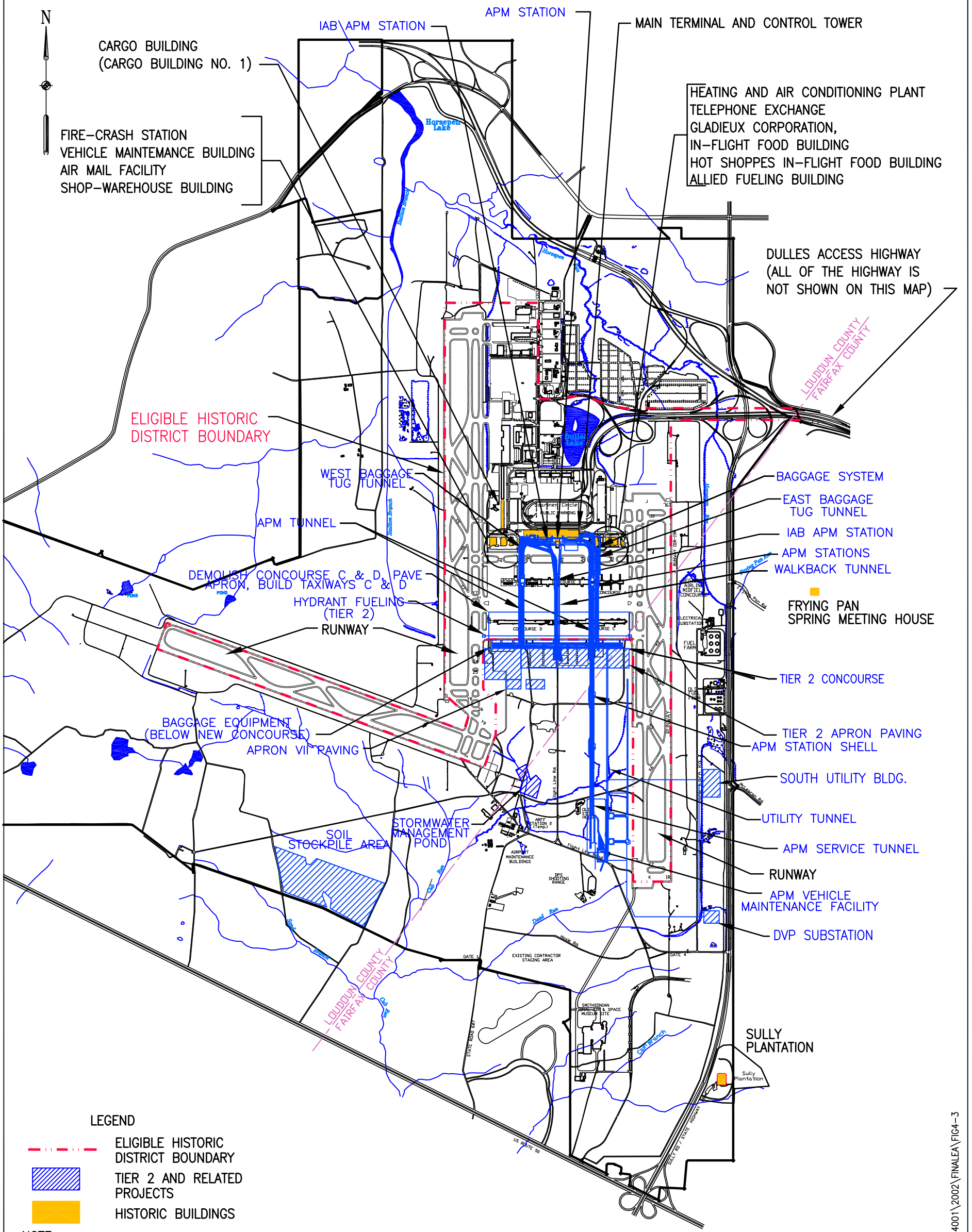
The Section 106 review process ensures that a Federal agency will weigh historical preservation issues into the balance of a proposed project's anticipated benefits and costs.

4.9.1 Potentially Affected Historic Resources and Proposed Actions at IAD. Many of the Tier 2 and related projects at IAD were addressed in the approved Airport Master Plan which includes general planning guidelines taken from the original Saarinen Master Plan (KPMG Peat Marwick 1985). Additionally, many of the Tier 2 and related projects are discussed in the March 25, 1993 Memorandum of Agreement (MOA) for the Midfield Concourse Facilities at IAD (ACHP 1993a) and the April 5, 1993 MOA for the Main Terminal Expansion at IAD (ACHP 1993b). Additionally, a Programmatic Memorandum of Agreement for IAD was signed in 1987 (MWAA 1987). These MOAs are included in Appendix D. Because of the proximity of the Tier 2 projects to the historic Main Terminal, these projects may have a potential effect on the historic setting and airfield views of the Main Terminal (MWWA 1993). In addition, the demolition of Concourse C/D will be within the historic district. As a result, the Tier 2 structures will be carefully designed to minimize effects upon and within this historic district. Careful consideration of the effect of the new structures on the views of the Main Terminal will be a central part of the design development and review process (MWWA 1993).

Figure 4-3 depicts the proximity of the proposed Tier 2 projects to the historic resources at IAD.

Table 4-6 presents a summary of the status of historic and archaeological resource consultation for Tier 2 and related projects. Components of the consultation included on the table are:

- **Programmatic Agreement –** This agreement indicates whether the project falls within the defined terms of Categorical Exemption. Exempt projects would require further consultation, while all other projects would need to be addressed through some other consultation process.
- **Project Agreements –** This agreement indicates whether the project falls under the terms of previously executed project MOAs. Project effects that were specifically addressed in prior agreements are already the subject of formal consultation, and would not require the execution of additional agreements.
- **Archaeological Assessment –** This indicates a preliminary determination whether the potential archaeological impact of a specific project would require a project-specific Phase I(B) archaeological field survey, or if it could be assessed through a Phase I(A) analysis of existing archival/land-use records.
- **Consult on Effect –** This indicates three categories of information: (1) a preliminary determination of whether a specific project has the potential to have either No Effect or No Adverse Effect on the airport's historic properties; (2) whether a specific project has already been the subject of completed consultation, and (3) whether a specific project has the potential to have new Adverse Effects, and may require the execution of a project-specific MOA.



LEGEND

- ELIGIBLE HISTORIC DISTRICT BOUNDARY
- TIER 2 AND RELATED PROJECTS
- HISTORIC BUILDINGS

NOTE:
MOBILE LOUNGES AND TERMINAL AREA LANDSCAPING ARE NOT SHOWN ON THIS MAP.

SOURCE: (PARSONS MANAGEMENT CONSULTANTS 1989)

FILE: Q:\PROJECTS\1384001\2002\FINALEA\FIG4-3

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	HISTORIC STRUCTURES AFFECTED BY THE PROPOSED DEVELOPMENT PROJECTS	DRAWN BY WCM	DATE 8–7–02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 4–3

TABLE 4-6 SUMMARY OF HISTORIC AND ARCHAEOLOGICAL RESOURCES CONSULTATION

	Programmatic Agreement		Project Agreements		Archaeological Assessment		Consult on Effect			
Project Component	**Exempt**	**New Consultation**	**Midfield**	**Main Terminal**	**Phase 1A**	**Phase 1B**	**No Effect**	**No Adverse Effect**	**Consultation Completed**	**MOA**
Tier 2										
Baggage Conveyor Tunnels to Tier 2		•			•			•	•	
Baggage Tug Tunnels		•			•			•	•	
High Speed Conveyor Baggage System (Main Terminal to Tier 2)		•			•			•	•	
Tier 2 Baggage Equipment		•						•	•	
Tier 2 Concourse			•					•	•	
Walkback Tunnel (Tier 2 to Tier 1) (Phase II)				•				•	•	
Demolish Old C/D Concourses, Repave Apron and Taxiways C/D		•						•	•	
Hydrant Fueling for Tier 2		•			•		•		•	
Tier 2 Apron Paving		•			•		•		•	
Apron VII Paving		•			•		•		•	
Automated People Mover										
Concourse B Bldg. Adaptations for IAB People Mover (Tier 1)			•					•	•	
Concourse B Bldg. Adaptations for People Mover			•					•	•	
IAB People Mover Stations, Tunnels and System				•				•	•	
People Mover - Main Terminal to Concourse B				•				•	•	
People Mover - Maintenance Facility and Service Tunnel		•			•			•	•	
People Mover - Tier 1 to Tier 2				•				•	•	
APM Shell between Tier 2 and APM Vehicle Maintenance Facility				•				•	•	
Security Mezzanine & Main Terminal People Mover Station, Pkg.6				•				•	•	
South Utilities										
Right-of-way Easements for Sewer Lines		•			•			•	•	
Expanded Water Storage		•				•		•	•	
DVP Substation and Distribution Center		•				•	•		•	
South Utility Building, Phase I		•				•	•		•	
Utility Tunnel		•			•			•	•	
Stormwater Management Facilities, Tier 2 Projects		•			•			•	•	
Support Facilities										
Soil Stockpile Area		•				•	•		•	

The consultation process has resulted in finding that the proposed Tier 2 and related projects do not have the potential to result in unanticipated Adverse Effects on the IAD Historic District. This determination of "No Adverse Effect" is documented in a coordination letter from the Authority to the Virginia SHPO dated February 22, 2002, and a Statement of Concurrence from the SHPO dated March 11, 2002 (Appendix D).

The results of SHPO consultation on the individual projects to the historic and archaeological resources are discussed below.

4.9.1.1 Tier 2. Only two (Tier 2 Concourse and the Walkback Tunnel) of the ten Tier 2 projects are addressed in the terms of the two 1993 MOAs. The Tier 2 Concourse falls under the Midfield Concourse Facilities and the Walkback Tunnel is covered under the Main Terminal Expansion. The 1993 Midfield Concourse Facilities MOA includes specific provisions addressing the architectural design parameters of the entire set of these facilities, and their potential effect on the Historic District. The 1993 Main Terminal Expansion MOA covers formal consultation of all aspects of the terminal expansion and rehabilitation project (including the development of the Main Terminal – APM and Security Mezzanine).

One project (Demolish Old C/D Concourses/Repave Apron and Taxiways C/D) was identified as having a potential effect on historic properties that was not addressed under an existing agreement. However, the potential project impact was deemed to fall below the threshold of an Adverse Effect (MWAA 2002).

The remaining seven Tier 2 projects (Baggage Conveyor Tunnels to Tier 2, Baggage Tug Tunnels, High Speed Conveyor Baggage System (Main Terminal to Tier 2), Tier 2 Baggage Equipment, Hydrant Fueling for Tier 2, Tier 2 Apron Paving, and Apron VII Paving have the potential to disturb archaeological remains, which might exist on previously untested portions of the airport. However, all these projects will result in soil disturbance within the midfield area between the two existing runways. Existing land use clearly demonstrates that this area has been so severely disturbed, that the potential for intact subsurface archaeological resources no longer exists. The Phase I(A) analysis of this disturbance concludes that neither project avoidance nor field investigation is warranted in the area (MWAA 2002).

4.9.1.2 Automated People Mover. Two APM projects (the Concourse B Building Adaptations for IAB People Mover [Tier 1] and Concourse B Building Adaptations for People Mover) are addressed in the 1993 Midfield Concourse Facilities MOA. Five APM projects (IAB People Mover Stations, Tunnels, and System; People Mover – Main Terminal to Concourse B; People Mover – Tier 1 to Tier 2; APM Shell between Tier 2 and APM Vehicle Maintenance Facility; and Security Mezzanine & Main Terminal People Mover Station, Pkg.6) are covered under the 1993 Main Terminal Expansion MOA.

The remaining APM improvement project (People Mover – Maintenance Facility and Service Tunnel) was identified as having a potential effect on historic properties that was not addressed under an existing agreement. However, the potential project impact was deemed to fall below the threshold of an Adverse Effect (MWAA 2002).

A summary of the Tier 2 and APM improvement projects addressed under the 1993 MOAs is presented below:

.

1993 Main Terminal Expansion MOA –

- Walkback Tunnel (Tier 2 to Tier 1) (Phase II)
- IAB People Mover Stations, Tunnels, and System
- People Mover – Main Terminal to Concourse B
- People Mover – Tier 1 to Tier 2
- APM Shell between Tier 2 and APM VMF
- Security Mezzanine and Main Terminal People Mover Station (Package 6)

1993 Midfield Concourse MOA –

- Tier 2 Concourse
- Concourse B Building Adaptations for IAB People Mover (Tier 1)
- Concourse B Building Adaptations for People Mover.

4.9.1.3 South Utilities. The six South Utilities projects were not addressed under an existing agreement. Three of the six projects (Expanded Water Storage, DVP Substation and Distribution Center, and South Utility Building) are proposed to be located in areas where a Phase I(A) assessment of prior disturbance could not be made confidently. As a result, the Authority completed Phase I(B) field surveys of these areas. Results of the investigations revealed no significant archaeological materials, and clearly suggest that neither further investigation nor avoidance is required (MWAA 2002).

The Utility Tunnel and Stormwater Management Facilities have the potential to disturb archaeological remains that potentially exist on areas of the airport that have not been surveyed. However, these projects will result in soil disturbance within the midfield area between the two existing runways. Existing land use clearly demonstrates that this area has been so severely disturbed, that the potential for intact subsurface archaeological resources no longer exists. The Phase I(A) analysis of this disturbance concludes that neither project avoidance nor field investigation is warranted in the midfield area (MWAA 2002).

The remaining project (Right-of-Way Easements for Sewer Lines) represents a budgetary line item to make provisions (if required) for the future installation of utility feeds onto airport property. The potential archaeological impacts of this project will be assessed through Phase I(A) or I(B) investigations, when the impact areas are identified (under the terms of the existing PMOA) (MWAA 2002).

4.9.1.4 Support Facilities. The Support Facilities (soil stockpiling area) was not addressed under an existing agreement. The Authority conducted a Phase I(B) field survey of the area. The survey report indicates that, although artifacts were found at this site, they lacked sufficient significance or integrity to warrant avoidance or additional archaeological investigation (MWAA 2002).

4.9.2 Potentially Affected Historic Resources in the Vicinity of IAD. The Tier 2 and related projects were investigated to determine whether the proposed actions would directly or indirectly affect the historic and/or archaeological integrity of historic resources in the near vicinity of IAD. The only historic site (listed on the NRHP) outside the airport boundaries within the ROI is the Frying Pan Spring Meeting House. Eight historic sites potentially eligible for the NRHP are also located outside of airport boundaries but are within the ROI. Due to the distance of IAD from the Meeting House and the eight historic sites eligible for the NRHP, the buffer zone at IAD, and that the improvement projects will conform to the Airport Master Plan, Tier 2 would have no impact on the Frying Pan Spring Meeting House or on the eight sites eligible for the NRHP.

4.10 Biotic Communities. No direct impacts are expected to the flora or fauna for the Tier 2 Concourse project since this proposed project involves an area with buildings or paved surfaces that are already in existence.

The SUB, the APM, the DVP Substation, the stormwater management systems, and the soil stockpile area could potentially disrupt or displace animal species in the area. The SUB, the DVP Substation, and the soil stockpile area will require removal of forest habitat. The loss of forest habitat will be mitigated by re-vegetating and stabilizing the stockpile area at the end of the construction period.

4.11 Endangered and Threatened Species. The Virginia threatened upland sandpiper and the state special concern northern harrier have been observed at IAD by USDA personnel. The USDA observations since 1998 are of casual use. The red-breasted nuthatch, golden crowned kinglet, hermit thrush, and winter wren, all species of state special concern, have been observed in the project area during surveys conducted in 2002. Neither the USDA nor the investigators for this project have observed any sign of nesting activity by these species at IAD (Appendix F).

A federally and state listed threatened bald eagle was observed flying over the airport but has not been found using the habitat at IAD.

The Virginia Department of Conservation and Recreation responded to a request for endangered and threatened species information, and stated that two state rare plant species, hairy beardtongue (*Penstemon hirsutus*) and white heath aster (*Aster ericoides*), have been documented within IAD. The hairy beardtongue was found during the June/July 2001 surveys at several locations in the vicinity of Tier 2 projects. The white heath aster was not observed during the June/July 2001 surveys.

The Virginia Department of Game and Inland Fisheries has stated that the state threatened wood turtle (*Clemmys insculpta*) has been documented in the area. Further consultation with the Virginia Department of Game and Inland Fisheries revealed the location of the wood turtle to be outside of the northeast property boundary of IAD. Additionally, USFWS has stated that the Federally listed, threatened plant, the small whorled pogonia (*Isotria medeoloides*), may be present if suitable hardwood forest habitat is present within the project area. These species were not found during surveys of the project site in June/July 2001.

Threatened and endangered species are not expected to be adversely affected by implementation of the Build Alternative. Comparable habitat for the upland sandpiper is found throughout the airport parcel. One state-listed rare species, the hairy beardtongue, was found along the proposed alignment of the Automated People Mover and at the proposed site of a stormwater management facility. Although these individual specimens would be lost as a result of the Build Alternative, this loss does not constitute a significant impact.

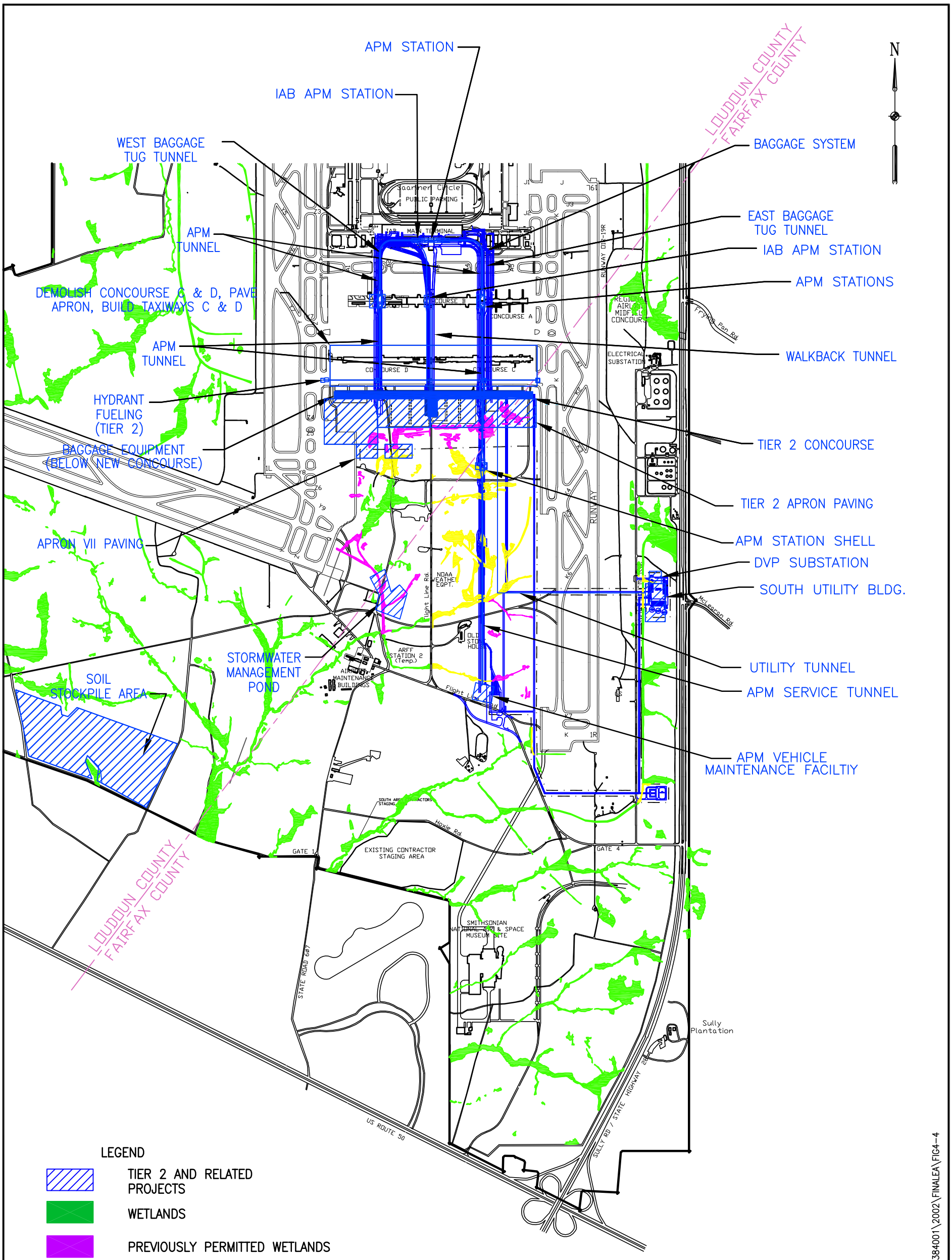
4.12 Wetlands. Wetland areas at IAD will be adversely affected by implementation of the Build Alternative. The wetland areas at IAD have been delineated, and USACE has issued a jurisdictional determination for all of the wetlands delineated at IAD. The jurisdictional determination is provided in Appendix E Previous applications for permits to alter wetlands have included some of the wetland areas within the Tier 2 and related projects limit of disturbance. Figure 4-4 depicts wetlands that are directly affected by the limit of disturbance of Tier 2 and related projects.

A joint permit application (JPA) for a Virginia Water Protection Permit has been submitted by the Authority for review by Virginia DEQ, USACE, and other regulatory agencies. In order to increase the anticipated limits of disturbance around cut-and-cover tunnel projects, nearly all of the wetlands in the mid-field area have been included in the permit application. Table 4-7 provides an inventory of affected wetlands by type. Construction activities in wetland areas will not occur prior to approval of the permit application.

Wetlands are located in close proximity to the proposed location for the South Utility Building and the Dominion Virginia Power Substation. The site layout plans have been designed to minimize impacts to the wetlands to the maximum extent possible. The soil stockpile area has been designed to avoid impacts to wetlands. An appropriate buffer between the stockpile and the wetland area will be maintained. The Authority's Alternatives Analysis to avoid or minimize wetland impacts is included in the JPA and is provided separately in Appendix I-2 of this Environmental Assessment.

Loss of wetlands at IAD will be mitigated through the purchase of approximately 28 wetland credits from the Cedar Run Wetland Bank. This bank is approved to provide mitigation credits at IAD. Wetland banking is part of the Authority's Comprehensive Wetland Strategy to mitigate wetlands that could be potentially affected by near-term and future planned airport development. In addition to the purchase of approximately 28 wetland credits, approximately 3,070 linear feet of streams will be mitigated either through the purchase of either stream mitigation credits at a 1:1 replacement to loss ratio from an approved mitigation bank or an in lieu fee contribution to the Virginia Wetlands Restoration Trust Fund.

4.13 Floodplains. The Tier 2 and related projects are not expected to affect the floodplains located on IAD property. The Authority intends to construct projects to be consistent with applicable county mandates for floodplain protection.



TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	AREAS INCLUDED IN THE TIER 2 AND RELATED PROJECTS JOINT APPLICATION PERMIT	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 4-4

TABLE 4-7 WETLAND ACRES AND THE PROJECTED MITIGATION ACRES INCLUDED IN THE TIER 2 AND RELATED PROJECTS JOINT PERMIT APPLICATION

Project Description	Wetland Site [a]	Wetland Type	Wetland Description	Impact Area (square feet)	Impact Area (acres)	Impact to Streams (linear feet) [b]	Projected Mitigation Ratio	Projected Mitigation (acres)
Mid-Field Area	A	PEM1	Palustrine, Emergent, Persistent	48,401	1.111	---	1 To 1	1.111
Mid-Field Area	AA	PEM1	Palustrine, Emergent, Persistent	6,777	0.156	---	1 To 1	0.156
Mid-Field Area	AB/AE	PEM1	Palustrine, Emergent, Persistent	128,320	2.946	---	1 To 1	2.946
Mid-Field Area	AC	PEM1	Palustrine, Emergent, Persistent	4,883	0.112	---	1 To 1	0.112
Mid-Field Area	AD	PEM1 ISOLATED	Palustrine, Emergent, Persistent	8,865	0.204	---	1 To 1	0.204
Mid-Field Area	AF	PEM1 ISOLATED	Palustrine, Emergent, Persistent	2,491	0.057	---	1 To 1	0.057
Mid-Field Area	AH	PEM1	Palustrine, Emergent, Persistent	1,020	0.023	---	1 To 1	0.023
Mid-Field Area	AI	PEM1 ISOLATED	Palustrine, Emergent, Persistent	5,504	0.126	---	1 To 1	0.126
Mid-Field Area	AJ	PEM1 ISOLATED	Palustrine, Emergent, Persistent	40,415	0.928	---	1 To 1	0.928
Mid-Field Area	AK	PEM1	Palustrine, Emergent, Persistent	17,106	0.393	---	1 To 1	0.393
Mid-Field Area	AR	PEM/FO 1	Palustrine, Emergent/Forested, Broad-Leaved Deciduous	29,921	0.687	---	2 To 1	1.374
Mid-Field Area	AR	R3SB5	Riverine, Upper Perennial, Streambed, Mud	7,228	0.166	---	1 To 1	0.166
Mid-Field Area	AR	PEM1	Palustrine, Emergent, Persistent	720	0.017	---	1 To 1	0.017
Mid-Field Area	AR to AS	WATER	Intermittent Stream	1,485	0.034	280 I	1 To 1	N/A (stream)
Mid-Field Area	B	PEM1 ISOLATED	Palustrine, Emergent, Persistent	10,977	0.252	---	1 To 1	0.252
Mid-Field Area	F	PEM1	Palustrine, Emergent, Persistent	57,702	1.325	---	1 To 1	1.325
Mid-Field Area	H/M	PEM1	Palustrine, Emergent, Persistent	162,736	3.736	---	1 To 1	3.736
Mid-Field Area	H/M	PSS 1	Palustrine, Scrub/Shrub, Broad-Leaved Deciduous	29,063	0.667	---	1.5 To 1	1.001
Mid-Field Area	U	PEM1	Palustrine, Emergent, Persistent	135,144	3.102	---	1 To 1	3.102
Mid-Field Area	UA	PEM1 ISOLATED	Palustrine, Emergent, Persistent	11,304	0.260	---	1 To 1	0.260
Mid-Field Area	V	PEM1 ISOLATED	Palustrine, Emergent, Persistent	1,718	0.039	---	1 To 1	0.039
Mid-Field Area	W/X/Y	PEM1	Palustrine, Emergent, Persistent	213,100	4.892	---	1 To 1	4.892
Mid-Field Area	W/X/Y	PEM1x CHANNELIZED	Palustrine, Emergent, Persistent	40,673	0.934	1,900 P	1 To 1	N/A (stream)
Mid-Field Area	W/X/Y	PEM/FO1	Palustrine, Emergent/Forested, Broad-Leaved Deciduous	127,292	2.922	---	2 To 1	5.844

Project Description	Wetland Site [a]	Wetland Type	Wetland Description	Impact Area (square feet)	Impact Area (acres)	Impact to Streams (linear feet) [b]	Projected Mitigation Ratio	Projected Mitigation (acres)
Buried Utility Line from Substation/SEDC to Ductbank and Main Utility Tunnel	HE/HEA	PEM/SS1	Palustrine, Emergent, Persistent/ Scrub/Shrub, Broad-Leaved Deciduous	8,845	0.203	---	1.5 To 1	0.305
South Utility Building	ZZA	PEM1	Palustrine, Emergent, Persistent	165	0.004	---	1 To 1	0.004
South Utility Building and Buried Utility Line from South Utility Building to Main Utility Tunnel	HHH/III/ZZZ	R2EM	Riverine, Lower Perennial, Emergent	16,383	0.376	500 P	1 To 1	N/A (stream)
Substation/SEDC and Buried Utility Line from Substation/SEDC to Ductbank and Main Utility Tunnel	HHH/III/ZZZ	R2EM	Riverine, Lower Perennial, Emergent	11,491	0.264	390 P	1 To 1	N/A (stream)
Substation/SEDC and Buried Utility Line from Substation/SEDC to Ductbank and Main Utility Tunnel	HHH/III/ZZZ	PEM1	Palustrine, Emergent, Persistent	2,385	0.055	---	1 To 1	0.055
Buried Utility Line from Substation/SEDC to Ductbank and Main Utility Tunnel	X[c]	PEM1	Palustrine, Emergent, Persistent	1,661	0.038	---	1 To 1	0.038
			TOTAL	**1,133,775**	**26.029**	**3,070**	**N/A**	**28.465**

(a) Wetland site designation from Wetland Survey (MWAA 2000c).
(b) Stream type designated as "P" perennial or "I" intermittent.
(c) Wetland "X" was confirmed as jurisdictional in 1997 and was partially permitted in 1999 by the Smithsonian Institution for the Proposed National Air and Space Museum Dulles Center.

4.14 Coastal Zone Management. The Commonwealth of Virginia implements the federal Coastal Zone Management Act through its Coastal Resources Management Program (VCP). Fairfax County is part of the coastal zone. The Tier 2 and related projects will be developed in accordance with the provisions of the VCP. A Federal Consistency Certification for the portions of the Tier 2 and Related Projects that are within the County of Fairfax RMA has been submitted by the Authority to DEQ for review.

Nine enforceable regulatory programs comprise the VCP. Four of these—Fisheries Management, Subaqueous Lands Management, Dunes Management, and Shoreline Sanitation—were determined to be not applicable to this project. The projects are in demonstrated compliance with four programs—Wetlands Management, Non-Point Source Pollution Control, Point Source Pollution Control, and Air Pollution Control—through existing permits or new permits in these programs. The Coastal Lands Management program was established pursuant to the Chesapeake Bay Preservation Act and is a state-local cooperative program administered by the Chesapeake Bay Local Assistance Department and the coastal localities including Fairfax County. Provisions of the Tier 2 and Related Projects that represent consistency with this program are described below.

The County of Fairfax has identified several Chesapeake Bay tributary stream reaches and associated 100-ft buffer zones in the southern portion of IAD and one along Horsepen Run, north of the fuel farms on IAD. There will be no development associated with the Tier 2 and related projects within the areas identified by Fairfax County. The proposed activities of the Tier 2 and related projects located in Fairfax County are located outside of areas currently delineated as RPAs by Fairfax County.

The stormwater management pond, located south of the Tier 2 Concourse construction area near the eastern end of runway 12-30 (Figure 1-9) on an unnamed tributary of Cub Run, is positioned within a Fairfax-identified RMA but is located upstream of the Fairfax-identified RPA along Cub Run. The stormwater management pond was designed to provide BMPs for 50 percent phosphorus reduction, and to provide sufficient capacity for 2-year and 10-year storm event volumes as required by Virginia regulations (Alpha Corporation 2000). As discussed in Section 4.6.1, 50 percent phosphorus removal is a standard of the Northern Virginia BMP Handbook [Northern Virginia Planning District Commission and Engineers and Surveyors Institute (NVPDC & ESI) 1992] for stormwater management systems draining to the Occoquan Reservoir in Fairfax County. The 50 percent phosphorus reduction standard is more stringent than the 40 percent phosphorus reduction general performance criterion in the Fairfax County Chesapeake Bay Preservation Ordinance for development within an RMA and RPA (CODE County of Fairfax 2001). The stormwater management pond was developed and designed to meet the pollutant reduction performance criteria listed in Section 6-0401 of the Fairfax County Public Facilities Manual, which implements the Chesapeake Bay Preservation Ordinance in the Code of the County of Fairfax (CODE County of Fairfax 2001). As a consequence of strict requirements in the design and development of BMPs, stormwater impacts associated with RPAs and RMAs identified by Fairfax County are expected to be minimal.

The Tier 2 and related projects are consistent with The Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management standards called for by the "Chesapeake Bay Preservation Ordinance" in the Code of the County of Fairfax.

4.15 Coastal Barriers. IAD is not located within a Coastal Barriers Resources System and thus the Coastal Barriers Resource Act is not applicable to Tier 2 and related projects.

4.16 Wild and Scenic Rivers. The nearest State designated scenic river, Goose Creek, is located approximately 5 miles northwest upstream of IAD. The proposed action is not anticipated to have any adverse impacts on existing or planned recreational facilities. The project will also not impact any streams on the National Park Service's Nationwide Inventory, Final List of Rivers, potential Scenic Rivers, or existing or potential State Scenic Byways.

4.17 Prime and Unique Farmland. IAD and the Proposed Action are located in either areas that have been previously developed, or in areas that are not being converted from farmland to non-agricultural uses. The Farmland Protection Policy Act is not applicable and no formal consultation is required for land that was purchased prior to August 6, 1984 (FAA 1985). Therefore, the lands at IAD affected by Tier 2 and related projects do not qualify as prime or unique farmland.

4.18 Energy. The heating energy demands for the Tier 2 and related projects will be met by three new HTHW generators that are planned for the new South Utility Building. Each planned HTHW unit is rated at 70 million Btu per hour heat output and will use natural gas with diesel fuel backup. There are no backup electrical generators planned for the South Utility Building.

Use of Concourse C/D will be discontinued when Tier 2 becomes operational, and the concourse will be demolished. The natural gas consumed by the existing natural-gas-fired heating units that supply space and water heating to Concourse C/D would cease as well.

The footprint of Tier 2 is estimated to be approximately 20 percent larger than Concourse C/D, and Tier 2 will have an additional floor in the form of the basement that is lacking in Concourse C/D. Tier 2 also will contain more passenger and employee amenities. However, a planning goal for Tier 2 is that it be 20 percent more energy efficient than the airport's newest concourse, Concourse B, which went into operation in 1998. Overall, a more energy efficient building envelope and appliances for Tier 2 and the termination of space and water heating for Concourse C/D are predicted to result in no net increases in fuel consumption for the concourse facilities when Tier 2 becomes operational, and Concourse C/D is demolished.

The new HTHW generators in the proposed South Utility Building will provide heat to several other facilities, in addition to Tier 2. The heating loads of these buildings have been estimated as part of a larger engineering study of the South Utility Building (Burns and McDonnell 2001). Based on natural gas consumption by several existing IAD buildings, it was estimated that approximately 50 million cubic feet of natural gas would be required to meet the additional heating load associated with the other Tier 2 related facilities. This represents about a 20 percent increase in total natural gas consumption by the airport relative to the year 2000.

Electrical energy to operate Tier 2 and associated systems would increase the airport's overall electricity demand. Terminating the use of the existing Concourse C/D will reduce part of this increase. Historically, electricity has been supplied by Dominion Virginia Power (formerly named Virginia Electric and Power Company) since the airport's opening in 1962. The Authority has discussed their proposed increased electricity demand to operate Tier 2, the APM, and other systems with Dominion Virginia Power, and no supply problems are envisioned.

Mitigating energy reduction measures include a goal of reducing energy consumption in the Tier 2 Concourse by 20 percent relative to Concourse B by using a more energy-efficient building envelope and appliances and eliminating the energy requirements of the existing Concourse C/D, which will be demolished. The net increase in demand for natural gas and electricity is not expected to have a significant effect on local supplies.

4.19 Light Emissions. None of the proposed projects have the potential to create increased or intrusive light emissions that affect sensitive off-airport land uses or aircraft operations, and additional lighting requirements during construction activities are not anticipated to create a hazardous wildlife attraction or impact aircraft operations.

The proposed construction projects will take place within the configuration of the airport. While nighttime construction activity will require additional lighting, the lighting will be appropriate to the activity and will not impact the surrounding community. The existing buffer zone of vegetation around the airport will protect the surrounding communities from potential intrusive and persistent light interference during and after the construction of IAD development projects.

4.20 Visual Impacts. Due to the distance of IAD from parks, historic sites, or other public use areas, the buffer zone, and compliance with the Airport Master Plan, the proposed projects are not expected to have a visual impact on the aesthetic integrity of the area surrounding IAD. Additionally, as stated in Sections 4.8 and 4.9, the Tier 2 and related projects are not expected to significantly impact the historic district at IAD, including the visual aspects of the district (i.e., view from the Main Terminal). The SUB and DVP substation will not adversely impact onsite or offsite historic resources. The SUB and DVP substation will not be visible from Sully Plantation or Route 28 due to distance, intervening wooded area, and heights of proposed structures. The DVP substation and the SUB are approximately 0.85 mile (4,500 ft) and 1.55 miles (8,200 ft), respectively, from Sully Plantation. A 250-ft wooded buffer will be left in place between the project sites and Sully Road. The buffer should effectively shield the facilities from view from Sully Road except for a relatively narrow powerline right-of-way. In addition, the DVP substation will include a one-story building (16-20 ft) with switch gear no higher than 30 ft. The maximum height of the SUB features will be 60 ft (the top of the cooling towers).The Tier 2 improvement projects include planning to minimize harm resulting from use as well as ensuring the project will be compatible with the normal activity or aesthetic value of the historic district.

4.21 Solid Waste, Hazardous Waste, and Pollution Prevention. The airport currently produces and collects municipal solid waste and hazardous wastes, and the types, collection, and disposal of these wastes are not expected to change appreciably when Tier 2 and related projects become functional. Although there are no projections of future waste quantities, the nature of the airport's operation would result in an increase that would be proportional to the increase in

passengers utilizing the airport in the future. This increase is the same under both the Build and No Build Alternative. Municipal solid waste and hazardous waste would continue to be collected by contractors and removed from the airport for proper disposal.

In-place mitigation measures that reduce the volume of wastes would continue and would include the Tier 2 Concourse and related projects when they become functional. These measures include a recycling program that in 2000 reclaimed approximately 400 tons of paper and ferrous metals. The airport also operates an incinerator that destroys contraband and foreign food, plants, and other prohibited items that are confiscated from passengers arriving on international flights.

In previous construction projects at IAD, soil containing residues of jet fuel has been encountered during excavation in areas that have had hydrant fueling lines. Although IAD's ground-water monitoring system has not detected migration of petroleum products in the proposed project area, such soils could be found during the demolition of Concourse C/D. Excavation and dewatering operations will be monitored for evidence of petroleum products. Contaminated soils, if found, will be hauled offsite for disposal. If necessary, dewater discharge will be processed by means of oil-water separation and two-stage carbon adsorption.

The DEQ Office of Remedial Programs conducted a review of its files and did not find any sites that might impact this project.

4.22 Sanitary Waste. No impacts to the sanitary sewer system are expected from the Tier 2 development. Tier 2 is a one-for-one replacement facility that will generate no additional sanitary waste over No Build levels. There will be increases in sanitary waste due to projected increased traffic at IAD, with or without the Tier 2 development. Sanitary waste generation is projected to increase by 56 percent by the year 2005 (Khozeimeh 2001, personal communication). In terms of volume, the maximum discharge to Blue Plains in recent years (just under 1 mgd in 2000) is just 61 percent of the permitted maximum discharge rate of 1.5 mgd. Therefore, the projected increased discharge can be accommodated within No Build permit limits. Tier 2 sanitary waste will go to a Fairfax County interceptor and then to the Occoquan treatment plant.

As indicated in Section 4.6.3, recovered deicing fluid of less than 7 percent glycol concentration is routed to the sanitary sewer. These discharges are included in IAD's wastewater discharge permit. The Authority currently has studies underway to modify deicing procedures at IAD to minimize the volume of runoff containing spent deicing fluid and maximize recycling. Discharge to the sanitary sewer will continue to be coordinated with the Washington, DC Water and Sewer Authority (DCWASA) to ensure that the discharge will not exceed the requirements of the sewer use permit (Wollard 2001, personal communication).

4.23 Design, Art, and Architecture. Since IAD was declared eligible for the National Register of Historic Places, the Tier 2 and related projects within IAD are planned to be consistent with Eero Saarinen's master plan for the airport. The original architectural and cultural designs of the airport will be adhered to in the design and implementation of the

improvement projects. The principles of good design, art, and architectural treatment will also be applied.

Additionally, improvement projects planned for most of the buildings will be of limited height and located a considerable distance from the Main Terminal, where they will not have an adverse effect on the terminal setting or views or take away from the original design. The intent of the Authority is to maintain and enhance the Saarinen Plan by designing low-rise and below-grade construction to minimize impacts to the Plan. The architectural design of the proposed improvement projects at IAD will conform to the expansion planning process included in the Master Plan.

4.24 Construction Impacts. The construction phase of the capital improvement program is expected to create minor and temporary impacts at the project construction sites and in the surrounding area. These impacts will be short-term in nature, lasting for the duration of construction activities. Site restoration measures will be undertaken. At IAD, multiple projects will be undergoing construction at the same time; however, construction will be conducted in a series of phases over a 6-year time period.

Impacts related to construction activities include the seven general categories: contractor staging areas, noise, air quality, solid waste, roadway use, water quality, and excess soil stockpiling.

Contractor Staging Areas: Temporary contractor staging areas will be required throughout the construction process to store and assemble construction equipment and materials. Two types of staging areas are anticipated:

1) Close-in staging (port hole staging)
2) Long-term supply staging (larger supplies)

The temporary contractor staging areas have the potential to temporarily impact pervious surfaces or cause adjustments to airport operations that occur in the near vicinity. The main long-term staging area is an existing facility south of Hoxie Road (Figure 1-4). Following completion of construction and demolition activities, the temporary areas will be re-seeded and returned to pre-construction conditions. Stormwater runoff from the staging areas will flow to the temporary stormwater detention facilities.

Noise: Noise impacts are generally localized at the vicinity of the construction and demolition sites. Earthmoving equipment, pile drivers, asphalt pavers, drilling and tunneling equipment, and other construction machinery and vehicles will create localized increases in noise levels. These temporary noise impacts should not disrupt normal airport operations.

Noise levels generally dissipate as distance from their origin increases. Distance from the construction site must be considered when evaluating potential noise impacts to land uses adjacent to or near the construction areas. All proposed construction activities will take place inside the IAD boundary. Loudoun County has approved a residential subdivision, Loudoun Reserve, west of Route 606. However, the subdivision is located a far enough distance so as to not be impacted by construction noise. Due to the presence of a buffer zone on the airport

perimeter, construction-generated noise from Tier 2 and related projects will not impact surrounding land uses (i.e., light industrial, commercial, retail, residential, and agriculture).

Air Quality: Emissions from construction equipment and airborne dust have the potential to impact air quality. Emissions related to demolition and construction activities will be temporary and limited to the duration of individual demolition and construction projects. Phasing of construction will minimize the quantity of emissions generated in a given year. Dust control is important for airport construction activities, because light reflecting off of dust particles at night jeopardizes aircraft safety. Fugitive dust emissions from surface construction will be kept at a minimum by using applicable control methods outlined in 9VAC-5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. Dust from the tunneling activities will be controlled throughout the construction phase using a tunnel bag house filter system. Table 4-8 summarizes the air emissions that are estimated to be generated by demolition and construction equipment. Details on these emissions data are provided in Appendix C.

TABLE 4-8 ESTIMATED CONSTRUCTION ACTIVITY AIR QUALITY EMISSIONS

Construction Equipment	Usage (hr)	Emissions (lb)				
		CO	NOx	VOC	PM	SOx
Concrete Pavers	4,443	3,957	8,676	972	779	805
Paving Equipment	4,443	2,364	5,659	531	463	478
Excavators	640	765	1,582	105	212	137
Concrete/Industrial Saw	44,478	36,879	44,134	5,784	5,772	3,728
Cranes	1,217	940	2,305	289	322	208
Graders	4,443	3,905	9,866	1,617	1,028	894
Dump Trucks	117,117	201,510	690,890	62,108	57,574	64,051
Crushing Equipment	1,885	3,787	4,532	594	593	383
Rubber Tired Loaders	69,542	62,788	134,732	11,289	16,874	11,249
Rubber Tired Dozer	41,845	54,255	186,016	16,722	12,789	18,020
Tractor/Loader/Backhoe	87,792	55,738	82,787	11,746	8,607	6,967
Project Total	lbs	426,888	1,171,179	111,757	105,013	106,920
	tons	213	586	56	53	53
Average Annual Total Assuming 6-Year Construction Period	tons	36	98	9	9	9

The Authority conducted an analysis to identify the level of NO_X and VOC emissions from construction emissions that are included in the emission budget developed by the Metropolitan Washington Council of Governments (COG) for the Northern Virginia part of the State Implementation Plan (SIP) (MWAA 2001). It was concluded from this analysis that the SIP for the Metropolitan Washington, DC nonattainment area includes 0.746 tons of NO_X and 0.106 tons of VOC per ozone season day due to the activities of construction equipment at IAD. On an annual basis, the IAD construction emissions included in the SIP are 272 tons/yr NO_X and 39 tons/yr VOC, which compare to the average annual totals of 98 tons NO_X and 9 tons VOC noted in Table 4-8 for this project. Both the Metropolitan Washington COG and the Virginia DEQ have reviewed this analysis and concurred with the methodology and data (see agency letters in Appendix E).

Solid Waste: Construction and demolition activities will generate solid waste. Concrete paving may be recycled onsite. Dumpsters will be located in construction areas for proper onsite disposal of construction-generated waste. A contracted solid waste disposal company will haul the materials offsite for either landfilling or for another appropriate disposal method. Buildings proposed for demolition will be tested for lead-based paint (LBP) and asbestos-containing materials (ACM) prior to demolition in accordance with the Authority Design Manual (July 2000) requirements. If LBP or ACM are identified, these substances will be disposed in accordance with required protocols for managing these materials.

Roadway Use: During the construction period, construction-related vehicles will be traversing the airport access roads and internal roadways to deliver materials and equipment and to transport construction workers to their job sites. This increase in roadway use will be managed to avoid impact to normal airport operations. The access roads and internal roadways may experience a slight increase in traffic volume; the increase should be easily accommodated on the existing roadways. To mitigate the potential for increase in traffic volume, delivery of construction materials and large or bulky construction equipment that is slow-moving and could temporarily congest roadway traffic will be scheduled for non-peak hours. This congestion is likely to be intermittent and infrequent. Construction-related vehicles working near the airfield will be required to follow specified traffic patterns in areas where aircraft operate.

Wetlands and Water Quality: Construction activities have the potential to cause erosion and sedimentation that can impact water quality. Construction activities will be conducted in accordance with appropriate BMPs and will adhere to wetland permit conditions of the JPA to minimize impacts to wetlands and waterways. Erosion control measures, such as silt fences, as required in the Authority Design Manual (July 2000) will be implemented to minimize offsite transport of soils from the construction areas. Contractors will be required to provide an erosion and sediment control plan that complies with the latest version of the Virginia Erosion and Sediment Control Law and General Criteria, including the *Virginia Erosion and Sediment Control Handbook*. Ground water and stormwater from construction areas will flow to two temporary stormwater detention ponds. Water will flow through a grit box prior to entering the ponds. Ground water is expected to be encountered during tunneling operations, and will be handled by pumping, treating as appropriate, and discharge under appropriate permits. Projects that disturb more than 10,000 square feet of land will be required to include the preparation and approval of a Stormwater Pollution Prevention Plan (SPPP) prior to implementation (MWAA 2000b).

Excess Soil Stockpiling: Temporary storage areas for excess soil from tunnels, foundations, and other facility construction will be necessary for soils removed during construction. It is anticipated that approximately 3.8 mcy of soil will require stockpiling over the life of the project. Some of this material will be used for fill in subsequent projects at portions of the airport, but it is anticipated that the storage area will be used for up to 10 years.

Prior to stockpiling, excess soil will undergo geotechnical testing (to determine future use) and screening for potential contamination. Unsuitable or contaminated materials will be removed and disposed of properly at an offsite location. The proposed stockpile location is located in the southern portion of the airport parcel set back approximately 50 ft from the property line (Figure

1-10). As currently planned, the site will be approximately 90 acres in size, with an approximate capacity of 3.8 mcy. The site will be filled to a 38-ft elevation and will have a 2:1 slope. For every 10 acres of stockpile, there will be 1 acre of stormwater pond to control potential erosion and runoff impacts. Trees will be removed to prepare and create the stockpile area. Because at least a 50-ft buffer will be retained south of the stockpile area, it is not anticipated that the stockpile will be visible from outside the airport property boundary. A Phase I Archaeological Survey is being performed on the site. Erosion from the stockpiles will be minimized by seeding to stabilize the exposed surfaces. The stockpile area will be revegetated after completion of the capital improvement program.

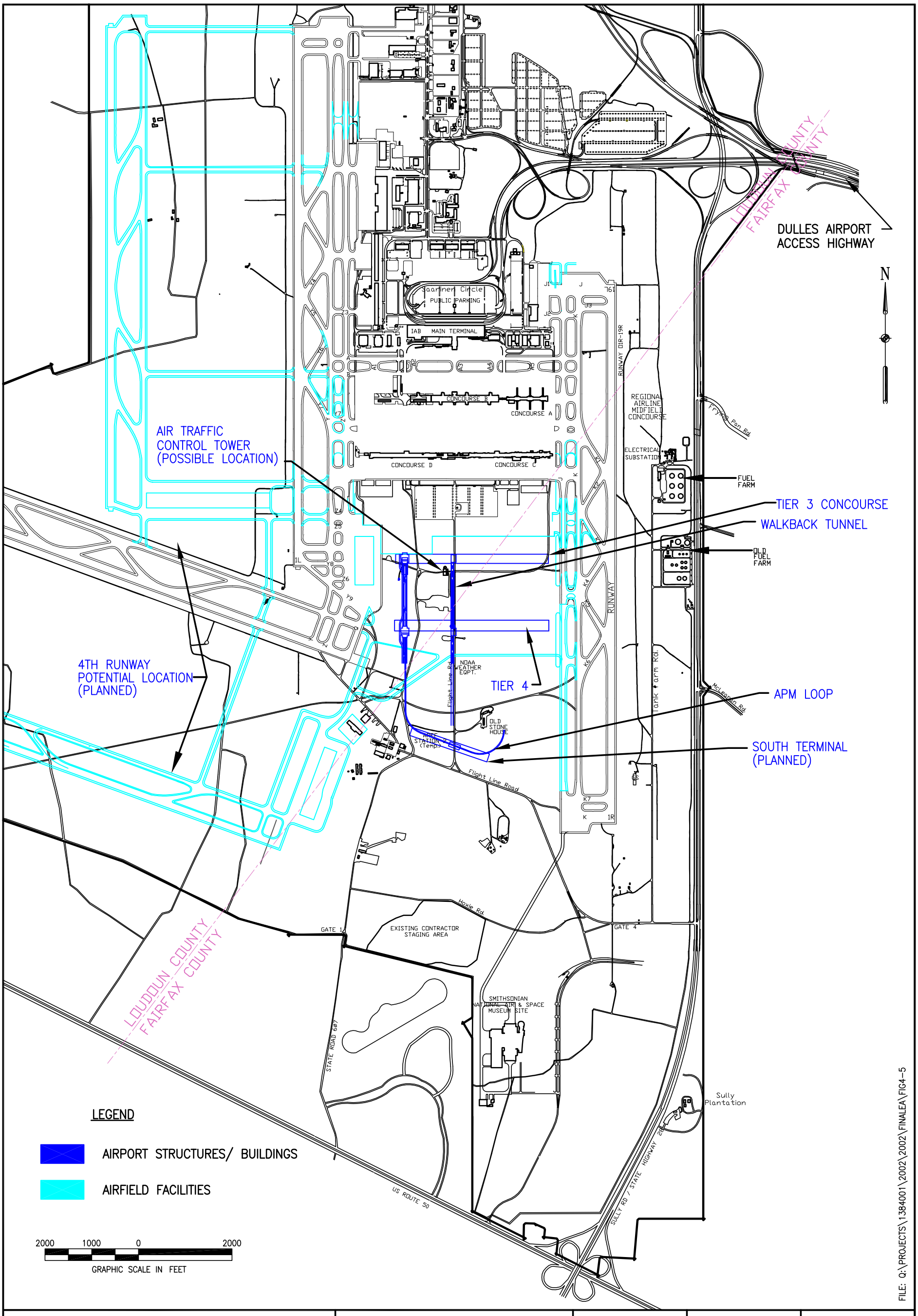
4.25 Cumulative Impacts. No cumulative impacts are expected as a result of the proposed Tier 2 and related projects. Tier 2 and related projects are designed to replace and improve existing services at IAD. Impacts that are associated with these projects are limited to the area of the airport property and will be effectively mitigated. The preceding analyses of potential for environmental effects identified air quality, stormwater, wetlands, RTE species, and historic and cultural resources as resources for which impact management or mitigation would be implemented for the Tier 2 and related projects. The potential for combined effects with other projects to result in a greater impact than any of the proposals when examined alone is evaluated below.

Proposed projects that could represent potential for cumulative impacts are divided into three categories:

- Planned Development at IAD
- Planned Land Use Development in the Region
- Planned Ground Transportation Projects

4.25.1 Planned Development at IAD. Passenger growth at Dulles during recent years has surpassed the national average. In 1999, the annual passenger growth rate for Dulles was 25.7 percent compared to an industry average growth rate of 2.9 percent. Growth is projected to continue at the rate of approximately 5 percent per year (HNTB 2000). Improvement projects that are currently underway or are planned for implementation concurrent with the Tier 2 and related projects include: a new airport traffic control tower, Concourse B extension, roadway and parking improvements (including two new public parking garages), a new air cargo building, and an upgrade of the existing heating and cooling utility plant. These improvement projects and the Tier 2 projects have independent utility in that they primarily are replacements for existing outmoded facilities or provide improvements to the quality of service. They do not individually or collectively increase capacity beyond what can be handled by the existing system of three runways.

Future planned development at IAD includes implementation of Tier 3 and Tier 4 midfield concourses and a fourth runway that will allow for major airport capacity expansion (Figure 4-5). The fourth runway may be either a second crosswind (east-west) or a third parallel (north-south) runway. The Authority is considering a fifth runway. The potential future development at IAD will be addressed in separate NEPA documentation. The Tier 2 projects have been designed in



FILE: Q:\PROJECTS\1384001\2002\2002\FINALEA\FIG4-5

TIER 2 AND RELATED PROJECTS ENVIRONMENTAL ASSESSMENT WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	FUTURE PLANNED DEVELOPMENT PROJECTS AT IAD	DRAWN BY WCM	DATE 4-5-02	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 4-5

the context of possible future airport expansion so that conflicts and/or cumulative impacts will not occur.

Air Quality
Tier 2 and related projects are intended to improve efficiencies of passenger movement and aircraft operations. The baseline air quality against which future projects will be assessed will be of higher quality with implementation of Tier 2 projects than with the No Build alternative.

Stormwater
The Authority has undertaken a planning study to develop a long-term stormwater management strategy that reflects ultimate site build-out. The stormwater management elements of the Tier 2 and related projects were developed within the context of this broader plan. Therefore, adverse cumulative impacts resulting from increased impervious surface and stormwater runoff from future onsite projects are not anticipated.

As noted in Section 4.6.3, the Authority also is completing an evaluation of alternative concepts for the management of spent deicing fluid. The objective is to maximize the recovery of spent glycol and minimize discharges to the stormwater system.

Wetlands
As for stormwater, the Authority has undertaken a planning process to address long-term wetland resource management through development of a mitigation program that encompasses future as well as current building plans. By planning ahead for mitigation, adverse cumulative impacts due to inadequate mitigation opportunity are being avoided.

Rare, Threatened, and Endangered Species
The Authority has undertaken RTE surveys to identify species of concern in the vicinity of the Tier 2 project area. The observed RTE species have habitat requirements that are found either outside of the Tier 2 project area or are found throughout the airport property. Supplemental RTE surveys will be conducted to investigate the project areas for future planned development at IAD, and consultation with federal and state resource agencies will continue. Therefore, it is not anticipated that significant adverse cumulative impacts to RTE will occur on the airport property as the result of Tier 2 and subsequent airport projects.

Historic and Cultural Resources
The Authority has an ongoing resource management program that involves coordination with the SHPO and is developing memoranda of agreement that address historic and cultural resource management throughout the airport property. This comprehensive coordination program will work to prevent cumulative adverse impact to onsite historic and cultural resources.

4.25.2 Planned Development in the IAD Region. The IAD region is rapidly growing with business parks and industrial centers. Most of this development is subject to the approval of either Fairfax County or Loudoun County and must comply with local environmental requirements. Only the National Air and Space Museum at IAD has been evaluated in a NEPA Environmental Assessment. The Smithsonian Institution found that there were no significant impacts associated with the development of the Air and Space Museum and, consequently, no cumulative impacts associated with the Tier 2 and related projects is anticipated.

Several land use planning studies are underway in the IAD region. These are:

- Expansion of the Dulles Greenway (business corridor)
- Business Land Use and Corridor Development for Route 625 (Waxpool Road)
- Business Land Use and Corridor Development for Route 606 (Old Ox Road)
- Business Land Use and Corridor Development for Route 50

These studies are not subject to environmental assessment requirements; however, planning is within the context of the existing and projected quality of service at the airport which the Tier 2 and related projects are designed to serve. While the Tier 2 and related projects are not projected to result in offsite impacts, these planning studies are intended to prevent adverse cumulative effects.

Land use growth in the Counties is guided by County plans that recognize the quality of service required by the airport. The Counties' planning activities are intended to minimize potential for adverse cumulative impacts.

Air Quality
The growth in business parks and industrial centers in the vicinity of IAD implies an increase in patronage at IAD to serve these parks and centers. The Tier 2 and related projects are intended to increase efficiencies of passenger movements and aircraft operations to accommodate regional economic growth. These efficiencies reduce the probability of adverse cumulative impacts on air quality by reducing aircraft delay times and replacing most of the motorized mobile lounges and planemates with an APM system.

Stormwater
Growth in business parks and industrial areas in the IAD region will increase impervious surface areas associated with building footprints and parking lots. The Commonwealth of Virginia and Fairfax and Loudoun counties have implemented requirements for stormwater management plans to accommodate growth in the region. Stormwater management, treatment, and monitoring requirements will minimize the potential for adverse cumulative impacts. If sufficient retention and detention facilities are constructed, the resulting increased impervious surface areas should not cause significant adverse cumulative impacts to local streams and waterways.

Wetlands
Entities undertaking projects that require the removal of wetlands are required to mitigate such impacts through wetland banking programs or other watershed restoration effects. Therefore, no net cumulative loss of wetlands is expected to occur due to growth in business parks or industrial areas in the IAD region.

Rare, Threatened, and Endangered Species
The Tier 2 and related projects will not result in the loss of critical habitat for protected species. Therefore, adverse cumulative impacts are not expected.

Historic and Cultural Resources
The Tier 2 and related projects at IAD will not affect any offsite historic and cultural resources (including sites on the NRHP as well as sites that are eligible for the NRHP) and, therefore, adverse cumulative effects are not anticipated.

4.25.3 Regional Ground Transportation Projects. Multiple roadway and transportation improvement projects are currently underway or in the planning process in the vicinity surrounding IAD. Virginia DOT projects include the following:

- I-66 Corridor Study
- Dulles Toll Road "Smart Travel" Improvements
- Route 28 Improvements (Between I-66 and Route 7)
- Park-and-Ride Lot Feasibility Studies (I-95, I-395, I-66, and Dulles Toll Road)

In addition to projects designed to ease vehicular traffic, the Virginia Department of Rail and Public Transportation, in cooperation with the Federal Transit Administration (FTA) and Washington Metropolitan Area Transit Authority (WMATA), is working to improve the rapid transit systems in the Dulles Corridor. Preparation of an Environmental Impact Statement (EIS) for the Dulles Corridor Rapid Transit Project is currently underway.

Fairfax County-specific projects include:

- Improvements to Dulles Toll Road Interchange at Hunter Mill Road
- Pedestrian and bicycle trail construction at Sully Road (Route 28), Route 50, and Adkins Road

All transportation projects that involve federal funding are subject to evaluation under NEPA. The projects identified above are in various phases of the process, but each has or will address potential for cumulative impacts with IAD. Since the Tier 2 and related projects are designed to improve service to air traffic levels that are expected regardless of the project, and the transportation improvements are, likewise, intended to reduce adverse offsite environmental impacts associated with those levels of use, no adverse cumulative impacts due to these projects is expected.

Air Quality
Roadway and transportation improvement projects in the vicinity of IAD complement the increase in efficiencies in passenger movement and aircraft operations that the Tier 2 and related projects will achieve by reducing congestion of ground vehicles operating to and from IAD. Reduced vehicle congestion has an attendant positive impact on air quality.

Stormwater
Growth in business parks and industrial areas in the IAD region will increase impervious surface areas associated with building footprints and parking lots. The Commonwealth of Virginia and Fairfax and Loudoun counties have implemented requirements for stormwater management plans to accommodate growth in the region. Stormwater management, treatment, and monitoring requirements will minimize the potential for adverse cumulative impacts.

Wetlands
Entities undertaking projects that require the removal of wetlands are required to mitigate such impacts through wetland banking programs or other watershed restoration effects. Therefore, no net cumulative loss of wetlands is expected to occur due to ground transportation projects in the region.

Rare, Threatened, and Endangered Species
The Tier 2 and related projects will not result in the loss of critical habitat for protected species. Therefore, adverse cumulative impacts are not expected.

Historic and Cultural Resources
Federally funded ground transportation projects require compliance with Section 106 of the National Historic Preservation Act. Consultation with the SHPO and the ACHP will minimize or avoid cumulative impacts to cultural resources (includes sites on the NRHP as well as sites that are eligible for the NRHP) in the IAD region.

4.25.4 Cumulative Impact Summary. Overall, the Tier 2 and related projects comprise a small portion of the current and planned development activity in the Dulles region. Although the region could experience cumulative effects to air quality, water quality (stormwater runoff and increased impervious surface area), and habitat loss due to multiple ongoing roadway and development projects, the Tier 2 projects account for a small fraction of these effects and will not in and of themselves cause impacts that would be expected to exceed thresholds of significance.

It is not expected that the Tier 2 and related projects discussed in this environmental assessment will produce significant environmental impacts. Nor is it expected that the effects of these projects, when added to the effects of other proposed projects in the region, will cause impacts that otherwise would not be significant to exceed thresholds of significance. Therefore, no significant cumulative impacts are expected from the Tier 2 and related projects.

5.0 ENVIRONMENTAL CONSEQUENCES – OTHER CONSIDERATIONS

This chapter discusses consequences and other considerations that do not fall into the categories discussed in Chapter 4. Specifically, the following consequences are discussed as they pertain to Tier 2 and related projects: possible conflicts with land use plans, policies, and controls; consistency with approved State or local plans; mitigation to avoid environmental impacts; degree of controversy on environmental grounds; and coordination with public agencies and State and local officials.

5.1 Possible Conflicts With Land Use Plans, Policies, and Controls. The proposed projects have no known conflicts with Federal, State, or local land use plans. The projects are consistent with the Airport Master Plan (KPMG Peat Marwick 1985).

5.2 Consistency With Approved State or Local Plans. The proposed projects are consistent with approved State and local land use plans. The projects will occur on the airport property and will not impact resources outside the airport boundary. Appropriate Commonwealth of Virginia government agencies have reviewed the Environmental Assessment for conformance with State and local plans. A Federal Consistency Certification for the portions of the Tier 2 and Related Projects that are within the County of Fairfax RMA has been submitted to Virginia DEQ for review.

5.3 Means to Mitigate Adverse Environmental Impacts. Coordination with the Virginia State Historic Preservation Officer and the Advisory Council on Historic Preservation has been conducted to minimize impacts to historic or architectural resources and to ensure that appropriate mitigation measures are implemented. In addition, coordination with Virginia DEQ and USACE is underway regarding wetlands permitting for the proposed projects. The Authority is working with DEQ and appropriate entities to develop a wetland banking strategy to mitigate loss of wetlands and streams on the IAD property. A mitigation strategy is outlined in the Draft JPA.

5.4 Degree of Controversy on Environmental Grounds. The Draft Environmental Assessment was reviewed by the Virginia State Historic Preservation Officer, the Advisory Council on Historic Preservation, Virginia DEQ, and other appropriate Federal, State, and local agencies and officials, and the public to identify controversial actions. Comments from the reviewers were addressed and are appended to this Environmental Assessment. It is not expected that the proposed Tier 2 and related projects will be controversial on environmental grounds.

5.5 Coordination With Public Agencies, State and Local Officials. Agency coordination has been conducted. A list of agencies contacted is provided in Appendix G. Agency consultation letters and responses are provided in Appendix E. A distribution list for the Draft EA, agency comments for the Draft EA and Authority responses are provided in Appendix J.

6.0 REFERENCES

Advisory Council on Historic Preservation (ACHP). 1993a. Memorandum of Agreement – Main Terminal Expansion, Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. To: James A. Wilding, General Manager, MWAA, From: Don Klima, Director, Eastern Office of Review. April 5, 1993.

Advisory Council on Historic Preservation (ACHP). 1993b. Memorandum of Agreement – Midfield Concourse Facilities, Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. To: Frank D. Holly, Jr., Manger, Engineering Division, MWAA, From: Don Klima, Director, Eastern Office of Review. March 25, 1993.

Air Force Magazine (Air Force). 2001. New Horizons for Air and Space. *Journal of the Air Force Association* 84(3). March.

Air Survey Photogrammetric Mapping Service. 2001. Digital aerial photograph of Washington Dulles International Airport. September 17, 2000.

Alpha Corporation. 2000. *Storm Water Management MWAA Solicitation 1-99-C087 100% Submittal.* Prepared for Metropolitan Washington Airports Authority. Submitted by Crawford, Murphy & Tilly, Inc. Prepared by Alpha Corporation, Dulles, VA. December 5.

American Rivers. Downloaded File 30 April 2001. "State River Protection Programs." (www.amriver.org/wildscenictoolkit/stateprograms.htm)

Baummer, C. 2001. Metropolitan Washington Airports Authority. Personal Communication. June 11.

Beatty, T. 2001. Metropolitan Washington Airports Authority. Personal Communication. May.

Blackburn, A. C. 1998. *Interpretive Guide to the Use of Soils Maps of Loudoun County, Virginia.* Loudoun County Cooperative Extension Office.

Burns and McDonnell. 2001. *South Utility Building, Preliminary Engineering Report, Washington Dulles International Airport.* 90% Submittal. Prepared for Metropolitan Washington Airports Authority. June.

Chesapeake Bay Local Assistance Department. Downloaded File 1 May 2001. *The Chesapeake Bay Preservation Act*. (www.cblad.stat.va.us/bayact.htm)

CODE County of Fairfax. 2001. *Chapter 118: Chesapeake Bay Preservation*. Downloaded File 2 May 2001. (www.fws.municode.com)

Commonwealth of Virginia, Department of Conservation and Recreation. Fax of *Components of the Virginia Scenic Rivers System* Received from Bob Munsen on April 30, 2001.

Dalaker, J., and B.D. Proctor. 2000. *Poverty in the United States, 1999.* U.S. Census Bureau, Current Population Reports, Series P60-210. U.S. Government Printing Office, Washington D.C.

Department of Transportation (DOT), Federal Aviation Administration (FAA). 1985. *Airport Environmental Handbook.* Order 5050.4A. October 8, 1985.

Department of Transportation (DOT), Federal Aviation Administration (FAA). 1986. *Environmental Impacts: Policies and Procedures*. Order 1050.1D.

Eggleton, R.E. 1975. *Supplementary Pamphlet from the Preliminary Geologic Map of the Herndon Quadrangle, Virginia.* U.S. Geologic Survey Open File report No. 75-386. Department of the Interior, U.S Geologic Survey, Washington, D.C.

Evans, G.W., M. Bullinger, and S. Hygge. 1998. Chronic noise exposure and physiological response: A prospective, longitudinal study of children under environmental stress. *Psychological Science* 9:75-77.

Evans, G.W., and L. Maxwell. 1997. Chronic noise exposure and reading deficits: The mediating effects of language acquisition. *Environment and Behavior* 29:710-728.

Executive Order 11988. 1977. *Floodplain Management*, Signed 24 May 1977. The Bureau of National Affairs.

Fairfax County Website (www.co.fairfax.va.us)

Fairfax County. 1991. *The Comprehensive Plan for Fairfax County, Virginia, Area III.* Fairfax County Government Center, 12000 Government Center Parkway, Fairfax, Virginia.

Fairfax County Department of GIS and Mapping. 2001. (www.co.fairfax.va.us/maps)

Fairfax County Department of Planning and Zoning. 2001. (www.co.fairfax.va.us/gov/ocp)

Fairfax County Office for Children. 2001. (www.co.fairfax.va.us/service/ofc)

Federal Aviation Administration (FAA). 2000. Emissions and Dispersion Modeling System (EDMS). Version 3.23. Office of Environment and Energy.

Federal Aviation Administration (FAA). 1985. *Airport Environmental Handbook*. Order 5050.4A, October 8, 1985.

Federal Aviation Administration (FAA). 1997. *Advisory Circular: Hazardous Wildlife Attractant on or Near Airports.* AC No. 150/5200-33. May 1, 1997.

Federal Emergency Management Agency (FEMA). 1990. Flood Insurance Rate Map (FIRM) of Fairfax County, Virginia. Community Panel Number 515525 0025D and Community Panel Number 515525 0050D. March 5.

Federal Emergency Management Agency (FEMA) Map Service Center. Downloaded File 24 April 2001. Coastal Barrier Resource Area (CBRA). (www.fema.gov/MSC/cbra_q3.htm)

Froelich, A.J., Department of Interior, U.S. Geological Survey. 1989. Maps Showing Geologic and Hydrologic Factors Affecting Land-Use Planning in the Culpeper Basin, Virginia and Maryland.

Great Buildings. 2001a. The Great Buildings Collection. Downloaded File May 8, 2001. (www.greatbuildings.com/architects/Eero_Saarinen.html)

Great Buildings. 2001b. The Great Buildings Collection. Downloaded File May 8, 2001. (www.greatbuildings.com/buildings/Dulles_Airport.html)

Hewitt, M. 2001. Parsons Management Consultants. Personal Communication. June 8.

HNTB Corporation. 2000. *Washington Dulles International Airport Aviation Activity Forecasts*. Submitted to Metropolitan Washington Airports Authority, Washington National Airport, Washington D.C. October.

HNTB Corporation. 2001a. *Aircraft Noise Study for Washington Dulles International Airport.* Prepared for Metropolitan Washington Airports Authority, Washington National Airport, Washington, D.C. Draft. July.

HNTB Corporation 2001b. *Washington Dulles International Airport Project Definition Document, Dulles North Area Roadway Improvements.* Prepared for Metropolitan Washington Airports Authority Planning Department. January.

Khozeimeh, I. 2001. Metropolitan Washington Airports Authority. Personal Communication. May 16.

KPMG Peat Marwick Airport Consulting Services. 1985. *Final Technical Report, Master Plan Update, Washington Dulles International Airport.* Prepared for Federal Aviation Administration, Metropolitan Washington Airports. September.

KPMG Peat Marwick Airport Consulting Services. 1993a. *Final Environmental Assessment Land Acquisition, Washington Dulles International Airport*. Prepared for Metropolitan Washington Airports Authority, Alexandria, Virginia.

KPMG Peat Marwick Airport Consulting Services. 1993b. *FAR Part 150 Noise Compatibility Program, Washington Dulles International Airport*. Prepared for Metropolitan Washington Airports Authority. March.

Lee, K.Y., and A.J. Froelich. 1989. *Triassic-Jurassic Stratigraphy of the Culpeper and Barboursville Basins, Virginia and Maryland*. U.S. Geological Survey Professional Paper 1472. United States Government Printing Office, Washington.

Loudoun County. 2001. *Loudoun County Revised General Plan, Planning Commission*. July 23.

Loudoun County Department of Economic Development. 2001. (www.loudounva.com)

Loudoun County Department of Planning. 2001. (www.co.loudoun.va.us)

Loudoun County Department of Social Services. 2001. (www.co.loudoun.va.us/service/ccare)

Loudoun County Office of Mapping and Geographic Information. 2001. (www.co.loudoun.va.us/omagi)

Metropolitan Washington Airports Authority (MWWA). 1983. Midfield Concourse Facilities, Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. Letter to: Mary Harding Sadler, State Historic Preservation Office, From: James A. Wilding, General Manager, MWAA. Dated March 17, 1993.

Metropolitan Washington Airports Authority (MWWA). 1987. Programmatic Memorandum of Agreement Among the Advisory Council on Historic Preservation, the Virginia State Historic Preservation Officer and the Federal Aviation Administration, Metropolitan Washington Airports.

Metropolitan Washington Airports Authority (MWAA). 1998a. *"Issues Related to the Future People Mover System at Washington Dulles International Airport"*, (Green Book), as amended, presented to the Airports Authority Board of Directors – Planning Committee.

Metropolitan Washington Airports Authority (MWAA). 1998b. *Consolidated Spill Contingency Plan, Washington Dulles International Airport.* MWWA, Washington, D.C.

Metropolitan Washington Airports Authority (MWAA). 2000a. Dulles Airport Fastest Growing of Top 50 World Airports. Press Release. March 28.

Metropolitan Washington Airports Authority (MWAA). 2000b. *Stormwater Pollution Prevention Plan, Washington Dulles International Airport.* Prepared by Earth Tech, Inc., Alexandria, VA and revised by Dames & Moore, Inc., Bethesda, MD. January.

Metropolitan Washington Airports Authority (MWAA). 2000c. Wetland delineation unpublished data. Prepared by Dames and Moore, Inc.

Metropolitan Washington Airports Authority (MWWA). 2001. *Construction Equipment Emissions for Washington Dulles International Airport Included in the State Implementation Plan*. Planning Department. November.

Metropolitan Washington Airports Authority (MWWA). 2002. Tier 2 and Related Facilities Project, Washington Dulles International Airport, Fairfax and Loudoun Counties. Letter to: Lily A. Richards, State Historic Preservation Office, From: Frank D. Holly Jr., Vice President for Engineering, MWAA. Dated February 22, 2002.

Metropolitan Washington Airports Authority (MWWA). 2002. Joint Permit Application for Activities in Waters and Wetlands of the Commonwealth of Virginia, Washington Dulles International Airport Tier 2 and Related Projects. March.

McBride, W. 2001. Parsons Management Consultants. Personal Communication. April 19.

National Air and Space Museum (NASM). 2001. *Smithsonian National Air and Space Museum, Steven F. Udvar-Hazy Center*. Downloaded File 8 June 2001. (www.nasm.edu/nasm/ext/overview.htm)

National Park Service (NPS). *Wild and Scenic Rivers Act* (*16 U.S.C 1271-1287), Public Law 90-542*. Downloaded File 24 April 2001. (www.nps.gov/rivers/wsract.html)

National Wild and Scenic Rivers System. Downloaded File 24 April 2001. *Wild and Scenic Rivers*. (www.nps.gov/rivers)

Northern Virginia Planning District Commission and Engineers and Surveyors Institute (NVPDC & ESI). 1992. *Northern Virginia BMP Handbook: A Guide to Planning and Designing Best Management Practices in Northern Virginia.* Annandale, VA.

Parsons Management Consultants (PMC). 1989. *Historic and Archaeological Survey Report Washington Dulles International Airport*. Submitted to: Metropolitan Washington Airports Authority, Washington National Airport, Washington, DC. August.

Richardson, T. 2001. Parsons Management Consultants. Personal Communication. June 7.

United States Army Corps of Engineers (USACE). 1987. U.S. Army Corps of Engineers Wetland Delineation Manual. (http://www.wetlands.com/regs/tlpge02e.htm).

United States Bureau of Labor Statistics. 2001. United States Department of Labor. (www.bls.gov)

United States Census Bureau. 1990. 1990 Census Summary Tape File 3 (STF3), Sample count – all socioeconomic and demographic variables." 1990 Census Data Lookup Server at http://homer.ssd.census.gov/cdrom/lookup.

United States Census Bureau. 2001. Census 2000 Redistricting Data (Public Law 94-171) Summary File. (www.census.gov)

United States Census Bureau. 1997. Small Area Income and Poverty Estimates Program. Model-based income and poverty estimates for Loudoun and Fairfax Counties, VA. (www.census.gov)

United States Department of Agriculture (USDA). 1951. 1951. *Soil Survey of Loudoun County, Virginia*. Soil Conservation Service, Virginia Agricultural Experiment Station, and Loudoun County, Virginia. U.S. Government Printing Office.

United States Department of Agriculture (USDA). 1963. 1963. *Soil Survey of Fairfax County, Virginia*. Soil Conservation Service, Virginia Agricultural Experiment Station, and Fairfax County, Virginia. U.S. Government Printing Office.

United States Department of Agriculture (USDA). Downloaded File, May 2, 2001. Land Use Policy. Land Use Staff, Soil Conservation Service. (www.usda.gov/ocio/directives/DR/DR9500-003.htm)

United States Department of Agriculture (USDA). Downloaded File, May 3, 2001. Department Policy for the Farmland Protection Policy Act. Environmental Compliance Library. (www.snowhill.com/~apachee/farmland.htm)

United States Department of Agriculture (USDA) Natural Resources Conservation Service. Received fax from Jim Snyder (District Conservationist), May 4, 2001 of Prime Farmland Soils for Fairfax County.

United States Environmental Protection Agency (EPA). 2001a. Office of Children's Health Protection. (www.epa.gov/children/air.htm)

United States Environmental Protection Agency (EPA). 2001b. *EPA Air Data, NET (National Emission Trends) Tier Report.* (www.epa.gov/air/data/nettier.html)

Virginia Department of Conservation and Recreation (VDCR). Downloaded file 30 July 2002. VA Natural Communities and Ecosystems: Conservation Priorities for the Future. (www.dcr.state.va.us/dnh/environ.htm)

Virginia Department of Environmental Quality (VDEQ). Downloaded File, May 1, 2001. *Virginia Coastal Program Administration*. (www.deq.state.va.us/coastal/about.html)

Virginia Economic Commission. 2001. (www.vec.state.va.us/2000census.htm)

Wollard, G. 2001. Metropolitan Washington Airports Authority. Personal Communication. May 4.

APPENDIX A

GLOSSARY OF AVIATION AND ENVIRONMENTAL TERMINOLOGY

GLOSSARY OF TERMS

100-YEAR FLOODPLAIN – The land adjacent to a river corridor that would be covered by water during a 100-year flood event. A 100-year flood event has a one percent probability of occurring during any given year.

A-WEIGHTED SOUND LEVEL (dBA) - The ear does not respond equally to various sound frequencies. It is less efficient at low and high frequencies than it is at medium or speech-range frequencies. Thus, to obtain a single number representing the sound level of a noise having a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are decibels (dB); therefore, the abbreviation is dBA. The A-weighted sound level is also called the noise level. Sound level meters have an A-weighting network for measuring A-weighted sound levels.

AFFECTED ENVIRONMENT – The existing biological, physical, cultural, economic, and social conditions that are subject to both direct and indirect changes as a result of actions described within alternatives under consideration.

AFFECTED LOCAL GOVERNMENT AGENCIES – The local government agencies that have the authority to control land uses in areas adversely affected by aviation activities.

AIP PROGRAM – See AIRPORT IMPROVEMENT PROGRAM

AIRCRAFT DELAY – The additional travel time at an airport or in the air, caused by aircraft traffic congestion, taken by an aircraft to move from its origination to its destination.

AIRCRAFT OPERATION – An aircraft arrival (landing) or departure (takeoff) represents one aircraft operation at an airport. Aircraft operations are typically recorded by the FAA in four categories: air carrier, air taxi, general aviation, and military.

AIR CARRIER OPERATIONS – Operations performed in revenue service by certificated route air carriers.

AIR QUALITY CONTROL REGION (AQCR) - An area designated by the Federal government where two or more communities – either in the same or different states – share a common air pollution problem.

AIR TAXI – Operations performed by operators of aircraft holding an air taxi certificate. This category includes commuter airline operations (excluding certificated commuter airlines), mail carriers under contract with the U.S. Postal Service, and operators of nonscheduled air taxi service.

AIRPORT IMPROVEMENT PROGRAM (AIP) – A program administered to provide financial grants-in-aid for airport development projects such as runways, taxiways, aircraft parking aprons, public areas in terminal buildings, and land acquisition associated with airport development, clear zones, and approach protection.

AIRPORT MASTER PLAN – An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, environmental, economical, social, and political jurisdictional perspective.

AIRPORT NOISE AND CAPACITY ACT OF 1990 – The Airport Noise and Capacity Act of 1990 contains provisions requiring the gradual phaseout of noisier Stage 2 aircraft. This provision, which has set the standard for a national noise policy, was mandated by Congress to be established prior to the authorization of passenger facility charges. The phaseout generally requires all airlines to comply with the regulations by December 31, 1999.

AIRPORT SPONSOR – A public agency or tax-supported organization, such as an airport authority, that is authorized to own and operate an airport, to obtain property interests, to obtain funds, and to be legally, financially, and otherwise able to meet all applicable requirements of the current laws and regulations.

AIR TRAFFIC CONTROL (ATC) – A service provided by the FAA to promote the safe, orderly, and expeditious flow of air traffic.

AMBIENT NOISE – The total of all noise in a system or situation, independent of the presence of the specific sound to be measured. In acoustical measurements, ambient noise means electrical noise in the measurement system. However, in popular usage ambient noise is also used with the same meaning as "background" or "residual" noise.

ATC – See AIR TRAFFIC CONTROL

ARCHEOLOGICAL AND HISTORIC PRESERVATION ACT OF 1974 – Provides for the survey, recovery, and preservation of significant scientific, prehistoric, historic, or archaeological data which may be destroyed or irreparably lost due to a Federally funded, or Federally licensed project.

ARCHAEOLOGY – The systematic recovery by scientific methods of material evidence remaining from man's life and culture in past ages, and the detailed study of this evidence.

ARCHITECT – One who designs and supervises the construction of buildings or other large structures.

BEST MANAGEMENT PRACTICES (BMPs) – Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land and water management measures that avoid or minimize adverse impacts to natural and cultural resources. Best Management Practices may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

CEQ – COUNCIL OF ENVIRONMENTAL QUALITY.

CEQ 1500 – Regulations of the Federal Council of Environmental Quality (CEQ) for implementing the procedural provisions of the National Environmental Policy Act of 1969 (NEPA).

CLEAR ZONE – See RUNWAY PROTECTION ZONE.

COMPUTER MODEL – An analytical process that employs a computer to perform difficult, laborious calculations involving mathematical functions or formulas. Computation of cumulative noise exposure (DNL) contours requires the use of computer modeling in order to process enormous quantities of aircraft traffic, performance, and operating procedures data.

COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) – Established by the National Environmental Policy Act of 1969. The Council is composed of three members appointed by the President. A major purpose of the Council is to formulate and recommend national policies to promote the improvement of environmental quality.

CUMULATIVE IMPACTS – Impacts that are additive in nature.

DNL – Formerly Ldn. See DAY-NIGHT AVERAGE SOUND LEVEL.

DAY-NIGHT AVERAGE SOUND LEVEL (DNL) – A method for predicting, by a single number rating, cumulative aircraft noise affecting communities in airport environs. The DNL value represents decibels of noise as measured by an A-weighted sound-level meter (see also). In the DNL procedure, the noise exposure from each aircraft takeoff or landing at ground level around an airport is calculated, and these noise exposures are accumulated for a typical 24-hour period. (The 24-hour period often used is the average day during the peak month of the year being analyzed). Daytime and nighttime noise exposures are considered separately. A-weighting factor equivalent to a penalty of 10 decibels is applied to operations between 10 p.m. and 7 a.m. to account for the increased perceived sensitivity of people to noise during the sleeping hours. The DNL values can be expressed graphically on maps using contours of equal noise exposure. DNL may also be used for measuring other noise sources, such as automobile traffic, to determine combined noise effects. This metric was previously referred to as Ldn; however the international convention is DNL.

dBA – A-WEIGHTED SOUND LEVEL

DECIBEL (dBA) – A unit for measuring the volume of a sound, equal to the logarithm of the ratio of the intensity of the sound to the intensity of an arbitrarily chosen standard sound.

EIS – See ENVIRONMENTAL IMPACT STATEMENT.

ENVIRONMENTAL ASSESSMENT – An assessment of the environmental effects of a proposed action for which Federal financial assistance is being requested or for which Federal authorization is required. The Environmental Assessment serves as the basis for the FAA's Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI), as specified in FAA Orders 1050.1D and 5050.4A.

ENVIRONMENTAL IMPACT STATEMENT (EIS) – A document prepared under the requirements of NEPA, Section 102(2)(c). The EIS represents a Federal agency's evaluation of the effect of a proposed action on the environment. Regulations relating to the preparation of an EIS are published in FAA Order 1050.1D and 5050.4A.

ENVIRONMENTAL QUALITY CORRIDOR – Some or all of a stream valley component may constitute a "genetic corridor" that should be managed primarily to protect and enhance biological diversity and wildlife movement.

ENPLANED/DEPLANED PASSENGERS – The volume of passengers outbound from an airport (enplaned) or inbound to an airport (deplaned). The annual passenger volume of an airport is the total of enplaned and deplaned passengers.

EPA – U.S. Environmental Protection Agency.

FAA – See FEDERAL AVIATION ADMINISTRATION

FAA ORDER – An internal FAA directive that sets standards, procedures, and guidelines for FAA execution of its various regulatory and grant administration mandates.

FAA ORDER 1050.1D – An order prepared in response to the CEQ 1500 Regulations.

FAA ORDER 5050.4A – This document, entitled "Airport Environmental Handbook," was published by the FAA on October 8, 1985. It contains all of the essential information an airport sponsor needs to meet both procedural and substantive environmental requirements, including relevant text from Order 1050.1D.

FAR – FEDERAL ACQUISITION REGULATIONS

FAR PART 77 – Federal Acquisition Regulations Part 77 – Establishes standards for identifying obstructions to aircraft in navigable airspace.

FAR PART 150 – Federal Acquisition Regulations, Part 150. Effective February 28, 1982, FAR Part 150 is the regulation that implements the noise compatibility standards and provisions contained in the Aviation Safety and Noise Abatement Act (ASNA). FAR Part 150 prescribes procedures for airport sponsors who wish to develop Noise Exposure Maps and Noise Compatibility Plans to identify and mitigate airport/land use compatibility problems.

FEDERAL AVIATION ADMINISTRATION (FAA) – The FAA is the agency of the U.S. Department of Transportation that is charged with (1) regulating air commerce to promote its safety and development; (2) achieving the efficient use of navigable airspace of the United States; (3) promoting, encouraging, and developing civil aviation; (4) developing and operating a common system of air traffic control and air navigation for both civilian and military aircraft; and (5) promoting the development of a national system of airports.

FINDING OF NO SIGNIFICANT IMPACT (FONSI) – A finding by the FAA that a proposed action by an airport sponsor will have no significant impact on the environment. Specific guidelines for the preparation of a FONSI report (see Environmental Assessment) are included in FAA Orders 1050.1D and 5050.4A.

FONSI – See FINDING OF NO SIGNIFICANT IMPACT.

GENERAL AVIATION (GA) – Operations performed by all civil aviation except that classified as air carrier or air taxi. The types of aircraft typically used in general aviation activities vary from multi-engine jet aircraft to single-engine piston aircraft.

HISTORIC PROPERTY – A property that is listed in, or eligible for, the National Register of Historic Places.

IMPACT – In environmental and noise control studies, the word "impact" is used to express the extent or severity of an environmental problem, (i.e., the number of persons exposed to a given noise environment). As indicated in CEQ 1500 (section 1508.8), impacts and effects are considered to be synonymous. Effects or impacts may be ecological, aesthetic, historic, cultural, economic, social, or health related, and they may be direct, indirect, or cumulative.

INCOMPATIBLE LAND USE – Residential, public, recreational, and certain other noise sensitive land uses that are designated as unacceptable within specific ranges of cumulative (DNL) noise exposure as set forth in FAR Part 150, Appendix A, Table 2.

LDN – See DAY-NIGHT AVERAGE SOUND LEVEL

INTENSELY DEVELOPED AREAS (IDAs) – An area of existing development and infill sites where development is concentrated and little of the natural environment remains.

LAND USE COMPATIBILITY – The compatibility of land uses surrounding an airport with airport activities and particularly with the noise from aircraft operations.

MILITARY – Operations performed by military aircraft, by groups such as the Air National Guard, the U.S. Air Force, the U.S. Marine Corps, or the U.S. Navy.

MITIGATION MEASURE – An action that can be planned or taken to reduce the severity of (mitigate) an adverse environmental impact. As set forth in CEQ 1500 (Section 1508.20), "mitigation" includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing the impact by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

A proposed airport development project, or alternatives to that project, may constitute a mitigation measure as defined by the CEQ.

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) - Regulations promulgated by the U.S. Environmental Protection Agency under the Clean Air Act for six criteria pollutants – sulfur dioxide, particulate matter, nitrogen dioxide, carbon monoxide, ozone, and lead – in order to protect the public from emissions to the atmosphere.

NATIONAL HISTORIC PRESERVATION ACT OF 1966 – This act, as amended, establishes the national historic preservation program which includes elements for identification, assistance, and production of historic properties.

NATIONAL REGISTER OF HISTORIC PLACES – The official list of the nations' cultural resources worthy of preservation.

NEPA – National Environmental Policy Act of 1969 (PL 91-190). The Federal act that requires the development of an environmental impact statement (EIS) for Federal actions that might have substantial environmental, social, or other impacts.

NOISE – Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

NOISE ABATEMENT PROCEDURES – Changes in operational procedures affecting runway use, in flight approach and departure routes and procedures, and in other air traffic procedures that are made to shift adverse aviation effects away from noise-sensitive areas (such as residential neighborhoods).

NOISE EXPOSURE CONTOURS – Lines drawn on a map connecting points of equal cumulative noise exposure (DNL) values. They are usually drawn in 5 dB intervals, such as DNL 75 dB values, DNL 70 dB values, DNL 65 dB values, and so forth.

NOISE-SENSITIVE LAND USE – Land uses that can be adversely affected by high levels of aircraft noise. Residences, schools, hospitals, religious facilities, libraries, and other similar uses are often considered to be sensitive to noise.

NON-COMPATIBLE LAND USE – See INCOMPATIBLE LAND USE.

OBSTRUCTION – An object that exceeds a limiting height or penetrates an imaginary surface described by current Federal Aviation Regulations (Part 77).

ORDER – see FAA ORDER.

REGION OF INFLUENCE – The area surrounding the location of the proposed action within which resources and impacts are evaluated.

RESOURCE MANAGEMENT AREAS (RMAs) – Those areas defined by the Chesapeake Bay Preservation Area as lands that, if improperly used or developed, have a potential for causing significant water quality degradation or for diminishing the functional value of the Resource Protection Area.

SIGNIFICANT NOISE EXPOSURE – Exposure to aircraft noise that is likely to interfere with human activity in noise-sensitive areas; individual complaints may be expected and group action is possible. This exposure may be specified by a cumulative noise descriptor as a level of noise exposure, such as the DNL 65 level.

SOUND LEVEL (NOISE LEVEL) – The weighted sound pressure level obtained by the use of a sound level meter having a standard frequency filter for attenuating or accentuating part of the sound spectrum.

STATE IMPLEMENTATION PLAN – A detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. State implementation plans are collections of the regulations used by a state to reduce air pollution. The Clean Air Act requires that EPA approve each state implementation plan, and members of the public are given opportunities to participate in review and approval of state implementation plans.

STANDARD – A specific statement by an authority of permitted environmental conditions.

SYNTHETIC MINOR – A state air quality operating permit option that sets enforceable operating limitations on a facility to keep emissions from exceeding a defined “major” threshold level.

TIDEWATER VIRGINIA – Includes the following jurisdictions: The Counties of Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King George, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland, and York, and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach, and Williamsburg.

TITLE V – An air quality operating permit program that consolidates all air pollution control requirements into a single, comprehensive operating permit that covers all aspects of an emission source's year-to-year air pollution activities.

TOWER/AIRPORT TRAFFIC CONTROL TOWER (ATCT) – A central operations facility in the terminal air traffic control system, consisting of a tower cab structure, including an associated IFR room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices, to provide safe and expeditious movement of terminal air traffic.

TRAPROCK – Dark colored diabase dikes and sills that are relatively resistant to erosion, forming topographic ridges and cliffs. Formed during the Triassic by volcanic intrusions into the overlying sedimentary rocks, these diabase dikes and sills are found along the east coast of North America from Nova Scotia to North Carolina. Traprock is often quarried and used for crushed stone.

WETLAND – Areas that are inundated by surface or ground water with a frequency sufficient to support, under normal circumstances, vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

APPENDIX B

NOISE ANALYSIS

This section provides background information on the methods used for calculating noise exposure, policies regulating airport noise issues, and current knowledge of the impacts of noise on human activity. The most recent noise analysis completed for IAD is also included.

APPENDIX B-1: NOISE ANALYSIS BACKGROUND INFORMATION

Noise analysis is a complicated process that involves quantification and interpretations of complex physical and psychological interactions. Generally, there are three major considerations when interpreting the impact of aircraft noise –environmental degradation, land use planning, and the health and welfare of a population. This appendix provides background information on methods for calculating noise exposure, policies regulating noise issues, and current knowledge of the impacts of noise on human activity.

I. NOISE EVALUATION PARAMETERS

The Decibel

The decibel (dB) is a unit used to measure the intensity of sound. It is a logarithmic unit that compares the sound pressure in air (of the source of interest) to the reference sound pressure (the quietest audible sound). Most sounds in an every day environment have sound levels that range from 30-100 dBs, but any sound above 85 dB can cause hearing loss, especially during prolonged exposure. The logarithmic nature of the decibel means that every time the sound level from either a single source or a combination of sources doubles, the sound level only increases by 3 dB. A tenfold increase in the source sound increases the exposure by 10 dB, while a hundredfold increase in the source results in an exposure increase if 20 dB. Additionally, because decibels are logarithms, the loudest source has the greatest effect on the total.

To accurately reflect the noise range heard by the human ear, filters (weighting scales) were developed to identify the relative loudness of sounds at different frequencies. A-weighting significantly de-emphasizes noise at low and high frequencies and has little effect on mid-frequency noise. This filter generally matches the ears ability to pick up sounds, and therefore, sounds with higher A-weighted sound levels (dBA) are interpreted as louder than those with lower A-weighted sound levels (HMMH 2000). Such a relationship does not always hold true for unweighted levels, and that is the primary reason why A-weighted sound levels are normally used to evaluate environmental noise.

The DNL

The Day-Night Average Sound Level (DNL) is the standard metric that has been adopted by federal and state agency regulations to describe the impacts of noise on a particular area. The DNL is the annualized 24-hour average sound level, in A-weighted decibels, obtained after adding a 10 decibel penalty to sound levels occurring between 10 PM and 7 AM. It is important to note that the DNL is a cumulative noise exposure metric, not a single event exposure metric. Variations in the weight of the aircraft, daily and seasonal weather changes, and wind can all influence the sound level of a single event. The calculation of a DNL takes into account the sound levels of all the individual sound events that occur in a 24-hour period, the number of events that occur, and the increased sensitivity to noise during sleeping.

Noise analyses are based on computer generated DNL estimates that incorporate information from noise monitoring locations in the surrounding community, the types of aircraft utilizing the airport, the number of aircraft departures and arrivals, the location of aircraft flight tracks, and runway utilization. Noise exposures are depicted as equal-exposure noise contours, and typically noise contours of 65, 70 and 75 dBA are mapped.

Aircraft operations (the number of flight departures and arrivals) and runway utilization have a significant impact on the DNL contours calculated by the Integrated Noise Model (INM). The average daily runway use at IAD (Table B-1) was modeled based on 1990 aircraft operations for the 1993 Part 150 Study (KPMG Peat Marwick 1993). Average runway use was not expected to change significantly through 1996 (KPMG Peat Marwick 1993), and the most recent noise analysis used the percentages from the 1993 Part 150 study in calculating noise contours for 1998 and 2007 (HNTB 2001). When a runway is used for a disproportionate number of departures or arrivals, the length of a given noise contour is extended. For example, the high number of departures from runways 1L and 30 results in 1998 noise contours that are both wider and extend further from the end of the runway.

TABLE B-1 AVERAGE DAILY RUNWAY UTILIZATION PERCENTAGES AT IAD (1990)

Runway	Percent Departures	Percent Arrivals
1L	30%	23%
1R	6%	34%
19L	23%	7%
19R	15%	16%
12	0%	20%
30	26%	0%

Source: 1993 IAD Part 150 Study (KPMG Peat Marwick 1993).

Use of the DNL has been criticized because it represents an average exposure level based on yearly operations. While the maximum sound level of a single event over the course of the 24-hour period strongly influences the calculated DNL for a given area, the DNL does not accurately convey the loudness of an individual flyover.

Advocates support the use of the DNL because of its correlation to potential health effects. In 1978, Schultz published a paper, "Synthesis of Social Surveys on Noise Annoyances," that showed a mathematical relationship between noise level and the percent of people highly annoyed. This was the first quantitative means by which chronic noise exposure impacts to a surrounding community could be evaluated. Schultz's 1978 study demonstrated that while an individual's response to a noise event can vary, the aggregate response of a group of people is predictable and correlates well to the DNL. This correlation between the DNL and percent highly annoyed allows for a predictive model to be used in estimating the impacts of noise exposure on a population.

II. POLICIES REGULATING NOISE LEVELS AND IMPACTS

The Federal Aviation Administration (FAA) is subject to Title 14 of the Code of Federal Regulations (CFR) Part 150, which requires noise capability planning at airports, including a comprehensive noise analyses. It recommends a single system for measuring noise at airports using a highly reliable relationship between projected noise exposure and the surveyed reaction of people to noise. This type of analysis is then used to determine the exposure of individuals in the surrounding community to noise resulting from the operations of an airport (14 CFR 150.1). Part 150 studies also assess and identify land uses around an airport to determine if they are compatible with various noise level exposures.

With the passage of the National Environmental Policy Act (NEPA) in 1969, it became a national policy to "encourage productive and enjoyable harmony between man and his environment and to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man." Each federal agency, including the FAA, has its own implementation procedures for complying with the NEPA guidelines.

It is important to note that the FAA Part 150 process and the NEPA process are separate studies that have different purposes and arise from different statutes. Part 150 studies are airport comprehensive and discuss the impact of noise and land-compatibility issues in an entirety around an airport. NEPA studies are project specific and discuss the noise impacts of a particular project.

In 1972, Congress enacted the Noise Control Act giving the Environmental Protection Agency (USEPA) the responsibility to coordinate Federal programs related to noise research and noise control. Additionally, the USEPA was directed to identify noise levels requisite to protect public health and welfare with an adequate margin of safety. As a result, the EPA published a report that recommended the adoption of a single method of describing noise impacts in a simple and uniform manner (USEPA 1974). Known as the "Levels Document," the report determined that the best metrics to describe noise exposure were the Long-Term Equivalent A-Weighted Sound Level (L_{eq}) and the Day-Night Average Sound Level (DNL). The DNL is similar to the L_{eq}, except that it incorporates a 10 dB "penalty" for nighttime noise.

In 1979, Congress passed the Aviation Safety and Noise Abatement Act, which required the adoption of a single noise descriptor and single set of standards to assess noise impacts on people. The DNL was adopted as the standard metric to be used in evaluating airport noise impacts, and a land-use compatibility table (FICUN 1980) was published in order to evaluate the environmental effect of that noise.

Congress passed the Airport Noise and Capacity Act in 1990, which required a phased elimination of Stage 2 aircraft weighing more than 75,000 pounds in the contiguous United States by December 31, 1999. This act was aimed at reducing the impact of noise from an airport on the surrounding community by requiring a transition to an entire fleet

of significantly quieter Stage 3 aircraft. Congress found that a noise policy must be carried out at the national level, but local interest in aviation noise management should be considered in determining the national interest.

There currently are three interagency committees that are relevant in setting noise abatement guidelines and promoting research into the topic of noise pollution: the Federal Interagency Committee on Urban Noise (FICUN), the Federal Interagency Committee on Noise (FICON) and the Federal Interagency Committee on Aviation Noise (FICAN). These committees' memberships include a broad range of government agencies including the FAA, the USEPA, Departments of Defense (DOD), Housing and Urban Development (HUD) and Veteran's Administration (VA), the National Aeronautic and Space Administration (NASA), the National Park Service and the Centers for Disease Control and Prevention.

FICUN was formed in 1979 to develop federal policy and guidance on noise and is primarily responsible for the designation of noise measurement metrics and acceptable noise thresholds in a variety of environments. As a result, it is critical in influencing the FAA's definition of acceptable noise pollution. FICON was formed in 1990 to review issues specifically regarding airport noise impacts. FICAN was formed in 1993 and serves as a clearinghouse for aircraft noise research and development efforts.

III. LAND USE REGULATIONS

The land use in the areas exposed to airport noise is the primary factor in evaluating the impact of the noise originating from airport sources. The level of noise that a parcel of land is subjected to and the parcel's primary function (agriculture, industrial, residential, etc.) are used to determine if the land parcel is compatible with normal airport operations.

The Aviation Safety and Noise Abatement Act of 1979 directed the FAA to establish by regulation a single system for measuring aircraft noise exposure and to identify land uses that are normally compatible with various noise exposure levels. In 1980, the FICUN developed the Federal agency land use compatibility guidelines using the DNL as the Federally accepted common descriptor of noise levels.

The FAA's Part 150 provides the recommended guidelines for noise/land use compatibility evaluations. Standard residential development is compatible for noise exposure for all sources up to DNL 65 dBA. Table B-2 shows the land uses that are compatible with designated levels of noise.

The recommended guidelines of the FAA agree with the formal noise standards adopted by HUD. HUD regulations determine acceptable exterior noise exposure for new housing construction projects assisted or supported by the Department (HUD 1991). These regulations (24 CFR Part 51) establish three zones of noise exposure: 65 DNL or less (acceptable for funding), between 65 and 75 DNL (normally acceptable for funding, but appropriate sound attenuation measures must be provided), and greater than 75 DNL (unacceptable for funding). It is important to note that the FAA's Part 150 land use

criteria are recommendations, and that Part 150 allows airports and local land use control jurisdictions to adopt land use compatibility criteria that differ from the guidelines in Table B-2.

TABLE B-2 LAND USE COMPATIBILITY WITH DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly day-night average sound level (DNL) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	YES	NO (1)	NO (1)	NO	NO	NO
Mobile home parks	YES	NO	NO	NO	NO	NO
Transient lodgings	YES	NO (1)	NO (1)	NO (1)	NO	NO
Public Use						
Schools	YES	NO (1)	NO (1)	NO	NO	NO
Hospitals	YES	25	30	NO	NO	NO
Churches, auditoriums, and concert halls	YES	25	30	NO	NO	NO
Government services	YES	YES	25	30	NO	NO
Transportation	YES	YES	YES (2)	YES (3)	YES (4)	YES (4)
Parking	YES	YES	YES (2)	YES (3)	YES (4)	NO
Commercial Use						
Offices, business and professional	YES	YES	25	30	NO	NO
Wholesale and retail-building materials, hardware and farm equipment	YES	YES	YES (2)	YES (3)	YES (4)	NO
Retail trade-general	YES	YES	25	30	NO	NO
Utilities	YES	YES	YES (2)	YES (3)	YES (4)	NO
Communications	YES	YES	25	30	NO	NO
Manufacturing and Production						
Manufacturing, general	YES	YES	YES (2)	YES (3)	YES (4)	NO
Photographic and optical	YES	YES	25	30	NO	NO
Agricultural (except livestock) and forestry	YES	YES (6)	YES (7)	YES (8)	YES (8)	YES (8)
Livestock farming and breeding	YES	YES (6)	YES (7)	NO	NO	NO
Mining and fishing, resource production and extraction	YES	YES	YES	YES	YES	YES
Recreational						
Outdoor sports arenas and spectator sports	YES	YES (5)	YES (5)	NO	NO	NO
Outdoor music shells, amphitheaters	YES	NO	NO	NO	NO	NO
Nature exhibits and zoos	YES	YES	NO	NO	NO	NO
Amusement, parks, resorts, and camps	YES	YES	YES	NO	NO	NO
Golf courses, riding stables, and water recreation	YES	YES	25	30	NO	NO

Numbers in parenthesis refer to notes; see below for notes and key.

NOTE: The designations contained in this table do not constitute a Federal determination that any use of land covered by the program 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 contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute Federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Land Use	Yearly day-night average sound level (DNL) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Key to Table						
YES	Land use and related structures compatible without restrictions.					
NO	Land use and related structures are not compatible and should be prohibited.					
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.					
25, 30, or 35	Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in to the design and construction of the structure.					
Notes for Table						
(1)	Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.					
(2)	Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.					
(3)	Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.					
(4)	Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.					
(5)	Land use compatible provided special sound reinforcement systems are installed.					
(6)	Residential buildings require an NLR 25.					
(7)	Residential buildings require an NLR 30.					
(8)	Residential buildings are not permitted.					

Source: FAA Order 1050.1D 1986.

IV. EFFECT ON POPULATION

Direct Health Effects

Hearing loss is the most direct harmful health effect of noise exposure. While the threshold of pain is 130 dBA, prolonged exposure to sound over 85 dBA can cause permanent hearing loss. Increased chronic noise exposure is suspected to be a contributing factor in stress-related health effects, such as heart disease, high blood pressure, stroke, and ulcers, but no definitive relationship has been quantified (USEPA 1982).

Indirect Effects

Annoyance

The effects of aircraft noise have typically been evaluated in terms of annoyance–the response of a community to chronic and acute noise exposure. The intrusiveness of noise on human activity has been an important social evaluative tool in determining the impact

of noise on people. Parameters such as sleep disturbance, speech interference, and interference with outdoor activities have all been incorporated into social surveys designed to evaluate the exposure of a community to noise.

In 1978, Schultz published a paper in which he reviewed social surveys concerning noise exposure. He developed an equation which described the relationship between the percent of people that were highly annoyed (%HA) by a noise exposure and the DNL level of the noise event. This relationship was validated in subsequent studies (Fidell 1989) and is still considered the most appropriate means to assess a community's response to noise exposure (FICON 1992).

Sleep Disturbance

Another indirect effect of airport noise on a community is sleep disturbance. Several recent studies (Fidell et al 1995, Pearsons et al 1995) have focused on the sleep disturbance caused by airport noise by evaluating the number of "awakenings" in communities near airports. These studies indicate that a cumulative measure of noise, such as the DNL, is an inadequate predictor of noise-induced sleep disturbances because it was the sound level produced by a single event that usually woke people up (Fidell 1995). Based on the results of multiple studies, FICAN has developed a dose-response curve to predict the percent of the exposed population expected to be awakened (% awakening) as a function of the exposure to single noise event levels, expressed as sound exposure levels (SEL) (FICAN 1997).

V. References

Department of Transportation (DOT), Federal Aviation Administration (FAA). 1986. *Environmental Impacts: Policies and Procedures.* Order 1050.1D.

Evans, G.W., M. Bullinger, and S. Hygge. 1998. Chronic noise exposure and physiological response: A prospective, longitudinal study of children under environmental stress. *Psychological Science* 9:75-77.

Evans, G.W., and L. Maxwell. 1997. Chronic noise exposure and reading deficits: The mediating effects of language acquisition. *Environment and Behavior* 29:710-728.

Federal Interagency Committee on Aviation Noise (FICAN). 1997. *Effects of Aviation Noise on Awakenings from Sleep*. Downloaded File 1 August 2001. (www.fican.org).

Federal Interagency Committee on Noise (FICON). 1992. *Federal Agency Review of Selected Airport Noise Analysis Issues*. Ft. Walton Beach, FL: Spectrum Sciences and Software, Inc.

Federal Interagency Committee on Urban Noise (FICUN). 1980. *Guidelines for Considering Noise in Land Use Planning and Control*. (U.S. Government Printing Office Report #1981-337-066/8071) Washington D.C.

Fidell S., D. Barber, and T. Schultz. 1989. *Updating a Doseage-Effect Relationship for the Prevalence of Annoyance Due to General transportation Noise.* HSD-TR-89-09. Wright-Patterson AFB, Ohio: U.S. Air Force, Noise and Sonic Boom Impact Technology.

Fidell, S., K. Pearsons, R. Howe, B. Tabachnick, L. Silvati, and D.S. Barber. 1995. Field study of noise-induced sleep disturbance. *Journal of the Acoustical Society of America* 98(2): 1025-1033.

Harris, Miller, Miller, and Hanson, Inc. (HMMH) 2000. *Noise Analysis for BWI Assessment*. Prepared for the Maryland Aviation Administration. May 2000.

HNTB Corporation. 2001. *Aircraft Noise Study for Washington Dulles International Airport.* Prepared for Metropolitan Washington Airports Authority, Washington National Airport, Washington, D.C. Draft. July.

KPMG Peat Marwick Airport Consulting Services. 1993. *FAR Part 150 Noise Compatibility Program, Washington Dulles International Airport*. Prepared for Metropolitan Washington Airports Authority. March.

Pearsons, K.S., D.S. Barber, B.G. Tabachnick, and S. Fidell. 1995. Predicting noise-induced sleep disturbance. Journal of the Acoustical Society of America 97(1): 331-338.

Schultz, T.J. 1978. Synthesis of social surveys on noise annoyance. *Journal of the Acoustical Society of America* 64(2): 377-405.

U.S. Department of Housing and Urban Development (HUD). Office of Environment and Energy. 1991. *The Noise Guidebook*. HUD-953-CPD(1). Washington D.C.

U.S. Environmental Protection Agency (USEPA). Office of Noise Abatement and Control. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* EPA Report #550/9-74-004. Washington D.C.

U.S. Environmental Protection Agency (USEPA). 1982. *Guidelines for Noise Impact Analysis*. EPA-550/8-82-410. Washington D.C.

APPENDIX B-2

AIRCRAFT NOISE STUDY FOR WASHINGTON-DULLES INTERNATIONAL AIRPORT

Prepared by HNTB, Draft Report July 2001
Prepared for the Metropolitan Washington Airports Authority

AIRCRAFT NOISE STUDY FOR WASHINGTON-DULLES INTERNATIONAL AIRPORT

In support of the Environmental Assessment (EA) for the Tier 2 at Washington-Dulles International Airport (IAD), an aircraft noise study was conducted of existing (1998) aircraft operations and forecast (2007) aircraft operations. This document summarizes the data upon which the estimates of aircraft noise exposure are based in two primary sections, Section 1.1, Existing Noise Environment and Section 1.2, Forecast Noise Environment.

1.1 EXISTING NOISE ENVIRONMENT

This section is distributed into the following four subsections:

- Airport Layout
- Flight Operations
- Runway and Flight Track Utilization
- Flight Profiles and Performance Data

Environmental analyses of subsonic aircraft noise exposures and compatible land uses around civilian airports can be accomplished using a computer-based program, the Integrated Noise Model (INM), which is distributed via the FAA. Version 6.0a was the version used for this Aircraft Noise Study.

The INM program incorporates the number of daily daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) events, flight paths, and profiles of the aircraft to calculate the overall daily sound level (DNL) at many points on the ground around an airport. From a grid of points, contours of equal daily sound level are drawn by an INM program for overlay onto land-use maps. As a minimum for most studies, DNL contours of 65, 70, and 75 dB are developed. The INM can calculate daily sound levels at any specified point so that noise exposure at representative locations around an airport can be obtained.

The results of the INM analysis provide a relative measure of noise level around airfield facilities. When the calculations are made in a consistent manner, the INM is most accurate for comparing before-and-after noise effects resulting from forecast changes or alternative noise control actions. It allows noise predictions for such proposed actions without the actual implementation and noise monitoring of those actions.

Airport Layout

This section presents the location, length, and orientation of all runways.

The airport is located in Loudoun and Fairfax Counties, Virginia, and has three paved operational runways: 1R-19L, 1L-19R, and 12-30. Runways 1R-19L and 1L-19R are parallel north-south oriented runways with lengths of 11,500 feet. Runway 12-30 is a northwest-southeast oriented crosswind runway of 10,500 feet in length.

The airport elevation is 313 feet above Mean Sea Level. The current magnetic declination (the difference between magnetic north and

true geographic north) is 9-degrees west as of December 2000.[i] Air Traffic Control (ATC) and pilots use magnetic headings to direct and fly aircraft.

The terrain in the vicinity of IAD is generally flat and does not affect flight operations.

Weather and Climate

Weather has a significant impact on noise exposure and propagation. Runway use and the operational characteristics of aircraft are heavily influenced by weather. The following three subsections detail modeled weather conditions and their impacts on aircraft operations.

Temperature

Temperature is an important factor in aircraft performance. High temperatures increase takeoff distance and reduce climb performance, and generally result in increased noise exposure. An annual average daily temperature of 57.9°F was used in the noise model; this value is standard atmospheric temperature, adjusted for airport elevation.

Humidity

Humidity does not have a significant impact on aircraft performance. In conjunction with temperature, however, it does impact the propagation of noise through the air. In general, sound travels farther in more humid conditions. Humidity is highest at night, and gradually drops during the day. It is generally at its lowest point in the afternoon. An annual average daily humidity of 70% was used in INM.

Wind

Wind speed and direction primarily determine runway selection and operational flow.

Aircraft generally takeoff and land into the wind (known as a headwind) when possible. Headwinds reduce an aircraft's takeoff and landing distance, and increase climb rate. Aircraft can operate with considerable crosswinds (a wind blowing at the side of the aircraft) of up to about 20 knots for a typical air carrier aircraft. Aircraft can operate with limited tailwinds (a wind blowing on the rear of the aircraft) up to 10 knots for a typical air carrier aircraft. Tailwinds increase takeoff and landing distance. Winds in excess of crosswind and tailwind limits generally force aircraft to use a different runway. The winds at IAD are generally out of the north or south, and favor operations on the existing runways, which are aligned accordingly[ii].

Flight Operations

Flight operations are the numbers of departures and arrivals conducted by each type of aircraft. Although the noise environment around IAD derives almost entirely from operations of jet aircraft, both the 1998 and 2007 contours reflect the noise from many types of aircraft.

Table 1 presents the total annual operations for 1998 and 2007. The 1998 flight operations represent actual (historical) operations, while the 2007 flight operations represent forecast operations. Historical and forecast flight operations were developed by HNTB as a separate task order and are summarized in the "Washington Dulles International Airport Aviation Activity Forecasts" document. Official Airline Guide (OAG) data was used to determine

the stage length of air carrier and regional aircraft.

INM uses annual average daily operations to compute existing and forecast noise. Annual average daily operations are representative of all aircraft operations that occur over the course of a year. The total annual operations are divided by 365 days to determine the annual average daily operations. Runway and flight track use is also averaged over one year. INM flight operations inputs are described by aircraft type (fleet mix), by operation type (arrival or departure, or touch-and-go), and by time of day (day/night).

Table 2 shows the 1998 average daily flight operations. In 1998, (CFR Part 36) Stage 1 and 2 aircraft conducted approximately 17% of total operations (see Table 2). General Aviation, military, regional turboprop, regional jet, narrow-body jet, and widebody jet aircraft conducted 17%, 2%, 42%, 6%, 26%, and 7% of total operations, respectively.

The period between 1998 and 2007 is expected to bring a number of significant changes to IAD's aircraft fleet mix. These changes will be the result of the following factors:

- Air carrier operations are forecast to grow by 244,124 annual operations, an increase of approximately 79%.
- The pursuit of younger, quieter fleets by the nation's carriers. Airbus A319s, newer B-737s, and increased usage of large regional jets on domestic routes will significantly change the passenger carrier fleet as older, noisier aircraft are retired or sold.
- Regional carriers will continue the shift toward large fleets of regional jets. Regional jets are expected to account for more than 73% of the regional operations at IAD by 2007.

Table 3 shows the 2007 average daily flight operations. In 2007, Stage 3 hushkit aircraft are forecast to conduct approximately 2% of total operations. General Aviation, military, regional turboprop, regional jet, narrow-body jet, and widebody jet aircraft are forecast to conduct 12%, 1%, 14%, 37%, 28%, and 8% of total operations, respectively.

Table 1

Annual Operations and Fleet Mix

FORECAST ANNUAL OPERATIONS AND FLEET MIX FOR 1998 AND 2007

WASHINGTON DULLES INTERNATIONAL AIRPORT

Category	Aircraft Type	**INM Aircraft Type**	**1998**	**2007**
General Aviation	Single-Engine Piston	GASEPF	1,896	1,900
	Twin Engine Piston	BEC58P	6,554	6,500
	Turboprop	CNA441	8,358	8,200
	Business Jet	LEAR35	14,206	17,513
		LEAR25	8,711	10,738
		GIV	4,704	5,799
		CL600	4,240	5,225
		MU3001	4,240	5,225
		GIIB	2,842	3,503
		IA1125	2,843	3,503
		CIT3	2,050	2,526
		CNA500	1,818	2,239
		CL601	932	1,148
Military Aircraft	Turboprop	C130E	1,550	1,705
		DHC6	1,270	1,395
	Jet	L1011	2,306	2,550
		A310	1,384	1,530
		KC135R	922	1,020
Regional Turboprop	AT43 (ATR)	DHC8	7,034	1,162
	B190	DHC6	10,494	27,380
	BE20	-	710	0
	D328	DHC8	1,419	5,163
	DH8B	DHC8	1,742	5,938
	EMB2	-	66	0
	JS31	-	62,584	0
	JS41	SF340	73,679	45,193
	SF34	SF340	1,742	1,291
	Cessna	DHC6	944	60
	Ayres Loadmaster	SD330	0	520
Regional Jet	CARJ	CL601	22,973	130,788
	E135	CL600	0	3,356
	E145	EMB145	0	22,719
	FRJ3	EMB145	0	37,009
	FRJ4	EMB145	0	39,798
	CRJ7	CL601	0	1,820
Narrow-Body Jet	F100	F10065	2,284	657
	A319	A320	457	31,933
	A320	A320	10,061	43,758
	A321	-	0	0
	B717-200	F10062	0	10,967
	B727	727EM2	2,342	1,412
	B737-300	7373B2	6,717	9,007
	B737-400	-	784	0

Category	Aircraft Type	**INM Aircraft Type**	**1998**	**2007**
Narrow-Body Jet	B757-200	757RR	17,476	29,903
	B737-500	737500	3,132	2,366
	B737-700	-	849	0
	B737-800	737400	0	21,224
	B727-200	727EM2	9,630	3,592
	B737-700	737400	0	2,989
	B737-700	737N17	262	6,693
	B737-200	737N17	13,698	2,651
	DC9-32	DC93LW	24,662	9,072
	DC9	-	197	0
	MD80	MD81	4,916	5,312
	Fokker 28	-	0	0
	Concorde	-	0	0
	DC-8-50	-	27	0
	DC-8-62	-	19	0
	DC-8-63	DC8QN	939	707
	DC-8-71	-	3	0
	DC-8-73	-	4	0
Wide-Body Jet	B767	767300	3,344	263
	B767-200	767CF6	0	4,286
	B767-300	767300	4,608	10,288
	B767-400	767300	0	273
	B777-200	777200	8,775	18,014
	B777-300	777200	0	273
	B747 Combi	74720A	0	396
	B747	74710Q	2,149	78
	B747-200	74720B	1	488
	B747-300	74720B	73	0
	B747-400	747400	2,904	5,434
	DC10	DC1030	3,412	1,055
	MD11	MD11GE	12	832
	A300	-	0	0
	A300-600	A300	244	1,248
	A310	A310	1,582	2,657
	A330	A310	0	438
	A330-200	A310	0	1,040
	A330-300	-	0	0
	A340	DC870	808	862
	A340-200	-	0	0
	A340-300	DC870	0	1,504
	A380	-	0	0
Total			380,584	636,088

Note: 1998 figures from Table 74 of HNTB forecast ; 2007 figures are interpolated, provided via email (June 13, 2001) by Charlie Baummer.

HNTB. 2000. Washington Dulles International Airport Aviation Activity Forecasts, Prepared for MWAA.

Table 2

DULLES INTERNATIONAL AIRPORT

1998 Annual Average Daily Flight Operations

		Departures			Arrivals			DEP & ARR
Aircraft	**INM Type**	**Total Day**	**Total Night**	**Total**	**Total Day**	**Total Night**	**Total**	**Total**
KC-135 (1)	707QN	1.3	-	1.3	0.6	0.6	1.3	2.5
B777-200	777200	11.2	0.8	12.0	12.0	-	12.0	24.0
B727-200 (2)	727Q15	12.4	0.8	13.2	10.8	2.4	13.2	26.4
B727 (2)	727Q7	3.2	-	3.2	3.2	-	3.2	6.4
B737-300	7373B2	8.3	0.9	9.2	8.3	0.9	9.2	18.4
B737-400	737400	1.1	-	1.1	1.1	-	1.1	2.1
B737-500	737500	4.1	0.2	4.3	4.1	0.2	4.3	8.6
B737-200 Combi (2)	737QN	18.9	1.4	20.3	18.9	1.4	20.3	40.6
B747 (all)	74710Q	2.9	-	2.9	2.9	-	2.9	5.9
B747-200	74720A	0.0	-	0.0	0.0	-	0.0	0.0
B747-300	74720B	0.1	-	0.1	0.1	-	0.1	0.2
B747-400	747400	4.0	-	4.0	4.0	-	4.0	8.0
B757-200	757RR	22.5	1.5	23.9	12.7	11.3	23.9	47.9
B767-300	767300	6.3	-	6.3	6.3	-	6.3	12.6
B767-300	767CF6	4.6	-	4.6	2.3	2.3	4.6	9.2
A300	A300	0.3	-	0.3	0.2	0.2	0.3	0.7
A310	A310	4.1	-	4.1	3.0	1.1	4.1	8.1
A320	A320	14.4	0.0	14.4	11.8	2.6	14.4	28.8
Twin Piston	BEC58P	6.0	3.0	9.0	7.9	1.1	9.0	18.0
C-130 HP	C130	2.1	-	2.1	2.1	-	2.1	4.2
Citation 3 Jet	CIT3	2.8	-	2.8	2.8	-	2.8	5.6
GA Jet	CL600	5.8	-	5.8	4.5	1.3	5.8	11.6
Canadair RJ	CL601	31.0	1.8	32.7	31.5	1.3	32.7	65.5
Twin Turboprop	CNA441	25.9	1.2	27.1	25.0	2.1	27.1	54.2
GA Jet	CNA500	2.5	-	2.5	2.5	-	2.5	5.0
DC-10-30	DC1030	4.7	-	4.7	4.7	-	4.7	9.3
DC-8-70	DC870	1.1	0.0	1.1	0.6	0.6	1.1	2.2
DC-8-63 (2)	DC8QN	0.7	0.7	1.4	1.3	-	1.3	2.7
DC-9 (all) (2)	DC9Q7	0.2	0.1	0.3	0.2	0.0	0.3	0.5
DC-9-32 (2)	DC9Q9	27.0	6.8	33.8	29.4	4.4	33.8	67.6
Dash-6	DHC6	86.7	1.8	88.4	84.9	3.5	88.4	176.9
Dash-8	DHC8	13.5	0.5	14.0	13.5	0.5	14.0	27.9
Embraer 120	EMB121	0.1	0.0	0.1	0.1	0.0	0.1	0.2
Fokker 100	F10065	3.1	-	3.1	3.1	-	3.1	6.3
Single-Engine	GASEPF	2.6	-	2.6	1.9	0.6	2.6	5.2
Gulfstream II GA Jet (2)	GIIB	3.6	0.3	3.9	3.0	0.9	3.9	7.8
Gulfstream IV GA Jet	GIV	5.3	1.2	6.4	5.7	0.7	6.4	12.9
Israel Astra 1125	IA1125	3.6	0.3	3.9	3.5	0.4	3.9	7.8
L-1011	L1011	1.6	1.6	3.2	2.4	0.8	3.2	6.3
Lear 25 (2)	LEAR25	11.6	0.4	11.9	10.7	1.2	11.9	23.9
Lear 35	LEAR35	18.1	1.4	19.5	18.5	1.0	19.5	38.9
MD-11	MD11GE	0.0	-	0.0	0.0	-	0.0	0.0
MD-80	MD81	6.1	0.6	6.7	5.5	1.2	6.7	13.5
GA Jet	MU3001	5.2	0.6	5.8	5.5	0.4	5.8	11.6
Saab 340	SF340	95.2	8.1	103.3	100.3	3.0	103.3	206.6
Total Daily Operations		**485.6**	**35.7**	**521.4**	**473.5**	**47.8**	**521.3**	**1,042.7**

Note: 1 = Stage 1 aircraft, 2 = Stage 2 aircraft

Note: Difference may exist due to rounding

Source: HNTB Analysis, 1998

Table 3

DULLES INTERNATIONAL AIRPORT

2007 Annual Average Daily Flight Operations

		Departures			Arrivals			DEP & ARR
Aircraft	**INM Type**	**Total Day**	**Total Night**	**Total**	**Total Day**	**Total Night**	**Total**	**Total**
B737-400	737400	33.2	-	33.2	33.2	-	33.2	66.3
B737-500	737500	3.1	0.1	3.2	3.1	0.1	3.2	6.5
B747-400	747400	7.4	-	7.4	7.4	-	7.4	14.9
B767-300	767300	14.8	-	14.8	14.6	0.2	14.8	29.7
B777-200	777200	23.4	1.6	25.1	25.1	-	25.1	50.1
B727-200	727EM2	6.6	0.3	6.9	6.0	0.9	6.9	13.7
B737-300	737IB2	11.1	1.2	12.3	11.1	1.2	12.3	24.7
B737-200	737N17	12.0	0.8	12.8	12.1	0.7	12.8	25.6
B747 (all)	74710Q	0.1	-	0.1	0.1	-	0.1	0.2
B747 combi	74720A	0.5	-	0.5	0.5	-	0.5	1.1
B747-200	74720B	0.7	-	0.7	0.7	-	0.7	1.3
B757-200	757RR	38.4	2.5	41.0	21.7	19.3	41.0	81.9
B767-200	767CF6	5.9	-	5.9	2.9	2.9	5.9	11.7
A300-600	A300	1.7	-	1.7	0.9	0.9	1.7	3.4
A310	A310	7.8	-	7.8	5.9	1.8	7.8	15.5
A320	A320	100.4	3.3	103.7	82.8	20.9	103.7	207.4
Twin Piston	BEC58P	6.0	2.9	8.9	7.8	1.1	8.9	17.8
C-130	C130E	2.3	-	2.3	2.3	-	2.3	4.7
GA Jet	CIT3	3.5	-	3.5	3.5	-	3.5	6.9
GA Jet	CL600	11.5	0.3	11.8	10.0	1.7	11.8	23.5
Canadair RJ	CL601	173.1	10.1	183.2	177.4	5.8	183.2	366.5
Twin Turboprop	CNA441	10.7	0.6	11.2	9.9	1.3	11.2	22.5
GA Jet	CNA500	3.1	-	3.1	3.1	-	3.1	6.1
DC-10-30	DC1030	1.4	-	1.4	1.4	-	1.4	2.9
DC-8-70	DC870	3.2	-	3.2	2.7	0.6	3.2	6.5
DC8-63	DC8QN	0.0	1.0	1.0	-	1.0	1.0	1.9
DC9-32/40F	DC93LW	9.9	2.5	12.4	10.8	1.6	12.4	24.9
Beech 1900	DHC6	38.0	1.5	39.5	38.0	1.5	39.5	79.0
Dornier 328	DHC8	15.2	1.6	16.8	15.2	1.6	16.8	33.6
Embraer RJ	EMB145	128.7	7.6	136.3	132.2	4.1	136.3	272.7
B717-200	F10062	15.0	-	15.0	15.0	-	15.0	30.0
Fokker 100	F10065	0.9	-	0.9	0.9	-	0.9	1.8
Single-Engine	GASEPF	2.6	-	2.6	2.0	0.6	2.6	5.2
Gulfstream II Jet (2)	GIIB	4.4	0.4	4.8	3.7	1.1	4.8	9.6
Gulfstream IV Jet	GIV	6.5	1.4	7.9	7.1	0.9	7.9	15.9
Israel Astra 1125	IA1125	4.5	0.3	4.8	4.4	0.4	4.8	9.6
KC-135	KC135R	1.4	-	1.4	0.7	0.7	1.4	2.8
L-1011	L1011	1.7	1.7	3.5	2.6	0.9	3.5	7.0
Lear 25 (2)	LEAR25	14.3	0.4	14.7	13.2	1.5	14.7	29.4
Lear 35	LEAR35	22.3	1.7	24.0	22.8	1.2	24.0	48.0
MD-11	MD11GE	1.1	-	1.1	1.1	-	1.1	2.3
MD-80	MD81	6.6	0.7	7.3	6.0	1.3	7.3	14.6
GA Jet	MU3001	6.4	0.8	7.2	6.7	0.4	7.2	14.3
Ayres Loadmaster	SD330	0.7	0.0	0.7	0.7	0.0	0.7	1.4
Saab 340	SF340	58.7	5.0	63.7	61.8	1.9	63.7	127.4
Total Daily Operations		**820.9**	**50.4**	**871.4**	**791.2**	**80.2**	**871.4**	**1,742.8**

Note: 1 = Stage 1 aircraft, 2 = Stage 2 aircraft

Note: Difference may exist due to rounding

Source: 2007 Forecast, C. Baummer MWAA; provided via email (June 13, 2001)

RUNWAY AND FLIGHT TRACK UTILIZATION

Runway Utilization

Runway use is determined by several factors including safety, wind, weather, traffic demand, runway capacity, direction of flight, runway length requirements, and prescribed runway use procedures. ATC assigns runway use with consideration to all of these factors. Description of typical IAD runway use configurations (i.e., north, mixed, etc.)

As with aircraft flight operations, the INM runway use input is average daily runway use based on an entire year of operations. Runway use is the proportion of aircraft that use a runway for departure or arrival, expressed as a percent.

Table 4 shows modeled average annual runway use for 1998 and 2007. Modeled average runway use was taken directly from the 1993 IAD Part 150 Study.[iii] Table 4 shows average runway use, by arrival and departure, for daytime and nighttime periods. Daytime and nighttime runway use is equivalent.

Table 4

Runway Utilization Percentages

Annual Average Daily Runway Use
1998 & 2007

Runway	Percent Departures	Percent Arrivals
1L	30%	23%
1R	6%	34%
19L	23%	7%
19R	15%	16%
12	0%	20%
30	26%	0%

Source: 1993 IAD Part 150 Study

Flight Track Layout and Use

Flight tracks depict the paths, or ground tracks, that aircraft use as they travel to and from the airport.

Table 5 presents flight track utilization the existing conditions for 1998 and forecast 2007 cases. Flight track layout was taken directly from the 1993 IAD Part 150 Study.[iii] As with flight operations and runway use, modeled flight track use is based on an average annual basis. Nighttime flight track use is equal to daytime flight track use. Flight track use was taken directly from the 1993 IAD Part 150 Study.[iii]

INM uses flight tracks to model actual departure flight tracks. Since aircraft fly through a moving air mass, a given heading will result in different paths over the ground under different wind conditions. Weather, traffic levels, pilot technique, and differing aircraft performance capabilities make an infinite number of ground tracks possible. ATC does not currently have the ability to direct aircraft along a highway corridor or other specific points on the ground. Deviation from typical flight tracks will occur due to safety requirements, emergencies, weather, traffic demands, capacity needs, and aircraft performance.

The modeled flight tracks represent are core, or backbone tracks, and represent average track for a specific heading. The dispersion of aircraft about the average actual flight track resulting from the above factors is not modeled.

Arriving aircraft are assigned to straight-in flight tracks based on typical ATC procedures. Most jet arriving aircraft are turned onto final approach at a point

beyond the 60 dB DNL contour. At this distance from the airport, arriving aircraft do not affect the calculation of the 60 dB DNL noise contour.

The annual average daily number of aircraft modeled on any given flight track can be derived by multiplying the average daily flight operations by the runway use percentages, and then by the flight track use percentages. Note that this is representative of an average annual day only; in reality, the actual number of operations that use a specific flight track can vary significantly due to wind, runway configuration, and other operational factors.

Table 5
Annual Flight Track Use
1998 & 2007

Flight Track	Percent Departures	Flight Track	Percent Arrivals
D1L1	15%	A1L1	23%
D1L2	12%	A1R1	16%
D1L3	3%	A1R2	10%
D1R1	4%	A1R3	8%
D1R2	2%	A9L1	4%
D301	5%	A9L2	3%
D302	5%	A9R1	16%
D303	1%	A121	20%
D304	1%		
D305	9%		
D306	5%		
D9L1	9%		
D9L2	11%		
D9L3	3%		
D9R1	6%		
D9R2	7%		
D9R3	2%		
Total	100%		100%

Source: 1993 IAD Part 150 Study.

Flight Profiles and Performance Data

INM contains reference noise and performance data on nearly all aircraft types that operate at IAD, including hushkit aircraft. Aircraft manufacturers such as Boeing and Airbus provide the data to the FAA. The data are used to model aircraft departure and arrival flight profiles, and resultant noise exposure. Aircraft that are not specifically included in the database are modeled using appropriate substitution aircraft per the FAA's pre-approved substitution list.

Flight profiles model the vertical paths of aircraft during departure and arrival to determine the altitude, speed, and engine thrust of an aircraft at any point along a flight track. INM uses this information to calculate noise exposure on the ground. Profiles are unique to each aircraft type and are based on airline operation procedures, temperature, and aircraft operation weight. Detailed information on aircraft flight profiles under varying conditions is stored in the INM aircraft database.

The INM aircraft database contains departure flight profiles for each aircraft type, grouped by stage length. Stage length refers to the length of the trip (to be made) by the aircraft type. INM assumes that aircraft weight increases with stage, or trip length, due to the need for more fuel, and that each aircraft type's takeoff distance and climb performance is different for each stage length. Heavy (long trip, high stage length) aircraft have increased takeoff distances and lower climb rates than lighter (short trip) aircraft, for a given aircraft type.

Stage lengths are indexed according to the range of trip length, as shown in **Table 6**. For example, if an aircraft is departing for a trip less than 500 nautical miles (NM) long, it is assigned a stage length of 1; if the trip length is between 500 NM and 1,000 NM, it is assigned a stage length of 2, and so on.

Table 6

DULLES INTERNATIONAL AIRPORT

Stage Length Definition

Stage Length	Trip Distance
1	0 to 500 NM
2	500 to 1,000 NM
3	1,000 to 1,500 NM
4	1,500 to 2,500 NM
5	2,500 NM to 3,500 NM
6	3,500 NM to 4,500 NM
7	over 4,500 NM

Source: INM 6.0 User's Guide

Arriving aircraft do not use stage lengths as these aircraft consume most of their fuel during the flight, and land at typical landing weights. INM has a database of standard arrival flight profiles for each INM aircraft type. Arriving aircraft were modeled using a standard 3-degree approach path.

The climb rate and flight profile of departing aircraft varies considerably. New modern aircraft have higher thrust engines and improved wing designs compared to older aircraft, which results in a superior climb rate. Modern jet engines are also much quieter than their predecessors even though they can produce more thrust. Temperature, takeoff weight and airline operation procedures are also important factors that affect climb rate.

As temperature increases, air density decreases. This reduces engine thrust, which results in increased takeoff distance and lower climb rate. Because departing aircraft are at a lower altitude, noise exposure generally increase. Conversely, noise exposure is decreased on cold days when aircraft have improved performance capabilities.

Pilots use their respective airline's operating procedures to maneuver an aircraft during takeoff. The procedures are unique to each aircraft type. Airlines develop their own procedures with aircraft manufacturer and FAA approval. As a result, operating procedures among most airlines are essentially similar. Standard INM departure profiles were used in this study. Standard INM departure profiles approximate Distant Noise Abatement Departure Profile (NADP) procedures.

Noise Exposure for Existing (1998) Aircraft Operations

Using the data described in Sections 1.1.1 through 1.1.4, INM V6.0a was used to calculate and plot the 65 dB through 75 dB Day-Night Average Sound Level (DNL) contours for the average daily operations. The DNL contours are shown in **Figure 1**.

The 1998 DNL contours are significantly affected by aircraft operations to the north, south, and west of the airport. For example, the 60 DNL contour extends approximately 2.5 miles off the departure end of Runway 1L. The contour width at this location is near one mile wide, a result of significant departures from Runway 1L. Arrivals to Runway 19R add to the size of this contour also. Off the departure end of Runways 19R and 30, the contours have a width of one mile or more. Again, the size is directly related to the high number of departures from these two runways. Arrivals to Runways 12, 1L, and 1R increase the distance that the contours extend from the approach end of each respective runway.

Contours surrounding Runway 1R-19L are influenced by a large number of arrivals to both ends of the runway. The width of the contours is approximately one half mile wide.

Table 7 shows the impacts of existing aircraft operations at IAD in terms of land area, in acres, within the 65, 70, and 75 dB contours. The overall acreage contained within the 65 DNL contour is 9,197 acres.

Table 7

DULLES INTERNATIONAL AIRPORT

1998 & 2007 Land Impact (in Acres)

Year	Acreage (inside 65 DNL contour)
1998	9,197
2007	6,367

Source: HNTB Analysis

1.2 FORECAST (2007) NOISE ENVIRONMENT

Development of estimates of noise exposure of forecast operations requires compilation of the same data categories described in Section 1.1 for the existing (1998) case. However, for this study, the only variable for forecast (2007) operations that differs from the existing (1998) conditions are the flight operations and fleet mix, which is described in Section 1.2.1.

2007 Flight Operations

Table 2 shows modeled average annual runway use for 1998 and 2007. Modeled average runway use was taken directly from the 1993 IAD Part 150 Study[iii]. **Table 3** shows average runway use, by arrival and departure, for daytime and nighttime periods. Daytime and nighttime runway use is equivalent.

In the 2007 forecast, there is a significant amount of stage three aircraft used in the model. Table 3 presents the annual average daily aircraft operations for 2007. The Gulfstream II B (General Aviation Jet) and Lear 25 Jet are the only Stage Two aircraft that remain in the 2007 model. The decreased use of stage two aircraft significantly changes the fleet mix at IAD. The overall effect of stage three aircraft in INM can be seen in the decreased size of the 65–75 DNL contours. The annual aircraft operations are forecasted to increase to approximately 636,108 in 2007.

Noise Exposure for Forecast (2007) Aircraft Operations

Using the data described in Sections 1.1.1 through 1.1.5, and 1.2.1, INM v6.0a was used to calculate and plot the 65 dB through 75 dB Day-Night Average Sound Level (DNL) contours for the annual average daily operations. The DNL contours are shown in **Figure 2**.

An increased number of aircraft are forecast to use IAD in 2007, surpassing the 380,054 annual aircraft operations in 1998. However, the 2007 DNL contours are smaller than the 1998 contours. The decreased size of the contours is directly related to the reduction of Stage Two aircraft and increased number of stage three aircraft that make up the 2007 fleet mix. The newer, Stage Three aircraft are quieter than their Stage Two predecessors, which affects the total noise impact of aircraft operations at IAD. However, the shape of the 1998 and 2007 contours are similar, as seen in **Figure 3**.

Table 7 shows the impacts of forecast aircraft operations at IAD in terms of land area, in acres, within the 65, 70, and 75 dB contours. The overall acreage contained within the 65 DNL contour is 6,367 acres.

Figures 1-3 present the contour graphics for existing year 1998, forecast year 2007, and a combination of both years, respectively.

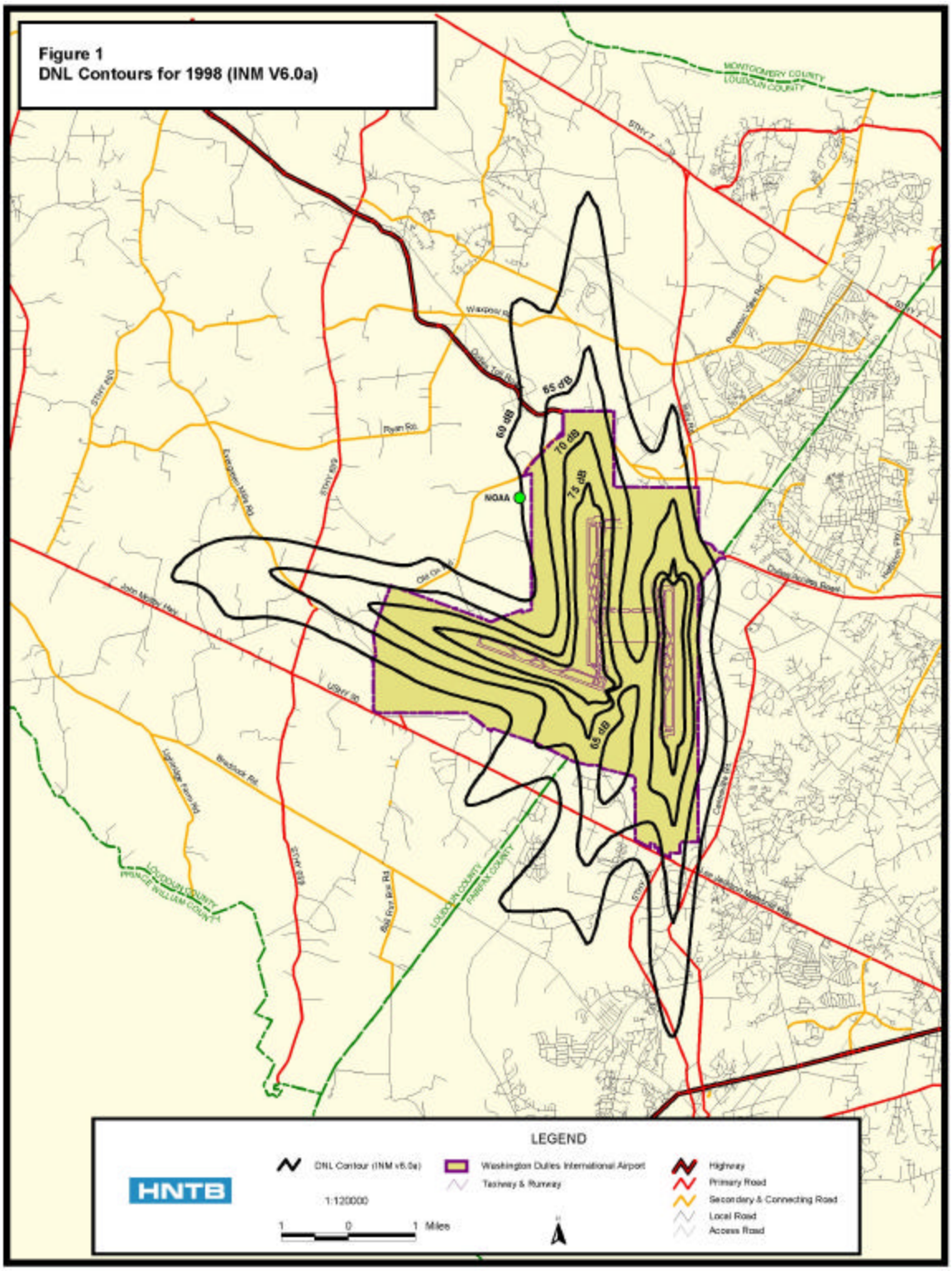


Figure 1
DNL Contours for 1998 (INM V6.0a)
65 dB
69 dB
70 dB
75 dB
NOAA
LEGEND
DNL Contour (INM v6.0a)
Washington Dulles International Airport
Taxiway & Runway
Highway
Primary Road
Secondary & Connecting Road
Local Road
Access Road
HNTB
1:120000
1 0 1 Miles

Figure 1

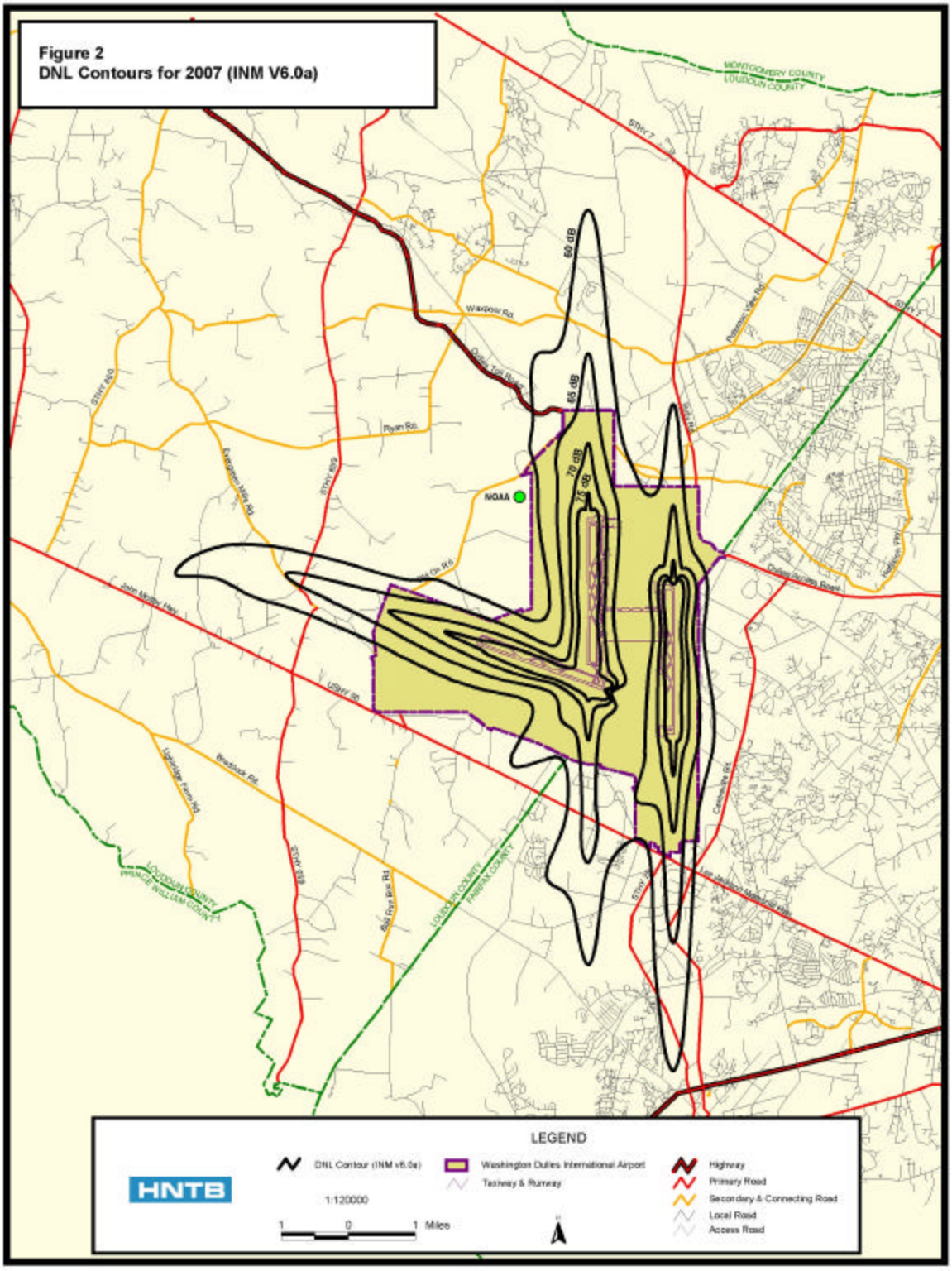


Figure 2
DNL Contours for 2007 (INM V6.0a)
60 dB
65 dB
70 dB
75 dB
NOAA
LEGEND
DNL Contour (INM v6.0a)
Washington Dulles International Airport
Taxiway & Runway
Highway
Primary Road
Secondary & Connecting Road
Local Road
Access Road
HNTB
1:120000
1 0 1 Miles

Figure 2

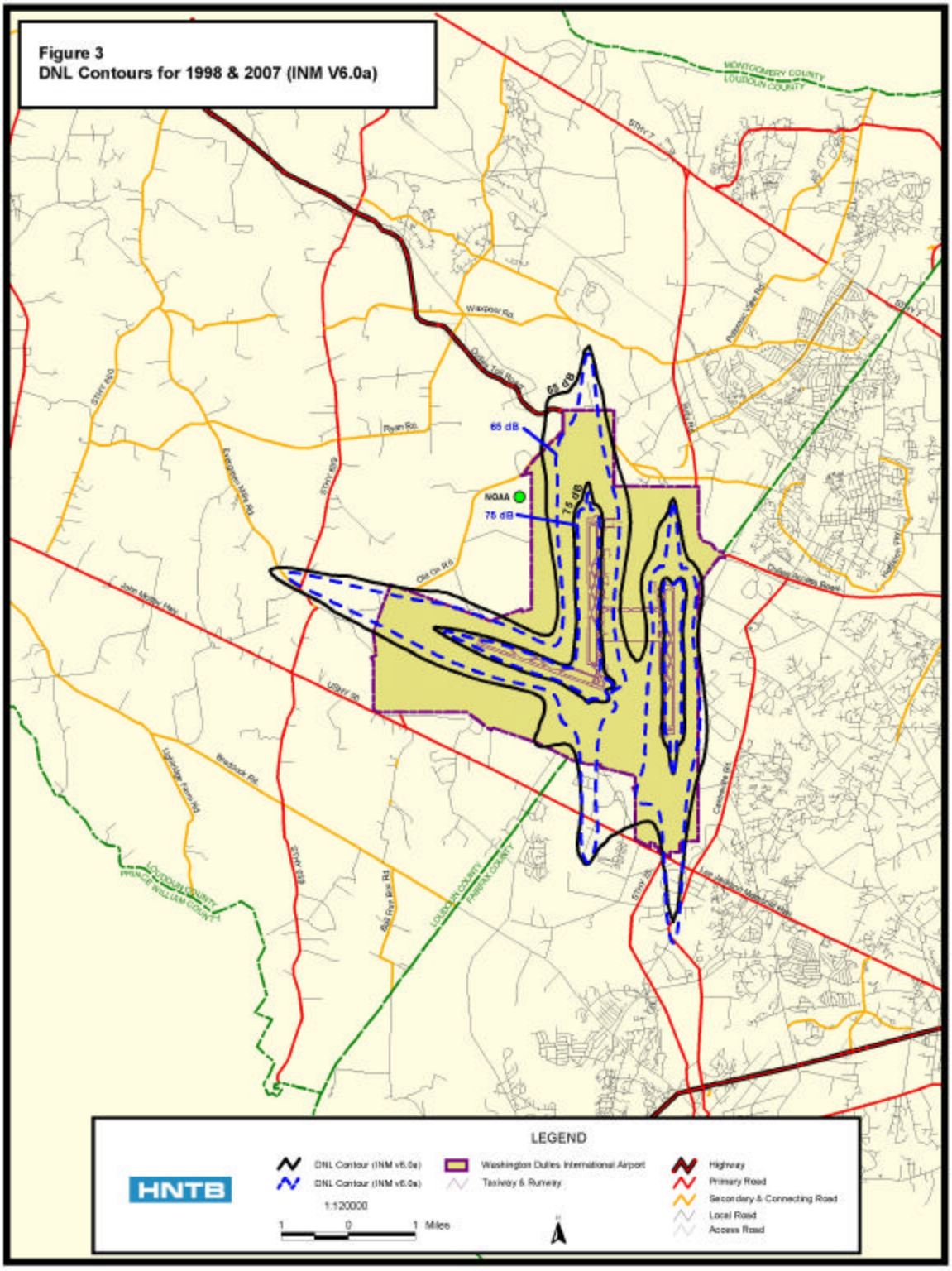


Figure 3
DNL Contours for 1998 & 2007 (INM V6.0a)
65 dB
75 dB
NOAA
LEGEND
DNL Contour (INM v6.0a)
DNL Contour (INM v6.0a)
Washington Dulles International Airport
Taxiway & Runway
Highway
Primary Road
Secondary & Connecting Road
Local Road
Access Road
HNTB
1:120000
1 0 1 Miles

Figure 3

NOTES

---

[i] Source: National Climatic Data Center

[ii] Source: National Climatic Data Center

[iii] Source: KPMG Peat Marwick Consulting Services, 1993

APPENDIX C

AIR EMISSIONS CALCULATIONS

This appendix describes the methodology that was used to calculate air emissions from stationary and mobile sources. The latter are emphasized since they are the largest source of air emissions at IAD. The appendix also contains several attachments, including the inputs and outputs of the model that was used to calculate mobile source air emissions.

APPENDIX C – AIR EMISSIONS CALCULATIONS

STATIONARY SOURCES

Stationary sources that generate air emissions include boilers, heaters, generators, an incinerator, fire training facility, fuel tanks, and miscellaneous paints and chemicals. The principal fuels used by stationary sources at IAD are natural gas, propane, diesel, and No. 2 fuel oil. Emissions were calculated using the weighted emission factors detailed in the Authority's operating permit application (MWAA 1998).

AIRCRAFT EMISSIONS

The number and types of aircraft operating at IAD form the basis for estimating aircraft emissions attributable to the airport. The data used for this air quality analysis are actual 1999 aircraft operational data (MWAA 2001) and a forecast of aircraft operations for the year 2007. The forecast data for 2007 were derived by interpolating between forecast data for the years 2005 and 2010 (HNTB 2000). These data are presented in Table C-1. Each arrival is counted as an aircraft operation, and each departure is counted as an operation, so that one landing and takeoff (LTO) cycle equates to two aircraft operations.

TABLE C-1 1999 AND 2007 IAD AIRCRAFT LTOs

Aircraft Category	1999 LTOs	2007 LTOs
General Aviation		
Single Engine Piston	966	950
Twin Engine Piston	3,224	3,250
Turboprop	19,183	4,100
Business Jets	23,842	28,710
Military	1,557	4,100
Commercial Turboprop	78,396	42,482
Regional Jet	23,248	115,927
Narrow-Body Jet	69,923	95,917
Wide-Body Jet	14,641	23,921
Total	234,980	319,357

Air emissions from aircraft were estimated using the Federal Aviation Administration's Emissions and Dispersion Modeling System (EDMS) (FAA 2000), which is the recommended model for air quality impact assessment for civilian airports. The FAA model calculates emissions from aircraft based on the aircraft fleet make-up and the airport level of activity expressed as the number of LTO cycles for each aircraft type using procedures prescribed by the EPA.

When the EPA first established standards for VOC emissions from aircraft engines, an operating regime was defined to standardize the engine certification testing procedure. There are five operating modes that are considered for aircraft emission calculation purposes. These include: (1) approach, (2) taxi-in, (3) taxi-out, (4) takeoff, and (5) climb-out. The specific inputs to the FAA model are aircraft categories, engine types, and the annual LTOs. The emissions of each aircraft type are calculated by multiplying the time-in-

mode (minutes), by the aircraft fuel flow rate (pounds of fuel per minute), the emission index (pound of pollutant per 1,000 pounds of fuel), and the number of aircraft engines. This calculation can be represented by the equation:

$$E_{ij} = \sum [TIM_{jk}] \; x \; [FF_{jk} / 1000] \; x \; [EI_{ijk}] \; x \; [NE_j]$$

where:

E_{ij} = total emissions of pollutant i produced by aircraft type j for one landing or takeoff
TIM_{jk} = time-in-mode for mode k for aircraft type j
FF_{jk} = fuel flow for mode k for each engine used on aircraft type j
E_{ijk} = emission index for pollutant i in mode k for aircraft j
NE_j = number of engines on aircraft type j.

The total emissions for each aircraft type are then obtained by multiplying the previous product by the annual number of LTOs by that aircraft type. Total aircraft emissions are tabulated by summing the emissions of all aircraft types.

Emission indices for HC and CO are relatively high during the taxi-out/taxi-in modes since the engines are at low power and operate at less than optimum efficiency. These indices then fall as higher power operating modes are achieved. For NO_X, the opposite trend is observed. NO_X emissions are relatively low at the taxi-out/taxi-in modes when power and combustion temperatures are relatively low, and they increase as the power level and associated combustion temperatures increase in the take-off and climb-out modes. There are no emission indices for particulates from aircraft engines at this time.

For this air quality evaluation, the aircraft types and annual LTOs noted in Table B-1 were used as inputs to the FAA model. The model's default values for engine fuel flow, emission indices, number of engines, and time-in-mode, except for taxi-out/taxi-in, by aircraft type were utilized where possible. When a particular aircraft/engine type was not available in the EDMS model or a particular aircraft type is not identified in the available data set of aircraft operating from IAD, a surrogate aircraft type was used. For example, the Cherokee Six, Navajo, and Learjet 35/36 general aviation (GA) aircraft were used as surrogates for all single piston, twin piston, and business jets, respectively.

The time-in-mode for taxi-out and taxi-in also was modified to utilize the 1999 FAA Consolidated Operations and Delay Analysis System data that are specific to IAD. Specifically, a total aircraft taxi time of approximately 22.66 minutes was assumed based on the 1999 FAA data for IAD. For the year 2007, an estimated taxi and delay time of 35 minutes was assumed based on an ongoing runway and alternatives study for IAD (Baummer 2001). The estimated IAD aircraft emissions for 2007 are summarized and compared to 1999 levels in Table C-2.

TABLE C-2 1999 AND 2007 IAD AIRCRAFT EMISSIONS

LTOs	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Build 2007					
319,357	2,817	141	3,993	533	--
No Build 2007					
319,357	2,817	141	3,993	533	--
1999					
234,980	1,463	72	1,726	280	--

Additional details on the model inputs and emission results are provided in an attached printout of the model emissions inventory report for 1999 (Attachment 1) and 2007 (Attachment 2).

GSE/AGE EMISSIONS

A variety of ground support equipment (GSE) services civilian aircraft, while aerospace ground equipment (AGE) services military aircraft. Principal GSE types servicing commercial carriers include:

Baggage Tugs	Fuel Truck	Belt Loader
Water Truck	Food Truck	Air Start Unit
Transporter	Container Loader	Aircraft Tug
Lavatory Truck	Cabin Service	Auxiliary Power Unit

While larger aircraft require multiple GSE types per LTO, smaller general aviation and transient aircraft may require the services of only one piece of GSE or none. AGE servicing the military aircraft include generators, compressors, and heaters.

As with aircraft emissions, emissions from GSE and AGE were estimated using the FAA EDMS model. The model assigns a set of default GSE types to each aircraft type, as well as default parameters that are used to estimate emissions. These default parameters include GSE engine brake horsepower, load factors, operating time, and emission index or emission factor. Emissions from GSE and AGE operations at IAD for the years 1999 and 2007 are summarized in Table C-3, and additional details on the model inputs and emission results are provided in Attachments 1 and 2 for 1999 and 2007, respectively.

TABLE C-3 1999 AND 2007 IAD GSE/AGE EMISSIONS

LTOs	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Build 2007					
319,357	517	14	5,941	161	19
No Build 2007					
319,357	517	14	5,941	161	19
1999					
234,980	359	9	4,142	113	12

AIRPORT ROADWAY AND PARKING FACILITIES

For purposes of this analysis, vehicles operating on airport property were categorized as vehicles operating on roadways on airport property and vehicles operating in parking facilities. Vehicles operating on airport roadways and parking facilities produce exhaust, evaporative, and idling emissions. The FAA EDMS model again was used to estimate these emissions. The FAA vehicle emissions model is separated into two categories: roadway and parking lots. The procedures used by the FAA model for calculating emissions from on-road or highway vehicles are based on EPA's MOBILE and PART5 motor vehicle emissions models that are used to develop highway vehicle emission indices and emission inventories.

To estimate emissions from vehicles operating on airport roadways, the estimated number of yearly vehicles, average distance traveled, and average speed are inputs to the FAA model. To estimate parking emissions, the model inputs include annual number of vehicles, average speed, average distance traveled, and average idle times. Data on roadway volumes were obtained from a recent study of north area roadway improvements (HNTB 2001), and public parking data were obtained from an access and parking study (SAIC 1999). Public parking data included demand for spaces and average duration of stay for hourly, valet, daily, and remote parking lots. Emissions from employee parking lots also were estimated using the EDMS model. These input data and resultant detailed emission results are provided in Attachments 1 and 2 for 1999 and 2007, respectively. Summaries of the emission results for vehicles operating on airport roadways and on parking facilities are provided in Table C-4.

TABLE C-4 1999 AND 2007 IAD ROADWAY AND PARKING EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Build 2007					
Roadways	188	10	1,771	233	8
Parking Facilities	7	<1	171	21	<1
Total	195	10	1,942	254	9
No Build 2007					
Roadways	188	10	1,771	233	8
Parking Facilities	7	<1	171	21	<1
Total	195	10	1,942	254	9
1999					
Roadways	164	7	1,481	200	8
Parking Facilities	8	<1	180	23	<1
Total	172	7	1,661	223	8

MOBILE LOUNGES AND PLANEMATES

Passenger Mobile Lounges and Planemates have been used at IAD since its opening. Originally, these relatively large, 100-passenger vehicles transported passengers directly from the Main Terminal to the aircraft. Today, these vehicles transport passengers from the Main Terminal to Concourses B and C/D. Similar to the Mobile Lounges, Planemates are used to transport passengers from the Main Terminal directly onto airplanes by attaching to the aircraft. At the completion of the Tier 2 and related projects, the Mobile Lounges and Planemates will be largely replaced by the Automated People Mover (APM) train system.

There are 16 Mobile Lounges and 25 Planemates in use today. These vehicles are powered by diesel propulsion engines and are equipped with diesel-fueled auxiliary power units (APU). Emissions were calculated based on the engine size, average fuel consumption, and appropriate emission factors. It is estimated that the existing fleet of about 40 vehicles makes approximately one million trips a year, but that the fleet will be reduced by over 50 percent when the new Automated People Mover begins operations in 2006/2007 in the Build scenario. These remaining vehicles are estimated to make only about 30,000 trips a year, but the one-way trip distance will double. For the No Build 2007 scenario, it is estimated that more vehicles and/or passenger trips relative to 1999 levels would be required to accommodate the anticipated increased passenger loads. Estimated emissions from the Mobile Lounges and Planemates are summarized in Table C-5, and detailed calculations are provided in Attachment 3.

TABLE C-5 MOBILE LOUNGE AND PLANEMATE EMISSIONS

Source	No.	Emissions (tons/yr)				
		NO_X	SO_2	CO	VOCs	PM_{10}
Build 2007						
Mobile Lounges/ Planemates	18	9.36	0.50	0.27	0.45	0.20
No Build 2007						
Mobile Lounges/ Planemates	18	152.09	8.11	4.38	7.38	3.22
1999						
Mobile Lounges/ Planemates	41	121.67	6.49	3.50	5.90	2.58

TOTAL MOBILE SOURCE EMISSIONS

The estimated IAD mobile source emissions for 2007 are summarized and compared to 1999 levels in Table C-6. Note that the 1999 data contain emissions associated with the operation of Mobile Lounges and Planemates, while these are assumed to have been retired from service when the APM becomes operational.

TABLE C-6 1999 AND 2007 IAD MOBILE SOURCE EMISSIONS

Source	Emissions (tons/yr)				
	NO_X	SO_2	CO	VOCs	PM_{10}
Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	9	<1	<1	<1	<1
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,529	166	11,876	948	28
No Build 2007					
Aircraft	2,817	141	3,993	533	--
GSE/AGE	517	14	5,941	161	19
Mobile Lounges/Planemates	152	8	4	7	3
Roadways/Parking Lots	195	10	1,942	254	9
Total	3,681	173	11,880	955	31
1999					
Aircraft	1,463	72	1,726	280	--
GSE/AGE	359	9	4,142	113	12
Mobile Lounges/Planemates	122	6	4	6	3
Roadways/Parking Lots	172	7	1,661	223	8
Total	2,116	94	7,533	622	23

Although the increase in aircraft activity is forecasted to be approximately 36 percent between 1999 and 2007 under the No Build Alternative, the data in Table B-6 note an approximate 74, 58, and 54 percent increases in NO_X, CO, and VOC emissions from IAD mobile source emissions between 1999 and 2007. The latter increases are attributable to both an increase in aircraft operations and an approximate 50 percent increase in estimated taxi and delay times for aircraft. Emissions associated with the increased forecasted aircraft activity and increased taxi and delay times would occur for both the build and no build scenarios.

CONSTRUCTION EMISSIONS ANALYSIS

Air emissions will be generated by demolition and construction activities associated with the Tier 2 and related projects. Demolition and construction activities for the Tier 2 and related projects were grouped into several overall groups:

- Tunneling (APM tunnels, tug tunnels, baggage tunnels, International APM tunnels, walkback tunnel, utility tunnel, and vehicle maintenance facility)
- South employee parking lot demolition
- Clearing of land south of Tier 2
- Paving of former impervious land south of Tier 2
- C/D Concourse demolition
- Paving of former C/D Concourse area

In general, construction emissions will be generated by fugitive dust resulting from construction and demolition activities and construction vehicle exhaust emissions. EPA has published an emission factor from heavy construction activities based on field measurements of total suspended particulate concentrations surrounding construction projects. For purposes of this analysis, it was assumed that approximately 160 acres of current pervious land south of the proposed Tier 2 concourse location would be cleared and paved for aircraft taxi. The PM_{10} size fraction of the total PM EPA emission factor is estimated to be 0.6 tons per acre. Therefore, approximately, 80 tons of PM_{10} emissions are estimated to be generated during the southern land clearing process.

Nonroad or construction vehicle exhaust emissions were estimated using EPA's NONROAD emissions inventory model. This model, which updates previous AP-42 factors for heavy-duty construction equipment, allows the user to estimate construction vehicle emissions based on an assumed construction vehicle mix and equipment usage rates. Equipment types and hours of equipment operation for the above the construction project groups were developed using standard construction estimation techniques that are based on unit operations (e.g., square feet paved per hour, cubic yards of material demolished per hour) (RSMeans 1999). Table C-7 summarizes the equipment types and operating hours for each project grouping and the estimated emissions. Detailed calculations are provided in Attachment 3.

TABLE C-7 ESTIMATED CONSTRUCTION ACTIVITY AIR QUALITY EMISSIONS

Project	Construction Equipment	Usage (hrs)	Emissions (lbs)				
			CO	NO_X	VOC	PM	SO_X
Tunneling	Concrete/Industrial Saw	44,478	36,879	44,134	5,784	5,772	3,728
	Dump Trucks	113,375	195,071	668,816	60,124	55,735	62,005
	Rubber Tired Loaders	66,440	59,987	128,722	10,785	16,121	10,748
	Rubber Tired Dozer	41,845	54,255	186,016	16,722	12,789	18,020
	Tractor/Loader/Backhoe	85,907	54,541	81,010	11,494	8,422	6,818
	Total	(lbs)	400,733	1,108,698	104,909	98,839	101,318
		(tons)	200	554	52	49	51
South Employee Parking Lot Demolition	Dump Trucks	1,885	3,243	11,120	1,000	927	1,031
	Crushing. Equipment	1,885	3,787	4,532	594	593	383
	Rubber Tired Loaders	1,885	1,702	3,652	306	457	305
	Tractor/Loader/Backhoe	1,885	1,197	1,778	252	185	150
	Total	(lbs)	9,929	21,082	2,152	2,162	1,868
		(tons)	5	11	1	1	1
Clearing of Land South of Tier 2	Excavators	640	765	1,582	105	212	137
	Dump Trucks	640	1,101	3,775	339	315	350
	Total	(lbs)	1,866	5,358	444	527	487
		(tons)	1	3	0	0	0
Paving of Land South of Tier 2	Concrete Pavers	4,130	3,678	8,065	904	724	749
	Paving Equipment	4,130	2,198	5,260	494	430	444
	Graders	4,130	3,630	9,171	1,503	955	831
	Total	(lbs)	9,506	22,496	2,900	2,110	2,024
		(tons)	5	11	1	1	1
C/D Concourse Demolition	Cranes	1,217	940	2,305	289	322	208
	Dump Trucks	1,217	2,094	7,179	645	598	666
	Rubber Tired Loaders	1,217	1,099	2,358	198	295	197
	Total	(lbs)	4,133	11,842	1,132	1,216	1,071
		(tons)	2	6	1	1	1
Paving of Former C/D Concourse Area	Concrete Pavers	313	279	611	69	55	57
	Paving Equipment	313	167	399	37	33	34
	Graders	313	275	695	114	72	63
	Total	(lbs)	720	1,705	220	160	153
		(tons)	<1	1	<1	<1	<1
Total		(lbs)	426,888	1,171,179	111,757	105,013	106,920
		(tons)	213	586	56	53	53

REFERENCES

Baummer, Jr., J.C. Personal Communication. Parsons Management Consultants. May, 1, 2001.

Federal Aviation Administration. 2000. Emissions and Dispersion Modeling System (EDMS). Version 3.23. Office of Environment and Energy. February.

HNTB Corporation. 2001. *Dulles North Area Roadway Improvements, Project Definition Document, Washington Dulles International Airport*. January.

HNTB Corporation. 2000. *Washington Dulles International Airport Aviation Activity Forecast*. October.

Metropolitan Washington Airports Authority (MWAA). 2001. *1999 Air Emissions Inventory, Washington Dulles International Airport and Ronald Reagan Washington International Airport*. April.

Metropolitan Washington Airports Authority (MWAA). 1998. *Application for a Synthetic Minor Permit, Metropolitan Washington Airport Authority, Washington Dulles International Airport*. September 23.

RS Means. 1999. *Means Cost Works.*

SAIC. 1999. *Washington Dulles International Airport Access and Parking Study*.

EDMS 3.23 Emissions Inventory Report

Study Name: IAD-1999

Airport: WASHINGTON DULLES INTERNA

Report Date: 05/17/01

SUMMARY

(Tons/Year)

NAME	CO	HC	NOx	SOx	PM10
Aircraft	1,726.440	255.333	1,462.685	71.689	.000
GSE/AGE/APU	4,141.714	102.869	359.392	9.279	12.318
Roadways	1,480.682	182.386	163.905	7.408	7.782
Parking Lots	180.095	21.106	7.674	.281	.304
Total	7,528.931	561.694	1,993.656	88.657	20.404

* Report includes 2 Aircraft and 0 GSE created by the user.

VEHICULAR EMISSIONS

(Tons/Year)

Source	CO	HC	NOx	SOx	PM10
N. Employye Lot	58.389	6.903	5.733	.259	.271
Rent-a-Car	113.778	13.806	11.467	.518	.541
Saarinen Circle	965.269	121.452	113.295	5.121	5.393
Service Road Loop	340.245	40.225	33.410	1.510	1.577
Daily	27.741	3.282	1.147	.037	.049
Employee Lots	39.832	4.768	1.569	.060	.060
Hourly	83.905	9.726	3.715	.142	.142
Remote	28.616	3.331	1.244	.042	.053

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	HC	NOx	SOx	PM10
**Jetstream 31	DEFAULT	APCH	3.202	.226	6.592	.627	.000
**Jetstream 31	DEFAULT	CLMB	1.395	.064	6.452	.581	.000
**Jetstream 31	DEFAULT	TKOF	.268	.012	1.409	.125	.000
**Jetstream 31	DEFAULT	TAXI	33.837	3.148	7.397	1.572	.000
**Jetstream 31	DEFAULT	APU	4.006	.391	19.736	.000	.000
**Jetstream 31	DEFAULT	GSE	677.594	15.446	44.684	1.533	1.992
**Jetstream 41	DEFAULT	APCH	4.742	.217	8.693	.987	.000
**Jetstream 41	DEFAULT	CLMB	1.734	.077	10.791	.962	.000
**Jetstream 41	DEFAULT	TKOF	.333	.016	2.553	.222	.000
**Jetstream 41	DEFAULT	TAXI	67.826	8.139	13.842	2.766	.000
**Jetstream 41	DEFAULT	APU	4.623	.451	22.775	.000	.000
**Jetstream 41	DEFAULT	GSE	781.907	17.824	51.563	1.769	2.299
A300-600C	JT9D-20J	TAXI	10.916	4.010	.540	.088	.000
A300-600C	JT9D-20J	TKOF	.044	.000	2.204	.027	.000
A300-600C	JT9D-20J	CLMB	.114	.000	4.424	.068	.000
A300-600C	JT9D-20J	APCH	.452	.041	.773	.044	.000
A300-600C	JT9D-20J	APU	.370	.012	.228	.000	.000
A300-600C	JT9D-20J	GSE	5.031	.152	.618	.018	.031
A300-600R	CF6-80C2A5	TAXI	.058	.005	.015	.002	.000
A300-600R	CF6-80C2A5	TKOF	.000	.000	.034	.001	.000
A300-600R	CF6-80C2A5	CLMB	.000	.000	.066	.002	.000
A300-600R	CF6-80C2A5	APCH	.003	.000	.022	.001	.000
A300-600R	CF6-80C2A5	APU	.008	.000	.005	.000	.000
A300-600R	CF6-80C2A5	GSE	.110	.003	.013	.000	.001
A310	JT9D-20J	TAXI	14.014	5.148	.693	.113	.000
A310	JT9D-20J	TKOF	.057	.000	2.830	.034	.000
A310	JT9D-20J	CLMB	.146	.000	5.679	.088	.000
A310	JT9D-20J	APCH	.581	.053	.993	.057	.000
A310	JT9D-20J	APU	.270	.015	.071	.000	.000
A310	JT9D-20J	GSE	6.233	.142	.411	.014	.018

EDMS 3.23 Emissions Inventory

A310-300	DEFAULT	TAXI	32.185	2.783	6.578	.791	.000
A310-300	DEFAULT	TKOF	.020	.025	11.316	.273	.000
A310-300	DEFAULT	CLMB	.065	.065	24.057	.707	.000
A310-300	DEFAULT	APCH	2.031	.095	9.408	.428	.000
A310-300	DEFAULT	APU	2.330	.133	.615	.000	.000
A310-300	DEFAULT	GSE	53.874	1.228	3.553	.122	.158
A319	CFM56-5A1	TAXI	22.333	1.777	5.076	.685	.000
A319	CFM56-5A1	TKOF	.366	.094	10.007	.220	.000
A319	CFM56-5A1	CLMB	.944	.241	20.552	.566	.000
A319	CFM56-5A1	APCH	1.609	.257	5.149	.348	.000
A319	CFM56-5A1	APU	3.833	.219	1.012	.000	.000
A319	CFM56-5A1	GSE	88.624	2.020	5.844	.201	.261
A320-200	DEFAULT	TAXI	41.904	3.333	9.524	1.286	.000
A320-200	DEFAULT	TKOF	.687	.176	18.776	.412	.000
A320-200	DEFAULT	CLMB	1.771	.453	38.562	1.062	.000
A320-200	DEFAULT	APCH	3.019	.483	9.661	.652	.000
A320-200	DEFAULT	APU	.983	.096	4.843	.000	.000
A320-200	DEFAULT	GSE	166.287	3.791	10.966	.376	.489
A330	CF6-80C2B5F	TAXI	.443	.033	.125	.014	.000
A330	CF6-80C2B5F	TKOF	.001	.001	.291	.006	.000
A330	CF6-80C2B5F	CLMB	.001	.001	.561	.014	.000
A330	CF6-80C2B5F	APCH	.028	.002	.193	.008	.000
A330	CF6-80C2B5F	APU	.000	.000	.000	.000	.000
A330	CF6-80C2B5F	GSE	.000	.000	.000	.000	.000
A330-300	DEFAULT	TAXI	.714	.051	.200	.022	.000
A330-300	DEFAULT	TKOF	.001	.001	.441	.008	.000
A330-300	DEFAULT	CLMB	.002	.002	.863	.021	.000
A330-300	DEFAULT	APCH	.043	.003	.291	.012	.000
A330-300	DEFAULT	APU	.000	.000	.000	.000	.000
A330-300	DEFAULT	GSE	.000	.000	.000	.000	.000
A340-200	CFM56-5B1/2P	TAXI	4.051	.322	.455	.060	.000
A340-200	CFM56-5B1/2P	TKOF	.030	.004	.877	.020	.000
A340-200	CFM56-5B1/2P	CLMB	.182	.010	1.573	.052	.000
A340-200	CFM56-5B1/2P	APCH	1.393	.223	.440	.033	.000
A340-200	CFM56-5B1/2P	APU	.249	.008	.153	.000	.000
A340-200	CFM56-5B1/2P	GSE	3.383	.102	.416	.012	.021
A340-300	DEFAULT	TAXI	1.416	.236	.174	.022	.000
A340-300	DEFAULT	TKOF	.013	.000	.466	.008	.000

A340-300	DEFAULT	CLMB	.030	.000	.953	.020	.000
A340-300	DEFAULT	APCH	.039	.002	.222	.012	.000
A340-300	DEFAULT	APU	.095	.003	.059	.000	.000
A340-300	DEFAULT	GSE	1.296	.039	.159	.005	.008
ATR42	PW120	TAXI	5.331	.000	2.039	.193	.000
ATR42	PW120	TKOF	.047	.000	.325	.013	.000
ATR42	PW120	CLMB	.240	.000	1.286	.056	.000
ATR42	PW120	APCH	.780	.000	1.053	.070	.000
ATR42	PW120	APU	.352	.034	1.733	.000	.000
ATR42	PW120	GSE	59.514	1.357	3.925	.135	.175
B717-200	BR700-715A1-30	TAXI	.366	.005	.121	.012	.000
B717-200	BR700-715A1-30	TKOF	.005	.000	.145	.003	.000
B717-200	BR700-715A1-30	CLMB	.012	.000	.292	.008	.000
B717-200	BR700-715A1-30	APCH	.038	.000	.113	.005	.000
B717-200	BR700-715A1-30	APU	.072	.004	.019	.000	.000
B717-200	BR700-715A1-30	GSE	1.654	.038	.109	.004	.005
B727-100	DEFAULT	TAXI	1.264	.336	.278	.048	.000
B727-100	DEFAULT	TKOF	.019	.005	.359	.011	.000
B727-100	DEFAULT	CLMB	.059	.013	.754	.029	.000
B727-100	DEFAULT	APCH	.076	.014	.217	.019	.000
B727-100	DEFAULT	APU	.139	.008	.037	.000	.000
B727-100	DEFAULT	GSE	3.223	.073	.213	.007	.009
B727-100F	DEFAULT	TAXI	4.249	1.129	.936	.160	.000
B727-100F	DEFAULT	TKOF	.063	.018	1.208	.038	.000
B727-100F	DEFAULT	CLMB	.199	.045	2.534	.098	.000
B727-100F	DEFAULT	APCH	.255	.046	.731	.063	.000
B727-100F	DEFAULT	APU	.469	.027	.124	.000	.000
B727-100F	DEFAULT	GSE	10.834	.247	.714	.025	.032
B727-200	DEFAULT	TAXI	36.055	4.785	10.489	1.770	.000
B727-200	DEFAULT	TKOF	.830	.193	15.639	.435	.000
B727-200	DEFAULT	CLMB	2.337	.569	30.690	1.098	.000
B727-200	DEFAULT	APCH	3.685	.732	9.179	.718	.000
B727-200	DEFAULT	APU	4.519	.259	1.193	.000	.000
B727-200	DEFAULT	GSE	104.462	2.381	6.889	.236	.307
B737-200	DEFAULT	TAXI	32.546	7.181	6.675	1.243	.000
B737-200	DEFAULT	TKOF	.580	.084	10.768	.301	.000
B737-200	DEFAULT	CLMB	1.583	.257	20.684	.770	.000
B737-200	DEFAULT	APCH	1.955	.548	5.481	.493	.000

B737-200	DEFAULT	APU	5.314	.304	1.403	.000	.000
B737-200	DEFAULT	GSE	122.844	2.800	8.101	.278	.361
B737-200C	DEFAULT	TAXI	59.627	13.157	12.229	2.277	.000
B737-200C	DEFAULT	TKOF	1.063	.153	19.729	.552	.000
B737-200C	DEFAULT	CLMB	2.901	.470	37.894	1.411	.000
B737-200C	DEFAULT	APCH	3.582	1.004	10.042	.904	.000
B737-200C	DEFAULT	APU	9.735	.557	2.570	.000	.000
B737-200C	DEFAULT	GSE	225.059	5.130	14.842	.509	.662
B737-300	DEFAULT	TAXI	67.017	3.103	10.177	1.340	.000
B737-300	DEFAULT	TKOF	.604	.027	13.886	.362	.000
B737-300	DEFAULT	CLMB	1.662	.092	31.939	.929	.000
B737-300	DEFAULT	APCH	3.754	.097	10.537	.654	.000
B737-300	DEFAULT	APU	5.818	.333	1.536	.000	.000
B737-300	DEFAULT	GSE	134.505	3.066	8.870	.304	.395
B737-400	DEFAULT	TAXI	6.324	.475	.631	.090	.000
B737-400	DEFAULT	TKOF	.036	.002	.667	.022	.000
B737-400	DEFAULT	CLMB	.106	.005	1.559	.057	.000
B737-400	DEFAULT	APCH	.302	.006	.575	.039	.000
B737-400	DEFAULT	APU	.457	.026	.121	.000	.000
B737-400	DEFAULT	GSE	10.559	.241	.696	.024	.031
B737-500	DEFAULT	TAXI	72.345	5.431	7.216	1.025	.000
B737-500	DEFAULT	TKOF	.414	.023	7.636	.248	.000
B737-500	DEFAULT	CLMB	1.214	.061	17.840	.655	.000
B737-500	DEFAULT	APCH	3.456	.066	6.583	.444	.000
B737-500	DEFAULT	APU	5.225	.299	1.379	.000	.000
B737-500	DEFAULT	GSE	120.788	2.753	7.965	.273	.355
B737-700	CFM56-3C-1	TAXI	.409	.022	.066	.008	.000
B737-700	CFM56-3C-1	TKOF	.004	.000	.091	.002	.000
B737-700	CFM56-3C-1	CLMB	.010	.000	.203	.006	.000
B737-700	CFM56-3C-1	APCH	.023	.001	.066	.004	.000
B737-700	CFM56-3C-1	APU	.038	.002	.010	.000	.000
B737-700	CFM56-3C-1	GSE	.869	.020	.057	.002	.003
B737-800	CFM56-3C-1	TAXI	2.076	.110	.333	.042	.000
B737-800	CFM56-3C-1	TKOF	.020	.001	.460	.012	.000
B737-800	CFM56-3C-1	CLMB	.052	.002	1.028	.031	.000
B737-800	CFM56-3C-1	APCH	.115	.003	.337	.020	.000
B737-800	CFM56-3C-1	APU	.191	.011	.050	.000	.000
B737-800	CFM56-3C-1	GSE	4.410	.101	.291	.010	.013

B747-200	DEFAULT	TAXI	103.873	23.518	5.880	1.058	.000
B747-200	DEFAULT	TKOF	.125	.125	19.677	.336	.000
B747-200	DEFAULT	CLMB	.321	.321	41.026	.865	.000
B747-200	DEFAULT	APCH	1.685	.297	7.733	.535	.000
B747-200	DEFAULT	APU	2.227	.072	1.372	.000	.000
B747-200	DEFAULT	GSE	30.251	.916	3.716	.109	.186
B747-200C	DEFAULT	TAXI	2.713	.957	.158	.024	.000
B747-200C	DEFAULT	TKOF	.008	.009	.568	.008	.000
B747-200C	DEFAULT	CLMB	.020	.027	1.161	.021	.000
B747-200C	DEFAULT	APCH	.102	.024	.226	.013	.000
B747-200C	DEFAULT	APU	.055	.002	.034	.000	.000
B747-200C	DEFAULT	GSE	.747	.023	.092	.003	.005
B747-300	DEFAULT	TAXI	.032	.004	.010	.001	.000
B747-300	DEFAULT	TKOF	.001	.000	.037	.000	.000
B747-300	DEFAULT	CLMB	.001	.000	.065	.001	.000
B747-300	DEFAULT	APCH	.002	.000	.012	.001	.000
B747-300	DEFAULT	APU	.003	.000	.002	.000	.000
B747-300	DEFAULT	GSE	.044	.001	.005	.000	.000
B747-400	DEFAULT	TAXI	38.884	3.415	8.538	.961	.000
B747-400	DEFAULT	TKOF	.272	.037	17.355	.334	.000
B747-400	DEFAULT	CLMB	.912	.016	36.631	.864	.000
B747-400	DEFAULT	APCH	1.983	.129	11.502	.535	.000
B747-400	DEFAULT	APU	2.303	.075	1.419	.000	.000
B747-400	DEFAULT	GSE	31.283	.948	3.843	.113	.193
B757-200	DEFAULT	TAXI	49.120	1.365	12.769	1.993	.000
B757-200	DEFAULT	TKOF	.905	.000	52.777	.635	.000
B757-200	DEFAULT	CLMB	1.500	.030	96.193	1.620	.000
B757-200	DEFAULT	APCH	2.142	.075	12.737	1.014	.000
B757-200	DEFAULT	APU	6.262	.359	1.653	.000	.000
B757-200	DEFAULT	GSE	144.767	3.300	9.547	.328	.426
B757-200F	DEFAULT	TAXI	.187	.017	.031	.004	.000
B757-200F	DEFAULT	TKOF	.001	.000	.089	.001	.000
B757-200F	DEFAULT	CLMB	.003	.000	.184	.004	.000
B757-200F	DEFAULT	APCH	.008	.001	.044	.002	.000
B757-200F	DEFAULT	APU	.015	.001	.004	.000	.000
B757-200F	DEFAULT	GSE	.339	.008	.022	.001	.001
B767-200	DEFAULT	TAXI	12.460	2.775	1.502	.239	.000
B767-200	DEFAULT	TKOF	.205	.061	6.060	.111	.000

B767-200	DEFAULT	CLMB	.592	.199	14.314	.291	.000
B767-200	DEFAULT	APCH	.932	.150	3.593	.180	.000
B767-200	DEFAULT	APU	1.587	.051	.978	.000	.000
B767-200	DEFAULT	GSE	21.551	.653	2.647	.078	.133
B767-300ER	CF6-80C2A5	TAXI	23.372	1.831	5.889	.668	.000
B767-300ER	CF6-80C2A5	TKOF	.029	.019	13.719	.259	.000
B767-300ER	CF6-80C2A5	CLMB	.049	.061	26.592	.662	.000
B767-300ER	CF6-80C2A5	APCH	1.365	.079	8.955	.386	.000
B767-300ER	CF6-80C2A5	APU	3.251	.105	2.003	.000	.000
B767-300ER	CF6-80C2A5	GSE	44.157	1.338	5.424	.159	.272
B777-200	GE90-76B	TAXI	173.242	14.684	25.246	2.318	.000
B777-200	GE90-76B	TKOF	.114	.089	57.018	.686	.000
B777-200	GE90-76B	CLMB	.428	.197	116.411	1.776	.000
B777-200	GE90-76B	APCH	11.632	1.344	25.430	1.083	.000
B777-200	GE90-76B	APU	7.839	.254	4.830	.000	.000
B777-200	GE90-76B	GSE	106.482	3.226	13.080	.383	.656
BH-1900C	PT6A-65B	TAXI	64.545	21.515	2.836	.528	.000
BH-1900C	PT6A-65B	TKOF	.290	.000	.433	.033	.000
BH-1900C	PT6A-65B	CLMB	.446	.000	.460	.038	.000
BH-1900C	PT6A-65B	APCH	2.821	.492	.582	.070	.000
BH-1900C	PT6A-65B	APU	.000	.000	.000	.000	.000
BH-1900C	PT6A-65B	GSE	225.806	4.517	11.037	.404	.337
C-130 HERCULES	T56 series I	TAXI	5.099	.799	6.529	.480	.000
C-130 HERCULES	T56 series I	TKOF	.115	.012	.419	.023	.000
C-130 HERCULES	T56 series I	CLMB	.330	.042	1.081	.061	.000
C-130 HERCULES	T56 series I	APCH	1.267	.172	1.923	.145	.000
C-130 HERCULES	T56 series I	APU	.000	.000	.000	.000	.000
C-130 HERCULES	T56 series I	GSE	47.630	4.946	1.794	.019	.128
CONCORDE-101	OLYMPUS-593-610	TAXI	.506	.169	.009	.003	.000
CONCORDE-101	OLYMPUS-593-610	TKOF	.068	.007	.022	.001	.000
CONCORDE-101	OLYMPUS-593-610	CLMB	.054	.005	.025	.001	.000
CONCORDE-101	OLYMPUS-593-610	APCH	.131	.028	.009	.001	.000
CONCORDE-101	OLYMPUS-593-610	APU	.002	.000	.000	.000	.000
CONCORDE-101	OLYMPUS-593-610	GSE	.042	.001	.003	.000	.000
Canadair Reg-100	CF34-3A1	TAXI	137.989	12.795	12.373	1.749	.000
Canadair Reg-100	CF34-3A1	TKOF	.000	.049	9.516	.443	.000
Canadair Reg-100	CF34-3A1	CLMB	.000	.127	21.455	1.143	.000
Canadair Reg-100	CF34-3A1	APCH	2.602	.178	9.394	.739	.000

Canadair Reg-100	CF34-3A1	APU	19.946	1.142	5.266	.000	.000
Canadair Reg-100	CF34-3A1	GSE	461.122	10.512	30.409	1.043	1.356
Cherokee six	TIO-540-J2B2	TAXI	12.008	.632	.004	.001	.000
Cherokee six	TIO-540-J2B2	TKOF	1.808	.015	.000	.000	.000
Cherokee six	TIO-540-J2B2	CLMB	24.246	.274	.004	.002	.000
Cherokee six	TIO-540-J2B2	APCH	12.091	.000	.013	.001	.000
Cherokee six	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Cherokee six	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
DC10-30ER	CF6-50A	TAXI	15.214	1.721	2.152	.342	.000
DC10-30ER	CF6-50A	TKOF	.112	.039	7.052	.140	.000
DC10-30ER	CF6-50A	CLMB	.329	.094	15.647	.363	.000
DC10-30ER	CF6-50A	APCH	1.860	.133	4.156	.231	.000
DC10-30ER	CF6-50A	APU	1.394	.045	.859	.000	.000
DC10-30ER	CF6-50A	GSE	18.937	.574	2.326	.068	.117
DC10-30F	CF6-50A	TAXI	4.395	.497	.622	.099	.000
DC10-30F	CF6-50A	TKOF	.032	.011	2.037	.040	.000
DC10-30F	CF6-50A	CLMB	.095	.027	4.520	.105	.000
DC10-30F	CF6-50A	APCH	.537	.038	1.201	.067	.000
DC10-30F	CF6-50A	APU	.403	.013	.248	.000	.000
DC10-30F	CF6-50A	GSE	5.470	.166	.672	.020	.034
DC8-71F	CFM56-2A SERIES	TAXI	8.550	.411	1.564	.196	.000
DC8-71F	CFM56-2A SERIES	TKOF	.087	.004	1.961	.052	.000
DC8-71F	CFM56-2A SERIES	CLMB	.222	.010	4.275	.133	.000
DC8-71F	CFM56-2A SERIES	APCH	.533	.013	1.364	.085	.000
DC8-71F	CFM56-2A SERIES	APU	.427	.024	.113	.000	.000
DC8-71F	CFM56-2A SERIES	GSE	9.880	.225	.652	.022	.029
DC9-10	DEFAULT	TAXI	.233	.062	.051	.009	.000
DC9-10	DEFAULT	TKOF	.003	.001	.066	.002	.000
DC9-10	DEFAULT	CLMB	.011	.002	.139	.005	.000
DC9-10	DEFAULT	APCH	.014	.003	.040	.003	.000
DC9-10	DEFAULT	APU	.039	.002	.010	.000	.000
DC9-10	DEFAULT	GSE	.890	.020	.059	.002	.003
DC9-30	DEFAULT	TAXI	62.896	16.713	13.855	2.375	.000
DC9-30	DEFAULT	TKOF	.935	.260	17.875	.561	.000
DC9-30	DEFAULT	CLMB	2.947	.670	37.503	1.447	.000
DC9-30	DEFAULT	APCH	3.779	.687	10.821	.927	.000
DC9-30	DEFAULT	APU	.000	.000	.000	.000	.000
DC9-30	DEFAULT	GSE	.000	.000	.000	.000	.000

DC9-80	JT8D-209	TAXI	18.531	5.296	4.600	.710	.000
DC9-80	JT8D-209	TKOF	.382	.130	8.446	.200	.000
DC9-80	JT8D-209	CLMB	1.345	.480	18.253	.519	.000
DC9-80	JT8D-209	APCH	2.790	1.079	5.618	.345	.000
DC9-80	JT8D-209	APU	3.081	.176	.813	.000	.000
DC9-80	JT8D-209	GSE	71.217	1.623	4.696	.161	.209
DHC-8-100	PW120A	TAXI	6.167	.000	2.359	.223	.000
DHC-8-100	PW120A	TKOF	.054	.000	.370	.015	.000
DHC-8-100	PW120A	CLMB	.278	.000	1.488	.065	.000
DHC-8-100	PW120A	APCH	.756	.000	.768	.068	.000
DHC-8-100	PW120A	APU	.407	.040	2.005	.000	.000
DHC-8-100	PW120A	GSE	68.843	1.569	4.540	.156	.202
DO 328	PW119-B	TAXI	2.778	.000	2.410	.181	.000
DO 328	PW119-B	TKOF	.041	.000	.335	.011	.000
DO 328	PW119-B	CLMB	.176	.000	1.240	.045	.000
DO 328	PW119-B	APCH	.354	.000	.904	.050	.000
DO 328	PW119-B	APU	.250	.024	1.233	.000	.000
DO 328	PW119-B	GSE	42.340	.965	2.792	.096	.124
EMB-120	PW118	TAXI	.054	.000	.018	.002	.000
EMB-120	PW118	TKOF	.000	.000	.003	.000	.000
EMB-120	PW118	CLMB	.002	.000	.010	.000	.000
EMB-120	PW118	APCH	.006	.000	.008	.001	.000
EMB-120	PW118	APU	.003	.000	.016	.000	.000
EMB-120	PW118	GSE	.551	.013	.036	.001	.002
EMB-145	AE3007A	TAXI	.304	.044	.067	.009	.000
EMB-145	AE3007A	TKOF	.003	.001	.085	.002	.000
EMB-145	AE3007A	CLMB	.010	.003	.191	.006	.000
EMB-145	AE3007A	APCH	.024	.005	.057	.004	.000
EMB-145	AE3007A	APU	.015	.001	.073	.000	.000
EMB-145	AE3007A	GSE	2.523	.058	.166	.006	.007
FOKKER 100	DEFAULT	TAXI	10.985	1.550	1.140	.246	.000
FOKKER 100	DEFAULT	TKOF	.068	.078	2.049	.052	.000
FOKKER 100	DEFAULT	CLMB	.202	.076	4.250	.137	.000
FOKKER 100	DEFAULT	APCH	.655	.151	.957	.091	.000
FOKKER 100	DEFAULT	APU	1.266	.072	.334	.000	.000
FOKKER 100	DEFAULT	GSE	29.259	.667	1.929	.066	.086
Kingair 200	PT6A-41	TAXI	26.814	23.632	.457	.126	.000
Kingair 200	PT6A-41	TKOF	.073	.025	.114	.008	.000

Kingair 200	PT6A-41	CLMB	.107	.033	.125	.009	.000
Kingair 200	PT6A-41	APCH	1.060	.692	.141	.016	.000
Kingair 200	PT6A-41	APU	.000	.000	.000	.000	.000
Kingair 200	PT6A-41	GSE	63.066	1.262	3.083	.113	.094
Learjet 35/36	TFE 731-2-2B	TAXI	100.685	34.432	4.845	.928	.000
Learjet 35/36	TFE 731-2-2B	TKOF	.361	.029	3.944	.140	.000
Learjet 35/36	TFE 731-2-2B	CLMB	.554	.035	3.568	.147	.000
Learjet 35/36	TFE 731-2-2B	APCH	7.566	1.440	1.995	.183	.000
Learjet 35/36	TFE 731-2-2B	APU	.000	.000	.000	.000	.000
Learjet 35/36	TFE 731-2-2B	GSE	.000	.000	.000	.000	.000
Navajo	TIO-540-J2B2	TAXI	40.077	2.109	.012	.003	.000
Navajo	TIO-540-J2B2	TKOF	6.033	.052	.002	.000	.000
Navajo	TIO-540-J2B2	CLMB	80.920	.915	.013	.006	.000
Navajo	TIO-540-J2B2	APCH	40.352	.000	.044	.004	.000
Navajo	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Navajo	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
SF-340-B PLUS	CT7-5	TAXI	2.361	.267	.147	.036	.000
SF-340-B PLUS	CT7-5	TKOF	.025	.010	.137	.005	.000
SF-340-B PLUS	CT7-5	CLMB	.124	.046	.608	.025	.000
SF-340-B PLUS	CT7-5	APCH	.210	.060	.274	.021	.000
SF-340-B PLUS	CT7-5	APU	.186	.018	.915	.000	.000
SF-340-B PLUS	CT7-5	GSE	31.400	.716	2.071	.071	.092

** Denotes User Created Aircraft

EDMS 3.23 Study Information IAD-1999

Date: Thursday, May 17, 2001
Study Created: Friday, December 15, 2000
Study Pathname: P:\INDUSTRIAL & OTHER\ARCHITECT-ENGINEER\PARSONS MGT CONSULTANTS\1384001\EDMS\IAD-1999\IA

Airport: WASHINGTON DULLES INTERNA, VA IAD
Airport Location (lat / lon): 38-56-40.897N 077-27-20.864W
Field elevation: 313
English airport layout units selected
Average temperature: 58.
Mixing Height: 3000
Vehicle fleet year: 1999

1999 Emissions Inventory
Hourly Profiles:
DEFAULT

Hour	Fraction of Peak	Hour	Fraction of Peak	Hour	Fraction of Peak
1	1.000	9	1.000	17	1.000
2	1.000	10	1.000	18	1.000
3	1.000	11	1.000	19	1.000
4	1.000	12	1.000	20	1.000
5	1.000	13	1.000	21	1.000
6	1.000	14	1.000	22	1.000
7	1.000	15	1.000	23	1.000
8	1.000	16	1.000	24	1.000

Daily Profiles:
DEFAULT

Day	Fraction of Peak	Day	Fraction of Peak
Monday	1.000	Friday	1.000
Tuesday	1.000	Saturday	1.000
Wednesday	1.000	Sunday	1.000
Thursday	1.000		

Monthly Profiles:
DEFAULT

Month	Fraction of Peak	Month	Fraction of Peak
January	1.000	July	1.000
February	1.000	August	1.000
March	1.000	September	1.000
April	1.000	October	1.000
May	1.000	November	1.000
June	1.000	December	1.000

Aircraft:

Aircraft Name	Engine Type	Aircraft Category	Identification
A300-600C	JT9D-20J	HCJP	#1

Annual LTO: 000000000229
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A300-600R	CF6-80C2A5	HCJP	#1

Annual LTO: 000000000005
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
ATR42	PW120	SCTP	#1

Annual LTO: 000000002807
TGO: 0

Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
BH-1900C	PT6A-65B	SCTP	#1

Annual LTO: 000000014995
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Ground Power Unit	30.00
Diesel Fuel Truck	35.00
Diesel Aircraft Tug Narrow	6.00

Aircraft Name	Engine Type	Aircraft Category	Identification
Canadair Reg-100	CF34-3A1	LCJP	#1

Annual LTO: 000000021749
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-

Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC9-10	DEFAULT	LCJP	#1

Annual LTO: 000000000042
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DHC-8-100	PW120A	SCTP	#1

Annual LTO: 000000003247
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00

Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC10-30F	CF6-50A	HCJP	#1

Annual LTO: 000000000249
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC10-30ER	CF6-50A	HCJP	#1

Annual LTO: 000000000862
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00

Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DO 328	PW119-B	SCTP	#1

Annual LTO: 000000001997
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC8-71F	CFM56-2A SERIES	HCJP	#1

Annual LTO: 000000000466
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00

Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC9-30	DEFAULT	LCJP	#1

Annual LTO: 000000011346
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
EMB-120	PW118	SCTP	#1

Annual LTO: 000000000026
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
EMB-145	AE3007A	LCJP	#1

Annual LTO: 000000000119
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00

Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC9-80	JT8D-209	LCJP	#1

Annual LTO: 000000003359
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
SF-340-B PLUS	CT7-5	SCTP	#1

Annual LTO: 000000001481
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations

Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification	
CONCORDE-101	OLYMPUS-593-610		HCJP	#1

Annual LTO: 000000000002
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
FOKKER 100	DEFAULT	LGJB	#1

Annual LTO: 000000001380
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A310	JT9D-20J	HCJP	#1

Annual LTO: 000000000294
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A319	CFM56-5A1	LCJP	#1

Annual LTO: 000000004180
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00

Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A320-200	DEFAULT	LCJP	#1

Annual LTO: 000000007843
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A330	CF6-80C2B5F	HCJP	#1

Annual LTO: 000000000041
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A330-300	DEFAULT	HCJP	Surrogate for A330-200

Annual LTO: 000000000060
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT

Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A340-200	CFM56-5B1/2P	HCJP	#1

Annual LTO: 000000000154
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A340-300	DEFAULT	HCJP	Surrogate for A343

Annual LTO: 000000000059
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B717-200	BR700-715A1-30	LCJP	#1

Annual LTO: 000000000078
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B727-100F	DEFAULT	LCJP	#1

Annual LTO: 000000000511
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B727-200	DEFAULT	LCJP	#1

Annual LTO: 000000004927
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B727-100	DEFAULT	LCJP	#1

Annual LTO: 000000000152
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00

Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-700	CFM56-3C-1	LCJP	#1

Annual LTO: 000000000041
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-200C	DEFAULT	LCJP	#1

Annual LTO: 000000010615
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-300	DEFAULT	LCJP	#1

Annual LTO: 000000006344
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-200	DEFAULT	LCJP	#1

Annual LTO: 000000005794
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-400	DEFAULT	LCJP	#1

Annual LTO: 000000000498
TGO: 0
Annual Average Taxi Time: 22.66

Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-500	DEFAULT	LCJP	#1

Annual LTO: 000000005697
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-800	CFM56-3C-1	LCJP	#1

Annual LTO: 000000000208
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:

Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-200C	DEFAULT	HCJP	#1

Annual LTO: 000000000034
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-300	DEFAULT	HCJP	#1

Annual LTO: 000000000002
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:

Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-400	DEFAULT	HCJP	#1

Annual LTO: 000000001424
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-200	DEFAULT	HCJP	#1

Annual LTO: 000000001377
TGO: 0
Annual Average Taxi Time: 22.66

Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B757-200F	DEFAULT	LCJP	#1

Annual LTO: 000000000016
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B757-200	DEFAULT	LCJP	#1

Annual LTO: 000000006828
TGO: 0
Annual Average Taxi Time: 22.66

Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B767-300ER	CF6-80C2A5	HCJP	#1

Annual LTO: 000000002010
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B767-200	DEFAULT	HCJP	#1

Annual LTO: 000000000981
TGO: 0
Annual Average Taxi Time: 22.66

Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B777-200	GE90-76B	HCJP	#1

Annual LTO: 000000004847
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
Learjet 35/36	TFE 731-2-2B	SGJB	Representative Business Jet

Annual LTO: 000000023842
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Kingair 200	PT6A-41	SGTB	Representative GA Turboprop

Annual LTO: 000000004188
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Ground Power Unit	30.00
Diesel Fuel Truck	35.00
Diesel Aircraft Tug Narrow	6.00

Aircraft Name	Engine Type	Aircraft Category	Identification
Navajo	TIO-540-J2B2	SGPB	Representative GA Twin Piston

Annual LTO: 000000003224
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Cherokee six	TIO-540-J2B2	SGPP	Representative GA Single Piston

Annual LTO: 000000000966
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A310-300	DEFAULT	HCJP	Military A310

Annual LTO: 000000002541
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
C-130 HERCULES	T56 series I	LMTC	Military C-130

Annual LTO: 000000001557
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-

Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
TTU228E Hydraulic Test Stand	28.00
NF-2 Light Cart	105.00
MJ1 Bomblift	95.00
M32T1 Pressure Tester	6.00
H1 Heater	105.00
9MC2A Compressor	36.00
590G20P Generator	20.00

Aircraft Name	Engine Type	Aircraft Category	Identification
**Jetstream 31	DEFAULT	SCTP	#1

Annual LTO: 000000031959
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
APU GTCP 36 (80HP)	26.00
Diesel Aircraft Tug Narrow	6.00
Diesel Belt Loader	48.00
Diesel Cabin Service	15.00
Diesel Food Truck	35.00
Diesel Fuel Truck	35.00
Diesel Lavatory Truck	20.00
Gasoline Baggage Tug	85.00

Aircraft Name	Engine Type	Aircraft Category	Identification
**Jetstream 41	DEFAULT	SCTP	#1

Annual LTO: 000000036879
TGO: 0
Annual Average Taxi Time: 22.66
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
APU GTCP 36 (80HP)	26.00
Diesel Aircraft Tug Narrow	6.00

Diesel Belt Loader	48.00
Diesel Cabin Service	15.00
Diesel Food Truck	35.00
Diesel Fuel Truck	35.00
Diesel Lavatory Truck	20.00
Gasoline Baggage Tug	85.00

Parking Lots:

Hourly

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.31 high
Annual number of vehicles: 2572381
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 2000.01
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Daily

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.31 high
Annual number of vehicles: 1106701
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1300.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Remote

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.28 high
Annual number of vehicles: 956177
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1750.01
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Employee Lots

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.28 high
Annual number of vehicles: 1825000
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1000.01
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Saarinen Circle

End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 10329500
Average speed: 30 MPH
Round trip distance: 3.980
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Service Road Loop
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 2372500
Average speed: 25 MPH
Round trip distance: 5.110
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Rent-a-Car
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 2737500
Average speed: 25 MPH
Round trip distance: 1.520
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

N. Employye Lot
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 1825000
Average speed: 25 MPH
Round trip distance: 1.140
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Advanced Dispersion Settings
Urban vs. Rural flag set to urban
Aircraft Settings

Aircraft Size:	Small	Large	Heavy
Initial Sigma Y:	6	15	25
Initial Sigma Z:	2	4	7

Stationary Source Settings
Initial Sigma Y: 2
Initial Sigma Z: 2

ATTACHMENT 2

2007 EDMS EMISSIONS INVENTORY REPORT

This attachment contains the input and output data from the Emissions and Dispersion Model System (EDMS) that was run for the year 2007. The first page contains a summary of the results by mobile source category. This is followed by emission results by operating mode for each aircraft category and a summary of vehicle emissions by airport roadway segment and parking lot. The remaining data are the input assumptions for the model.

EDMS 3.23 Emissions Inventory Report

Study Name: IAD 2007

Airport: WASHINGTON DULLES INTERNA

Report Date: 08/20/02

SUMMARY

(Tons/Year)

NAME	CO	HC	NOx	SOx	PM10
Aircraft	3,993.492	486.739	2,816.552	141.425	.000
GSE/AGE/APU	5,941.324	146.667	517.376	13.619	18.565
Roadways	1,771.254	213.062	188.414	9.857	8.374
Parking Lots	170.836	19.636	7.254	.313	.255
Total	11,876.906	866.104	3,529.596	165.214	27.194

* Report includes 1 Aircraft and 0 GSE created by the user.

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	HC	NOx	SOx	PM10
**Jetstream 41	DEFAULT	APCH	2.905	.133	5.326	.605	.000
**Jetstream 41	DEFAULT	CLMB	1.063	.047	6.611	.590	.000
**Jetstream 41	DEFAULT	TKOF	.204	.010	1.564	.136	.000
**Jetstream 41	DEFAULT	TAXI	64.073	7.689	13.076	2.613	.000
**Jetstream 41	DEFAULT	APU	2.832	.276	13.954	.000	.000
**Jetstream 41	DEFAULT	GSE	479.058	10.920	31.592	1.084	1.408
A300-600R	CF6-80C2A5	TAXI	5.916	.464	1.491	.169	.000
A300-600R	CF6-80C2A5	TKOF	.005	.003	2.252	.043	.000
A300-600R	CF6-80C2A5	CLMB	.008	.010	4.366	.109	.000
A300-600R	CF6-80C2A5	APCH	.224	.013	1.470	.063	.000
A300-600R	CF6-80C2A5	APU	.534	.017	.329	.000	.000
A300-600R	CF6-80C2A5	GSE	7.250	.220	.891	.026	.045
A310	JT9D-20J	TAXI	24.253	8.909	1.200	.196	.000
A310	JT9D-20J	TKOF	.064	.000	3.176	.038	.000
A310	JT9D-20J	CLMB	.164	.000	6.375	.099	.000
A310	JT9D-20J	APCH	.652	.059	1.114	.064	.000
A310	JT9D-20J	APU	.303	.017	.080	.000	.000
A310	JT9D-20J	GSE	6.997	.159	.461	.016	.021
A310-300	DEFAULT	TAXI	75.832	6.558	15.498	1.864	.000
A310-300	DEFAULT	TKOF	.031	.039	17.293	.418	.000
A310-300	DEFAULT	CLMB	.100	.100	36.763	1.081	.000
A310-300	DEFAULT	APCH	3.103	.145	14.376	.655	.000
A310-300	DEFAULT	APU	3.561	.204	.940	.000	.000
A310-300	DEFAULT	GSE	82.327	1.877	5.429	.186	.242
A319	CFM56-5A1	TAXI	131.527	10.462	29.893	4.035	.000
A319	CFM56-5A1	TKOF	1.398	.357	38.223	.839	.000
A319	CFM56-5A1	CLMB	3.605	.921	78.500	2.163	.000
A319	CFM56-5A1	APCH	6.146	.983	19.666	1.327	.000
A319	CFM56-5A1	APU	14.642	.838	3.866	.000	.000
A319	CFM56-5A1	GSE	338.511	7.717	22.323	.766	.995
A320-200	DEFAULT	TAXI	180.238	14.337	40.963	5.530	.000
A320-200	DEFAULT	TKOF	1.916	.490	52.378	1.150	.000

EDMS 3.23 Emissions Inventory

A320-200	DEFAULT	CLMB	4.940	1.262	107.573	2.964	.000
A320-200	DEFAULT	APCH	8.422	1.347	26.950	1.819	.000
A320-200	DEFAULT	APU	2.742	.268	13.511	.000	.000
A320-200	DEFAULT	GSE	463.878	10.574	30.591	1.050	1.364
A330	CF6-80C2B5F	TAXI	25.263	1.897	7.108	.782	.000
A330	CF6-80C2B5F	TKOF	.019	.019	10.786	.204	.000
A330	CF6-80C2B5F	CLMB	.038	.048	20.782	.516	.000
A330	CF6-80C2B5F	APCH	1.024	.062	7.132	.302	.000
A330	CF6-80C2B5F	APU	.000	.000	.000	.000	.000
A330	CF6-80C2B5F	GSE	.000	.000	.000	.000	.000
A330-300	DEFAULT	TAXI	4.015	.289	1.128	.125	.000
A330-300	DEFAULT	TKOF	.003	.002	1.611	.030	.000
A330-300	DEFAULT	CLMB	.006	.006	3.149	.077	.000
A330-300	DEFAULT	APCH	.155	.009	1.062	.045	.000
A330-300	DEFAULT	APU	.000	.000	.000	.000	.000
A330-300	DEFAULT	GSE	.000	.000	.000	.000	.000
A340-200	CFM56-5B1/2P	TAXI	42.544	3.380	4.779	.629	.000
A340-200	CFM56-5B1/2P	TKOF	.205	.026	5.975	.138	.000
A340-200	CFM56-5B1/2P	CLMB	1.241	.065	10.714	.353	.000
A340-200	CFM56-5B1/2P	APCH	9.488	1.520	2.998	.222	.000
A340-200	CFM56-5B1/2P	APU	1.697	.055	1.045	.000	.000
A340-200	CFM56-5B1/2P	GSE	23.045	.698	2.831	.083	.142
A340-300	DEFAULT	TAXI	27.818	4.647	3.428	.442	.000
A340-300	DEFAULT	TKOF	.169	.001	5.938	.098	.000
A340-300	DEFAULT	CLMB	.377	.004	12.150	.254	.000
A340-300	DEFAULT	APCH	.495	.023	2.831	.153	.000
A340-300	DEFAULT	APU	1.216	.039	.749	.000	.000
A340-300	DEFAULT	GSE	16.520	.500	2.029	.059	.102
ATR42	PW120	TAXI	1.698	.000	.650	.062	.000
ATR42	PW120	TKOF	.010	.000	.067	.003	.000
ATR42	PW120	CLMB	.050	.000	.266	.012	.000
ATR42	PW120	APCH	.161	.000	.218	.015	.000
ATR42	PW120	APU	.073	.007	.358	.000	.000
ATR42	PW120	GSE	12.297	.280	.811	.028	.036
B717-200	BR700-715A1-30	TAXI	39.664	.512	13.091	1.316	.000
B717-200	BR700-715A1-30	TKOF	.331	.000	10.177	.229	.000
B717-200	BR700-715A1-30	CLMB	.826	.022	20.541	.595	.000
B717-200	BR700-715A1-30	APCH	2.673	.007	7.956	.384	.000
B717-200	BR700-715A1-30	APU	5.030	.288	1.328	.000	.000
B717-200	BR700-715A1-30	GSE	116.293	2.651	7.669	.263	.342

B727-200	DEFAULT	TAXI	7.966	1.057	2.317	.391	.000
B727-200	DEFAULT	TKOF	.119	.028	2.241	.062	.000
B727-200	DEFAULT	CLMB	.335	.082	4.398	.157	.000
B727-200	DEFAULT	APCH	.528	.105	1.315	.103	.000
B727-200	DEFAULT	APU	.647	.037	.171	.000	.000
B727-200	DEFAULT	GSE	14.969	.341	.987	.034	.044
B737-200C	DEFAULT	TAXI	15.555	3.432	3.190	.594	.000
B737-200C	DEFAULT	TKOF	.180	.026	3.338	.093	.000
B737-200C	DEFAULT	CLMB	.491	.080	6.411	.239	.000
B737-200C	DEFAULT	APCH	.606	.170	1.699	.153	.000
B737-200C	DEFAULT	APU	1.647	.094	.435	.000	.000
B737-200C	DEFAULT	GSE	38.079	.868	2.511	.086	.112
B737-300	DEFAULT	TAXI	73.361	3.396	11.140	1.467	.000
B737-300	DEFAULT	TKOF	.429	.019	9.859	.257	.000
B737-300	DEFAULT	CLMB	1.180	.066	22.675	.660	.000
B737-300	DEFAULT	APCH	2.665	.069	7.481	.464	.000
B737-300	DEFAULT	APU	4.131	.236	1.091	.000	.000
B737-300	DEFAULT	GSE	95.494	2.177	6.297	.216	.281
B737-400	DEFAULT	TAXI	120.728	9.063	12.041	1.711	.000
B737-400	DEFAULT	TKOF	.448	.025	8.264	.269	.000
B737-400	DEFAULT	CLMB	1.313	.066	19.308	.709	.000
B737-400	DEFAULT	APCH	3.741	.071	7.125	.481	.000
B737-400	DEFAULT	APU	5.655	.324	1.493	.000	.000
B737-400	DEFAULT	GSE	130.731	2.980	8.621	.296	.384
B737-500	DEFAULT	TAXI	23.143	1.737	2.308	.328	.000
B737-500	DEFAULT	TKOF	.086	.005	1.584	.052	.000
B737-500	DEFAULT	CLMB	.252	.013	3.701	.136	.000
B737-500	DEFAULT	APCH	.717	.014	1.366	.092	.000
B737-500	DEFAULT	APU	1.084	.062	.286	.000	.000
B737-500	DEFAULT	GSE	25.061	.571	1.653	.057	.074
B737-800	CFM56-3C-1	TAXI	163.287	8.652	26.199	3.290	.000
B737-800	CFM56-3C-1	TKOF	1.021	.034	23.475	.612	.000
B737-800	CFM56-3C-1	CLMB	2.652	.118	52.447	1.591	.000
B737-800	CFM56-3C-1	APCH	5.849	.132	17.170	1.019	.000
B737-800	CFM56-3C-1	APU	9.733	.557	2.570	.000	.000
B737-800	CFM56-3C-1	GSE	225.016	5.129	14.839	.509	.662
B747-200	DEFAULT	TAXI	10.002	2.265	.566	.102	.000
B747-200	DEFAULT	TKOF	.008	.008	1.229	.021	.000
B747-200	DEFAULT	CLMB	.020	.020	2.562	.054	.000

B747-200	DEFAULT	APCH	.105	.019	.483	.033	.000
B747-200	DEFAULT	APU	.139	.005	.086	.000	.000
B747-200	DEFAULT	GSE	1.889	.057	.232	.007	.012
B747-200C	DEFAULT	TAXI	8.896	3.138	.518	.078	.000
B747-200C	DEFAULT	TKOF	.017	.020	1.237	.018	.000
B747-200C	DEFAULT	CLMB	.043	.060	2.526	.046	.000
B747-200C	DEFAULT	APCH	.222	.052	.491	.028	.000
B747-200C	DEFAULT	APU	.120	.004	.074	.000	.000
B747-200C	DEFAULT	GSE	1.626	.049	.200	.006	.010
B747-300	DEFAULT	TAXI	4.877	.639	1.568	.223	.000
B747-300	DEFAULT	TKOF	.066	.013	3.697	.048	.000
B747-300	DEFAULT	CLMB	.137	.030	6.424	.118	.000
B747-300	DEFAULT	APCH	.194	.025	1.221	.075	.000
B747-300	DEFAULT	APU	.322	.010	.198	.000	.000
B747-300	DEFAULT	GSE	4.372	.132	.537	.016	.027
B747-400	DEFAULT	TAXI	114.432	10.051	25.127	2.827	.000
B747-400	DEFAULT	TKOF	.519	.071	33.125	.637	.000
B747-400	DEFAULT	CLMB	1.740	.031	69.917	1.649	.000
B747-400	DEFAULT	APCH	3.785	.246	21.954	1.022	.000
B747-400	DEFAULT	APU	4.396	.142	2.709	.000	.000
B747-400	DEFAULT	GSE	59.711	1.809	7.335	.215	.368
B757-200	DEFAULT	TAXI	165.857	4.611	43.115	6.729	.000
B757-200	DEFAULT	TKOF	1.983	.000	115.579	1.391	.000
B757-200	DEFAULT	CLMB	3.285	.066	210.659	3.548	.000
B757-200	DEFAULT	APCH	4.690	.165	27.894	2.222	.000
B757-200	DEFAULT	APU	13.713	.785	3.621	.000	.000
B757-200	DEFAULT	GSE	317.033	7.227	20.907	.717	.932
B767-200	DEFAULT	TAXI	48.372	10.772	5.832	.926	.000
B767-200	DEFAULT	TKOF	.516	.155	15.259	.278	.000
B767-200	DEFAULT	CLMB	1.490	.501	36.041	.732	.000
B767-200	DEFAULT	APCH	2.346	.377	9.047	.452	.000
B767-200	DEFAULT	APU	3.995	.129	2.461	.000	.000
B767-200	DEFAULT	GSE	54.263	1.644	6.666	.195	.334
B767-300ER	CF6-80C2A5	TAXI	104.487	8.186	26.329	2.987	.000
B767-300ER	CF6-80C2A5	TKOF	.084	.056	39.777	.752	.000
B767-300ER	CF6-80C2A5	CLMB	.142	.178	77.105	1.920	.000
B767-300ER	CF6-80C2A5	APCH	3.958	.228	25.965	1.119	.000
B767-300ER	CF6-80C2A5	APU	9.425	.305	5.808	.000	.000
B767-300ER	CF6-80C2A5	GSE	128.034	3.878	15.728	.461	.789
B777-200	GE90-76B	TAXI	496.421	42.076	72.341	6.644	.000

B777-200	GE90-76B	TKOF	.213	.165	105.966	1.276	.000
B777-200	GE90-76B	CLMB	.795	.367	216.346	3.301	.000
B777-200	GE90-76B	APCH	21.618	2.497	47.261	2.013	.000
B777-200	GE90-76B	APU	14.568	.472	8.977	.000	.000
B777-200	GE90-76B	GSE	197.894	5.995	24.309	.712	1.220
BH-1900C	PT6A-65B	TAXI	27.211	9.070	1.196	.223	.000
BH-1900C	PT6A-65B	TKOF	.079	.000	.118	.009	.000
BH-1900C	PT6A-65B	CLMB	.122	.000	.126	.010	.000
BH-1900C	PT6A-65B	APCH	.771	.134	.159	.019	.000
BH-1900C	PT6A-65B	APU	.000	.000	.000	.000	.000
BH-1900C	PT6A-65B	GSE	.000	.000	.000	.000	.000
BH-C99	PT6A-27	TAXI	58.818	46.107	2.233	.496	.000
BH-C99	PT6A-27	TKOF	.048	.000	.378	.026	.000
BH-C99	PT6A-27	CLMB	.274	.000	1.597	.123	.000
BH-C99	PT6A-27	APCH	5.146	.484	1.848	.119	.000
BH-C99	PT6A-27	APU	1.716	.167	8.454	.000	.000
BH-C99	PT6A-27	GSE	290.255	6.617	19.141	.657	.853
C-130 HERCULES	T56 series I	TAXI	7.826	1.227	10.021	.736	.000
C-130 HERCULES	T56 series I	TKOF	.114	.012	.417	.023	.000
C-130 HERCULES	T56 series I	CLMB	.328	.041	1.076	.060	.000
C-130 HERCULES	T56 series I	APCH	1.261	.171	1.914	.145	.000
C-130 HERCULES	T56 series I	APU	.000	.000	.000	.000	.000
C-130 HERCULES	T56 series I	GSE	8.697	.599	.837	.011	.063
Canadair Reg-100	CF34-3A1	TAXI	630.821	58.491	56.566	7.996	.000
Canadair Reg-100	CF34-3A1	TKOF	.000	.146	28.214	1.312	.000
Canadair Reg-100	CF34-3A1	CLMB	.000	.376	63.613	3.388	.000
Canadair Reg-100	CF34-3A1	APCH	7.714	.528	27.853	2.192	.000
Canadair Reg-100	CF34-3A1	APU	59.139	3.386	15.615	.000	.000
Canadair Reg-100	CF34-3A1	GSE	1,367.209	31.166	90.162	3.093	4.020
Cherokee six	TIO-540-J2B2	TAXI	18.208	.958	.005	.002	.000
Cherokee six	TIO-540-J2B2	TKOF	1.778	.015	.000	.000	.000
Cherokee six	TIO-540-J2B2	CLMB	23.844	.270	.004	.002	.000
Cherokee six	TIO-540-J2B2	APCH	11.890	.000	.013	.001	.000
Cherokee six	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Cherokee six	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
DC8-71F	CFM56-2A SERIES	TAXI	10.014	.482	1.832	.230	.000
DC8-71F	CFM56-2A SERIES	TKOF	.066	.003	1.490	.039	.000
DC8-71F	CFM56-2A SERIES	CLMB	.169	.008	3.247	.101	.000
DC8-71F	CFM56-2A SERIES	APCH	.405	.010	1.036	.064	.000

DC8-71F	CFM56-2A SERIES	APU	.325	.019	.086	.000	.000
DC8-71F	CFM56-2A SERIES	GSE	7.505	.171	.495	.017	.022
DC9-30	DEFAULT	TAXI	38.778	10.305	8.542	1.464	.000
DC9-30	DEFAULT	TKOF	.374	.104	7.148	.224	.000
DC9-30	DEFAULT	CLMB	1.178	.268	14.996	.578	.000
DC9-30	DEFAULT	APCH	1.511	.275	4.327	.371	.000
DC9-30	DEFAULT	APU	.000	.000	.000	.000	.000
DC9-30	DEFAULT	GSE	.000	.000	.000	.000	.000
DHC-8-100	PW120A	TAXI	8.694	.000	3.326	.315	.000
DHC-8-100	PW120A	TKOF	.050	.000	.338	.013	.000
DHC-8-100	PW120A	CLMB	.254	.000	1.360	.060	.000
DHC-8-100	PW120A	APCH	.691	.000	.702	.062	.000
DHC-8-100	PW120A	APU	.372	.036	1.834	.000	.000
DHC-8-100	PW120A	GSE	62.949	1.435	4.151	.142	.185
DO 328	PW119-B	TAXI	5.537	.000	4.804	.360	.000
DO 328	PW119-B	TKOF	.053	.000	.433	.014	.000
DO 328	PW119-B	CLMB	.228	.000	1.604	.059	.000
DO 328	PW119-B	APCH	.458	.000	1.169	.065	.000
DO 328	PW119-B	APU	.000	.000	.000	.000	.000
DO 328	PW119-B	GSE	.000	.000	.000	.000	.000
EMB-145	AE3007A	TAXI	51.317	7.424	11.328	1.597	.000
EMB-145	AE3007A	TKOF	.341	.114	9.348	.246	.000
EMB-145	AE3007A	CLMB	1.100	.347	20.880	.645	.000
EMB-145	AE3007A	APCH	2.647	.517	6.288	.436	.000
EMB-145	AE3007A	APU	1.634	.159	8.052	.000	.000
EMB-145	AE3007A	GSE	276.431	6.301	18.229	.625	.813
F-15	F100-PW-100	TAXI	57.587	14.034	7.147	.881	.000
F-15	F100-PW-100	TKOF	.155	.047	6.774	.093	.000
F-15	F100-PW-100	CLMB	.236	.036	8.000	.140	.000
F-15	F100-PW-100	APCH	1.425	.063	5.036	.221	.000
F-15	F100-PW-100	APU	.000	.000	.000	.000	.000
F-15	F100-PW-100	GSE	14.308	.985	1.377	.017	.103
FOKKER 100	DEFAULT	TAXI	471.361	66.499	48.896	10.562	.000
FOKKER 100	DEFAULT	TKOF	1.892	2.162	57.026	1.459	.000
FOKKER 100	DEFAULT	CLMB	5.633	2.112	118.290	3.602	.000
FOKKER 100	DEFAULT	APCH	18.228	4.206	26.640	2.524	.000
FOKKER 100	DEFAULT	APU	35.221	2.017	9.300	.000	.000
FOKKER 100	DEFAULT	GSE	814.262	18.562	53.697	1.842	2.394
Learjet 35/36	TFE 731-2-2B	TAXI	186.938	63.929	8.996	1.722	.000
Learjet 35/36	TFE 731-2-2B	TKOF	.434	.036	4.749	.168	.000

Learjet 35/36	TFE 731-2-2B	CLMB	.667	.042	4.297	.177	.000
Learjet 35/36	TFE 731-2-2B	APCH	9.111	1.734	2.402	.220	.000
Learjet 35/36	TFE 731-2-2B	APU	.000	.000	.000	.000	.000
Learjet 35/36	TFE 731-2-2B	GSE	.000	.000	.000	.000	.000
MD-80-88	DEFAULT	TAXI	20.873	5.751	5.950	.892	.000
MD-80-88	DEFAULT	TKOF	.243	.090	8.991	.180	.000
MD-80-88	DEFAULT	CLMB	1.006	.352	17.443	.453	.000
MD-80-88	DEFAULT	APCH	2.183	.853	4.897	.290	.000
MD-80-88	DEFAULT	APU	2.436	.139	.643	.000	.000
MD-80-88	DEFAULT	GSE	56.312	1.284	3.714	.127	.166
Navajo	TIO-540-J2B2	TAXI	62.291	3.278	.019	.005	.000
Navajo	TIO-540-J2B2	TKOF	6.082	.052	.002	.000	.000
Navajo	TIO-540-J2B2	CLMB	81.573	.922	.013	.006	.000
Navajo	TIO-540-J2B2	APCH	40.677	.000	.045	.004	.000
Navajo	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Navajo	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
SF-340-B PLUS	CT7-5	TAXI	1.588	.179	.099	.024	.000
SF-340-B PLUS	CT7-5	TKOF	.011	.004	.060	.002	.000
SF-340-B PLUS	CT7-5	CLMB	.054	.020	.265	.011	.000
SF-340-B PLUS	CT7-5	APCH	.092	.026	.119	.009	.000
SF-340-B PLUS	CT7-5	APU	.000	.000	.000	.000	.000
SF-340-B PLUS	CT7-5	GSE	.000	.000	.000	.000	.000

** Denotes User Created Aircraft

VEHICULAR EMISSIONS

(Tons/Year)

Source	CO	HC	NOx	SOx	PM10
N. Employee Lot	53.711	6.100	4.954	.259	.220
Rent-a-Car	134.203	15.243	12.377	.648	.550
Saarinen Circle	1,161.193	143.773	132.148	6.913	5.873
Service Road Loop	422.148	47.947	38.934	2.037	1.730
Daily	3.263	.381	.133	.005	.005
Employee Lots	34.541	4.104	1.348	.060	.040
Hourly	99.260	11.284	4.322	.191	.153
Remote	33.772	3.868	1.450	.057	.057

EDMS 3.23 Study Information IAD 2007

Date: Tuesday, August 20, 2002
Study Created: Tuesday, June 12, 2001
Study Pathname: P:\INDUSTRIAL & OTHER\ARCHITECT-ENGINEER\PARSONS MGT CONSULTANTS\1384001\MGMT\EDMS\IAD 2007\IAD 2007.ED

Airport: WASHINGTON DULLES INTERNA, VA IAD
Airport Location (lat / lon): 38-56-40.897N 077-27-20.864W
Field elevation: 313
English airport layout units selected
Average temperature: 58.
Mixing Height: 3000
Vehicle fleet year: 2005

2007 Emissions Inventory
Hourly Profiles:
DEFAULT

Hour	Fraction of Peak	Hour	Fraction of Peak	Hour	Fraction of Peak
1	1.000	9	1.000	17	1.000
2	1.000	10	1.000	18	1.000
3	1.000	11	1.000	19	1.000
4	1.000	12	1.000	20	1.000
5	1.000	13	1.000	21	1.000
6	1.000	14	1.000	22	1.000
7	1.000	15	1.000	23	1.000
8	1.000	16	1.000	24	1.000

Daily Profiles:
DEFAULT

Day	Fraction of Peak	Day	Fraction of Peak
Monday	1.000	Friday	1.000
Tuesday	1.000	Saturday	1.000
Wednesday	1.000	Sunday	1.000
Thursday	1.000		

Monthly Profiles:
DEFAULT

Month	Fraction of Peak	Month	Fraction of Peak
January	1.000	July	1.000
February	1.000	August	1.000
March	1.000	September	1.000
April	1.000	October	1.000
May	1.000	November	1.000
June	1.000	December	1.000

Aircraft:

Aircraft Name	Engine Type	Aircraft Category	Identification
A300-600R	CF6-80C2A5	HCJP	#1

Annual LTO: 000000000330
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
ATR42	PW120	SCTP	#1

Annual LTO: 000000000580
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
BH-1900C	PT6A-65B	SCTP	Beechcraft 1900C

Annual LTO: 000000004100
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Canadair Reg-100	CF34-3A1	LCJP	#1

Annual LTO: 000000064485
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DHC-8-100	PW120A	SCTP	#1

Annual LTO: 000000002969
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00

Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DO 328	PW119-B	SCTP	Dornier

Annual LTO: 000000002582
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
DC8-71F	CFM56-2A SERIES	HCJP	#1

Annual LTO: 000000000354
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
DC9-30	DEFAULT	LCJP	#1

Annual LTO: 000000004537
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
EMB-145	AE3007A	LCJP	#1

Annual LTO: 000000013038
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
SF-340-B PLUS	CT7-5	SCTP	Saab Fairchild 340

Annual LTO: 000000000646
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
FOKKER 100	DEFAULT	LGJB	#1

Annual LTO: 000000038405
TGO: 0

Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A310	JT9D-20J	HCJP	#1

Annual LTO: 000000000330
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A319	CFM56-5A1	LCJP	#1

Annual LTO: 000000015966
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A320-200	DEFAULT	LCJP	#1

Annual LTO: 000000021879
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A330	CF6-80C2B5F	HCJP	#1

Annual LTO: 000000001518
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-

Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A330-300	DEFAULT	HCJP	Surrogate for A330-200

Annual LTO: 000000000219
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A340-200	CFM56-5B1/2P	HCJP	#1

Annual LTO: 000000001049
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
A340-300	DEFAULT	HCJP	Surrogate for A343

Annual LTO: 000000000752
TGO: 0

Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B717-200	BR700-715A1-30	LCJP	#1

Annual LTO: 000000005485
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B727-200	DEFAULT	LCJP	#1

Annual LTO: 000000000706
TGO: 0

Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-200C	DEFAULT	LCJP	#1

Annual LTO: 000000001796
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-300	DEFAULT	LCJP	#1

Annual LTO: 000000004504
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-400	DEFAULT	LCJP	#1

Annual LTO: 000000006166
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-500	DEFAULT	LCJP	#1

Annual LTO: 000000001182
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-

Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B737-800	CFM56-3C-1	LCJP	#1

Annual LTO: 000000010613
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-200C	DEFAULT	HCJP	#1

Annual LTO: 000000000074
TGO: 0
Annual Average Taxi Time: 34.20
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00

Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-300	DEFAULT	HCJP	#1

Annual LTO: 000000000199
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-400	DEFAULT	HCJP	#1

Annual LTO: 000000002718
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-

Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B747-200	DEFAULT	HCJP	#1

Annual LTO: 000000000086
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B757-200	DEFAULT	LCJP	#1

Annual LTO: 000000014953
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B767-300ER	CF6-80C2A5	HCJP	#1

Annual LTO: 000000005828
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B767-200	DEFAULT	HCJP	#1

Annual LTO: 000000002470
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
B777-200	GE90-76B	HCJP	#1

Annual LTO: 000000009008
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Water Truck	12.00
Diesel Transporter	10.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Container Loader	92.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Airstart Unit	3.00
Diesel Airstart Transporter	3.00
Diesel Aircraft Tug Wide	8.00
APU GTCP 660 (300 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
Learjet 35/36	TFE 731-2-2B	SGJB	Representative Business Jet

Annual LTO: 000000028710
TGO: 0

Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:
GSE Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Navajo	TIO-540-J2B2	SGPB	Representative GA Twin Piston

Annual LTO: 000000003250
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:
GSE Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
Cherokee six	TIO-540-J2B2	SGPP	Representative GA Single Piston

Annual LTO: 000000000950
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:
GSE Op Time

Aircraft Name	Engine Type	Aircraft Category	Identification
A310-300	DEFAULT	HCJP	Military A310

Annual LTO: 000000003883
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT

Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
C-130 HERCULES	T56 series I	LMTC	Military C-130

Annual LTO: 000000001550
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
H1 Heater	105.00
590G20P Generator	20.00

Aircraft Name	Engine Type	Aircraft Category	Identification
**Jetstream 41	DEFAULT	SCTP	#1

Annual LTO: 000000022595
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
APU GTCP 36 (80HP)	26.00

Diesel Aircraft Tug Narrow	6.00
Diesel Belt Loader	48.00
Diesel Cabin Service	15.00
Diesel Food Truck	35.00
Diesel Fuel Truck	35.00
Diesel Lavatory Truck	20.00
Gasoline Baggage Tug	85.00

Aircraft Name	Engine Type	Aircraft Category	Identification
BH-C99	PT6A-27	SCTP	Beechcraft C99

Annual LTO: 000000013690
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 36 (80HP)	26.00

Aircraft Name	Engine Type	Aircraft Category	Identification
F-15	F100-PW-100	LMJA	Representative Military Jet

Annual LTO: 000000002550
TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
H1 Heater	105.00
590G20P Generator	20.00

Aircraft Name	Engine Type	Aircraft Category	Identification
MD-80-88	DEFAULT	LCJP	MD80 Narrow Body

Annual LTO: 000000002656

TGO: 0
Annual Average Taxi Time: 35.00
Annual Average Queue Time: 0.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT
Assigned Gate:
Aircraft does not use configurations
Assigned Taxiway 1: -NONE-
Assigned Taxiway 2: -NONE-
Assigned Taxiway 3: -NONE-
Assigned Runway:
Assigned GSE/AGE:

GSE	Op Time
Gasoline Baggage Tug	85.00
Diesel Lavatory Truck	20.00
Diesel Fuel Truck	35.00
Diesel Food Truck	35.00
Diesel Cabin Service	15.00
Diesel Belt Loader	48.00
Diesel Aircraft Tug Narrow	6.00
APU GTCP 85 (200 HP)	26.00

Parking Lots:

Hourly

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.31 high
Annual number of vehicles: 3470000
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 2000.01
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Daily

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.31 high
Annual number of vehicles: 149500
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1300.00
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Remote

Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.31 high
Annual number of vehicles: 1290000
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1750.01
Hourly Profile: DEFAULT

Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Employee Lots
Coordinates (lower left corner): (0.00, 0.00)
492.00 long by 328.00 wide
3.28 high
Annual number of vehicles: 1825000
Average Speed: 10 MPH
Average Idle Time: 1.5 minutes
Average Distance Traveled: 1000.01
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Saarinen Circle
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 13945000
Average speed: 30 MPH
Round trip distance: 3.980
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Service Road Loop
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 3200000
Average speed: 25 MPH
Round trip distance: 5.110
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Rent-a-Car
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 3420000
Average speed: 25 MPH
Round trip distance: 1.520
Hourly Profile: DEFAULT
Daily Profile: DEFAULT
Monthly Profile: DEFAULT

N. Employee Lot
End 1 coordinates: (0.00, 0.00)
End 2 coordinates: (0.00, 0.00)
Type: AG
Roughness: 74.00
Annual number of vehicles: 1825000
Average speed: 25 MPH
Round trip distance: 1.140
Hourly Profile: DEFAULT

Daily Profile: DEFAULT
Monthly Profile: DEFAULT

Advanced Dispersion Settings
Urban vs. Rural flag set to urban
Aircraft Settings

Aircraft Size:	Small	Large	Heavy
Initial Sigma Y:	6	15	25
Initial Sigma Z:	2	4	7

Stationary Source Settings
Initial Sigma Y: 2
Initial Sigma Z: 2

ATTACHMENT 3

MOBILE LOUNGE AND PLANEMATE
and
CONSTRUCTION EQUIPMENT
EMISSION CALCULATIONS

1999 IAD MOBILE LOUNGE AND PLANEMATE EMISSIONS

MWAA Data

41 Mobile Lounges/Planemates
Each has one propulsion engine and one APU.
Propulsion: Cummins C series, 8.3-liter diesel
APU: Cummins B series, 5.9-liter diesel (Cummins says these are 3.9-liter, based on serial numbers given to Cummins).
Total Daily Average Fuel Consumption: 1250-1350 gallons/day (say 1300 gallons/day).

Data from Cummins

Engine	Planemate APU (no data available for the other three engine types)	
Service	Prime (not standby)	
BHP @ 1	78	BHP
Fuel Con	3.96	gal/hr
Exhaust Emissions		
	0.57	grams/hp-hr
	11.81	grams/hp-hr
	0.34	grams/hp-hr
	0.25	grams/hp-hr
	0.63	grams/hp-hr

Assumptions

Assume that the engine for which we have data is representative of the others in terms of grams of pollutant per gallon of fuel.
Conversion from HC to VOC is assumed to be the same as for heavy duty diesel engines cited in EPA 1992 (Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, Report EPA420-R-92-009, U.S. EPA Office of Mobile Sources and Office of Air Quality Planning and Standards).

	HC	VOC-HC Conversion	VOC	NOx	CO	PM	SO2
A. Emission Factor (g/hp-hr)	0.57	1.005	0.57	11.81	0.34	0.25	0.63
B. Horsepower (hp)	78		78.00	78.00	78.00	78.00	78.00
C. Hourly Emissions (g/hr) [A*B]	44.46	1.005	44.68	921.18	26.52	19.50	49.14
D. Hourly fuel consumption (gal/hr)	3.96		3.96	3.96	3.96	3.96	3.96
E. Emissions per gallon of fuel (g/gal) [C/D]	11.23	1.005	11.28	232.62	6.70	4.92	12.41
F. Fleet daily fuel consumption (gal/day)	1,300		1,300	1,300	1,300	1,300	1,300
G. Fleet daily emissions (g/day) [E*F]	14,595	1.005	14,668	302,408	8,706	6,402	16,132
H. Fleet annual emissions (tonnes/yr) [G*365/1000000]	5.33	1.005	5.35	110.38	3.18	2.34	5.89
I. Fleet annual emissions (tons/yr) [H*1.023113]	5.87	1.005	**5.90**	**121.67**	**3.50**	**2.58**	**6.49**

Source: MWAA 2001

NO BUILD 2007 IAD MOBILE LOUNGE AND PLANEMATE EMISSIONS

MWAA Data

41 Mobile Lounges/Planemates
Each has one propulsion engine and one APU.
Propulsion: Cummins C series, 8.3-liter diesel
APU: Cummins B series, 5.9-liter diesel (Cummins says these are 3.9-liter, based on serial numbers given to Cummins).
Total Daily Average Fuel Consumption: Assume an approximate 25 percent increase over the estimated 1999 consumption of 1,300 gallons/day to account for increases in flight operations.

Data from Cummins

Engine	Planemate APU (no data available for the other three engine types)	
Service	Prime (not standby)	
BHP @ 1	78	BHP
Fuel Con	3.96	gal/hr
Exhaust Emissions		
	0.57	grams/hp-hr
	11.81	grams/hp-hr
	0.34	grams/hp-hr
	0.25	grams/hp-hr
	0.63	grams/hp-hr

Assumptions

Assume that the engine for which we have data is representative of the others in terms of grams of pollutant per gallon of fuel.
Conversion from HC to VOC is assumed to be the same as for heavy duty diesel engines cited in EPA 1992 (Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, Report EPA420-R-92-009, U.S. EPA Office of Mobile Sources and Office of Air Quality Planning and Standards).

	HC	VOC-HC Conversion	VOC	NOx	CO	PM	SO2
A. Emission Factor (g/hp-hr)	0.57	1.005	0.57	11.81	0.34	0.25	0.63
B. Horsepower (hp)	78		78.00	78.00	78.00	78.00	78.00
C. Hourly Emissions (g/hr) [A*B]	44.46	1.005	44.68	921.18	26.52	19.50	49.14
D. Hourly fuel consumption (gal/hr)	3.96		3.96	3.96	3.96	3.96	3.96
E. Emissions per gallon of fuel (g/gal) [C/D]	11.23	1.005	11.28	232.62	6.70	4.92	12.41
F. Fleet daily fuel consumption (gal/day)	1,625		1,625	1,625	1,625	1,625	1,625
G. Fleet daily emissions (g/day) [E*F]	18,244	1.005	18,336	378,009	10,883	8,002	20,165
H. Fleet annual emissions (tonnes/yr) [G*365/1000000]	6.66	1.005	6.69	137.97	3.97	2.92	7.36
I. Fleet annual emissions (tons/yr) [H*1.023113]	7.34	1.005	**7.38**	**152.09**	**4.38**	**3.22**	**8.11**

Source: MWAA 2001

BUILD 2007 IAD MOBILE LOUNGE AND PLANEMATE EMISSIONS

MWAA Data

18 Mobile Lounges/Planemates
Each has one propulsion engine and one APU.
Propulsion: Cummins C series, 8.3-liter diesel
APU: Cummins B series, 5.9-liter diesel (Cummins says these are 3.9-liter, based on serial numbers given to Cummins).
Total Daily Average Fuel Consumption: 100 gallons/day

Data from Cummins

Engine	Planemate APU (no data available for the other three engine types)	
Service	Prime (not standby)	
BHP @ 1	78	BHP
Fuel Con	3.96	gal/hr
Exhaust Emissions		
	0.57	grams/hp-hr
	11.81	grams/hp-hr
	0.34	grams/hp-hr
	0.25	grams/hp-hr
	0.63	grams/hp-hr

Assumptions

Assume that the engine for which we have data is representative of the others in terms of grams of pollutant per gallon of fuel.
Conversion from HC to VOC is assumed to be the same as for heavy duty diesel engines cited in EPA 1992 (Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, Report EPA420-R-92-009, U.S. EPA Office of Mobile Sources and Office of Air Quality Planning and Standards).

	HC	VOC-HC Conversion	VOC	NOx	CO	PM	SO2
A. Emission Factor (g/hp-hr)	0.57	1.005	0.57	11.81	0.34	0.25	0.63
B. Horsepower (hp)	78.00		78.00	78.00	78.00	78.00	78.00
C. Hourly Emissions (g/hr) [A*B]	44.46	1.005	44.68	921.18	26.52	19.50	49.14
D. Hourly fuel consumption (gal/hr)	3.96		3.96	3.96	3.96	3.96	3.96
E. Emissions per gallon of fuel (g/gal) [C/D]	11.23	1.005	11.28	232.62	6.70	4.92	12.41
F. Fleet daily fuel consumption (gal/day)	100		100	100	100	100	100
G. Fleet daily emissions (g/day) [E*F]	1,123	1.005	1,128	23,262	670	492	1,241
H. Fleet annual emissions (tonnes/yr) [G*365/1000000]	0.41	1.005	0.41	8.49	0.24	0.18	0.45
I. Fleet annual emissions (tons/yr) [H*1.023113]	0.45	1.005	**0.45**	**9.36**	**0.27**	**0.20**	**0.50**

Source: MWAA 2001

Summary of Diesel and Other Heavy Equipment for IAD Construction Projects

Project	Daily Output*	Total Output*	Unit*	Work Day* (hours)	Equipment*																					
					Concrete Pavers		Concrete Saw		Cranes		Crushing Equipment		Excavators		Graders		Dump Trucks		Paving Equipment		Rubber-Tired Dozer		Rubber Tired Loaders		Tractor/ Loader/ Backhoe		Total	
					(days)	(hours)	(days)	(hours)	(months)	(hours)	(months)	(hours)	(months)	(hours)	(days)	(hours)	(days)	(hours)	(days)	(hours)	(days)	(hours)	(days)	(hours)	(days)	(hours)	(days)	(hours)
Tunneling**	---	---	---	8	0	0	5,560	44,478	0	0	0	0	0	0	0	0	14,172	113,375	0	0	5,231	41,845	8,305	66,440	10,738	85,907	44,006	352,045
South Employee Parking Lot Demolition	420	98,958	S.Y	8	0	0	0	0	0	0	236	1,885	0	0	0	0	236	1,885	0	0	0	0	236	1,885	236	1,885	942	7,540
Clearing of Land South of Tier 2	2	160	Acres	8	0	0	0	0	0	0	0	0	80	640	0	0	80	640	0	0	0	0	0	0	0	0	160	1,280
Paving of Land South of Tier 2	1,500	774,400	S.Y.	8	516	4,130	0	0	0	0	0	0	0	0	516	4,130	0	0	516	4,130	0	0	0	0	0	0	1,549	12,390
C/D Concourse Demolition	15,300	2,326,760	C.F.	8	0	0	0	0	152	1,217	0	0	0	0	0	0	152	1,217	0	0	0	0	152	1,217	0	0	456	3,650
Paving of Former C/D Concourse Area	1,500	58,667	S.Y.	8	39	313	0	0	0	0	0	0	0	0	39	313	0	0	39	313	0	0	0	0	0	0	117	939
				Total	555	4,443	5,560	44,478	152	1,217	236	1,885	80	640	555	4,443	14,640	117,117	555	4,443	5,231	41,845	8,693	69,542	10,974	87,792	47,230	377,844

Notes

* Source: MEANS database

** Source: T. Richardson, Parsons Management Consultants, April 2001

Days of usuge equals total output divided by daily output

Hours equals days of usage times daily work time

Summary of Diesel and Other Heavy Equipment for IAD Tunnel Project

Project	Section	Method	Duration (months)	Volume (cy)	Shifts (per wk)	Equipment: Muckers (months)	Muckers Total Hours	Front End Loader (months)	Front End Loader Total Hours	Dump Truck (trips)	Bulldozer (months)	Bulldozer (hours)	Rocksaw (months)	Rocksaw (hours)	Backhoe (months)	Backhoe (hours)
APM Tunnels	West-Tier 2 to Taxiway A	TBM	6	60,000	18	0		6	1871	7500	6	1871		0		0
	East-Tier 2 to Taxiway A	TBM	6	60,000	18	0		6	1871	7500	6	1871		0		0
	East-Curved Section near Tax.A	NATM	6	10,000	18	6	1871	6	1871	1250	3	935		0		0
	West-Curved Section near Tax.A	NATM	6	10,000	18	6	1871	6	1871	1250	3	935		0		0
	Open Cut at West Main Terminal	Open Cut	12	30,000	10	0		12	2078	3750	6	1039	12	3118	8	1386
	Open Cut at Tier 2-East and West	Open Cut	6	40,000	10	0		12	2078	5000	3	520	12	3118	10	1732
	Open Cut south of Tier 2 to VMF	Open Cut	18	40,000	20	0		36	12470	5000	18	6235	36	18706	36	12470
Tug Tunnels	West-Tier 2 to Taxiway A	NATM	18	50,000	18	36	11223	18	5612	6250	9	2806		0		0
	East-Tier 2 to Taxiway A	NATM	18	50,000	18	36	11223	18	5612	6250	9	2806		0		0
	Open Cut at West Main Terminal	Open Cut	8	10,000	10	0		8	1386	1250	4	693	8	2078	4	693
	Open Cut at Tier 2-East and West	Open Cut	6	20,000	10	0		6	1039	2500	3	520	6	1559	6	1039
	Open Cut south of Tier 2 to Tier 3	Open Cut	12	25,000	20	0		12	4157	3125	12	4157	12	6235	12	4157
Baggage Tunnels	East-Tier 2 to Main Terminal	NATM	24	80,000	18	48	14964	24	7482	10000	24	7482		0		0
	Open Cut at East Main Terminal	Open Cut	3	2,000	10	0		3	520	250	3	520	3	779	3	520
	Open Cut at Tier 2-East and West	Open Cut	3	50,000	10	0		3	520	6250	3	520	3	779	3	520
International APM Tunnels	Tier 2 to Tier 1	TBM	8	60,000	18	0		6	1871	7500	4	1247		0		0
	Curved Section near Tax.A	NATM	8	10,000	18	6	1871	4	1247	1250	4	1247		0		0
	Open Cut at West Main Terminal	Open Cut	6	30,000	10	0		6	1039	3750	3	520	6	1559	6	1039
	Open Cut at Tier 2	Open Cut	6	40,000	10	0		6	1039	5000	3	520	6	1559	6	1039
Walkback Tunnel to Tier 2	Tier 2 to Concourse B	NATM	24	80,000	18	48	14964	24	7482	10000	12	3741		0		0
Utility Tunnel from West UB to Concourse B	West UB to Conc B	NATM														
Vehicle Maintenance Facility	Open Cut- Building	Open Cut	8	75,000	12	0		8	1663	9375	4	831	8	2494	8	1663
	Open Cut - Track Yard	Open Cut	8	75,000	12	0		8	1663	9375	4	831	8	2494	8	1663
	Total			907,000			57,987		66,440	113,375		41,845		44,478		27,920

Notes

All equipment assumes 50% usage except rock saws at 75%

2 Hours equals months of usage times shifts time usage

3 Where months of equipment does not equal duration, assumes not full time usage (equipment less than duration) or multiple equipment (equipment more than duration)

4 Dump truck trips assume volume divided by 8 cy per trip; depending on disposal site, each trip = 1 hour

Source: T. Richardson, Parsons Management Consultants, April 2001

APPENDIX D

HISTORICAL AND ARCHAEOLOGICAL INFORMATION AND MEMORANDUMS OF AGREEMENT

This appendix contains a figure and table of the past archaeological surveys, and historic and prehistoric sites identified in archival sources at IAD. This appendix also contains three Memorandums of Agreement (MOA): March 17, 1993 MOA on the Midfield Concourse Facilities; April 5, 1993 MOA on the Main Terminal Expansion; and 1987 Programmatic MOA on Historic Preservation. Additionally, signature pages from the Tier 2 and Related Facilities Project and the IAD South Substation/Utility Building Phase I Survey "Statement of Concurrence" letters dated March 14, 2002 and March 11, 2002 are included.

ATTACHMENT 1

1999 EDMS EMISSIONS INVENTORY REPORT

This attachment contains the input and output data from the Emissions and Dispersion Model System (EDMS) that was run for the year 1999. The first page contains a summary of the results by mobile source category. This is followed by emission results by operating mode for each aircraft category and a summary of vehicle emissions by airport roadway segment and parking lot. The remaining data are the input assumptions for the model.

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
Survey Areas (Initial Survey 1989 – VDOT 1987, AU 1987, and ES 1989)				
Runway	Most of the survey area is forested with pines of uniform size and alignment, indicative of recent re-seeding; 2 concentrations of prehistoric lithics (R1 & R2) were found in the northern third of the runway area	Expends from the northeast corner of the airport property south along Stallion Branch to Runway 12/30	All nineteenth and twentieth century homesteads have been cleared away; the area does not appear to have been grubbed and re-seeded and it is possible that more remains lie under the dense and thorny scrub	PMC (1989a)
FBO	FBO survey area was a field about 800 ft wide by 4000 ft long; extremely level contour suggests that the area was graded; large spreads of road gravel and asphalt pieces scattered throughout indicate previous and widespread disturbance	East of the northern half of runway 19R/1L	No intact soils remain anywhere within the FBO survey area; no possibility of recovering archaeological resources	PMC (1989a)
Dead Run	Drainage of Dead Run; forested; uniform size and alignment of the trees indicate that the area has been graded and re-seeded since the airport's initial construction	West of Flight Line Rd	The Dead Run Survey Area seems to have been infrequently occupied in prehistoric times; yielded no historic material; no historic structures were located in this area	PMC (1989a)
Cain Branch	Survey area consisted of a pine forest seeded after airport construction; Sites C1, C2, C3, and 84	Southeastern panhandle of airport property	Three prehistoric sites were identified (C1, C2, C3); 11 prehistoric sites are known from previous survey work along Cain Branch; high potential for finding prehistoric occupations within the southeastern section of the airport; also the remains of 11 historic structures (84) (Travis family, 1958) were found – more extensive archaeological investigation will be required to recover evidence of earlier phases	PMC (1989a)
Satellite Site (Phase II)	Phase II excavations at the Satellite site; a walkover of the site during construction revealed evidence of prehistoric and historic occupations (44LD423); construction was delayed	North of Dulles Lake and the Dulles Access Rd	The prehistoric site functioned as a staging area for hunting game; historic artifacts consisted of domestic goods dating to the eighteenth century; the intact area may be eligible for the National Register of Historic Places; further destruction without prior investigation would constitute an extremely adverse effect	PMC (1989b)
Horsepen Run	Testing took place along the 260 to 280 ft contour lines which rise above a confluence of Horsepen Run and a small tributary; the area is forested with pines of uniform size and alignment, indicative of recent re-seeding	Northeast section of the airport	The survey area yielded no historic material; there is potential for historic sites east of the survey area and west of the airport property line; nineteenth century maps indicate there was occupation in this area; the potential for finding additional sites along Horsepen Run and its tributaries is high	PMC (1989a)
Dulles Toll Road Extension (Phase I)	Cultural resources survey for the proposed Dulles Toll Road Extension; Sites 380, 381, 382, 383, 384, 385, 386 (44LD380 – 44LD386)	Northern portion of the airport	7 sites were surveyed within airport boundaries; 3 sites (380, 382, and 386) were found disturbed and no further testing was recommended; 4 sites (381, 383, 384, and 385) should have further testing conducted before construction is allowed to proceed	WAPORA (1988)
Dulles Toll Road Extension (Phase II)	Phase II cultural resources survey for the Dulles Toll Road Extension; field work conducted May – Nov 1988; Sites 379, 383, 384, 385, 405, 406, 408 (44LD379, 383-385, 405, 406, 408)	Northern portion of the airport	8 sites were surveyed within airport boundaries; sites (379, 405, & 406) must be protected from destruction; the context of site (383) has been disrupted by cultural and natural disturbances; no significant data resources remain at sites (384, 385, & 408)	WAPORA (1990)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
Survey Areas (1990 to Present)				
Remote Employee Parking Lot (Phase I & II)	Phase I & II testing survey for the proposed construction of a remote employee parking lot and access road to the lot; survey completed in October 2000; 160 acres; Site 385 (44LD385)	Northeast corner of the airport	One archaeological site (385) was revisited and 4 artifact locations were recorded; as a result of Phase II testing it was determined that 385 was not significant; the site has been disturbed by agricultural and pine planting activities; no additional archaeological investigations are recommended; if buried cultural resources are found during construction then ground disturbing activities will cease and the Authority will be notified	Burns & McDonnell (2000)
Satellite Parking Facilities (Phase II)	Phase II testing survey for the proposed expansion of the Green Lot Satellite Parking Facility; investigation to determine the eligibility of 44LD423 to the National Register	North of Dulles Lake and the Dulles Access Rd	The Phase II testing determined that the entire site has been disturbed by agricultural usage, soil erosion, the construction of a sewer line, airport construction activities, and construction of the Green Lot; the site is not eligible for the National Register and no further work is recommended for this site	Greenhorne & O'Mara (1993)
Proposed PMC Office Site (Phase I/II)	Phase I & Phase II testing survey for the proposed PMC Office site; survey work performed in Oct – Dec 2000; 9.7 acres; Site 384 (44LD384)	Northeast portion of the airport	A single prehistoric concentration (384) was identified along the west side; Dulles Toll Rd Extension survey concluded that site 384 does not have significant data resources	EAC/A (2001)
Police/Fire Facilities (Phase I)	Phase I testing survey for the proposed construction of a Police/Fire Facility; survey completed in December 1991; 6 acres; Site 500 (44LD500)	North of the Main Terminal	One prehistoric site was identified, the Trueno Site (44LD500); evidence of previous disturbance; no additional work was recommended	Greenhorne & O'Mara (1991)
Live Fire Training Facility (Phase I)	Phase I investigation for the proposed construction of a Live Fire Training Facility; field work Sept/Oct 1991; 18 acres	Southeastern portion of the airport	Material recovered at the site was considered isolated finds rather than artifacts representative of prehistoric occupation if the area, no further work is recommended	Greenhorne & O'Mara (1992)
Proposed Materials Recovery Facility (Phase I)	Phase I testing survey for the proposed construction of a new Materials Recovery Facility; survey completed in February 1995; 4 acres	Southern portion of airport; intersection of Willard and Hoxie Rds	No archaeological resources were encountered within the proposed impact area; no further archaeological investigations are necessary	Greenhorne & O'Mara (1995)
Excess Spoils Site (Phase I)	Phase I testing survey for an excess excavation spoils storage site; 9.7 hectares; Sites 797 & 798 (44LD797 & 44LD798)	Southern portion of the airport; east of Pleasant Valley Rd	Two small prehistoric sites were located; the findings are not of sufficient substance to warrant further archaeological study	EAC/A (2001d)
Staging Area I (Phase I)	Phase I testing survey for proposed Staging Area I; survey date November 2000; 83.4 acres	Southern portion of airport near Gate 1	Survey revealed no evidence of significant archeological resources; seven isolated prehistoric artifact loci and four isolated historic artifact loci were detected	EAC/A (2001c)
Proposed Substation/SEDC & South Utility Building Sites	Phase I testing survey for two proposed development parcels; field work December 2001; 10 acres	Eastern portion of the airport along Flight Line Road	No archaeological materials were recovered during the survey at either the Substation/SEDC or the South Utility Building sites	EAC/A (2001e)
Batch Plant (Phase I)	Phase I archaeological survey of the proposed Batch Plant Site; 9.7 acres	Southern portion of the airport; west of Willard Rd	Investigation discovered several isolated prehistoric and historic artifacts; none of the artifacts were found significant; no further investigation recommended	EAC/A (2001)
Known Prehistoric Sites				
R1 R2	2 concentrations of prehistoric lithics (R1 & R2) were found in the northern third of the runway area; most area is forested with pines of uniform size and alignment,	Expends from the northeast corner of the airport property	All nineteenth and twentieth century homesteads have been cleared away; the area does not appear to have been grubbed and re-seeded and it is possible that more remains lie under	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
	indicative of recent re-seeding	south along Stallion Branch to Runway 12/30	the dense and thorny scrub	
C1 C2 C3	Three prehistoric sites were identified (C1, C2, C3); pine forest seeded after airport construction	Southeastern panhandle of airport property	High potential for finding prehistoric occupations within the southeastern section of the airport; remains of 11 historic structures (Travis family, 1958) were found - more extensive archaeological investigation will be required to recover evidence of earlier phases	PMC (1989a)
423 (44LD423)	A single large multi-component prehistoric concentration (423) was identified; staging area for hunting game	Northeast portion of the airport	Uniform size and alignment of the trees reflect re-seeding after the airport's initial construction; construction has obliterated an indeterminable amount of the site	EAC/A (2001)
Known Historic Sites/Resources				
Sully Plantation and Park	The home of Richard Bland Lee, northern Virginia's first congressman***;*** the main house was built in 1794; it was saved from demolition as part of construction of nearby Dulles Airport; the house and grounds have been restored and are operated by Fairfax County Park Authority; National Register site; Site 83	Southeastern portion of airport	Not Applicable	PMC (1989a)
Railroad Embankment	An abandoned elevated railroad embankment extends for almost four miles across the southern width of the airport; the embankment is generally thought to be the remnant of a pre-Civil War project intended to connect Leesburg with the coast by a spur line; construction had proceeded as far as the present embankment when the war began; lack of funds and manpower stopped the project	Southern portion of airport	Not Applicable	PMC (1989a)
South Service Road Site	A group of artifacts dating primarily to the civil War era was found on a small hillock; no excavation took place	Intersection of Flight Line Road and Willard Road	A stone foundation was visible; the quantity of finds suggest at least a temporary occupation on the hill; excavation may reveal foundations and other related artifacts which would clarify the sites function and date	PMC (1989a)
Previously Recorded Archaeological Sites				
161 (44FX161)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
190 (44FX190)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
297 (44LD297)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northeast portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions	PMC (1989a)
298 (44LD298)	Historic and prehistoric site identified along the upper sections of Horsepen run drainage	Northeast portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; historic site may be associated with the Coleman residence located slightly north of airport property	PMC (1989a)
299 (44LD299)	Historic and prehistoric site identified along the upper	Northeast portion of	The site is small to moderate is size representing ephemeral	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
	sections of Horsepen run drainage	airport	encampments along the watershed for the purpose of either hunting or foraging expeditions; historic site may be associated with the Coleman residence located slightly north of airport property	
300 (44LD300)	Historic and prehistoric site identified along the upper sections of Horsepen run drainage	Northeast portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; historic site may be associated with the Coleman residence located slightly north of airport property	PMC (1989a)
380 (44LD380)	Prehistoric and historic site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; dwellings are located north and south of the site; site is sparse and moderately to heavily disturbed; no further testing is recommended	PMC (1989a); WAPORA (1988)
381 (44LD381)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; further research and testing should be conducted at this site if future proposed construction would impact this area	PMC (1989a); WAPORA (1988)
382 (44LD382)	Prehistoric site identified along the upper sections of Horsepen run drainage; entire site was vegetated	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; no further testing is recommended	PMC (1989a); WAPORA (1988)
383 (44LD383)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; phase I testing recommended further testing; phase II testing revealed that the context has been disrupted by cultural and natural disturbances	PMC (1989a); WAPORA (1988); WAPORA (1990)
384 (44LD384)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northeast portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; phase I testing recommended further testing; phase II testing revealed no significant data resources remaining	PMC (1989a); WAPORA (1988); WAPORA (1990)
385 (44LD385)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northeast portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; phase I concluded that further testing of this site should be conducted before the proposed construction is allowed to proceed; phase II testing revealed that little additional information of significance can be expected from further excavations	PMC (1989a); WAPORA (1988); WAPORA (1990)
386 (44LD386) (also on map as # 14)	Prehistoric and historic site - two story frame dwelling, 2 barns, and one other farm building	Northeastern portion of airport	Historic site located on 1910 US Postal Service map, the site was checked and found extant; disturbed site; no further testing is recommended	PMC (1989a); WAPORA (1988)
379 (44LD379)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either	PMC (1989a); WAPORA (1990)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
			hunting or foraging expeditions; this site must be protected from destruction	
391 (44FX391)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
405 (44LD405)	Prehistoric site identified along the upper sections of Horsepen run drainage; area was probably logged; evidence of ground disturbance	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; phase II testing concluded that the site holds data commensurate to criteria for eligibility to the National Register	PMC (1989a); VAPORA (1990)
406 (44LD406)	Historic and prehistoric site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The prehistoric site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; a house is also located 1000 ft to the west; phase II testing concluded that the site holds data commensurate to criteria for eligibility to the National Register	PMC (1989a); VAPORA (1990)
407 (44LD407) (also on map as #7)	Prehistoric and historic site - one story frame dwelling, 2 barns, silo, and 5 other farm buildings	Northern portion of airport	Site located on 1958 USCGSM map, the site was checked and found extant	PMC (1989a)
408 (44LD408)	Prehistoric site identified along the upper sections of Horsepen run drainage	Northern portion of airport	The site is small to moderate is size representing ephemeral encampments along the watershed for the purpose of either hunting or foraging expeditions; phase II testing concluded that the data resources at the site are not significant	PMC (1989a); VAPORA (1990)
431 (44FX431)	Prehistoric site identified along the north bank of Cain Branch; historic site associated with Sully Plantation	Southeastern portion of the airport	Small prehistoric lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found; historic site is stone footings of a bridge built over Cain Branch in the mid-nineteenth century	PMC (1989a)
690 (44FX690)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
691 (44FX691)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
692 (44FX692)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
693 (44FX693)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
694 (44FX694)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
695 (44FX695)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
696 (44FX696)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
697 (44FX697)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
698 (44FX698)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
712 (44FX712)	Prehistoric site identified along the north bank of Cain Branch; historic site associated with Sully Plantation	Southeastern portion of the airport	Small prehistoric lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found; historic tenant house dating to the same period as Sully	PMC (1989a)
749 (44FX749)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
750 (44FX750)	Prehistoric site identified along the north bank of Cain Branch	Southeastern portion of the airport	Small lithic scatter representing a ephemeral encampment along the watercourse; no evidence of large or semi-permanent settlement has been found	PMC (1989a)
Documented Structures (including structures standing in 1958, 1910, and possible 18th – 19th Century structures)				
1	Two story frame dwelling, barn, silo, and 7 other farm buildings	Northern portion of airport	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
2	Two story frame dwelling, barn, silo, and 3 other farm buildings	Northern portion of airport	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
3	Masonry dwelling	Northern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
4	Two story frame dwelling and 6 other farm buildings	Northern portion of airport	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
5	Two story frame dwelling, barn, and 4 other farm buildings	Northern portion of airport	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
6	Masonry dwelling and one other farm building	Northern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
7 (also on figure as # 407) (see archaeological sites)	One story frame dwelling, 2 barns, silo, and 5 other farm buildings	Northern portion of airport	Site located on 1958 USCGSM, the site was checked and found extant (Dulles Toll Rd Extension Survey)	PMC (1989a)
8	**Masonry dwelling and 2 other farm buildings**	North of runway 19R/1L	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures; **possible 18th –19th century structures**	PMC (1989a)
9	**One barn and one other farm building**	North of runway 19R/1L	Site located on 1910 US Postal Service map, the site was checked and found gone (FBO Survey); **possible 18th –19th century structures**	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
10	Masonry dwelling	North of runway 19R/1L	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
11	One two story frame dwelling and 3 other farm buildings	North of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (FBO Survey)	PMC (1989a)
12	Two story frame dwelling, 2 barns, and one other farm building	North of runway 19R/1L	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
13	One story frame dwelling and one other farm building	Northeastern portion of the airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
14 (also on figure as # 386) (see archaeological sites)	Two story frame dwelling, 2 barns, and one other farm building	Northeastern portion of airport	Site located on 1910 US Postal Service map, the site was checked and found extant.	PMC (1989a)
15	Two masonry dwellings, one barn, and 4 other farm buildings	East of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (FBO Survey)	PMC (1989a)
16	Two masonry dwellings, one barn, and two other farm buildings	North of runway 19R/1L	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
17	One masonry dwelling	Northwest of runway 19R/1L	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
18	Two story frame dwelling	Northwest of runway 19R/1L	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
19	One story frame dwelling	West of runway 19R/1L	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
20	One story frame dwelling	West of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (Runway Survey)	PMC (1989a)
21	Four one story frame dwellings, one other farm building	West of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (Runway Survey)	PMC (1989a)
22	Four one story masonry dwellings, one other farm building	West of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (Runway Survey)	PMC (1989a)
23	One two story frame dwelling, silo, barn, five other farm buildings	West of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found gone (Runway Survey)	PMC (1989a)
24	One barn	East of runway 19R/1L	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
25	One masonry dwelling	East of runway 19R/1L	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
26	One masonry dwelling, one barn, and two other farm buildings	Northwest of Dulles Lake	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
27	One masonry dwelling, two barns, one silo, and two other farm buildings	North of runway 19L/1R	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
28	One barn	Intersection of Sully Rd and Dulles Access Rd	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
29	Ruins	Intersection of Sully Rd and Dulles Access Rd	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
30	One story frame dwelling, two barns, one silo, and 3 other farm buildings	West of runway 19R/1L	Site located on 1910 US Postal Service map, the site was checked and found gone (Runway Survey)	PMC (1989a)
31	Ruins, silo	West of runway 19R/1L	Site located on 1910 US Postal Service map, the site was checked and found gone (Runway Survey)	PMC (1989a)
32	**Beard Residence (1830), one two story frame dwelling, one barn, one silo, one other farm building**	East of runway 19L/ 1R	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
33	One story frame dwelling	Northwest of Runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
34	One story frame dwelling	Northwest of Runway 12/30	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
35	Two story frame dwelling, one story frame dwelling, and 5 other farm buildings	Northwest of Runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
36	One two story frame dwelling, 5 other farm buildings, and pumphouse	Northwest of Runway 12/30	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
37	Two story frame dwelling	Intersection of Runways 19R/1L & 12/30	Site located on 1910 US Postal Service map, the site was checked and found extant (Runway Survey)	PMC (1989a)
38	One story frame dwelling, one barn, two story masonry dwelling, one other farm building	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
39	One story frame dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
40	One story masonry dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
41	One story frame dwelling, 5 other farm buildings	Intersection of runways 19R/1L & 12/30	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
42	One story frame dwelling, one other farm building	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
43	One story frame dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
44	Two story frame dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
45	One story masonry dwelling, one other farm building, frame church, cemetery	Intersection of runways 19R/1L &	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
		12/30	structures	
46	One story masonry dwelling, one other farm building	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
47	Five farm buildings	Intersection of runways 19R/1L & 12/30	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
48	One story frame dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
49	One story frame dwelling and one story masonry dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
50	One story frame dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
51	One story masonry dwelling	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
52	Two story frame dwelling, one other farm building	Intersection of runways 19R/1L & 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
53	Two story frame dwelling, one barn	South of Concourse D	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
54	Two story frame dwelling, 5 other farm dwellings	South of Concourse D	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
55 (44FX55)	Prehistoric and historic site – one story masonry dwelling	South of Concourse D	Historic site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures; prehistoric site represents ephemeral encampment along the watercourse	PMC (1989a)
56	**Morris Residence (1850), two story frame dwelling, 2 barns, 2 other farm buildings**	South of Concourse C/D	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures;**19th century structures**	PMC (1989a)
57	One story masonry dwelling	South of Concourse C/D	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
58	**Herwig Residence (1850), two story frame dwelling, 2 barns, 2 silos, 4 other farm buildings**	South of Concourse C/D	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
59	**Carusillo Residence (1895), two story frame dwelling, one barn, 2 silos, 4 other farm buildings**	South of Concourse C	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
60	**Hyde Residence (1910), Tenant House (1915) two story frame dwelling, one barn, 4 other farm buildings**	East of runway 19L/1R	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures; **possible 19th century structures**	PMC (1989a)
61	One story frame dwelling	East of runway	Site located on 1958 USCGSM, moderate archaeological	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

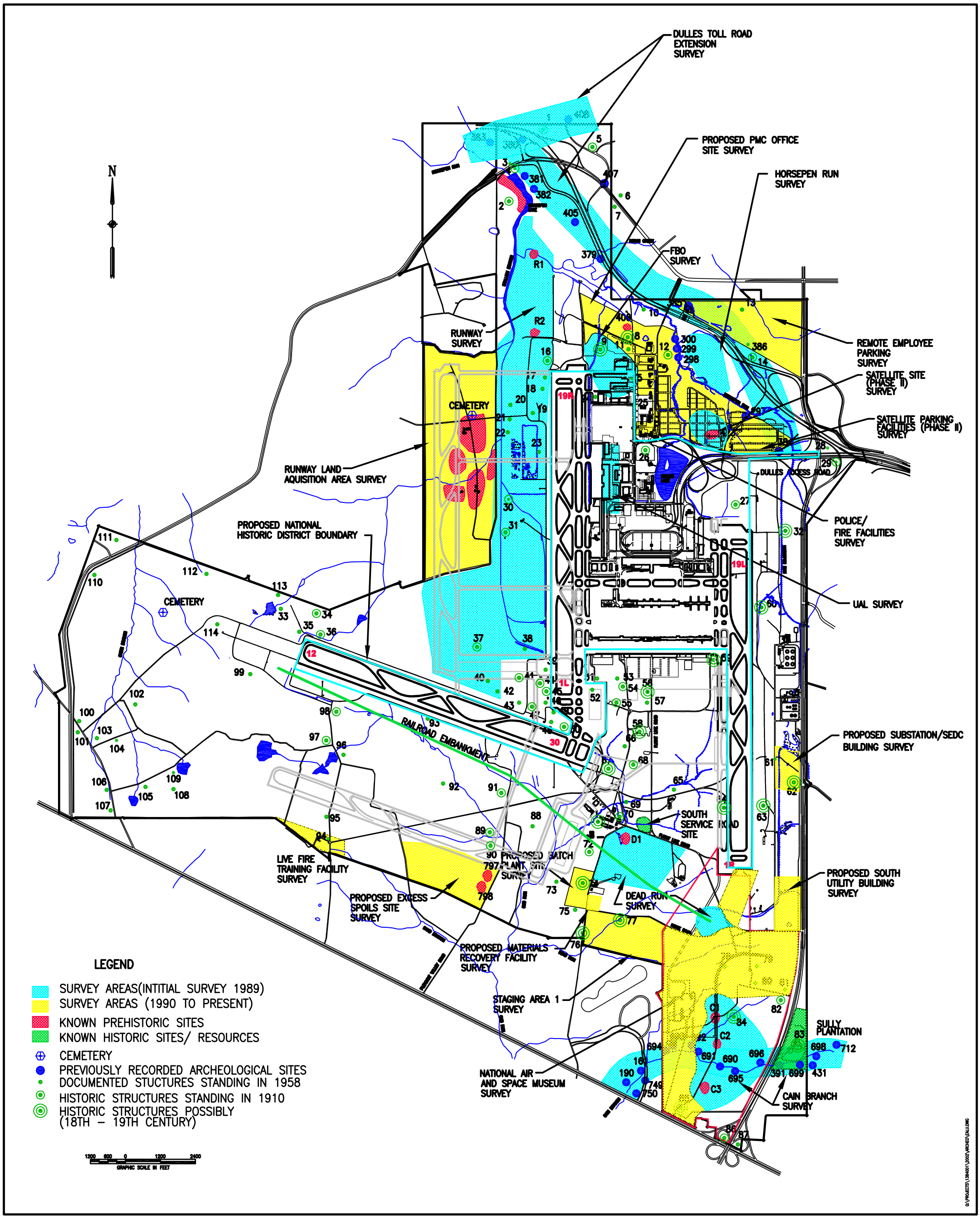
RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
		19L/1R	potential based on proximity to airport structures	
62	**McClaren Residence & Tenant house (1830), two story frame dwelling, one silo**	Intersection of Sully Rd & McLearan Rd	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
63	**Jackson Residence (1830), two story frame dwelling, one barn, 2 other farm buildings**	East of runway 19L/1R	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
64	**Hasilden Residence (1890), two story frame dwelling**	East of runway 19L/1R	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
65	One story masonry dwelling, one barn, one silo, one other farm building	West of runway 19R/1L	Site located on 1958 USCGSM, the site was checked and found extant (used by airport operations)	PMC (1989a)
66	One story masonry dwelling, one other farm building	East of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
67	**Wrenn Residence (1820), abandoned farm, two story frame dwelling, 5 other farm buildings**	East of runway 19L/1R	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures; **19th century structures**	PMC (1989a)
68	One story frame dwelling, one other farm dwellings	East of runway 12/30	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
69	One barn, one silo, 4 other farm building	Intersection of Willard Rd and Flight Line Rd	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
70	Two story frame dwelling, 3 other farm dwellings	Intersection of Willard Rd and Flight Line Rd	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
71	**Melton Residence (1910), two story masonry dwelling, 2 barns**	Intersection of Willard Rd and Flight Line Rd	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures**; possible 19th century structures**	PMC (1989a)
72	Two story frame dwelling, 2 barns, 3 other farm dwellings	Intersection of Railroad Embankment & Willard Rd	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
73	Two story frame dwelling, 3 other farm building	South of Railroad Embankment & west of Willard Rd	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
74	**Delay Residence (1905), two story frame dwelling, 2 other farm buildings**	Intersection of Hoxie Rd & Willard Rd	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures**; possible 19th century structures**	PMC (1989a)
75	Two frame dwellings, one barn, 2 other farm buildings	Intersection of Hoxie Rd & Willard Rd	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
76	**Rector Residence (1928), one story frame dwelling**	Intersection of Hoxie Rd & Willard Rd	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures**; possible 19th century structures**	PMC (1989a)
77	**Lohmen & Mayhew Residence (1915), two frame dwellings, 2 barns, one silo**	Intersection of Hoxie Rd & Willard Rd	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
			structures; **possible 19th century structures**	
78	One masonry dwelling, 6 other farm buildings	South of runway 19L/1R	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
79	One masonry dwelling	South of runway 19L/1R	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
80	One story frame dwelling	South of runway 19L/1R	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
81	One story frame dwelling, 3 other farm buildings	Intersection of Sully Rd & Barnsfield Rd	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
82	One story frame dwelling	Intersection of Sully Rd & Barnsfield Rd	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
83	**Sully Plantation, residence, smokehouse, kitchen, office (1795), dairy (1801), two story frame dwelling, barn, one story frame dwelling, one story masonry dwelling**	Southeastern portion of airport, east of Sully Rd	Site located on 1910 US Postal Service map, the site is extant; **18th century structures**	PMC (1989a)
84	**Travis Residence (1794), Tenant house (1850), 3 story masonry dwelling, one barn, two story frame dwelling, swimming pool**	South of runway 19L/1R	Site located on 1910 US Postal Service map, the site was checked and found extant (Cain Branch Survey); more extensive archaeological investigation would be required to recover evidence of earlier phases; **possible 18th –19th century structures**	PMC (1989a)
85	**Smith log cabin (date uncertain), one story frame dwelling, 2 other farm buildings**	Southeastern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures**; possible 18th century structures**	PMC (1989a)
86	One story frame dwelling, 6 other farm buildings	Southeastern portion of airport	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
87	One story masonry dwelling, 3 other farm buildings	Intersection of Sully Rd & Rt 50	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
88	Two story masonry dwelling	South of runway 19R/1L	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
89	One story frame dwelling, 6 other farm buildings	South of runway 19R/1L	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
90	Two story masonry dwelling, one story frame dwelling, one barn, 2 silos, 11 other farm buildings	South of runway 19R/1L	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
91	Two story masonry dwelling, one other farm building	Southeast of runway 12/30	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
92	One story frame dwelling, 2 silos, 4 other farm buildings	South of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
93	Barn, silo	South of runway 12/30	Site located on 1958 USCGSM, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
94	One story masonry dwelling, one other farm building	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)

SUMMARY OF ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

RESOURCE	DESCRIPTION	LOCATION	RESULTS OF SURVEY	REFERENCE
95	One story masonry dwelling, 2 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
96	One story frame dwelling, 2 other farm buildings	South of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
97	Two story frame dwelling, barn, silo, 4 other farm buildings	Southwest of runway 12/30	Site located on 1910 US Postal Service map, high archaeological potential based on proximity to airport structures	PMC (1989a)
98	Two story masonry dwelling	Southwest of runway 12/30	Site located on 1910 US Postal Service map, moderate archaeological potential based on proximity to airport structures	PMC (1989a)
99	One story frame dwelling, 2 other farm buildings	Southwest of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
100	One story masonry dwelling	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
101	One story masonry dwelling, one other farm building	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
102	Two story frame dwelling, one barn, 7 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
103	One story masonry dwelling, 5 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
104	Two story frame dwelling, one barn, one silo, 6 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
105	Two story frame dwelling, 4 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
106	Four one story masonry dwellings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
107	One story frame dwelling, one other farm building	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
108	One story masonry dwelling	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
109	One story masonry dwelling, 2 other farm buildings	Southwestern portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
110	Two story frame dwelling, one story masonry dwelling, barn, 2 silos, 4 other farm buildings	Western portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
111	Two story frame dwelling, one story frame dwelling, barn, silo, one other farm building	Western portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
112	Two story frame dwelling, 2 barns, silo, 3 other farm buildings	Western portion of airport	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
113	One story frame dwelling, one other farm building	Northwest of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
114	Ruins	West of runway 12/30	Site located on 1958 USCGSM, high archaeological potential based on proximity to airport structures	PMC (1989a)
Cemetery	Cemetery attested on 1958 Dulles Acquisition Map.	Southwestern portion of the airport	Not Applicable	PMC (1989a)



ARCHAEOLOGICAL INVESTIGATIONS AT DULLES AIRPORT

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Washington National Airport ✈ Washington, DC 20001–4901

MAR 17 1993

Ms. Mary Harding Sadler
State Historic Preservation Office
Division of Historic Resources
221 Governor Street
Richmond, VA 23219

RE: Midfield Concourse Facilities, Washington Dulles International Airport
Loudoun and Fairfax Counties, Virginia

Dear Ms. Sadler:

As a result of plans to expand passenger terminal facilities at Washington Dulles International Airport, the Metropolitan Washington Airports Authority (the Authority) is proposing the construction of new permanent Midfield Concourse Facilities in the airfield south of the existing Main Terminal. The construction of these facilities should not have a direct effect on any of the airport's eligible historic architectural or archaeological properties. However, because of the proximity to the Main Terminal, the new structures do have the potential to affect the historic setting and airfield views of this significant historic structure.

Because of the potential for effect, the Authority wishes to initiate consultation with the Virginia State Historic Preservation Office (VASHPO) and the Advisory Council on Historic Preservation (ACHP). Due to the complex planning issues related to this project, and the Authority's desire for early agency comments, the Authority suggests that consultation be initiated through the negotiation and execution of a Memorandum of Agreement (MOA). The Authority has provided a draft text for this agreement to the staffs of the VASHPO and the ACHP for review and comment. The MOA, reflecting staff comments, has been signed by the Authority's General Manager and is submitted for final review and signature (Attachment A).

1.0 PROJECT INFORMATION

The construction of the new passenger facility is the first step in the implementation of the midfield development plans contained in the approved Airport Master Plan. When fully completed the Midfield Concourse complex will include three tiers of concourse buildings, linked with the South Finger of the Main Terminal by a below-

grade people mover system (Attachment B). The development of the three tier Midfield Concourse design is consistent with the Airport Master Plan which includes general planning guidelines taken from the original Saarinen 1964 Master Plan Report.

2.0 PROJECT DESIGN REVIEW

At this time, the Authority is moving forward with the planning for the first of these midfield facilities. The first permanent Midfield Concourse will represent the northern-most set of structures in the ultimate three tier complex, and will be built approximately 1,200 feet south of the Main Terminal (Attachment C). As construction of the planned People Mover system will not be possible until after the Main Terminal Expansion project is complete, this first tier facility will continue to be served by the present Mobile Lounge/Plane Mate passenger transportation vehicles.

The Authority is currently reviewing the original design, and evaluating possible alternatives for design revisions and construction staging. Due to the significant time that has elapsed since this initial review and original determination of effect, the Authority understands that both the VASHPO and the ACHP have requested the opportunity to review the original design and any planned revisions.

The Authority suggests that consultation begin with a prompt review of the existing original design. This will give both agencies an opportunity to comment on the original design and for these comments to be considered during the design alternatives evaluation process. Following this initial review, a mutually agreed schedule for design review could be established in order to give both agencies the chance for systematic review and comment during the design process. In keeping with standard design review procedures, the Authority suggests that these reviews occur at the thirty, sixty and ninety percent stages of design completion.

3.0 POTENTIAL EFFECT ON ARCHAEOLOGICAL RESOURCES

Completed archaeological research and testing have clearly demonstrated that the central portion of the airport has undergone extensive landscaping and construction disturbance. Given the location of the Midfield Concourses within the heavily graded airfield, it is extremely unlikely that any intact prehistoric or historic archaeological resources remain in the proposed Midfield Concourse construction area. A more detailed analysis of the potential effect of the project on archaeological resources will be presented during the consultation process.

The Authority and its consultants are aware of the historic and architectural significance of the Main Terminal and the surrounding complex of original support buildings. However, due to the airfield location, well south of the Main Terminal

and support buildings, the construction of the new Midfield Concourse Facilities will not have a direct effect on any contributing elements of the original Saarinen airport complex. In fact, the new construction will not require the removal, relocation or alteration of noncontributing airport facilities.

Because of the proximity to the Main Terminal, the new Midfield Concourse Facilities may have a potential effect on the historic setting and airfield views of the Main Terminal. As a result, the Midfield Concourse buildings will be carefully designed to minimize effects upon this historic property. Because the building will be of limited height and located a considerable distance from the Main Terminal, it is the Authority's belief that the Midfield Concourse Facilities will not result in an adverse effect on the terminal setting or views. A careful consideration of the effect of the new structures on the views from the South Finger and the South Concourse of the Main Terminal will be a central part of the design development and review process.

4.0 CONSULTATION PROCEDURES

In an attempt to provide for consultation on the potential effect of this project, the Authority is proposing the following consultation procedures:

1) The Authority shall provide an opportunity for the staff of the VASHPO and the ACHP to review and comment on the original design documentation for the project (1986 Midfield Terminal Expansion Project).

2) At mutually agreed intervals, revised design documentation will be submitted to the design review staff of the VASHPO and the ACHP for review and comment.

3) Through the consultation process, the Authority shall review agency comments and take them into account in the development of the final design.

4) Prior to the end of the consultation process, a set of final design documents for the proposed facilities will be provided to the VASHPO and the ACHP for review and approval.

5) Through the consultation process, the Authority shall demonstrate the compatibility of the new design with the historic character of the Main Terminal and nearby original airport support structures.

6) Through the consultation process, the Authority shall demonstrate the compatibility of the new design with the Airport Master Plan which includes general planning guidelines from the original Saarinen 1964 Master Plan.

7) Special care will be taken to consider the view of the new facilities from the south side of the existing Main Terminal concourse.

8) Appropriate provisions for future consultation would be established to address the Authority's plans to construct the remaining Midfield Concourse Facilities.

5.0 PROJECT SUMMARY

This letter has discussed the potential effects of the proposed construction of Midfield Concourse Facilities on eligible historic properties at Washington Dulles International Airport. Through the means of the MOA, the Authority agrees to initiate consultation which will demonstrate that the project will: 1) have no effect on historic or prehistoric archaeological resources, 2) have no effect on the original fabric of any historic property, 3) be designed to minimize effects on the architectural setting and views from the Main Terminal and surrounding eligible historic properties, and 4) be compatible with the Airport Master Plan which includes general planning guidelines taken from the original Saarinen 1964 Master Plan.

My staff and I would be pleased to provide you with any additional information or documentation. Please feel free to contact Mr. Richard Turner if he can be of any assistance. His phone number is (703) 685-8152.

Thank you once again for your help in assisting the Authority in its continuing efforts to preserve and protect the historic resources of the Metropolitan Washington Airports.

Sincerely,

Frank D. Holly, Jr.
Manager, Engineering Division

Enclosures

cc: M. Naber ACHP

FDH:klm

MEMORANDUM OF AGREEMENT
THE CONSTRUCTION OF MIDFIELD CONCOURSE FACILITIES AT WASHINGTON DULLES INTERNATIONAL AIRPORT

WHEREAS, the Metropolitan Washington Airports Authority (Authority), the Virginia State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) are parties to a Programmatic Memorandum of Agreement (PMOA) executed in 1987 in connection with the transfer of Washington National and Washington Dulles International Airports from the Federal Aviation Administration to the Authority;

WHEREAS, the PMOA governs the handling of airport projects which may have an effect on properties eligible for inclusion in the National Register of Historic Places and provides that such projects will be handled in accordance with 36 CFR Part 800 with respect to review by the SHPO and the Council.

WHEREAS, the Authority has determined that the proposed construction of the Midfield Concourse Facilities at Washington Dulles International Airport may have an effect on an eligible property and wishes to initiate consultation pursuant to the PMOA.

NOW, THEREFORE, the Authority, the SHPO, and the Council agree that the consultation shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on the historic property.

Stipulations

The Authority will ensure that the following stipulations are carried out:

1) The design of the Midfield Concourse Facilities will be compatible with the historic and architectural qualities of the original Dulles International Airport Historic District and will incorporate the recommended approaches to rehabilitation and new construction set forth in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (U.S. Department of the Interior, National Park Service, 1992).

2) In order to ensure that project designs meet the Standards, the Authority will submit a comprehensive set of Midfield Concourse Facilities design documents to the SHPO and the Council for review and comment at the following stages of the design process: Preliminary, 30%, 60%, and 90%. The Authority will review any resulting comments and take them into account in the continued development of the project design.

3) As development of the project design permits, the Authority shall evaluate the effects of the proposed project on historic properties pursuant to 36 CFR Part 800.5. If it is determined that the project may have an adverse effect, the Authority will consult with the SHPO and Council to seek ways to avoid or

reduce the effects on historic properties. Final construction documents will be submitted to the Virginia SHPO and Council for review and approval prior to the initiation of construction.

4) Through the consultation process, the Authority shall ensure that the new construction is compatible with the airport Master Plan which includes general planning guidelines taken from the original Saarinen 1964 Master Plan. (Dulles International Airport, Master Plan Report, 1964).

5) The Authority will undertake a viewshed analysis in order to study the views of the new Midfield Concourses from the main concourse of the Main Terminal and the South Finger.

6) Changes to the lower level of the Main Terminal, required by the installation of a people mover system, will be covered under the provisions of a separate Memorandum of Agreement on the Main Terminal Expansion. Review and approval of the construction for the Midfield Concourse Facilities will in no way alter the requirements for full historic preservation consultation on the Main Terminal Expansion project, in accordance with 36 CFR Part 800.

7) Although the specific focus of the consultation stipulated above, will be the design and construction of the first tier Midfield Concourse Facilities, the Authority will provide design and programming documentation on the comprehensive Midfield Concourse Facilities plan. In consultation with the SHPO and the Council, provisions shall be established for continued consultation in accordance with 36 CFR Part 800, in order to assess the effect of the construction of future Midfield Concourse Facilities on historic properties at the Dulles International Airport Historic District.

8) Should the SHPO or the Council object, within 30 working days, to any plans or specifications provided for review under this Agreement, the Authority shall consult further with the objecting party, in an attempt to resolve the objection. If the Authority determines that the objection cannot be resolved, the Authority shall so inform the Council and provide copies of all documentation relevant to the objection not previously made available to the Council.

Within 30 days of notification, the Council will provide the Authority with comments, which the Authority will take into account in accordance with 36 CFR Part 800 in reaching a final decision regarding the issue under consideration.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the Authority has afforded the Council an opportunity to comment on the construction of the Midfield Concourse Facilities and its effect on a historic property, and that the Authority has taken into account the effects of the undertaking on the historic property.

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

By: _____ Date 3/17/93

James A. Wilding
General Manager
Metropolitan Washington Airports Authority

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: H. Bryan Mitchell Date 3/18/93

H. Bryan Mitchell
Deputy Virginia State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Robert D. Bush Date 3/25/93

Robert D. Bush
Executive Director, Advisory Council on Historic Preservation

Advisory
Council On
Historic
Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

APR 5 1993

Mr. James A. Wilding
General Manager
Metropolitan Washington
Airports Authority
44 Canal Center Plaza, Suite 219
Alexandria, VA 22314

REF: Main Terminal Expansion
Washington Dulles International Airport
Loudoun and Fairfax Counties, Virginia

Dear Mr. Wilding:

Enclosed is your copy of the fully executed Memorandum of Agreement for the referenced project. By carrying out the terms of the Agreement, you will have fulfilled your responsibilities under Section 106 of the National Historic Preservation Act and the Council's regulations. A copy of the Agreement has also been sent to the Virginia State Historic Preservation Officer, and the original will remain on file at our office.

We wish to recognize the close coordination between the Authority, the Virginia State Historic Preservation Office, and the Council that has characterized the process leading to this agreement. We appreciate your cooperation and look forward to our continuing partnership as we seek to carry out the terms and spirit of this agreement.

Sincerely,

Don L. Klima
Director
Eastern Office of Review

MEMORANDUM OF AGREEMENT
EXPANSION AND REHABILITATION OF THE MAIN TERMINAL
AT WASHINGTON DULLES INTERNATIONAL AIRPORT

WHEREAS, the Metropolitan Washington Airports Authority (Authority), the Virginia State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) are parties to a Programmatic Memorandum of Agreement (PMOA) executed in connection with the transfer of Washington National and Washington Dulles International Airports from the Federal Aviation Administration to the Authority;

WHEREAS, the PMOA governs the handling of airport projects which may have an effect on properties eligible for inclusion in the National Register of Historic Places and provides that such projects will be handled in accordance with 36 CFR 800 with respect to review by the SHPO and the Council.

WHEREAS, the Authority has determined that the proposed expansion and rehabilitation project will have an effect on original portions of the Main Terminal at Washington Dulles International Airport, which have been determined to be eligible for inclusion in the National Register of Historic Places and has consulted with the Virginia SHPO pursuant to the PMOA.

NOW, THEREFORE, the Authority, the SHPO, and the Council agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on the historic property.

Stipulations

The Authority will ensure that the following measures are carried out:

1. Prior to the proposed expansion and rehabilitation of the Main Terminal the Authority shall curate archival drawings and other historic documentation according to the Secretary of Interior's "Standards for Architectural and Engineering Documentation" (48 FR 44730-44734, September 29,1983). The Authority shall contact the HABS/HAER, National Park Service, Mid-Atlantic Regional Office, Philadelphia, Pennsylvania to determine what level and kind of documentation is required. Unless otherwise agreed to by the National Park Service, the Authority shall ensure that all documentation is completed and accepted by the HABS/HAER prior to initiation of expansion activities which may directly affect the Main Terminal, and that copies of this document are made available to the Virginia SHPO and an appropriate local archive designated by the SHPO.

The historic drawings, photographs and written documentation submitted to the National Park Service by the Authority shall include documents which provide a detailed record of past alterations to the historic fabric of the Main Terminal from the date of construction to the present. The level and kind of this supplementary documentation will be determined in consultation with the staffs of the SHPO, the Council and the National Park Service, and will take into consideration the recommended approaches to historic documentation set forth in the Secretary of Interior's "Standards for Architectural and Engineering Documentation" (48 FR 44730-44734, September 29,1983).

2. The expansion project design is to be compatible with the historic and architectural qualities of the original Main Terminal, and take into consideration the recommended approaches to rehabilitation and new construction set forth in the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (U.S. Department of the Interior, National Park Service, 1983). To that end, the Authority will provide the SHPO and the Council with the opportunity to review and comment upon significant elements of the project design as they are developed. As provided in the terms of the PMOA, the Authority will review any resulting comments and take them into account in the continued development of the final project plans and specifications.

3. At an appropriate stage in the design process (identified by mutual agreement of all parties), the Authority will submit a comprehensive set of Main Terminal Expansion and Rehabilitation design documents to the SHPO and the Council for review and comment. As provided in the terms of the PMOA, the Authority will review any resulting comments and take them into account in the continued development of the final project plans and specifications.

4. At the completion of the design process, a comprehensive set of project design and construction documents will be submitted to the SHPO and Council for final review and approval.

5. The Authority will require that change orders to the project design (developed subsequent to the approval of the project pursuant to Stipulation 4) which have the potential to result in previously unidentified effects on historic or character defining elements of the Main Terminal, be developed in consultation with the SHPO and the Council.

6. In order to provide for the continued safeguard of the historic fabric and architectural character of the Main Terminal from future construction impacts after the expansion and rehabilitation project is complete, the Authority shall develop a set of architectural and signing standards. These standards will be incorporated into an approved Design Manual (supplemented by a series of design standards appendices) and the Authority shall distribute these standards to architectural/engineering contractors involved in projects affecting the Main Terminal. It will be the Authority's responsibility to enforce compliance with these standards. A complete set of these documents will be submitted to the SHPO and Council for review and comment. The Authority will review any resulting comments and take them into account in the revision of the Design Manual and appendices.

7. In order to provide for the timely review of temporary construction activities required by this project, the following review procedure shall be followed: for temporary construction anticipated to remain in place longer than 6 months, plans will be submitted to the SHPO and the Council for expedited review and comment under the terms of this agreement; temporary facilities which will be in place for less than 6 months will be subject to review by the SHPO only. Temporary conditions remaining in place less than 30 days shall not require separate consideration by the SHPO or the Council, but those areas should be identified as part of the general review of project plans and specifications.

8. The Authority shall provide an opportunity for public review of the historic preservation aspects of the Main Terminal Expansion project. In consultation with the SHPO and the Council, the Authority shall identify a means to solicit relevant comments from interested parties, and demonstrate that those comments have been taken into account in the project planning process.

9. The Authority shall continue consultation with the SHPO and the Council in order to identify and assess the indirect effects which the Main Terminal Expansion and Rehabilitation project may have on contributing properties with the Dulles district. Such effects will be addressed by amendment of this agreement or negotiation of a separate agreement as appropriate.

10. Should the SHPO or Council object within 30 working days, to any plans or specifications pursuant to this agreement, the Authority shall consult with the objecting party to resolve the objection. If the Authority determines that the objection cannot be resolved, it shall request further comments of the Council using the process set forward in 36 CFR Section 800.6 (b).

Any Council comment provided in response to such a request shall be taken into account by the Authority in accordance with 36 CFR Section 800.6(c)(2). The requirements of this stipulation shall only apply to the subject of the dispute; the Authority's ability and responsibility to carry out all other actions under this Memorandum of Agreement are not the subject of the dispute will remain unchanged.

Execution of this Memorandum of Agreement and implementation of its terms evidence that the Authority has afforded the Council an opportunity to comment on the construction of the Main Terminal Expansion and Rehabilitation and its effect on a historic property, and that the Authority has taken into account the effects of the undertaking on the historic property.

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

By: _____ Date 9-12-1993

"per" General Manager
Metropolitan Washington Airports Authority

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: _____ Date 3/16/93

Deputy Virginia State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date 9/2/93

Chair, Advisory Council on Historic Preservation

PROGRAMMATIC MEMORANDUM OF AGREEMENT AMONG THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER AND THE FEDERAL AVIATION ADMINISTRATION, METROPOLITAN WASHINGTON AIRPORTS

WHEREAS, the Federal Aviation Administration, Metropolitan Washington Airports ("MWA"), currently owns and operates Washington National Airport ("National Airport") and Washington Dulles International Airport ("Dulles Airport");

WHEREAS, control over National and Dulles Airports will be transferred shortly to the Metropolitan Washington Airports Authority, a public body corporate and politic, authorized by the Metropolitan Washington Airports Act of 1986 (P.L. 99-591) and created by the statutory enactments of the Commonwealth of Virginia and the District of Columbia for the purpose, inter alia, of financing and redeveloping capital improvements at both airports;

WHEREAS, upon the date of transfer, the Metropolitan Washington Airports Authority will assume the responsibility for carrying out this Programmatic Agreement pursuant to Section 6005(d)(6) of the Metropolitan Washington Airports Act of 1986;

WHEREAS, the long-term lease of National and Dulles Airports to Metropolitan Washington Airports Authority is an undertaking which is considered under section 106 of the National Historic Preservation Act (16 USC § 470f), and its implementing regulations in 36 CFR § 800.9, to have an adverse effect on properties eligible for the National Register of Historic Places that are located on the airports; and

NOW, THEREFORE, MWA, the Virginia State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) agree that adherence to the following shall constitute compliance with Section 106.

Stipulations

MWA will ensure that the following conditions are carried out:

1. Historic Property Plan: A Plan for the identification and treatment of significant historic, architectural, archeological and cultural resources (hereinafter referred to as "the Plan") will be developed and implemented for the portions of National and Dulles Airports that contain properties that meet the National Register criteria listed in 36 CFR Part 60. The plan will also define the consideration to be given to activities in areas adjacent to properties meeting the National Register criteria that will affect the National Register eligible properties. The Plan will be developed by MWA in consultation with the Council and SHPO. Work carried out in accordance with the Plan will require no further review by the Council or the SHPO. The Plan will include identification and treatment of historic resources as follows:

a. Identification: MWA will arrange to have National and Dulles Airports surveyed by a team of qualified person(s) for the purpose of identifying all properties that meet the eligibility criteria of the National Register for Historic Places ("National Register"). The survey will include structure of historic, architectural (both exterior and interior) and cultural significance, significant landscaping, open

spaces and archeological resources. Where necessary, the survey shall also include a description and delineation of the boundaries or scope of these properties. The survey will be conducted by or under the supervision of persons who meet the requirements set forth in Attachment 1 to this Agreement. A copy of the survey report shall be provided to the SHPO for review as provided in § 4(c) of this Agreement. If there is any disagreement with a determination of eligibility, the procedures set forth in § 4 (e) of this Agreement will be followed.

b. Treatment: With the assistance of qualified persons meeting the standards set forth in Appendix 1, MWA will establish and implement standards and procedures for the treatment of all identified properties. These standards and procedures will be developed in consultation with the SHPO and the Council and may include, but are not limited to, the following:

i. Protecting, preserving and maintaining in place, where appropriate, identified properties as part of the airport management practices;

ii. Rehabilitation in accordance with the Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings ("Standards");

iii. Stabilization and continued maintenance;

iv. Where appropriate, archeological data recovery and provisions for permanent curation of specimens, field notes, photographs, negatives, and processed data at an appropriately equipped institution that meets the standards set forth in "Archeological and Historic Preservation: Secretary of the Interior's Standards and Guidelines" (48 FR 44716 et seq.) and that makes this data available to other parties for research or other appropriate purposes;

v. A process for considering reasonable alternatives to undertakings that would have an adverse effect on resources;

vi. A procedure to be followed if, after meeting all the responsibilities for identification of properties, MWA finds, or is notified after an undertaking has begun, that the undertaking will affect a previously unidentified National Register eligible property.

c. Airport Master Plans: Based upon the survey, MWA will, in consultation with the SHPO, determine if any National Register eligible properties will be affected by the National Airport Master Plan that is presently being developed. The Master Plan will take these properties into account. Also, based upon the survey, MWA will, in consultation with the SHPO, determine which, if any, of the Dulles Airport properties identified in the survey as meeting the National Register criteria (hereinafter referred to as "identified properties") will be affected by the Dulles Airport Master Plan. Upon completion of the Historic Property Plan, MWA will amend the Dulles Airport Master Plan to include the Historic Property Plan.

2. Plan Standards: MWA will ensure that the Plan is consistent with the following guidelines and standards:

a. *The Archeological Survey: Methods and Uses (DOI, 1978; GPO Stock No. 024-016-00091-9).

b. *Preservation Planning in Context (ACHP).

c. *Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines, 48 FR 44716 et. seq., September 29, 1983.

d. *The Secretary of the Interior's Standards for Rehabilitation and Guidlelines for Rehabilitation of Historic Buildings (Revised 1983).

e. *The standards of the Historic American Buildings Survey (HABS) for recording architectural, historical, and engineering properties, as determined in consultation with HABS, National Park Service, Department of the Interior.

3. Treatment of Properties Pending Completion of the Plan:

a. Prior to the completion and implementation of the Plan all projects that may affect National Register eligible property will be handled in accordance with 36 CFR Part 800 with respect to review by the SHPO and the Advisory Council. However, the following undertakings will have no effect on the properties and will require no review by the SHPO or the Council:

i. The following infra-structure improvements and other ground-disturbing activities (e.g., sidewalks, street lights, street and drainage improvements, and utility installations) will require no review prior to construction.

1. Maintenance, repair, replacement in place of paving or line painting of roads, driveways, runways, ramps, taxiways and parking areas.

2. Maintenance, repair, replacement in place of sidewalks, curbs and fencing.

3. Maintenance, repair, replacement in place, or new installation of street lights, traffic signals, and traffic signs.

4. Maintenance, repair, replacement in place or upgrading of existing utility and mechanical systems that does not alter the visual appearance or structure of the building.

5. Maintenance, repair, or replacement in place of existing drainage systems.

6. Maintenance, repair, replacement in place or new additions of interior signs which are consistent with existing signs.

ii. Replacement in-kind, i.e., matching the configuration, material, size, detail, color, and construction of the historic fabric or landscaping.

4. Schedule for Development of Survey Report and Plan:

a. By July 1, 1987, MWA will forward a draft scope of work for the Historic Property Plan (including the survey) to the SHPO and the Council for concurrent review. The SHPO and the Council shall have 30 calendar days to comment upon the draft.

MWA shall have 30 calendar days after receipt of comments to complete the scope of work.

b. By December 1, 1987, MWA will award the contract for the Historic Property Plan based upon the final scope of work.

c. By March 1, 1988, a draft of the survey report will be forwarded to the SHPO for review. The SHPO shall have 30 calendar days to comment upon the draft. A final survey report will be completed by MWA within 30 calendar days following receipt of the comments, and submitted to the SHPO for approval. If no notice of approval or disapproval is received from the SHPO within 30 calendar days from the date the report is received by it, the report shall be deemed to have been accepted.

d. By July 1, 1988, a draft of the Historic Property Plan will be forwarded to the SHPO and the Council for concurrent review. The SHPO and the Council shall have 30 calendar days in which to comment upon the draft. A final Historic Property Plan shall be completed by MWA within 90 calendar days following receipt of the comments. The final plan shall go into effect when all parties have signed it.

e. MWA will consult with the SHPO and the Council in an effort to resolve any negative comments received from them on the scope of work, the survey or the Plan. In the event of a disagreement on a determination of eligibility, MWA will forward documentation to the Keeper of the National Register for a determination of eligibility.

5. Signatures: Execution of this Memorandum of Agreement evidences that MWA has afforded the Council and the SHPO an opportunity to comment on the continued operation, maintenance and development of the airports and the effects of these activities on properties eligible for inclusion in the National Register and that the U.S. Department of Transportation has met the requirements of section 106 of the National Historic Preservation Act.

Date 29 May 87
Chairman
Advisory Council on Historic Preservation

Date 6/1/87
Virginia State Historic Preservation Officer

Date 5/29/87
Director
Metropolitan Washington Airports
Federal Aviation Administration
U.S. Department of Transportation

-30
-31
-38
3&B
cc: 3&D
H. Ward

STATEMENT OF CONCURRENCE:

As a certified representative of the Virginia State Historic Preservation Officer, I have reviewed the attached Phase I Survey Report for the proposed South Substation/Utility Building, Washington Dulles International Airport, and concur with conclusions outlined below. By my signature, the Metropolitan Washington Airports Authority is authorized to proceed with the project in accordance with the following provisions:

A) The Authority has submitted a Phase I Survey Report which adequately presents the results of the completed Phase I investigation;

B) Base on my review of the Phase I Survey Report, I concur that the proposed project area does not appear to contain archaeological resources of sufficient significance or integrity to justify site avoidance or additional archaeological investigation to evaluate National Register eligibility;

C) Given the lack eligible archaeological resources, I concur that the South Substation/Utility Building project can proceed as outlined;

D) As the proposed lot is located well outside the boundaries of the eligible Dulles Airport Historic District, the project should have "No Effect" on the historic and architectural qualities of the adjacent Historic District.

E) As the proposed projects will be constructed within the airport's landscape buffer, they will have "No Effect" on any off-airport Historic Properties.

E) After reviewing the submitted report, this office will provide the Authority and its consultants with report review comments that shall be addressed in a final Phase I Survey Report, which will then be submitted, for the DHR archive.

[signature]
Project Review Staff

3·11·02
Date

1990 - 0460
VASHPO/DHR File No.

STATEMENT OF CONCURRENCE

As a certified representative of the Virginia State Historic Preservation Officer, I have reviewed the attached project documentation for the Tier 2 and Related Facilities, Washington Dulles International Airport, and concur with terms of the conditional determination of No Adverse Effect outlined below. Successful implementation of these conditions will demonstrate the Authority's compliance with the terms of the 1987 Programmatic Memorandum of Agreement (as regards the Section 106 of the National Historic Preservation Act (36 CRF Part 800) and Section 4(f) of the Department of Transportation Act (23 U.S.C. 138). By my signature, the Metropolitan Washington Airports Authority is authorized to proceed with project in accordance with the following conditions:

1) CATAGORICAL EXCEPTIONS (UNDER THE 1987 PMOA)

Given the very limited terms of Exemption in the 1987 PMOA, none of the Tier 2 and Related Facilities project components fall into this category. As a result, the Authority shall assure that appropriate consultation will be concluded with the representatives of the VASHPO and ACHP prior to construction, or other actions with the potential to effect the Airport's Historic properties or the architectural character of the Historic District.

2) NEW CONSTRUCTION IN HISTORIC DISTRICT (ABOVE-GRADE)

New above-grade construction within the Historic District is already covered under the terms of the 1993 Midfield Concourse Facilities MOA (Tier 2 Concourse, Concourse B Adaptations for IAB People Mover, and Concourse B Adaptations for People Mover). Pursuant to the stipulations of this agreement the Authority shall continue consultation, in order to limit potential effects on the architectural character of the Historic District.

3) DEMOLITION OF EXISTING STRUCTURES

The construction of the new Tier 2 Concourse will require the demolition of the existing C/D Concourse (including elements of the original Apron Service Buildings - Apron Control Tower). This demolition will have No Adverse Effect, as the Apron Service Buildings have been determined not to be historic properties, and the Apron Control Tower was recorded and removed under the terms of another MOA.

4) NEW CONSTRUCTION IN HISTORIC DISTRICT (BELOW GRADE)

The new below-grade construction components, relating to the IAD Automated People Mover System, fall under the terms of both the 1993 Main Terminal Expansion and the 1993 Midfield Concourse Facilities MOA. As these agreements contain specific stipulations requiring continuing agency consultation, provisions are already in place to assure that these project components will have No Adverse Effect.

RECEIVED
MAR 14 2002
OFFICE OF ENGINEERING

-300
-VBA
-39
18
34B
cc: H. Whiting

5) NEW CONSTRUCTION OUTSIDE OF THE HISTORIC DISTIRICT

New construction projects outside of the historic district boundaries will be distant enough from the Main Terminal and other original historic structures, that they will have minimal impacts on the architectural character of the historic district. Although it is anticipated that there will be reduced agency scrutiny of design of these facilities, the Authority shall make provision for agency review and comment.

6) ARCHAEOLOGICAL IMPACTS – MIDFIELD AREA

With the exception of the Phase I(B) projects identified in condition 8, all the ground disturbance activities related to the Tier 2 and Related Facilities program are limited to the midfield area bound by the two existing runways. A Phase I(A) analysis of archival land-use data and the results archaeological surveys, clearly indicates that this portion of the airport has been so severely disturbed, that these project components will have No Effect on archaeological resources.

7) ARCHAEOLOGICAL IMPACTS – OUTSIDE OF MIDFIELD

Projects located outside the midfield disturbance area, with the potential to contain intact archaeological resources, underwent standard Phase I(B) field investigation. As none of these project areas contained significant prehistoric or historic archeological resources, these projects will have No Effect on the Airport's archaeological resources. Furthermore, due to their location, new construction associated with these project components will have No Effect on either on-airport or off-airport historic properties.

8) ADDITIONAL ARCHAEOLOGICAL I MPACTS

Under the terms of the 1987 PMOA, the Authority assures that any soil disturbance associated with future (but not yet defined) project elements – shall undergo prior archaeological assessment.

Head of Project Review — *Date*

99-0460

VASHPO/DHR Project No.

11 MARCH 02

APPENDIX E

AGENCY CONSULTATION LETTERS AND RESPONSES

This appendix contains the consultation letters sent to the agencies that were contacted by MWAA to assist in identifying environmental issues that may affect the future implementation of the improvement projects at IAD. This appendix also contains the responses from the agencies to these letters.

MAY 16

Ms. Renee Hypes
Project Review Coordinator
Commonwealth of Virginia
Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, VA 23219

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Ms. Hypes:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility. In accordance with Section 7(c)(1) of the Endangered Species Act, we are requesting information on whether any proposed or listed species or their critical habitats are present within the project site.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the U.S. Fish and Wildlife Service, the Virginia Department of Agriculture and Consumer Services, and the Virginia Department of Game and Inland Fisheries in regard to the issue of protected species, and to the Virginia Department of Environmental Quality and the U.S. Environmental Protection Agency.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

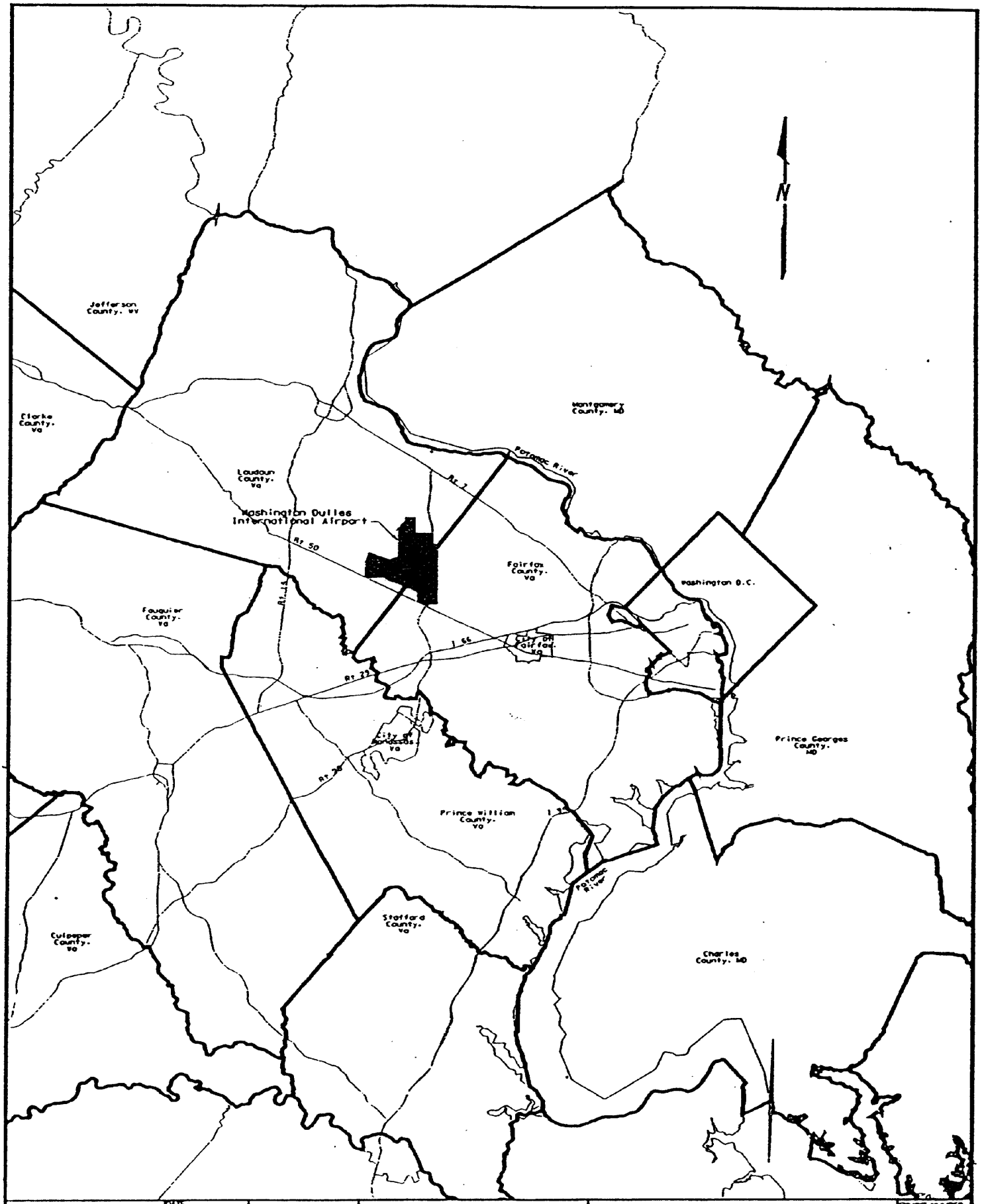
Sincerely,

Original Signed By
J. Charles Baummer, Jr., Ph.D.
Environmental Planner

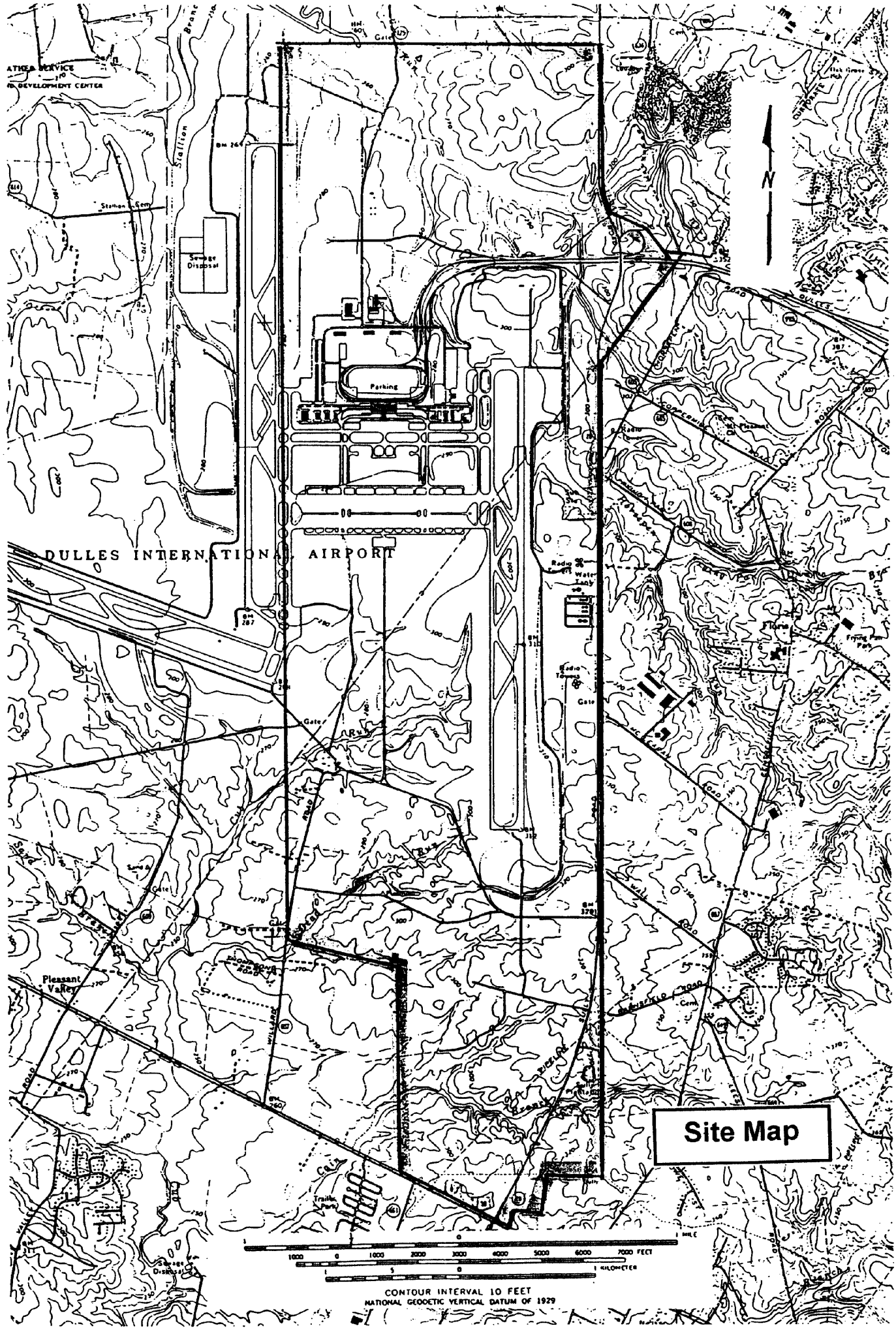
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\PLANNING\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\DCAR May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

David G. Brickley
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street, 3rd Floor
TDD (804) 786-2121 Richmond, Virginia 23219 (804) 786-7951 FAX (804) 371-2674
http://www.state.va.us/~dcr/vaher.html

June 1, 2001

Charles Baummer, Jr., Ph. D.
Environmental Planner
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Dr. Baummer:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, hairy beardtongue (*Penstemon hirsutus*, G4/S2/NF/NS) and white heath aster (*Aster ericodies*, G5/S2/NF/NS) have been documented within the project site. In addition, several other rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades in Virginia may occur at this location if suitable habitat is present. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase also supports occurrences of several global and state rare plant species: earleaf foxglove (*Agalinis auriculata*, G2/S1/SOC/NS), blue-hearts (*Buchnera americana*, G3G4/S1/NF/NS), downy phlox (*Phlox pilosa*, G5T5/S2/NF/NS), stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*, G5/S2/NF/NS), and marsh hedgenettle (*Stachys pilosa* var. *arenicola*, G5/S1/NF/NS). Please note that earleaf foxglove is currently tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however this designation has no official legal status.

Due to the potential for this site to support additional populations of these natural heritage resources, DCR recommends an inventory of suitable habitat in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at (804) 371-6206 to discuss arrangements for field work.

Under the Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Department of Conservation and Recreation (DCR), DCR has the authority to report for VDACS on state-listed plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes

S. René Hypes
Project Review Coordinator

CC: Kim Marbain, USFWS

Literature Cited

Rawinski, T.J. 1995. Natural communities and ecosystems: Conservation priorities for the future. Unpublished report for DCR-DNH.

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

David G. Brickley
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street, 3rd Floor
TDD (804) 786-2121 Richmond, Virginia 23219 (804) 786-7951 FAX (804) 371-2674
http://www.state.va.us/~dcr/vaher.html

1 May 2001

Tracy Layfield
EA Engineering, Science and Technology
15 Loveton Circel
Sparks, MD 21152

Re: IAD Dullas International Airport Expansion

Dear Ms. Layfield:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, natural heritage resources have not been documented at the project site. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, our files do not indicate the presence of any natural area preserves under DCR's jurisdiction in the project vicinity.

Under the Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Department of Conservation and Recreation (DCR), DCR has the authority to report for VDACS on state-listed plant and insect species. The current activity will not affect any documented state-listed plants or insects.

DCR's Biological and Conservation Data System is constantly growing and revised. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $50.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 402, Richmond, VA 23219 ATTN: Cashier. Payment is due within thirty days of the invoice date.

Thank you for the opportunity to comment on this project.

Sincerely,

Robbie Barbuto
Locality Liaison

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF LOUDOUN COUNTY

	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	*LAST SEEN IN CO SINCE 1980?
** BIRDS							
	BARTRAMIA LONGICAUDA	UPLAND SANDPIPER	G5	S1S2		LT	Y
	DOLICHONYX ORYZIVORUS	BOBOLINK	G5	S1			Y
	RALLUS ELEGANS	KING RAIL	G4G5	S2			Y
** COMMUNITIES							
		MOUNTAIN/PIEDMONT ACIDIC SEEPAGE SWAMP					Y
		BASIC MESIC FOREST					Y
		LOW ELEVATION BASIC OUTCROP BARREN					Y
		PIEDMONT/MOUNTAIN BASIC CLIFF					Y
** INVERTEBRATES							
	ELLIPTIO LANCEOLATA	YELLOW LANCE	G2G3	S2S3	SOC	SC	Y
	GOMPHUS ABBREVIATUS	SPINE-CROWNED CLUBTAIL	G3G4	S2	SOC		N
	LASMIGONA SUBVIRIDIS	GREEN FLOATER	G3	S2	SOC	SC	Y
	STYLURUS NOTATUS	ELUSIVE CLUBTAIL	G3	S1	SOC		N
** REPTILES							
	CLEMMYS INSCULPTA	WOOD TURTLE	G4	S2		LT	Y
** VASCULAR PLANTS							
	ARABIS SHORTII	SHORT'S ROCKCRESS	G5	S2			Y
	ASTER SHORTII	SHORT'S ASTER	G4G5	S1			Y
	CAREX CRISTATELLA	CRESTED SEDGE	G5	S2			No Date
	CERASTIUM ARVENSE SSP VELUTINUM	A FIELD CHICKWEED	G5T4?	S2?			Y
	ERYTHRONIUM ALBIDUM	WHITE TROUT-LILY	G5	S2			Y
	HASTEOLA SUAVEOLENS	SWEET-SCENTED INDIAN-PLANTAIN	G3G4	S2	SOC		Y
	LYTHRUM ALATUM	WINGED-LOOSESTRIFE	G5	S2			Y
	OLIGONEURON RIGIDUM VAR RIGIDUM	STIFF GOLDENROD	G5T5	S2			Y
	PENSTEMON HIRSUTUS	HAIRY BEARDTONGUE	G4	S2			Y
	PRUNUS NIGRA	CANADA PLUM	G4G5	S1			Y
	QUERCUS PRINOIDES	DWARF CHINQUAPIN OAK	G5	S2			N
	RORIPPA SESSILIFLORA	STALKLESS YELLOWCRESS	G5	S1			Y
	VITIS RUPESTRIS	SAND GRAPE	G3G4	S1?	SOC		Y

25 Records Processed

*Indicates at least one occurrence in the county seen since 1980

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF ARLINGTON & FAIRFAX COUNTIES

	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	*LAST SEEN IN CO SINCE 1980?
ARLINGTON:							
** INVERTEBRATES							
	STYGOBROMUS PIZZINII	PIZZINI'S AMPHIPOD	G2G4	S1S2	SOC	SC	Y
	STYGOBROMUS SP 15	A GROUNDWATER AMPHIPOD	G1	S1	SOC		Y
** VASCULAR PLANTS							
	BROMUS CILIATUS	FRINGED BROME	G5	S1			Y
	ERYTHRONIUM ALBIDUM	WHITE TROUT-LILY	G5	S2			Y
	PHACELIA COVILLEI	BLUE SCORPION-WEED	G2	S1	SOC		Y
	SALIX EXIGUA	SANDBAR WILLOW	G5	S1			Y
	SIDA HERMAPHRODITA	VIRGINIA MALLOW	G2	S1	SOC		Y
FAIRFAX:							
** BIRDS							
	BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	G4	SU			Y
	CERTHIA AMERICANA	BROWN CREEPER	G5	S2S3		SC	Y
	GALLINULA CHLOROPUS	COMMON MOORHEN	G5	S1		SC	Y
	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	G4	S2	LT	LT	Y
	IXOBRYCHUS EXILIS	LEAST BITTERN	G5	S2			Y
	NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	G5	S2		SC	Y
	PODILYMBUS PODICEPS	PIED-BILLED GREBE	G5	S2			Y
	RALLUS ELEGANS	KING RAIL	G4G5	S2			Y
** COMMUNITIES							
		TIDAL FRESHWATER MARSH					Y
		COASTAL PLAIN/PIEDMONT ACIDIC SEEPAGE SWAMP					Y
		UPLAND DEPRESSION SWAMP					Y
		RIVER-SCOUR WOODLAND					Y
		EASTERN HEMLOCK FOREST					Y
		MESIC MIXED HARDWOOD FOREST					Y
		BASIC MESIC FOREST					Y
		BASIC OAK - HICKORY FOREST					Y
		PIEDMONT/MOUNTAIN BASIC WOODLAND					Y
		RIVERSIDE OUTCROP BARREN					Y
** INVERTEBRATES							
	CALLOPHRYS POLIOS	HOARY ELFIN	G5	S1S3			N
	CELITHEMIS MARTHA	MARTHA'S PENNANT	G4	S2			N
	CICINDELA FORMOSA GENEROSA	A TIGER BEETLE	G5T5	SH			No Date
	ELLIPTIO LANCEOLATA	YELLOW LANCE	G2G3	S2S3	SOC	SC	No Date
	FIXSENIA FAVONIUS ONTARIO	NORTHERN HAIRSTREAK	G4T4	S2S3			No Date
	GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	G5	S1			Y
	GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	G3	S1	SOC		N
	LORDITHON NIGER	BLACK LORDITHON ROVE BEETLE	G1	SH	SOC		No Date
	NEHALENNIA GRACILIS	SPHAGNUM SPRITE	G5	S2			Y
	SPHALLOPLANA HOLSINGERI	HOLSINGER'S GROUNDWATER PLANARIAN	GH	SH			N
	SPHALLOPLANA SUBTILIS	BIGGER'S GROUNDWATER PLANARIAN	GH	SH			N
	STYGOBROMUS KENKI	ROCK CREEK GROUNDWATER AMPHIPOD	G1G3	SH	SOC		N
	STYGOBROMUS PHREATICUS	NORTHERN VIRGINIA WELL AMPHIPOD	G1	S1	SOC		Y
	STYGOBROMUS PIZZINII	PIZZINI'S AMPHIPOD	G2G4	S1S2	SOC	SC	Y
	STYGOBROMUS SP 15	A GROUNDWATER AMPHIPOD	G1	S1	SOC		Y
** OTHER							
	BALD EAGLE ROOST						Y
** REPTILES							
	CLEMMYS INSCULPTA	WOOD TURTLE	G4	S2		LT	Y
** VASCULAR PLANTS							
	AGALINIS AURICULATA	EARLEAF FOXGLOVE	G3	S1	SOC		Y
	ARABIS SHORTII	SHORT'S ROCKCRESS	G5	S2			Y
	ASTER ERICOIDES	WHITE HEATH ASTER	G5	S2			Y
	BOLBOSCHOENUS FLUVIATILIS	RIVER BULRUSH	G5	S1			Y
	CABOMBA CAROLINIANA	CAROLINA FANWORT	G3G5	S1			Y
	CAREX CRISTATELLA	CRESTED SEDGE	G5	S2			Y
	CAREX STRAMINEA	STRAW SEDGE	G5	S1			Y
	CAREX TENERA	SLENDER SEDGE	G5	S1?			Y
	CAREX VESTITA	A SEDGE	G5	S2			Y
	CERASTIUM ARVENSE SSP ARVENSE	A FIELD CHICKWEED	G5T?	S2?			Y

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

NATURAL HERITAGE RESOURCES OF ARLINGTON & FAIRFAX COUNTIES

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	*LAST SEEN IN CO SINCE 1980?
DIARRHENA OBOVATA	A BEAKGRAIN	G4G5	S1			Y
ELEOCHARIS COMPRESSA	FLAT-STEMMED SPIKE-RUSH	G4	S2			Y
ENEMION BITERNATUM	FALSE RUE-ANEMONE	G5	S1			Y
ERYTHRONIUM ALBIDUM	WHITE TROUT-LILY	G5	S2			Y
GEUM LACINIATUM VAR TRICHOCARPUM	ROUGH AVENS	G5T?	S2			No Date
HASTEOLA SUAVEOLENS	SWEET-SCENTED INDIAN-PLANTAIN	G3G4	S2	SOC		Y
HELIANTHUS OCCIDENTALIS	MCDOWELL SUNFLOWER	G5	S1			Y
HEMICARPHA MICRANTHA	DWARF BULRUSH	G4	S1			Y
LATHYRUS PALUSTRIS	VETCHLING	G5	S1			Y
MATTEUCCIA STRUTHIOPTERIS VAR PENSYLVANICA	OSTRICH FERN	G5T5	S1			Y
MOEHRINGIA LATERIFLORA	GROVE SANDWORT	G5	S1			Y
OLIGONEURON RIGIDUM VAR RIGIDUM	STIFF GOLDENROD	G5T5	S2			Y
ONOSMODIUM VIRGINIANUM	VIRGINIA FALSE-GROMWELL	G4	S2			Y
PACKERA PAUPERCULA	BALSAM RAGWORT	G5	S2			Y
PENSTEMON HIRSUTUS	HAIRY BEARDTONGUE	G4	S2			N
PHACELIA COVILLEI	BLUE SCORPION-WEED	G2	S1	SOC		Y
PLATANTHERA PERAMOENA	PURPLE FRINGELESS ORCHIS	G5	S2			Y
PYCNANTHEMUM TORREI	TORREY'S MOUNTAIN-MINT	G2	S2?	SOC		Y
QUERCUS PRINOIDES	DWARF CHINQUAPIN OAK	G5	S2			N
RANUNCULUS AMBIGENS	WATER-PLANTAIN SPEARWORT	G4	S1			Y
RHODODENDRON ARBORESCENS	SMOOTH AZALEA	G4G5	S2			Y
SIDA HERMAPHRODITA	VIRGINIA MALLOW	G2	S1	SOC		N
SILENE NIVEA	SNOWY CAMPION	G4?	S1			Y
SOLIDAGO RACEMOSA	STICKY GOLDENROD	G5T4?	S1			Y
SOLIDAGO RUPESTRIS	ROCK GOLDENROD	G4?	S1			Y
SPARTINA PECTINATA	FRESHWATER CORDGRASS	G5	S2			Y
VALERIANA PAUCIFLORA	VALERIAN	G4	S2			Y
VITIS RUPESTRIS	SAND GRAPE	G3G4	S1?	SOC		Y

75 Records Processed

MAY 16

Ms. Shelly Miller
Commonwealth of Virginia
Environmental Services Division
Department of Game and Inland Fisheries
4010 West Broad Street
P.O. Box 11104
Richmond, VA 23220

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Ms. Miller:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility. In accordance with Section 7(c)(1) of the Endangered Species Act, we are requesting information on whether any proposed or listed species or their critical habitats are present within the project site.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the U.S. Fish and Wildlife Service, the Virginia Department of Agriculture and Consumer Services, and the Virginia Department of Conservation and Recreation in regard to the issue protected species, and to the U.S. Environmental Protection Agency and Virginia Department of Environmental Quality.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

Sincerely,

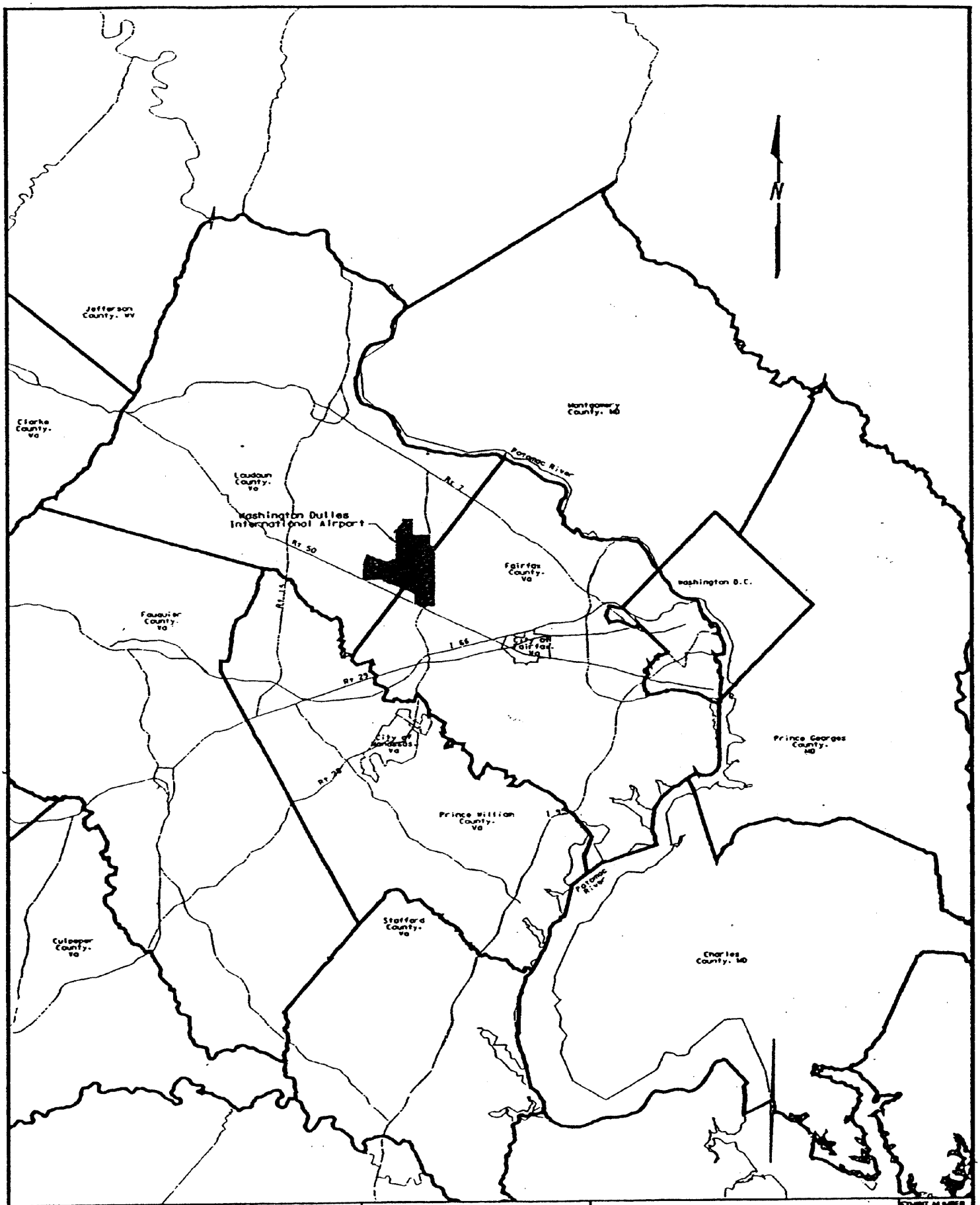
Original Signed By

J. Charles Baummer, Jr., Ph.D.
Environmental Planner

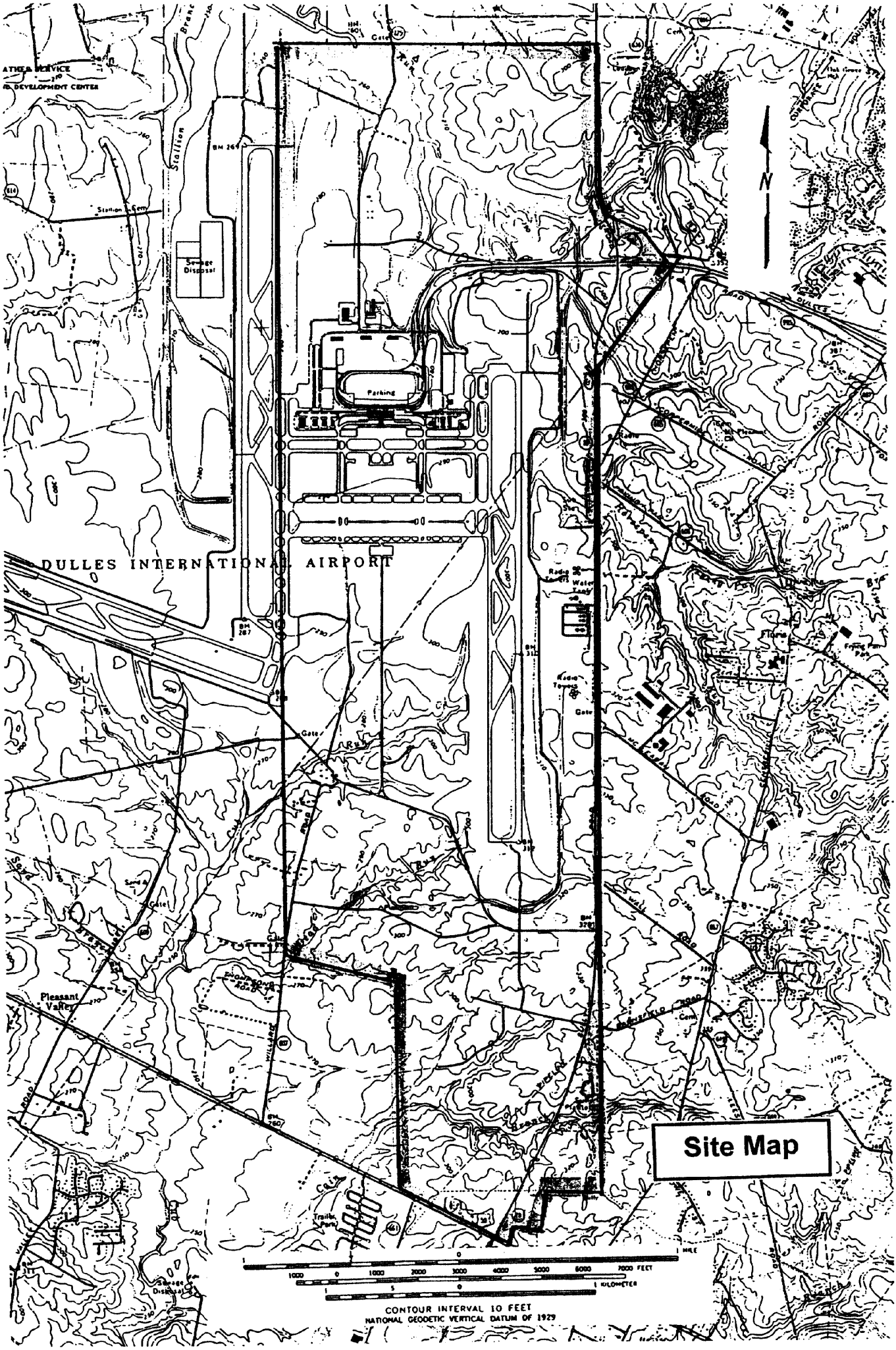
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\PLANNING\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\DGIF May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

COMMONWEALTH of VIRGINIA

James S. Gilmore, III
Governor
John Paul Woodley, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

June 18, 2001

J. Charles Baummer, Jr.
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

RE: ESSLOG 14986; Proposed Facility Improvements At Washington Dulles International Airport

Dear Mr. Baummer:

This letter is in response to your request for information related to the presence of threatened or endangered species in the vicinity of the above referenced project.

Information about fish and wildlife species was generated from our agency's computerized Fish and Wildlife Information System, which describes animals that are known or may occur in a particular geographic area. Field surveys may be necessary to determine the presence or absence of some of these species on or near the proposed area. Also, additional sensitive animal species may be present, but their presence has not been documented in our information system.

The *state threatened* wood turtle, (*Clemmys insculpta*), and the *state threatened* upland sandpiper, (*Bartramia longicauda*) have been documented in the project area. The applicant should coordinate with this Department to evaluate potential impacts on these species.

The federal species of concern state special concern species yellow lance mussel, (*Elliptio lanceolata*), and the state special concern species brown creeper, (*Certhia amaericana*), have been documented in the project area. The classifications of "fed eral species of concern" and "state special concern species" are not legal designations and do not require further coordination.

A block survey of an area encompassing the project site documented the following species during the breeding season: the federal species of concern *state threatened* Henslow's sparrow, (*Ammodramus henslowii susurrans*). These species may occur at the project site if appropriate habitat exists, but no coordination is necessary at this time.

Endangered plants and insects are under the jurisdiction of the Virginia Department of Agriculture and Consumer Services, Bureau of Plant Protection. Questions concerning sensitive

plant and insect species occurring at the project site should be directed to Keith Tignor at (804) 786-3515.

This letter summarizes the likelihood of the occurrence of endangered or threatened animal species at the project site. If you have additional questions in this regard, please contact me at (804) 367-2211. Please note that this response does not address any other environmental concerns; these issues are analyzed by our Environmental Services Section, in conjunction with interagency review of applications for state and federal permits. If you have any questions in this regard, please contact Ray Fernald or Tom Wilcox at (804) 367-8999.

There is a processing charge of $25.00 for our response. Please remit a check, made payable to **TREASURER OF VIRGINIA**, within 30 days to MaryBeth Murr at the address listed on the first page. Include a copy of this letter with your payment to ensure that your account is properly credited.

The Fish and Wildlife Information Service, the system of databases used to provide the information in this letter, can now be accessed via the Internet! The Service currently provides access to current and comprehensive information about all of Virginia's fish and wildlife resources, including those listed as threatened, endangered, or special concern; colonial birds; waterfowl; trout streams; and all wildlife. Users can choose a geographic location and generate a report of species known or likely to occur around that point. From our main web page, at www.dgif.state.va.us, choose the hyperlink to "Wildlife Information Online". For more information, please contact Amy Martin, Online Service Coordinator, at (804) 367-2211.

Thank you for your interest in the wildlife resources of Virginia.

Sincerely,

Amy Martin

Amy Martin
Online Service Coordinator

cc: R.T. Fernald, VDGIF

MAY 16 200

Ms. Karen L. Mayne
Supervisor, Virginia Field Office
U.S. Department of the Interior
Fish and Wildlife Service
Gloucester Office of Fisheries Assistance
6669 Short Lane
Gloucester, VA 23061

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Ms. Mayne:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility. In accordance with Section 7(c)(1) of the Endangered Species Act, we are requesting information on whether any proposed or listed species or their critical habitats are present within the project site.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the Virginia Department of Agriculture and Consumer Services, the Virginia Department of Conservation and Recreation, and the Virginia Department of Game and Inland Fisheries in regard to the issue of protected species, and to the U.S. Environmental Protection Agency and the Virginia Department of Environmental Quality.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

Sincerely,

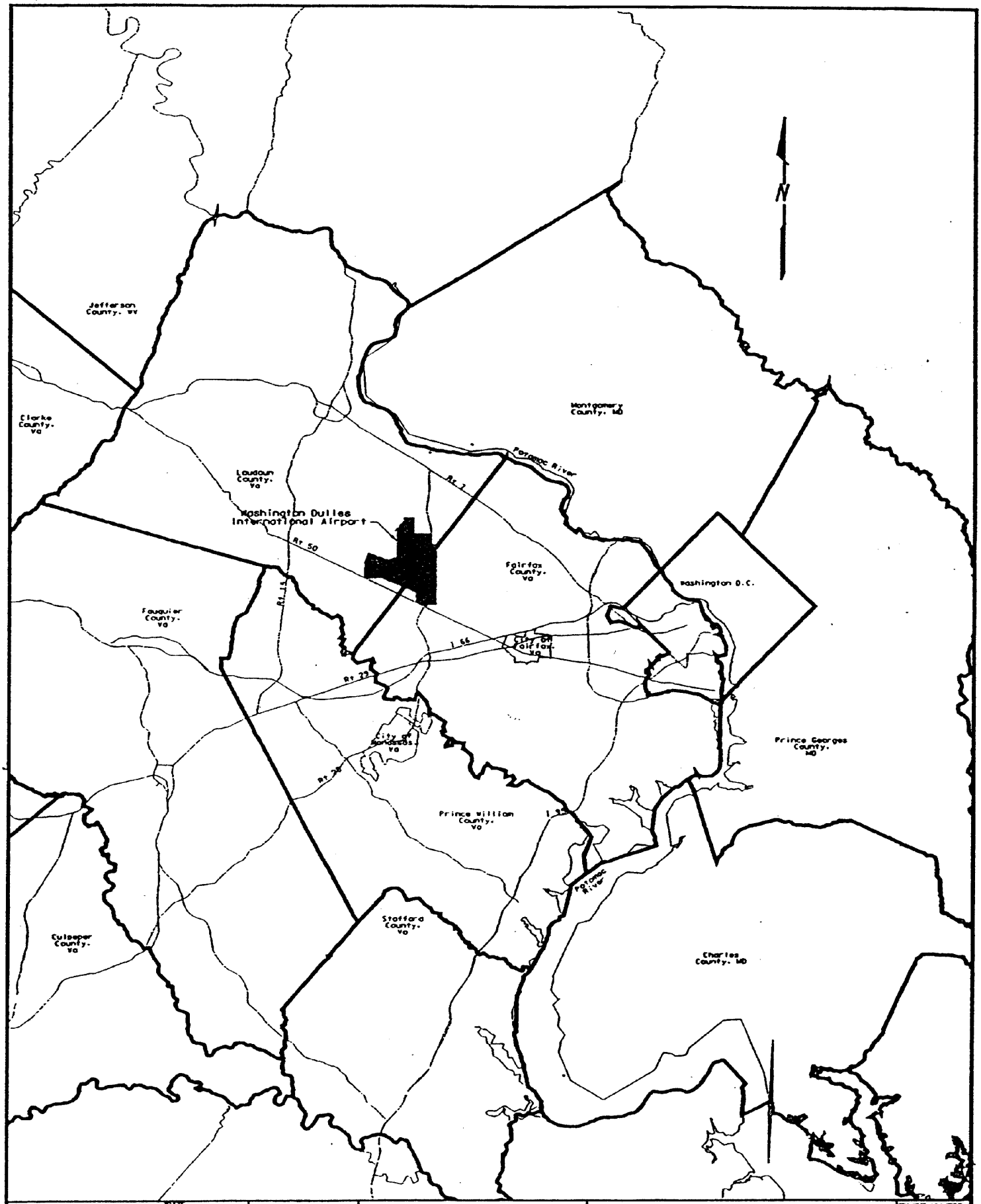
Original Signed By

J. Charles Baummer, Jr., Ph.D.
Environmental Planner

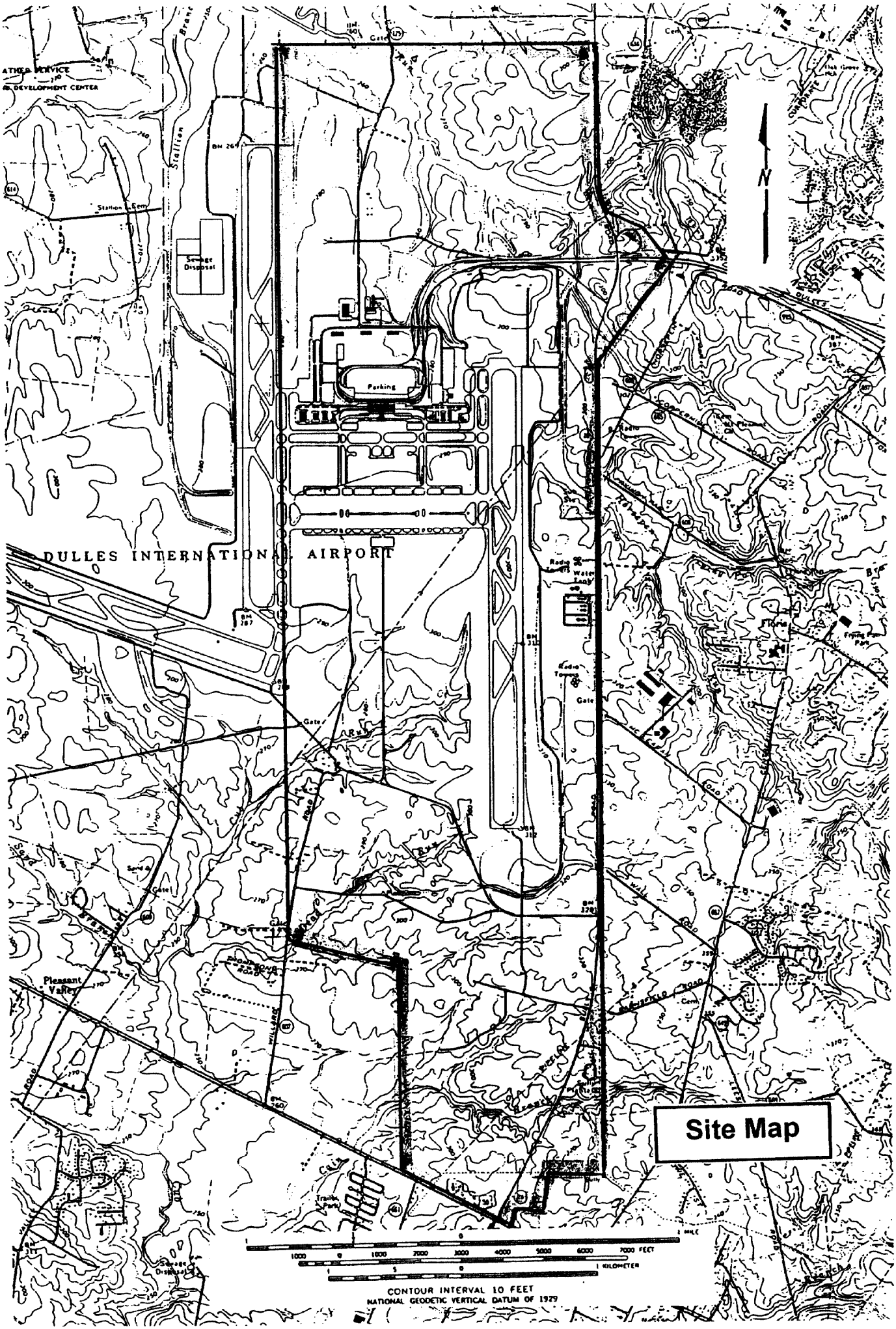
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\PLANNING\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\USFWS May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, Virginia 23061

May 25, 2001

Dr. J. Charles Baummer, Jr.
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

Greetings:

The U.S. Fish and Wildlife Service has received your request to review the attached project for potential impacts to federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Attached are lists of species with federal status and species of concern that have been documented or may occur in the county(s) where your project is located. These lists were prepared by this office and are based on information obtained from previous surveys for rare and endangered species.

Due to the limited staff in this office, we are unable to review projects in a timely manner. Therefore, we request that you send the attached project to the following state agencies for review:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, VA 23219
(804) 786-7951

It is recommended that each agency named above review the project because each maintains a different database and has differing expertise and/or regulatory responsibility.
IF EITHER OF THESE AGENCIES DETERMINES THAT YOUR PROJECT MAY IMPACT A FEDERALLY LISTED, PROPOSED, OR CANDIDATE SPECIES OR CRITICAL HABITAT, PLEASE CONTACT THIS OFFICE AND PROVIDE A COPY

OF THE RESPONSE LETTER FROM EACH AGENCY; OTHERWISE, FURTHER CONTACT WITH THIS OFFICE IS NOT NECESSARY.

If you have any questions or need further assistance, please contact Eric Davis of this office at (804) 693-6694, extension 104.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

FAIRFAX COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica[2]	Sensitive joint-vetch	LT
Isotria medeoloides[2]	Small whorled pogonia	LT

Species with Natural Heritage Rankings of G2G3 or Rarer

The species listed below are tracked by this office due to their rarity in Virginia; however they carry no federal legal status.

INVERTEBRATES		
Pyrgus wyandot	Appalachian grizzled skipper	G2
Stygobromus kenki	Rock Creek groundwater amphipod	G1
Stygobromus phreaticus	Northern Virginia well amphipod	G1G2
Stygobromus pizzinii	Pizzini's amphipod	G2
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[2]	Marsh senna	G5T2
Paronychia virginica var. virginica	Yellow nailwort	G4T1T2Q
Pycnanthemum torrei	Torrey's mountain-mint	G2
Sida hermaphrodita	Virginia mallow	G2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the Potomac River.
[2]This species has been documented in an adjacent county and may occur in this county.

March 22, 1999
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

LOUDOUN COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
None documented		

Species of Concern

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Speyeria idalia	Regal fritillary	G3
VASCULAR PLANTS		
Agalinis auriculata[1]	Earleaf foxglove	G3
Carex decomposita	Epiphytic sedge	G3
Carex polymorpha[1]	Variable sedge	G2G3
Hesperia attalus slossonae	Dotted Skipper	G3G4T3
Poa paludigena[1]	Bog bluegrass	G3
Vitis rupestris	Sand grape	G3

[1]This species has been documented in an adjacent county and may occur in this county.

May 25, 2000
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

KEY

LE - federally listed endangered.

LT - federally listed threatened.

PE - federally proposed endangered.

PT - federally proposed threatened.

EX - believed to be extirpated in Virginia.

LE(S/A) - federally listed endangered due to similarity of appearance to a federally listed species.

LT(S/A) - federally listed threatened due to similarity of appearance to a federally listed species.

C - candidate species; the U.S. Fish and Wildlife Service has enough information to list the species as threatened or endangered, but this action is precluded by other listing activities.

SOC - species of concern; those species that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range. These species are not protected under the Endangered Species Act.

G - global rank; the species rarity throughout its total range.

G1 - extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - either very rare and local throughout its range or found locally (abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G_T_ - signifies the rank of a subspecies or variety. For example, a G3T1 would apply to a subspecies of a species that is very rare and local throughout its range or found locally in a restricted range (G3) but the subspecies warrants a rank of T1, critically imperiled.

G_Q - The taxon has a questionable taxonomic assignment.

U.S. Fish & Wildlife Service

Bald Eagle

Haliaeetus leucocephalus

Description - The bald eagle occurs throughout the United States. It is a large bird-of-prey with dark brown plumage, a white head and tail, and a yellow bill, feet, and eyes. Juvenile eagles generally have a dark brown body, sometimes with white patches on the tail, belly, and underwings. The head and tail become completely white when full adult plumage is reached at four to five years of age.

Life History - The majority of Virginia's eagle population is found on the coastal plain. The bald eagle breeding season begins in mid-November when large nests are built (or the previous year's nest is repaired) usually in loblolly pine trees that are in close proximity to water. Eagles lay one to three eggs between mid-January and late March. In March, most eggs hatch and by June or July most young have fledged. However, the young will continue to use the nest for several weeks. In Virginia, during the summer and winter months, juvenile and nonbreeding adult eagles congregate along large rivers in areas with abundant food and little human disturbance. During the day, these eagles feed and perch along the river shoreline. In late afternoon, they move inland to roost either singly or communally. Roosts are typically located away from human disturbance and near water and a food source. Bald eagles feed primarily on fish, but will also eat carrion, waterfowl, small mammals, snakes, and turtles.

Conservation - The bald eagle was federally listed as an endangered species in the Chesapeake Bay Region on March 11, 1967. On July 12, 1995, the bald eagle was reclassified to threatened throughout the 48 lower states because the population had increased due to the banning persistent pesticides, habitat protection, and other recovery activities. On July 6, 1999, the bald eagle was proposed for removal from the list of endangered and threatened wildlife in the lower 48 states. This action was proposed because the available data indicated that this species has recovered. The recovery is due in part to habitat protection and management actions initiated under the Endangered Species Act. It is also due to reduction in levels of persistent pesticides occurring in the environment. If and when the eagle is no longer protected by the Endangered Species Act, it will still be protected by the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and state laws. Until the eagle is officially delisted, it will continue to receive protection pursuant to the Endangered Species Act. Bald eagles in the Chesapeake Bay are increasing. However, habitat destruction through urban and residential development and human disturbance in nesting, roosting, and foraging habitats continue to be a threat.

What You Can Do To Help - If you know of a bald eagle nest on or near property proposed for clearing, development, or logging please contact one of the following agencies for assistance:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

U. S. Fish and Wildlife Service
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

U.S. Fish and Wildlife Service. 1990. Chesapeake Bay Region bald eagle recovery plan: first revision. Newton Corner, Massachusetts.

U.S. Fish and Wildlife Service. 1999. Proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife. Federal Register 64(128): 36453-36464.

Watts, B.D., K.W. Cline, and M.A. Byrd. 1994. The bald eagle in Virginia: An information booklet for land planners. The Center for Conservation Biology, College of William and Mary, Williamsburg, Virginia.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

U.S. Fish & Wildlife Service

Sensitive Joint-Vetch

Aeschynomene virginica

© M. Rollins

Description - The sensitive joint-vetch is an annual legume native to the eastern United States. Populations currently exist in Maryland, New Jersey, North Carolina, and Virginia. The historical range for the species extended to Delaware and Pennsylvania. In Virginia, populations are found along the Potomac, Mattaponi, Pamunkey, Rappahannock, Chickahominy, and James Rivers and their tributaries. This plant usually attains a height of three to six feet in a single growing season, but may grow as tall as eight feet. The flowers are yellow, streaked with red and the fruit is a pod, turning dark brown when ripe.

Life History - The joint-vetch occurs in fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily. It typically occurs at the outer fringe of marshes or shores; its presence in marsh interiors may be a result of nutrient deficiencies, ice scouring, or muskrat herbivory. The sensitive joint-vetch is found in localities where plant diversity is high and annual species are prevalent. Bare to sparsely vegetated substrates appear to be a habitat feature of critical importance for establishment and growth of this species. Plants flower from July through September and into October in some years. Fruits are produced from July through late October, concurrent with flowering.

Conservation - The sensitive joint-vetch was federally listed as a threatened species on June 19, 1992. Threats to the species include sedimentation, competition from non-native plant species, dams, dredging, filling, recreational activities, shoreline stabilization, shoreline structures, road and bridge construction, commercial and residential development, water withdrawal projects, water quality degradation, agricultural practices, introduced pest species, mining, timber harvest, over-visitation, declines in muskrat populations, rise in sea level (this may also be a result of natural cycles), and collection. Natural threats are often identified with disturbances, such as wave and ice action associated with severe storm events, competition, herbivory, channel migration, sea level rise and natural sedimentation processes. Adequate habitat conservation for this species will only be achieved through on-site protection of marshes supporting plant populations when coupled with protection of the natural ecological processes responsible for creating and maintaining habitat for the sensitive joint-vetch.

What You Can Do To Help - Avoid the use of herbicides in or near waterways. If you are planning construction or stabilization activities along the shoreline in one of the counties indicated on the attached map, please contact the U.S. Fish and Wildlife Service.

References

Davison, S.E. and L.P. Bruderle. 1984. Element stewardship abstract for *Aeschynomene virginica* - sensitive joint vetch. The Nature Conservancy. Arlington, Virginia.

Hershner, C. and J.E. Perry. 1987. Population status of potentially threatened vascular plants from coastal plain tidal rivers in Virginia. College of William and Mary, Virginia Institute of Marine Science, Gloucester Point, Virginia.

Rouse, G.D. 1994. Sensitive joint-vetch life history and habitat study, 1993 Field Season, Mattaponi and Rappahannock River systems, Virginia. Schnabel Environmental Services. Richmond, Virginia.

U.S. Fish and Wildlife Service. 1995. Sensitive joint-vetch (*Aeschynomene virginica*) recovery plan. Hadley, Massachusetts.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

U.S. Fish & Wildlife Service

Small Whorled Pogonia

Isotria medeoloides

Description - The small whorled pogonia is a herbaceous perennial orchid. It has a widely scattered distribution in the eastern United States along the Atlantic coast from Maine to Georgia with outlying occurrences in the midwest and Canada. This species has pale green, elliptical leaves, usually five or six, that grow in a single whorl at the top of a hairless, grayish-green stem. The one or two flowers per plant are yellowish-green, unscented, and form in the center of the whorl.

Life History - In Virginia, the small whorled pogonia is found in ordinary looking third-growth upland forests with an open understory and a closed canopy where the topography is typically moderately sloping or almost level. The plants are usually associated with decaying vegetative matter such as fallen trunks and limbs, leaf litter, bark, and tree roots. The pogonia is found in soils that are acidic sandy loams with low nutrient content. The flowers appear in late April to mid-May. The small whorled pogonia reproduces primarily through self-pollination and occasionally vegetatively. It is often confused with the Indian cucumber-root (***Medeola virginiana***) and the large whorled pogonia *(Isotria verticillata)*. The Indian cucumber-root has deep green leaves with a stem that is thin, hairy, and wiry. The large whorled pogonia has a reddish-purple stem and dark green leaves; its flower is reddish-purple.

Conservation - The small whorled pogonia was federally listed as an endangered species on September 10, 1982. It was reclassified as threatened on November 7, 1994. This was possible because at the time of reclassification 61% of the viable populations had been protected. The small whorled pogonia and its habitat continue to be threatened, directly and indirectly, by residential and commercial development. The upland habitat where it is found is seldom protected by federal or state laws unless it occurs on federally-owned property. Without voluntary landowner protection many pogonia populations have been and will be destroyed. Other threats to this species are collection by plant enthusiasts and browsing by white-tailed deer and invertebrates.

What You Can Do To Help - If you find a plant that appears to be the small whorled pogonia, take note of the location and photograph the plant, if possible. Please do not remove the plant!

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

Contact one of the following agencies for assistance:

Virginia Department of Agriculture and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, Virginia 23209
(804) 786-3515

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

U.S. Fish and Wildlife Service. 1992. Small whorled pogonia (*Isotria medeoloides*) recovery plan, first revision. Newton Corner, Massachusetts.

Ware, D.M.E. 1991. Small whorled pogonia. Pages 95-97 in K. Terwilliger, ed. Virginia's Endangered Species, Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

July 3, 2001

Dr. J. Charles Baummer, Jr.
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

Re: Improvements to Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia

Dear Dr. Baummer:

The U.S. Fish and Wildlife Service (Service) has received your May 16, 2001 letter and your June 27, 2001 facsimile requesting information on federally listed species for the referenced project. The proposal is to make improvements to Washington Dulles International Airport, Loudoun and Fairfax Counties, Virginia. This letter is submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The proposed action is to improve passenger handling facilities, provide additional gate capacity, construct a new air traffic control tower, and improve related facilities. The project description is not clear as to whether any of these improvements will require destruction of hardwood forests, which is habitat for the federally listed threatened small whorled pogonia, *Isotria medeoloides*. Appropriate habitat for this orchid is ordinary-looking, third-growth upland forests with an open understory on terrain that is almost level or gently to moderately sloping, but it has been found on steep slopes. Although the pogonia may be found more often on slopes with northerly or easterly exposures, all aspects with appropriate habitat may contain the pogonia. Small whorled pogonia sites can be generally characterized by their proximity to canopy openings, the presence of dead standing trunks, little herbaceous ground cover, and wood litter on the ground. The Service recommends a survey within appropriate habitat at the project site. Surveys should be conducted from June 1 through July 20 in your region of Virginia. Outside of these months, a site visit by a qualified individual can determine if appropriate habitat exists at the project site. A list of qualified pogonia surveyors is enclosed. Should you select a surveyor not already known by the Service to be qualified, the Service recommends you submit the proposed surveyor's qualifications at least 30 days prior to surveying.

If the proposed action does not contain any pogonia habitat modification, then the Service believes that the proposed action will have no effect on federally listed species.

If you have any questions or need further assistance concerning this project, please contact Mr. Eric Davis at (804) 693-6694, extension 104.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosure

cc: VDCR, DNH (Rene Hypes)

SMALL WHORLED POGONIA *(Isotria medeoloides)* SURVEY CONTACTS

LISTED IN ALPHABETICAL ORDER

Ted Bradley
Dept. of Biology
George Mason University
Fairfax, VA 22030-4444
(703) 993-1050

Bill Brumbeck
New England Wildflower Soc., Inc.
180 Hemenway Rd.
Framingham, MA 01701-2699
(413) 877-7630

Dave Davis
D.L. Davis Consulting Biologist, L.L.C.
3208 West Grace St.
Richmond, VA 23221
(804) 358-4078

Douglas A. DeBerry
Williamsburg Env. Group
3000 Easter Circle
Williamsburg, VA 23188
ph (757) 220-6869
fax (757) 229-4507
www.wegnet.com

Cris Fleming
3508 Shepherd Street
Chevy Chase, MD 20815
(301) 657-9289

Elaine Haug
Smithsonian Institution
Washington, DC
(202) 357-3339
OR
4814 Dillon Avenue
Dale City, VA 22193
(703) 670-2347

John Lowenthal
Landmark Design Group
4029 Ironbound Road, Suite 100
Williamsburg, VA 23188
(757) 253-2975
fax (757) 229-0049

Chris Ludwig
Division of Natural Heritage
217 Governor St., 3rd Floor
Richmond, VA 23219
(804) 786-7951

Edward P. Milhous
4641 Sudley Road
Catharpin, VA 22018
(703) 754-4214

Sherri Miller
Espey, Huston & Associates
11838 Rock Landing Dr., Suite 250
Newport News, VA 23606
(757) 596-8267

Dr. Alan J. Neumann
Stokes Environmental Associates, Inc.
4101 Granby St. Suite 404
Norfolk, VA 23504
(757) 623-0777
jneumann@widomaker.com

Allen Plocher
Dept. of Biological Science
Old Dominion University
Norfolk, VA 23529
(757) 683-3595

Garrie D. Rouse
Rouse Environmental Services
P.O. Box 146
Aylett, VA 23009
(804) 769-0846

R. Thomas Sankey
Malcolm Pirnie
11832 Rock Landing Dr., Suite 400
Newport News, VA 23606-4206
(757) 873-8700

Bill Saunders
126 Shellbank Drive
Williamsburg, VA 23185
(757) 220-0358

Bob Smiley
Resource International, Ltd.
P.O. Box 6160
Ashland, VA 23005
(804) 550-9214

Lenwood Smith
7325 Goodwill Church Road
Greensboro, NC 27284
(336) 644-6864

Kathryn B. Sweeney
Malcolm Pirnie
11832 Rock Landing Dr., Suite 400
Newport News, VA 23606-4206
(757) 873-4425
ksweeney@pirnie.com

Catharine Tucker
302 Danray Drive
Richmond, VA 23227
(804) 786-0450 (W)
(804) 264-6941 (H)

Dr. Donna Ware
Department of Biology
College of William and Mary
Williamsburg, VA 23187
(757) 221-2799

Inclusion of names on this list does not constitute endorsement by the U.S. Fish and Wildlife Service or any other U.S. Government agency.
June 5, 2001

MAY 16

Mr. Michael Murphy, Director
Commonwealth of Virginia
Department of Environmental Quality
Division of Environmental Enhancement
P.O. Box 10009
Richmond, VA 23240

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Murphy:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the U.S. Fish and Wildlife Service, the Virginia Department of Agriculture and Consumer Services, the Virginia Department of Conservation and

Recreation, and the Virginia Department of Game and Inland Fisheries in regard to the issue of protected species, and to the U.S. Environmental Protection Agency.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

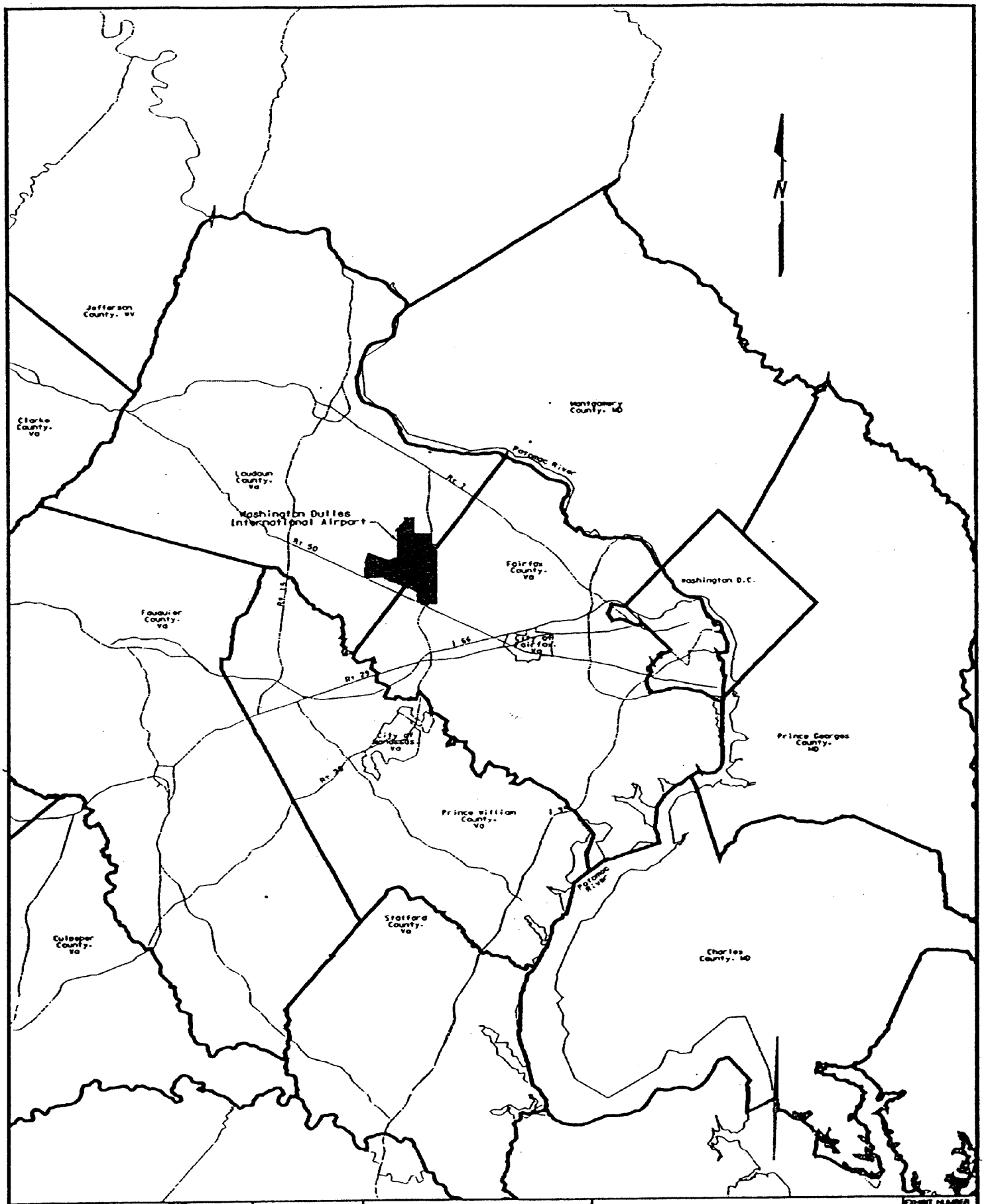
Sincerely,

Original Signed By
J. Charles Baummer, Jr., Ph.D.
Environmental Planner

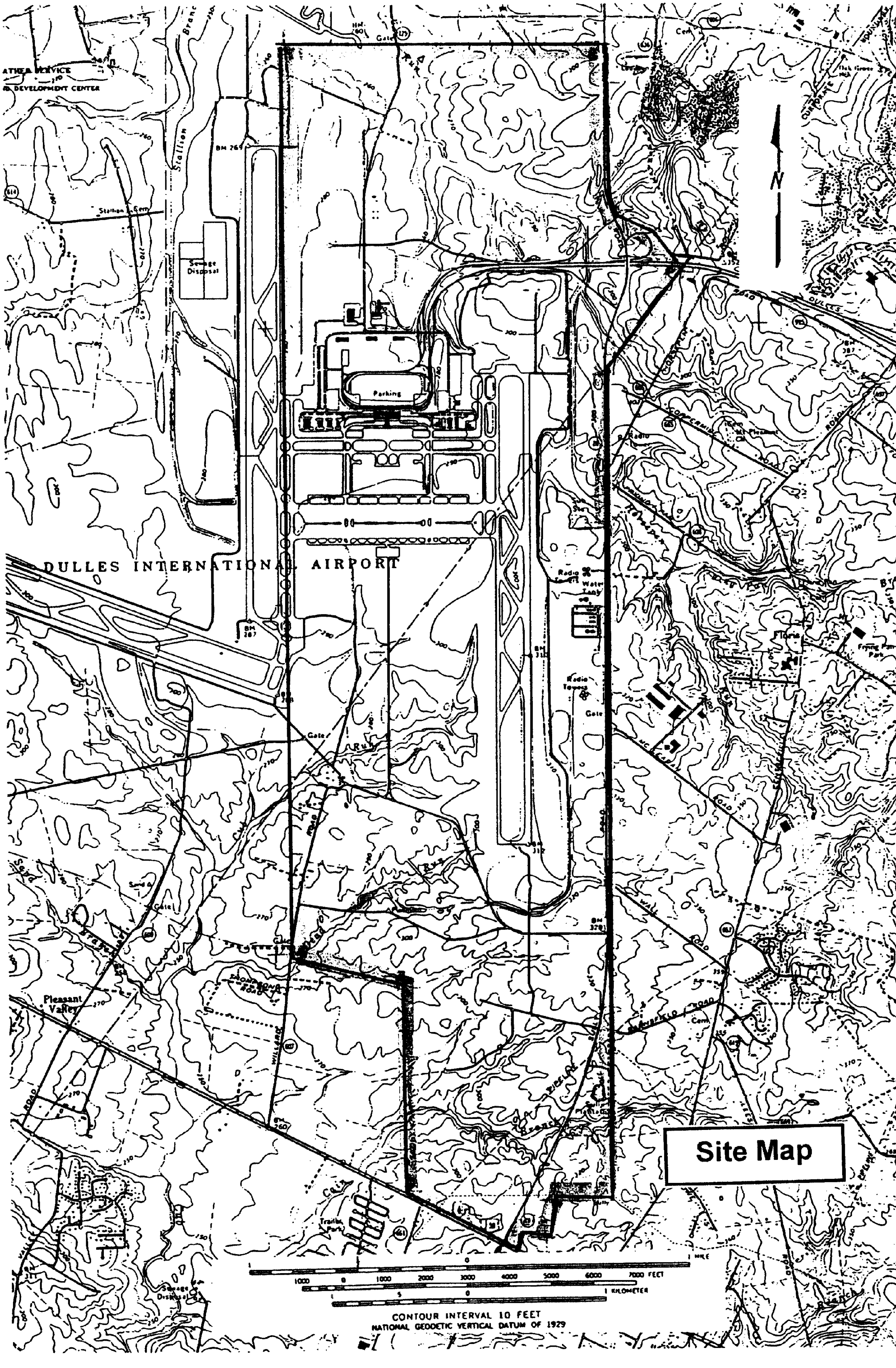
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\PLANNING\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\DEQ May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Site Map
Parking
Sewage Disposal
N
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
http://www.deq.state.va.us

Dennis H. Treacy
Director

(804) 698-4000
1-800-592-5482

June 13, 2001

Dr. J. Charles Baummer, Jr.
Metropolitan Washington Airports Authority
Ronald Reagan National Airport
Washington DC, 20001-4901

RE: Scoping Comments for Preparation of the Environmental Assessment concerning Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Baummer:

The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. In general, DEQ does not coordinate scoping comments. Agencies are expected to send comments directly to the sponsoring agency. Therefore, the following comments do not represent comments from other agencies. Any comments submitted by agencies concerning their area of expertise supersede DEQ's comments. These comments are provided solely as guidelines on issues that should be addressed in the EA.

The following agencies, planning district commission, and localities may wish to comment: Department of Conservation and Recreation; Department of Game and Inland Fisheries; Department of Historic Resources; Department of Health; Department of Forestry; Department of Agriculture and Consumer Services; Chesapeake Bay Local Assistance Department; Department of Mines, Minerals and Energy; Department of Transportation; Marine Resources Commission; Virginia Institute of Marine Science; Northern Virginia Regional Commission; and the Counties of Fairfax and Loudoun. We recommend that you contact these agencies and localities if this has not been already done. Also, copies of the NEPA document should be sent to these agencies. I have enclosed a list of reviewers normally involved in the Commonwealth's coordinated review process. As customary, DEQ will coordinate the review of the NEPA document that results from this effort.

Also, pursuant to the Coastal Zone Management Act of 1972, as amended, federal actions, in this case the Federal Aviation Administration's approval or financial assistance must be carried out a manner which is consistent with the Virginia Coastal Resources Management Program (VCP). Accordingly, the sponsoring agency must provide a federal consistency certification that the proposed action will be consistent with the VCP. In order to be consistent with the VCP, the Authority must receive all the applicable permits and approvals listed under the Enforceable Programs of the VCP (Attachment 1) prior to commencing the project. We encourage you to include the consistency certification in the NEPA document. If this is done, DEQ will coordinate its federal consistency review concurrently with its coordinated review of the NEPA document. If you have any questions concerning this approach to the federal consistency review aspect of this proposal, please feel free to call me at (804) 698-4325.

As previously stated, the Commonwealth will review the NEPA document which follows this scoping process. We recommend that the document includes, but is not limited to, discussions of the following:

DESCRIPTION OF PROPOSED ACTION

ALTERNATIVES CONSIDERED
As required under NEPA, this should include discussion of the no-action alternative.

AFFECTED ENVIRONMENT

Physical resources
- Physiography, Topography, Climate
- Geology
- Soils
- Air Quality
- Noise

Water Quality and Associated Resources
- Groundwater
- Surface Water
- Wetlands: type, quantity, functional values, etc.
- Chesapeake Bay Preservation Areas
- Floodplains

Biological Resources
- Vegetation
  - Forests:
    - Upland areas
    - Wetlands vegetation

- Fish and Wildlife
  - Wildlife Species
  - Aquatic Species
- Natural Heritage Resources

Hazardous Materials and Solid Waste
- Emergency Planning and Community Right-to-Know Act
- Hazardous Waste
- Non-hazardous Waste
- Solid Waste
  - Solid Waste Disposal
  - Solid Waste Reuse and Recycling
- Storage Tanks
  - Underground Storage Tanks
  - Above-ground Storage Tanks
- Asbestos Management
- Lead Paint Management
- Pest Management

Cultural Resources
- Archaeological Sites
- Historic Buildings
- Visual Aesthetics

Sociological Environment

Economic Development

Environmental Justice

Land Use
- Site under consideration
- Surrounding land use

Infrastructure
- Utilities
  - Potable water
  - Sanitary Sewer
  - Stormwater
  - Electricity
  - Natural Gas
  - Telecommunications
  - Heating Systems

Transportation Systems
Highways and Roads
Airport Traffic
Railroads, etc.

ENVIRONMENTAL CONSEQUENCES
Thorough discussion of potential Impacts on the above parameters that will result from the proposed action.

CUMULATIVE IMPACT EVALUATION
Assessment of cumulative impacts to resources discussed above.

MITIGATION OF IMPACTS
Discussion of measures proposed to mitigate any unavoidable adverse impacts to resources discussed above.

When the NEPA document is ready for publication, please contact me at (804) 698-4325. Thank you for the opportunity to comment on this proposal.

Sincerely,

Ellie L. Irons
EIR Program Manager

Enclosures

MAY 16

Mr. Peter Stokley
U.S. Environmental Protection Agency
Region III, Environmental Services Division
1650 Arch Street, 3-ES-43
Philadelphia, PA 19103-2029

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Stokely:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the U.S. Fish and Wildlife Service, the Virginia Department of Agriculture and Consumer Services, the Virginia Department of Conservation and

Recreation, and the Virginia Department of Game and Inland Fisheries in regard to the issue of protected species, and to the Virginia Department of Environmental Quality.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

Sincerely,

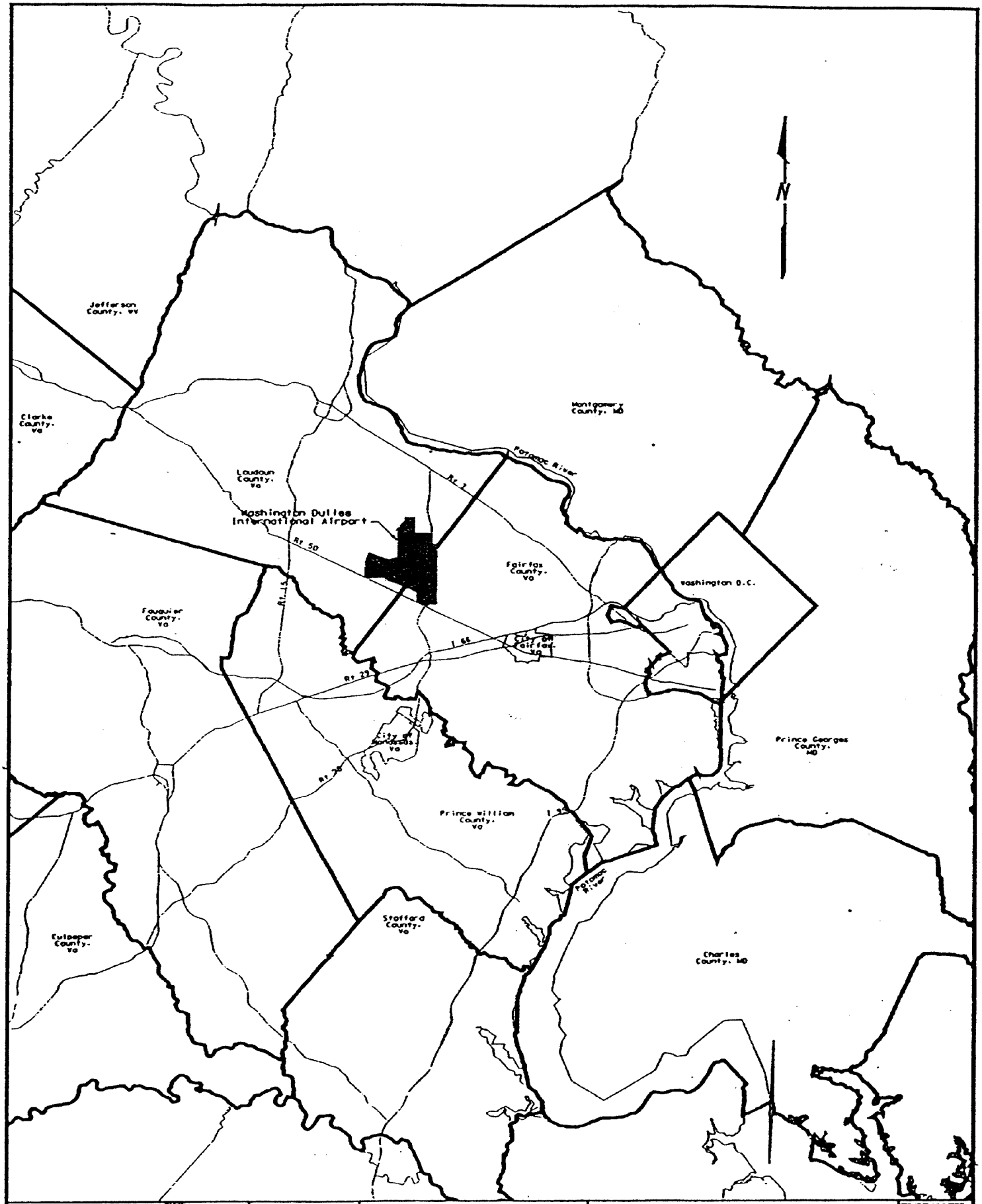
Original Signed By

J. Charles Baummer, Jr., Ph.D.
Environmental Planner

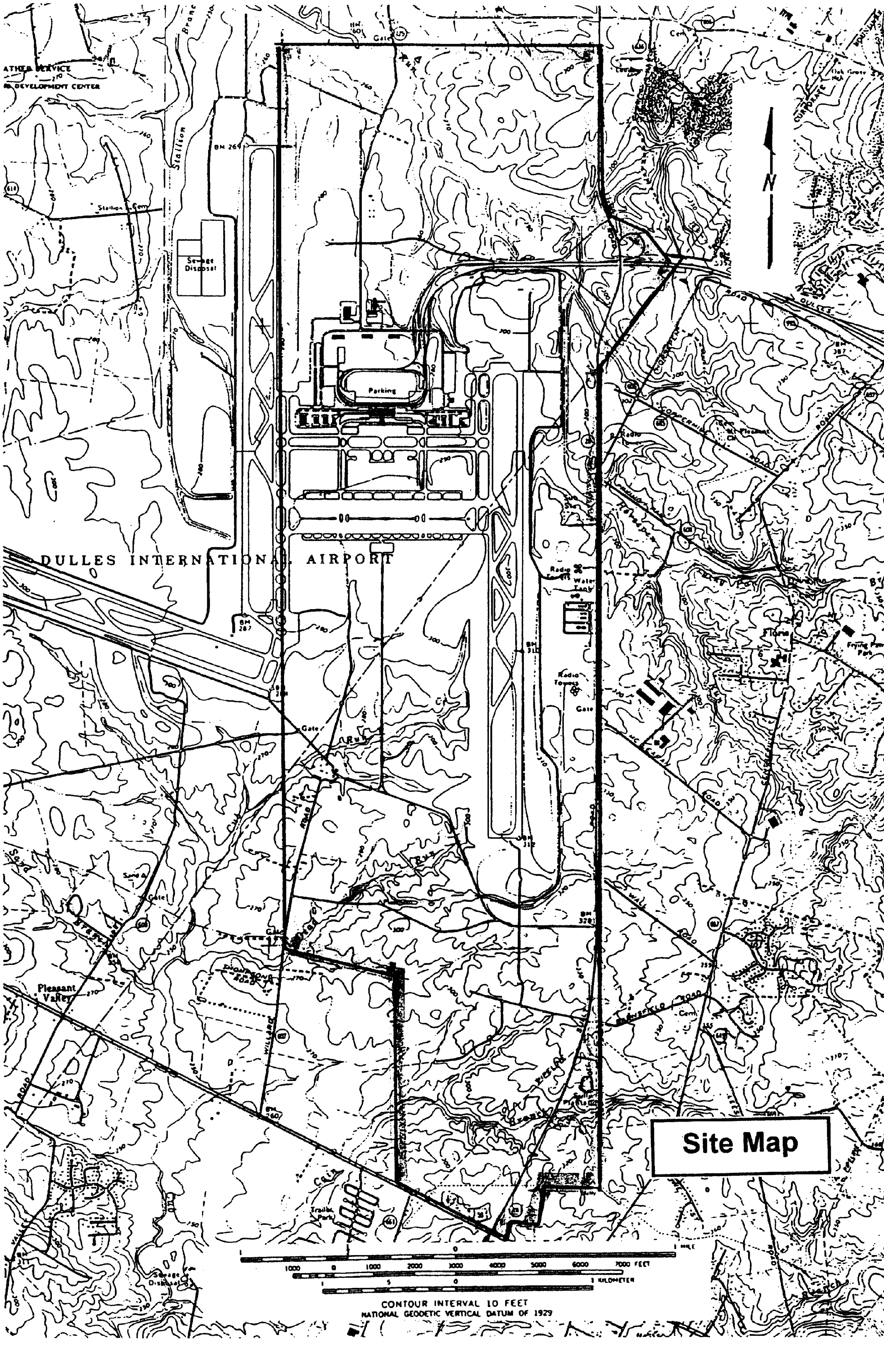
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\PLANNING\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\EPA May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Stallion Branch
Pleasant Valley
Trailer Park
N
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
Site Map

MAY 16

Mr. Keith Tignor
Commonwealth of Virginia
Department of Agriculture and Consumer Services
Division of Consumer Protection
Office of Plant and Pest Services
P.O. Box 1163
Richmond, VA 23218

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Tignor:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD include modern passenger handling facilities to replace Concourse C/D and to provide additional gate capacity, an automated people mover system to replace the mobile lounge system, a utilities complex, and a new airport traffic control tower. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility. In accordance with Section 7(c)(1) of the Endangered Species Act, we are requesting information on whether any proposed or listed species or their critical habitats are present within the project site.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated. Letters have also been sent to the U.S. Fish and Wildlife Service, the Virginia Department of Conservation and Recreation, and the Virginia Department of Game and Inland Fisheries in regard to the issue of protected species, and to the U.S. Environmental Protection Agency and the Virginia Department of Environmental Quality.

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

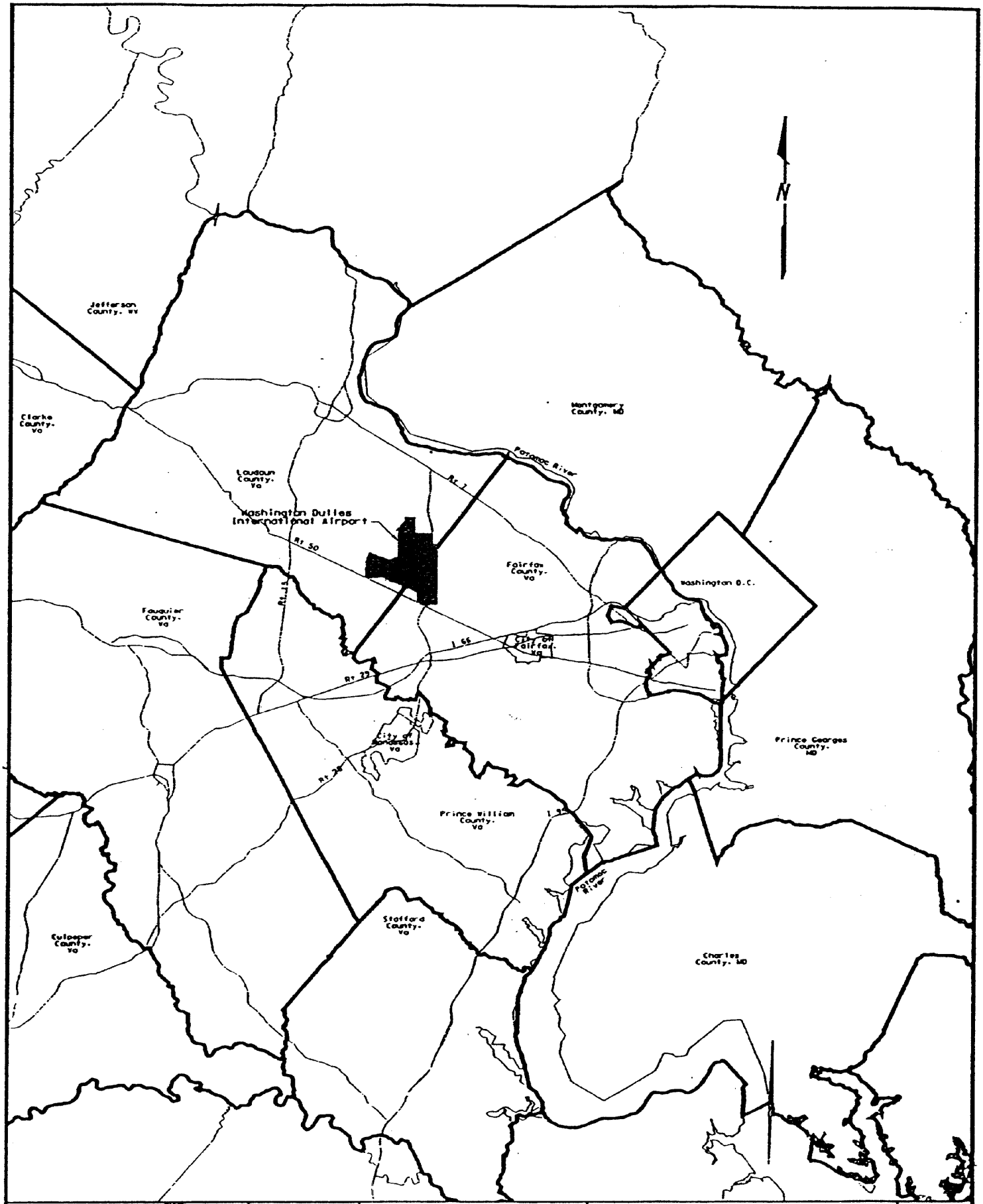
Sincerely,

Original Signed By
J. Charles Baummer, Jr., Ph.D.
Environmental Planner

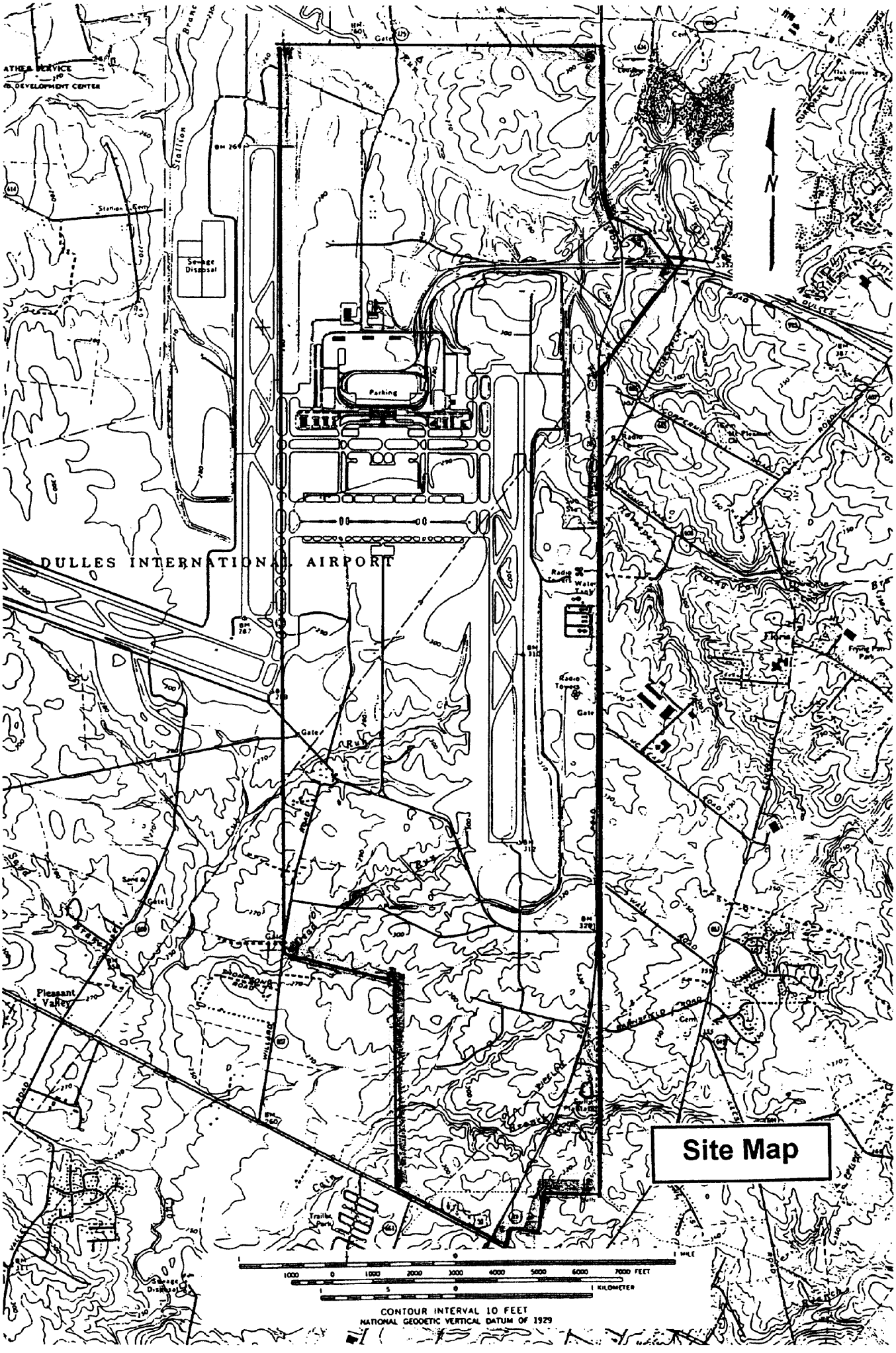
Enclosures

JCB:pp

MA-32E:CBaummer:pp:78168:05/14/01:G:\Planning\JCB\Dulles NEPA\Tier 2 Env Assmnt\EA Engineering\Agency Coordination\DACS May-01.wpd
cc: MA-32, 1/2(chron), 30(pink), file(grid)



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Thomas A. Barnard, Jr.
Virginia Institute of Marine Science
Gloucester Point, VA 23062

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Barnard:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

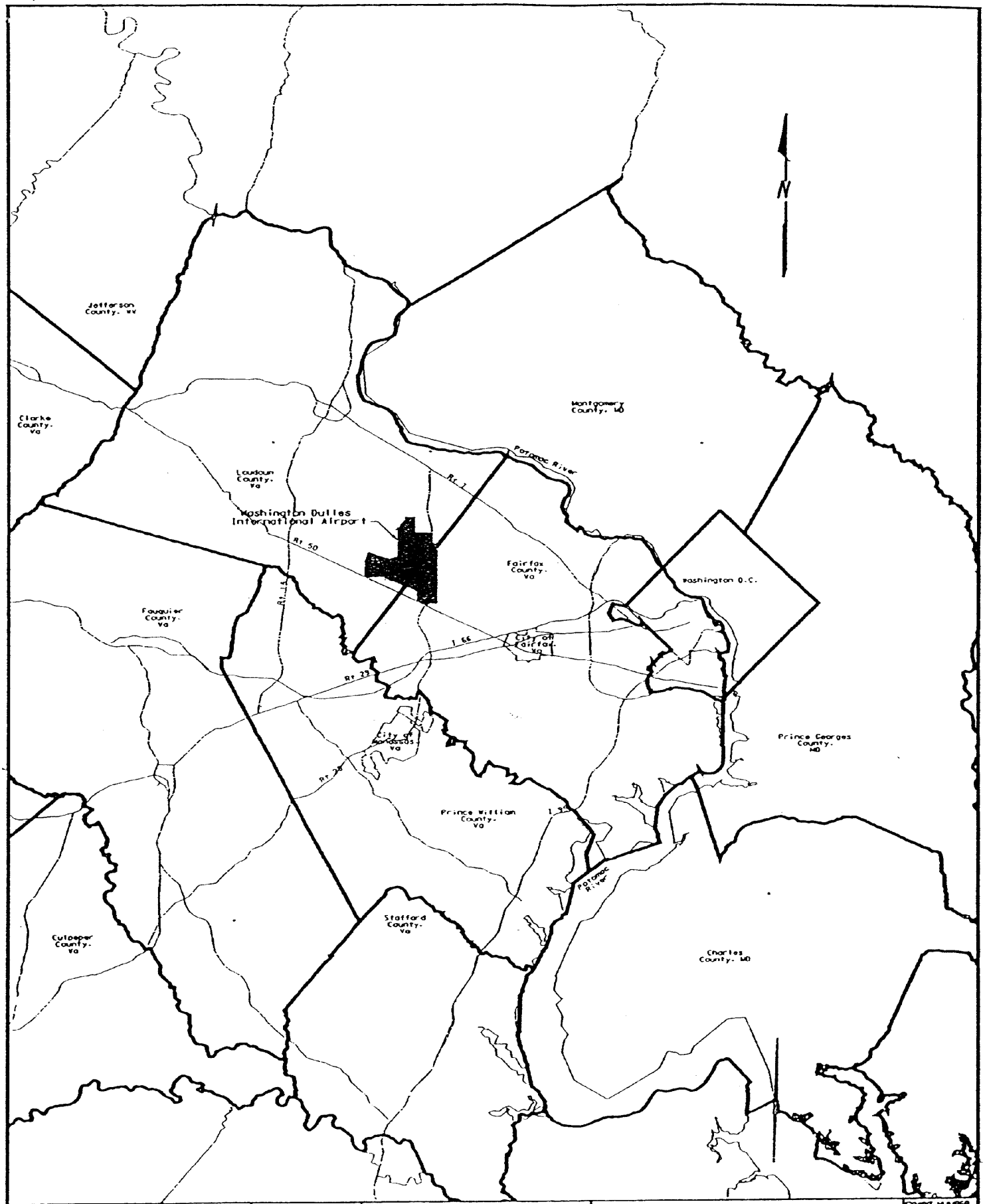
Sincerely,

J. Charles Baummer

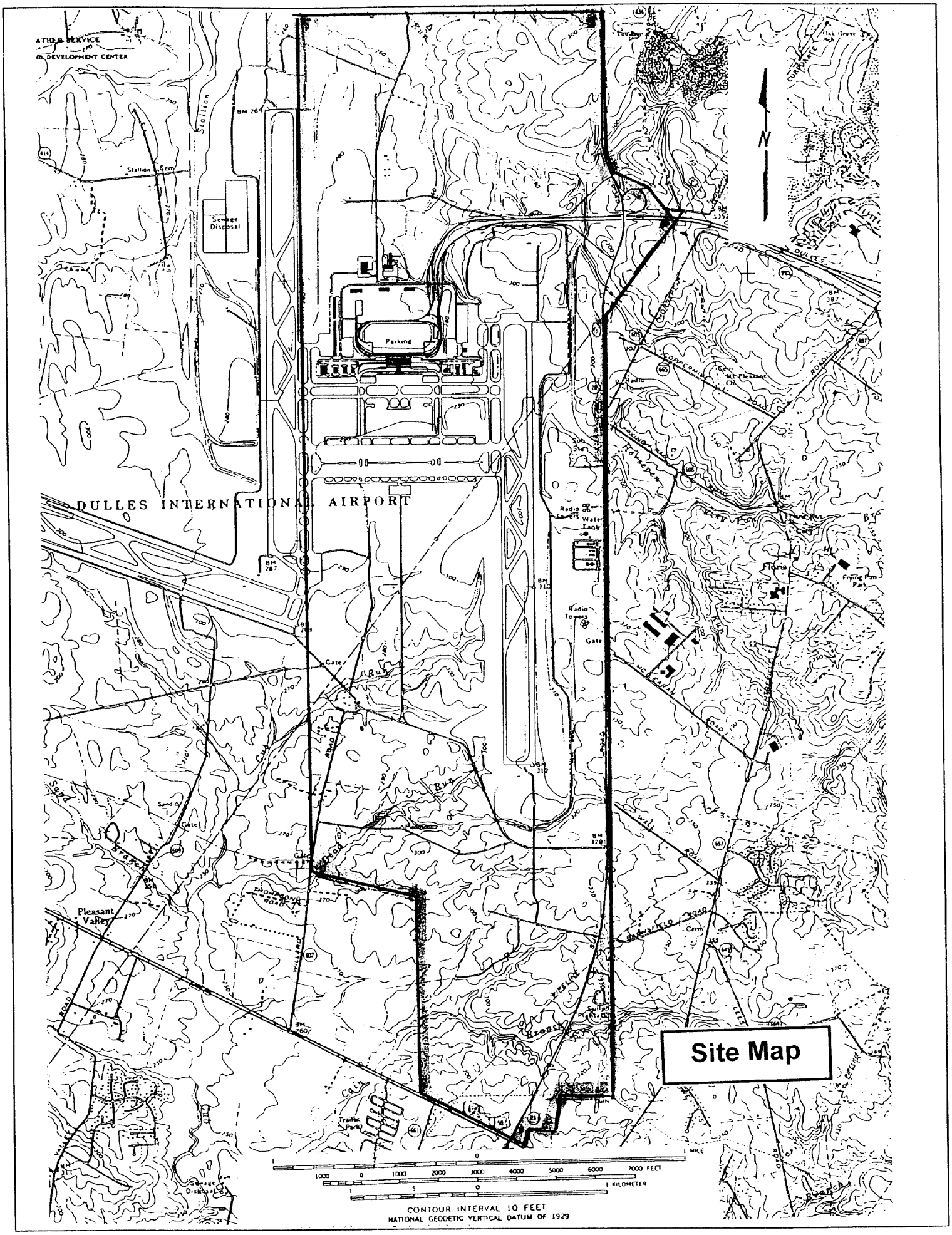
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

WILLIAM & MARY
VIMS
Virginia Institute of Marine Science
School of Marine Science

CCRM
Center for
Coastal Resources Management

August 9, 2001

Mr. J. Charles Baummer, Jr., Ph.D
Environmental Planner, MA-32E
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

RE: Proposed Facility Improvements at Washington Dulles International Airport

Dear Dr. Baummer,

On behalf of Dr. Gene Burreson, Director of Research and Advisory Services, I wish to inform you that your project, as referenced above, is outside the sphere of interest of the Virginia Institute of Marine Science, College of William and Mary and we will therefore be making no comments.

We will respond to specific questions dealing with areas in which we have institutional knowledge and expertise should this become desirable. Please do not hesitate to contact us in the future if we may be of service.

Thank you for the opportunity to comment.

Sincerely,

Thomas A. Barnard, Jr.
Assistant Professor

PO Box 1346 • Route 1208 Greate Road • Gloucester Point, Virginia 23062-1346 USA
804/684-7380 • FAX 804/684-7179

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. W. Douglas Beisch, Jr.
Commonwealth of Virginia
Chesapeake Bay Local Assistance Department
101 N. 14th Street, 17th Floor
Richmond, VA 23219

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Beisch:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

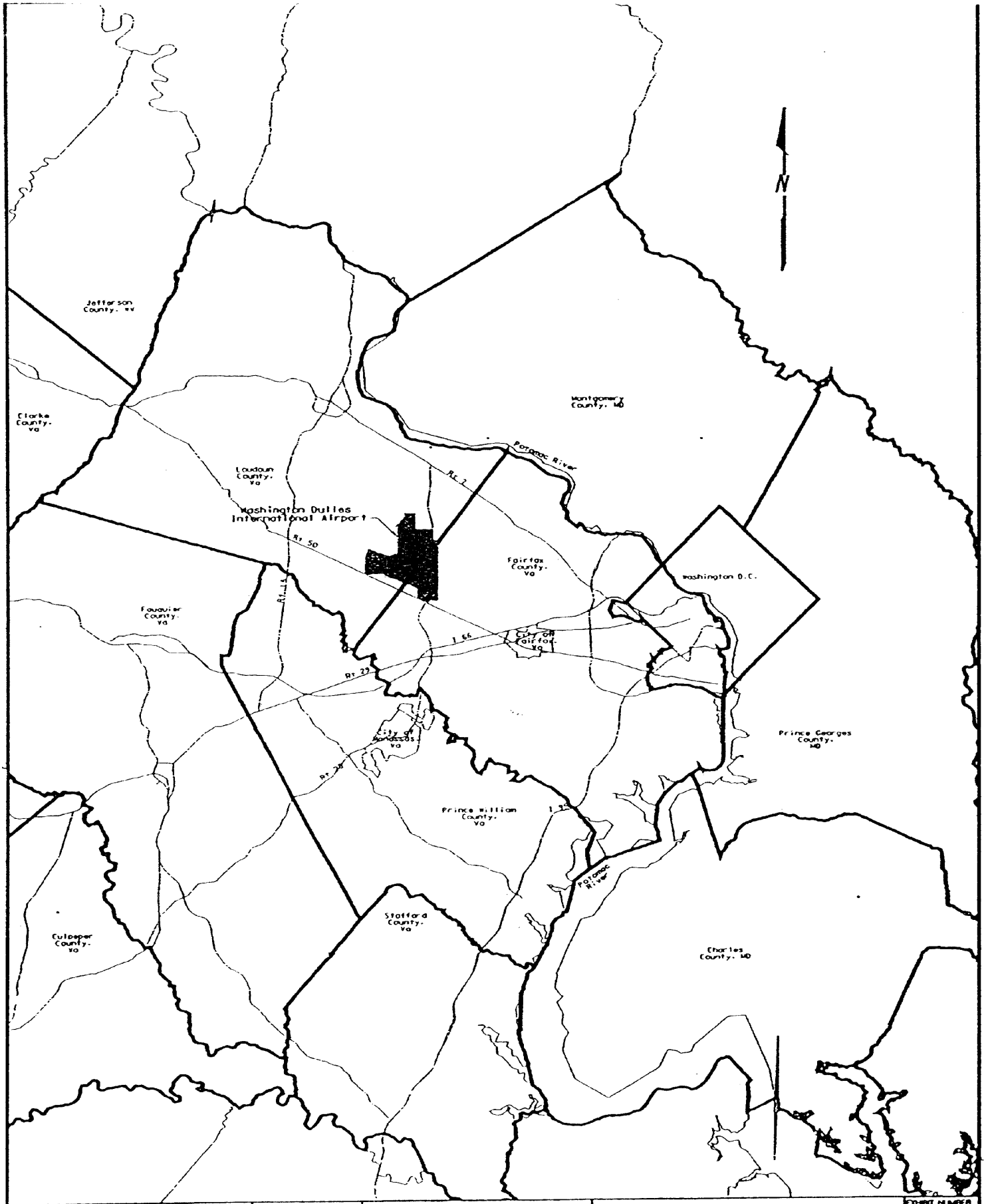
Thank you.

Sincerely,

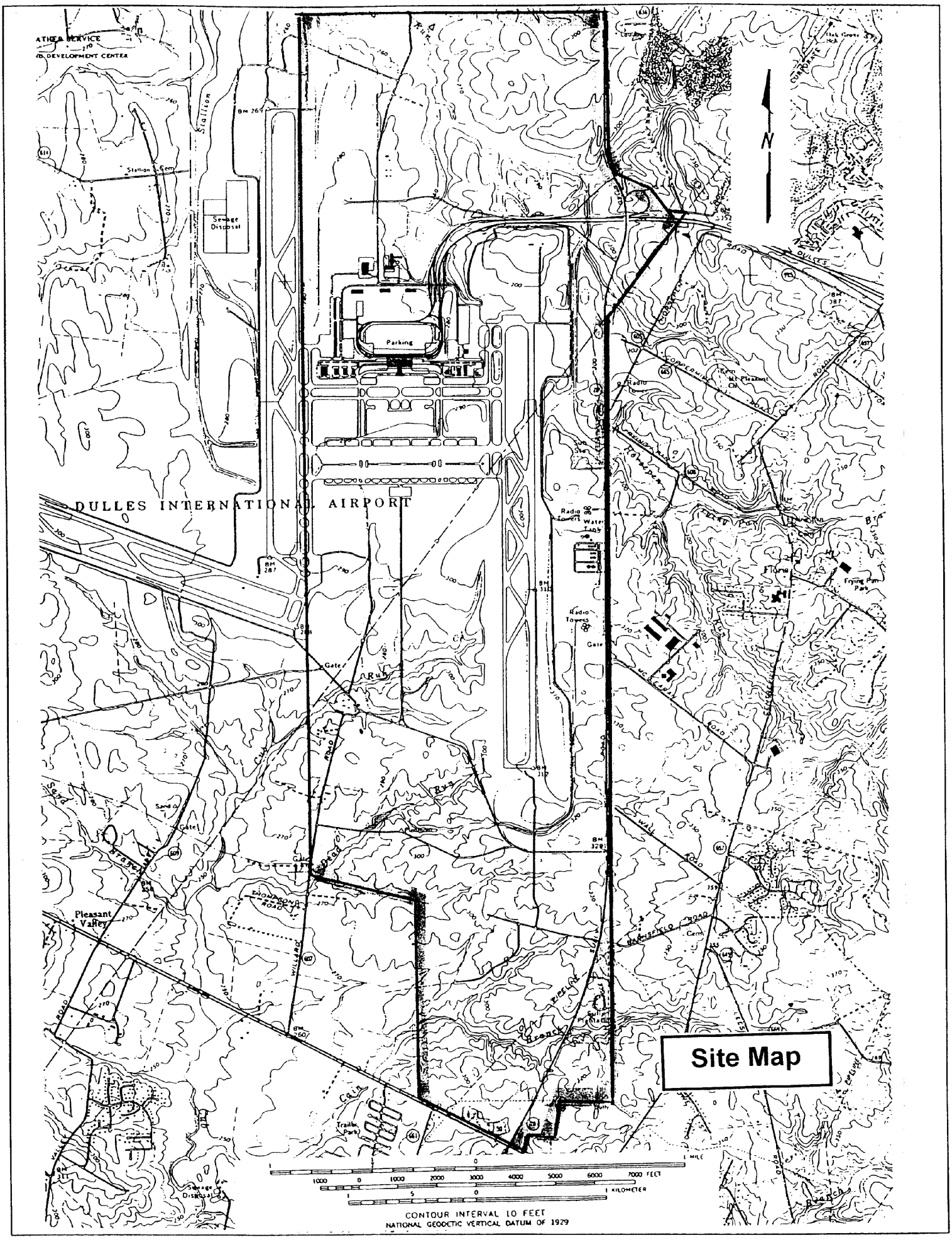
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. Robert W. Grabb
Commonwealth of Virginia
Marine Resources Commission
2600 Washington Avenue
Newport News, VA 23607

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Grabb:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Aviation
Virginia Department of Agriculture and Consumer Services
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

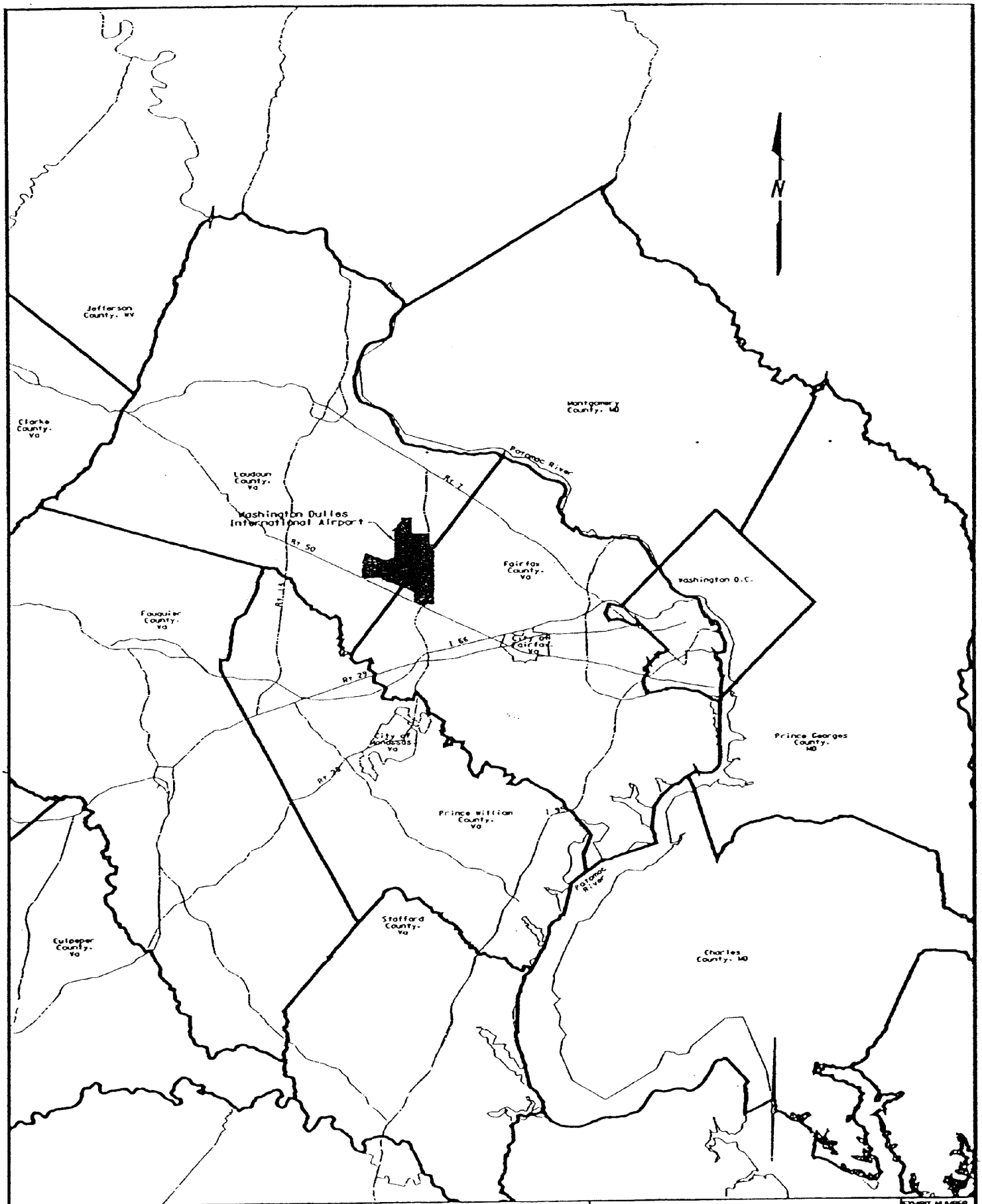
Thank you.

Sincerely,

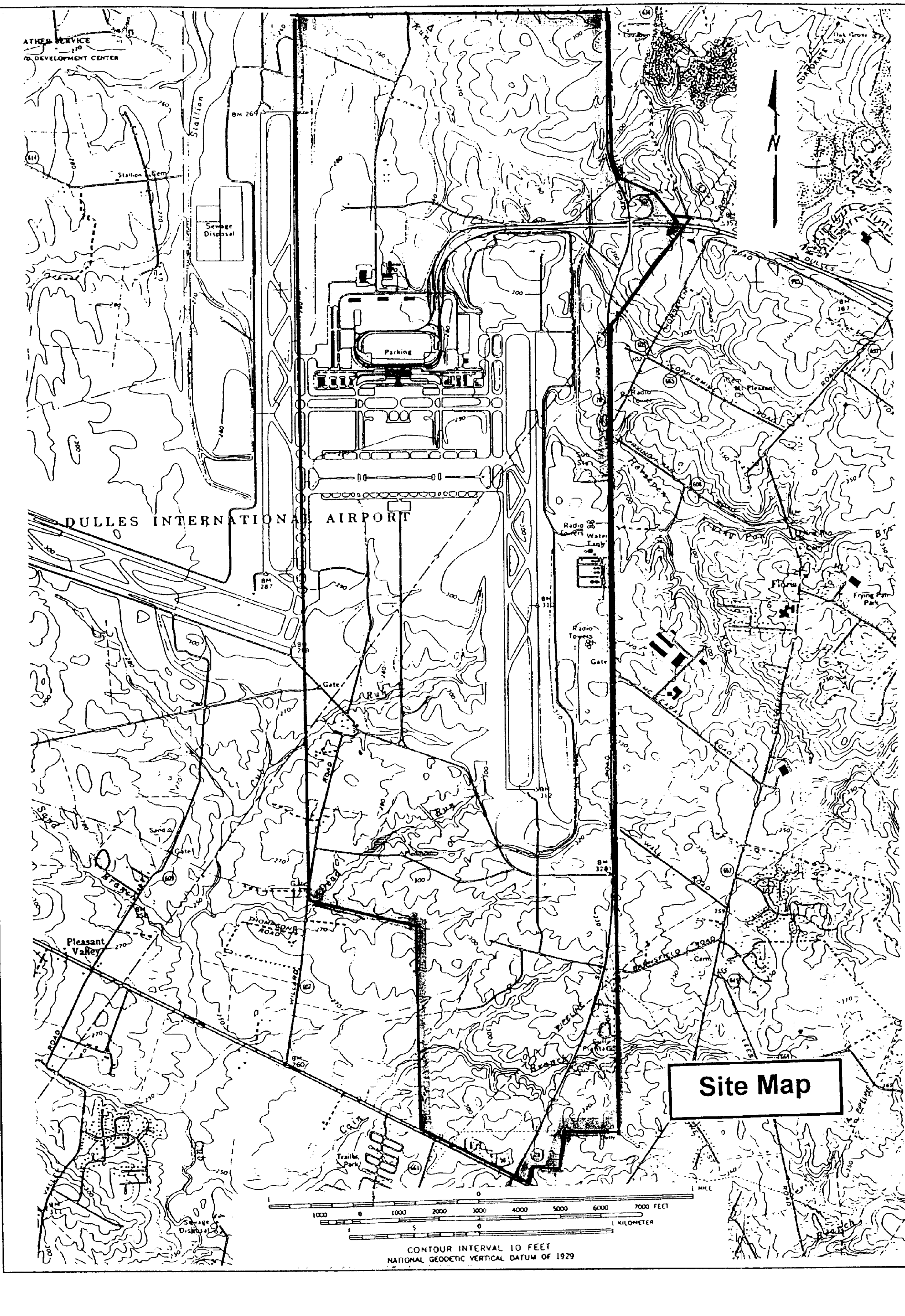
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Stallion
Radio Towers
Water Tank
Gate
Floris
Frying Pan Park
Pleasant Valley
Trailer Park
N
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1 MILE
7000 FEET
1 KILOMETER

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. Alan Weber
Commonwealth of Virginia
Department of Health
Division of Water Supply Engineering
1500 East Main Street, Room 109
Richmond, VA 23219

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Weber:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

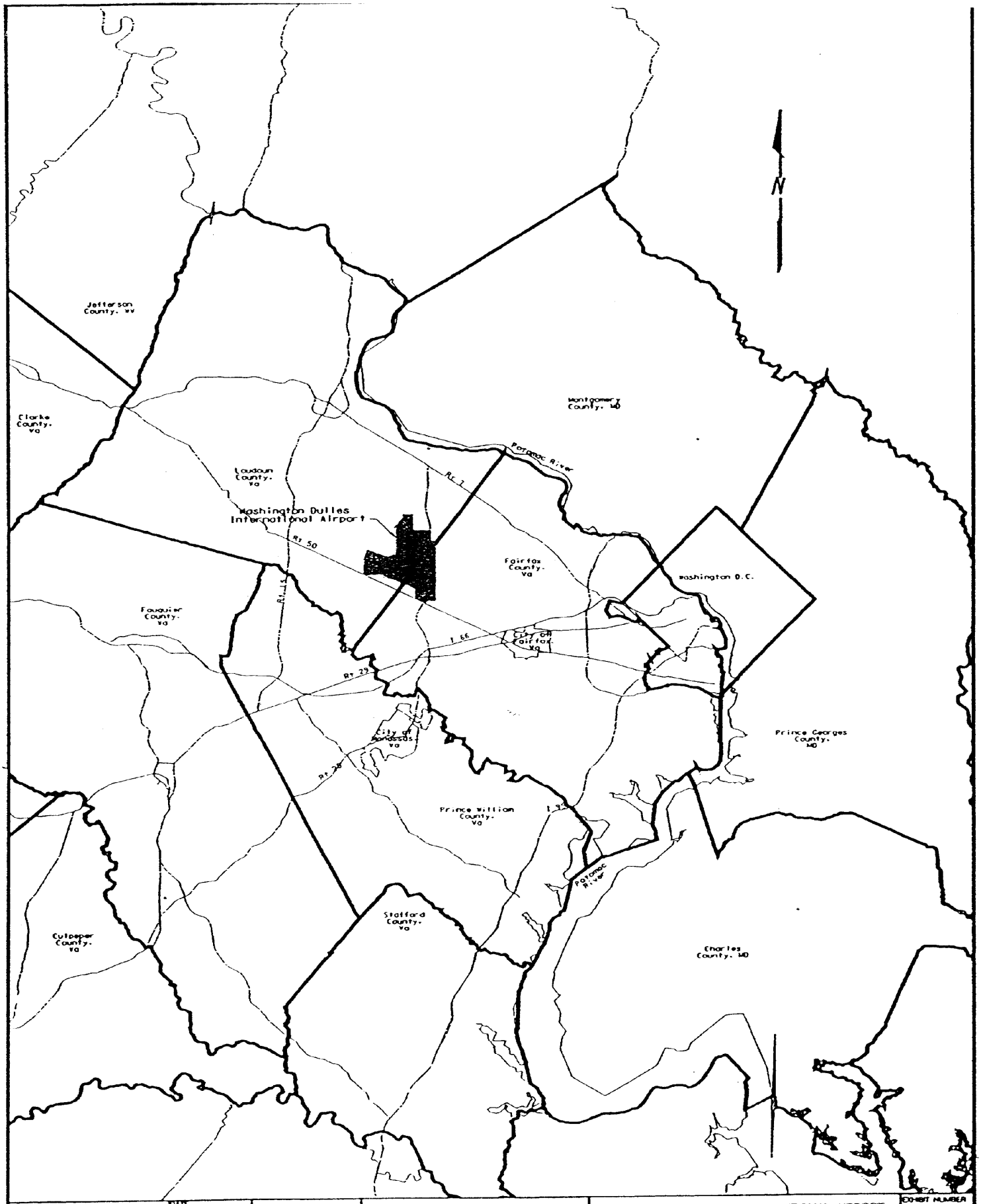
Sincerely,

J. Charles Baummer

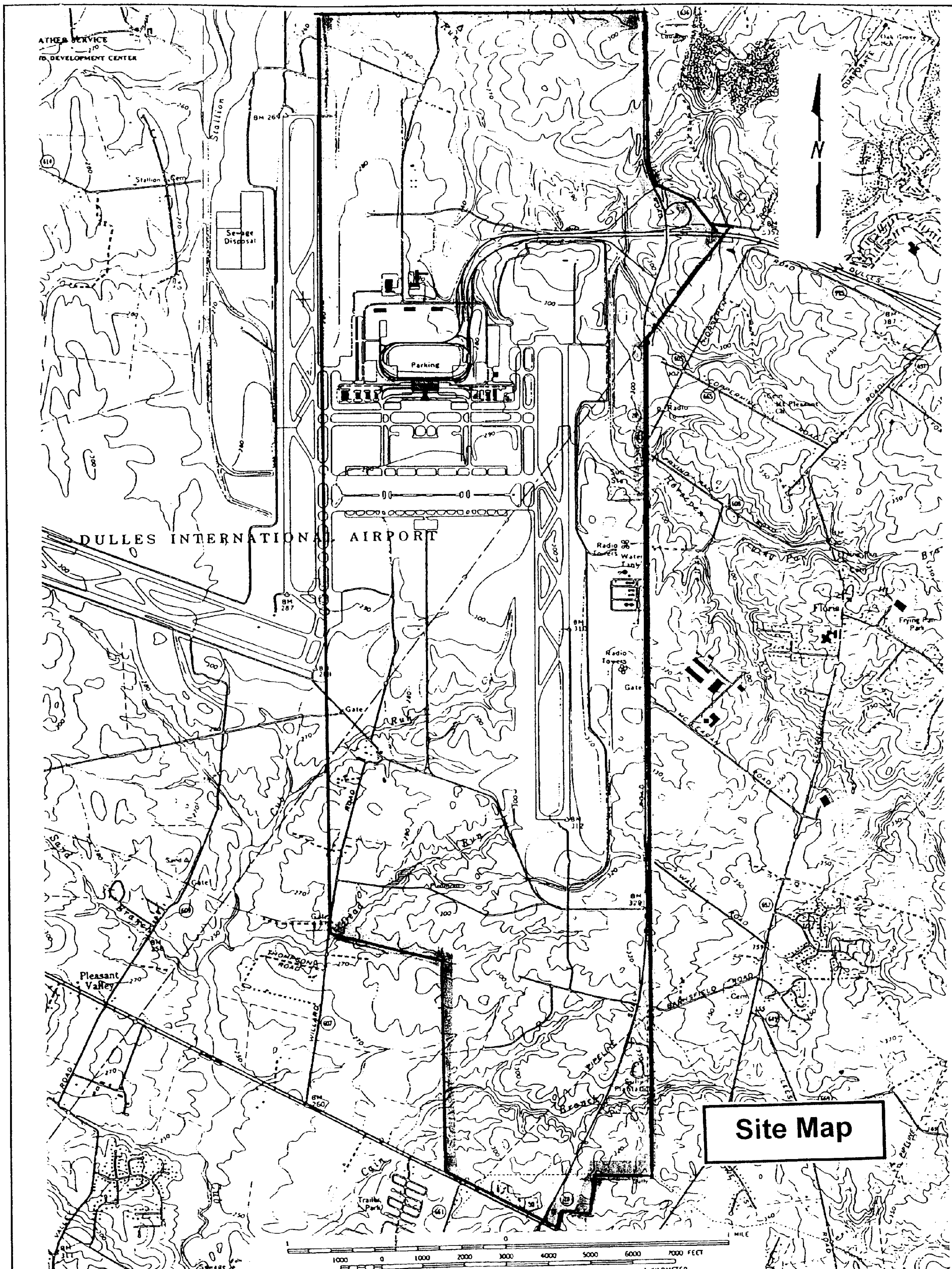
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Site Map
N
Parking
Sewage Disposal
Stallion
Radio Towers
Water Tank
Gate
Pleasant Valley
Frying Pan Park
Floris
Trailer Park
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1 MILE
7000 FEET
1 KILOMETER

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. Michael Foreman
Commonwealth of Virginia
Department of Forestry
900 Natural Resources Dr., Suite 800
Charlottesville, VA 23230

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Foreman:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Aviation
Virginia Department of Agriculture and Consumer Services
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

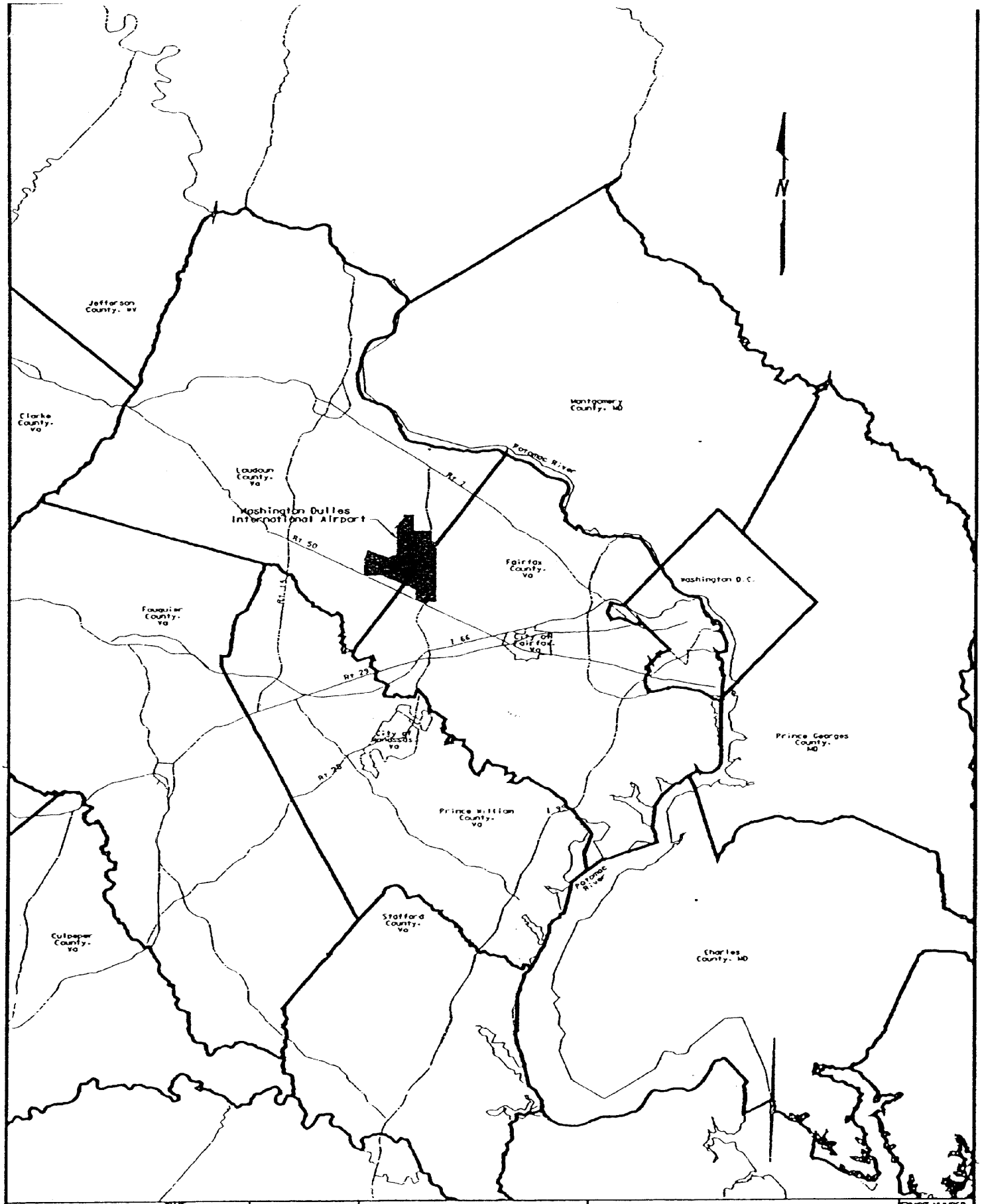
Sincerely,

J. Charles Baummer

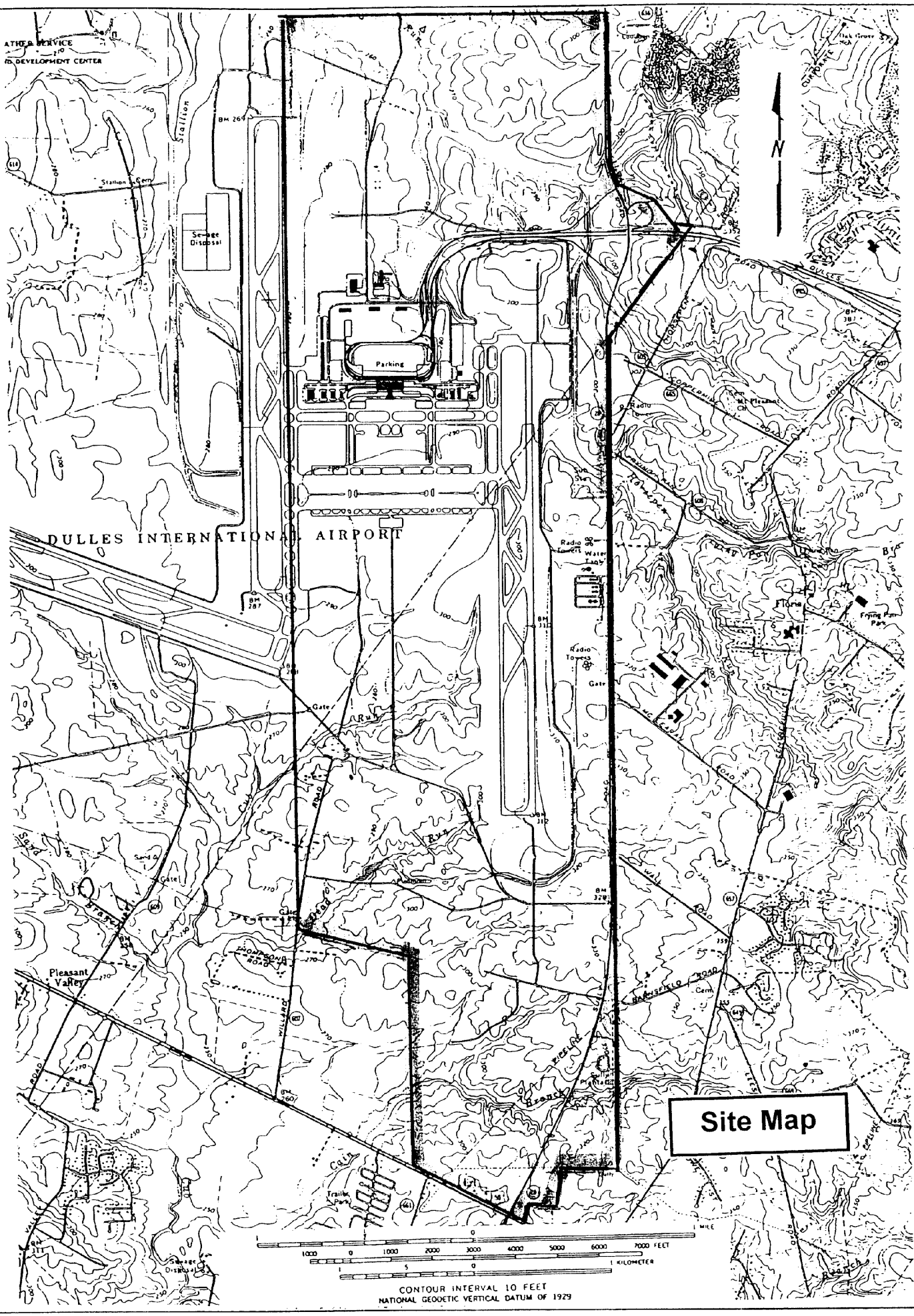
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	SHEET NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. Eugene K. Rader
Commonwealth of Virginia
Department of Mines, Minerals and Energy
P.O. Box 3667
Charlottesville, VA 22903

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Rader:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

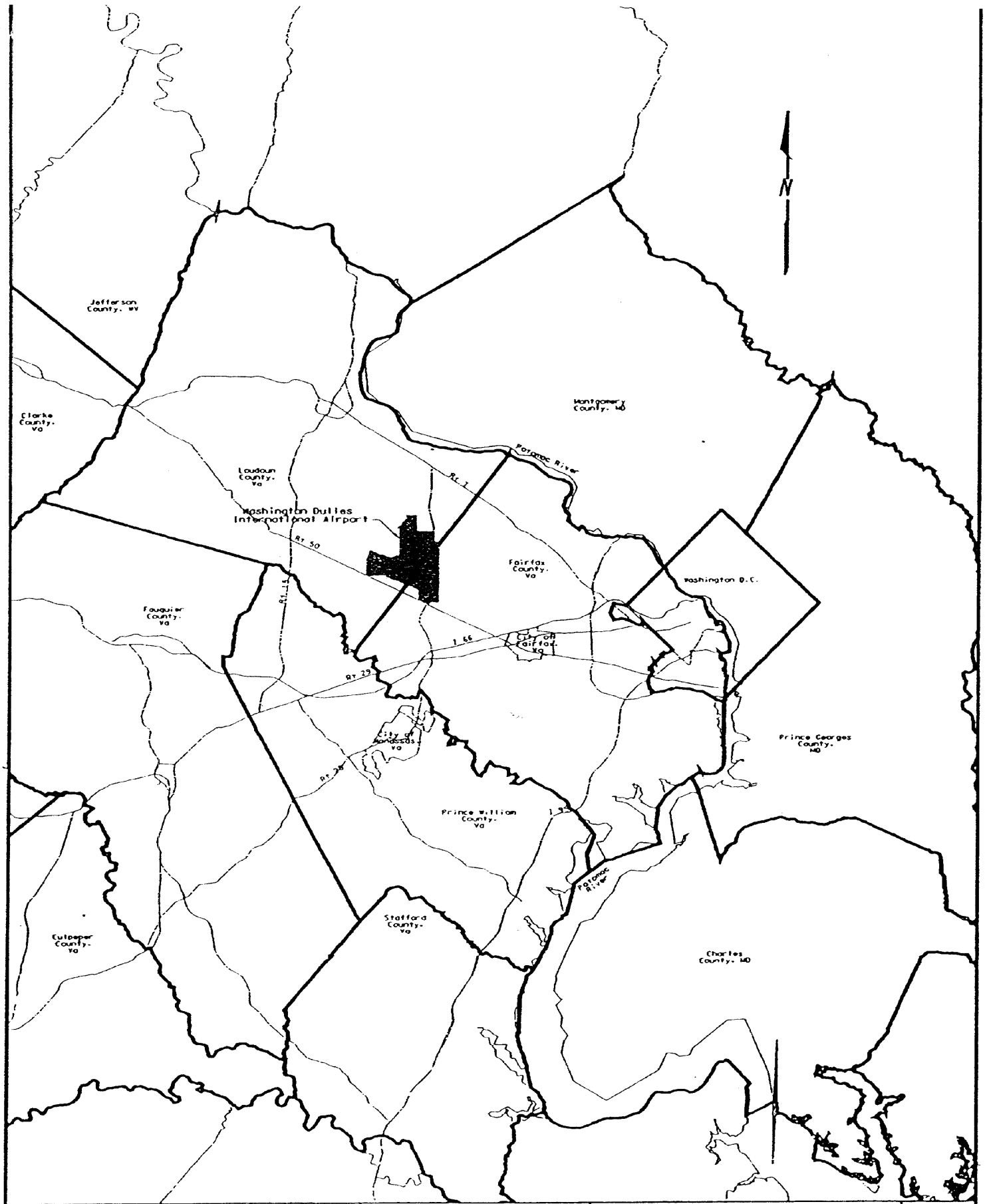
Sincerely,

J. Charles Baummer

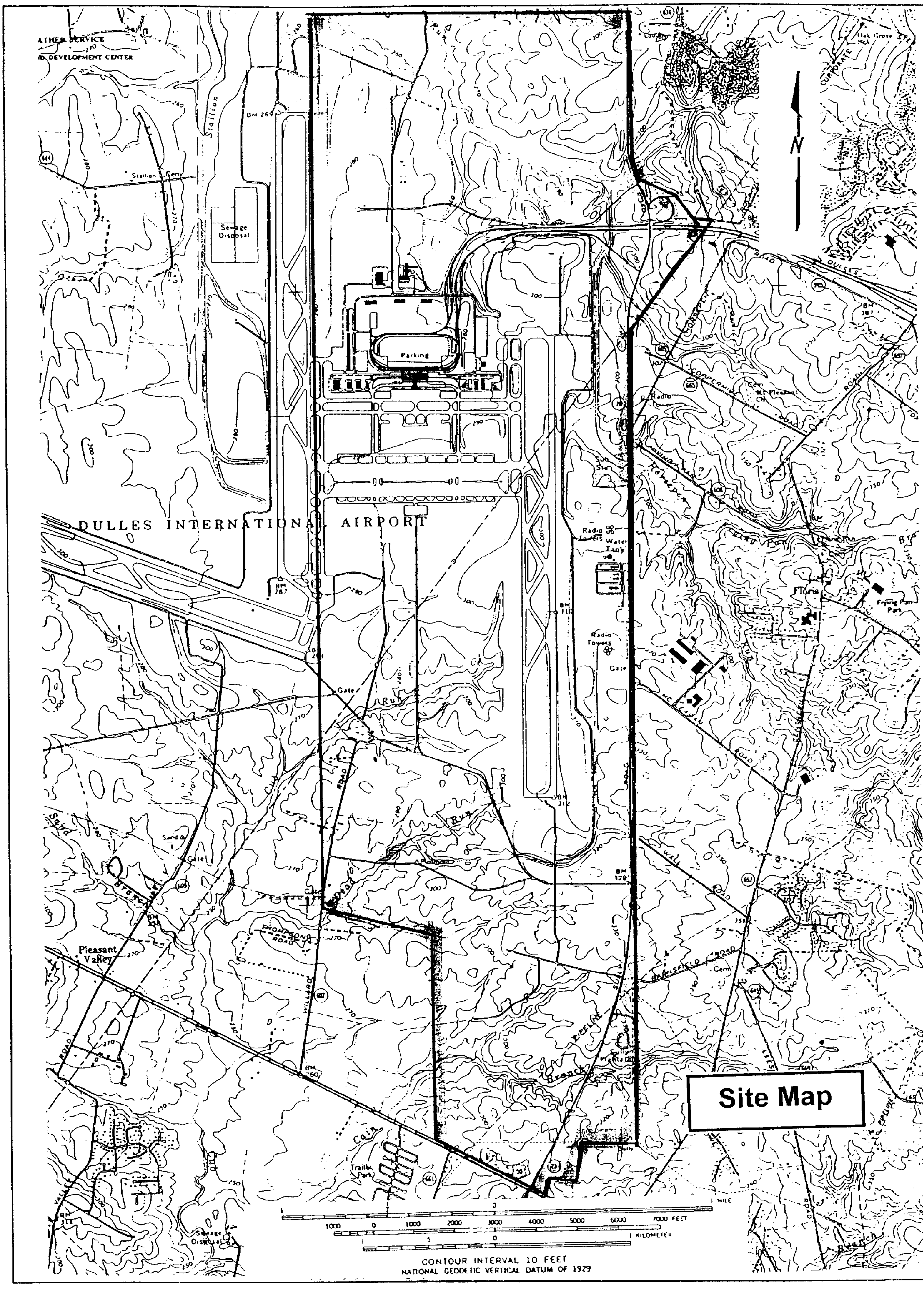
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	DRAWING NUMBER M-1


Site Map
DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Stallion
Radio Towers
Water Tank
Pleasant Valley
Trailer Park
N
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1 MILE
7000 FEET
1 KILOMETER

O. GENE DISHNER
DIRECTOR

CHARLES M. HALE, JR.
CHIEF DEPUTY DIRECTOR

BENNY R. WAMPLER
DEPUTY DIRECTOR

DIVISIONS
ENERGY
GAS AND OIL
MINED LAND RECLAMATION
MINERAL MINING
MINERAL RESOURCES
MINES
ADMINISTRATION

COMMONWEALTH of VIRGINIA

Department of Mines, Minerals and Energy
Division of Mineral Resources
P.O. Box 3667
Charlottesville, Virginia 22903-0667
(434) 951-6340
Stanley S. Johnson, State Geologist

August 6, 2001

Mr. J. Charles Baummer, Jr.
Environmental Planner, MA-32E
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, D.C. 20001-4901

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Dr. Baummer:

The IAD property is underlain by Triassic age sandstone, siltstone, and shale. Soils developed on the underlying bedrock may be plastic and expansive and have a low to moderate load-bearing capacity. A significant unconsolidated alluvial deposit occurs in the valley of Horsepen Run. I recommend that full geotechnical evaluation, including borings, be made for each proposed construction site.

A geologic map of the area (Herndon 7.5-minute quadrangle) is available from the U.S. Geological Survey in Reston.

Sincerely,

Eugene K. Rader
Geologist Manager

EKR/kh

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. P. Clifford Burnette
Commonwealth of Virginia
Department of Aviation
Planning and Promotion Division
5702 Gulf Stream Road
Sandston, VA 23150-2502

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Burnette:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

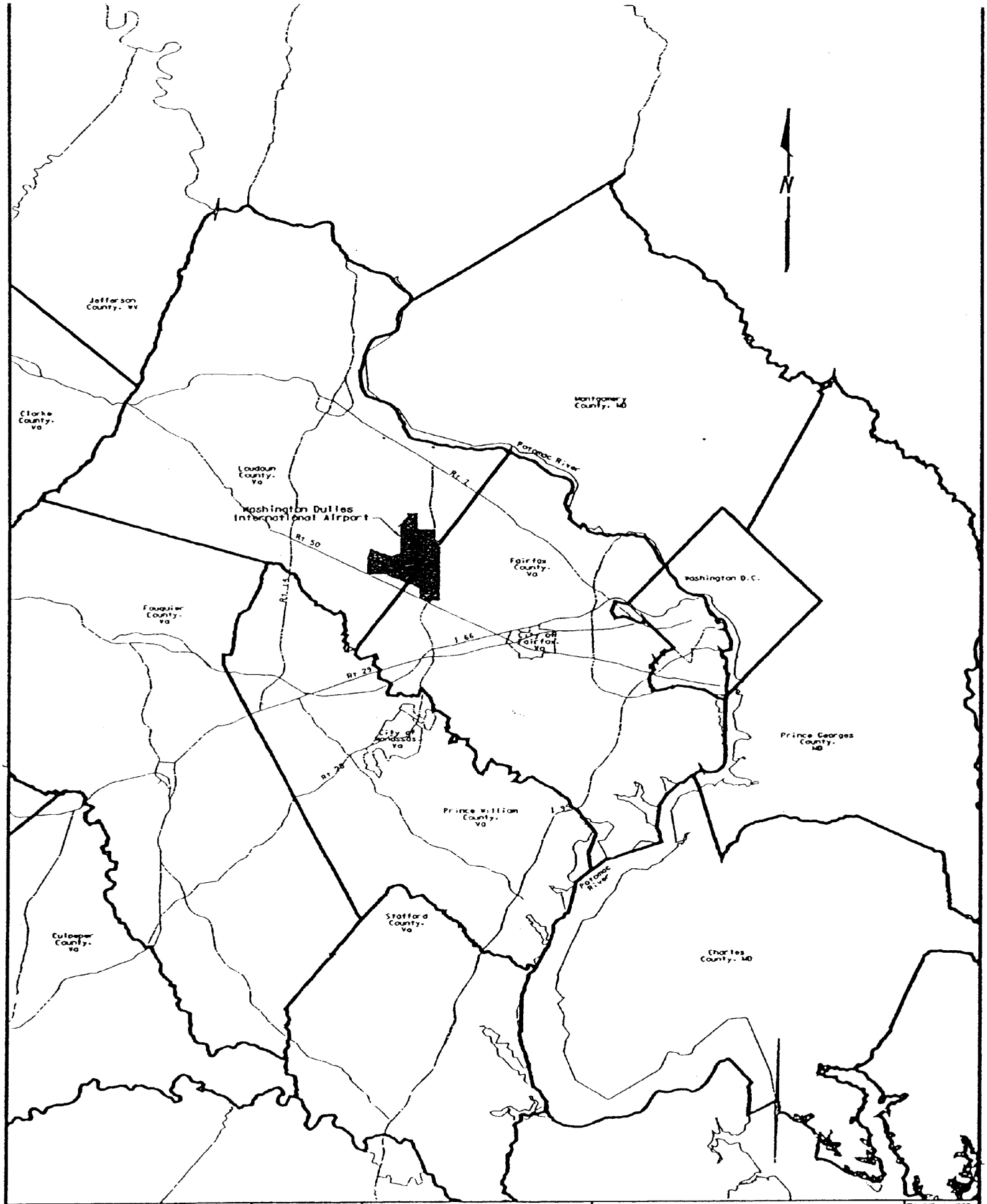
Sincerely,

J. Charles Baummer

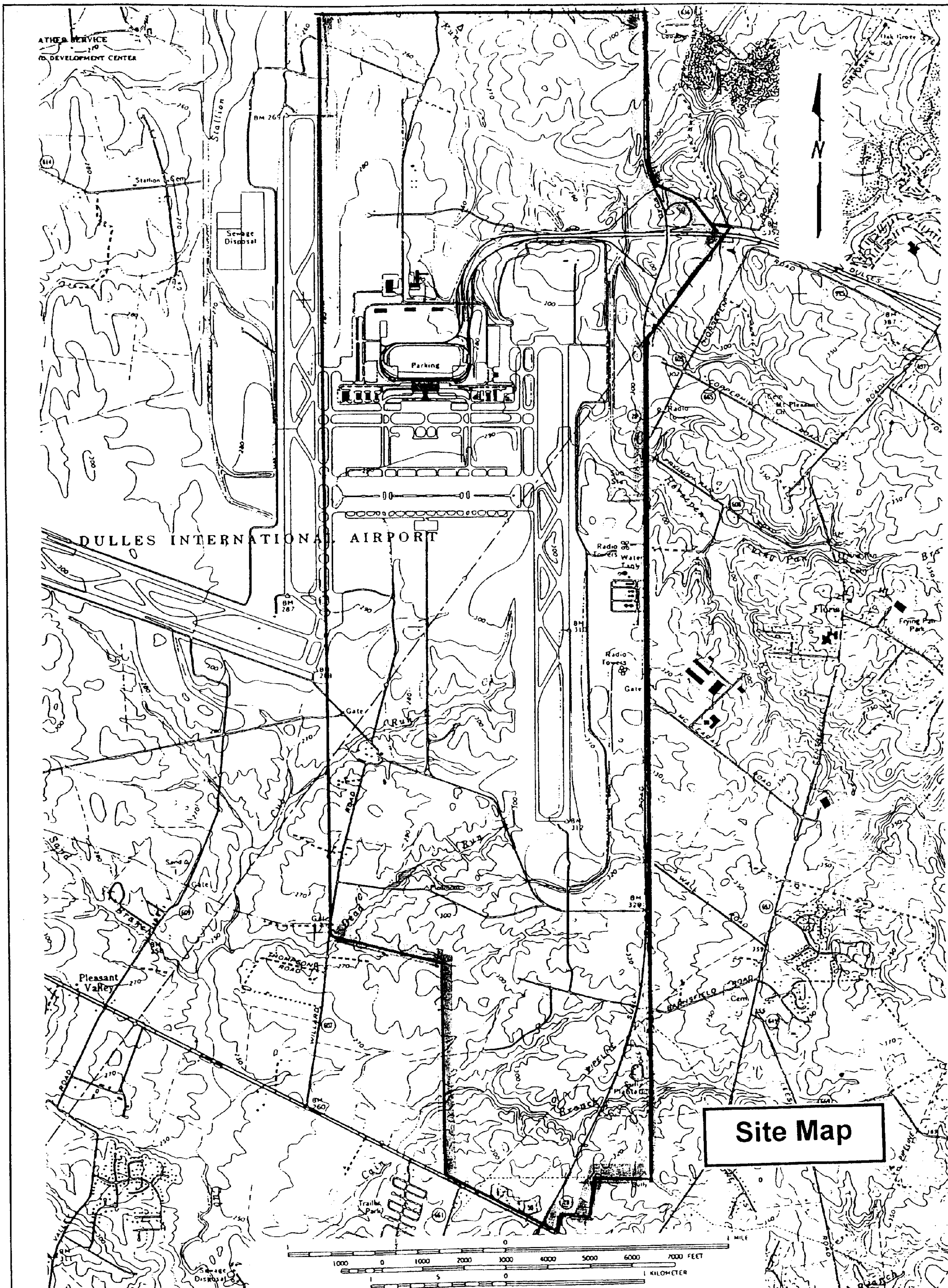
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


Site Map
DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Radio Towers
Water Tank
Gate
Pleasant Valley
Frying Pan Park
Trailer Park
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
N

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Ms. Lily A. Richards
Commonwealth of Virginia
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Ms. Richards:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

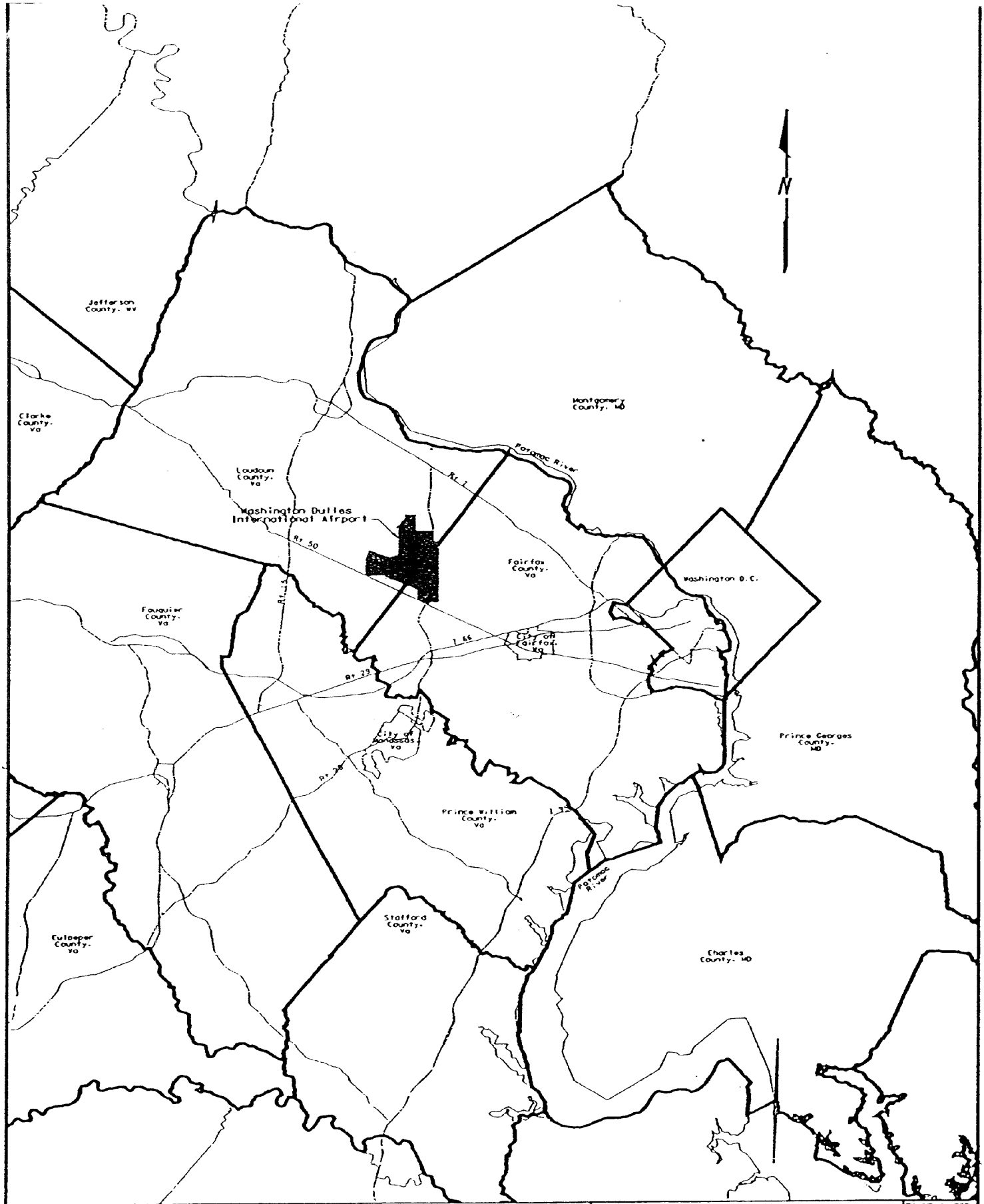
Thank you.

Sincerely,

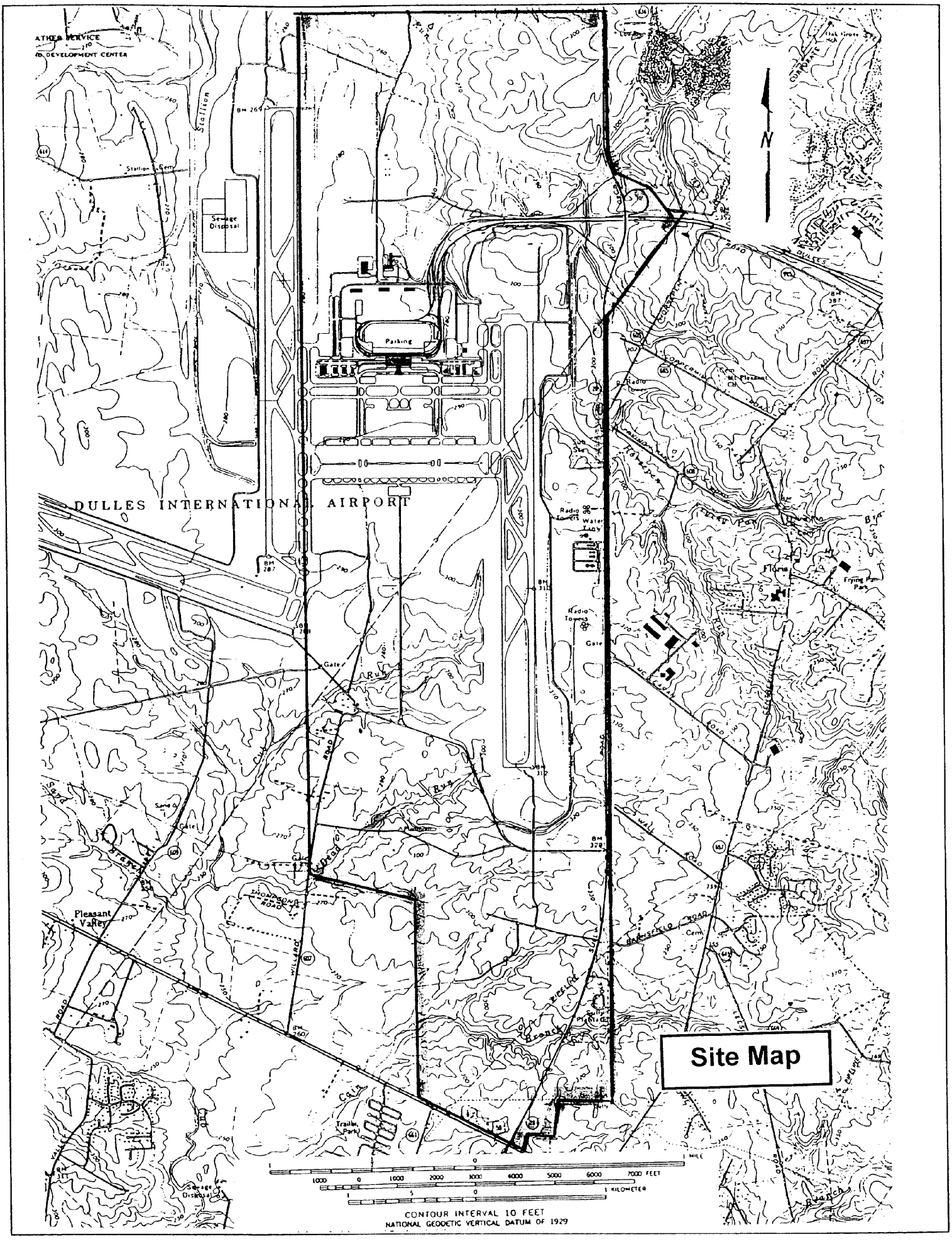
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Site Map
N
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 1 2001

Mr. Chris Collins
Commonwealth of Virginia
Department of Transportation
1401 East Broad Street
Richmond, VA 23219

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Collins:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact me at (703) 417-8168.

Thank you.

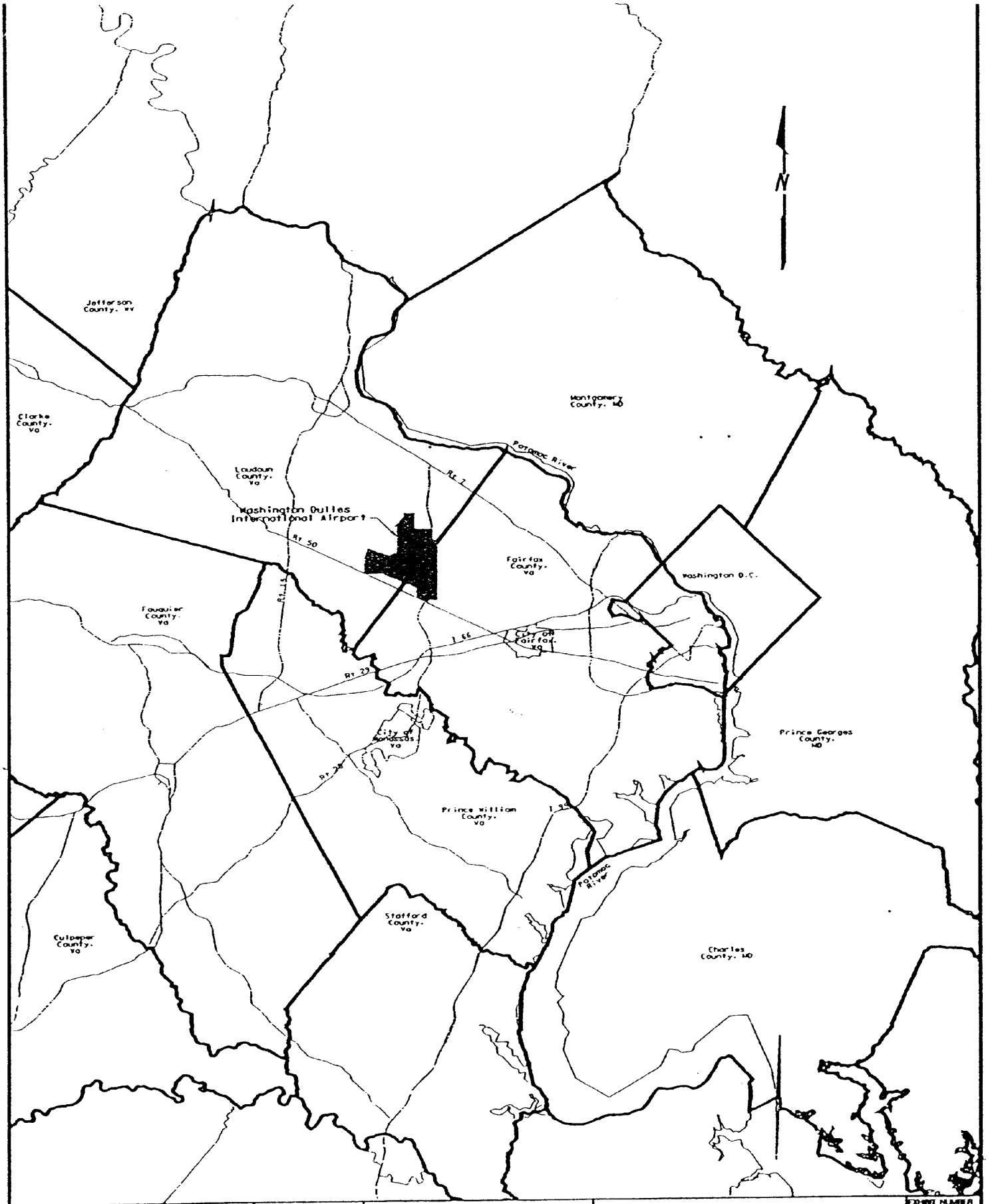
Sincerely,

J. Charles Baummer

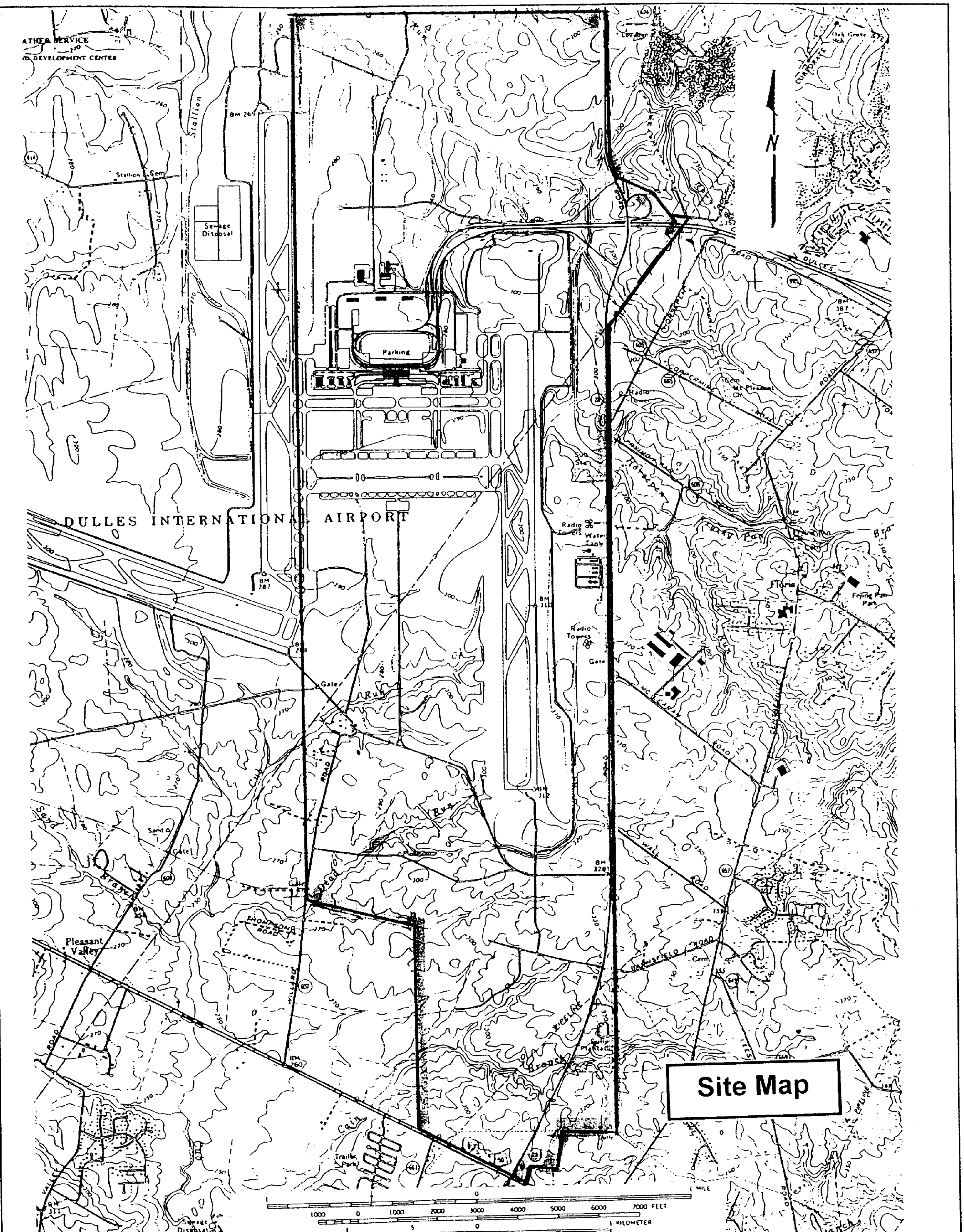
J. Charles Baummer, Jr., Ph.D.
Environmental Planner, MA-32E

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Radio Towers
Water Tank
Pleasant Valley
Trailer Park
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
N

Site Map

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 6 2001

Mr. G. Mark Gibb
Executive Director
Northern Virginia Regional Commission
7535 Little River Turnpike, Suite 100
Annandale, VA 22003-2937

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Gibb:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact Charles Baummer of our Department of Planning at (703) 417-8168.

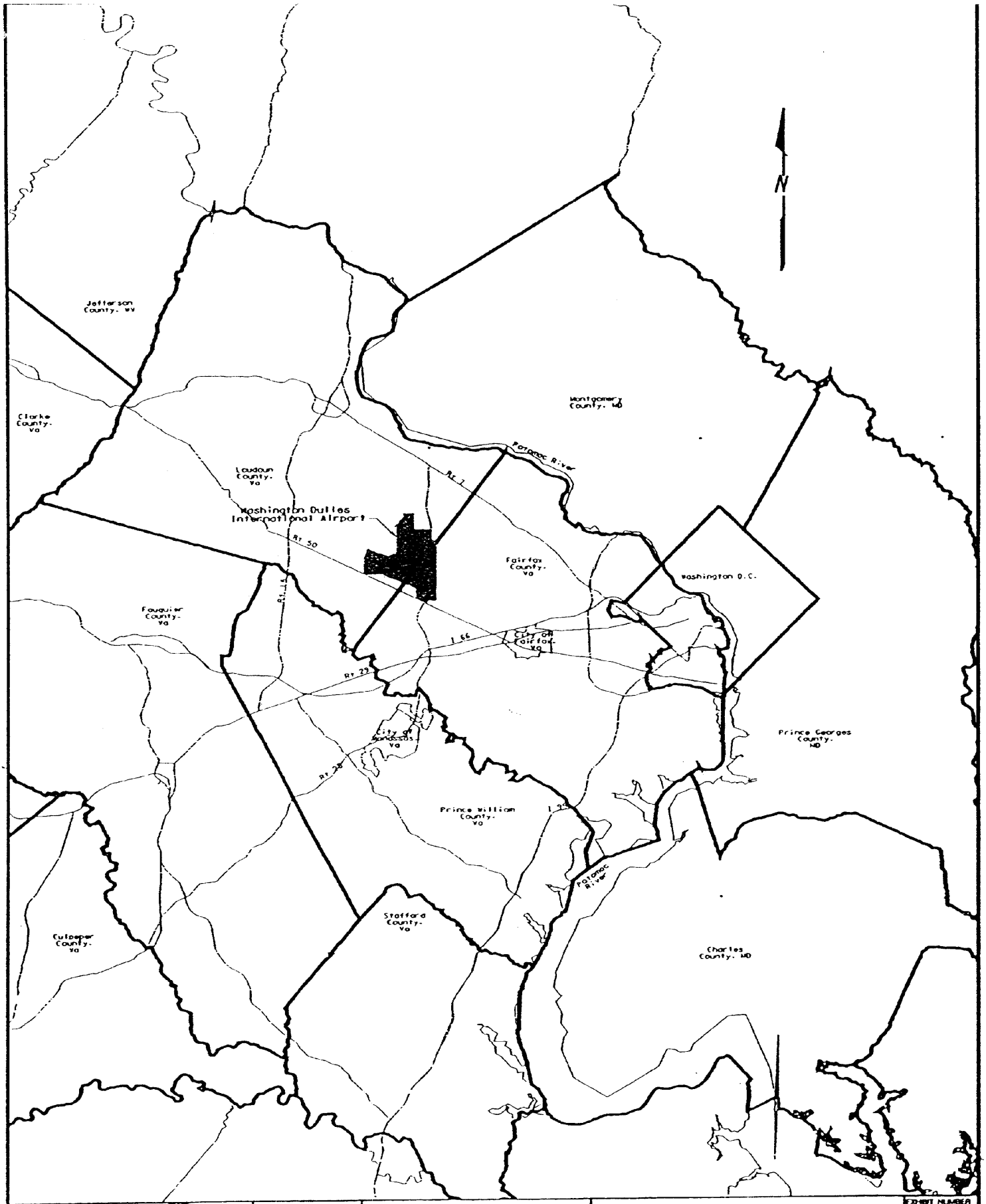
Thank you.

Sincerely,

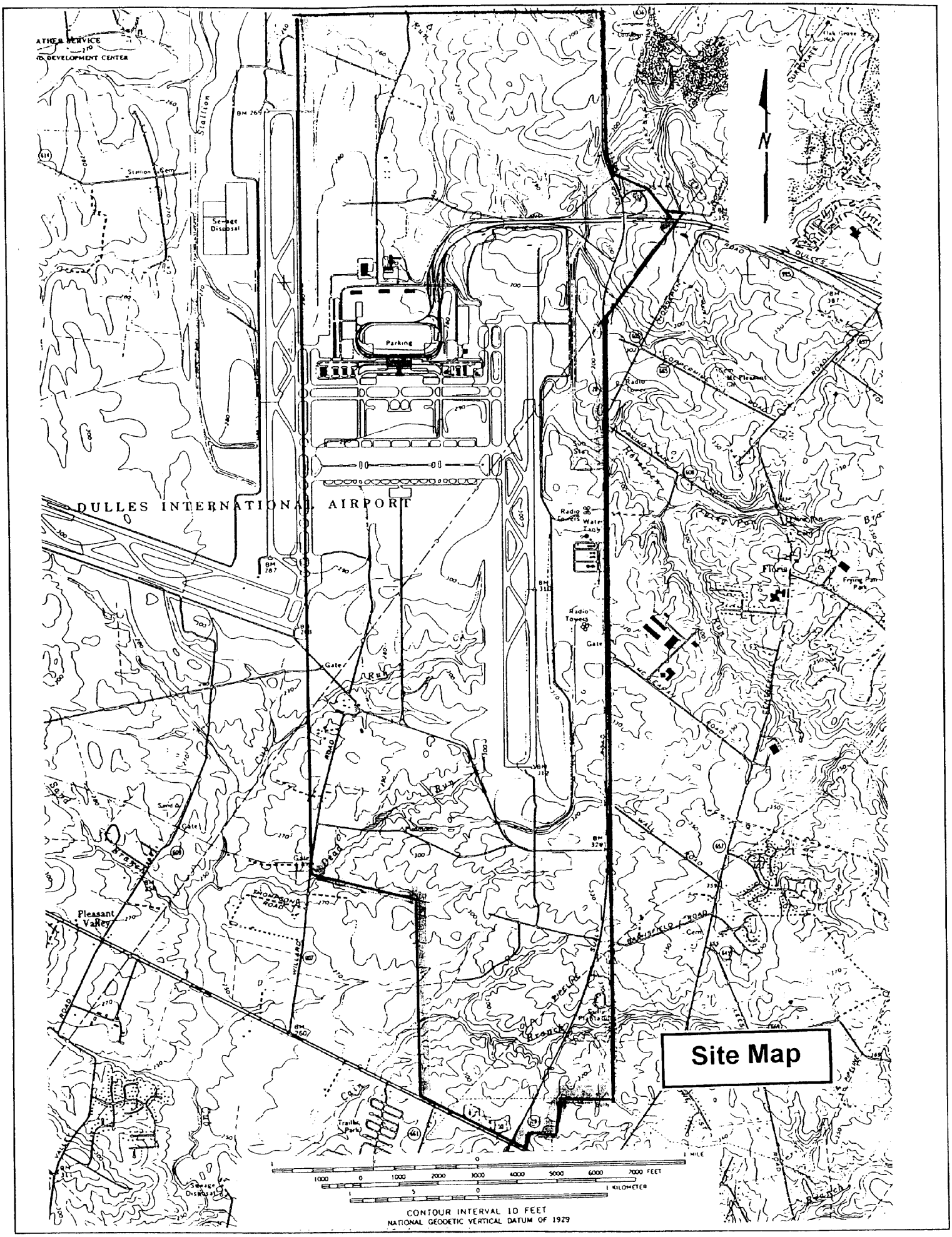
Frank D. Holly, Jr.
Vice President, Engineering

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Radio Towers
Water Tank
Gate
Pleasant Valley
Site Map
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 6 2001

Hon. Kirby M. Bowers
County Administrator, Loudoun County
1 Harrison Street, S.E., Fifth Floor
P.O. Box 7000
Leesburg, VA 20177-7000

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Bowers:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Fairfax County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact Charles Baummer of our Department of Planning at (703) 417-8168.

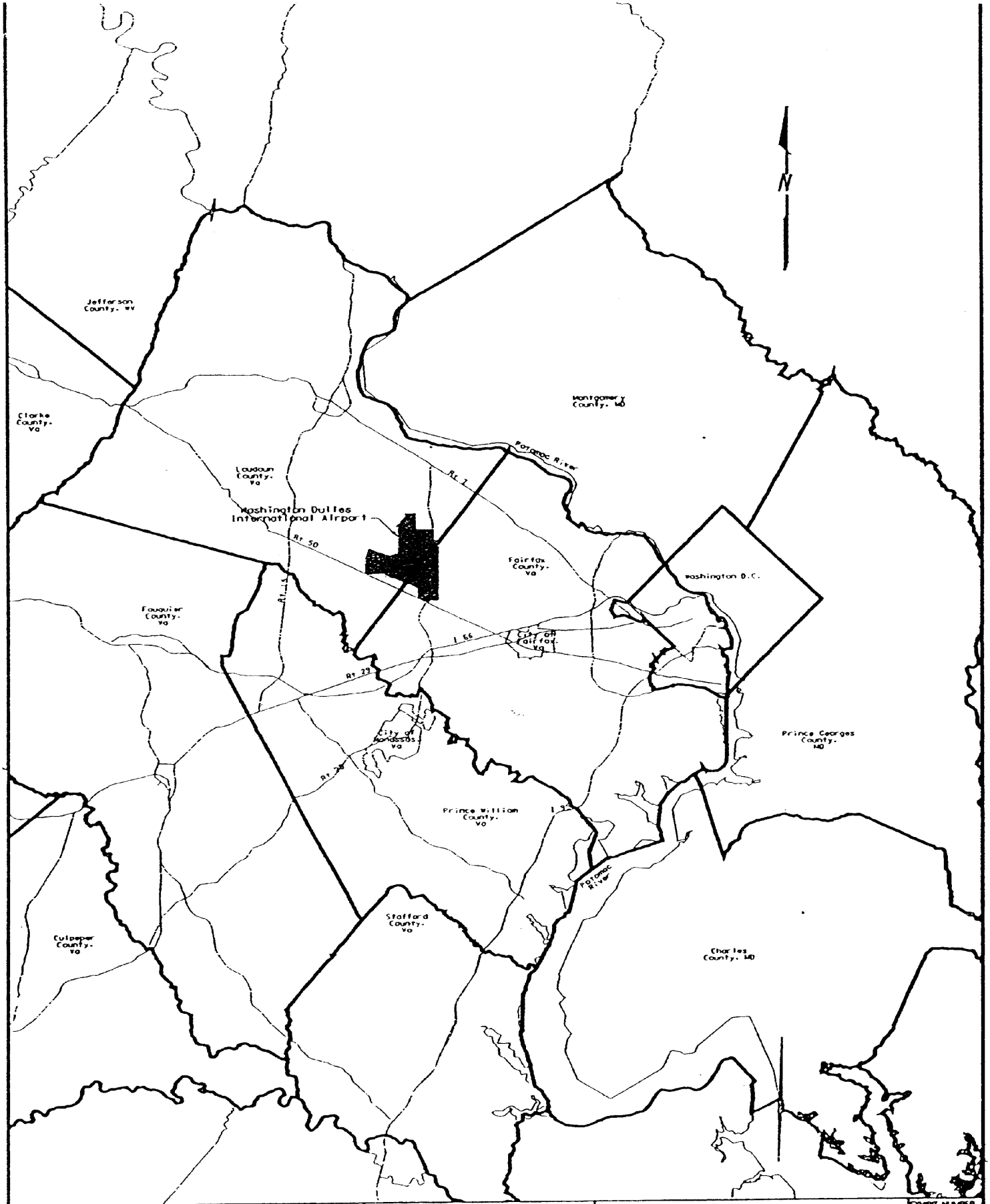
Thank you.

Sincerely,

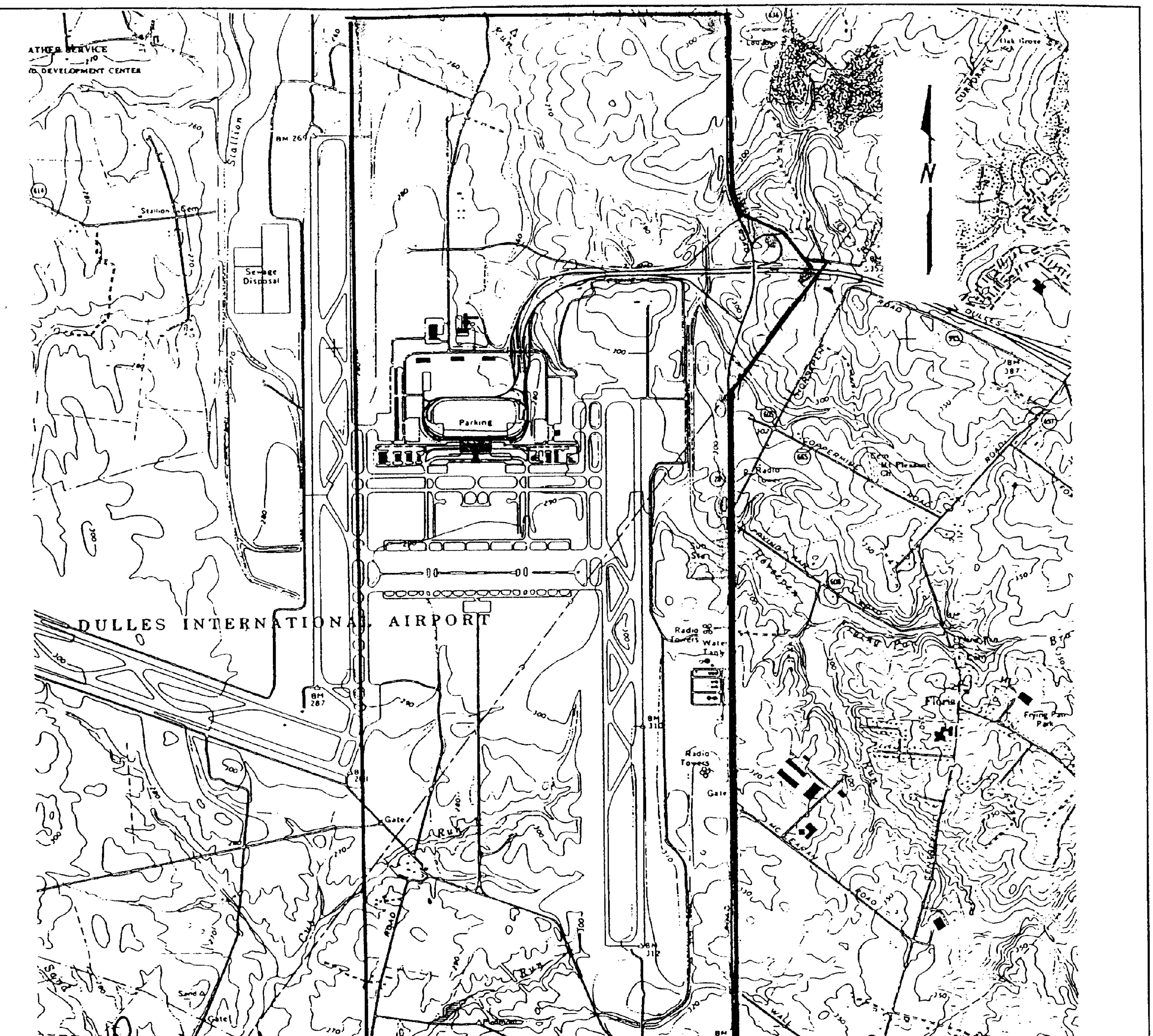
Frank D. Holly, Jr.
Vice President, Engineering

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"-6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1



DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Stallion
Radio Towers
Water Tank
Floris
Frying Pan Park
Pleasant Valley
Trailer Park
N
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1 MILE
1 KILOMETER
7000 FEET

Site Map

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Ronald Reagan Washington National Airport ✈ Washington, DC 20001-4901

AUG - 6 2001

Hon. Anthony H. Griffin
County Executive, Fairfax County
12000 Government Center Parkway, Suite 552
Fairfax, VA 22035-0066

Re: Proposed Facility Improvements at Washington Dulles International Airport

Dear Mr. Griffin:

The Metropolitan Washington Airports Authority (MWAA) is preparing National Environmental Policy Act (NEPA) documentation for proposed facility improvements at Washington Dulles International Airport (IAD). The improvement projects are intended to replace outmoded facilities, and to enhance the quality and efficiency of passenger handling at IAD within the constraints of the present system of three runways. The documentation will be prepared in accordance with FAA regulations implementing NEPA.

The Airport is located approximately 26 miles west of central Washington, DC, astride the boundary between Fairfax and Loudoun Counties, Virginia. The Airport and Dulles Access Highway cover 10,943 acres, of which 7,508 are in Loudoun County and 3,435 are in Fairfax County.

The major proposed improvements at IAD consist of a modern 44-gate passenger concourse to replace Concourse C/D (which will be closed), additional aircraft parking capacity, a utilities complex, a new airport traffic control tower, and an underground automated people mover train system with six miles of tunnels to replace the mobile lounges. The other current proposed improvement projects at IAD are on a smaller scale. The attachment shows the project area.

To assist us in identifying environmental issues that may affect the future implementation of the facility improvements, please provide us with written comments concerning interest within your agency's responsibility.

Your response within 20 days from the date of receipt of this letter will be greatly appreciated.

Similar requests for input to the scoping of the NEPA process are being sent to:

Loudoun County
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Agriculture and Consumer Services
Virginia Department of Aviation
Virginia Department of Conservation and Recreation
Virginia Department of Environmental Quality
Virginia Department of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Health
Virginia Department of Historic Resources
Virginia Department of Mines, Minerals and Energy
Virginia Department of Transportation
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Northern Virginia Regional Commission
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

If you have any questions regarding this request, please contact Charles Baummer of our Department of Planning at (703) 417-8168.

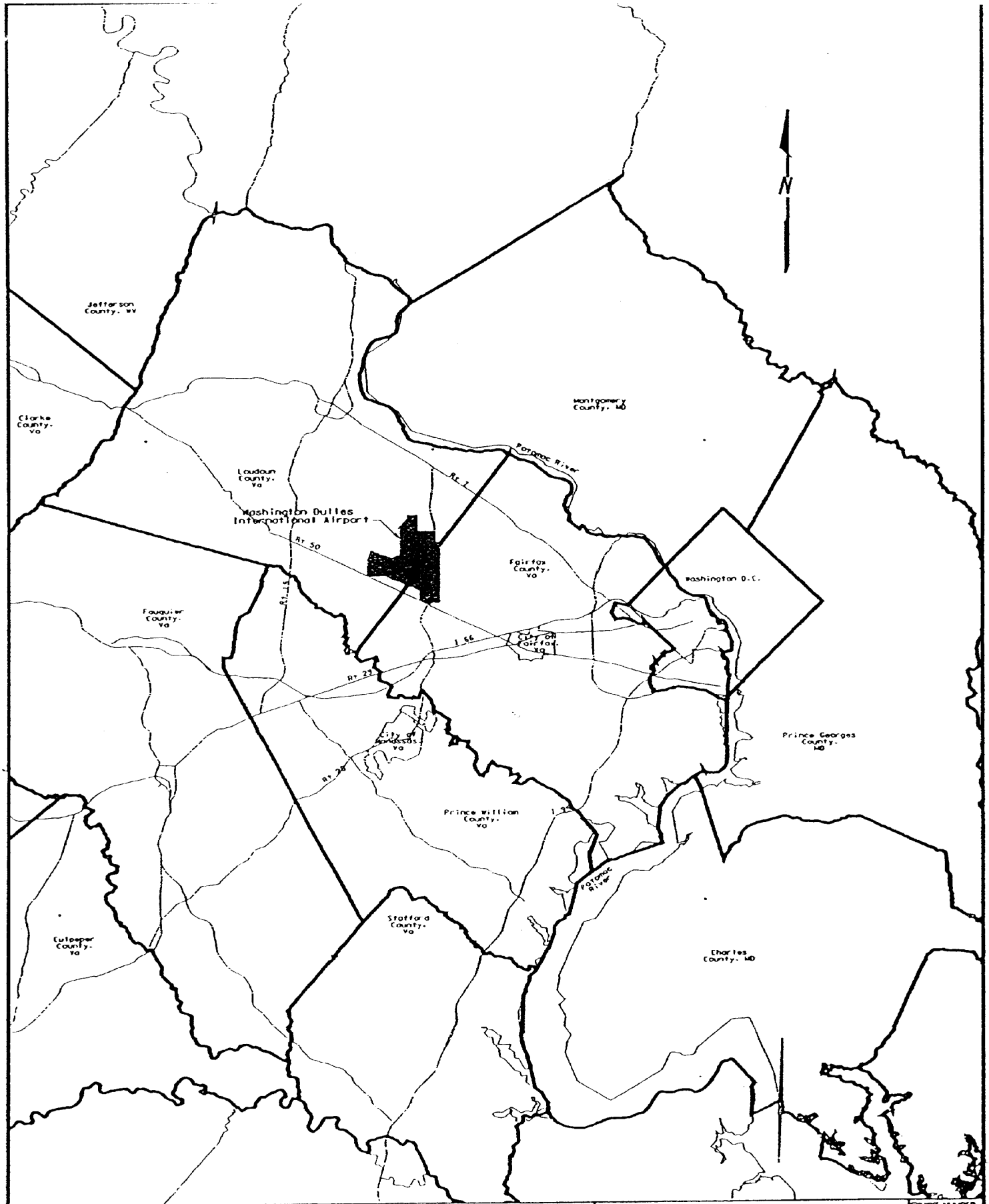
Thank you.

Sincerely,

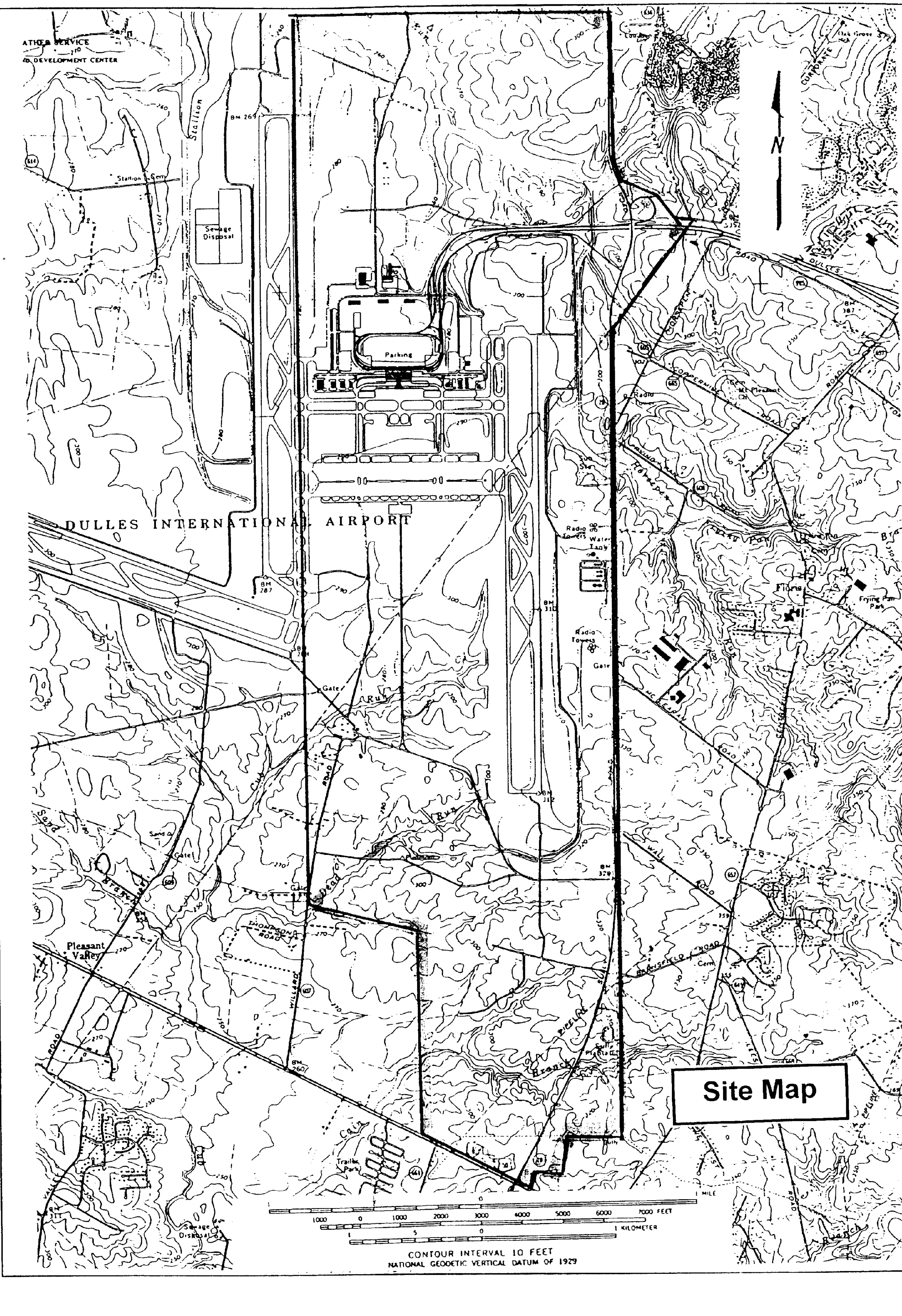
Frank D. Holly, Jr.
Vice President, Engineering

Enclosures

JCB:pp



HNTB CORPORATION	DATE 01/15/01 SCALE 1"=6miles		METROPOLITAN WASHINGTON AIRPORTS AUTHORITY OFFICE OF ENGINEERING	WASHINGTON DULLES INTERNATIONAL AIRPORT VICINITY MAP	EXHIBIT NUMBER M-1


N
DULLES INTERNATIONAL AIRPORT
Parking
Sewage Disposal
Radio Towers
Water Tank
Gate
Frying Pan Park
Pleasant Valley
Trailer Park
Site Map
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

Local governments working together for a better metropolitan region

November 26, 2001

District of Columbia
Bowie
College Park
Frederick County
Gaithersburg
Greenbelt
Montgomery County
Prince George's County
Rockville
Takoma Park
Alexandria
Arlington County
Fairfax
Fairfax County
Falls Church
Loudoun County
Prince William County

Dr. J. Charles Baummer, Jr.
Environmental Planner
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, D.C. 20001 – 4901

Dear Dr. Baummer: Charlie

Re: Construction equipment emissions for Washington Dulles International Airport included in the State Implementation Plan (SIP)

We have reviewed your analysis of the emissions from non-road construction equipment at the Washington Dulles International (IAD) Airport as related to Washington, DC-VA-MD ozone non-attainment area's emissions projections for the year 2005 in the recently approved State Implementation Plan (SIP).

We concur with the methodology used by the Metropolitan Washington Airports Authority for deriving the emissions that are attributable to the construction equipment usage activities at the IAD airport. However, we suggest a minor correction to your nitrogen oxides emissions data. We believe that data truncation caused this error in your analysis. As noted, the region's attainment SIP attributes 0.746 tons of nitrogen oxides (NOx) and 0.106 tons of volatile organic compounds (VOCs) per ozone season day due to the activities of the construction equipment at IAD Airport.

Contact us if you need further details or for any additional help.

Sincerely,

Joan Rohlfs

Joan Rohlfs
Chief, Air Quality Planning

Enclosure.

777 North Capitol Street, N.E. Suite 300 Washington, D.C. 20002-4239
Telephone (202) 962-3200 Fax (202) 962-3201 TDD (202) 962-3213 Internet http://www.mwcog.org

Washington Dulles International Airport
Emissions from Construction Equipment (tons per Ozone Season Day)

Round 6.1 Cooperative Forecasts - EMPLOYMENT

Year	Fairfax Co.	IAD-Ffx	IAD-Ffx %	Loudoun Co.	IAD-Loud	IAD-Loud %
1990	403700	1491	0.369%	38300	8037	20.984%
2005	589300	394	0.067%	92700	16000	17.260%

Volatile Organic Compounds (VOCs) - Construction Equipment at IAD (tpd)

Year	Fairfax Emissions	IAD-Fairfax Emissions	Loudoun Emissions	IAD-Loudoun Emissions	IAD-Emis. NO Controls	**IAD-Emis. with Controls**
Base - 1990	2.1810	0.0081	0.3070	0.0644	0.0725	**0.0725**
SIP - 2005	3.1277	0.0021	0.7252	0.1252	0.1273	**0.1058**

Nitrogen Oxides (NOx) - Construction Equipment at IAD (tpd)

Year	Fairfax Emissions	IAD-Fairfax Emissions	Loudoun Emissions	IAD-Loudoun Emissions	IAD-Emis. NO Controls	**IAD-Emis. with Controls**
Base - 1990	14.1057	0.0521	1.9802	0.4155	0.4676	**0.4676**
SIP - 2005	20.2282	0.0135	4.6780	0.8074	0.8209	**0.7456**

Washington Dulles International Airport
Emissions from Construction Equipment (tons per Ozone Season Day)

VOC - Break-down of 2005 emissions by sub-type

	Diesel	4-Stroke	2-Stroke	Total	
Uncontrolled	0.1010	0.0144	0.0118	0.1273	
Gasoline Controls	-	-0.0044	-0.0036	-0.0080	Spark Ignition Rule-Reductions (30.5%)
Diesel Controls	-0.0134	-	-	-0.0134	Non-road Diesel Engine Standards - Reductions (13.3%)
Controlled VOC	***0.0876***	***0.0100***	***0.0082***	***0.1058***	

NOx - Break-down of 2005 emissions by sub-type

	Diesel	4-Stroke	2-Stroke	Total	
Uncontrolled	0.8182	0.0027	0.0000	0.8209	
Gasoline Controls	-	0.0041	0.0000	0.0041	Spark Ignition Rule-Disbenefit (150.7%)
Diesel Controls	-0.0794	-	-	-0.0794	Non-road Diesel Engine Standards - Reductions (9.7%)
Controlled NOx	***0.7389***	***0.0068***	***0.0000***	***0.7456***	

Baummer Jr., Charlie

From: Thomas R. Ballou [trballou@deq.state.va.us]
Sent: Friday, January 11, 2002 9:41 AM
To: Baummer Jr., Charlie
Subject: Estimates of Construction Equipment Emissions from Dulles

Hello Charlie. The purpose of this email is to inform you that we have reviewed the MWAA document entitled "Construction Equipment Emissions for Washington Dulles International Airport included in the State Implementation Plan", that you forwarded to Jim Sydnor. We concur with the methods and data used to estimate the air pollutant emissions from Dulles construction activities contained in the current SIP for the Washington, D.C. area, and have no substantial comments or issues concerning this document.

Do not hesitate to contact us if you need more assistance concerning the conformity and related SIP/inventory issues involved in the Dulles Airport expansion program.

Tom Ballou
Emissions Inventory Unit Supervisor
Division of Air Program Coordination - Air Data Analysis
Virginia Department of Environmental Quality
(804) 698-4406 (trballou@deq.state.va.us)

U.S. Army Corps of Engineers, Norfolk District
Northern Virginia Field Office
18139 Triangle Plaza, Suite 213
Dumfries, VA 22026

September 28, 2001

Project Number: 99-B0857

Waterway: Horsepen Run tributaries

1. Participant:
Metropolitan Washington Airports Authority
Attn: Mr. Thomas Beatty
Ronald Reagan Washington National Airport
Washington, DC 20001-4901

2. Authorized Agent:
Dames & Moore
7101 Wisconsin Avenue, Suite 700
Bethesda, MD 20814-4870

3. Project Location:
The project is located at Dulles International Airport, west of Herndon in Fairfax and Loudoun Counties, Virginia.

4. Project Description:
The project consists of the confirmation of a wetland delineation for the subject tract. The project is called Dulles International Airport.

5. Findings

A site inspection has verified that waters and/or wetlands regulated under Section 404 of the Clean Water Act (33 U.S.C. 1344) exist at the location stated above. The wetland delineation maps and wetland classification maps received by letter dated August 8, 2001, are in accordance with the methodology described in the 1987 Corps of Engineers Wetland Delineation Manual. This confirmation is valid for five years from the date of this letter unless new information warrants revision of the delineation before the expiration date.

Corps Contact: Mr. Ron Stouffer at 703-221-6967

Bruce F. Williams
Chief, Northern Virginia Regulatory Section

APPENDIX F

SURVEY FOR RARE, THREATENED, AND ENDANGERED SPECIES

SURVEY FOR RARE, THREATENED, AND ENDANGERED SPECIES AT THE PROPOSED TIER 2 AND RELATED PROJECTS

WASHINGTON DULLES INTERNATIONAL AIRPORT

Prepared for:

Metropolitan Washington Airports Authority

Ronald Reagan National Airport

One Aviation Circle

Washington, D.C., 20001

Prepared by:

EA Engineering, Science, and Technology
15 Loveton Circle
Sparks, Maryland 21152
(410) 771-4950

August 2001

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

EA Engineering, Science, and Technology (EA), of Sparks, MD, conducted field surveys in the study area for the Tier 2 and related projects at the Washington Dulles International Airport (IAD) property on 5 June 2001 and again on 25, 26, and 27 July 2001. The survey was requested by the Planning Department (MA-32) of the Metropolitan Washington Airports Authority (MWAA) to support NEPA evaluations and the Joint [Wetlands] Permit Application for these proposed projects. The primary goal of the surveys was to determine whether a Virginia state-listed threatened species, the upland sandpiper (*Bartramia longicauda*), nests in specific areas proposed for future development at the proposed Tier 2 and related projects. The Tier 2 and related projects are included in more detail in Table 1. The surveyed projects of Tier 2 are grouped into four main categories:

- Tier 2 Concourse
- Automated People Mover (APM) System
- South Utilities
- Support Facilities

The surveys were also conducted to attempt to determine whether a Virginia state-listed threatened species, the wood turtle (*Clemmys insculpta*) inhabits areas proposed for future developments of Tier 2 and related projects at IAD. An additional goal of the surveys was to determine whether any rare, threatened, or endangered (RTE) plant species that are known or suspected to occur in Loudoun and Fairfax counties, Virginia are located in specific areas proposed for future development at IAD.

Based on correspondence with the U.S. Fish and Wildlife Service, the Commonwealth of Virginia Department of Game and Inland Fisheries, and the Commonwealth of Virginia

Department of Conservation and Recreation, specifically targeted plant species in the surveys included the hairy beardtongue (*Penstemon hirsutus*), the white heath aster (*Aster ericoides*), and the small whorled pogonia (*Isotria medeoloides*). Additional rare plant species known or suspected to occur in Loudoun and Fairfax counties were also included in the surveys.

2.0 HABITAT AND SPECIES DESCRIPTION

The survey boundaries included approximately 300 acres and are associated with the planned construction of the Tier 2 Concourse, the Automated People Mover System (APM), South Utilities, and Support Facilities (see Figure 1). These projects are part of the Dulles Development (*d2*) program. They are located in the mid-field area and southern portion of the airport. These undeveloped project sites are dominated by mowed meadows and old field habitats. Emergent wetlands are present in a portion of the areas designated for construction at the mid-field area including the APM service facility, various APM tunnel locations, Right-of-Way Easement crossings for sewer lines, and the stormwater management facility serving the Tier 2 and related projects. In addition, emergent wetlands are also present in the northern portions of both South Utility Building (SUB) Option 2 and SUB Option 2B.

Upland Sandpiper

The upland sandpiper is a ground nesting bird that builds its nest in shallow depressions lined with grass. The upland sandpiper uses grasslands of various heights for foraging, nesting, and brood cover. The breeding season is typically from early April to early May. The bird has a long, dove-like head with a black crown and white eye ring and long,

slender yellow legs. Although the survey took place outside of the breeding window, any nests that may have been present should have remained intact at the time of the June survey.

Wood Turtle

The wood turtle is a terrestrial/aquatic turtle with an irregular pyramid pattern on the shell and inhabits forested rivers and streams. Wood turtle mating is most frequent in the spring and fall, when the turtles are more aquatic. In May or June, female wood turtles seek open, sunny nesting sites, preferring sandy banks adjacent to moving water whenever possible. The 5 June 2001 survey took place during the nesting period of the wood turtle.

Targeted Plant Species

The hairy beardtongue is a woolly-stemmed plant with open, stalked clusters of lavender, trumpet-shaped flowers with white lips that typically blooms from June to July and inhabits dry or rocky grounds. The white heath aster has alternate leaves and white flowers that bloom from August to October and inhabits fields and open, rocky areas. Finally, the small whorled pogonia has one or two greenish-yellow flowers at the top of a green stem above a whorl of five to six leaves. The small whorled pogonia blooms from May to July and inhabits dry woodlands. The 5 June 2001 survey took place during the blooming period of the hairy beardtongue and the small whorled pogonia. Although the July surveys took place outside of the blooming window of the hairy beardtongue, the bronze-colored seed capsules with evident protruding stigmas would be present during this time period.

3.0 FIELD METHODS

USDA Wildlife Services staff and representatives of Parsons Management Consultants (PMC) accompanied personnel from EA during the field survey. The surveys began in the mornings of 5 June 2001 and 25-27 July 2001 and went through the afternoons. Approximately 30 hours (5 people times 6 hours each) were expended on 5 June 2001 and approximately 90 hours were expended on 25-27 July 2001 (up to 7 people with varying hours each) in the areas proposed for construction at the Tier 2 Concourse, the Automated People Mover System (APM), South Utilities, and Support Facilities. See Attachment A for a list of participants by date and time.

Attention was focused on the ground in an attempt to locate nests of the upland sandpiper that may be present and to locate any county-specific RTE plant species. Open grassland habitat was considered to be the most suitable habitat for the hairy beardtongue and the white heath aster. Areas with open water and wetlands were also targeted and considered to be the most likely habitat used by the wood turtle.

Dry woodlands with thin understory growth were viewed as possible habitat for the small whorled pogonia. The oldfield areas were also surveyed for the targeted species. Densely forested areas with thick understory growth were surveyed as access would allow, but viewed as areas that would least likely support the species being targeted by the survey.

Each person walked independently of the others to maximize the area covered. Field observations were recorded in the field as they were made and photographs were taken as necessary and included at the end of this report.

Observations of species of concern were marked in the field with flagging tape and Global Positioning System (GPS) coordinates of the location were recorded. The GPS coordinate information was collected in latitude and longitude format through the use of a Trimble ProXRS with an Omnistar differential. In addition, to ensure accuracy, three benchmark points were collected (See Figure 1 for location of benchmark points). The first two benchmarks, 9013 and 9014, were located south of Concourse C/D and the third benchmark, 9018, was located in the grassed median of the curve in Flight Line Road.

4.0 OBSERVATIONS IN PROJECT AREAS

Tier 2 Concourse

An employee parking lot is currently located in the area designated for the Tier 2 Concourse. Emergent wetlands were observed below the existing parking lot, along the southern and eastern portion of the proposed Tier 2 Concourse area. The remainder of the proposed Tier 2 Concourse area was mowed meadow and oldfield. Eastern red cedar, blackberries, and various wildflowers dominated this area. Red-winged blackbirds and killdeer were observed at this site. Rodent tunnels in the turf were also observed in the meadow portions of the site.

Automated People Mover System (APM)

The area proposed for the APM tunnel included the existing parking lot, grassy meadows both unmowed and mowed, soil stockpile areas, and emergent wetlands at various locations along the proposed APM tunnel. At the site of the proposed APM Service Facility, emergent wetlands were also observed. Areas of dense cedar trees were observed along and adjacent to the emergent wetlands south of the proposed APM Service Facility.

South Utilities

The proposed south utilities project sites monitored in the RTE surveys included the stormwater management pond, the SUB Options, the South Electrical Substation, and the Right-of-Way Easements for sewer lines. The area proposed for the stormwater management pond, included as a south utilities project, consisted of emergent wetlands, open, grassy meadows, and upland deciduous woods. Some of the open, grassy areas appeared to have been recently mowed, while other, unmowed areas consisted of tall grasses and mature wildflowers. Typical wetland plant species inhabited the emergent wetlands and a mud turtle swimming in open water was observed by the culvert, below the road crossing. The area of the proposed SUB Option 2 consisted of an abandoned radio tower facility, mowed, grassy areas and dense woods surrounding the adjacent radio tower facility. Emergent wetlands are located in the northern portion of the SUB Option 2. The area of the proposed SUB Option 2B consisted of a dry woodland cedar forest with a thin understory. An emergent wetland was observed in the northern portion of the SUB Option 2B and two box turtles were observed in the forested areas during the

survey. The proposed location for the South Electrical Substation was a densely forested area with a medium dense understory; no emergent wetlands were present in this location. The area of the proposed SUB 1 was north of the Department of Public Safety training facility, and adjacent to the roadside the grassy areas were mowed. Three beardtongues, not hairy, were located along the dry drainage ditch adjacent to the road. Adjacent to the mowed grassland habitat of the proposed SUB 1, and dense cedar and pine forest with a thin understory was observed. A small creek, running perpendicular to the main road was also observed, but no wetlands on the proposed site were documented. The area of the SUB Option 3 included a haul road through the proposed SUB Option 3 area for construction machinery approximately 50 ft wide. A dry woodlands area of cedars with a thin understory was observed on either side of the existing haul road. Two showy orchis, not on the RTE list, were observed in the forested area of the proposed SUB Option 3. No emergent wetlands were observed.

Support Facilities

The contractor staging area and the alternative contractor staging area, both support facilities of the Tier 2 projects, were observed to be almost completely cleared. Cardinal flower and a Dodder species, neither on the RTE list, were observed in an uncleared habitat adjacent to the cleared area of the proposed alternative staging area. The proposed soil stockpile area, also a support facility of the Tier 2 projects, was located in a densely forested area with a thick understory of both red raspberries and blackberries approximately 8 ft tall. As access would allow, the far west and south central areas of the proposed soil stockpile area were surveyed (Figure 1). An emergent wetland is present south of the proposed middle area of the soil stockpile site.

5.0 RESULTS OF SURVEY

No upland sandpiper nests and no upland sandpiper individuals were observed during the field surveys. Similarly, no wood turtles were observed during the field surveys. Of the Loudoun and Fairfax County RTE plant species, only the hairy beardtongue was observed. Lists of typical wildlife and plant species observed during the surveys are included as Table 2 and Table 3 of this report.

Hairy beardtongue (*Penstemon hirsutus*), a Virginia rare plant was observed during the 5 June 2001 field investigation at the location of the proposed Tier 2 Concourse, south of the existing parking lot. During the 5 June 2001 field investigation, the hairy beardtongue was in full bloom and each stand included fewer than 12 plants. A photo of hairy beardtongue taken in the midfield area during the June survey is included in the photographic record of this report.

The Virginia Department of Conservation and Recreation (VDCR) responded to a request for endangered and threatened species information for another IAD project by stating that two state rare plant species, hairy beardtongue and white heath aster (*Aster ericoides*), have been documented on the IAD property. The second species, white heath aster, was not observed during the 5 June 2001 or the 25-27 July 2001 field investigations. The white heath aster may not have been conspicuous, as it does not bloom until mid to late summer.

During the field investigations conducted from 25-27 July 2001, the hairy beardtongue was observed at three locations. The first two locations were approximately 15 ft apart adjacent to the proposed APM Tunnel, and were labeled HBT-1 and HBT-2, respectively (See Figure 1). These two occurrences, HBT-1 and HBT-2, were located adjacent to the proposed project area. Due to the scale of Figure 1 and close proximity of the two locations, HBT-1 and HBT-2 are presented in the figure as one location. The third occurrence of the hairy beardtongue was located in the proposed stormwater management facility, that will serve the Tier 2 and related projects, and labeled as HBT-3 (See Figure 1). The hairy beardtongue plants observed and documented were approximately 10 to 12 inches in height, had intact seed capsules on the stalks, and had various degrees of leaf condition. The habitat of the three hairy beardtongue occurrences (HBT-1, HBT-2, and HBT-3) was open, unmowed, dry grassy areas inhabited by other wildflower species. See Table 4 for a description of each hairy beardtongue observation, GPS point name, and coordinate information.

6.0 ADDITIONAL DATA

USDA employees stationed at IAD conduct bi-monthly wildlife surveys at fixed stations throughout IAD as part of the airport's Wildlife Hazard Management monitoring program. Upland sandpipers have been observed on IAD property during these surveys. Incidental observations of upland sandpipers have also been made at locations and times outside of the scheduled Wildlife Hazard Management monitoring activities. Based on data provided by the accompanying USDA employees, between September 1998 and April 2001, a total of 9 upland sandpipers were observed at 5 of the stations during the

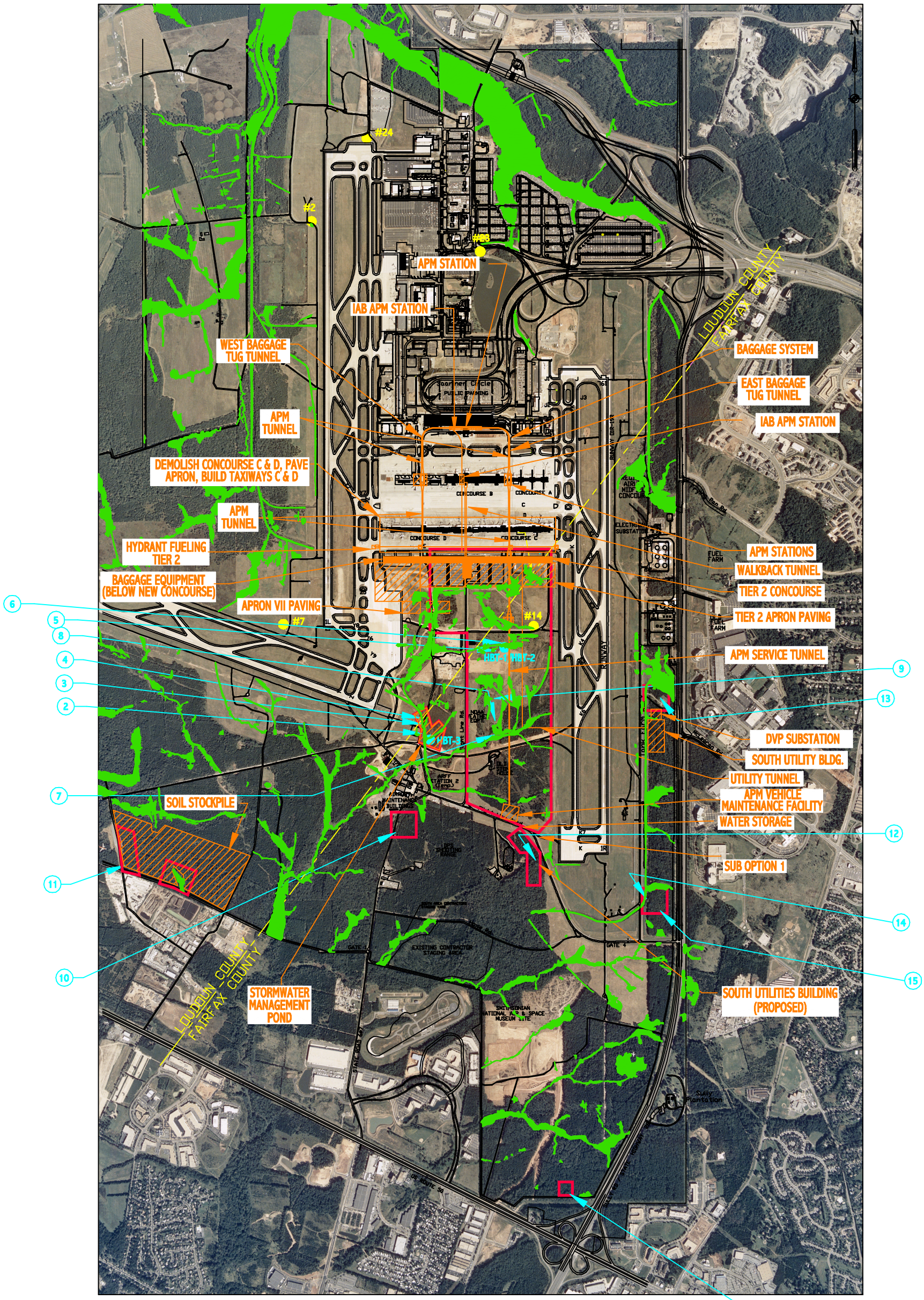
Wildlife Hazard Management monitoring activities at IAD (see Table 5 for the station number, date, and number of individuals observed and see Figure 1 for the location of observations). Wildlife Hazard Management monitoring Station #14 is located midway between the proposed Taxiway F and the proposed South Employee Parking Lot, Phase 1. At Station #14, a single upland sandpiper was observed flying on 7 May 2000. At Station #7, located at the intersection of runways 19R/1L and 12/30 (west of Station #14), a single upland sandpiper was observed loafing in temporary standing water on 27 May 2000. Two upland sandpipers were observed at Station #24, located at the northern end of the north-south runway 19R/1L; one on 9 September 1998 and another on 4 June 2000. Five upland sandpipers were observed at 2 stations (Stations #2 and #23) north of the terminal on 30 April 2001 (USDA 2001).

7.0 CONCLUSIONS

Evidence of the state-listed threatened upland sandpiper using IAD property for nesting sites was not documented in the 5 June 2001 or the 25-27 July 2001 surveys or in discussions with USDA employees. However, upland sandpipers have been observed flying and loafing at IAD during Wildlife Hazard Management monitoring activities. Incidental observations (i.e., in addition to Wildlife Hazard Management monitoring activities) have also been made in the past.

The Virginia state-listed wood turtle was not observed at IAD during either the 5 June 2001 or the 25-27 July 2001 field surveys. The Federally-listed threatened plant species, the small whorled pogonia, was not observed during these surveys.

The Virginia rare plant, hairy beardtongue, was observed in three locations. Two of the three locations were adjacent to the proposed APM Tunnel project locations and one location was within a proposed development area, the stormwater management facility that will serve the Tier 2 and related projects.



2500 1250 0 2500

GRAPHIC SCALE IN FEET

LEGEND

- TIER 2 AND RELATED PROJECTS
- DELINEATED WETLANDS
- SURVEYED AREAS
- EQUIVALENT TO 2 ACRES
- HISTORIC UPLAND SANDPIPER OBSERVATIONS
- (10) PHOTOGRAPH LOCATIONS
- HAIRY BEARDTONGUE OBSERVATIONS

FILE: Q:\PROJECTS\1384001\FIG1A

TIER 2 AND RELATED PROJECTS RARE, THREATENED, OR ENDANGERED SPECIES SURVEYS WASHINGTON DULLES INTERNATIONAL AIRPORT PROJECT LOCATION	FIGURE 1 LOCATION OF AREAS SURVEYED FOR RTE SPECIES AND LOCATIONS OF WILDLIFE HAZARD MANAGMENT MONITORING STATIONS WITH UPLAND SANDPIPER OBSERVATIONS	DRAWN BY WCM	DATE 8-07-01	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 1

Table 1. Tier 2 And Related Projects: Dulles Development Program, Washington Dulles International Airport

TIER 2 CONCOURSE	**Airport Buildings:**	• Tier 2 Concourse • Walkback Tunnel (Tier 2 to Tier 1) (Phase II) • Baggage Tug Tunnels • Baggage Conveyor Tunnels to Tier 2 • High Speed Conveyor Baggage System (Main Terminal to Tier 2) • Tier 2 Baggage Equipment
	Airfield Facilities:	• Demolish Old C/D Concourses, Repave Apron and Taxiways C/D • Tier 2 Apron Paving • Hydrant Fueling for Tier 2 • Apron VII Paving
AUTOMATED PEOPLE MOVER SYSTEM	**Airport Buildings:**	• IAB People Mover Stations, Tunnels and System • Concourse B Bldg. Adaptations for IAB People Mover (Tier 1) • People Mover – Main Terminal to Concourse B • Concourse B Bldg. Adaptations for People Mover • People Mover – Maintenance Facility and Service Tunnel • People Mover – Tier 1 to Tier 2 • APM Shell between Tier 2 and APM Vehicle Maintenance Facility • Security Mezzanine & Main Terminal People Mover Station, Pkg. 6
SOUTH UTILITIES	**Land:**	• Right-of-Way Easements for Sewer Lines
	Airport Buildings:	• South Utility Building, Phase I
	Utility Systems:	• Stormwater Management Facilities, Tier 2 Projects • Utility Tunnel • Expanded Water Storage • South Area Utility Distribution and Tie-Ins • South Area Utility Trunk Lines • South Electrical Substation and Distribution Center
SUPPORT FACILITIES	**Other:**	• Contractor Staging Area for Tier 2 Facilities • Soil Stockpile Area

Table 2. Wildlife Species and/or Sign Observed at Washington Dulles International Airport during Surveys in June/July 2001

Common Name	**Scientific Name**	**Sign**
Birds		
Canada geese	*Branta canadensis*	Observed
Mallard	*Anas platyrhynchos*	Observed
Killdeer	*Charadrius vociferus*	Observed
American woodcock	*Scolopax minor*	Observed
Rock dove (pigeon)	*Columba livia*	Observed
American crow	*Corvus brachyrhymos*	Observed
Red-winged blackbird	*Agelaius phoeniceus*	Observed
Mammals		
Opossum	*Didelphis marsupialis*	Skull
Groundhog	*Marmota marmox*	Observed
Eastern cottontail	*Sylvilagus floridanus*	Observed
White-tailed deer	*Odocoileus virginianus*	Tracks
Coyote	*Canis latrans*	Scat
Red fox	*Vulpes fulva*	Observed
Reptiles and Amphibians		
Bullfrogs	*Rana catesbeiana*	Calls
Black racer snake	*Coluber constrictor*	Observed
Eastern mud turtle	*Kinosternon subrubrum*	Observed
Eastern box turtle	*Terrapene carolina*	Observed

Table 3. Plant Species Observed at Washington Dulles International Airport during Surveys in June/July 2001

Common Name	**Scientific Name**
Trees	
Red maple	*Acer rubrum*
Smooth hickory	*Carya sp.*
Persimmon	*Diospyros virginiana*
Juniper	*Juniperus sp.*
Eastern red cedar	*Juniperus virginiana*
Oak sp.	*Quercus sp.*
Virginia pine	*Pinus virginiana*
Winged sumac	*Rhus copallina*
Black locust	*Robinia psuedo-acacia*
Black willow	*Salix nigra*
Sassafras	*Sassafras albidum*
Shrubs and Vines	
Dodder sp.	*Cuscuta sp.*
Japanese honeysuckle	*Lonicera japonica*
Tartarian honeysuckle	*Lonicera tatarian*
Virginia creeper	*Parthenocissus quinquefolia*
Poison ivy	*Toxicodendron radicans*
Multiflora rose	*Rosa multiflora*
Wild raspberry	*Rubus sp.*
Elderberry	*Sambucus canadensis*
Grasses, Sedges, and Rushes	
Sedge	*Carex sp.*
Velvet grass	*Holcus lanatus*
Soft rush	*Juncus effusus*
Herbs	
White yarrow	*Achillea millefolium*
Wild garlic	*Allium vineale*
Dogbane	*Apocynum sp.*
Swamp milkweed	*Asclepias incarnata*
Common milkweed	*Asclepias syriaca*
Aster	*Aster sp.*
Partridge-pea	*Chamaecrista fasciculata*
Chicory	*Cichorum intybus*
Asiatic dayflower	*Commelina communis*

Table 3. Plant Species Observed at Washington Dulles International Airport during Surveys in June/July 2001 (Continued)

Common Name	Scientific Name
Herbs	
Queen Anne's lace	*Daucus carota*
Deptford pinks	*Dianthus armeria*
Teasil	*Dipsacus sylvestris*
Common fleabane	*Erigeron philadelphicus*
Joe-pye weed	*Eupatorium sp.*
Flowering spurge	*Euphorbia corollata*
Jerusalem artichoke	*Helianthus tuberosus*
Swamp rose-mallow	*Hibiscus moscheutos*
Bluets	*Houstonia caerulea*
Common St. Johnswort	*Hypericum perforatum*
Jewelweed	*Impatiens capensis*
Slender bush clover	*Lespedeza virginica*
Monkeyflower	*Mimulus ringens*
Evening primrose	*Oenothera biennis*
Showy orchis	*Orchis spectabilis*
Beardtongue	*Penstemon digitalis*
Hairy beardtongue *	*Penstemon hirsutus**
Pokeweed	*Phytolacca americana*
Heal-all	*Prunella vulgaris*
Black-eyed susan	*Rudbeckia fulgida*
Gloriosa daisy	*Rudbeckia hirta*
Curly dock	*Rumex crispus*
Crows pink	*Sabatia stellaris*
Nightshade	*Solanum dulcamara*
Goldenrod	*Solidago sp.*
Wild pink bean	*Strophostyles helvula*
Cattail	*Typha angustifolia*
Moth mullein	*Verbascum blattaria*
Common mullein	*Verbascum thapsus*
Blue vervain	*Verbena hastata*
New York ironweed	*Veronica novaborascensis*

* Virginia listed rare plant

Table 4. Description of Observed Hairy Beardtongue GPS Points

Point Name	GPS Coordinates	On-Site of a Proposed Project?	Description of Observation at Point
HBT-1	38°56'15.06" 77°26'41.45"	NO	Two stalks approximately 12 inches tall, bronze rusty-orange colored, approximately 50 seed capsules and good, green stems.
HBT-2	38°56'14.98" 77°26'41.26"	NO	Six stalks approximately 10 inches tall, bronze rusty-orange colored, with seed capsules and wilted, crispy foliage.
HBT-3	38°55'53.06" 77°27'04.51"	YES-Stormwater Management Facility	One stalk approximately 12 inches tall, bronze rusty-orange colored, approximately 25 seed capsules and good, green stems.

Table 5. Description of Historical Upland Sandpiper Observations at Proposed Wildlife Hazard Management Monitoring Stations

Observation Point Number	Date of Observation	Number of Individuals Observed
24	9/9/98	1
7	5/7/00	1
14	5/27/00	1
24	6/4/00	1
23	4/30/01	3
2	4/30/01	2

Source: USDA Wildlife Management Services, unpublished data

Photographic Record

Proposed Locations for the Tier 2 Concourse, Automated People Mover System, South Utilities, and Support Facilities

Washington Dulles International Airport
(See Figure 1 for picture locations)

Picture 1. Hairy Beardtongue (*Penstemon hirsutus*), Virginia state-listed rare plant. (Plant with lavender flower in center of photo)

Picture 2. Hairy Beardtongue (HBT-3) observed in proposed Stormwater Management Facility project area

Picture 3. Drainage ditch with standing water located in area of proposed Stormwater Management Facility

Picture 4. Mowed and grassy areas of Stormwater Management Facility habitat

Photographic Record

**Proposed Locations for the Tier 2 Concourse,
Automated People Mover System,
South Utilities, and Support Facilities**

Washington Dulles International Airport
(See Figure 1 for picture locations)

Picture 5. Habitat where HBT-1 was observed, adjacent to the proposed APM Tunnel project area.

Picture 6. Hairy Beardtongue (HBT-1), observed adjacent to the proposed APM Tunnel project area

Picture 7. Area east of Flight Line Road, south of proposed APM Service Facility, looking east.

Picture 8. Area east of Flight Line Road, south of the soil stockpiles in the mid-field area, north of the stone house, and looking south.

Photographic Record

**Proposed Locations for the Tier 2 Concourse,
Automated People Mover System,
South Utilities, and Support Facilities**

Washington Dulles International Airport
(See Figure 1 for picture locations)

Picture 9. Area east of Flight Line Road and south of soil stockpiles in mid-field area, looking east.

Picture 10. Haul Road at site of proposed SUB Option 3, looking east.

Picture 11. Area at western end of proposed soil stockpile area, looking east.

Picture 12. Area at proposed SUB Option 1, looking south.

Photographic Record

**Proposed Locations for the Tier 2 Concourse,
Automated People Mover System,
South Utilities, and Support Facilities**

Washington Dulles International Airport
(See Figure 1 for picture locations)

Picture 13. Area at proposed SUB Option 2, vacant radio tower on site of proposed SUB Option 2.

Picture 14. Area of proposed SUB Option 2B, mowed grassy area and oldfield habitat

Picture 15. Dry woodland habitat with thin understory on location of proposed SUB Option 2B

Picture 16. Densely forested area at proposed South Electrical Substation

ATTACHMENT A

Table A-1. Personnel Present during the 5 June 2001 and 25, 26, and 27 July 2001 Surveys at Washington Dulles International Airport

List of Participants by Company	5 June		25 July		26 July		27 July	
	AM	PM	AM	PM	AM	PM	AM	PM
Parsons Management Consultants								
• Mike Callahan	√	√	√	√	√	√	√	√
• Diego Rincon					√			
USDA Wildlife Services								
• David Allaben	√	√	√			√		
• Stephen Kendrot	√	√	√			√		
EA Engineering, Science, and Technology								
• Charles Leasure	√	√	√	√	√	√	√	√
• Sarah Koser	√	√	√	√	√	√	√	√
• Todd Ward			√	√	√	√	√	√

APPENDIX G

LIST OF AGENCIES CONTACTED

This appendix contains the list of agencies that were contacted by MWAA to assist in identifying environmental issues that may affect the future implementation of the improvement projects at IAD.

AGENCY CONSULTATION

Mr. Peter Stokley
Environmental Protection Agency
Region III, Environmental Services Division
1650 Arch Street, 3-ES-30
Philadelphia, PA 19103-2029

Ms. Karen L. Mayne
Supervisor, Virginia Field Office
U.S. Department of the Interior
Fish and Wildlife Service
Gloucester Office of Fishery Assistance
6669 Short Lane
Gloucester, VA 23061

Ms. Shelly Miller
Commonwealth of Virginia
Department of Game and Inland Fisheries
Environmental Services Section
4010 West Broad Street
Richmond, VA 23230

Ms. Renee Hypes
Project Review Coordinator
Commonwealth of Virginia
Division of Natural Heritage
217 Governor Street
3rd Floor
Richmond, VA 23219

Mr. Keith Tignor
Commonwealth of Virginia
Department of Agriculture and Consumer Services
Division of Consumer Protection
P.O. Box 1163
Richmond, VA 23218

Mr. Michael Murphy, Director
Commonwealth of Virginia
Department of Environmental Quality
Division of Environmental Enhancement
PO Box 10009
Richmond, VA 23240

Mr. Thomas Barnard, Jr.
Virginia Institute of Marine Science
Gloucester Point, VA 23062

Mr. W. Douglas Beisch, Jr.
Commonwealth of Virginia
Chesapeake Bay Local Assistance Department
101 N. 14th Street, 17th Floor
Richmond, VA 23219

Mr. Robert Grabb
Commonwealth of Virginia
Marine Resources Commission
2600 Washington Avenue
Newport News, VA 23607

Mr. Alan Weber
Commonwealth of Virginia
Department of Health
Division of Water Supply Engineering
1500 East Main Street, Room 109
Richmond, VA 23219

Mr. Michael Foreman
Commonwealth of Virginia
Department of Forestry
900 Natural Resources Dr., Suite 800
Charlottesville, VA 23230

Mr. Eugene Rader
Commonwealth of Virginia
Department of Mines, Minerals and Energy
P.O. Box 3667
Charlottesville, VA 22903

Mr. P. Clifford Burnette
Commonwealth of Virginia
Department of Aviation
Planning and Promotion Division
5702 Gulf Stream Road
Sandston, VA 23150-2502

Ms. Lily A. Richards
State Historic Preservation Office
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Mr. Chris Collins
Commonwealth of Virginia
Department of Transportation
1401 East Broad Street
Richmond, VA 23219

Mr. G. Mark Gibb
Executive Director
Northern Virginia Regional Commission
7525 Little River Turnpike, Suite 100
Annandale, VA 220003-2937

Hon. Kirby Bowers
Country Administrator, Loudoun County
1 Harrison Street, S.E., Fifth Floor
P.O. Box 7000
Leesburg, VA 20177-7000

Hon. Anthony Griffin
County Executive, Fairfax County
12000 Government Center Parkway, Suite 552
Fairfax, VA 22035-0066

APPENDIX H

LIST OF PREPARERS

LIST OF PREPARERS

Preparer	Responsibility
Christine Papageorgis, Ph.D. Senior Project Manager EA Engineering, Science, and Technology	Project Manager and Senior Technical Review
Peggy Derrick Senior Scientist EA Engineering, Science, and Technology	Task Manager
Frank Pine, Ph.D. Senior Scientist EA Engineering, Science, and Technology	Project Overview
Daniel Raley, PE, DEE Senior Engineer EA Engineering, Science, and Technology	Air, Solid Waste, and Energy Analysis
David Mayhew Senior Scientist EA Engineering, Science, and Technology	Water Quality and Coastal Zone Analysis
Charles Leasure Scientist EA Engineering, Science, and Technology	Wetlands Analysis
Tracy Layfield Scientist EA Engineering, Science, and Technology	Historic and Cultural Resources; Design, Art, and Architecture Analysis
Karin Olsen Scientist EA Engineering, Science, and Technology	Noise, Environmental Justice, Land Use and Light Emissions Analysis
Brian Lindley Scientist EA Engineering, Science, and Technology	Endangered Species; Soils and Geology Analysis
Sarah Koser Scientist EA Engineering, Science, and Technology	Endangered Species, Wetlands; Biotic Communities and Floodplain Analysis

Mary-Alice Koeneke
Scientist
EA Engineering, Science, and Technology ..... Endangered Species

Kevin T. Sharpe, P.G.
Geologist
EA Engineering, Science, and Technology .....Geology

Janet Earickson
Technical Writer/Editor
EA Engineering, Science, and Technology ..... Technical Editing

Diane Bauman
Technical Editor
EA Engineering, Science, and Technology ..... Technical Editing

William Merrey
CADD/GIS Regional Manager
EA Engineering, Science, and Technology .....CADD/GIS

Denise Little
Graphic Artist
EA Engineering, Science, and Technology ..... Graphics

APPENDIX I

SUMMARY OF ALTERNATIVES ANALYSES

APPENDIX I-1

SUMMARY OF ALTERNATIVES ANALYSIS FOR CONCOURSE AND APM ALIGNMENT

Terminal Concept Alternatives From the Master Plan. Alternative concepts for future development of passenger terminal facilities at the airport were considered in the Airport Master Plan (KPMG Peat Marwick 1985). Specifically, the Master Plan included an evaluation of a midfield and northwest terminal. Because the midfield terminal would be closer to existing operations, the concept of a midfield concourse was evaluated in detail. The principal evaluation criteria for the terminal concepts included:

(1) Capability to meet potential future requirements for aircraft parking;
(2) Capability to meet potential future requirements for terminal building space;
(3) Ability to stage development in separate components as demand for service increases;
(4) Capability to provide convenient facilities for originating and destination passengers;
(5) Capability to provide convenient facilities for passengers transferring between flights;
(6) Efficiency of airline operations; and
(7) Architectural and aesthetic considerations.

Five initial midfield terminal concepts (A, B, C, D, and E) were evaluated and are depicted in Figures I-1 through I-5, respectively.

Concept A – No midfield concourse would be constructed. Aircraft would park at remote aprons and be served by mobile lounges. Commuter airline service would be provided at the base of the ATCT tower. This concept would provide minimal walking distance for passengers and the remote apron would be able to accommodate a wide range of aircraft types. Originating and destination passengers would be served effectively through the use of mobile lounges; however, connecting flight passengers would be served less effectively. Airlines dependent upon fast turnaround aircraft and transfer of passengers would not be efficiently served. Additional mobile lounges would be required to accommodate increased demand for service over time.

Concept B – Two concourses would be constructed adjacent and perpendicular to the Main Terminal. Aircraft parking would exist at the new concourses and at the remote apron. Modifications to the Main Terminal would be required to accommodate transfer of passengers from the Main Terminal to the concourses. Originating and destination passengers would be served effectively through the use of mobile lounges; however, connecting flight passengers would be served less effectively. Airlines operating from both the remote apron and the concourse would experience inefficiencies. A compatible architectural design with the Main Terminal would be difficult to achieve.

Concept C – Two single-level concourses running east-west would be connected to the Main Terminal and a two-level midfield concourse would be connected to the Main Terminal via an underground people mover system. Aircraft would park at the single-level concourse, at the midfield concourse, and at the existing remote apron. Originating and destination passengers at the remote apron would be served effectively through the use of mobile lounges. Passengers transferring between flights would be most effectively served in the concourses, although passengers would have further walking distances if flight connections were located in different concourses. Passengers arriving at the remote apron would experience longer transfer times to connections in the concourses. Airline operations from three separate areas would complicate operations and passenger transfers. Airlines operating from a single concourse would provide

the most efficient service and be able to accommodate short turnaround times. Architectural compatibility with the Main Terminal would be easier to achieve than with Concept B.

Concept D – A single, two-level midfield concourse would be connected to the Main Terminal via a people mover system. Additional aircraft parking would occur at the existing remote apron and would be served by mobile lounges. No concourse development would take place off of or directly connected to the Main Terminal, with the exception of commuter aircraft. Aircraft parking would be provided at two locations, rather than the three locations in Concept C. Passenger walking distances at a single concourse would be minimal. Passengers arriving at the remote apron would experience longer transfer times to connections in the concourse. Airlines operating from both the remote apron and the concourse would experience some operational inefficiencies.

Concept E – One or more two-level concourses would be connected to the Main Terminal via an underground people mover system. Only commuter aircraft would operate from the Main Terminal. The mobile lounge system would be replaced by the underground people mover system. All aircraft parking would take place at the midfield concourse(s). Because airlines would operate from a single location, operational difficulties associated with multiple areas would not occur. There potentially could be difficulties separating international passengers and transporting them to the Main Terminal. Although the underground people mover would transport passengers more efficiently than the mobile lounges, walking distances for passengers would be greater.

Alternative Locations and Track Designs for the Automated People Mover From the Master Plan. The goal of developing an APM was to reduce the passenger walking time between ticketing and the gate, and to improve and expedite passenger transfer times. The alternatives for the layout of the APM assumed that a midfield concourse would be constructed. Several factors were important in evaluating the feasibility of an APM system:

1) Ability to handle peak capacities of passengers;
2) Simplistic and easy for passengers to use;
3) Mechanically reliable and cost-effective; and
4) Capable of expansion to meet future needs.

Main Terminal Station Locations. The Master Plan addressed three possible locations of the Main Terminal station location (Figure I-6):

1) Under Main Terminal: If the station were located under the Main Terminal building, walking distances would be minimal, but tunnel construction under the existing building would be costly and significantly disrupt terminal operations during construction.

2) Under Mobile Lounge System: If the station were located under the mobile lounge apron, walking distances would be longer. Again, the construction costs of this option would be high and construction activity would be disruptive to terminal operations.

3) Under Aircraft Parking Apron: If the station were located beneath the aircraft parking apron at the tower base, walking distance would be increased compared to other options, but relatively similar to existing walking distances at IAD. This option would decrease construction costs and only minor alterations would be required to existing structures, minimizing the disruption to terminal operations during construction.

APM Design Alternatives: Track Layouts. The Master Plan also considered six options for the track layout of the underground people mover, three each for a shuttle and a loop. The Master Plan assumes the construction of a single midfield concourse. A shuttle system involves a train that moves back and forth on a single track between two or more stations, and only one train can move on each track at any time. A loop system is a closed circuit around which a train travels, and multiple trains can operate on the same track, as long as adequate room is maintained between them. Dual tracks can be utilized in both systems, providing transportation in both directions and continued service in case of mechanical failure.

Three shuttle systems were considered in the Master Plan and are depicted in Figure I-7:

1) Central Shuttle System: The central shuttle system would require one station in the midfield concourse and one beneath the aircraft parking apron at the base of the tower. This system would be the least expensive to construct and only minimally impact ongoing terminal operations.

2) Twin Shuttle System: The twin shuttle system would require four stations, two located at either end of the midfield concourse and two located at either end of the Main Terminal. Walking distances would be shorter, but dual track systems at both ends of the building would be necessary to reduce the waiting times. Potential extension to a location under the main parking lot would be possible.

3) Y-Shaped Shuttle System: The Y-shaped shuttle system would require two stations in the Main Terminal building and one station in the midfield concourse. Walking distances would be shorter, but waiting times would be long for enplaning passengers traveling from the Main Terminal to the midfield concourse. Potential extension to a location under the main parking lot would be possible.

Three loop systems were also considered in the Master Plan and are depicted in Figure I-7:

1) Broad Loop System: The broad loop system would need four stations, two at each end of the midfield concourse and the Main Terminal. Short walking times for passengers would be offset by additional waiting times at the stations. A dual track broad loop system would require more track, increasing cost. An extension to the main parking lot would be possible.

2) Narrow Loop System: A narrow loop system would require two stations, one at the Main Terminal and one at the midfield concourse. Walking distances would be longer than the broad loop option, but frequency of service would be increased, reducing waiting time at the station. The amount of track required would be reduced, cutting costs. This system could be expanded to future terminals built to the south, but a main parking lot extension would not be feasible.

3) Combination Loop System: A combination loop system would need three stations, two at either end of the Main Terminal building and one located in the midfield concourse. Walking times for passengers would be short, but waiting time at the station would be higher because of reduced frequency of service. This option would also require less track than the broad loop system, decreasing cost.

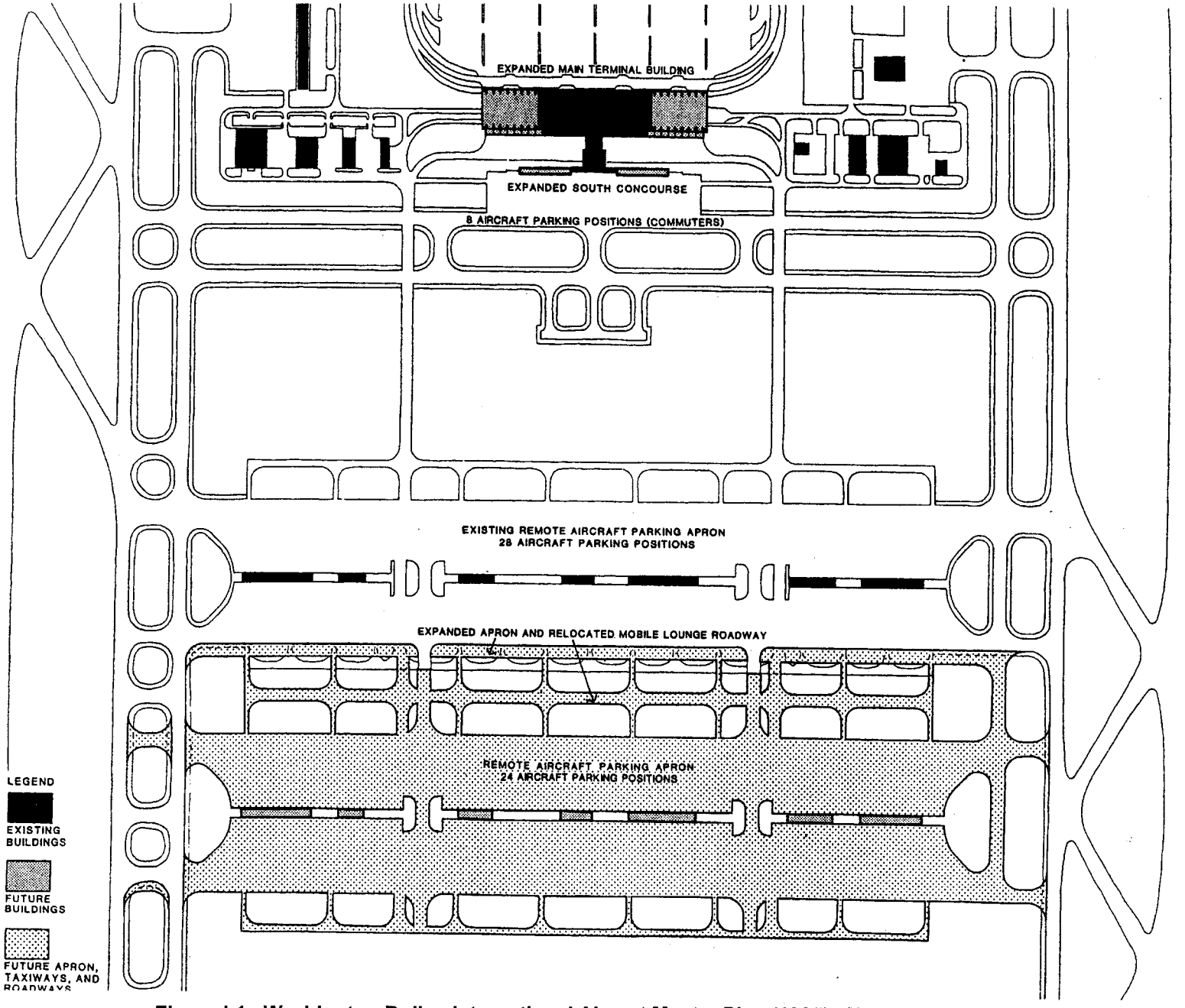


Figure I-1. Washington Dulles International Airport Master Plan (1985): Terminal Concept A.

P:\Projects\Industrial&Other\Architect-Engineer\ParsonsMgtConsultants\1384001\TaskCTier2EA\DraftEASections\AppendixH\FigI-1.cdr

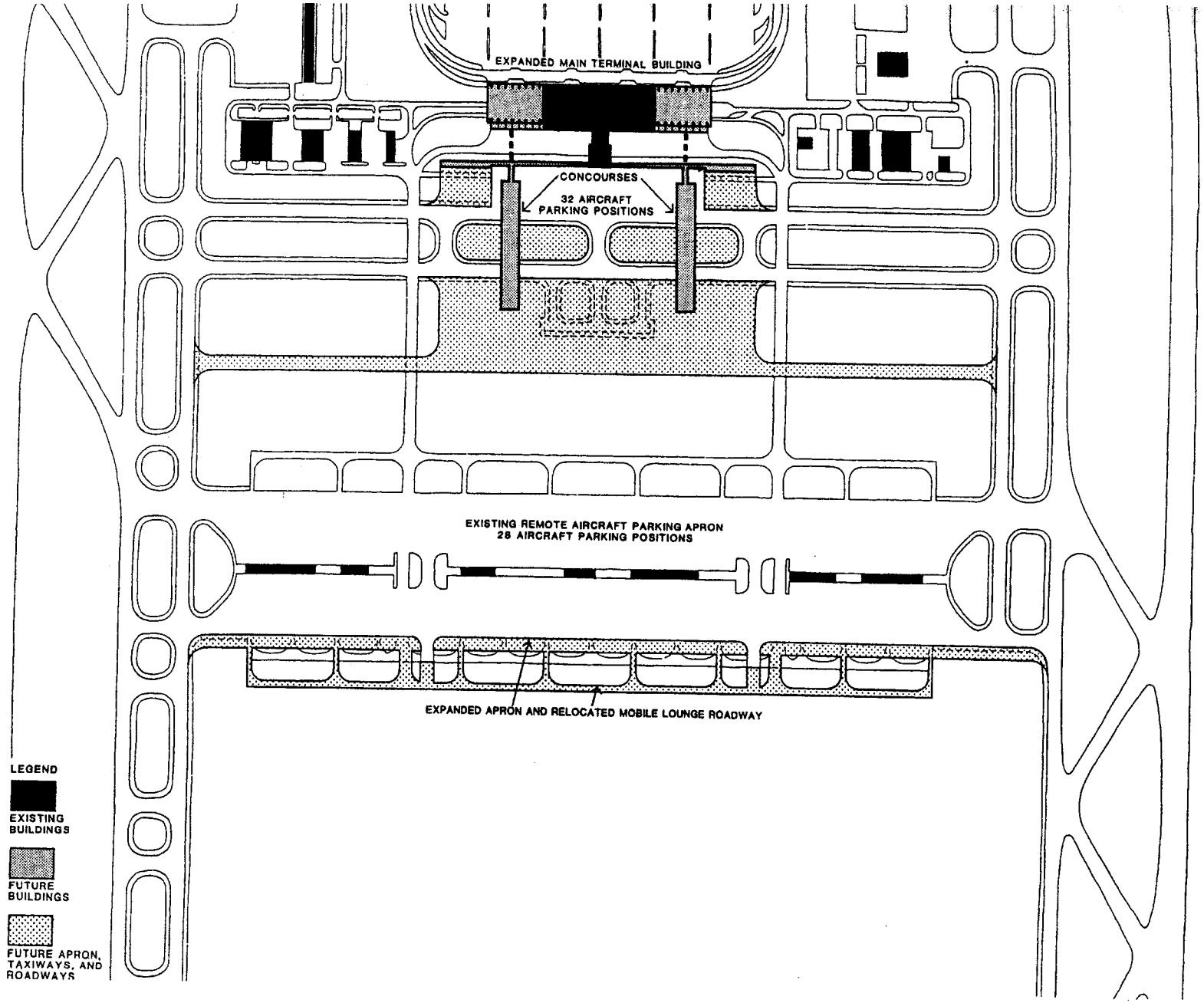


Figure I-2. Washington Dulles International Airport Master Plan (1985): Terminal Concept B.

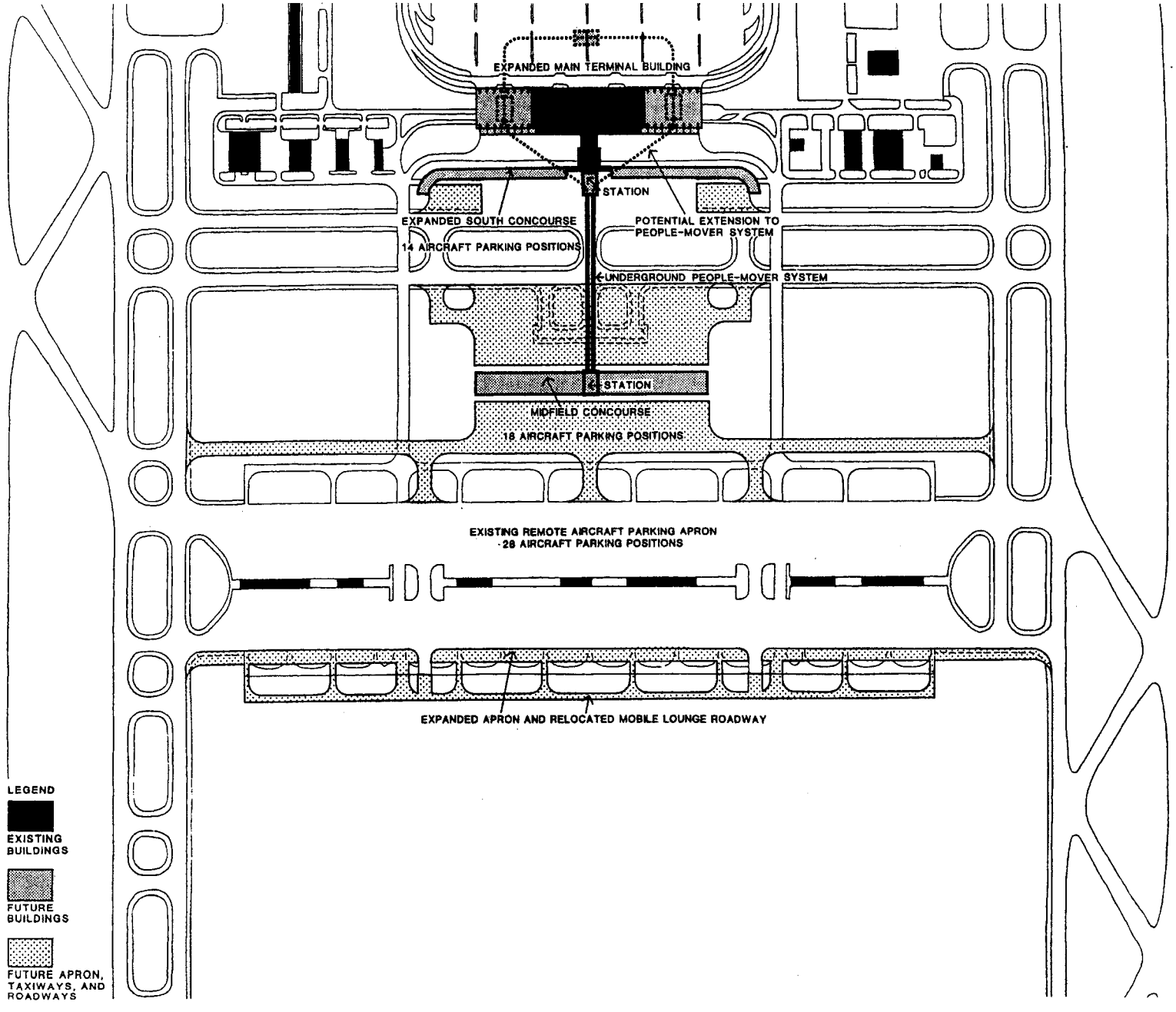


Figure I-3. Washington Dulles International Airport Master Plan (1985): Terminal Concept C.

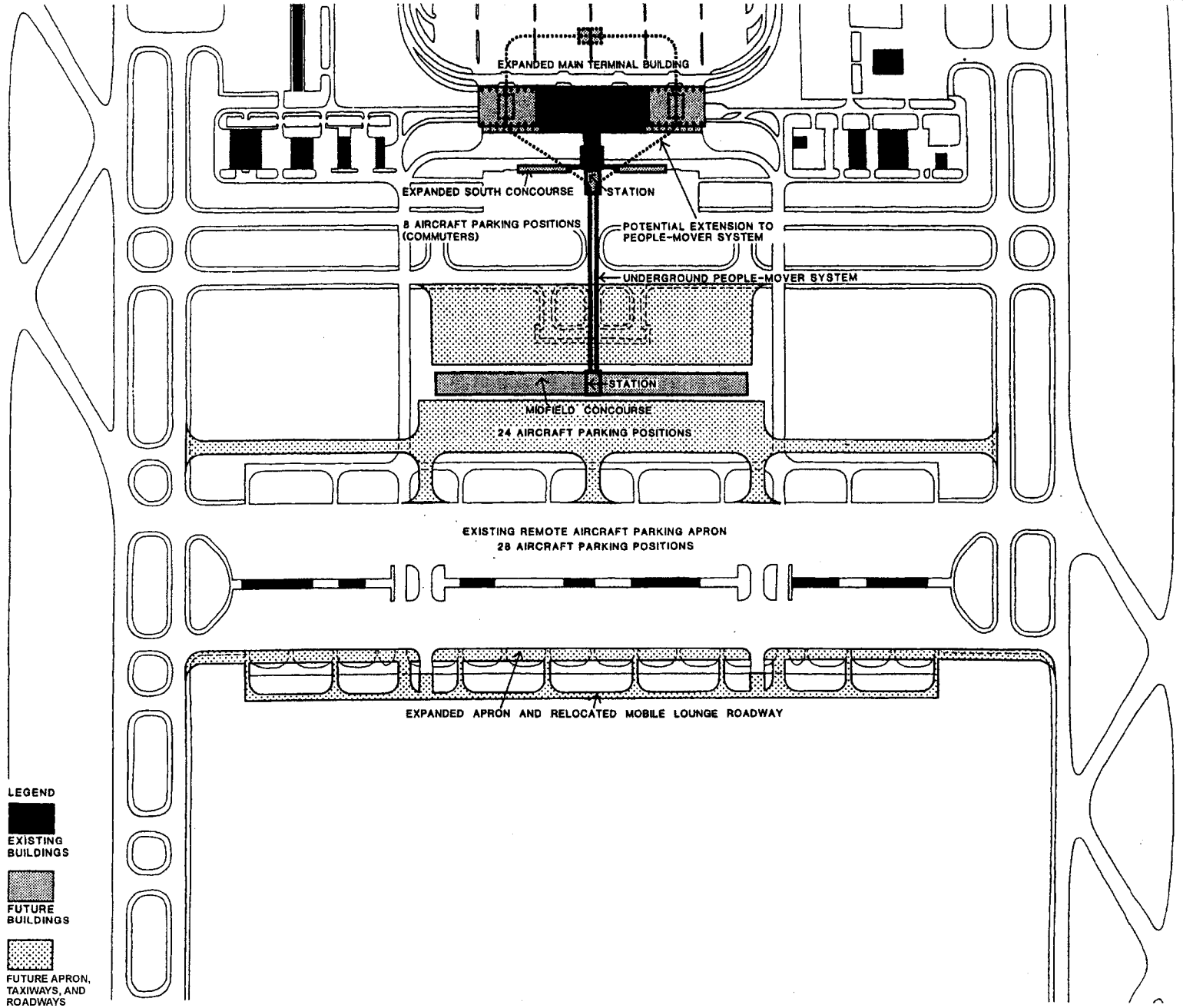


Figure I-4. Washington Dulles International Airport Master Plan (1985): Terminal Concept D.

P:\Projects\Industrial&Other\Architect-Engineer\ParsonsMgtConsultants\1384001\TaskCTier2EA\DraftEASections\AppendixH\FigI-4.cdr

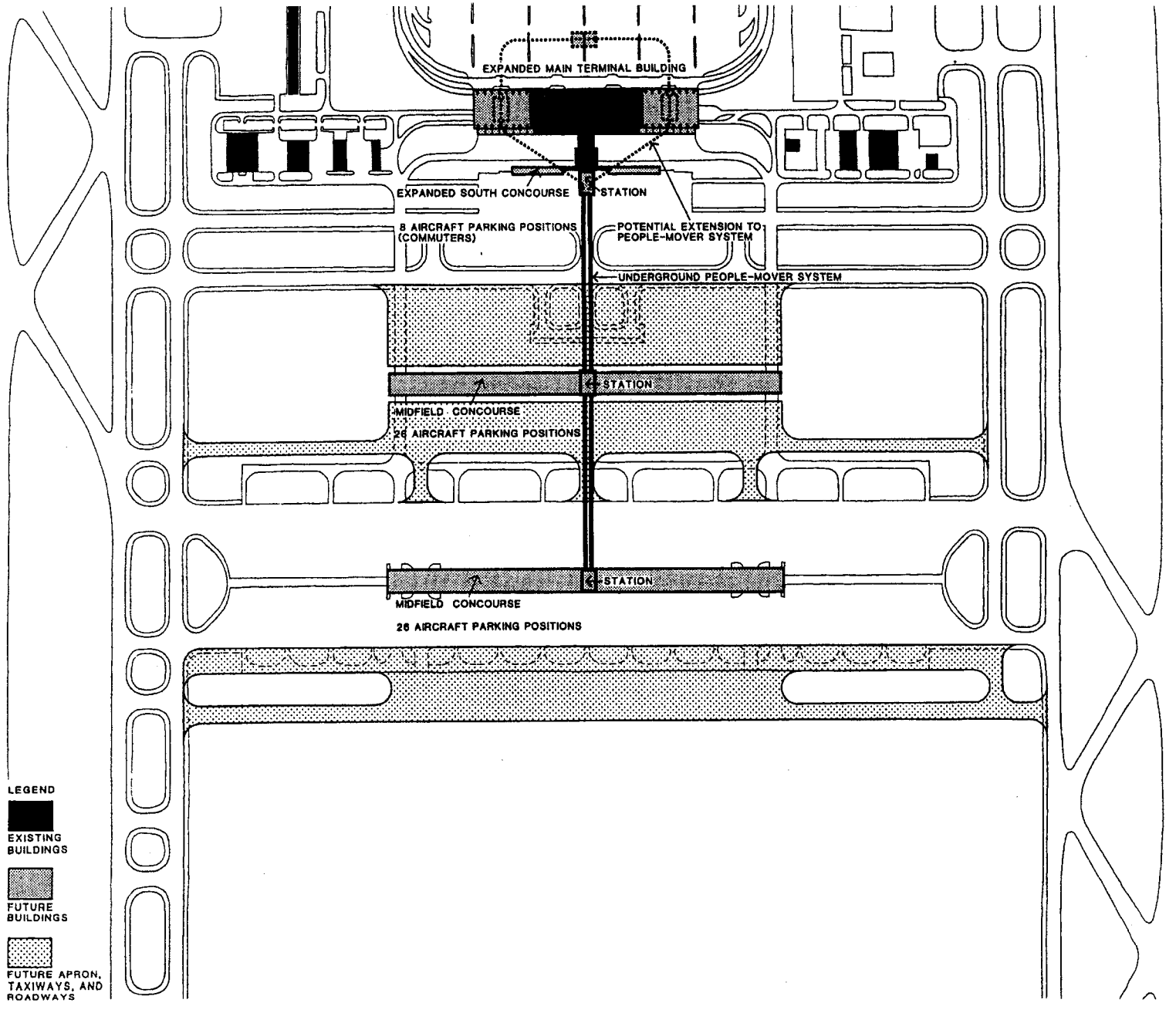


Figure I-5. Washington Dulles International Airport Master Plan (1985): Terminal Concept E.

P:\Projects\Industrial&Other\Architect-Engineer\ParsonsMgtConsultants\1384001\TaskCTier2EA\DraftEASections\AppendixH\FigI-5.cdr

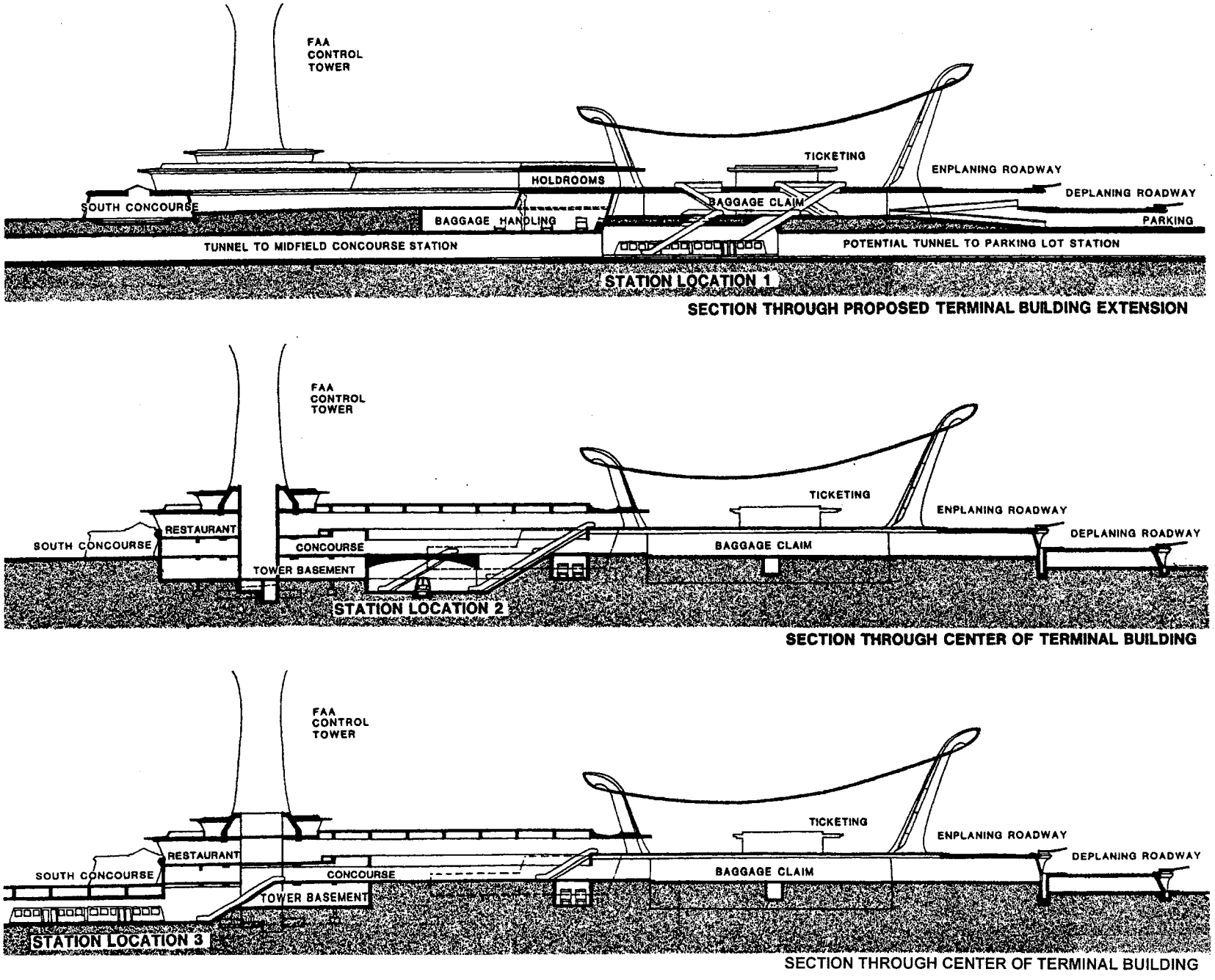


Figure I-6. Washington Dulles International Airport Master Plan (1985): Locations for People Mover Stations.

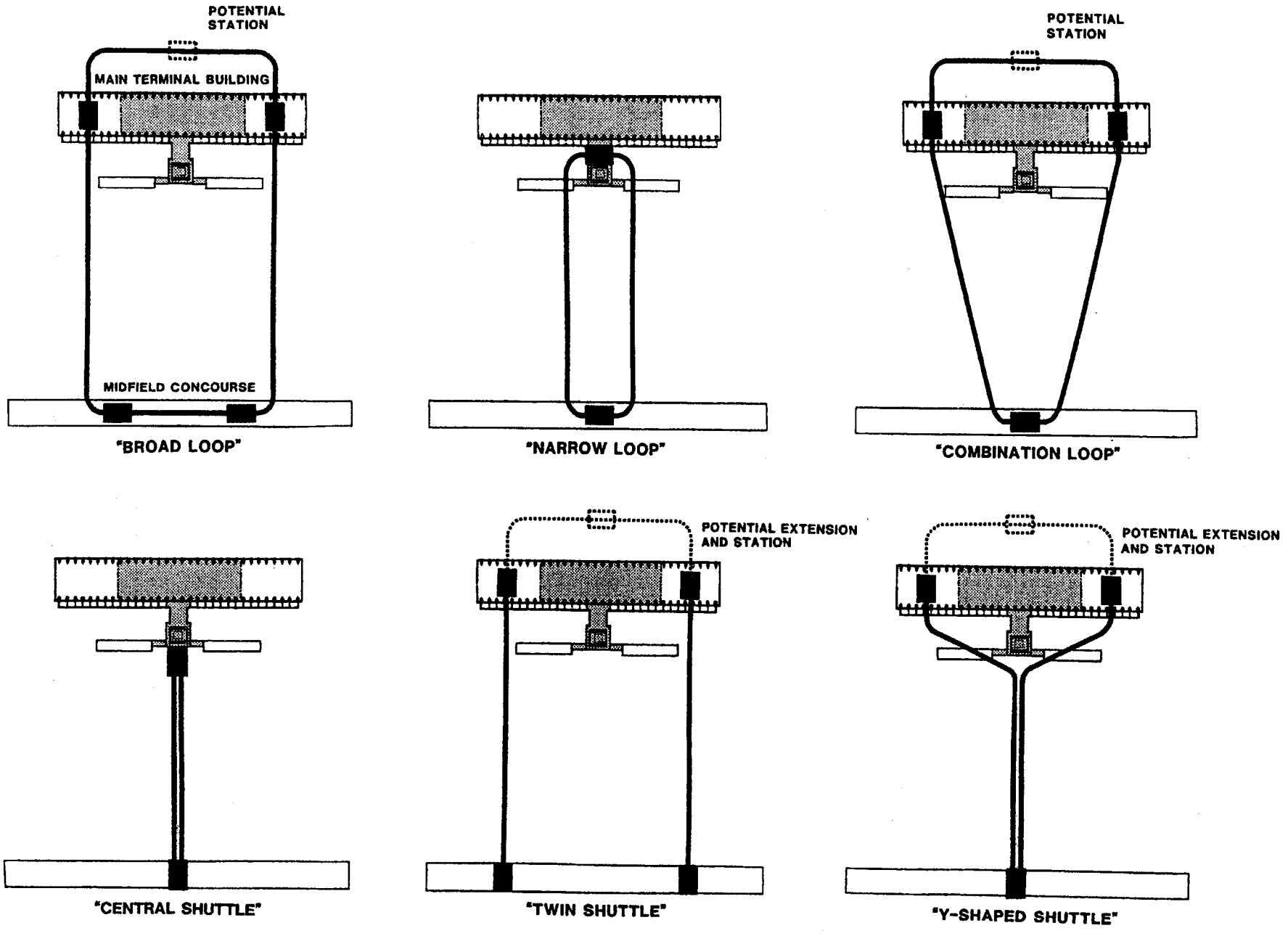


Figure I-7. Washington Dulles International Airport Master Plan (1985): Shuttle Systems and Loop Configurations for the Underground People Mover System.

P:\Projects\Industrial&Other\Architect-Engineer\ParsonsMgtConsultants\1384001\TaskCTier2EA\DraftEASections\AppendixH\FigI-7.cdr

APPENDIX I-2

ALTERNATIVES ANALYSIS FOR WETLAND PERMITTING

Alternatives Analysis for Wetland Permitting

1.0 INTRODUCTION

This document was prepared as an attachment to a Joint Permit Application (JPA) for Activities in Waters and Wetlands of the Commonwealth of Virginia submitted by the Metropolitan Washington Airports Authority (the Authority). In accordance with the minimum requirements for Question 7 Mitigation Plan, this attachment demonstrates that (1) there are no practicable alternatives available to the Authority to avoid wetlands completely, and (2) the project planning process has minimized the loss of wetlands where practicable.

The Authority is requesting the issuance of this permit to proceed with Tier 2 and related projects at Washington Dulles International Airport (IAD). The Tier 2 program consists of three main components: (1) a concourse, (2) an underground automated people mover (APM) system, and (3) utility system structures and easements. Specific projects are listed in Table 1. The footprints of these projects are shown in Figure 1 of this document. Plan views and cross-section views of the projects are detailed in Attachment 5 of the JPA.

The Airport Master Plan (KPMG Peat Marwick 1985) includes provisions for future airport development and expansion in the mid-field area. Therefore, it is the Authority's intent to request a permit for impacts to all wetlands in the mid-field grading area to facilitate future airport development projects, rather than to submit separate individual applications for near—term projects located in the mid-field area. The limit of disturbance for the midfield area as defined for this JPA is shown in Figure 2 of this attachment.

By this JPA, the Authority requests authorization to impact wetlands outside of the mid-field grading area associated with the construction of utility tunnels and utility buildings in the south utilities project area (Figure 2). It is the Authority's intent that mitigation of wetland impacts will occur as a single action, and mitigation will occur in advance of the initiation of many of the future mid-field and south utilities projects.

The following sections summarize elements of the planning process that encompassed the Authority's efforts to avoid impacts to wetlands and to minimize impacts where there were no practicable alternatives that would avoid wetland impacts.

- Section 2 describes the need for these projects in the context of existing and projected airport operations. This information demonstrates that the No Action Alternative is not a practicable option.

- Section 3 describes the measures undertaken to avoid or minimize impacts to wetlands in planning the Tier and related projects in the Mid-field Area.

- Section 4 describes measures undertaken to avoid or minimize impacts to wetlands in planning the South Utilities Area Projects.

- Section 5 provides conclusions and the proposed mitigation plan.

2.0 PURPOSE AND NEED

2.1 Airport Operations. IAD, which occupies approximately 11,000 acres and has three runways, serves primarily medium to long haul markets. Daily nonstop service is provided from IAD to 80 cities nationwide and direct service to 28 international destinations. Passenger traffic increased 56 percent from 1996, to 20.1 million passengers in 2000, with more than 4.2 million passengers on international flights. United Airlines maintains a major domestic hub and European international gateway operation and accounted for approximately 42 percent of domestic and international enplanements at IAD in 2000. As of May 2001, 11 major national carriers, 19 foreign carriers, 7 regional commuter airlines, and 5 cargo carriers were tenants at IAD.

2.2 Purpose and Need for Proposed Projects. The purpose of the Tier 2 and related projects is replacement of existing facilities and enhancement of existing services that are provided at IAD. While improving the capabilities of the concourse and the ground transportation system, none of the projects is designed to increase this capability beyond the capacity of the existing system of three runways. These projects will better serve the passenger activity that will occur at IAD based on the existing airfield capacity and expected air services at the airport.

2.3 Airport Growth and Planned Development. Passenger growth at IAD during recent years has surpassed the national average. In 1999, the annual passenger growth rate for IAD was 25.7 percent compared to an industry average growth rate of 2.9 percent. Prior to 2001 growth had been projected to continue at the rate of approximately 5 percent a year (HNTB 2000); however, there was a decrease during the period November 2000 through October 2001. Growth is expected to resume eventually but its timing is uncertain. Other improvement projects that are currently underway or are planned for implementation concurrent with the Tier 2 and related projects include: a new air traffic control tower, Concourse B extension, roadway and parking improvements (including two new public parking garages), a new air cargo building, an upgrade of the existing heating and cooling utility plant, and a fourth runway.

Future planned development at IAD includes implementation of Tier 3 and Tier 4 projects that will allow for major airport capacity expansion. These projects will include construction of additional concourses south of Tier 2. In addition, a new South Terminal and construction of a fifth runway are also under consideration.

3.0 MID-FIELD GRADING AREA

The proposed projects that involve wetlands are part of the Tier 2 program at IAD. The primary component of the Tier 2 program is the construction of a new concourse in the mid-field area. The new concourse is the driver for other projects that directly impact wetlands in the Mid-Field Grading Area.

3.1 Tier 2 Concourse. The new Tier 2 Concourse will replace the existing Concourse C/D in the mid-field area that has neither the necessary space nor appropriate updated passenger amenities to serve present-day or future needs of United Airlines. The project will consist of the

construction of a permanent mid-field concourse south of the existing Concourse C/D. In addition, a baggage tunnel containing a baggage conveyor system, a tug tunnel, and a pedestrian walkback tunnel will be constructed as part of the Tier 2 Concourse project. After completion of the new concourse, Concourse C/D will be demolished.

The footprint of the Tier 2 Concourse will not impact wetlands. The new concourse will be constructed on impervious surface area that currently exists in the mid-field area. Apron paving associated with the Tier 2 Concourse will impact wetlands addressed in a previous permit application and are not part of the attached application. However, support structures and facilities that are necessary for successful operation of the Tier 2 Concourse (i.e., the Automated People Mover and the South Utilities) will impact wetlands that are included and discussed within the attached application.

3.2 Mid-Field Grading Area Projects.

Automated People Mover System. The APM system project will consist of a new underground train system for moving people between concourses and the Main Terminal. The train system will be electric-powered and will reduce the use of the existing mobile lounge service. The project will include tunnels, stations, and connections to the Main Terminal, to the concourses, and to a maintenance facility. Two separate APM systems will be constructed: one for domestic passengers and one for arriving international passengers. Two components of the APM system will impact wetlands in the mid-field grading area: 1) the APM Vehicle Maintenance Facility (VMF) and Service Tunnel and the 2) APM Shell between Tier 2 and the VMF.

3.3 Alternatives for Mid-Field Grading Area Projects. The proposed concourse and the automated people mover system are located in the Mid-Field Grading Area. Alternatives for these components have been extensively evaluated in the Airport Master Plan (KPMG Peat Marwick 1985), in the Master Plan Update of 1990, and in the "Issues Related to the Future People Mover System at Washington Dulles International Airport" (Green Book) 1998 as amended, presented to the Airports Authority Board of Directors – Planning Committee. Alternatives related to the terminal development and layout and APM system configuration are discussed below.

3.3.1 Terminal Development – Alternative concepts for future development of passenger terminal facilities at the airport were considered in the Airport Master Plan. Specifically, the Master Plan included an evaluation of a mid-field or a northwest terminal. Because the mid-field terminal would be closer to existing operations, the concept of a mid-field concourse was evaluated in detail. The principal evaluation criteria for the terminal concepts included:

1) Capability to meet potential future requirements for aircraft parking;
2) Capability to meet potential future requirements for terminal building space;
3) Ability to stage development in separate components as demand for service increases;
4) Capability to provide convenient facilities for originating and destination passengers;
5) Capability to provide convenient facilities for passengers transferring between flights;
6) Efficiency of airline operations; and
7) Architectural and aesthetic considerations.

Five initial mid-field terminal concepts were evaluated:

- Concept A – No mid-field concourse would be constructed. Aircraft would park at remote aprons and be served by mobile lounges.

- Concept B – Two concourses would be constructed adjacent and perpendicular to the main terminal. Aircraft parking would exist at the new concourses and at the remote apron.

- Concept C – Two single-level concourses running east-west would be connected to the main terminal and a two-level mid-field concourse would be connected to the main terminal via an underground people mover system. Aircraft would park at the single-level concourse, at the mid-field concourse, and at the existing remote apron.

- Concept D – A single, two-level mid-field concourse would be connected to the main terminal via a people mover system. Additional aircraft parking would occur at the existing remote apron and would be served by mobile lounges. No concourse development would take place off of or directly connected to the main terminal, with the exception of commuter aircraft.

- Concept E – One or more two-level concourses would be connected to the main terminal via an underground people mover system. Only commuter aircraft would operate from the main terminal. The mobile lounge system would be replaced by the underground people mover system. All aircraft parking would take place at the mid-field concourse(s).

The proposed projects within the attached application fall under a modified Concept E. This concept required the greatest cost, but it allowed for future expansion possibilities. All terminal development concepts (A through E) are located in the mid-field grading area. There are no other viable locations on IAD property for the development of a terminal complex that would be in close proximity to the existing airport operations and would allow for future airport expansion. The footprint of the Tier 2 Concourse has been sited on impervious surface area that currently exists, and no wetlands will be impacted by the Tier 2 Concourse structure. Wetlands will be impacted by some of the projects located within the Mid-Field Grading Area. The impacts to wetlands would be similar for each of the mid-field terminal concept alternatives evaluated. The Tier 2 apron paving will impact wetlands that have been the subject of a previous permit application.

3.3.2 Automated People Mover System - The goal of developing an automated people mover was to reduce the passenger walking time between ticketing and the gate, and to improve and expedite passenger transfer times. The alternatives for the layout of the people mover assumed that a mid-field concourse would be constructed. Several factors were important in evaluating the feasibility of a people mover system:

1) ability to handle peak capacities of passengers;
2) simplistic and easy for passengers to use;
3) mechanically reliable and cost-effective; and
4) capable of expansion to meet future needs.

The Master Plan considered six options for the track layout of the underground people mover, three each for a shuttle and a loop. The Master Plan assumed the construction of a single mid-field concourse. The three loop systems that were considered in the Master Plan included: a broad loop system, a narrow loop system, and a combination loop system. The three shuttle systems that were considered in the Master Plan included: a central shuttle system, a twin shuttle system, and a Y-shaped shuttle system.

The proposed APM project in the mid-field area utilizes a twin shuttle system and assumes future expansion to multiple terminals. Regardless of the selected loop or shuttle configuration for the APM system, expansion of any of the configurations for future terminal development south of the Tier 2 Concourse would impact wetlands in the mid-field area. The location for the proposed shell for a future APM station is dictated by required taxiway widths, and is the only viable location for the facility. With regard to the APM track extension to the APM station shell and to the Vehicle Maintenance Facility (VMF), there are no routes that would avoid wetlands. The VMF location was sited based on the Airport Land Use Plan and FAA regulations that dictate the locations where permanently occupied structures can be built. Land designated for potential future development is limited. The proposed APM VMF and yard avoids the use of land reserved for future permanent structures.

4.0 SOUTH UTILITIES AREA

The South Utilities include a series of utility improvements and additions east and south of the mid-field grading area. These improvements include a new South Utility Building (SUB), expanded water storage, a Dominion Virginia Power (DVP) Substation (SES), and utility tunnels. These facilities will serve the new Tier 2 structures and will be designed to allow for expansion to accommodate future airport projects. The components of the South Utilities will potentially impact wetlands in the east and southern portion of the airport parcel

4.1 Alternatives for the South Utilities Area Projects. The central feature of the utilities projects is the South Utilities Building (SUB). The SUB includes three major built components: the building, the cooling towers, and the chilled and domestic water storage tanks. The SUB will provide hot water, chilled water for air conditioning, and a switch gear for electrical distribution and control. Located in close proximity to the SUB will be a new expanded water storage facility and a new DVP substation and distribution center. A utility tunnel will connect the South Utilities to Tier 2. Utility distribution lines will connect from the trunk lines to the future facilities.

The purpose of the SUB Phase 1 and associated projects is to provide utility services to Tier 2 projects (e.g., Tier 2 Concourse, APM, etc.). The utility system will have the capacity to expand to provide service to subsequent improvement projects. Four alternative locations were initially evaluated for the siting of the SUB (Burns and McDonnell 2001). These locations include two areas in the buffer zone on the east side of the airport (Options 2 and 2A) and two locations south of the mid-field grading area (Options 1 and 3) (see Figure 3). The four initial alternative locations for the SUB were evaluated using six criteria: utility tunnel alignment, south terminal compatibility, other facility compatibility, airport operations compatibility, utilities availability,

and environmental considerations (wetlands, topography, ground cover, etc.). Table 2 summarizes the four initial options in detail.

Based on this preliminary evaluation, two of the four initial alternative locations (Options 1 and 3) were eliminated as viable options due to incompatibility with future development and designated land uses. Options 2 and 2A were further assessed in detail to facilitate site selection for the SUB. The Option 2 and 2A areas that were further evaluated are depicted in Figure 4. The following criteria were investigated in detail for Options 2 and 2A:

1) Airfield and Airspace Safety and Compatibility (Permanent)
2) Impact on Future Development / Compatibility with Plans
3) Cost
4) Site Size
5) Safety Services and Security
6) Functionality and Adjacencies
7) Potential Environmental Impacts
8) Aesthetics / Visual Impacts
9) Program Management and Construction Impacts
10) Transmission Lines

Based on an evaluation of various subcriteria under each of the main criterion, Option 2 was selected as the preferred location for the SUB. A synopsis of the subcriteria scoring for the Option 2 and 2A comparison is provided in Table 3. Although many subcriteria were evaluated, it is important to note that placement of the SUB at option 2 will result in less impacts to wetlands than Option 2A (0.81 acres vs. 2.36 acres of impact, for Options 2 and 2A, respectively).

Other components of the south utilities projects include the DVP substation and utility tunnels. The DVP substation will be located in the footprint of Option 2A and will be situated to avoid wetlands. The underground utility tunnel from the SUB to the DVP substation has been located into the service road right-of-way (west of the existing alignment) to minimize impacts to wetlands. An underground utility line from the DVP substation to the main utility service tunnel near the VMF will require several unavoidable wetland crossings. There are no alternative routes that would avoid wetland crossings for the underground utility tunnels.

5.0 CONCLUSION

The projects within this JPA were analyzed for practicable alternatives. The mid-field grading area, where the Tier 2 concourse and APM system will be configured, was evaluated in the Airport Master Plan and other siting documentation. Based on the Master Plan and current airport layout plan, there are no viable alternatives to the development in the mid-field area. The recommendations in the Master Plan were influenced by IAD's land envelope, runway configuration and visibility requirements, the presence of the Main Terminal, future aviation growth and use projections, FAA Airport Land Use Regulations, and the Authority's Land Use Directives. Permitting of all wetlands in the mid-field grading area will facilitate both future construction projects at IAD and the wetland mitigation process. Wetland credits will be

purchased from a local wetland bank in lieu of on-site mitigation. Credits will be purchased prior to initiation of construction activities for the mid-field and south utilities projects.

Four initial siting locations were considered for the SUB and two of the four initial alternatives were eliminated due to incompatibility with future development and designated land uses. Options 2 and 2A were further assessed in detail to facilitate site selection for the SUB, and the preferred location for the SUB (Option 2) minimizes loss of wetlands. In addition, the DVP substation has been sited to avoid impacts to wetlands. There are no routes for the utility tunnels that avoid wetlands. Wetland impacts have been minimized where practicable through the Authority's planning process.

Table 1. Tier 2 and Related Projects Involving Wetlands: Dulles Development Program, Washington Dulles International Airport

MID-FIELD GRADING AREA	**Airport Buildings:**	• Automated People Mover – Maintenance Facility and Service Tunnel • APM Shell between Tier 2 and APM Vehicle Maintenance Facility
	Utility Structures:	• Stormwater Management Facility, South Employee Parking Lot
SOUTH UTILITIES AREA	**Airport Buildings:**	• South Utility Building, Phase I • Dominion Virginia Power Sub-station
	Utility Systems:	• Utility Tunnels • South Area Utility Trunk Lines

Table 2. South Utility Building (SUB) Options Analysis Summary

Criteria	Option 1	Option 2	Option 2A	Option 3
Utility Tunnel Alignment– Construction of a 24'w x 15'h tunnel to interface with the piping distribution tunnel to south area development	Allows direct north/south alignment of tunnel to connect with proposed and future projects; construction would have minimal impact on south employee parking lot	Tunneling required under a runway and two taxiways; underground work and additional tunnel length would add to initial and life cycle costs	Tunneling required under southern approach to runway; location would require nighttime construction when runway is shut down	Tunnel access and location will need to coordinated with APM tunnels, engineering maintenance yard, and proposed sanitary and drainage outfalls; additional tunnel length would add to initial and life cycle costs
South Terminal Compatibility– Compatibility with future development on the South Terminal campus	Visually incompatible with future South Terminal Building; potential impact for South Terminal land use; land may need to be reserved for other tenant uses or south terminal projects	Far removed from South Terminal campus; best compatibility with future south terminal development	Removed from South Terminal development area; would be visually incompatible or occupy valuable land targeted for future projects	Some visual incompatibility with future South Terminal; potential impact for South Terminal land use; land may need to be reserved for other tenant uses or south terminal projects
Other Facility Compatibility– Compatibility with planned and ongoing projects and to existing facilities in the south area	Would require relocation of a Department of Safety Training Facility; minimal effect on use of Flight Line Road	Would extend the existing industrial use corridor along the Route 28 boundary	Final location of the crosswind runway could impact available area for this site	Vacant land that is easily accessible by existing roads
Operations Compatibility– Potential impacts to airport operations	Would have minimal impact on airport operations	Tunneling under the runways and taxiways could interfere with airport operations; future access to SUB will require frequent trips around runway for personnel	Working within the runway approach could disrupt existing navigation aids	Minimal effect on airport operations
Utilities Availability– Availability of existing utilities including water, sewer, gas, power, and telephone	A gravity sewer extension would be necessary; other utilities would be routed from existing facilities	Water access would require an additional loop; other utilities would be routed from existing facilities	All utilities would be routed from existing facilities	All utilities would be routed from existing facilities
Other Environmental Considerations– Wetlands, topography, ground cover, soils, cooling tower plume issues, etc	No impact to wetlands; significant earthwork required to grade the site; currently 50% wooded	Wetlands could be affected (footprint could be moved south to avoid wetland impact) ; minimal earthwork required; entire site is wooded	Wetlands could be affected (footprint could be moved south to avoid wetland impact); minimal earthwork required; entire site is wooded	Wetlands potentially affected along several tunnel alignments; mild topography; site is mostly cleared of vegetation

Source: Burns and McDonnell 2001. Wetlands acreage calculated from Dames and Moore report (MWAA 2000)

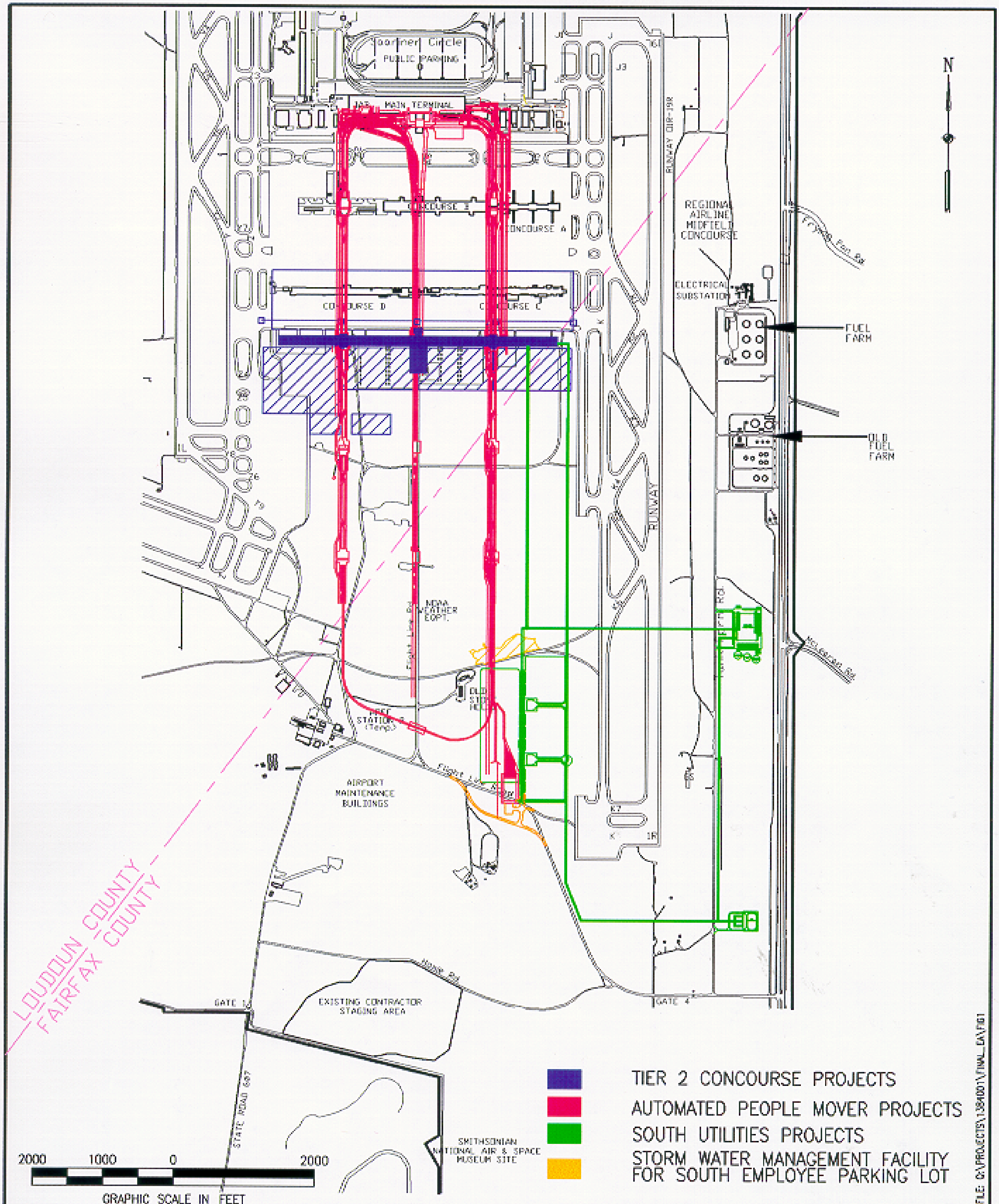
TABLE 3. Washington Dulles International Airport
South Utilities Area Study -- South Utility Building Site Selection Evaluation Matrix, Site 2 & 2a

LEGEND

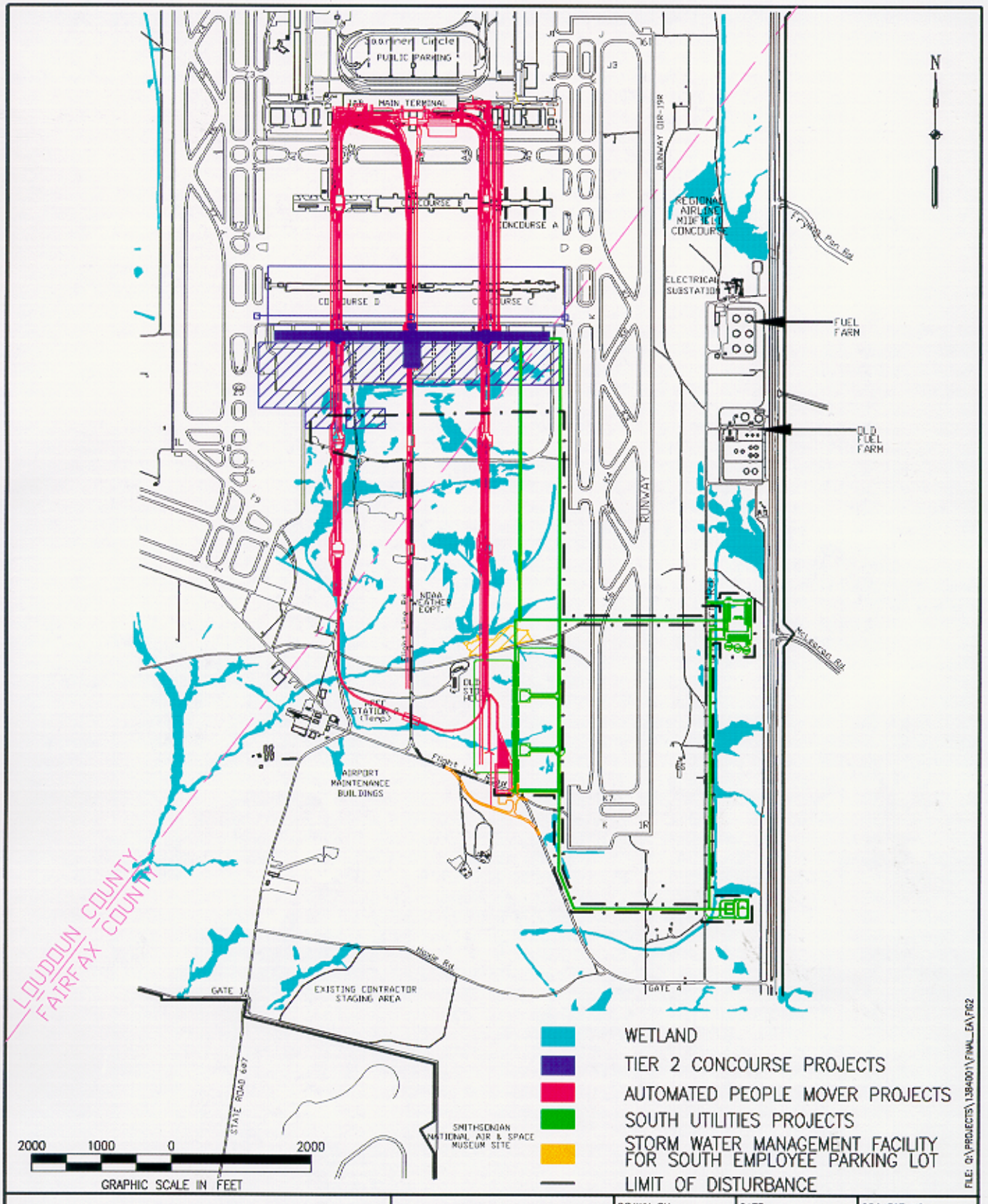
- Very Good
- Good
- Neutral
- Poor
- Very Poor

- Very Important
- Important
- Less Important

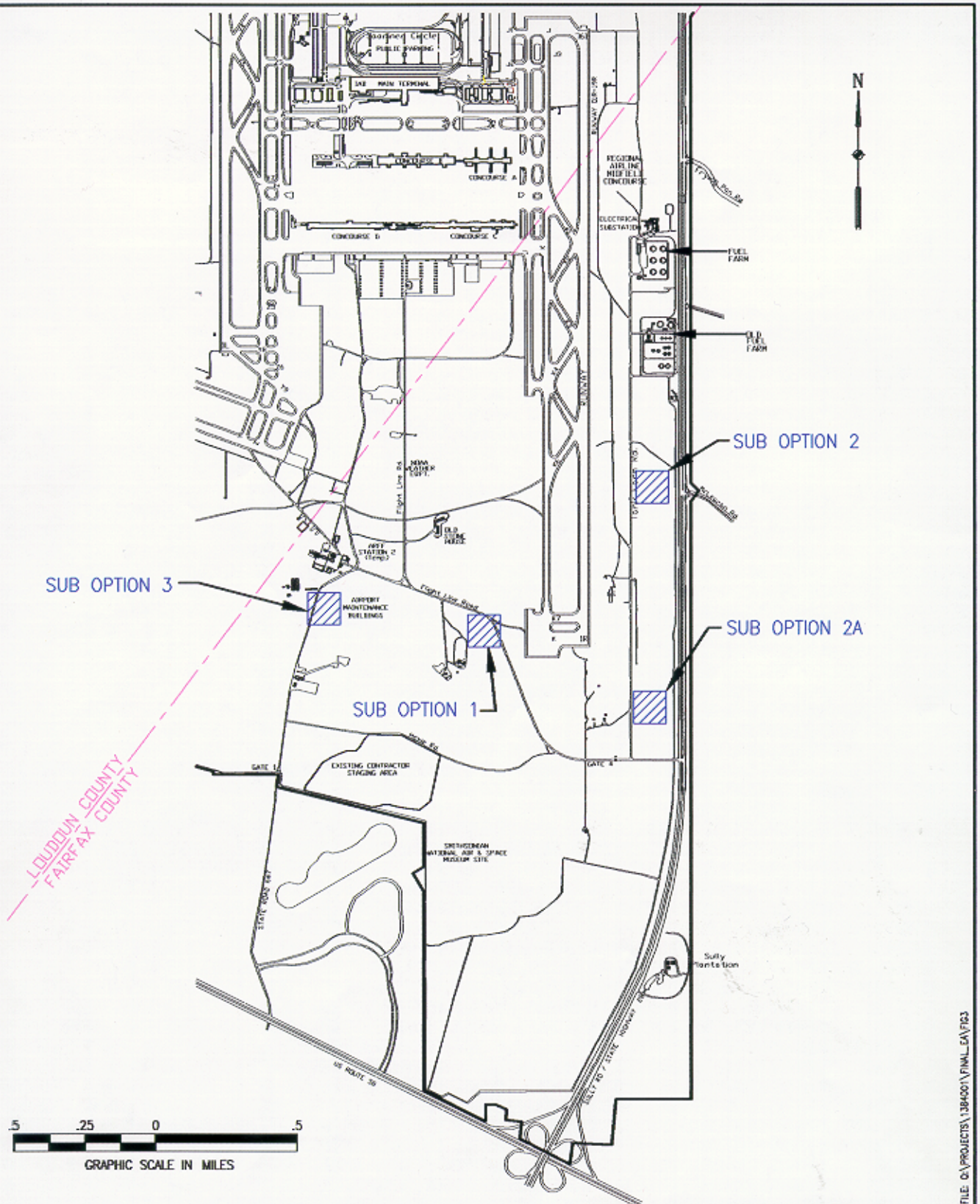
Evaluation Criteria	Remarks		Comparison of 2 to 2A -- Subcriteria	Comparison of 2 to 2A -- Main Criteria
	Site 2	Site 2A		
1. Airfield and Airspace Safety and Compatibility (Permanent)				
Part 77 Impacts	None. Height limits clear of Part 77 and same as 2A.	None. Height limits clear of Part 77 and same as 2.	Neutral	Neutral
TERPS Impacts	No impacts to instrument approaches.	No impacts to instrument approaches.	Neutral	
Aircraft Strike Potential	Nothing significant. Distance from threshold +2800'; 1200' left offset.	Nothing significant. Distance from threshold -600'; 1200' left offset.	Neutral	
Plume Obscuration	No plume impact expected but better than 2A if a problem is revealed.	No plume impact expected but closer to 1R threshold and between approaches to Rwys 30R and 30L.	Good	
Interference with ATCT sight-lines	None.	None.	Neutral	
Tunnel Maintenance Impacts on Runways and Taxiways	No impacts in tunnels - maintenance would be confined to within tunnels.	No impacts - no tunnels under runways.	Poor	
2. Impact on Future Development/Compatibility w/ Plans				
Consistency with current Airport Land Use designations	Currently designated as Buffer but in very close proximity to other industrial-type Airport Support uses in buffer.	Currently designated as Buffer. Not near other industrial development. Close to Gate 4 access corridor.	Good	Very Good
Near-term competition for site by other aviation-related development.	Nothing in foreseeable future .	Nothing in foreseeable future .	Neutral	
Other non-aviation near-term projects competing for site	Some potential of VDOT request to modify McLearan Rd. interchange concept.	None.	Poor	
Future aviation highest & best use of land	Only competing with current use as traditional buffer.	Competing with complex highway/transit/service road rights-of way to south terminal area/NASM or use as "gateway"	Very Good	
3. Cost				
Capital amount	Approximately the same as 2A.	Approximately the same as 2.	Neutral	Very Good
Potential to value-engineer capital amount down	Direct burial to VMF could save 2,500 to 3,100 feet of tunnel; Potential to build smaller SUB if separate satellite utility building provided for South Terminal.	Very little opportunity to change concept relative to basic assumptions.	Very Good	
O&M costs (annualized)	Shorter runs but more trouble balancing.	Longer runs but less trouble balancing.	Neutral	
Potential for consequential costs to future development.	Very little.	Future access concepts for roads and transit may carry large penalties for concepts that avoid.	Very Good	
4. Site Size				
Primary structures/occupancy acreage	6 1/2 acres	8 1/4 acres less 4 acres for Dominion substation = 4 1/4 acres	Good	Good
Surface support acres under approach or in restricted areas	3 1/2 acres	3 1/2 acres	Neutral	
Future expansion of primary structures/occupancy acreage	4 1/2 acres w/ relocated RTR; 13.3 acres w/ relocated RTR and relocation of 4 acres of disturbed wetlands	0 acres	Very Good	
Site proportions	Some unusual lot shaping caused by interchange and RTR	Rectangle of reasonable proportions	Poor	
5. Safety Services and Security				
Fire & rescue access	Greater distance from ARFF 2	Shorter distance from ARFF 2	Poor	Poor
Protected from sabotage/buffered from public	Site close to roadway used by general public.	Site close to roadway used by general public.	Neutral	
6. Functionality and Adjacencies				
Proximity to facilities served/operational efficiencies	In close proximity to Tier 2, Tier 3 and Tier 4.	In close proximity to VMF and future South Terminal.	Very Good	Good
Chilled Water Circulation and System Balancing	In the future, with a South Terminal complex, major divide in flow at first branch.	Location allows more unidirectional flow to and from the SUB; easier to balance the system.	Poor	
Convenience to related existing MA-220 facilities.	Approximately 4,000 feet longer route than Site 2A by current paths.	Closer to Gate 4 roadways.	Poor	
Likelihood of being located adjacent to future MA-220 campus	Could occur on expansion areas due north although MA-220 along Route 28 perhaps not desirable.	Not possible - land not available within or next to site.	Good	
Ease of access for maintenance contractors and vendors	Access provided via airport service road.	Access provided via airport service road.	Neutral	
Line operation and maintenance (especially long utility runs)	Shorter runs	Longer runs	Very Good	
7. Potential Environmental Impacts				
Wetlands	0.81 acres impacted.	2.36 acres impacted.	Good	Good
Noise	None.	None.	Neutral	
Air Quality	None.	None.	Neutral	
Water Quality	None.	None.	Neutral	
Historic Resources	None.	None.	Neutral	
Parkland/Open Space	Airport buffer zone would be negatively impacted.	Airport buffer zone would be negatively impacted.	Neutral	
Biotic Communities	None.	None.	Neutral	
8. Aesthetics/Visual Appeal				
Aesthetics/visual appeal to airport users when opened (assumes NASM)	No impact	Some potential intrusion on NASM Dulles Center gateway.	Good	Good
Aesthetics/visually appealing to airport users with future South Terminal.	Visual impact less apparent - can be ameliorated with effective landscaping and architectural design	Visual impact more due to prominent location - would require more attention to architectural and landscape design	Very Good	
Aesthetics/visually appealing to surrounding community	Intrusive to Hilton complex	Intrusive to NASM Dulles Center, Sully Plantation, EDS, and future Peterson hotel complex.	Good	
Consistent with surroundings; Like uses	Other industrial uses nearby.	No other planned industrial uses in vicinity.	Good	
9. Program Management & Construction Impacts				
Ability to open per d[2] schedule	No schedule conflicts foreseen.	No schedule conflicts foreseen.	Neutral	Poor
Constructibility	More difficult due to complexity of tunneling under runway and taxiways.	No foreseen issues.	Poor	
Tunnel Impacts- on Runways and Taxiways-Construction	Tunneling reduces Rwy 1R to 7300' land. and 7700' T.O. for 1 month, no CAT III but CAT III loss workable in the summer and CAT III scheduled for 19R in Sept. 2002.	IFR ops may be affected during tunnel construction in the vicinity of the approach light system and NAVAIDS.	Very Poor	
Risk of unanticipated construction interference with aircraft operations (longer runway closing, tunneling problems, etc.)	Tunnel under runway may pose problems.	None.	Poor	
Construction site access	Access to areas in proximity to runways and taxiways may be limited.	Access to site and tunnel alignment less encumbered.	Poor	
10. Transmission Lines				
HTHW/CW	9300' --or-- 6200' to 6800' with 2400' to 3200' of direct burial of smaller, temporary lines to VMF.	11,000' of tunnel.	Good	Good
Water	Water provided from existing service line to the north or from ARFF loop.	Water provided from existing service line to the north or from ARFF loop.	Neutral	
Fire system/Deluge Water	Pumping station on site/served from existing airport service line to the north	Pumping station on site/served from existing airport service line to the north	Neutral	
Sanitary	Routed to existing system on east side of Rte 28 or system near Gate 4 to tie into FFX County	Routed to existing system near Gate 4 to tie into FFX County	Neutral	
Electrical Distribution	Substation 4,000' south at 2A; could also be located on site.	Substation likely on site.	Poor	
Gas	Provided from main on Rte. 28 or main at fuel farm.	Provided from main on Rte. 28 or main at fuel farm.	Neutral	



TIER 2 AND RELATED PROJECTS WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	MAIN COMPONENTS OF TIER 2 AND RELATED PROJECTS AT IAD	DRAWN BY WCM	DATE 10-26-01	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 1

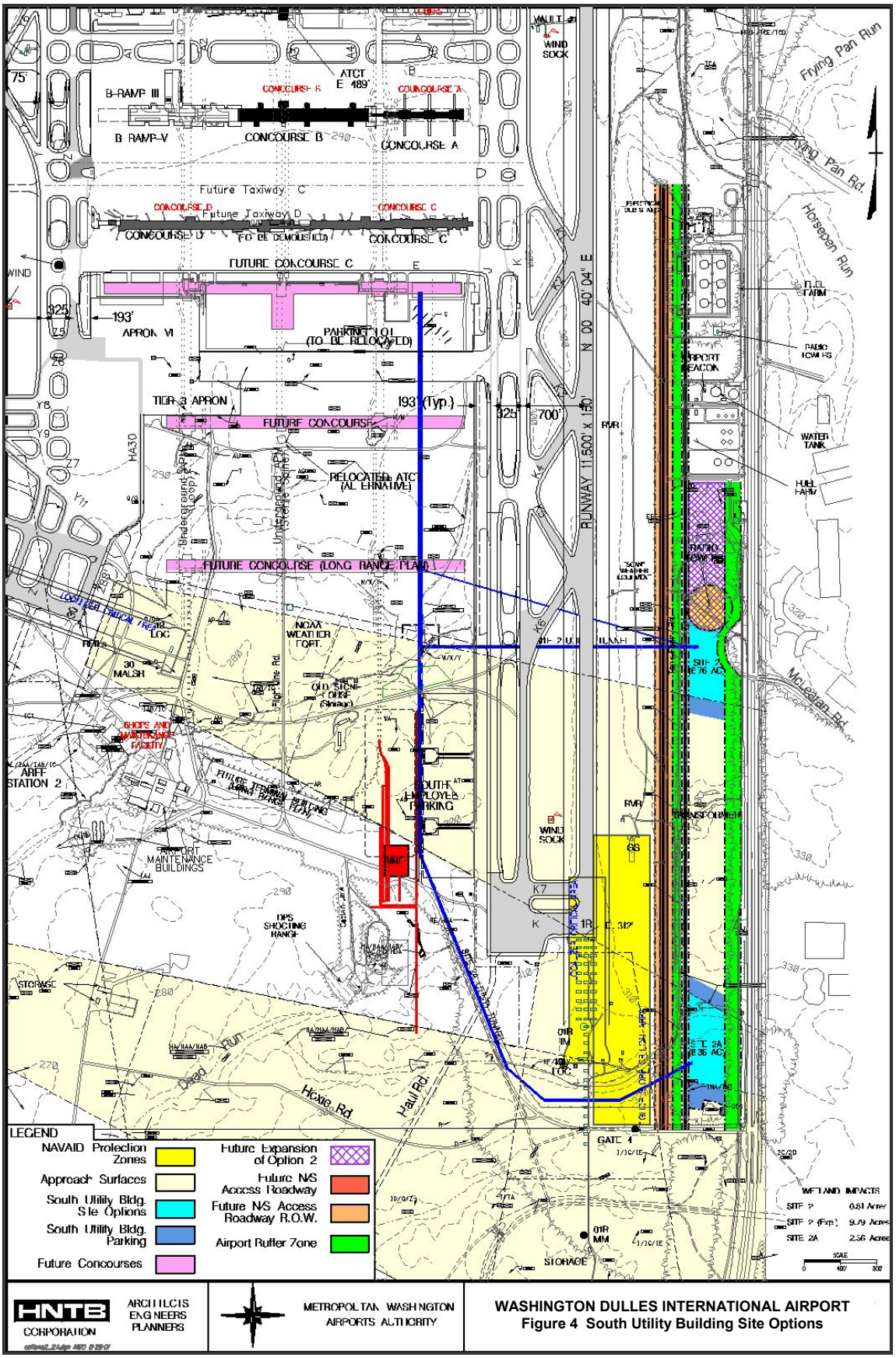


TIER 2 AND RELATED PROJECTS WASHINGTON DULLES INTERNATIONAL AIRPORT LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	LIMIT OF DISTURBANCE FOR MID-FIELD AND SOUTH UTILITIES PROJECT AREAS	DRAWN BY WCM	DATE 10-26-01	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 2



FILE: Q:\PROJECTS\13840011\FINAL_EA\FIG3

TIER 2 AND RELATED PROJECTS **WASHINGTON DULLES INTERNATIONAL AIRPORT** LOUDOUN & FAIRFAX COUNTIES, VIRGINIA	OPTIONS EVALUATED FOR THE LOCATIONS OF THE SOUTH UTILITIES BUILDING	DRAWN BY WCM	DATE 10-26-01	PROJECT NO. 13840.01
		CHECKED BY –	SCALE AS SHOWN	FIGURE 3



HNTB CORPORATION ARCHITECTS ENGINEERS PLANNERS

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

WASHINGTON DULLES INTERNATIONAL AIRPORT
Figure 4 South Utility Building Site Options

REFERENCES

Burns and McDonnell. 2001. *South Utility Building, Preliminary Engineering Report, Washington Dulles International Airport.* 90% Submittal. Prepared for Metropolitan Washington Airports Authority. June.

KPMG Peat Marwick Airport Consulting Services. 1985. *Final Technical Report, Master Plan Update, Washington Dulles International Airport.* Prepared for Federal Aviation Administration, Metropolitan Washington Airports. September.

HNTB Corporation. 2000. *Washington Dulles International Airport Aviation Activity Forecasts*. Submitted to Metropolitan Washington Airports Authority, Washington National Airport, Washington D.C. October.

Metropolitan Washington Airports Authority (MWAA). 1998. *"Issues Related to the Future People Mover System at Washington Dulles International Airport"*, (Green Book), as amended, presented to the Airports Authority Board of Directors – Planning Committee.

Metropolitan Washington Airports Authority (MWAA). 2000c. Wetland delineation unpublished data. Prepared by Dames and Moore, Inc.

APPENDIX J

PUBLIC AND AGENCY COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT AND RESPONSES

APPENDIX J:
PUBLIC AND AGENCY COMMENTS
ON THE DRAFT ENVIRONMENTAL ASSESSMENT

CONTENTS

APPENDIX J.1

PUBLIC NOTICE

The Public Notice for the availability to review and comment on the Environmental Assessment for a new Midfield Concourse (and projects related thereto) at Washington Dulles International Airport was published in 5 papers as listed below. Notice of the public information meeting held on June 17, 2002 for the Environmental Assessment was also included the Public Notice.

Publication	**Date of Notice**
Washington Post	June 2, 2002
Washington Times	June 2, 2002
Times Community Newspapers (Loudoun Times-Mirror)	June 5, 2002
Gazette Newspapers	June 5, 2002
The Journal Newspapers	June 2, 2002

PUBLIC NOTICE

WASHINGTON DULLES INTERNATIONAL AIRPORT

ENVIRONMENTAL ASSESSMENT FOR A NEW MIDFIELD CONCOURSE (AND PROJECTS RELATED THERETO) NOW AVAILABLE FOR REVIEW AND COMMENT

PUBLIC INFORMATION MEETING TO BE CONDUCTED JUNE 17, 2002

As a part of its Capital Construction Program at Washington Dulles International Airport, the Metropolitan Washington Airports Authority (MWAA) is planning to construct a new Midfield Concourse known as Tier 2, and an Automated People Mover System, as well as utility and other support facilities. Tier 2 will replace the existing Concourse C/D that was built in 1985 as a temporary facility. The proposed APM underground train system will connect the Main Terminal and the midfield concourses, largely replacing the existing Mobile Lounge surface vehicles.

As an integral part of the planning for this project, a Draft Environmental Assessment (EA) was prepared to evaluate existing conditions and potential environmental effects. The Draft EA addresses the environmental consequences of the Proposed Action (Build Alternative) and No Build Alternative, as well as other issues including noise, air quality, water quality, endangered and threatened species and wetlands. The Draft EA was prepared and comments are requested in conformance with the provisions of the National Environmental Policy Act (NEPA).

Beginning June 3, 2002, copies of the Draft Environmental Assessment are being made available for public review and comment at the following libraries:

Poolesville Library 19633 Fisher Ave. Poolesville, MD 20837	Rust Library 380 Old Waterford Rd. Leesburg, VA 20176
Eastern Loudoun Regional Library 21030 Whitfield Place Sterling, VA 20165	Centreville Regional Library 14200 St. Germaine Dr. Centreville, VA 20121
Chantilly Regional Library 4000 Stringfellow Rd. Chantilly, VA 20151	Fairfax City Regional Library 3915 Chain Bridge Rd. Fairfax, VA 22030
Reston Regional Library 11925 Bowman Towne Dr. Reston, VA 20190	Tysons-Pimmit Regional Library 7584 Leesburg Pike Falls Church, VA 22043

The Draft EA can also be reviewed at www.mwaa.com.

A Public Information Meeting will be held on Monday, June 17, 2002, from 3:00 p.m. to 8:00 p.m. at the Washington Dulles Airport Marriott, 45020 Aviation Drive,

Washington Dulles International Airport (703-709-0400). This session will offer an additional opportunity to review and/or provide written comment on the Draft Environmental Assessment.

This public participation meeting is also being conducted pursuant to the MWAA's 1987 Programmatic Memorandum of Agreement with the Virginia State Historic Preservation Officer and the Advisory Council on Historic Preservation (as regards Section 106 of the National Historic Preservation Act of 1966—36 CFR 800).

In accordance with Section 176 of the Clean Air Act Amendments of 1990, the Federal Aviation Administration (FAA) has assessed whether the emissions that would result from the FAA's action in approving the proposed projects are in conformity with the State Implementation Plan (SIP). The Draft General Conformity Determination is included in the Environmental Assessment and comments are requested.

For further information, questions or to submit written comments concerning the EA, historic preservation matters, and Draft Conformity Determination, please contact:

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

703-417-8745

The record is open for public comment until 5 :00 p.m. on July 8, 2002.

Please note that this notice is for the ongoing EA for Tier 2 Improvements at Washington Dulles International Airport and is not associated with the recently initiated EIS for new runways and associated improvements at the Airport.

DRAFT ENVIRONMENTAL ASSESSMENT
AGENCY AND INDIVIDUAL DISTRIBUTION LIST
Tier 2 and Related Facilities

Virginia Regulatory Agencies

- DEQ Office of Environmental Impact Review
- DEQ Division of Air Program Coordination
- VDEQ Air Data
- DEQ Division of Water Program Coordination
- DEQ Northern Regional Office
- Department of Agriculture & Consumer Services
- Chesapeake Bay Local Assistance Department
- Department of Conservation & Recreation
- Department of Game & Inland Fisheries
- Department of Health
- Department of Historic Resources
- Department of Mines, Minerals & Energy
- Virginia Institute of Marine Science
- Virginia Marine Resources Commission
- Virginia Department of Transportation
- Virginia Department of Aviation

Other Agencies

U.S. Fish and Wildlife Service
- Virginia Field Office

U.S. Army Corps of Engineers
- Norfolk District, Northern Virginia Field Office

U.S. Environmental Protection Agency
- Wetlands
- Air Quality Conformity

Northern Virginia Regional Commission
Metropolitan Washington Council of Governments
County Executive, Fairfax County
County Administrator, Loudoun County
Loudoun County Department of Planning
Fairfax County Water Authority
Advisory Council on Historic Preservation

Major Libraries within 10 miles of Dulles boundary

Montgomery County, MD
- Poolesville, MD

Fairfax County, VA
- Centreville Regional
- Chantilly Regional
- Fairfax City Regional
- Reston Regional
- Tysons-Pimmit Regional

Loudoun County, VA
- Eastern Loudoun Regional (Sterling)
- Rust Library (Leesburg)

Federal Elected Officials

U.S. Senators from Virginia
- John W. Warner
- George Allen

U.S. House of Representatives (districts covering Fairfax and Loudoun Counties, Virginia)
- James Moran (D-8th)
- Frank Wolf (R-10th)
- Thomas Davis III (R-11th)

U.S. Senators from Maryland
- Barbara A. Mikulski
- Paul S. Sarbanes

U.S. House of Representatives (district covering Montgomery County, MD)
- Constance A. Morella (R-8th)

U.S. House of Representatives (District of Columbia)
- Eleanor Holmes Norton (D-DC at-Large)

State of Virginia Elected Officials

Senators by District
- 29 Charles J. Colgan
- 30 Patricia S. Ticer
- 31 Mary Margaret Whipple
- 32 Janet D. Howell
- 33 William C. Mims
- 34 Leslie L. Byrne
- 35 Richard L. Saslaw
- 36 Linda T. Puller
- 37 Warren E. Barry

Delegates by District
- 32 Richard H. Black
- 33 Joe T. May
- 34 Vincent F. Callahan, Jr.
- 35 Jeanmarie Devolites

36 Kenneth R. Plum
37 J. Chapman Petersen
39 Vivian E. Watts
40 James K. O'Brien, Jr.
41 James H. Dillard, II
53 James M. Scott
67 Gary A. Reese
13 Robert G. Marshall

Federal Aviation Administration, Washington Airports District Office
Frank Smigelski

Metropolitan Washington Airlines Committee
Washington Airports Task Force

APPENDIX J.2

COMMENTS AND MEANS OF RESPONSE

J.2.1 INDEX TO COMMENTS

J.2.1 Index To Comments on the Draft Environmental Assessment Tier 2 and Related Projects Dulles International Airport

J.2.1 Index To Comments on the Draft Environmental Assessment Tier 2 and Related Projects Dulles International Airport

J.2.2 COMMENTS

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.state.va.us

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

July 8, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

RE: Draft Environmental Assessment: Tier 2 and Related Projects and FAA Draft General Conformity Determination, Washington Dulles International Airport (DEQ # 02-110F).

Dear Sir/Madam:

The Commonwealth of Virginia has completed its review of the Environmental Assessment (EA) for the above referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. Also, as you are aware, pursuant to the Coastal Zone Management Act of 1972, as amended, federal actions that can have foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent with the Virginia Coastal Resources Management Program (VCP). DEQ, as the lead agency for the VCP, is responsible for coordinating Virginia's review of federal consistency determinations or certifications. The following agencies, planning district commission and localities participated in the review of this EA:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Game and Inland Fisheries
Department of Agriculture and Consumer Services
Department of Transportation
Marine Resources Commission
Chesapeake Bay Local Assistance Department
Department of Health
Department of Mines, Minerals and Energy
Virginia Institute of Marine Science
Fairfax County
Loudoun County

The Department of Historic Resources, the Department of Aviation and the Northern Virginia Regional Commission were also invited to comment.

Project Description

The Metropolitan Washington Airports Authority (MWAA) proposes to upgrade and replace existing aircraft, passenger and support facilities at Washington Dulles International Airport (IAD). This Environmental Assessment (EA) includes four elements: Tier 2 Concourse, Automated People Mover (APM) System, South Utilities and Support Facilities. Each element consists of a variety of activities (described on page ES-2 of the Draft EA).

The Commonwealth of Virginia has no objection to the proposed project provided that it is carried out in accordance with all applicable federal, state and local laws and regulations.

Environmental Impacts and Mitigation

1. ***Wetlands and Water Quality.*** According to the EA (page ES-7), a Joint Permit Application has been submitted to the Department of Environmental Quality for approximately 26 acres of wetland impacts. Table 4-1 (page 4-2) of the EA states that wetland impacts will be mitigated through banking that will result in a no net loss of wetlands (page ES-7). The EA (page 4-19) states that the approximately 30 acres of wetland credits will be purchased from the Cedar Run Wetland Bank. The EA makes no further mention of the wetlands to be impacted or efforts to avoid or minimize impacts to wetlands. The project must demonstrate compliance with section 404(b)(1) guidelines of the Clean Water Act and with the Commonwealth's wetland mitigation policies. Both Federal and State guidelines recommend avoidance and minimization of wetlands impacts as the first steps in the mitigation process. Any unavoidable impacts to State water may require compensation such as wetland creation, restoration or other acceptable forms of wetland compensatory mitigation.

In general, for unavoidable impacts, DEQ encourages the following practices to minimize the impacts to wetlands and waterways:

- Operate machinery and construction vehicles outside of wetlands to the extent practicable; use synthetic mats when in-stream work is unavoidable;
- Erosion and sedimentation controls should be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to State waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub, or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after

the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.

- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats, geotextile fabric in order to prevent entry in State waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.

2. Chesapeake Bay Preservation Area. The EA (page 3-32) states that the Authority and IAD are exempt from any County of Fairfax regulations concerning coastal zone management and the Chesapeake Bay Preservation Ordinance. This assertion is incorrect. Pursuant to the Coastal Zone management Act of 1972, as amended, federally approved or funded activities which can have foreseeable effects on Virginia's coastal uses and resources, must be conducted in a manner which is consistent with the Virginia Coastal Resources Management Program (VCP). The Chesapeake Bay Preservation Act and its related regulations, the Chesapeake Bay Preservation Area Designation and Management Program, is one of the core enforceable programs of the VCP. Fairfax County is located within Virginia's coastal management area. Therefore, activities associated with the proposed project that are located in Fairfax County fall under the regulations of the Chesapeake Bay Preservation Act. Accordingly, any proposed airport activities within Fairfax County must be consistent with the Regulations as locally implemented by the County. If the project is not designed to be consistent with the performance criteria of the County's Ordinance, the project will not be consistent with Virginia's Coastal Program. Also, the project proponent should be aware that a higher stormwater management standard applies to development within the Occoquan River watershed.

In addition, the 1998 Federal Agencies' Chesapeake Ecosystem Unified Plan requires the signatories, including the Department of Transportation, to fully cooperate with local and state governments in carrying out voluntary and mandatory actions to comply with the management of stormwater. The agencies also committed to encouraging construction design that minimizes natural area loss, adopt low impact development and best management technologies for stormwater, sediment and erosion control and reduces impervious surfaces.

3. Natural Heritage Resources. The EA (Appendix F) includes a "Survey for Rare, Threatened, and Endangered Species at the Proposed Tier 2 and Related Projects" that was conducted in June and July of 2001. The Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH) maintains a database of natural heritage resources in Virginia. Natural heritage resources are defined as the habitat of rare, threatened, or endangered animal and plant species, unique or exemplary natural communities, and significant geologic communities. DCR offers the following comments.

The Department of Conservation and Recreation has reviewed the EA and has searched its

Biological and Conservation Data System (BCD) for occurrences of natural heritage resources in the project vicinity. According to the information currently in DCR's files, natural heritage resources have not been documented at the project site. However, several rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades may occur at this location if suitable habitat is present. Diabase glades are characterized as historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase supports occurrences of several global and state rare plant species including the earleaf foxglove (*Agalinis auriculata*, G2/S1/SOC/NS), white heath aster (*Aster ericoides*, G5/S2/NF/NS), hairy beardtongue (*Penstemon hirsutus*, G4/S2/NF/NS), blue-hearts (*Buchnera americana*, G3G4/S1/NF/NS), downy phlox (*Phlox pilosa*, G5T5/S2/NF/NS), stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*, G5/S2/NF/NS), and the marsh hedgenettle (*Stachys pilosa* var. *arenicola*, G5/S1/NF/NS). Currently, the earleaf foxglove is tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however this designation has no official legal status.

According to the "Survey for Rare, Threatened, and Endangered Species at the Proposed Tier 2 and Related Projects" (Appendix F), the hairy beardtongue has been documented at three locations within the project boundaries, two adjacent to the proposed APM tunnel and one within the proposed stormwater management facility. DCR recommends avoidance of these natural heritage resources during construction of the proposed projects. The survey was conducted during June and July of 2001, which is within the survey window for hairy beardtongue; however, the survey period for other associated diabase species (earleaf foxglove, white heath aster and stiff goldenrod) is September through October (Chris Ludwig, DCR's chief biologist). Therefore, DCR recommends an additional survey be conducted during the appropriate time for these species.

In addition, DCR has documented the presence of the Yellow Lance (*Elliptio lanceolata,* G2G3/S2S3/NF/SC) and the Wood Turtle (*Clemmys insculpta,* G4/S2/NF/LT) downstream of the project site. The Department of Game and Inland Fisheries (DGIF) states that the nearest documented occurrence of either of these species is approximately 4-6 miles downstream. Therefore, to minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, both DCR and DGIF recommend the implementation of and strict adherence to erosion and sediment control measures during all land disturbing activities.

Also, pursuant to the Memorandum of Agreement established between DCR and the Virginia Department of Agriculture and Consumer Services (VDACS), DCR has the authority to report for VDACS on state-listed plant and insect species. The current activity will not affect any

documented state-listed plant or insect species under the jurisdiction of VDACS. VDACS reviewed the EA and indicated that they do not anticipate significant adverse impacts upon plant or insect species under their jurisdiction as a result of this project. Please contact DCR's Division of Natural Heritage at (804) 786-7951 if a significant amount of time passes before the project is implemented.

4. Wildlife Resources. Under title 29.1 of the Code of Virginia, the Department of Game and Inland Fisheries (DGIF) is the primary wildlife and freshwater fish management agency in the Commonwealth. DGIF has full law enforcement and regulatory jurisdiction over all wildlife resources, inclusive of state and federally endangered or threatened species, but excluding listed insects. Impacts to the project area include approximately 3.6 acres of forested wetland, 0.87 acres of scrub/shrub wetland, 19.9 acres of emergent wetland, 2,790 linear feet of perennial stream channel, and 280 linear feet of intermittent stream channel. DGIF recommends that the applicant avoid and minimize impacts to wetlands and streams to the fullest extent practicable including relocating stream channels as opposed to channelizing or filling and using a natural stream channel design with wooded buffers. The Department also recommends mitigating for unavoidable impacts to stream at a minimum of a 1:1 ratio on a per linear-foot basis. In addition, for any in-stream work, the DGIF recommends the following:

- conduct in-stream activities during low-flow conditions
- use non-erodible cofferdams to isolate the construction area
- block no more than 50% of the stream flow at any given time
- stockpile excavated material in a manner that prevents its re-entry into the stream
- restore the original streambed and streambank contours; re-vegetate barren areas

Finally, according to DGIF's records, the state-threatened upland sandpiper, *Bartramia longicauda*, has been documented on the MWAA property in close proximity to the project site. DGIF reviewed the survey results and impacts assessment provided by the airport and concurs with the conclusion that the project is not likely to adversely affect the upland sandpiper.

5. Non-point Source Pollution Control. Executive Order 12088-Federal Compliance with Pollution Control Standards and the Sikes Act authorizes cooperation between state and federal agencies regarding the conservation of natural resources. Compliance with the state Erosion and Sediment Control and Stormwater Management programs through proper design and implementation is consistent with the mandate of these federal directives. Notwithstanding cooperation with DCR, federal agencies are responsible for ensuring compliance with the state program on regulated activities under their authority through separate agreements with contractors, training, field inspection, enforcement action, or other means that are consistent with agency policy and federal and state mandates.

6. Air Quality. During construction, fugitive dust must be kept at a minimum by using applicable control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

In addition, this project is located in an ozone nonattainment area. Accordingly, DEQ recommends that precautionary measures be employed to reduce ground-level ozone concentrations especially during the ozone alert days. This can be done by minimizing the generation of ozone precursors such as volatile organic compounds and nitrogen oxides during operation of construction equipment and vehicles. Please contact the DEQ-Northern Regional Office, (703) 583-3800, for additional information.

7. Solid and Hazardous Wastes. The EA (page 4-23) states that in previous construction projects, soils containing residues of jet fuel have been encountered during excavation. If such soils are found during demolition of Concourse C/D, the contaminated soils will be hauled offsite for disposal and if necessary, dewater discharge will be processed by means of oil-water separation and two-stage carbon adsorption. The DEQ-Office of Remedial Program did a review of its data files and did not find any sites that might impact this project. Any solid or hazardous wastes generated by this project should be reduced at the source, re-used, or recycled. Solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations.

8. Wild and Scenic Rivers. The Department of Conservation and Recreation determined that the proposed action is not anticipated to have any adverse impacts on existing or planned recreational facilities. The project will also not impact any streams on the National Park Service's Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways.

9. Historic Structures and Archaeological Resources. The EA (Page ES-4) states that the proposed project will have no adverse effects on historic or archaeological resources in the project vicinity. Appendix D of the EA includes historical and archaeological information related to the proposed project. The Appendix also includes documentation from the Department of Historic Resources (DHR) that they have reviewed the EA. A Statement of Concurrence from the DHR was sent to the Applicant in March of 2002.

10. Pollution Prevention. The Department of Environmental Quality advocates that principles of pollution prevention be used in all construction projects. DEQ has some recommendations regarding pollution prevention:

- Consider development of an effective Environmental Management System (EMS). An effective EMS will ensure that the proposed facility is committed to minimizing

its environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and recognizes facilities with effective EMS through its Virginia Environmental Excellence Program.

- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered.
- Consider contractors' commitments to the environment when choosing contractors. Also, specifications regarding raw material selection (alternative fuels and energy sources) and construction practices can be included in contract documents and requests for proposals.
- Choose sustainable practices and materials in infrastructure and building construction and design. These could include asphalt and concrete containing recycled materials and integrated pest management in landscaping.
- Integrate pollution prevention techniques into the facility maintenance and operation to include the following: inventory control (record keeping and centralized storage for hazardous materials), product substitution (use of low toxic cleaners), and source reduction (fixing leaks, energy efficient products).
- Pollution prevention measures are likely to minimize chemical exposure to employees, reduce potential environmental impacts, and reduce costs for material purchasing and waste disposal.

Pollution prevention measures are likely to reduce potential environmental impacts. For more information, contact DEQ's Office of Pollution Prevention, Mr. Tom Griffin at (804) 698-4545.

11. Forest Protection. The EA (page 1-8) states that the creation of a temporary storage area for excess soil will be necessary for soil removed during construction. However, it is unclear from the EA exactly how much acreage will be impacted from the soil stockpiling. According to Page 4-4, Summary of Potential Construction Impacts for Tier 2 and Related Projects of the EA, the stockpiling of soil will impact 90 acres of forested habitat and will provide storage capacity for 3.8 million cubic yards of soil. Page 4-10 states that soil will be piled to a 30-foot height (although page 4-27 states that the height of the soil will reach 38 feet with a 2:1 slope) on 57 acres of land and stormwater, erosion and sediment control will be managed by a pond at least 5.7 acres in size. Regardless of the amount of impacts due to soil stockpiling, the impact will be mitigated at the end of the construction period through replanting of trees and stabilizing the stockpile area post-construction (page, 4-18).

The Department of Forestry (DOF) reviewed the EA and indicate that they are concerned with the apparent lack of information regarding the stockpiling of soil associated with the project. The Department requests a thorough evaluation of options relating to the treatment of soil displaced through construction. In addition, the Department considers the disturbance of 90 acres of forest habitat excessive and an inappropriate temporary disposal site. The Final EA

should address alternatives to the use of this site. The analysis should include all available land within a reasonable distance to the construction site and use all open land uses within IAD property as a primary temporary disposal site. For additional information on tree and forest protection, contact Mike Foreman of the Department of Forestry (telephone, (804) 977-6555).

In gereral, DEQ recommends limited removal of mature trees to the extent practicable. The trees which have been selected for protection should be marked and fenced to at least the dripline and/or the extent of the root system, whichever is farther from the tree trunk; a minimum of 30 feet is suggested to protect tree root systems. The protected area should be marked with highly visible ribbon for effective protection. If the protected zone must be used, temporary crossing bridges or mats should be used to minimize soil contamination and mechanical injury to trees.

12. Other Matters.

a) Local Issues. Loudoun County, on July 23, 2001 adopted the County's Revised General Plan, which supports the continued growth and expansion of the Washington Dulles International Airport. The comments they have provided make additions, corrections and clarifications to the EA that the County believes should be included in the Final EA (see attached comments, July 1, 2002).

Fairfax County raises several issues in their letter to the MWAA dated June 27, 2002. The issues include historic resources, Route 28 right-of-way, noise, planning and zoning, stormwater management, floodplains, the Chesapeake Bay Preservation Ordinance, wetland impacts and rare species impact. The following details each issue raised by Fairfax County.

- *Visual Impacts/Historic Resources.* Two of the proposed projects, the South Utility Building and the DVP Substation, have the potential to have adverse visual impacts on Fairfax County due to their proximity to Route 28 (Sully Road). Route 28 is a gateway into the County, and therefore the aesthetic character of development that occurs on either side of the highway is of significance to the County. Development that has occurred to date along the east side of the highway has been high quality office and hotel development. Development west of the highway on the airport property should reflect a similar attention to architectural and aesthetic quality. Development of an industrial nature should be designed, through the use of building setbacks, tree preservation, and/or landscaping, such that it is not visible from Route 28; the County strongly encourages MWAA to retain a significant wooded buffer area adjacent to the highway. Fairfax County further encourages MWAA to screen existing industrial uses (e.g., the fuel tank facilities) through the planting of trees between these uses and the highway right-of-way.

  The proposed substation is of particular concern due to its proximity to Sully Plantation, which is listed on both the National Register of Historic Places and the Virginia Landmarks Register. The substation would be located just north of the County's Historic Overlay District associated with Sully Plantation, and the EA does not present any design details regarding the proposed

substation. Information regarding the size and height of the structure should be provided, as should be information regarding efforts that will be pursued to screen the proposed facility from Route 28 and Sully Plantation (e.g., through tree preservation and/or planting). MWAA should ensure that the facility would not be visible from Sully Plantation or Route 28.

The proposed South Utility Building has been described as a 170,000 square foot structure; as such, there are concerns regarding the potential visual impact of this facility. Again, no details are provided regarding the design of this building and whether or not any efforts will be needed or pursued to screen this structure. As recommended above, this facility should be designed, through the use of building setbacks, tree preservation, and/or landscaping, such that it is not visible from Route 28.

The County recommends that the MWAA coordinate with the County's Department of Planning and Zoning on the siting, design, and buffering of any proposed development that will occur near Route 28.

- *Route 28 Right-of Way.* The EA indicates that the preferred location of the proposed South Utility Building is west of the intersection of Route 28 and McLearan Road. The EA states that "coordination with the planned interchange at Route 28 and McLearan" would be required. MWAA should ensure that the facility is sited and constructed in a manner that will ensure that all possible interchange design options can be pursued and that the facility will be sufficiently screened (if necessary) under all such options. Coordination with the Fairfax County Department of Transportation (703-324-1100) is recommended.

- *Noise.* The EA does not indicate if the new facilities that would be located near Route 28 will have noise impacts associated with them. Will either of these facilities generate noise that may be audible at noise-sensitive locations east of Route 28? If so, what will be the extent of these impacts? What measures, if any, will be needed/taken to mitigate noise impacts?

- *Planning and Zoning.* The discussion of Fairfax County's Airport Noise Impact Overlay District within this section (page 3-2) is inaccurate. While it is correct that there are policies in the County's Comprehensive Plan that recommend against new residential development inside the County's adopted DNL 60 dBA noise contour, the Overlay District itself does not regulate land use outside the adopted DNL 65 dBA noise contour. Finally, the last sentence of the fourth full paragraph on page 3-2 is confusing. It may be best to state that Fairfax County's Comprehensive Plan recognizes the need to ensure that buildings that will be constructed near the airport will not be so high as to obstruct operations at the airport.

- *Stormwater Management.* Guidance regarding the design of the stormwater management system for the proposed project and the siting rationale for the proposed stormwater management facility is not clear. Page 4-10 indicates that the stormwater management facility will be "temporary," yet the discussion states that the pond will be designed to reduce phosphorus loads by 50% (implying that the pond will be permanent). Will the facility

remain after construction is complete? Further, while page 4-10 indicates that drainage from the proposed Tier 2 Concourse area will be conveyed to this facility, figure 3-9 suggests that the pond will be constructed across a drainage divide from the proposed concourse area. Will drainage divides be altered such that drainage from the Tier 2 concourse area will be diverted into the Cub Run (and hence Occoquan Reservoir) watershed from the Horsepen Run watershed? If so, what is the rationale for this, when the diversion of drainage will result in increased pollutant loads and stormwater runoff volumes into Cub Run (even with the proposed stormwater management facility)? If drainage divides will not be altered, what function will the new stormwater management pond serve? Will the pond collect water that is pumped out of the ground during construction of tunnels? Have Dulles Lake and/or Horsepen Lake been designed to accommodate the additional impervious cover associated with the proposed Tier 2 projects in the Horsepen Run watershed? Finally, it would appear that additional impervious cover will be needed for the proposed South Utility Building and the DVP Substation, and that drainage from these areas will not be conveyed to the proposed stormwater management facility. Will the phosphorus reduction needs for this additional impervious area be accommodated, in a different subwatershed, by the new stormwater management pond? How will MWAA ensure that the increased stormwater runoff from these new impervious surfaces will not have adverse impacts on streams into which the additional runoff will be discharged?

The County recommend that MWAA pursue a stormwater management approach that will serve to both protect downstream areas from erosion and ensure consistency with the 50% phosphorus reduction requirement of the County's Water Supply Protection Overlay District (and the County's Chesapeake Bay Preservation Ordinance, which references this requirement).

- *Floodplains.* Fairfax County's definition of "floodplain," as provided in its Zoning Ordinance, is that a floodplain is present along any stream with a drainage area that is greater than 70 acres. Therefore, the extent of floodplains in the Fairfax County portion of the airport property is much greater than that shown in Figure 3-15.

- *Chesapeake Bay Preservation Ordinance.* Page 3-32 states that MWAA (including Dulles Airport) is exempt from the County's Chesapeake Bay Preservation Ordinance. However, it is the County's understanding that, pursuant to Federal Consistency Regulations, federally-financed projects in the area subject to Virginia's Chesapeake Bay Preservation Act (including Fairfax County) must be consistent with the Chesapeake Bay Preservation Area Designation and Management Regulations, which are implemented in Fairfax County through the County's Chesapeake Bay Preservation Ordinance. Therefore, it would be appropriate for MWAA to comply with the County's Ordinance when designing and constructing the proposed facilities. Based on the County's map of Chesapeake Bay Preservation Areas, it does not appear that the proposed activities will impact Resource Protection Areas (although the proposed stormwater management pond will come close). However, Resource Management Area requirements

(most notably the stormwater management best management practice requirements) will apply. MWAA should also be aware that RPA designations in the County will change in the future in order to more directly incorporate buffer areas around perennial streams; these changes may increase the extent of RPAs on the airport property.

- *Wetlands Impacts.* The EA indicates that approximately 26 acres of wetlands may be altered as a result of the implementation of the proposed alternative. Based on Figure 4-4, it appears that much of this impact will occur in association with the automated people mover system. It is not clear, however, if the extent of wetland impacts identified in Figure 4-4 will be needed. MWAA should ensure that wetland impacts are minimized.

  Wetland impacts will also be associated with the construction of the proposed South Utility Building (near the Route 28/McLearan Road intersection) and DVP Substation (north of Gate 4). While the small scale of Figure 4-4 does not allow for an assessment of whether or not wetland impacts have been minimized in these areas, it does appear that there may be some potential to reduce impacts associated with the proposed DVP Substation by moving this facility slightly southward. Would such relocation result in reduced wetland impacts? Would this allow for the retention of a broader riparian buffer area along the stream in this area? Could such relocation occur without increasing the potential for adverse visual impacts to Sully Plantation?

- *Rare Species Impact.* Page 4-18 notes that individual specimens of a state-listed rare species (hairy beardtongue) would be lost as a result of the Build Alternative (due to construction of the Automated People Mover and stormwater management pond), but that this loss will not constitute a significant impact. Can the impact in the area of the stormwater management pond be avoided through design modifications? Might it be possible to transplant affected specimens?

Please see the attached letter (June 27, 2002) from the County of Fairfax for further details on the issues above.

b) Energy Conservation. The new buildings should be planned and designed to comply with state and federal guidelines and industry standards for energy conservation and efficiency. For example, maximizing the use of the following can enhance energy efficiency of the facility:

- thermally-efficient building shell components (roof, wall, floor, and insulation);
- high efficiency heating, ventilation, air conditioning systems;
- high efficiency lighting systems; and
- energy-efficient office and data processing equipment.

The Department of Mines, Minerals and Energy should be contacted, Eugene Rader at (804) 951-6358, for assistance in meeting this challenge.

Regulatory and Coordination Needs

*1. **Wetlands and Water Quality.*** According to the Department of Environmental Quality (DEQ) Office of Water Protection Permit Program, a Virginia Water Protection Permit will be required. At this time, the Applicant has submitted the Joint Permit Application and the permit has been drafted by the Department of Environmental Quality (#02-0249). Also, a Virginia Pollution Discharge Elimination System Stormwater General Permit for Construction Activities is required for disturbance of 5 acres or more. For further information, please contact the DEQ-Northern Regional Office (telephone, (703) 583-3800.

*2. **Subaqueous Lands Management.*** In general, work performed in, over or under water within the Commonwealth of Virginia, including overhead and underground transmission line crossings, requires a permit from the Virginia Marine Resources Commission (VMRC). For additional information, contact Mark Eversol of the VMRC (telephone, (757) 247-2200).

*3. **Erosion and Sediment Control.*** For compliance with State erosion and sediment control and stormwater management programs, federal agencies and their authorized agents conducting regulated land disturbing activities on private and public lands in the state must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R), Virginia Stormwater Management Law and Regulations (VSWML&R), and other applicable federal nonpoint source pollution mandates (e.g., Clean Water Act-Section 313, Federal Consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, or other structures, soil/dredge spoil areas, or related land conversion activities that disturb 10,000 square feet or more (2,500 square feet or more in a CBPA area) would be regulated by VESCL&R and those that disturb one acre or greater would be covered by VSWML&R. Accordingly, federal agencies should prepare and implement erosion and sediment control (ESC) and stormwater management (SWM) plans that comply with state law. The federal agency is ultimately responsible for achieving project compliance through oversight of on site contractors, regular field inspection, prompt action against non-compliant sites, and/or other mechanisms consistent with agency policy. Agencies are highly encouraged to contact the Gary Switzer, 540/347-6420 in DCR's Potomac Watershed Office to obtain plan development or implementation assistance to ensure project compliance during and after active construction. *[Reference: VESCL§10.1-567; VSWML §10.1-603.15]*. A copy of the document titled, *DCR Urban Programs Contact Information,* is available at http://www.dcr.state.va.us/sw/e&s.htm for directing requests for assistance to the appropriate DCR office for consideration.

*4. **Air Quality Regulations.*** This project may be subject to regulation by the DEQ. The following sections of Virginia Administrative Code may be applicable: 9 VAC 5-50-60 et seq. governing fugitive dust emissions, 9 VAC 5-40-5600 et seq. addressing open burning and 9 VAC 5-40-5490 et seq. addressing cut-back asphalt usage restrictions. In addition, operation of new boilers proposed may require operating permits. For additional information, please contact the

DEQ-Northern Regional Office at (703) 583-3800.

5. Solid and Hazardous Waste. Any soil that is suspected of contamination that is encountered during construction must be tested and disposed of in accordance with applicable federal, state and local laws and regulations. Should contamination be discovered, please contact the Northern Regional Office of the DEQ. Also, all solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. The following state regulations may be applicable: Virginia Waste Management Act, Code of Virginia Sections 10.1-1400 et seq.; Virginia Hazardous Waste Management Regulations (9VAC 20-60); Virginia Solid Waste Management Regulations (9VAC 20-80) and Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal regulations are the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq. and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Parts 107, 171.1-172.558. Contact the DEQ-Northern Regional Office at (703) 583-3800 concerning the location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered.

Also, the EA (ES-5) states that asbestos-containing material (ACM) and lead-based paint (LBP) may be present in the structures to be demolished. The following Federal and State regulations must be followed.

(a) Asbestos Removal and Disposal. Upon classification as friable or non-friable, all waste ACM should be disposed of in accordance with the Virginia Solid Waste Management Regulations (9 VAC 20-80-640), and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9 VAC 20-110-10 et seq.). Contact the Department of Labor and Industry, Dr. Clarence H. Wheeling at (804) 371-0574.

(b) Lead-based Paint Removal and Disposal. The proposed project should comply with the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, and with the Virginia Lead-Based Paint Activities Rules and Regulations (9VAC 20-60-261). Contact the DEQ Waste Management Program for additional information, (804) 698-4021.

6. Water Supply. The South Utilities element of the proposal will include the expansion of existing potable water and sanitary sewer systems, including water storage. Design and construction of these facilities must adhere to Virginia's Waterworks Regulations and local utility requirements. For further information, contact the Department of Health's Culpeper Engineering Field Office (telephone, (540) 829-7340).

7. Coastal Lands Management. To ensure compliance with the Chesapeake Bay Preservation

Act, contact Catherine Harold of the Chesapeake Bay Local Assistance Department (telephone, (804) 371-7501).

8. Federal Consistency Certification. Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities (regardless of location) with reasonable foreseeable effects on coastal uses and resources must be constructed and operated in a manner that is consistent with the Virginia Coastal Resources Management Program. In order to be consistent with the VCP, the Applicant must obtain all applicable approvals listed under the Enforceable Programs of the VCP (see Attachment 1). In addition, we invite your attention to the Advisory Policies of the VCP (see Attachment 2). Section 930.39 of the federal consistency regulations (15 CFR Part 930) gives content requirements for the consistency certification. The consistency certification may be provided as part of the documentation concluding the NEPA process, or independently, depending on your agency's preference. Contact Anne Newsom at (804) 698-4135 for more information.

Thank you for the opportunity to review the Environmental Assessment. Detailed comments of reviewing agencies are attached for your review. If you have any questions, please contact Anne Newsom at (804) 698-4135.

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures
Cc: Martin Ferguson, OWPPP
Derral Jones, DCR
Ethel Eaton, DHR
William Cash-Robertson, DEQ-TRO
Catherine Harold, CBLAD
Tom Modena, DEQ-Waste
Mark Eversol, VMRC
Kotur S. Narasimhan, DEQ-Air
James P. Zook, Fairfax County
Kirby M. Bowers, Loudoun County

COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
http://www.deq.state.va.us

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

Attachment 1

Enforceable Regulatory Programs comprising Virginia's Coastal Resources Management Program (VCP)

a. Fisheries Management - The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (VMRC); Virginia Code §28.2-200 to §28.2-713 and the Department of Game and Inland Fisheries (DGIF); Virginia Code §29.1-100 to §29.1-570.

The State Tributyltin (TBT) Regulatory Program has been added to the Fisheries Management program. The General Assembly amended the Virginia Pesticide Use and Application Act as it related to the possession, sale, or use of marine antifoulant paints containing TBT. The use of TBT in boat paint constitutes a serious threat to important marine animal species. The TBT program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The VMRC, DGIF, and Virginia Department of Agriculture Consumer Services (VDACS) share enforcement responsibilities; Virginia Code §3.1-249.59 to §3.1-249.62.

b. Subaqueous Lands Management - The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, tidal wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality (DEQ). The program is administered by the Marine Resources Commission; Virginia Code §28.2-1200 to §28.2-1213.

c. Wetlands Management - The purpose of the wetlands management program is to preserve wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

(1) The tidal wetlands program is administered by the Marine Resources Commission; Virginia Code §28.2-1301 through §28.2-1320.

(2) The Virginia Water Protection Permit program administered by DEQ includes protection of wetlands --both tidal and non-tidal; Virginia Code §62.1-44.15:5 and Water Quality Certification pursuant to Section 401 of the Clean Water Act.

Attachment 1 continued

Page 2

d. Dunes Management - Dune protection is carried out pursuant to The Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission; Virginia Code §28.2-1400 through §28.2-1420.

e. Non-point Source Pollution Control – (1) Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by the Department of Conservation and Recreation; Virginia Code §10.1-560 et seq.).

(2) Coastal Lands Management is a state-local cooperative program administered by the Chesapeake Bay Local Assistance Department and 84 localities in Tidewater (see i) Virginia; Virginia Code §10.1-2100 –10.1-2114 and 9 VAC10-20 et seq.

f. Point Source Pollution Control - The point source program is administered by the State Water Control Board (DEQ) pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of:

(1) the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System (VPDES) permit program.

(2) The Virginia Water Protection Permit (VWPP) program administered by DEQ; Virginia Code §62.1-44.15:5 and Water Quality Certification pursuant to Section 401 of the Clean Water Act.

g. Shoreline Sanitation - The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code §32.1-164 through §32.1-165).

h. Air Pollution Control - The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code §10-1.1300 through §10.1-1320).

(i) Coastal Lands Management is a state-local cooperative program administered by the Chesapeake Bay Local Assistance Department and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act; Virginia Code §10.1-2100 –10.1-2114 and Chesapeake Bay Preservation Area Designation and Management Regulations; Virginia Administrative Code 9 VAC10-20 et seq.

Attachment 2

Advisory Policies for Geographic Areas of Particular Concern

a. Coastal Natural Resource Areas - These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources:

a) Wetlands
b) Aquatic Spawning, Nursery, and Feeding Grounds
c) Coastal Primary Sand Dunes
d) Barrier Islands
e) Significant Wildlife Habitat Areas
f) Public Recreation Areas
g) Sand and Gravel Resources
h) Underwater Historic Sites.

b. Coastal Natural Hazard Areas - This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are as follows:

i) Highly Erodible Areas
ii) Coastal High Hazard Areas, including flood plains.

c. Waterfront Development Areas - These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows:

i) Commercial Ports
ii) Commercial Fishing Piers
iii) Community Waterfronts

Although the management of such areas is the responsibility of local government and some regional authorities, designation of these areas as Waterfront Development Areas of Particular Concern (APC) under the VCRMP is encouraged. Designation will allow the use of federal CZMA funds to be used to assist planning for such areas and the implementation of such plans. The VCRMP recognizes two broad classes of priority uses for waterfront development APC:

i) water access dependent activities;
ii) activities significantly enhanced by the waterfront location and complementary to other existing and/or planned activities in a given waterfront area.

Attachment 2 con't

Advisory Policies for Shorefront Access Planning and Protection

a. Virginia Public Beaches - Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.

b. Virginia Outdoors Plan - Planning for coastal access is provided by the Department of Conservation and Recreation in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

c. Parks, Natural Areas, and Wildlife Management Areas - Parks, Wildlife Management Areas, and Natural Areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.

d. Waterfront Recreational Land Acquisition - It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

e. Waterfront Recreational Facilities - This policy applies to the provision of boat ramps, public landings, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.

f. Waterfront Historic Properties - The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest are significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and the VCRMP to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.

Review Instructions:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for you comments. **If you use the space below, the form must be signed and dated.**

Please return your comments to:

Ms. Anne B. Newsom
Dept. of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, VA 23219
Fax: (804) 698-4319

Anne B. Newsom
Environmental Program Planner

Comments: VWPP: Based on the review of the Draft Environmental Assessment dated May 2002, no surface water withdrawals will occur as a result of the proposed activities. Therefore, DEQ Central Office VWP Permit Program does not have any comments at this time. As per the document, a Joint Permit Application has been submitted to DEQ for approximately 26 acres of wetland impacts. The appropriate DEQ regional office will review the Application and determine if a permit will be issued or not.

VPA/VPDES: Cannot determine from the report the total acreage of land that will be disturbed. If it amounts to 5 acres or more then a storm water permit for construction activity will be required. A general permit is available for this project if a permit is required.

Name: Martin Ferguson Date: June 25, 2002
Signature:
Title:
Agency: DEQ - Water Permits Support

Project: 02-110F

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

RECEIVED
JUN 26 2002
DEQ-Office of Environmental Impact Review

Anne B. Newsom
Environmental Program Planner

COMMENTS

NO COMMENTS
Virginia Dept. of Environmental Quality
Northern Virginia Regional Office

(signed) _____ (date) 6/24/02

(title) RPM-NVRO

(agency) DEQ

PROJECT #02-110F

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW REPORT APPLICABLE TO AIR QUALITY

RECEIVED
JUN 21 2002
DEQ-Office of Environmental Impact Review

TO: Anne B. Newsom DEQ-OEIA PROJECT NUMBER: 02-110F

PROJECT TYPE: ☐ STATE EA/EIR/FONSI X FEDERAL EAEIS ☐ SCC

☐ CONSISTENCY DETERMINATION/CERTIFICATION

PROJECT TITLE: TIER 2 & RELATED PROJECTS & FAA DRAFT GENERAL CONFORMITY DETERMINATION, WASHINGTON DULLES INTERNATIONAL AIRPORT

PROJECT SPONSOR: FEDERAL AVIATION ADMINISTRATION

PROJECT LOCATION:
X OZONE NON-ATTANMENT AREA
☐ OZONE MAINTENANCE AREA
X STATE VOLATILE ORGANIC COMPOUNDS & NITROGEN OXIDES EMISSION CONTROL AREA

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: X CONSTRUCTION
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. X **9 VAC 5-40-5600 et seq. – Open Burning**
5. X **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to

COMMENTS SPECIFIC TO THE PROJECT:

Being in ozone non-attainment area, all precautions are to be taken to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx). Further, operation of new boilers proposed may require operating permits. For further assistance, Northern Virginia Regional Office may be consulted.

K. S. Narasimhan

June 21, 2002

(Kotur S. Narasimhan)
Office of Air Data Analysis

RECEIVED
JUN 25 2002
DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.state.va.us

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

MEMORANDUM

TO: Anne Newsom

FROM: Thomas Modena TM

DATE: June 25, 2002

COPIES: Kevin Greene

SUBJECT: Draft Environmental Assessment
Washington Dulles International Airport Tier 2 and Related Projects

The Office of Remedial Programs has reviewed the Draft Environmental Assessment for the Washington Dulles International Airport Tier 2 and Related Projects and FAA Draft General Conformity Determination, Fairfax and Loudoun Counties. We have the following comments concerning the waste issues associated with this project.

An environmental assessment was conducted on the property and solid and hazardous waste issues were addressed. The central office of the Waste Division did a cursory review of its data files and did not find any other sites that might impact this project.

Since this is a construction project, any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Parts 107, 171.1-172.558.

The report states that asbestos-containing materials (ACM) and lead-based paint (LBP)

may be present in the structures that are to be demolished. In addition to the Federal waste-related regulations, State regulations 9VAC 20-80-640 for ACM and 9VAC 20-60-261 for LBP must be followed.

Finally, pollution prevention was addressed in the report. VDEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated.

If you have any questions or need further information, please let me know.

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
TDD (804) 786-2121

MEMORANDUM

DATE: 25 June 2002

TO: Anne B. Newsom, Virginia Department of Environmental Quality

Derral Jones

FROM: Derral Jones, Planning Bureau Manager

SUBJECT: DEQ#02-110F: Draft Environmental Assessment, Tier 2 and Related Projects, Washington Dulles International Airport

The Department of Conservation and Recreation (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

In our May 2002 comments, DCR recommended a survey for rare plants associated with prairie vegetation that inhabit semi-open diabase in Virginia. These diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase supports occurrences of several global and state rare plant species: earleaf foxglove (*Agalinis auriculata*, G2/S1/SOC/NS), white heath aster (*Aster ericoides*, G5/S2/NF/NS), hairy beardtongue (*Penstemon hirsutus*, G4/S2/NF/NS), blue-hearts (*Buchnera americana*, G3G4/S1/NF/NS), downy phlox (*Phlox pilosa*, G5T5/S2/NF/NS), stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*, G5/S2/NF/NS), and marsh hedgenettle (*Stachys pilosa* var. *arenicola*, G5/S1/NF/NS). Please note that earleaf foxglove is currently tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however this designation has no official legal status.

In addition, DCR commented on the Yellow Lance (*Elliptio lanceolata*, G2G3/S2S3/NF/SC) and the Wood Turtle (*Clemmys insculpta*, G4/S2/NF/LT) documented downstream of the project site. To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommended the implementation of and strict adherence to erosion and sediment control measures during all land disturbing activities. DCR also suggested coordination in reference to the wood turtle, to ensure compliance with protective legislation.

According to the "Survey for Rare, Threatened, and Endangered Species at the Proposed Tier 2 and Related Projects" conducted by EA Engineering, Science and Technology that is included in the Environmental Assessment, Appendix F, the Hairy Beardtongue (*Penstemon hirsutus*, G4/S2/NF/NS) was documented at three locations within the project boundaries; two adjacent to the proposed

APM tunnel and one within the proposed stormwater management facility. DCR recommends avoidance of these natural heritage resources during construction of the proposed projects.

This survey was conducted during June and July of 2001, which are within the survey window for hairy beardtongue. However, according to Chris Ludwig, DCR's chief biologist, the survey period for other associated diabase species (earleaf foxglove, white heath aster and stiff goldenrod) is September through October. Therefore, DCR recommends an additional survey be conducted during the appropriate time for these species.

In reference to the wood turtle, according to the survey no wood turtles were found within the project area. Therefore, DCR has no further comments.

Under the Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Department of Conservation and Recreation (DCR), DCR has the authority to report for VDACS on state-listed plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

For compliance with State erosion and sediment control and stormwater management programs, federal agencies and their authorized agents conducting regulated land disturbing activities on private and public lands in the state must comply with the Virginia Erosion and Sediment Control Law and Regulations (VESCL&R), Virginia Stormwater Management Law and Regulations (VSWML&R), and other applicable federal nonpoint source pollution mandates (e..g, Clean Water Act-Section 313, Federal Consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, or other structures, soil/dredge spoil areas, or related land conversion activities that disturb ***2,500]*** square feet or more would be regulated by VESCL&R and those that disturb one acre or greater would be covered by VSWML&R. Accordingly, federal agencies should prepare and implement erosion and sediment control (ESC) and stormwater management (SWM) plans that comply with state law. The federal agency is ultimately responsible for achieving project compliance through oversight of on site contractors, regular field inspection, prompt action against non-compliant sites, and/or other mechanisms consistent with agency policy. Agencies are highly encouraged to contact the Gary Switzer, 540/347-6420 in DCR's Potomac Watershed Office to obtain plan development or implementation assistance to ensure project compliance during and after active construction. *[Reference: VESCL§10.1-567; VSWML §10.1-603.15]*

A copy of the document titled, *DCR Urban Programs Contact Information,* is available at **http://www.dcr.state.va.us/sw/e&s.htm** for directing requests for assistance to the appropriate DCR office for consideration.

Lastly, the proposed project is not anticipated to have any adverse impacts on existing or planned recreational facilities. Nor will it impact any streams on the National Park Service Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways. Please contact DCR for an update on this information if a significant amount of time passes before it is utilized.

Thank you for the opportunity to offer comments on this project.

CC: Ray Fernald, VDGIF
Kim Marbain, USFWS

Literature Cited

Mitchell, J. C. 1994. Reptiles of Virginia. Smithsonian Institution Press, Washington. pp. 88-91.

Rawinski, T.J. 1995. Natural communities and ecosystems: Conservation priorities for the future. Unpublished report for DCR-DNH.

Definition of Abbreviations Used on Natural Heritage Resource Lists of the Virginia Department of Conservation and Recreation

Natural Heritage Ranks
The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.

S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.

S5 Very common; demonstrably secure under present conditions.

SA Accidental in the state.

S#B Breeding status of an organism within the state.

SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

S#N Non-breeding status within the state. Usually applied to winter resident species.

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state.

SZ Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status
The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE Listed Endangered - threatened with extinction throughout all or a significant portion of its range
LT Listed Threatened - likely to become endangered in the foreseeable future
PE Proposed Endangered
PT Proposed Threatened
C Candidate - enough information is available to propose for listing, but listing is precluded by other pending proposals of higher priority
SOC Species of Concern -- species that merit special concern (not a regulatory category)
NF No federal legal status
E(S/A) Treat as endangered because of similarity of appearance
T(S/A) Treat as threatened because of similarity of appearance

State Legal Status
The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE Listed Endangered
LT Listed Threatened
C Candidate
SC Special Concern -- animals that merit special concern according to VDGIF (not a regulatory category)
NS No state legal status
PE Proposed Endangered
PT Proposed Threatened

Conservation Site Ranks
A rank is a rating of the significance of the conservation site based on presence and number of natural heritage resources; on a scale of 1-5, 1 being most significant:

B1 - Outstanding significance
B2 - Very high significance
B3 - High significance
B4 - Moderate significance
B5 - of General Biodiversity significance

Site names ending in Habitat Zone are B5 sites on private lands.

For information on the laws pertaining to threatened or endangered species, contact: U.S. Fish and Wildlife Service for all FEDERALLY listed species ; Department of Agriculture and Consumer Services Plant Protection Bureau for STATE listed plants and insects; Department of Game and Inland Fisheries for all other STATE listed animals

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
TDD (804) 786-2121

17 May 2002

Mr. Travis Beck
Environmental Specialist II
Virginia Department of Environmental Quality
Northern Virginia Regional Office
13901 Crown Court
Woodbridge, Virginia 22193-1453

Re: Joint Permit Application Number 02-0249: Dulles Tier 2 and Related Projects-Washington and Metropolitan Airports Authority

Dear Mr. Beck:

The Department of Conservation and Recreation (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, natural heritage resources have not been documented at this location. However, several rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades in may occur at this location if suitable habitat is present. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase supports occurrences of several global and state rare plant species: earleaf foxglove (*Agalinis auriculata*, G2/S1/SOC/NS), white heath aster (*Aster ericoides*, G5/S2/NF/NS), blue-hearts (*Buchnera americana*, G3G4/S1/NF/NS), downy phlox (*Phlox pilosa*, G5T5/S2/NF/NS), stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*, G5/S2/NF/NS), and marsh hedgenettle (*Stachys pilosa* var. *arenicola*, G5/S1/NF/NS). Please note that earleaf foxglove is currently tracked as a species of concern by the United States Fish and Wildlife Service (USFWS); however this designation has no official legal status.

Due to the potential for this site to support additional populations of these natural heritage resources,

DCR recommends an inventory of suitable habitat in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources. DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at (804) 371-6206 to discuss arrangements for field work.

In addition, the Cub Run Stream Conservation Units (SCUs) and the Upper Cub Run Conservation have been documented downstream of the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. Stream Conservation Units are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Cub Run SCU has been ranked as a B3 conservation site, which indicates it is of high significance. The natural heritage resource associated with this site is:

Elliptio lanceolata	Yellow lance	G2G3/S2S3/NF/SC

The Yellow lance occurs in mid-sized rivers and second and third order streams. To survive, it needs a silt-free, stable streambed and well-oxygenated water that is free of pollutants. In Virginia, the yellow lance is currently known from populations in the Chowan, James, York, Rappahannock, and Potomac river drainages. Please note that the yellow lance is currently classified as a special concern species by the Virginia Department of Game and Inland Fisheries (VDGIF); however, this designation has no official legal status.

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

Conservation Sites are a tool for representing key areas of the landscape worthy of protection and stewardship action because of the natural heritage resources and habitat they support. Conservation Sites are polygons built around one or more rare plant, animal, or natural communities designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation Sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Upper Cub Run Conservation Site has been ranked a B4 conservation site, which indicates it is of moderate significance. The natural heritage resource associated with this site is:

Clemmys insculpta	Wood Turtle	G4/S2/NF/LT

The wood turtle inhabits forested floodplains and nearby fields, wet meadows, and farmlands (Mitchell, 1994). As this species overwinters on the bottoms of creeks and streams, a primary habitat requirement is the presence of water (Mitchell, 1994). Please note that the wood turtle is classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR also recommends the implementation of and strict adherence to erosion and sediment control measures during all land disturbing activities.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

For your records, at this time, the proposed project is not anticipated to have any adverse impacts on existing or planned recreational facilities. Nor will it impact any streams on the National Park Service Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways. Please contact DCR for an update on this information if a significant amount of time passes before it is utilized.

Sincerely,

Derral Jones

Derral Jones
Planning Bureau Manager

CC: Ray Fernald, VDGIF
Kim Marbain, USFWS

Literature Cited

Mitchell, J. C. 1994. Reptiles of Virginia. Smithsonian Institution Press, Washington. pp. 88-91.

Rawinski, T.J. 1995. Natural communities and ecosystems: Conservation priorities for the future. Unpublished report for DCR-DNH.

Williams, J.D., M.L. Warren, Jr., K.S. Cummings, J.L. Harris, and R.J. Neves. 1993. Conservation status of freshwater mussels of the United States and Canada. Fisheries 18: 6-9.

Definition of Abbreviations Used on Natural Heritage Resource Lists of the Virginia Department of Conservation and Recreation

Natural Heritage Ranks

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or *occurrences*, i.e. the number of known *distinct localities*. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.

S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often *susceptible* to becoming extirpated.

S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.

S5 Very common; demonstrably secure under present conditions.

SA Accidental in the state.

S#B Breeding status of an organism within the state.

SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.

S#N Non-breeding status within the state. Usually applied to winter resident species.

SU Status uncertain, often because of low search effort or cryptic nature of the element.

SX Apparently extirpated from the state.

SZ Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

LE Listed Endangered - threatened with extinction throughout all or a significant portion of its range
LT Listed Threatened - likely to become endangered in the foreseeable future
PE Proposed Endangered
PT Proposed Threatened
C Candidate - enough information is available to propose for listing, but listing is Precluded by other pending proposals of higher priority
SOC Species of Concern -- species that merit special concern (not a regulatory category)
NF No federal legal status

E(S/A) Treat as endangered because of similarity of appearance
T(S/A) Treat as threatened because of similarity of appearance

State Legal Status

The Division of Natural Heritage uses similar abbreviations for State endangerment.

LE Listed Endangered
LT Listed Threatened
C Candidate
PE Proposed Endangered
PT Proposed Threatened
SC Special Concern -- animals that merit special concern according to VDGIF (not a regulatory category)
NS No state legal status

For information on the laws pertaining to threatened or endangered species, contact:
U.S. Fish and Wildlife Service for all FEDERALLY listed species
Department of Agriculture and Consumer Services Plant Protection Bureau for STATE listed plants and insects
Department of Game and Inland Fisheries for all other STATE listed animals
3/99

Newsom,Anne

From: Brian Moyer [bmoyer@dgif.state.va.us]
Sent: Thursday, June 27, 2002 4:19 PM
To: Newsom,Anne
Subject: Re: DEQ # 02-110F

Metropolitan Washington Airports Authority (MWAA) proposes to construct replacement facilities, upgrades, and related infrastructure for existing facilities. Approximately 3.6 acres of forested wetland, 0.87 acres of scrub/shrub wetland, 19.9 acres of emergent wetland, 2,790 linear feet of perennial stream channel, and 280 linear feet of intermittent stream channel will be impacted by the proposed construction. We recommend that the applicant avoid and minimize impacts to wetlands and streams to the fullest extent practicable including relocating stream channels as opposed to channelizing or filling and using a natural stream channel design with wooded buffers. We also recommend mitigating for unavoidable impacts to stream at a minimum of a 1:1 ratio on a per linear-foot basis.

According to our records, the state-threatened upland sandpiper, Bartramia longicauda, has been documented on the MWAA property in close proximity to the project site. We have reviewed the survey results and impacts assessment provided by the airport and we concur with the conclusion that the project is not likely to adversely affect the upland sandpiper.

Brian D. Moyer
Department of Game and Inland Fisheries
Environmental Services Section
4010 West Broad Street
Richmond, VA 23230
(804) 367-2733
(804) 367-2427 (fax)

>>> "Newsom,Anne" <abnewsom@deq.state.va.us> 06/27/02 10:56AM >>>
Reviewers,

The Office of Environmental Impact Review is finishing its review period for the following project:

Tier 2 & Related Projects and FAA Draft Conformity Determination, Washington Dulles International Airport, DEQ # 02-110F (comments due June 25, 2002)

If you would like to participate in the review, I need comments from you on your letterhead.

Thank you. If you have any questions, please email me or give me a call.

Anne

Anne Newsom
629 East Main Street
Richmond, Virginia 23219
(804) 698-4135
(804) 698-4319 (fax)

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

RECEIVED
JUN 27 2002
DEQ-Office of Environmental Impact Review

Anne B. Newsom
Environmental Program Planner

COMMENTS

Statements in the project document concerning endangered species were reviewed and compared to available information. No additional comments are necessary in reference to endangered plant and insect species regarding this project.

(signed) (Keith R. Tignor) (date) June 24, 2002

(title) Endangered Species Coordinator

(agency) VDACS, Office of Plant and Pest Service

PROJECT #02-110F 8/98

RECEIVED
JUN 27 2002
DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

CHESAPEAKE BAY LOCAL ASSISTANCE DEPARTMENT

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

James Monroe Building
101 North 14th Street, 17th Floor
Richmond, Virginia 23219
FAX: (804) 225-3447

C. Scott Crafton
Acting Executive Director

(804) 225-3440
1-800-243-7229 Voice/TDD

June 25, 2002

Ms. Anne B. Newsom
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, VA 23219

RE: Tier 2 & Related Projects – Dulles International Airport
CBLAD Project Review No. FSPR-FAA-04-02

Dear Ms. Newsom:

As you requested, we have reviewed the Environmental Assessment (EA) for Tier 2 and related projects at the Dulles International Airport.

The Chesapeake Bay Preservation Act (CBPA) and its related regulations, the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations), is a core program in Virginia's Coastal Resources Management Program (CRMP). As such, in accordance with the Federal Consistency Regulations (15 CFR Part 930), federal actions, including federally financed projects, in Tidewater Virginia are required to be consistent with the Regulations. The Chesapeake Bay Local Assistance Department provides administrative oversight for the CBPA, which is implemented at the local government level. The purpose of the CBPA is to protect and improve the water quality of the Chesapeake Bay and its tributaries through measures to reduce adverse impacts of land use and development.

Fairfax County is located within Tidewater Virginia and falls under the CBPA program, but Loudoun County is not. Proposed airport activities within the limits of Fairfax County must be consistent with the Regulations as locally implemented in Fairfax County. Section 3.13 of the EA implies that the proposed airport activities are exempt from Fairfax County's Chesapeake Bay Preservation Ordinance. If the project is not designed consistent with the performance criteria of County's Ordinance, the project will not be consistent with Virginia's CRMP. The project proponent should also be aware

that a higher stormwater management standard applies to development within the Occoquan river watershed.

The 1998 Federal Agencies' Chesapeake Ecosystem Unified Plan requires the signatories, including the Department of Transportation, to fully cooperate with local and state governments in carrying out voluntary and mandatory actions to comply with the management of storm water. The agencies also committed to encouraging construction design that minimizes natural area loss, adopt low impact development and best management technologies for storm water, sediment and erosion control and reduces impervious surfaces.

We appreciate the opportunity to provide our comments on this project. Please do not hesitate to contact us at 1-800-CHESBAY should you have any questions.

Sincerely,

Catherine M. Harold
Environmental Engineer

Shawn E. Smith
Principal Environmental Planner

Cc: Scott Crafton, CBLAD
Martha H. Little, CBLAD

Newsom,Anne

From: Michael Foreman
Sent: Tuesday, July 02, 2002 5:19 PM
To: Newsom,Anne
Subject: Dulles Airport Draft Environmental Assessment

The purpose of this e-mail is to offer comment on the above assessment. In short, this assessment deals with construction activity at Dulles Airport.

The Virginia Department of Forestry is concerned with the apparent lack of information regarding the stockpiling of soil associated wit this project. Table 4-2 states under "Biotic Communities" that "approximately 90 acres of forested habitat will be lost to soil stockpile; impact to be mitigated through replanting of trees post-construction..."

We consider this note to be an inadequate treatment of this resource and request a thorough evaluation of options relating to the treatment of soil displaced through construction. We also consider 90 acres disturbed to be excessive and the use of forested habitat, however "normal" and not unique, to be inappropriate as a temporary disposal site.

The aforementioned options review should include all available land within reasonable distance of the construction site and utilize all open land uses as a primary temporary disposal site.

Thank you for consideration of these points and for your effort in facilitating proper soil disturbance techniques.

J. Michael Foreman
VA Dept. of Forestry
July 2, 2002

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Anne B. Newsom
Environmental Program Planner

All work to be performed in, over or under, waters within the Commonwealth of Virginia, including overhead and underground transmission line crossings, require the submission of a Joint Permit Application (JPA) to the Virginia Marine Resources Commission (VMRC). VMRC would then act as the clearing house, distributing copies of the application to state, local and federal agencies for review and comments.
The review and permitting process normally requires a minimum of 90 days, so it is advised to contact this agency early in the planning phase, to allow ample time for public notice and permitting.
Copies of the JPA are available on the internet, or by contacting this office.

(signed) [signature] (date) 6-15-02

(title) Environmental Engineer

(agency) Va. Marine Resources Commission

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Anne B. Newsom
Environmental Program Planner

COMMENTS

South Utilities Project will include expansion of existing potable water and sanitary sewer systems, including water storage. Design and construction of these facilities must adhere to Virginia Waterworks Regulations and local utility requirements. Contact Virginia Health Departments' Culpeper Engineering Field Office, (540) 829-7340, for additional information.

(signed) A. E. Douglas (date) 6-13-02

(title) Technical Services Engineer

(agency) Virginia Dept. of Health

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Anne B. Newsom
Environmental Program Planner

COMMENTS

We reviewed the document and have no comment.

(signed) Angie Deem (date) 7-2-02

(title) Env. Commitment Coordinator

(agency) VDOT

PROJECT #02-110F

8/98

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Anne B. Newsom
Environmental Program Planner

COMMENTS

(signed) Eugene K. Rader (date) June 10, 2002

(title) Geologist Manager

(agency) DMME/DMR

PROJECT #02-110F

8/98

If you cannot meet the deadline, please notify ANNE B.NEWSOM at 804/698-4135 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency-stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ANNE B. NEWSOM
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Anne B. Newsom
Environmental Program Planner

COMMENTS

We have no comments from a marine environmental viewpoint on the plans for Dulles Airport.

(signed) IA Barnard S (date) 6/19/02

(title) Marine Scientist

(agency) VIMS-CCRM

PROJECT #02-110F

RECEIVED
FAIRFAX JUL 02 2002
COUNTY DEQ-Office of Environmental Impact Review

DEPARTMENT OF PLANNING AND ZONING
Director's Office
Suite 755
12055 Government Center Parkway
Fairfax, Virginia 22035-5506

Telephone: (703) 324-1325 Fax: (703) 324-3924

V I R G I N I A

Mr. William C. Lebegern, P.E., Manager, Planning Department
c/o Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

JUN 27 2002

Dear Mr. Lebegern:

Through this letter, I am transmitting to you comments from the Fairfax County Department of Planning and Zoning regarding the Draft Environmental Assessment for the Tier 2 and Related Projects at Washington Dulles International Airport. These comments are in response to your June 4, 2002 letter to the Fairfax County Executive and to a related request from the Virginia Department of Environmental Quality (DEQ). Please be aware that these comments represent the views of this agency and do not necessarily represent positions of the Fairfax County Board of Supervisors.

From a procedural standpoint, we would note that the Metropolitan Washington Airports Authority (MWAA) has chosen to pursue an Environmental Assessment (EA) process rather than an Environmental Impact Statement (EIS) process, even though the length of the EA seems to be closer to that typically associated with an EIS than an EA. While we are not suggesting that an EIS is warranted for the proposed activities, and while we are not suggesting that details of the analysis should have been withheld in order to condense the document, we do feel that the length of the document is such that a longer review period than five weeks should have been provided. Considering the time it has taken for the document to reach the appropriate review staff, and considering the needs of DEQ (which has requested our comments by June 25), our effective review time has been significantly less than the five weeks that have been provided. This time frame is insufficient to allow for a thorough review. We recommend that MWAA provide for a significantly longer review period for any future Environmental Assessments that are of a similar length and/or nature to this one.

Our specific comments are as follows:

Visual Impacts/Historic Resources

Two of the proposed projects, the South Utility Building and the DVP Substation, have the potential to have adverse visual impacts on Fairfax County due to their proximity to Route 28

(Sully Road). Route 28 is a gateway into the County, and therefore the aesthetic character of development that occurs on either side of the highway is of significance to the County. Development that has occurred to date along the east side of the highway has not been industrial in nature; to the contrary, high quality office and hotel development characterizes this area. Development west of the highway on the airport property should reflect a similar attention to architectural and aesthetic quality. Development of an industrial nature should be designed, through the use of building setbacks, tree preservation, and/or landscaping, such that it is not visible from Route 28; we strongly encourage MWAA to retain a significant wooded buffer area adjacent to the highway. We further encourage MWAA to screen existing industrial uses (e.g., the fuel tank facilities) through the planting of trees between these uses and the highway right-of-way.

The proposed substation is of particular concern due to its proximity to Sully Plantation, which is listed on both the National Register of Historic Places and the Virginia Landmarks Register. The substation would be located just north of the County's Historic Overlay District associated with Sully Plantation, and the EA does not present any design details regarding the proposed substation. Information regarding the size and height of the structure should be provided, as should be information regarding efforts that will be pursued to screen the proposed facility from Route 28 and Sully Plantation (e.g., through tree preservation and/or planting). MWAA should ensure that the facility will not be visible from Sully Plantation or Route 28.

The proposed South Utility Building has been described as a 170,000 square foot structure; as such, there are concerns regarding the potential visual impact of this facility. Again, no details are provided regarding the design of this building and whether or not any efforts will be needed or pursued to screen this structure. As recommended above, this facility should be designed, through the use of building setbacks, tree preservation, and/or landscaping, such that it is not visible from Route 28.

We recommend that MWAA coordinate with this office on the siting, design, and buffering of any proposed development that will occur near Route 28.

Route 28 Right-of Way

The EA indicates that the preferred location of the proposed South Utility Building is west of the intersection of Route 28 and McLearan Road. The EA states that "coordination with the planned interchange at Route 28 and McLearan" would be required. MWAA should ensure that the facility is sited and constructed in a manner that will ensure that all possible interchange design options can be pursued and that the facility will be sufficiently screened (if necessary) under all such options. Coordination with the Fairfax County Department of Transportation (703-324-1100) is recommended.

Noise

The EA does not indicate if either of the new facilities that would be located near Route 28 will have noise impacts associated with them. Will either of these facilities generate noise that may be audible at noise-sensitive locations east of Route 28? If so, what will be the extent of these impacts? What measures, if any, will be needed/taken to mitigate noise impacts?

Planning and Zoning

Section 3.2.1 is entitled "Zoning in Loudoun and Fairfax Counties." It would be more appropriate to title this section "Zoning and Planning in Loudoun and Fairfax Counties." The discussion of Fairfax County's Airport Noise Impact Overlay District within this section (page 3-2) is inaccurate. While it is correct that there are policies in the County's Comprehensive Plan that recommend against new residential development inside the County's adopted DNL 60 dBA noise contour, the Overlay District itself does not regulate land use outside the adopted DNL 65 dBA noise contour. Finally, the last sentence of the fourth full paragraph on page 3-2 (regarding the evaluation of proposed construction to ensure that there will be no obstructions to airport operations) is confusing; it may be best to state that Fairfax County's Comprehensive Plan recognizes the need to ensure that buildings that will be constructed near the airport will not be so high as to obstruct operations at the airport.

Stormwater Management

Guidance regarding the design of the stormwater management system for the proposed project and the siting rationale for the proposed stormwater management facility is not clear. Page 4-10 indicates that the stormwater management facility will be "temporary," yet the discussion states that the pond will be designed to reduce phosphorus loads by 50% (implying that the pond will be permanent). Will the facility remain after construction is complete? Further, while page 4-10 indicates that drainage from the proposed Tier 2 Concourse area will be conveyed to this facility, figure 3-9 suggests that the pond will be constructed across a drainage divide from the proposed concourse area. Will drainage divides be altered such that drainage from the Tier 2 concourse area will be diverted into the Cub Run (and hence Occoquan Reservoir) watershed from the Horsepen Run watershed? If so, what is the rationale for this, when the diversion of drainage will result in increased pollutant loads and stormwater runoff volumes into Cub Run (even with the proposed stormwater management facility)? If drainage divides will not be altered, what function will the new stormwater management pond serve? Will the pond collect water that is pumped out of the ground during construction of tunnels? Have Dulles Lake and/or Horsepen Lake been designed to accommodate the additional impervious cover associated with the proposed Tier 2 projects in the Horsepen Run watershed? Finally, it would appear that additional impervious cover will be needed for the proposed South Utility Building and the DVP Substation, and that drainage from these areas will not be

conveyed to the proposed stormwater management facility. Will the phosphorus reduction needs for this additional impervious area be accommodated, in a different subwatershed, by the new stormwater management pond? How will MWAA ensure that the increased stormwater runoff from these new impervious surfaces will not have adverse impacts on streams into which the additional runoff will be discharged?

We recommend that MWAA pursue a stormwater management approach that will serve to both protect downstream areas from erosion and ensure consistency with the 50% phosphorus reduction requirement of the County's Water Supply Protection Overlay District (and the County's Chesapeake Bay Preservation Ordinance, which references this requirement).

Floodplains

The brief discussion of floodplains on page 3-31 does not address Fairfax County's definition of "floodplain" as provided in its Zoning Ordinance. Based on this definition, a floodplain is present along any stream with a drainage area that is greater than 70 acres. Therefore, the extent of floodplains in the Fairfax County portion of the airport property is much greater than that shown in Figure 3-15.

Chesapeake Bay Preservation Ordinance

Page 3-32 states that MWAA (including Dulles Airport) is exempt from the County's Chesapeake Bay Preservation Ordinance. However, it is our understanding that, pursuant to Federal Consistency Regulations, federally-financed projects in the area subject to Virginia's Chesapeake Bay Preservation Act (including Fairfax County) must be consistent with the Chesapeake Bay Preservation Area Designation and Management Regulations, which are implemented in Fairfax County through the County's Chesapeake Bay Preservation Ordinance. Therefore, it would be appropriate for MWAA to comply with the County's Ordinance when designing and constructing the proposed facilities. Based on the County's map of Chesapeake Bay Preservation Areas, it does not appear that the proposed activities will impact Resource Protection Areas (although the proposed stormwater management pond will come close). However, Resource Management Area requirements (most notably the stormwater management best management practice requirements) will apply. MWAA should also be aware that RPA designations in the County will change in the future in order to more directly incorporate buffer areas around perennial streams; these changes may increase the extent of RPAs on the airport property.

Wetlands Impacts

The EA indicates that approximately 26 acres of wetlands may be altered as a result of the implementation of the proposed alternative. Based on Figure 4-4, it appears that much of this

impact will occur in association with the automated people mover system. It is not clear, however, if the extent of wetland impacts identified in Figure 4-4 will be needed. MWAA should ensure that wetland impacts are minimized.

Wetland impacts will also be associated with the construction of the proposed South Utility Building (near the Route 28/McLearan Road intersection) and DVP Substation (north of Gate 4). While the small scale of Figure 4-4 does not allow for an assessment of whether or not wetland impacts have been minimized in these areas, it does appear that there may be some potential to reduce impacts associated with the proposed DVP Substation by moving this facility slightly southward. Would such a relocation result in reduced wetland impacts? Would this allow for the retention of a broader riparian buffer area along the stream in this area? Could such a relocation occur without increasing the potential for adverse visual impacts to Sully Plantation?

Rare Species Impact

Page 4-18 notes that individual specimens of a state-listed rare species (hairy beardtongue) would be lost as a result of the Build Alternative (due to construction of the Automated People Mover and stormwater management pond), but that this loss will not constitute a significant impact. Can the impact in the area of the stormwater management pond be avoided through design modifications? Might it be possible to transplant affected specimens?

Thank you for affording us with the opportunity to provide these comments. If you have any questions about these comments, please feel free to contact Noel Kaplan of my staff at 703-324-1210.

Sincerely,

James P. Zook
Director

JPZ:NHK

cc:
Board of Supervisors
Fairfax County Airports Advisory Committee
Anthony H. Griffin, County Executive
Noel H. Kaplan, Environment and Development Review Branch, Department of Planning and Zoning
Anne B. Newsom, Virginia Department of Environmental Quality

Loudoun County, Virginia
County Administration
1 Harrison Street, S.E., 5th Floor, P.O. Box 7000, Leesburg, VA 20177-7000
Telephone (703) 777-0200 • Fax (703) 777-0325

July 1, 2002

Ms. Anne B. Newsom
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, VA 23219

Re: Draft Environmental Assessment, Tier 2 and Related Projects
Washington Dulles International Airport

Dear Ms. Newsom,

Thank you for the opportunity to comment on the above referenced project. The County's Revised General Plan, adopted on July 23, 2001, supports the continued growth and expansion of Washington Dulles International Airport for both passengers and cargo. I have outlined by section and topic my comments below:

Section 2.3 Alternative Locations for the South Utility Building: Option 2 was chosen over Option 2A but there is not a clear rationale in the report. Both options appear comparable in impacts however; Option 2 is the most expensive location for the SUB.

Section 3.1 Noise: Paragraph 3 states that there are 12 noise monitoring stations. However, Figure 3-1 shows the location of only 11 noise monitoring stations.

Section 3.2.2 Existing Land Use: Figure 3-3 shows current zoning not existing land use.

Section 3.3.4 Child Safety: Figure 3-6 and Table 3-4 should be updated to include the Nysmith School, Forest Grove Elementary School site, and Hutchison Farm Elementary School sites (See attached map for school locations).

Section 3.3.5 Places of Public Assembly: Figure 3-7 and Table 3-5 should be updated to include Arcola United Methodist and LDS Church (See attached map for church locations). Table 3-5 should be updated to include the Korean Presbyterian Church of Centerville. "Ellen" Korean Presbyterian Church of Washington listed in Table 3-5 should be Eden Korean Presbyterian Church of Washington.

Section 3.4.1 Air Monitoring Data: Table 3-7 under City/Town Asburn should be corrected to Ashburn.

Section 3.7 DOT Act Section 4(f) Lands: Section 4(f) lands refer to publicly owned lands and historic sites included in or eligible for inclusion in the National

Register of Historic Places (NRHP). County recorded sites from the Virginia Historic Landmarks Commission Survey indicate several potentially eligible NRHP resources within the ROI that should be evaluated and, if found eligible, should be included in this section as well as **Section 4.9.2 Potentially Affected Historic Resources in the Vicinity of IAD** and **Section 4.25 Cumulative Impacts.** The Virginia Historic Landmarks Commission survey records the following sites within the ROI: a Barn on Route 50 (Survey # 53-966, County USGS Historical Sites Map), Carter Schoolhouse (Survey # 53-967, County USGS Historical Sites Map), Pleasant Valley Methodist Church (Survey # 53-965, County USGS Historical Sites Map), Alexander D. Lee House (Survey # 53-892, County USGS Historical Sites Map), Arcola School (Survey # 53-982, County USGS Historical Sites Map), Arcola Methodist Church (Survey # 53-983, County USGS Historical Sites Map), Stone Slave Quarters (Survey # 53-984, County USGS Historical Sites Map), and a Stone Outbuilding on Route 774 (Survey # 53-985, County USGS Historical Sites Map). (Please note that County data sets are incomplete at this time therefore; there is a potential that there may be other sites or structures of historic and cultural significance within the ROI.)

Section 3.7.1 Public Parks and Recreation Areas: Table 3-13 and Figure 3-12 should be updated to include Bill Allen Field and the W&OD Trail.

Section 3.16 Prime and Unique Farmland: Lands adjacent to the airport are not planned for rural uses and, therefore, are not subject to the provisions of the Farmland Protection Policy Act (FPPA). This sections states that "The USDA Natural Resources Conservation Service office in Loudoun County could not provide a list of prime soils for the County". Eighteen prime farmland soil types exist in Loudoun County and are provided below for your use.

3A Comus silt loam
7A Huntington silt loam
13B Morven silt loam
17B Middleburg silt loam
23B Purcellville silt loam
28B Eubanks loam
31B Philomont and Tankerville soils
43B Myersville-Catoctin Complex
45B Fauquier silt loam
55B Glenelg silt loam
70B Leedsville cobbly silt loam
70C Leedsville cobbly silt loam
71B Panorama silt loam
76B Sudley-Oatlands Complex
90B Springwood silt loam
93B Hibler silt loam
94B Allegheny silt loam
95B Goresville gravelly silt loam

The Interpretive Guide to the Use of Soils Maps of Loudoun County, Virginia and the Loudoun County Soil Map are available should you need them (Please note that the Loudoun County Soil Map does not include those soils located within IAD).

Section 4.5.2 Mobile Sources: The second paragraph on page 4-8 should read "Build and No Build Alternatives".

Section 4.24 Construction Impacts: The Noise section states that there is an "absence of noise-sensitive land use adjacent to the airport". It should be noted that there is an approval for a residential subdivision, Loudoun Reserve west of Route 606. However, the subdivision is probably located a far enough distance so as to not to be impacted by construction noise.

Section 4.25.1 Planned Development at IAD: Future planned development at IAD should include the fifth runway and should also be evaluated in the Cumulative Impacts Section.

Section 4.25.2 Planned Development in the IAD Region: This section states that "Loudoun County has several land use planning studies underway. These are:

- Expansion of the Dulles Greenway (business corridor)
- Business Land Use and Corridor Development for Route 625 (Waxpool Road)
- Business Land Use and Corridor Development for Route 606 (Old Ox Road)
- Business Land Use and Corridor Development for Route 50"

The County is not currently pursuing any land use studies as entitled above, further clarification would be appreciated.

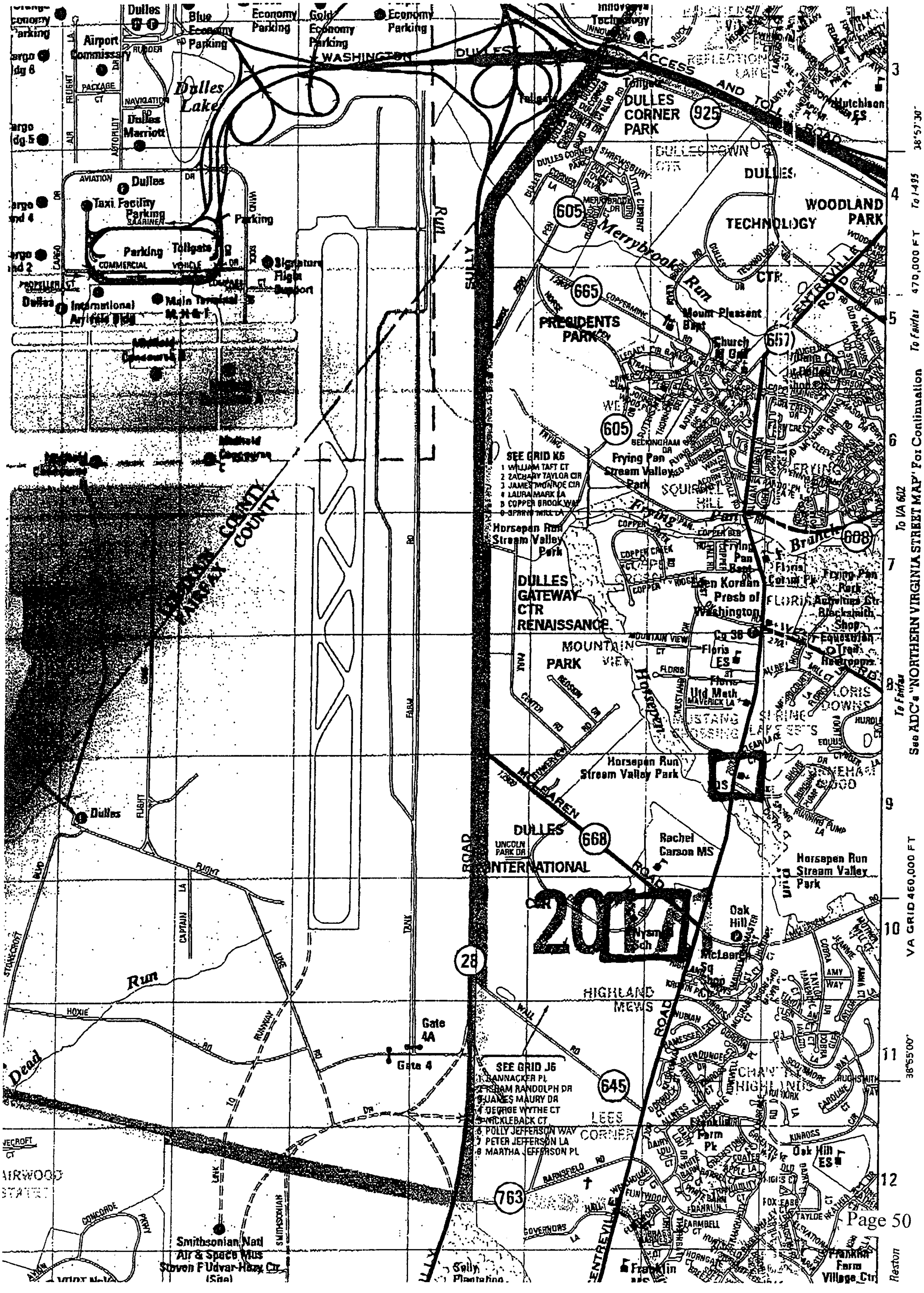
Section 4.25.3 Regional Ground Transportation Projects: It should be noted that the Route 50 Traffic Calming Project extends from Paris to Lenah ard is not within the direct vicinity of IAD.

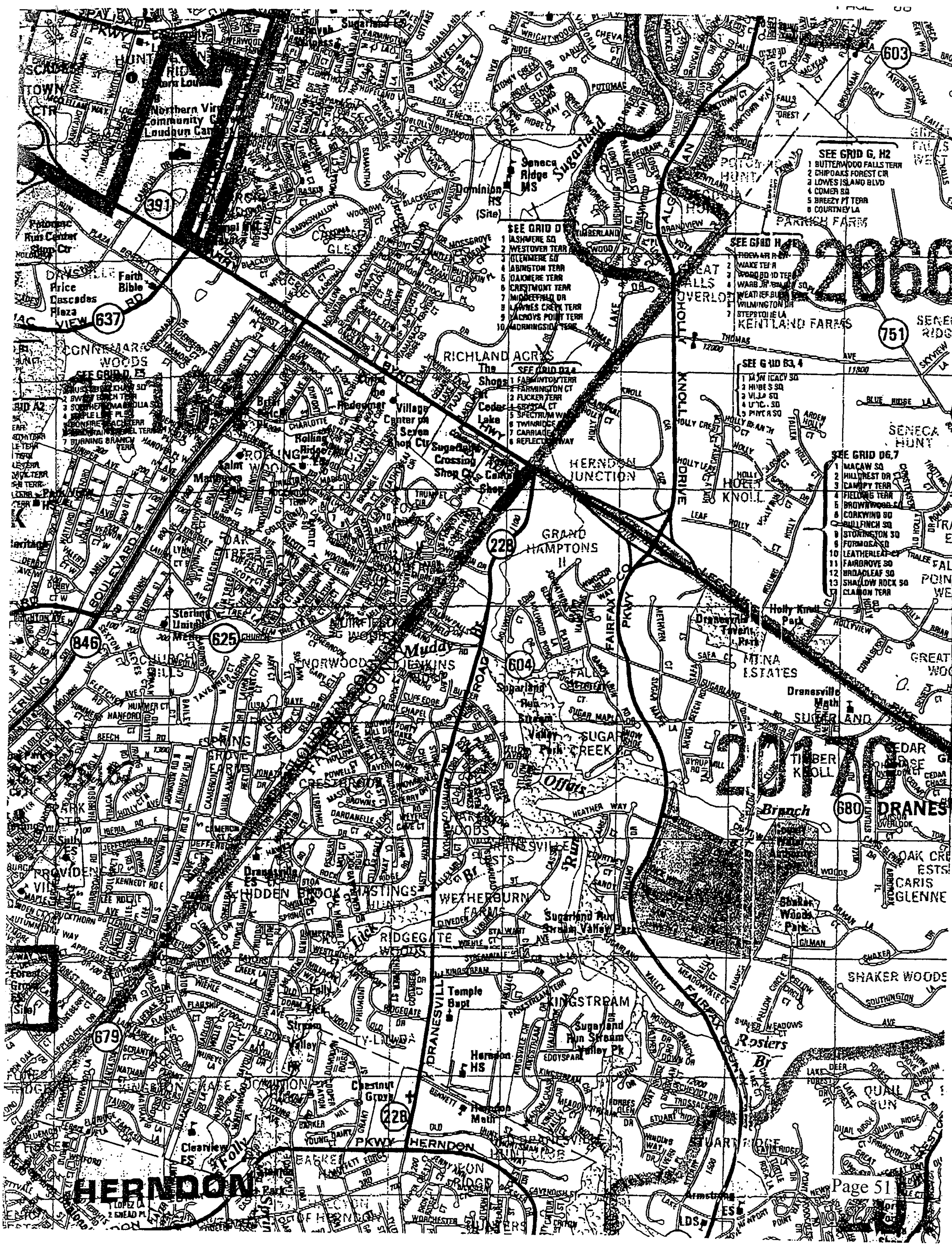
If you have any questions regarding these comments please contact Marie Genovese, Planner in the Department of Planning at (703) 777-0246.

Sincerely,

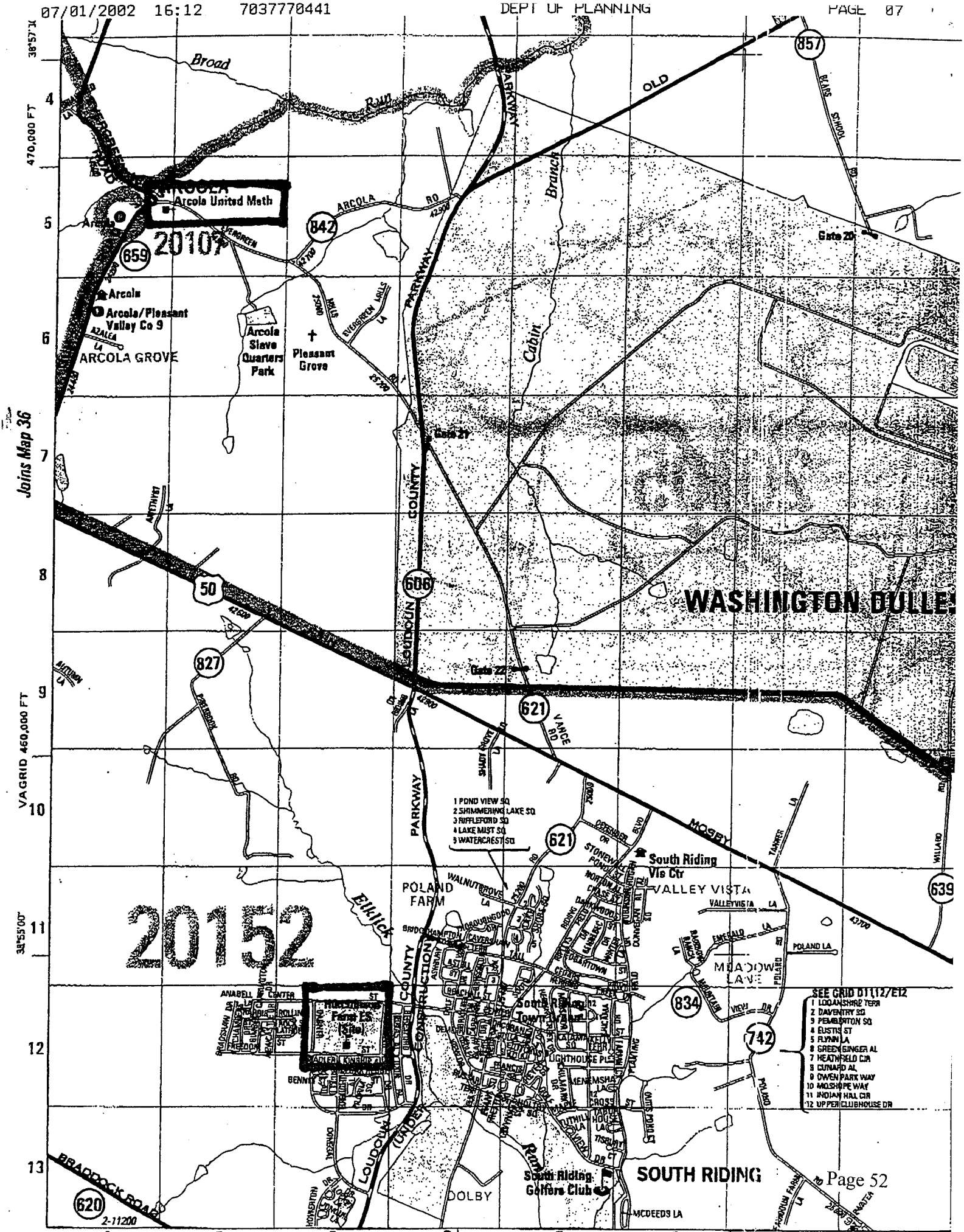
Kirby M. Bowers
County Administrator

cc: Linda Neri, Deputy County Administrator
Julie Pastor, Planning Director
Sarah Coyle, Community Planning Division Manager
Mark Moszak, Environmental and Historic Programs Administrator
Clark Draper, Senior Planner, Community Planning


Dulles
Blue Economy Parking
Economy Parking
Gold Economy Parking
Airport Commissary
WASHINGTON
DULLES ACCESS AND TOLL ROAD
Dulles Lake
Dulles Marriott
Technology
Tollgate
DULLES CORNER PARK
925
Hutchison ES
DULLES TECHNOLOGY CTR
WOODLAND PARK
Taxi Facility
Parking
Tollgate
Signature Flight Support
Main Terminal
International Arrivals Bldg
605
665
Merrybrook Run
Mount Pleasant Bapt
PRESIDENTS PARK
Church of God
657
CENTREVILLE ROAD
Run
SULLY
SEE GRID K6
1 WILLIAM TAFT CT
2 ZACHARY TAYLOR CIR
3 JAMES MONROE CIR
4 LAURA MARK LA
5 COPPER BROOK WAY
6 SPRING MILL LA
Frying Pan Stream Valley Park
SQUIRREL HILL
FRYING PAN
Branch
608
Horsepen Run Stream Valley Park
LOUDOUN COUNTY
FAIRFAX COUNTY
DULLES GATEWAY CTR RENAISSANCE
Floris Cemetery
Frying Pan Park Activities Ctr Blacksmith Shop Equestrian Trail Headrooms
Korean Presb of Washington
MOUNTAIN VIEW PARK
Floris ES
Floris Utd Meth
LORIS DOWNS
MUSTANG CROSSING
Horsepen Run Stream Valley Park
McLAREN ROAD
668
Dulles
DULLES INTERNATIONAL CTR
Rachel Carson MS
Horsepen Run Stream Valley Park
2017
Oak Hill
28
HIGHLAND MEWS
Run
HOXIE
Gate 4A
Gate 4
SEE GRID J6
1 BANNACKER PL
2 ISHAM RANDOLPH DR
3 JAMES MAURY DR
4 GEORGE WYTHE CT
5 NICKLEBACK CT
6 POLLY JEFFERSON WAY
7 PETER JEFFERSON LA
8 MARTHA JEFFERSON PL
645
LEES CORNER
Franklin Farm Pk
Oak Hill ES
Dead Run
763
Smithsonian Natl Air & Space Mus Steven F Udvar-Hazy Ctr (Site)
Sully Plantation
Franklin Farm Village Ctr
Reston
To I-495
To Fairfax
To VA 602
38°57'30"
470,000 FT
38°55'00"
VA GRID 460,000 FT
See ADC's "NORTHERN VIRGINIA STREET MAP" For Continuation



HERNDON
DRANESVILLE
DRANES
SEE GRID G, H2
1 BUTTERWOOD FALLS TERR
2 CHIPOAKS FOREST CIR
3 LOWES ISLAND BLVD
4 COMER SQ
5 BREEZY PT TERR
6 COURTNEY LA
SEE GRID D
1 ASHMERE SQ
2 WESTOVER TERR
3 GLENMERE SQ
4 ABINGTON TERR
5 OAKMERE TERR
6 CRESTMONT TERR
7 MIDDLEFIELD DR
8 LAWNES CREEK TERR
9 LACROYS POINT TERR
10 MORNINGSIDE TERR
SEE GRID D3,4
1 FARMINGTON TERR
2 FARMINGTON CT
3 FLICKER TERR
5 SPECTRUM WAY
6 TWINRIDGE
7 CARRIAGE
8 REFLECTOR WAY
SEE GRID D6,7
1 MACAW SQ
2 HILLCREST DR
3 CANOPY TERR
4 FIELDING TERR
5 BROWNWOOD
6 CORKWING SQ
7 BULLFINCH SQ
9 STONINGTON SQ
10 FORMOSA SQ
11 LEATHERLEAF CT
12 FAIRGROVE SQ
12 BROADLEAF SQ
13 SHALLOW ROCK SQ
13 CLAMON TERR
Seneca Ridge MS
Dominion HS (Site)
Northern Virginia Community College Loudoun Campus
Faith Bible
Price Cascades Plaza
CONNEMARA WOODS
RICHLAND ACRES
The Shops at Cedar Lake
Village Center on Seven Shop Ctr
Sugarland Crossing Shop Ctr
Rolling Ridge ES
HERNDON JUNCTION
HOLLY KNOLL
GRAND HAMPTONS II
Sterling United Meth
CHURCH HILLS
NORWOOD
JENKINS
Sugarland Run Stream Valley Park
SUGAR CREEK
Offutts
Branch
TIMBER KNOLL
Dranesville Meth
MINA ESTATES
Holly Knoll Park
SENECA HUNT
KENTLAND FARMS
PARRISH FARM
CRESTBROOK
Dranesville ES
HIDDEN BROOK
HASTINGS HUNT
WETHERBURN FARMS
RIDGEGATE WOODS
OAK CREEK ESTS
CARIS GLENNE
Shaker Woods Park
SHAKER WOODS
SHAKER MEADOWS
KINGSTREAM
Temple Bapt
Herndon HS
Herndon Meth
Sugarland Run Stream Valley Pk
Chestnut Grove
Clearview ES
QUAIL RUN
STUART RIDGE
Armstrong ES
DRANESVILLE RD
FAIRFAX COUNTY PKWY
SUGARLAND
HERNDON PKWY
Rosters
Br
BLUE RIDGE LA
22066
20170
603
391
637
751
846
625
604
228
680
679



7535 Little River Turnpike, Suite 100
Annandale, Virginia 22003-2937
www.novaregion.org

Voice: 703-642-0700
Fax: 703-642-5077
TDD: 703-642-8061

Northern Virginia Regional Commission

July 3, 2002

Office of Communications, MA-10
Metropolitan Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-60000

Re: Washington Dulles Airport, Tier 2 Draft Environmental Assessment

The Northern Virginia Regional Commission staff has reviewed the document described above and has the following comments.

Please be advised that the counties of Arlington, Fairfax, and Prince William, the City of Alexandria, and the Town of Herndon, have all enacted jurisdiction-wide Chesapeake Bay Resource Management Area (RMA) designation. This RMA designation requires that all development result in a no-net-increase standard for phosphorus loadings, based on the jurisdiction's average imperviousness.

Special attention should be given to post-construction stormwater quality management. The developing agency must adhere to the **post-development** water quality requirements set forth by the Virginia Stormwater Management Regulations (VR 215-02-00 Part IV and §2.3). Meeting the Virginia Stormwater Management Regulations should comply with the requirement that state agencies meet the local ordinances pursuant to the Virginia Chesapeake Bay Act.

Please refer to the *Northern Virginia BMP Handbook* for calculation procedures. A copy of the Handbook is available on NVRC's website, www.novaregion.org.

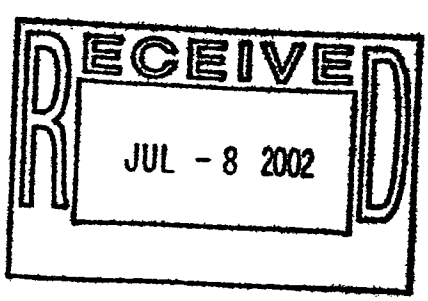
We would also suggest that, where possible, opportunities for retrofit of existing stormwater quantity facilities to stormwater quality facilities through new construction activities should be explored. NVRC's *Guidebook for Maintaining BMPs in Northern Virginia* is available, without charge, should you need it, and can also be downloaded from our website, or call me if you would like to receive a copy to use as a reference.

A photocopy of this letter should be included with your submission to indicate that the review by this agency has been completed.

Your cooperation in the intergovernmental review process is appreciated.

Sincerely yours,

James Van Zee
Director, Regional Planning Services



COMMONWEALTH of VIRGINIA

CHARLES S. MACFARLANE
Director

Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250-2422

V/TDD - (804) 236-3624
FAX - (804) 236-3635

June 8, 2002

Mr. Jonathan Gaffney, Director
Office of Communications, MA-10
Metropolitan Washington Airports Authority
Ronald Reagan Washington National Airport
Washington, D.C. 20001-60001

Re: Washington Dulles International Airport
Environmental Assessment--Tier 2 Concourse and Related Projects

Dear Mr. Gaffney:

The Commonwealth of Virginia supports the continued growth and development of Washington Dulles International Airport (IAD) in order to meet the needs of the flying public. IAD is a recognized economic generator and a catalyst for growth in Northern Virginia. As the principal agency in the Commonwealth charged with the responsibility for airport development, it is our desire to extend favorable support for the earliest approval of the "Tier 2" Concourse Environmental Assessment. We understand the Federal Aviation Administration stands ready to receive the report and complete the review expeditiously.

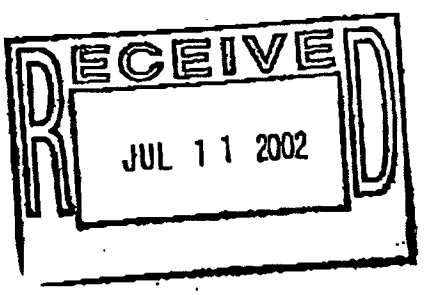
If the Virginia Department of Aviation can be of any assistance please contact Mr. Cliff Burnette, Chief Airport Planner at (804) 236-3632, ext. 106.

Sincerely,

Charles S. Macfarlane
Director

CSM/pcb

c: Mr. Leo Schefer, WATF
Mr. Frank Smigelski, FAA/WADO



Page 1

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

PUBLIC COMMENT FORM

Public Information Session for DRAFT Tier 2 Environmental Assessment/ DRAFT General Conformity Determination/ Section 106 of National Historic Preservation Act

June 17, 2002

Name: Ferman "Dick" Sh[illegible]

Address: 20246 Broad Run Dr.
Sterling, Va. 20165

COMMENTS: [*Attach other sheets of paper if necessary*]

These comments refer to:
☐ DRAFT Tier 2 Environmental Assessment
☐ DRAFT General Conformity Determination
☐ Section 106 of National Historic Preservation Act

1- Since We have A Pond of 57 Acres For Water ([illegible]) Storage. Why Can't this Be Recycled For the A/P use?

2. How much Water is going to Expected For All of this Building?

3. Can the Excavated Soil Stockpiled Be Reused? This 57 Acres is going to Take up A Lot of Good Space

Please mail comments to: Office of Communications, MA-10, Metropolitan Washington Airports Authority, One Aviation Circle, Ronald Reagan Washington National Airport, Washington, DC 20001-6000
Public comments must be received by July 8th at 5:00 PM.

The Draft Tier 2 Environmental Assessment can be found on the MWAA web site at: ***http://www.mwaa.com/dulles/EnvironmentalStudies/index.htm***.

Page 2

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

PUBLIC COMMENT FORM

Public Information Session for DRAFT Tier 2 Environmental Assessment/ DRAFT General Conformity Determination/ Section 106 of National Historic Preservation Act

June 17, 2002

Name: _____

Address: _____

_____

COMMENTS: [*Attach other sheets of paper if necessary*]

These comments refer to:
- ☐ DRAFT Tier 2 Environmental Assessment
- ☐ DRAFT General Conformity Determination
- ☐ Section 106 of National Historic Preservation Act

4. What is going to BE Required For Electric Usage? Where from?

5. Do not See Were We ARE Looking For Passenger Jets or Rockets for 2010 plus. Landing. Bldg.??

6. Will our Roads of Today or The Next 10 years Building, Provide use With enough Usage or For our INCREASE in TRAFFICE Estimated For Future Years.

Please mail comments to: Office of Communications, MA-10, Metropolitan Washington Airports Authority, One Aviation Circle, Ronald Reagan Washington National Airport, Washington, DC 20001-6000

Public comments must be received by July 8th at 5:00 PM.

The Draft Tier 2 Environmental Assessment can be found on the MWAA web site at: ***http://www.mwaa.com/dulles/EnvironmentalStudies/index.htm***.

Sullivan, Thomas

From: Hamilton, Tara
Sent: Wednesday, June 19, 2002 8:32 AM
To: Sullivan, Thomas
Subject: FW: Operations IAD

Here it is for your record too.

-----Original Message-----
From: Malandrino, Paul
Sent: Wednesday, June 19, 2002 6:53 AM
To: Nagelschmidt, Shirley; Hamilton, Tara
Subject: FW: Operations IAD

-----Original Message-----
From: Clarke, Marty
Sent: Tuesday, June 18, 2002 5:54 PM
To: 'rtucker1004@email.msn.com'; Lebegern, William
Cc: Malandrino, Paul; Pitts, Dana; Peed, Charlotte; Grayburn, Charlie
Subject: RE: Operations IAD

Mr. Tucker,

Thank you for your e-mail dated June 18, 2002. I am forwarding your E-mail to Mr. William Lebegren, Manager of our Planning Department, to review your comments. If I may be of any further assistance please advise.

Regards,

Martyn Clarke

OperationsIAD

-----Original Message-----
From: rtucker1004@email.msn.com [mailto:rtucker1004@email.msn.com]
Sent: Tuesday, June 18, 2002 10:27 AM
To: OperationsIAD
Subject: Operations IAD

Below is the result of your feedback form. It was submitted by (rtucker1004@email.msn.com) on Tuesday, June 18, 2002 at 09:26:41

---

email: rtucker1004@email.msn.com

Comments: I read in the news that you are looking for comment about the new underground train between terminals. Here's my comment:
Don't make the mistake DEN did with their train. They failed to leave a pedestrian walkway underground to allow passengers to walk between terminals when the trains break down/stop. As a result, people get stranded in the train stop, it gets dangerously overcrowded while people still come down the escalators, and they miss their flights. ATL has the walkway and it helps a lot. Please don't screw this up! Compare ATL and DEN.
Thanks,
Richard Tucker
A 1 Million Miler :>(

Action: Submit

BUCHANAN
PARTNERS
Developing Values. Building Relationships.

BUCHANAN COMPANIES, LLC
BUCHANAN CONSTRUCTION CO., INC.
BUCHANAN PROPERTIES, LLC

June 27, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sir:

I am writing this letter in support of rapid federal approval of the Environmental Assessment of the Washington Dulles International Airport improvements described as "Tier 2 and Related Projects."

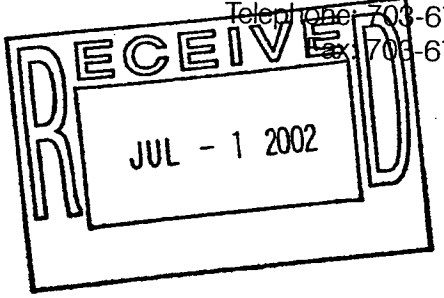
These projects should be constructed as quickly as possible in order help continue the success of air transportation, which is so vitally important to the infrastructure of the National Capital region.

Sincerely,

Robert E. Buchanan

9055 Comprint Court, Suite 200 · Gaithersburg, Maryland 20877 · P: 301.417.0510 · F: 301.417.1594 · www.buchananpartners.com

erkiletian
CONSTRUCTION CORP.
4401 Ford Avenue, Suite 400
Alexandria, Virginia 22302
Telephone: 703-671-4400
Fax: 703-671-0460



June 27, 2002

Office of Communication-MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

RE: Tier 2 and related projects

To Whom It May Concern:

I have served as a Director member of the Washington Airports Task Force. I have also served on Governor Robb and Governor Baliles Advisory Board of Economic Development.

Dulles Airport is a major element to the economic activity and prosperity of our Washington Metropolitan area and other Virginia Airports. Dulles must rank as a world-class airport, with the infrastructure needed through the 21st century.

Constructing the midfield concourse and replacing the antiquated mobile lounges will streamline Dulles to the international stature we wish it to achieve. Please let me know if I can be of further assistance.

Kindest regards,

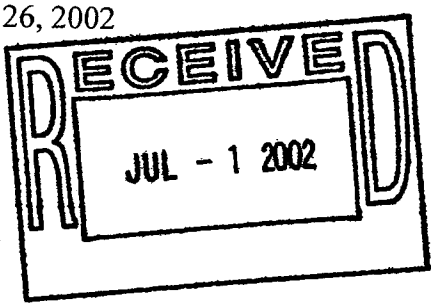
Myron P. Erkiletian

Cc: Leo Schefer

Farms & Acreage, Inc.—Realtors
10401 WHITE GRANITE DRIVE, OAKTON, VIRGINIA 22124
MAIL TO: P.O. BOX 339, OAKTON, VIRGINIA 22124-0339
BROKERS • CONSULTANTS

Area Code 703
Telephone: 591-7020
FAX: 591-7038
EMAIL: farmsacres@aol.com
Verlin W. Smith, President
Guy M. Gravett, Associate Bro

June 26, 2002



Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

To Whom It May Concern:

Congratulations to everyone connected with the proposed improvements at Dulles. These should greatly improve the efficiency and service to the traveling public at Dulles, as well as improve the environment.

The construction of the fourth runway is very timely and will go a long way toward servicing the increasing number of people flying to the area to visit the Smithsonian Air and Space Museum at Dulles, expanding industry in the area, as well as visits to the Nation's Capital and the offices therein.

Keep up your good work.

Sincerely,

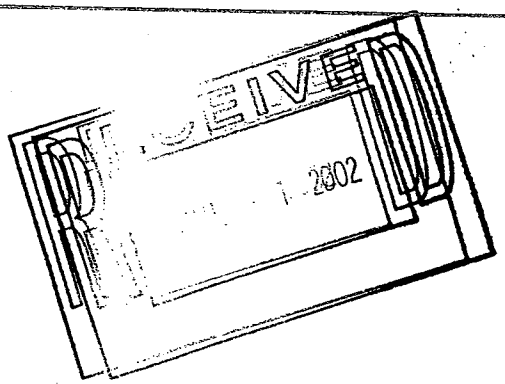
Verlin W. Smith

VWS:ps

Marriott
HOTELS · RESORTS · SUITES

Washington Dulles Airport Marriott
45020 Aviation Drive
Dulles, VA 20166
703-471-9500
Fax 703-661-8714

Washington Dulles Marriott Suites
13101 Worldgate Drive
Herndon, VA 20170
703-709-0400
Fax 703-709-0420



Regan R. Linke
General Manager

June 28, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sir or Madam:

As General Manager of the Washington Dulles Airport Marriott I am writing to let you know of my support for rapid federal approval of the EA for the Tier 2 and related projects at the Washington Dulles International Airport.

I have read the environmental assessment showing that there will be no harmful impact on the environment and no significant impact on the airport neighbors with this project.

Once again I urge your approval of the Tier 2 projects.

Sincerely,

Regan R. Linke
General Manager

RRL/cc

STATEMENT OF RICHARD P. DEI TOS
EXECUTIVE DIRECTOR
METROPOLITAN WASHINGTON AIRLINES COMMITTEE

DRAFT ENVIRONMENTAL ASSESSMENT
TIER 2 AND RELATED PROJECTS AND
FAA DRAFT GENERAL CONFORMITY DETERMINATION

JULY 1, 2002

MY NAME IS RICHARD P. DEI TOS JR. AND I AM EXECUTIVE DIRECTOR OF THE METROPOLITAN WASHINGTON AIRLINES COMMITTEE, WHICH REPRESENTS THE SCHEDULED AIR CARRIERS AT WASHINGTON DULLES INTERNATIONAL AIRPORT. ON BEHALF OF THE MEMBER CARRIERS, (SEE ATTACHED LIST OF CARRIERS), I AM PLEASED TO SUBMIT THE FOLLOWING STATEMENT IN SUPPORT OF THE DRAFT ENVIRONMETAL ASSESSMENT FOR TIER 2 AND RELATED PROJECTS.

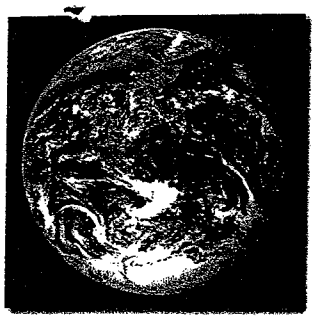
THE CARRIERS HAVE WORKED CLOSELY WITH THE AUTHORITY OVER THE PAST DECADE TO PLAN, DESIGN, FINANCE AND CONSTRUCT BILLIONS OF DOLLARS IN NEW AND IMPROVED FACILITIES AT DULLES. OVER THE PAST TWO YEARS THIS CONTINUED PARTNERSHIP BETWEEN MWAA AND THE CARRIER'S HAS RESULTED IN THE DEVELOPMENT OF THE D2 PROGRAM, WHICH WAS CONCEIVED TO CONTINUE THE EXPANSION AND IMPROVEMENT OF INFRASTRUCTURE NEEDS AT DULLES. THESE 21ST CENTURY FACILITIES ARE NEEDED TO HANDLE THE EXPONENTIAL GROWTH IN BOTH THE RESIDENTIAL AND BUSINESS COMMUNITIES

SURROUNDING DULLES. THIS AIRPORT BEING THE ECONOMIC ENGINE OF NORTHERN VIRGINIA MUST BE IMPROVED AND EXPANDED IN ORDER TO KEEP PACE WITH REGIONAL GROWTH AND TO KEEP THE METRO AREA ECONOMICALLY VIABLE.

WHILE THE EVENTS OF SEPTEMBER 11 HAVE STRAINED THE RESOURCES OF THE AVIATION COMMUNITY, THE FUTURE HEALTH OF THE REGION IS DEPENDENT ON A DULLES AIRPORT THAT CAN HANDLE CONTINUED GROWTH IN OPERATIONS, ACCOMMODATE EXPANDED SECURITY REQUIREMENTS AND FOCUS ON INITIATIVES IN IMPROVING CUSTOMER SERVICE. THE PROJECTS ASSOCIATED WITH THE D2 PROGRAM ACCOMPLISH THESE GOALS. AS THE ONLY AIRPORT EAST OF THE MISSISSIPPI WITH THE CAPACITY TO ADD TWO NEW RUNWAYS WHEN THEY ARE NEEDED AND TO SUPPORT THE ASSOCIATED FUTURE INFRASTRUCTURE NEEDS, IT IS IMPERATIVE THAT THE D2 PROGRAM BE STARTED. WHILE MWAA AND THE CARRIERS HAVE AGREED THAT SOME PROJECTS SHOULD BE DEFERRED BECAUSE OF ECONOMIC CONDITIONS EXPERIENCED DUE TO THE 9/11 TRAGEDIES, WE CONCUR WITH THE ENVIRONMENTAL ASSESSMENT MOVING FORWARD FOR ALL PROPOSED PROJECTS, SO WHEN MARKET CONDITIONS IMPROVE THE CONSTRUCTION CAN PROCEED IN A TIMELY MANNER.

WE BELIEVE THE AUTHORITY HAS DONE A THOROUGH AND COMPLETE JOB IN ADDRESSING THE ENVIRONMENTAL IMPACTS OF TIER 2 AND RELATED PROJECTS. WE CONCUR WITH THE FAA DETERMINATION THAT THE PROJECT COMPLIES WITH THE REQUIREMENTS OF THE GENERAL CONFORMITY RULE OF THE CLEAN AIR ACT, AS WELL AS COMMONWEALTH OF VIRGINIA REGULATIONS. IN ADDITION, WE BELIEVE MWAA HAS DONE AN EXCELLENT JOB IN MITIGATING THE IMPACTS TO HISTORICAL AND ARCHEOLOGICAL AREAS ON AIRPORT PROPERTY. MWAA HAS BEEN IN THE FOREFRONT IN ADDRESSING ENVIRONMENTAL CONCERNS AT BOTH AIRPORTS AND SHOULD BE CONGRATULATED FOR THEIR EFFORTS IN ADDRESSING THE MYRIAD OF ENVRIONMENTAL AND HISTORICAL ISSUES AND REGULATIONS.

ON BEHALF OF ALL THE CARRIERS SERVING WASHINGTON DULLES, WE CONCUR WITH THE MITIGATION MEASURES IN THE DRAFT EIS AND URGE FAA TO REPORT A FINDING OF NO SIGNIFICANT IMPACT (FONSI).



R & L D Consulting Co.

"Where Experience = Success"

June 26, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

To Whom It May Concern:

We would like to encourage in every respect, the approval of the Environmental Assessment for the latest improvements at the Washington Dulles Airport and the beginning of these projects as quickly as possible. The Environmental Assessment for these new Dulles projects reports no environmental problems that cannot be easily mitigated. Please move ahead with these projects with all due speed. We need to keep Dulles moving in a positive direction in providing premium services.

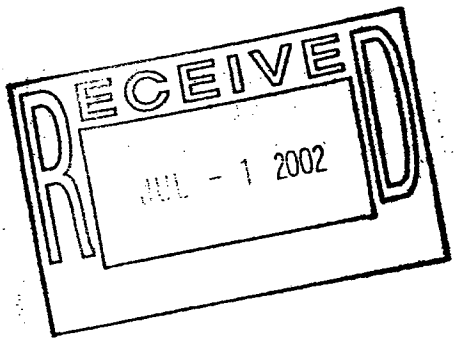
With kindest regards,

Ralph W. Dority

217 N. Lincoln Ave. • Sterling, VA 20164-1903
E-Mail: RWDority@aol.com Web Site: www.wimall.com/rwdority Phone: (703) 444-1754 Fax: (703) 444-4280

S.W. RODGERS Co., Inc.

P.O. Box 398 • 5816 Wellington Road, Gainesville, Virginia 20156 • (703) 754-8100 • Metro 591-8400 • Fax 968-0422



June 27, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

RE: ENVIRONMENTAL ASSESSMENT – WASHINGTON DULLES INTERNATIONAL AIRPORT

Dear Office of Communications:

I am writing this short letter in support of the Airports Authority's Draft Environmental Assessment in hopes that the Airports Authority can move forward with much needed Tier 2 construction projects at Washington Dulles International Airport.

Constructing a new midfield concourse that will replace the existing ***temporary*** C/D Concourse, as well as other vital support facilities, and replacing the Mobile Lounges with an underground, automated people mover system would greatly benefit travelers. Construction of these facilities is vital if we are to maintain the prosperity and quality of life for our region long-term.

Sincerely,
S.W. RODGERS COMPANY, INC.

Roy O. Beckner, Jr.
Director of Business Development

ROB/tac/ROB627

Fredericksburg • 10500 Wakeman Drive, Suite 100, Fredericksburg, Virginia 22407 • (540) 898-2600 • Fax (540) 898-7931
Richmond • Hanover Business Center • 303 B Ashcake Road • Ashland, Virginia 23005 • (804) 752-8300 • Fax (804) 752-6399
REGISTERED VIRGINIA CLASS "A" CONTRACTOR #2701 020132A

The ILEX Group

H. Hollister Cantus
President

11951 Freedom Drive
13th Floor
Reston, VA 20190
Tel: 703-251-4884
Fax: 703-356-4519
e-mail: BJILEX@aol.com

June 26, 2002

Metropolitan Washington Airports Authority
Office of Communications, MA-10
One Aviation Plaza
Reagan National Airport
Washington, DC 20001-6000

Dear Sirs:

I am writing to urge the Authority to take whatever steps are necessary to expedite federal approval of the Environmental Assessment for the so-called Tier 2 and related projects. A new mid-field terminal is absolutely essential in order for Dulles Airport to meet the requirements which its forecasted growth demands. The economy of Northern Virginia is but one segment which will rely on the airport's expansion, effectiveness and appeal – all of which hinge on the airport expansion and modernization plans.

Moreover, while the Mobile Lounges may well appear to be as modern as any Star Wars technology, they are now perceived as though they were the Empire's elephantine land battle cruisers. They have become obsolete and should be dispatched with the same speed as Princess Leah's star fighters dispatched their cinematic counterparts.

We have seen the Dulles Corridor Rail Project suffer a series of bureaucratic delays and resultant cost increases in a period of a restricted economy. The Tier 2 projects must proceed as expeditiously as possible to avoid the same chronological and financial setbacks.

Sincerely,

H. Hollister Cantus

20th Anniversary

Washington Airports Task Force

June 25, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sir:

The Washington Airports Task Force (WATF) recommends rapid approval of the Environmental Assessment of the Washington Dulles International Airport improvements described as "Tier 2 and Related Projects," as well as the construction of these projects in a timely manner.

The WATF is a non-profit, 501(c)(3) Virginia Corporation that works to promote the expansion and enhancement of aviation services for Virginia and the National Capital region. As such, its views represent consumer, civic, and economic interests in a region whose tourism and high tech employment is closely tied to the proficiency of its scheduled air service.

<u>The Tier 2 Construction Will Have a Positive Effect on the Environment and Quality of Life in the National Capital Region</u>

Transportation, and air transportation in particular, is vital infrastructure for the National Capital region. When transportation improvements are not constructed in a timely manner to support planned needs, the delays and inefficiencies that result inevitably have a negative effect upon the environment, the economy and the quality of life of the region. Further, concern for the environment is inevitably linked to, and benefits from, a healthy economy.

There is a wealth of evidence to demonstrate that in today's global market, the National Capital region cannot achieve its economic potential without adequate air service and airport facilities to serve its growing needs. In particular, it is noted that:

- The National Capital region residents generate 2-½ times as much domestic air travel as the national average. The region's residents also are major users of international air travel; 20% of the region's adult population for example have visited Europe within the last three years[1] (Figures 1 & 2).

[1] Scarborough research for the Washington Post

P.O. Box 17349, Washington Dulles International Airport, Washington, D.C. 20041
OFFICE: (703) 572-8714 FAX: (703) 572-8418 E-Mail: watf@washingtonairports.com

- Washington has become the nation's largest technology center over the last 20 years[2], a development that has helped expanded the region's employment by 40% since 1983[3]. These "new economy" employers in the National Capital region have at least a 50%[4] higher demand for air transportation than traditional smokestack industries and they located 68% (see footnote 3) of those new jobs in jurisdictions offering convenient access to Washington Dulles (Figures 3 & 4).
- Surveys have demonstrated that the region's airports are among its most widely used public buildings. Seventy-one percent of the region's adults, for example[5], visit Washington Dulles at least once each year.
- The National Capital region's second largest industry is tourism. Tourism from domestic sources is maturing[6] and most growth is projected to come from overseas, but largely from those markets to which the Capital is connected by direct air service. This places a high tourism priority on the planned Dulles improvements.

Nationwide, the evidence also points to the importance of air service.

- The jet airplane has compressed the time and cost barriers to long distance travel making possible today's global market and rewriting the economic geography of the United States. For example, Dallas, Texas ranked behind Buffalo, New York when DFW was conceived and many major American cities were not in the top 25 when the jet age started – today they are[7].
- An analysis conducted by United States Airports for Better International Air Service (USA-BIAS) some years ago demonstrated that when an American city is linked to a new international market, the direct impact of a new daily flight produces a $265 million to $720 million increase in economic activity. That excludes the ripple effects from the stimulation of new business and other factors[8].
- A study by George Mason University in conjunction with Monash University in Melbourne Australia concluded that when a new international service is introduced between Europe and a U.S. city with a high tech economy, it is equivalent to a commercial investment in the U.S. city worth between $385 million and $1.2 billion, depending on the number of European cities already served from that US airport[9].

The evidence is clear. Air transportation is critical infrastructure for the National Capital region. The construction of the proposed improvements at Washington Dulles in a timely manner is a priority to help the region sustain its economic vitality as well as its concern for the environment.

<u>The National Capital Region is Projected to Sustain High Rates of Growth</u>

The Metropolitan Washington Council of Governments (the region's Metropolitan Planning Organization) projects a 19% increase in employment and a 15% increase in population between the years 2000 and 2010. It is instructive to note that the region sustained a small but steady increase in jobs through the 2001-recessing period[10] (Figures 5 & 6).

---

[2] Dunn & Bradstreet analysis for the Greater Washington Initiative
[3] Metropolitan Washington Council of Governments
[4] SH&E analysis for WATF
[5] DCM survey for WATF
[6] Virginia Tourism Commission
[7] Comparison 1965 and 2000 demographic data
[8] International aviation and the prosperity of American cities in the new economy – USA-BIAS policy paper
[9] Button & Taylor – Journal of Air Transport Management
[10] John McClain, George Mason University, School of Public Policy

For the reasons already stated, this growth will translate into increased air service demand for Origin & Destination travel by residents and visitors. Washington is served through Reagan National as well as Washington Dulles. National is a physically limited downtown facility that cannot be expanded. The policy created originally by the Federal Aviation Administration, sustained by the Metropolitan Washington Airport Authority and cast into law by the U.S. Congress, is to limit National and direct growth to Dulles. That means that Washington Dulles not only serves a strong growing air travel market, but it must also accommodate the growth for both airports, i.e. the growth for a passenger volume of 36 million[11] travelers in 2000, up from 16 million in 1981 when the policy was established.

The FAA recognizes this growth in its own forecast published March 2002. Graph S-1 projects that passenger use of Washington Dulles to the year 2015 will exceed the average annual growth rate of all but six of the nation's 31 large hub airports.

The Expansion of Dulles to Match Demand Will Serve the American People's Ability to Visit Their Capital

As a major gateway to our Nation's Capital, Washington Dulles serves the nation as well as the local region. Sustaining a high standard of airport infrastructure to serve the Capital's needs should thus be a high priority for the Federal Aviation Administration as well as for the region.

The first phase of major capital improvement at Washington Dulles was launched in 1987. In that year, the airport served 9.8 million domestic and 900,000 international passengers. By the year 2000, the airport was serving 15.8 million domestic travelers and 4.2 million international passengers[12].

Local surveys and INS data show that 46.4% of the international passengers are foreign visitors and that 53% of domestic passengers represent citizens visiting their Capital (see footnote 3). These figures demonstrate the importance of the proposed Tier 2 Capital Development to meet the projected demand and that these developments are important for our nation as well as the region.

The Tier 2 Improvements can be Expected to Help the Environment

The Environmental Assessment reports on the broad array of environmental and social concerns and shows that:

1. No major environmental problems should result from the proposed projects.
2. Where there is an environmental impact, it is small and can be mitigated by remedial action.

The areas of major concern to this Task Force are harmony between the airport and its immediate neighbors, air quality, and the visual appearance of the airport. A review of the assessment suggests that these areas of concern have been addressed in an exemplary manner. Specifically:

Air Quality: No significant impact on the region's air quality is projected from the Tier 2 build alternative. The no-build alternative would generate very slightly higher levels of pollution from mobile sources, largely due to the continued operation of diesel-powered mobile lounges. However, the build alternative shows miniscule increases in emissions from fixed sources. Both differences are considered insignificant under Environmental Protection Agency guidelines.

---

[11] Metropolitan Washington Airports Authority airport records
[12] Metropolitan Washington Airports Authority airport records

The National Capital region has generated significant improvements in air quality since 1992 through emission reductions. As a result, the area is in "attainment" for all the national ambient air quality standards except Ozone, for which it is classified as a "serious non-attainment" area. Ozone is formed by the interaction of Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOX).

Actual emissions from Dulles in 2000 were well below the permitted levels. The airport only emitted 30% of its permitted NOX, only 27% of permitted CO, SO2 (Sulfur dioxides) and VOC, and Particulates (PM10) were less than 10% of the permitted level.

To put the airport's emissions into context, pollution from the airport's mobile sources accounted for 5.8% of the NOX, 2.9% of the CO, and 2.6% of the VOC emitted from all mobile sources in Fairfax and Loudoun Counties. Regarding Particulates (PM10), Dulles emitted 23 tons in the year 2000, compared to 2,294 tons by the two counties. Total NOX emissions from Washington Dulles in 2000 were 2,116 tons, compared to 7,500 tons emitted by the Dickerson Power Station in Montgomery County's Agricultural Preserve[13].

Compatible Land Uses: Loudoun and Fairfax Counties have implemented specific policies that restrict land use in areas around the airport in order to:
a) Promote compatibility with airport operations;
b) Provide the counties with the highest and best use of that land in economic and social terms.

The Tier 2 projects are not projected to have a negative effect on the airport's neighbors. As 9 of 10[14] of the homes close to Dulles generate air travel, the projects can be expected to have a positive impact on these neighbors through improved quality of service.

History and Viewsheds: The visual appearance or viewsheds created by public infrastructure are a critical part of the urban environment. The Capital's reputation for good public infrastructure fell into decay after World War II, but has been revived by our airports. The Saarinen terminal is a pleasing landmark recognized worldwide. The terminal, together with the other elements of the original Saarinen master plan, qualify for inclusion in the nation's Register of Historic Places. In their earlier construction at Washington Dulles and in their plans for the Tier 2 construction, the Metropolitan Washington Airports Authority has been meticulous in its respect for the original design and in its determination to ensure that future construction at Washington Dulles follows the same high standards of architectural design, functionality, efficiency and quality exhibited in the original structures. Further the Airports Authority has gone beyond the norm in its efforts to support other historic interests. No adverse impacts with respect to historic artifacts or to visual appearance of the airport are projected.

Conclusion
The Environmental Assessment found no reason why the Tier 2 improvements should not proceed, and the WATF urges the Federal Aviation Administration to approve the document with all speed for the reasons stated above.

Thank you for this opportunity to comment.

Sincerely,

Leo Schefer

Leo Schefer

[13] Federal Energy Commission web site
[14] DCM survey for the WATF

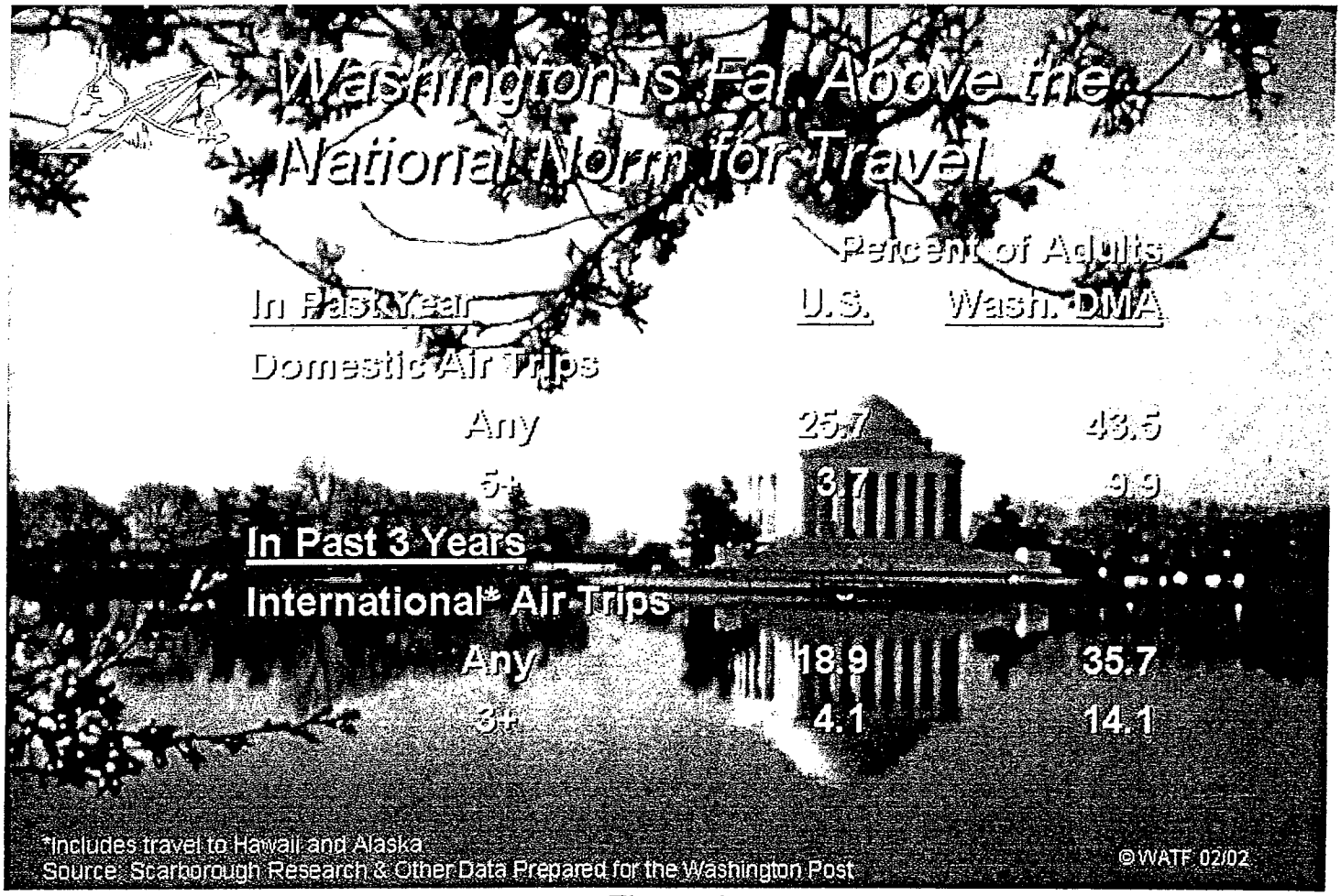

Washington is Far Above the National Norm for Travel
Percent of Adults
In Past Year
U.S.
Wash. DMA
Domestic Air Trips
Any
25.7
43.5
3.7
In Past 3 Years
International* Air Trips
Any
18.9
35.7
4.1
14.1
*Includes travel to Hawaii and Alaska
Source: Scarborough Research & Other Data Prepared for the Washington Post
©WATF 02/02

Figure 2


In the Past 3 Years
Adults from the Washington DMA Visited:
600,560
Hawaii
Mexico
329,610
7.9

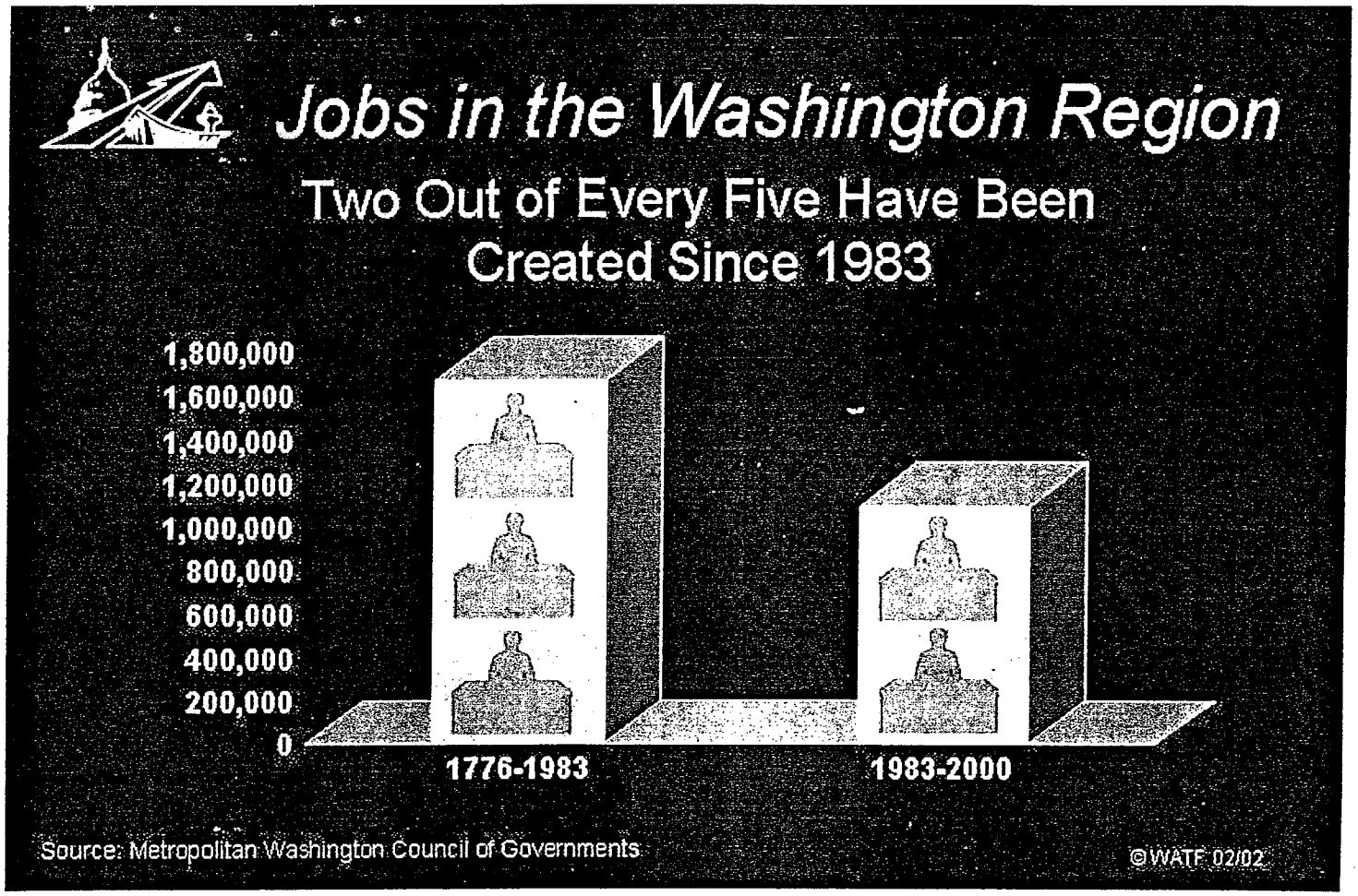

Jobs in the Washington Region
Two Out of Every Five Have Been Created Since 1983
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1776-1983
1983-2000
Source: Metropolitan Washington Council of Governments
©WATF 02/02

Figure 4

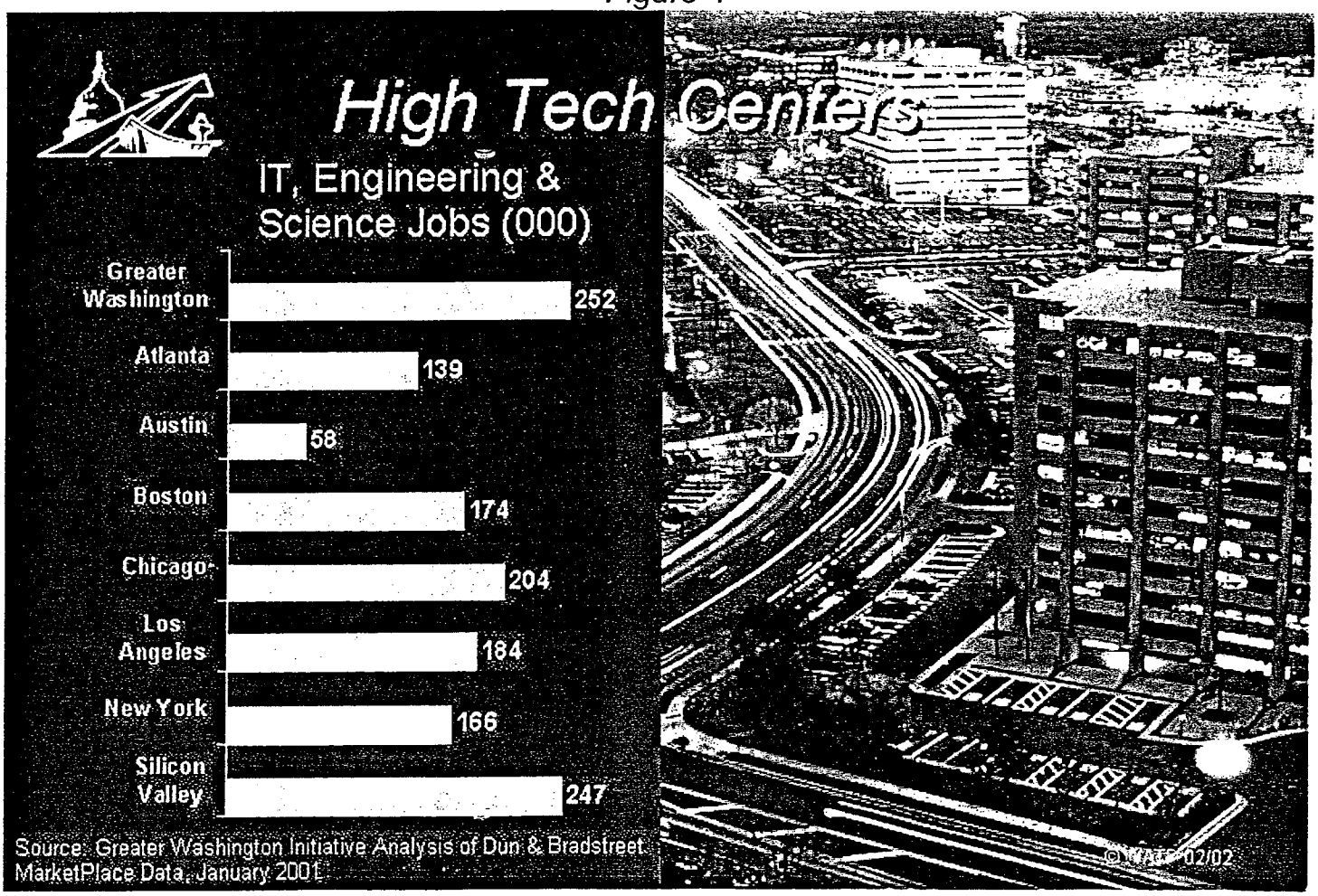
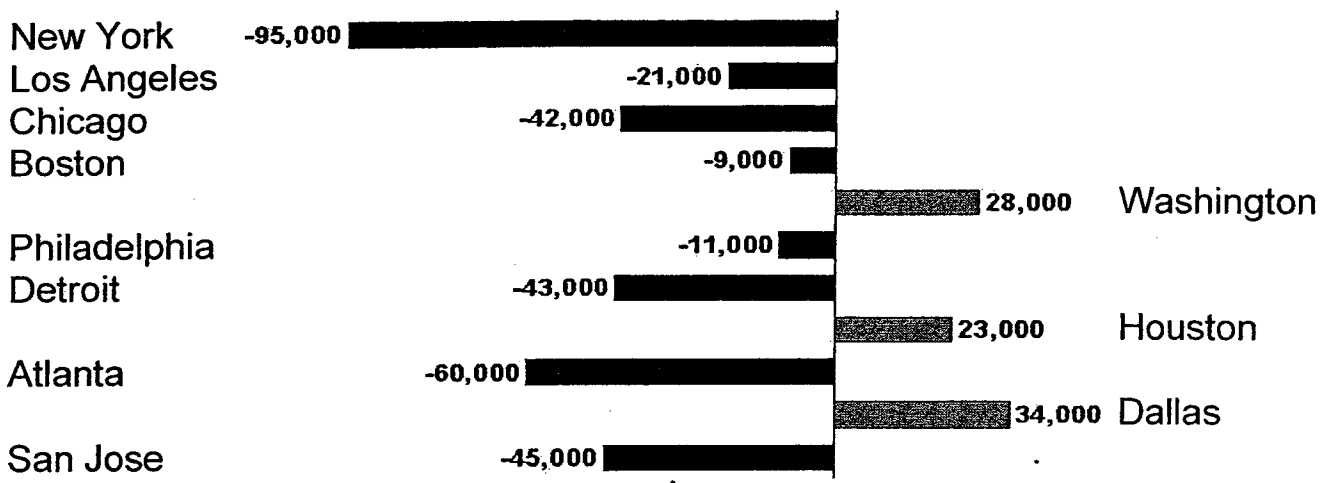

High Tech Centers
IT, Engineering & Science Jobs (000)
Greater Washington 252
Atlanta 139
Austin 58
Boston 174
Chicago 204
Los Angeles 184
New York 166
Silicon Valley 247
Source: Greater Washington Initiative Analysis of Dun & Bradstreet MarketPlace Data, January 2001
©WATF 02/02

Figure 5
MWCOG Growth Projections for National Capital Region

	2000	2010	CHANGE
Households	1,679,200	1,949,100	269,900 or 16.07%
Population	4,450,300	5,106,600	656,300 or 14.75%
Jobs	2,796,600	3,318,300	521,700 or 18.65%

Source: MWCOG Round 6.2 Forecast

Figure 6
Top Ten Job Markets
Job Change Dec. 2000-2001



METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

PUBLIC COMMENT FORM

Public Information Session for DRAFT Tier 2 Environmental Assessment/ DRAFT General Conformity Determination/ Section 106 of National Historic Preservation Act

June 17, 2002

Name: Paul S. Pilecki

Address: 11108 DeVille Estates Drive
Oakton, VA 22124

COMMENTS: [*Attach other sheets of paper if necessary*]
These comments refer to:
- ☒ DRAFT Tier 2 Environmental Assessment
- ☒ DRAFT General Conformity Determination
- ☐ Section 106 of National Historic Preservation Act

Implementation of the proposals will result in more efficient movement of passengers throughout the airport. This will be a big improvement and make the use of IAD more desireable.

Please mail comments to: Office of Communications, MA-10, Metropolitan Washington Airports Authority, One Aviation Circle, Ronald Reagan Washington National Airport, Washington, DC 20001-6000
Public comments must be received by July 8th at 5:00 PM.

The Draft Tier 2 Environmental Assessment can be found on the MWAA web site at: ***http://www.mwaa.com/dulles/EnvironmentalStudies/index.htm***.

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

PUBLIC COMMENT FORM

Public Information Session for DRAFT Tier 2 Environmental Assessment/ DRAFT General Conformity Determination/ Section 106 of National Historic Preservation Act

June 17, 2002

Name: Barbara Pilecki

Address: 11108 DeVille Estates Drive
Oakton, Va. 22124

COMMENTS: [*Attach other sheets of paper if necessary*]

These comments refer to:
- [x] DRAFT Tier 2 Environmental Assessment
- [x] DRAFT General Conformity Determination
- [ ] Section 106 of National Historic Preservation Act

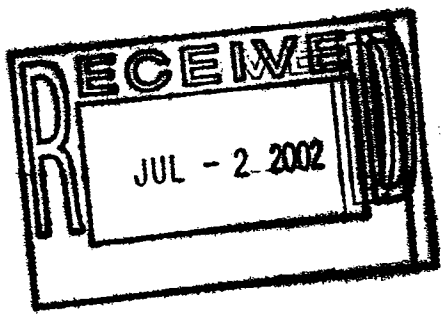
Upon completion, the Dulles Development Program will have a positive impact on the people who use Washington Dulles International Airport. The environmental assessment was interesting and well done.

Please mail comments to: Office of Communications, MA-10, Metropolitan Washington Airports Authority, One Aviation Circle, Ronald Reagan Washington National Airport, Washington, DC 20001-6000

Public comments must be received by July 8th at 5:00 PM.

The Draft Tier 2 Environmental Assessment can be found on the MWAA web site at: ***http://www.mwaa.com/dulles/EnvironmentalStudies/index.htm***.

JACK L. WUERKER
10001 LEAMOORE LANE
VIENNA, VIRGINIA 22181



June 27, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sir:

I support rapid approval of the Environmental Assessment of the Washington Dulles International Airport improvements described as "Tier 2 and Related Projects," as well as the construction of these projects in a timely manner.

I generally agree with and support the comments submitted by Leo Schefer of the Washington Airports Task Force (WATF) in his letter to you dated June 25, 2002. As Mr. Schefer notes, air transportation is a vital component of our region's infrastructure. For our region to continue its economic success, it must have air service and airport facilities adequate to serve its growing needs, thereby making the Dulles projects essential.

The bottom line is that the Environmental Assessment for the new Dulles projects reports no environmental problems that cannot be easily mitigated, the projects are needed and there is no good reason not to expeditiously move ahead with these projects.

Sincerely yours,

Jack L. Wuerker

AIRBUS

ALLAN McARTOR
CHAIRMAN

JUL 3 RECD

July 3, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Gentlemen:

As it relates to Washington-Dulles International Airport, we would like to support the Airports Authority's Draft Environmental Assessment (EA) so construction can begin on a new midfield concourse, other vital support facilities and replacement of the Mobile Lounges with an underground, automated people mover system.

We hope that our support will help accelerate approval of the Environmental Assessment (EA) for the projects that we understand to:

- have no harmful impact on the environment
- are consistent with the long-term objectives of the Airport Master Plan that has been well coordinated with the public since 1985, and
- are designed to "replace and upgrade facilities so that IAD can efficiently service its public".

Sincerely,

Allan McArtor

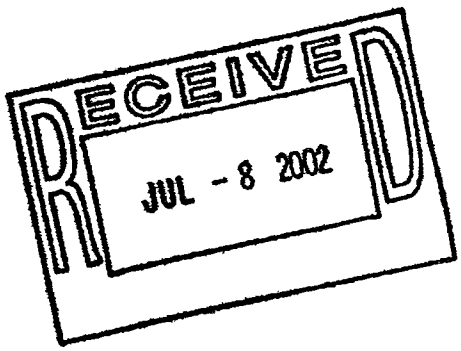
AN EADS JOINT COMPANY
WITH BAE SYSTEMS

AIRBUS NORTH AMERICA
HOLDINGS, INC.

198 VAN BUREN STREET, SUITE 300
HERNDON, VA 20170-5335
PHONE (703) 834-3499
FAX (703) 834-3448
www.airbus.com

THE REGION'S CHAMBER
PRINCE WILLIAM REGIONAL CHAMBER OF COMMERCE
4320 Ridgewood Center Drive, Prince William, Virginia 22192 • Tel. (703) 590-5000 • Fax (703) 590-9815
email: pwrcc@RegionalChamber.org • Internet: www.RegionalChamber.org

July 3, 2002



Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sir or Madam:

This letter is to express the support of the Prince William Regional Chamber of Commerce for the Airports Authority's Draft Environment Assessment for construction projects at Washington Dulles International Airport and the Chamber's support for the federal government's prompt approval of this Environmental Assessment.

The Environmental Assessment reports that proposed construction at Washington Dulles International Airport:

- Will have no harmful impact on the environment,
- Are consistent with the long-term objectives of the Airport Master Plan that has been well coordinated with the public since 1985, and
- Are designed to "replace and upgrade facilities so that Dulles can efficiently service its public."

The Prince William Regional Chamber of Commerce is an organization of 850 businesses located through out Prince William County and the surrounding region. The travel plans of our members, the free flow of products on which they depend, and the quality of life of our entire region is dependent upon an efficient airport system. Many of the planned enhancements at Washington Dulles International Airport are long overdue. The prompt review and approval of the Airports Authority's Draft Environment Assessment by the federal government will make it possible for necessary changes to be made in a timely fashion.

We urge the federal government to approve the Environment Assessment promptly.

Sincerely,

Carol A. Kalbfleisch
Chairman of the Board

Laurie C. Wieder
President

BAE SYSTEMS

June 28, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

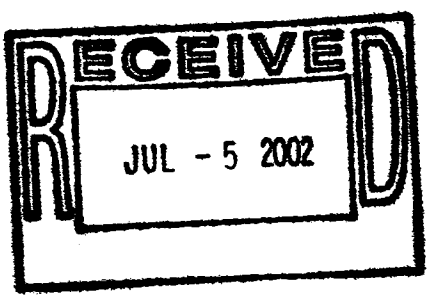
To whom it may concern,

I am writing in support of the Environmental Assessment for the latest improvements at Washington Dulles, and by way of this note seek your expedient approval thereof. The assessment for the new Dulles projects reports no environmental problems that cannot be easily mitigated. I urge you to move ahead with these projects as quickly as possible.

Thank you for your consideration.

Sincerely,

Michael Canzian
Senior Vice President and General Manager
North America Operations
Regional Aircraft, Inc.
BAE SYSTEMS Holdings, Inc.



13850 McLearen Road, Herndon, Virginia 20171 ♦ Telephone (703) 736-1080 Facsimile (703) 736-4305

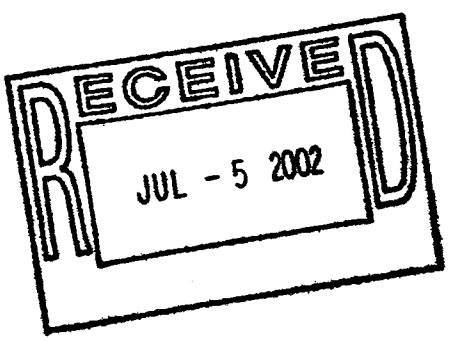
Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

To Whom it May Concern:

I would like to stress the need for rapid federal approval of the Environmental Assessment for the necessary construction of Tier 2 and related projects as well as the underground, automated people mover system. The existing mobile lounges are antiquated and inconvenient at best. It is unfortunate that the main airport for our nation's capital is burdened with the stigma of this irritating and archaic method of transportation.

Sincerely,

H.D. Campbell, Jr., P.E.



M.C. DEAN
BUILDING INTELLIGENCE

3725 Concorde Pkwy
Suite 100
P.O. Box 220870
Chantilly, VA 20153

TEL 703-802-6231
FAX 703-502-0319
www.mcdean.com

June 28, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Re: Environmental Assessment

To Whom It May Concern:

I am writing to express my support for the Airports Authority's Draft Environmental Assessment (EA). I understand this will allow for the progression of the construction projects taking place at Washington Dulles International Airport.

I believe that rapid federal approval is necessary for the "Tier 2 and Related Projects" as the EA has determined that there will be no harmful impacts on the environment, they are consistent of the Airport Master Plan and that the community will benefit from the replacement of the mobile lounges at Dulles Airport.

If you have any questions, please don't hesitate to contact me at 703-802-6231.

Sincerely,

William H. Dean
President

WHD/ldr

To: Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

From: Anthony Honeycutt
115 Eastland Dr.
Charles Town, WV 25414

June 27, 2002

Sir,

I am writing this letter in support of your approval / acceptance of the Airports Authority's Draft Environmental Assessment (EA) evolved with the construction of the new midfield concourse (Tier 2) and the much needed replacement of the Mobile Lounges. These two projects need to move forward at the fastest possible pace.

The new terminal will allow the Washington airport system to flourish and will provide the needed facilities to allow the future to not pass the system by. We in the Washington area are in serious jeopardy if we do not allow our infrastructure to maintain pace with the world outside. The terminal currently being utilized (C/.D) needs to be replaced with a permanent structure which will reflect the forward thinking of those that run and plan for our future aviation needs here in Washington. The additional upgrades to other functions such as support facilities are also vital to our survival of this great aviation facility.

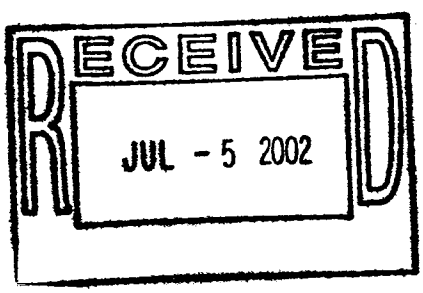
The people movers are a total throw back to a past generation. We are living in the past and those that "rave" about the wonder of them are likewise living in the past. We must complete the new system of moving people without having to put them on a "mobile lounger" to get them from the main terminal to the departure/arrival terminal. The new underground automatic people mover will give our passengers the freedom to move at their own pace, move when they are ready, and above all will remove the problems of breakdowns, mechanical problems, and just poorly run schedules run by our fellow man. We need these "mobile lounges" removed and never again seen here at Dulles.

The environmental portion of this problem is a done deal as per the WATF review and provides "no harmful impact on the environment." They are consistent with the long-term objectives of the airport master plan and above all they will replace and upgrade facilities so that Dulles can efficiently service its public.

Please accept my input as most positive and in support of the EA for the continuation of the progress toward a new and improved Dulles airport, a member of the Washington Airports System.

Very Respectfully,

A.O. Honeycutt



VISTA
CONTRACTING, INC.
1310 Pennsylvania Avenue, SE, Washington, DC 20003 202-543-3180 • fax: 202-543-3164 vista@speakeasy.net

July 1, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, D.C. 20001-6000

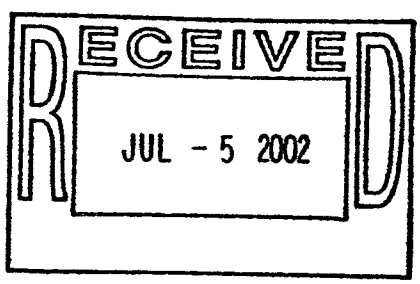
Re: Environmental Assessment for Mobile Lounge and Concourse C and D Replacement

To Whom It May Concern:

Please approve the Environmental Assessment for the latest improvements at Washington Dulles and begin these projects quickly. The Environmental Assessment for the new Dulles Projects reports no environmental problems that cannot be easily mitigated. Please move ahead with these projects.

Sincerely Yours,

Stjepan Sostaric



Dewberry & Davis LLC

ARCHITECTS•ENGINEERS•PLANNERS•SURVEYORS

8401 Arlington Boulevard • Fairfax, Virginia 22031-4666
Voice 703-849-0100 www.dewberry.com

July 3, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington national Airport
Washington, DC 20001-6000

To Whom It May Concern:

I am writing a brief letter in support of the Airports Authority's Draft Environmental Assessment, a process needed as quickly as possible to move forward with much needed construction projects at Dulles International Airport.

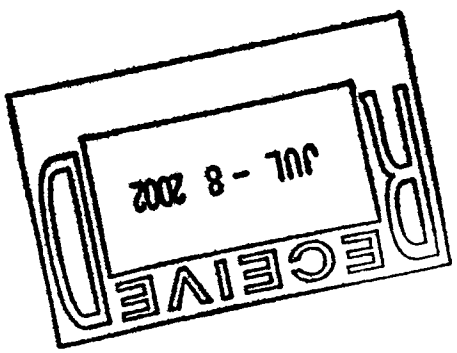
The two most important projects are a new midfield concourse (labeled Tier 2) and replacement of the Mobile Lounges with an underground, automated people mover system; rapid federal approval of the EA's for these is vital to the long-term prosperity, as well as the quality of life for our area.

I urge you to do what you can to get this process rolling forward without delay.

Thank you for your attention to my comments.

Sincerely,

Sidney O. Dewberry
Chairman



George Mason University
Office of the President
(703) 993-8700 fax: (703) 993-8880

TO: **Office of Communications, MA-10**

FAX NO.: **(703) 417-8371**

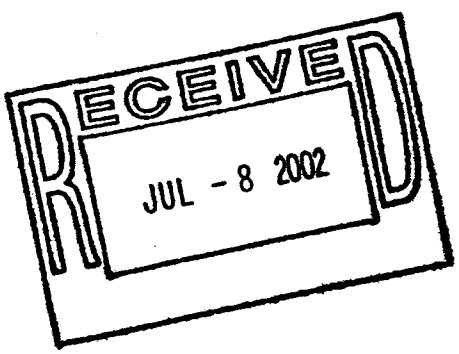
FROM: **Alan G. Merten**

DATE: **May 3, 2002**

SUBJECT: **Support letter re: Dulles Airport**

NO. OF PAGES (including cover): 02

Hard copy will follow in regular mail.



Alan G. Merten
President
Fairfax, Virginia 22030-4444

Office: (703) 993-8700
Fax: (703) 993-8880
E-mail: amerten@gmu.edu

George Mason University

July 8, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sirs:

Rapid federal approval of the Airport Authority's Draft Environmental Assessment (EA) is essential for the improved operations of the airport and its extended benefits to the region. Among the many reasons we have found for the needed improvements, the current operations at Dulles are time consuming for passengers and inconvenient. New underground facilities will make air travel more convenient. Second, the mobile lounges are operated by internal combustion engines so new planned underground people movers will likely reduce overall emissions at the airport thus having a positive air quality impact. In a region where emissions control remains a critical issue, reducing any source of emissions is significant.

Finally, the underground facility will be safer because it removes passengers from the surface part of airport operations thus reducing the possibility of a collision with other surface modes and with airplanes.

We believe that the planned improvements at Dulles are in the best interest of the public and the region and pose no, but in fact reduce, hazards to the community and to the traveling public.

Sincerely,

Alan G. Merten

Alan G. Merten

AGM: th

Alan G. Merten
President
Fairfax, Virginia 22030-4444

Office: (703) 993-8700
Fax: (703) 993-8880
E-mail: amerten@gmu.edu

George Mason University

July 8, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Sirs:

Rapid federal approval of the Airport Authority's Draft Environmental Assessment (EA) is essential for the improved operations of the airport and its extended benefits to the region. Among the many reasons we have found for the needed improvements, the current operations at Dulles are time consuming for passengers and inconvenient. New underground facilities will make air travel more convenient. Second, the mobile lounges are operated by internal combustion engines so new planned underground people movers will likely reduce overall emissions at the airport thus having a positive air quality impact. In a region where emissions control remains a critical issue, reducing any source of emissions is significant.

Finally, the underground facility will be safer because it removes passengers from the surface part of airport operations thus reducing the possibility of a collision with other surface modes and with airplanes.

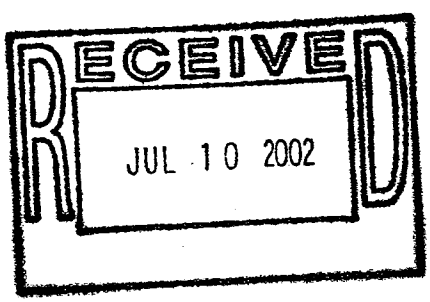
We believe that the planned improvements at Dulles are in the best interest of the public and the region and pose no, but in fact reduce, hazards to the community and to the traveling public.

Sincerely,

Alan G. Merten

Alan G. Merten

AGM: th



HOUSEHOLD GOODS FORWARDERS ASSOCIATION OF AMERICA, INC.®

2320 MILL ROAD, SUITE 102, ALEXANDRIA, VIRGINIA 22314-4679
TELEPHONE (703) 684-3780 FAX (703) 684-3784
E-MAIL: hhgfaa@aol.com WEB: http://www.hhgfaa.org

July 1, 2002

Office of Communications, MA-10

Metropolitan Washington Airports Authority

One Aviation Circle

Ronald Reagan Washington National Airport

Washington, DC 20001-6000

To Whom It May Concern;

Our organization would like to go on record in support for rapid Federal approval of MWAA's " Draft Environment Assessment for the Tier 2 and Related Projects" (EA) at Washington Dulles International Airport.

We believe that these improvements and projects are necessary to replace and upgrade IAD's existing facilities in order to properly position the airport to service both the current and future needs of air travelers utilizing Washington Dulles International.

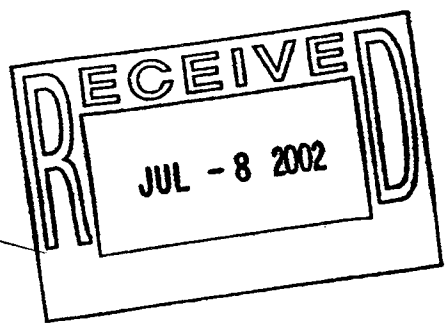
It is our understanding that the proposed projects are consistent with the Airport Master Plan and its long term objectives.

Further, we believe that the Tier 2 projects do not create any harmful impact on the environment.

We urge the prompt approval of the EA.

Sincerely,
Household Goods Forwarders
Association of America, Inc.

Terry R. Head
President



McINTYRE HARBIN & KING LLP
ONE MASSACHUSETTS AVENUE N.W., SUITE 350
WASHINGTON, D.C. 20001-1401
TEL: 202.408.2770
FAX: 202.408.2777

FACSIMILE TRANSMITTAL SHEET

TO: Jonathan J. Gaffney	FROM: Cellerino C. Bernardino
COMPANY: NWAA	DATE: 7/8/2002
FAX NUMBER: 703-417-8371	TOTAL NO. OF PAGES INCLUDING COVER: 2
PHONE NUMBER: 703-417-8745	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

☑ URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

July 7, 2002

Cellerino C. Bernardino
1726 5th Street N.W.
Washington, D.C. 20001

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan National Airport
Washington, DC 20001-6000

To Whom It May Concern:

I am writing in support of rapid federal approval of the Environmental Assessment (EA) for the "Tier 2 and related projects". Timely construction of the new facilities addressed in the EA is critical to the long term prosperity and quality of life of the Greater Washington region. Vital projects include replacement of the outmoded and inefficient Mobile Lounges with the planned underground automated people mover (APM) system, and construction of a new midfield concourse to replace the temporary C/D concourse.

The EA found no harmful impact on the environment. It also confirmed that the proposed improvements are consistent with the long-term objectives of the Airport Master Plan, and that they are designed to replace and upgrade facilities to provide better service to air travelers.

Given the importance of these improvements and of Dulles Airport to the region, and the very positive EA, I can see no reasons to delay approval.

Sincerely,

C Bernardino

Cellerino C. Bernardino

Smithsonian
National Air and Space Museum

Office of the Director

July 8, 2002

Mr. Frank Smigelski
Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Dear Mr. Smigelski:

The National Air and Space Museum fully supports the need for rapid federal approval of the Airports Authority's Draft Environmental Assessment (EA). As the new Steven F. Udvar-Hazy Center of the Museum is a tenant of the Authority, we have a strong interest in the future prosperity and efficiency of the Washington Dulles Airport. This efficiency will be greatly enhanced by the construction of a new Tier 2 that will replace the existing temporary C/D concourse, as well as other vital support facilities, and the replacement of the Mobile Lounges with an underground, automated people mover system.

We strongly urge that the EA be approved as soon as possible so these vital construction projects can move forward without delay.

Sincerely,

J. R. Dailey
Director

SMITHSONIAN INSTITUTION
National Air and Space Museum
Independence Avenue at Sixth Street SW
Washington DC 20560-0310
202.357.1745 Telephone
202.357.2426 Fax

Committee for Dulles

July 8, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Re: "TIER2 and Related Projects" Environmental Assessment

The Committee for Dulles would like to express its full support of the "TIER2 and Related Projects" Environmental Assessment. The Committee for Dulles feels that the construction of a midfield concourse and the underground automated people mover (APM) system are vital for Dulles Airport to reach its ultimate potential.

We urge the expeditious approval and construction of these facilities.

Sincerely

John M. Harris

John M. Harris
President

Washington Dulles International Airport → P.O. Box 16053 → Washington, DC 20041 → 703-803-6800
Fax 703-803-8961 → E-mail info@committeefordulles.org → Web site http://www.committeefordulles.org

VIRGINIA
CHAMBER OF COMMERCE
Business Leadership for Virginia's Future

July 3, 2002

Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, D.C. 20001-6000

Re: Environmental Assessment

Dear Sir:

This is to inform you that the Virginia Chamber of Commerce is in full support of MWAA's Draft Environmental Assessment (EA) and to express our hope for rapid federal approval of the EA. Doing so will permit timely construction of the Tier 2 and related projects so essential to the future efficiency of the airport. It is our understanding that the proposed projects have no negative environmental impacts and are fully consistent with the long-term objectives of the Airport Master Plan.

On behalf of the Virginia Chamber of Commerce, thank you for the opportunity to share these thoughts with you. The Virginia business community is grateful for your efforts in support of efficient air transportation in our Commonwealth.

Sincerely,

Hugh D. Keogh
President

Cc: Leo Schefer, Washington Airports Task Force

9 South Fifth Street • Richmond, Virginia 23219 • 804-644-1607 • Fax 804-783-6112 • www.vachamber.com

WORLD RESOURCES COMPANY

1600 Anderson Road
McLean, Virginia 22102

Tel: 703.734.9800
Fax: 703.790.7245

July 8, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Re: Approval of Environmental Assessment for Tier 2 Construction Improvements at Washington Dulles International Airport

Dear Sir:

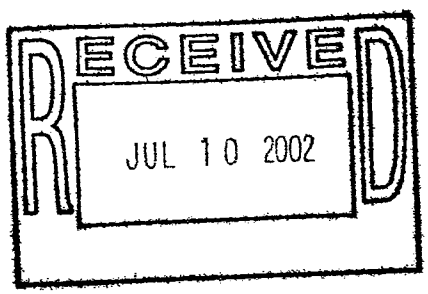
Please approve the Environmental Assessment for the latest improvement at Washington Dulles so these important projects can move ahead quickly. The Environmental Assessment for the new Dulles projects reports no environmental problems that cannot be easily mitigated.

Thank you for your attention to this matter.

Very truly yours,

WORLD RESOURCES COMPANY

Irwin A. Abt
Senior Vice President



Marriott International, Inc.
Sales & Marketing

Marriott Drive
Washington, D.C. 20058

John W. Marriott III
Executive Vice President
Sales & Marketing
301/380-1253
301/380-2512 Fax

June 27, 2002

Office of Communications MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, D.C. 20001-6000

Dear Sir:

Please approve the Environmental Assessment for the latest improvements at Washington Dulles and begin these projects quickly.

Thank you.

Sincerely,

John Marriott

DREAMLABS

July 17, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Re: Approval of Environmental Assessment for Tier 2 Construction Improvements at Washington Dulles International Airport

Dear Sir:

Please approve the Environmental Assessment for the latest improvement at Washington Dulles so these important projects can move ahead quickly. The Environmental Assessment for the new Dulles projects reports no environmental problems that cannot be easily mitigated.

Thank you for your attention to this matter.

Very truly yours,

Stasia MacLane
Managing Director
DreamLabs

7600 COLSHIRE DRIVE
SUITE 210
MCLEAN, VA 22102

T 703.356.0080
F 703.356.3166

www.dream-labs.com

TEQCORNER

OFFICE SPACE FROM CONCEPT TO COMPANY

July 17, 2002

Office of Communications, MA-10
Metropolitan Washington Airports Authority
One Aviation Circle
Ronald Reagan Washington National Airport
Washington, DC 20001-6000

Re: Approval of Environmental Assessment for Tier 2 Construction Improvements at Washington Dulles International Airport

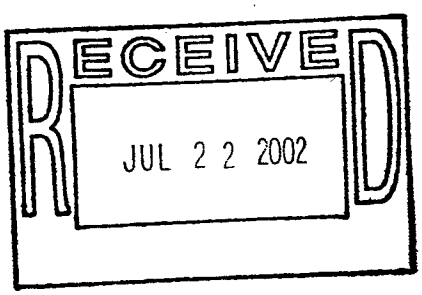
Dear Sir:

Please approve the Environmental Assessment for the latest improvement at Washington Dulles so these important projects can move ahead quickly. The Environmental Assessment for the new Dulles projects reports no environmental problems that cannot be easily mitigated.

Thank you for your attention to this matter.

Very truly yours,

Trey Hiller
Managing Director
Teqcorner



1616 ANDERSON ROAD MCLEAN, VIRGINIA 22102
T 703-714-6171 F 703-356-3166 WWW.TEQCORNER.COM

APPENDIX J.3

RESPONSE TO SPECIFIC COMMENTS

J.3.1 Response to Agency Comments

The Department of Environmental Quality (DEQ) provided a compilation of comments on behalf of the Commonwealth in a letter dated July 8, 2002 (Ellie L. Irons) . The comments of the following agencies, planning district commissions, and localities were represented in DEQ's letter:

Virginia Department of Environmental Quality (DEQ)
Virginia Department of Conservation and Recreation (CDR)
Virginia Department of Game and Inland Fisheries (DGIF)
Virginia Department of Agriculture and Consumer Services
Virginia Department of Transportation
Virginia Marine Resources Commission
Virginia Chesapeake Bay Local Assistance Department
Virginia Department of Health
Virginia Department of Mines, Minerals and Energy
Virginia Department of Forestry (DOF)
Virginia Institute of Marine Science
Fairfax County
Loudoun County

This document provides a description of how the comments of the above agencies and those of the Northern Virginia Regional Commission have been addressed in the *Final Environmental Assessment for Tier 2 and Related Projects* or provides clarification of how the issue was addressed in the planning process for these projects. The comments are addressed in the order they were presented in DEQ's letter.

Environmental Impacts and Mitigation

Item #1. Wetlands and Water Quality

Summary of Comment: DEQ requested demonstration that the impact to wetlands is unavoidable and has been minimized to the extent possible.

Response: The Authority addressed wetland avoidance and minimization in the alternatives analysis as presented in Attachment 4 of the Joint Permit Application for Activities in Waters and Wetlands of the Commonwealth of Virginia for Tier 2 and Related Projects (JPA). The complete text of this analysis has been included as Appendix I-2 in the Final Environmental Assessment.

Summary of Comment: DEQ also identified several practices it encourages to minimize impacts to wetlands and waterways during construction.

Response: Section 4.24 regarding impacts during construction has been amended to reflect the Authority's commitment to adhering to the provisions of the permit conditions of the JPA as well as the *Virginia Erosion and Sediment Control Handbook.*

Item #2. Chesapeake Bay Preservation Area

Summary of Comment: DEQ questioned the Authority's interpretation that it is exempt from Fairfax County's Chesapeake Bay Preservation Ordinance, which implements coastal zone management. DEQ stated that if the project is not designed to be consistent with the performance criteria of the County's Ordinance, it will not be consistent with Virginia's Coastal Program.

Response: Sections 3.13 and 4.14 of the Final EA have been revised to make them consistent with the performance criteria of Fairfax County's Chesapeake Bay Preservation Ordinance and responsive to DEQ's other comments concerning Virginia's Coastal Resources Management Program. Stormwater management facilities for proposed project work within Fairfax County will be designed to meet the pollutant reduction performance criteria specified in Section 6-0401 of the Fairfax County Public Facilities Manual which implements the Fairfax County Chesapeake Bay Preservation Ordinance as part of VCP. Section 4.6.1 of the Final EA addresses the stormwater management standards applicable to development within the Occoquan River watershed. These are discussed further in Section 4.14.

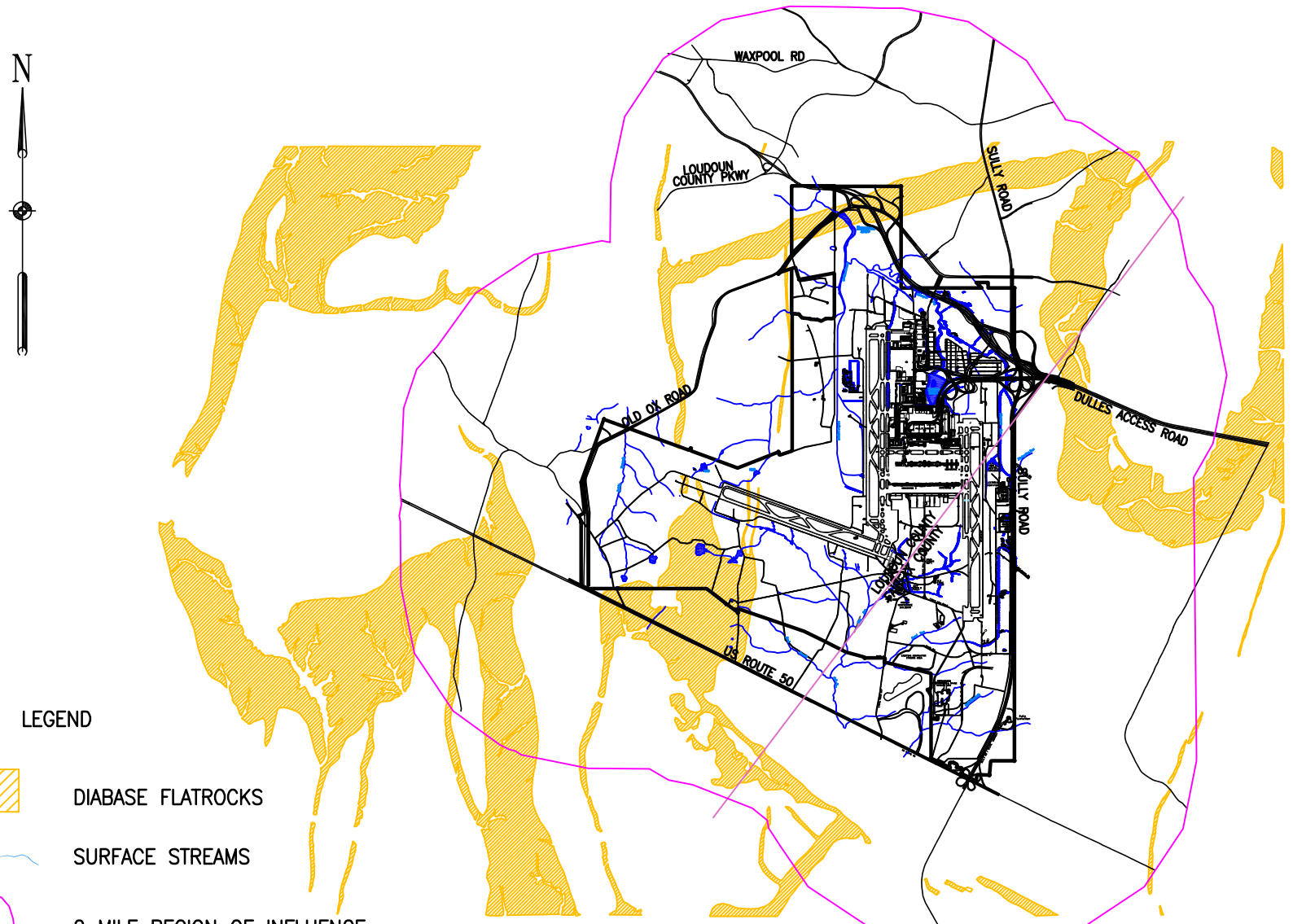
The 1998 Federal Agencies' Chesapeake Ecosystem Unified Plan and the U.S. Department of Transportation's commitments under that plan are acknowledged by reference in Table 1-7.

The applicability of local law to the Authority is a complex legal issue. The Authority's commitment to meet DEQ's requirement for consistency with Fairfax County's Chesapeake Bay Preservation Ordinance is not to be construed as accepting the authority of Fairfax County to compel such action by the Authority. Nevertheless, the Authority acknowledges that it is bound by the terms of the Final EA.

Item #3. Natural Heritage Resources

Summary of Comment: DCR indicated that according to the information currently in its files, natural heritage resources have not been documented at the project site. However, several rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades, may occur at this location if suitable habitat is present. DCR further noted that the survey for species was conducted during June and July of 2001, which is within the survey window for hairy beardtongue; however, the prime observation period for other associated diabase species (earleaf foxglove, white heath aster, and stiff goldenrod) is September through October and DCR recommended an additional survey be conducted during the appropriate time for these species.

Response: The Authority further evaluated the occurrence of potential diabase glade habitat on the Dulles Airport property. The Virginia Geological Survey Maps for the Herndon and Arcola Quadrangles were reviewed and the occurrence of diabase flatrocks in those survey areas is shown on Figure J-1, which follows. As shown on the figure, there are no potential diabase glade habitat areas within the Tier 2 and related projects study area. Therefore, the species noted above are not expected to occur within the project area. However, the Authority is planning to conduct a survey in September-October 2002. If these species are found, the Authority is committed to coordinating with DCR and will explore the possibility of transplanting specimens of affected species to suitable offsite habitat. As shown on Figure J-1, potential for diabase glade habitat is more prevalent in areas neighboring the IAD property. Sections 3.6.1, 3.10, and 4.11 have been amended to provide additional discussion of diabase glades and associated species. The Authority notes that the species addressed above, including the hairy beardtongue, are listed as rare and are not subject to protection by statute.



SOURCE: ARCOLA GEOLOGIC QUADRANGLE MAP BY K. Y. LEE 1978
HERNDON GEOLOGIC QUADRANGLE MAP BY RICHARD E. EGGLETON 1975

FILE: Q:\PROJECTS\1384001\FINALEA\FIGJ-1.DWG

TIER 2 & RELATED PROJECTS
ENVIRONMENTAL ASSESSMENT
WASHINGTON DULLES INTERNATIONAL AIRPORT
LOUDOUN & FAIRFAX COUNTIES, VIRGINIA

DISTRIBUTION OF DIABASE
FLATROCK IN THE VICINITY OF
DULLES INTERNATIONAL AIRPORT

DRAWN BY	DATE	PROJECT NO.
WCM	8-5-02	13840.01
CHECKED BY	SCALE	FIGURE
–	AS SHOWN	J-1

Summary of Comment: In addition, DCR has documented the presence of the Yellow Lance (*Elliptio lannceolata,* G2G3/S2S3/NF/SC) and the Wood Turtle (*Clemmys insculpta*, G4/S2/NF/LT) downstream of the project site and requests assurance of protection of downstream water quality.

Response: The Authority reaffirms its commitment of implementation to erosion and sediment control measures (Section 4.24) to minimize adverse impacts to the aquatic ecosystem as recommended by both DCR and DGIF.

Item #4. Wildlife Resources

Summary of Comment: DGIF recommended that the Authority avoid and minimize impacts to wetlands and streams to the fullest extent practicable and also recommended mitigating for unavoidable impacts to stream at a minimum of a 1:1 ratio on a per linear-foot basis.

Response: Wetland avoidance and minimization are addressed in the alternatives analysis as presented in Attachment 4 of the Joint Permit Application for Activities in Waters and Wetlands of the Commonwealth of Virginia for Tier 2 and Related Projects (JPA). The complete text of this analysis has been included as Appendix I-2 in the Final Environmental Assessment. Section 4.12 has been revised to incorporate the recommended mitigation strategy.

Summary of Comment: DEQ also identified several practices it encourages to minimize impacts to wetlands and waterways during construction.

Response: Section 4.24 regarding impacts during construction has been amended to reflect the Authority's commitment to adhering to the provisions of the permit conditions of the JPA as well as the *Virginia Erosion and Sediment Control Handbook.*

Item #5. Non-Point Source Pollution Control

Summary of Comment: Federal agencies are responsible for ensuring compliance with the state program on regulated activities under their authority through separate agreements with contractors, training, field inspection, enforcement action, or other means that are consistent with agency policy and federal and state mandates.

Response: The Authority requires any project that involves excavation, landfilling or disturbance of the existing ground to have erosion and sediment control measures in accordance with the Virginia Erosion and Sediment Control Law and General Criteria, including the *Virginia Erosion and Sediment Control Handbook*. The Authority's program is administered by individuals who are certified by DCR as Program Administrators, Inspectors and Plan Reviewers.

Item #6. Air Quality

Summary of Comment: DEQ notes that during construction, fugitive dust must be kept at a minimum by using applicable control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution.

Response: The Draft EA acknowledged that water suppression and other BMPs will be employed during construction to minimize fugitive dust. Compliance with the provisions of the cited regulations has been affirmed in Section 4.24.

Summary of Comment: Since this project is located in an ozone nonattainment area, DEQ recommended that precautionary measures be employed to reduce ground-level ozone concentrations especially during the ozone alert days.

Response: The Draft EA provided an estimate of projected construction-related emissions and summarized discussions with the Virginia DEQ and Metropolitan Washington Council of Governments (COG) which resulted in the confirmation that the construction emissions were within the budget of the State Implementation Plan. Construction industry practice is to plan projects to minimize the construction equipment required for a specific project and the duration of its operation in order to control costs. The associated benefit is the minimization of NOx and VOC emission generation.

Item #7. Solid and Hazardous Wastes

Summary of Comment: The DEQ-Office of Remedial Program did a review of its data files and did not find any sites that might impact this project.

Response: Text acknowledging this has been added to Section 3.20.2. Solid waste, hazardous waste, and hazardous materials will be managed in accordance with all applicable federal, state, and local environmental regulations as acknowledged in Table 1-7.

Item #8. Wild and Scenic Rivers

Summary of Comment: The Department of Conservation and Recreation determined that the proposed action is not anticipated to have any adverse impacts on existing or planned recreational facilities and noted that the project will also not impact any streams on the National Park Service's Nationwide Inventory, Final List of Rivers, potential Scenic Rivers or existing or potential State Scenic Byways.

Response: Text has been added to Section 4.16 acknowledging these findings.

Item #9. Historic Structures and Archaeological Resources

Summary of Comment: The DEQ comment acknowledges that there is no impact to these resources and that the Statement of Concurrence from the DHR was sent to the Authority in March of 2002.

Response: The Statement of Concurrence is included in Appendix D of the EA.

Item #10. Pollution Prevention

Summary of Comment: The Department of Environmental Quality advocates that principles of pollution prevention be used in all construction projects offers some specific recommendations.

Response: The Authority acknowledges its commitment to DEQ's goals and notes the measures that it has taken to achieve those goals:

- The Authority has in place a Stormwater Pollution Prevention Plan under its VPDES permit that includes all major tenants as co-permittees. Any construction project that disturbs 10,000 square feet or more must have its own Stormwater Pollution Prevention Plan.
- Systems are in place to ensure that environmental compliance inspection and monitoring are performed as required by both state and Authority permit programs.

- The Authority's sediment and erosion control program is being certified by the Virginia Department of Conservation and Recreation, and includes staff certified by DCR as program managers, inspectors and plan reviewers.
- The Authority has an active recycling program as noted in Sections 4.21 and 4.24.
- Although it has not adopted a formal Environmental Management System as advocated by VDEQ, the Authority is familiar with the Virginia program and continues to review program materials as they are distributed by VDEQ.

Item #11. Forest Protection

Summary of Comment: The Department of Forestry (DOF) has expressed concern regarding the use of 90 acres of forested land for stockpiling of soil associated with the projects. The Department requested a thorough evaluation of alternatives relating to the treatment of soil displaced through construction.

Response: The soil stockpile site was farmland at the time the property was purchased for the Airport. Following the purchase, white pine were planted to create a site buffer approximately 40 years ago. The proposed soil stockpile site is primarily pine plantation with an understory of invasive species including multiflora rose, Japanese honeysuckle, and *Rubus* spp.

The factors that the Authority considered in the process of developing the soil management strategy for the development program are summarized below:

- Soil stockpile site selection criteria included the following considerations
  - avoidance of wetlands
  - avoidance of areas planned for development during the period of stockpiling
  - proximity to source of excavated material, taking into account potential haul routes and security requirements—because the excavation sites are within the secure areas of the airport, the preferred stockpile site should allow access without the need to exit and re-enter the secure area.
  - proximity to potential sites for reuse of stockpiled material
  - height restrictions related to aviation safety
- Use of existing cleared areas on airport property for stockpiling future excess excavation was considered but found not to be viable. Existing cleared areas are either (1) developed, (2) planned for near-term development, (3) already in use for stockpiling and nearing capacity, (4) in use for construction staging, (4) required to be kept clear of obstacles for reasons of aviation safety, (5) not large enough to be practical, or (6) too far away from the excavation and reuse sites.
- Off-airport stockpiling is not viable because the Authority does not own such land.
- The alternative of hauling excess excavation for disposal off-site and purchasing fill for future projects would cost at least $30 million more than the cost of using the proposed soil stockpile site. This does not include costs related to security screening for trucks re-entering the airfield.
- Because of the longer haul distance, offsite disposal and importing of fill would increase dump truck tailpipe emissions relative to on-airport stockpiling.
- In summary, there are no practical alternatives for the management of excess excavated material that do not involve use of forested land on Dulles property.

Summary of Comment: DOF recommends marking of trees selected for protection and measures to protect their root systems.

Response: The limit of disturbance will be clearly marked in accordance with the soil and erosion plan, and as stated in the EA, the site will be revegetated at the conclusion of the construction program.

Item #12. Other Matters

Local Issues

Summary of Comment: Loudoun County provided additions, corrections and clarifications to the EA.

Response: These have been incorporated into the Final EA as referenced in the comment letter dated July 1, 2002. Section 3.2.1 of the EA has also been updated to cite the County's Revised General Plan (adopted July 23, 2001) which supports the continued growth and expansion of Washington Dulles International Airport.

Summary of Comment: Fairfax County raised several issues in their letter to the Authority dated June 27, 2002. The issues include historic resources, Route 28 right-of-way, noise, planning and zoning, stormwater management, floodplains, the Chesapeake Bay Preservation Ordinance, wetland impacts and rare species impact.

Response: The following details each issue raised by Fairfax County.

Visual Impacts/Historic Resources

Summary of Comment: Fairfax County expressed concern that the South Utility Building and the DVP Substation have the potential to have adverse visual impacts on Route 28 and the Sully Plantation.

Response: In fact, the SUB and Substation will not be visible from Sully Plantation or Route 28 because of distance, intervening wooded areas, and heights of proposed structures.

The Substation will include a 1-story building (16-20 ft) and switch gear no higher than 30 ft. The maximum height of the SUB will be 60 ft (top of the cooling towers). Except for a narrow access corridor, the 250-ft wooded buffer will effectively shield the facilities from view from Sully Road. The Substation site is approximately 0.85 miles (4,500 ft) from Sully Plantation. The SUB site is 1.55 miles (8,200 ft) from Sully Plantation. There are substantial wooded areas between Sully Plantation and the project sites, including trees on Sully Plantation, and the IAD buffer.

Route 28 Right-of Way

Summary of Comment: Fairfax County recommends coordination with the County Department of Transportation on the planned interchange at McLearan Rd. and Route 28.

Response: Authority coordination on this project to date has been with the Virginia Department of Transportation (VDOT) which has primary responsibility for the planned interchange. It is expected that future coordination will involve joint discussions with both VDOT and the County Department of Transportation.

Noise

Summary of Comment: Fairfax County requested information regarding potential noise sources in the SUB and Substation.

Response: The only potential noise source adjacent to Route 28 is the South Utility Building that is proposed to be located south of the Old Fuel Farm. Potential noise sources that are planned for this facility include three boilers and ten chillers; these are not expected to be significant sources of noise at the Airport. Standard building features will include thermal insulation that will suppress noise from the boilers. The 250 foot wooded buffer will also act to reduce noise.

Planning and Zoning

Summary of Comment: Fairfax County offered corrections to the discussion of the County's Airport Noise Impact Overlay District in Section 3.2 of the EA.

Response: Section 3.2 has been corrected in the Final EA to reflect the County's comments.

Stormwater Management

Summary of Comment: Fairfax County raised several questions regarding the stormwater management pond.

Response: Clarifications are provided as follows. The stormwater management pond will be temporary in the sense that it ultimately will be replaced by a permanent structure during implementation of Tier 3. However, following construction of Tier 2, the facility may be maintained and operated "semi-permanently" until permanent stormwater facilities for the south area are constructed.

The Tier 2 area is largely in the northern (Horsepen Run) drainage while the stormwater pond is in the southern (Cub Run) drainage. A graded trench will be constructed to breach the drainage and convey drainage from the Tier 2 construction area to the stormwater pond in the Cub Run drainage. The rationale for this is that the location in the Cub Run drainage was the only feasible location.

A Comprehensive Stormwater Management Plan for Washington Dulles International Airport has been prepared in draft form (May 2002). This document provides design recommendations for stormwater system upgrades to accommodate all planned future expansion or replacement projects at the airport, including the Tier 2 project. All recommendations in this document include explicit objectives of flood attenuation and phosphorus reduction called for in the Fairfax County Public Facilities Manual, which describes methods for controlling stormwater runoff quality in the Occoquan Watershed. Stormwater management facilities serving the Fairfax County portion of the Airport will be designed to reduce stormwater pollutant loadings to meet the performance criteria specified in Section 6-0401 of the Public Facilities Manual.

Floodplains

Summary of Comment: Fairfax County notes that it defines "floodplain," in its Zoning Ordinance to mean that a floodplain is present along any stream with a drainage area that is greater than 70 acres.

Response: Executive Order 11988 (Floodplain Management) and DOT Order 5650.2 establish a policy to avoid taking actions within a 100-year floodplain, where practicable. Independent of whether or not FEMA mapping extends to a project site, project design will include drainage analysis to ensure that proposed facilities are protected against flooding, and to ensure that drainage and stormwater management facilities are adequate to prevent adverse effects on the existing 100-year floodplain.

Chesapeake Bay Preservation Ordinance

Summary of Comment: Fairfax County understands that its Chesapeake Bay Preservation Ordinance, particularly in the area of stormwater management, is applicable to the proposed action via Federal Coastal Zone Consistency requirements.

Response: As stated in Item #2 above, stormwater management facilities for the portion of the project located in Fairfax County will be designed to meet the pollutant reduction performance criteria specified in Section 6-0401 of the Fairfax County Public Facilities Manual which implements the County Chesapeake Bay Preservation Ordinance.

Sections 3.13 and 4.14 of the Final EA contain revisions that are responsive to DEQ's comments regarding regulations concerning the Virginia Coastal Resources Management Program (VCP) and the Chesapeake Bay Preservation Act and its related regulations. The proposed project within Fairfax County will be designed to be consistent with the Regulations as locally implemented by the County. The stormwater management standards applying to development within the Occoquan River watershed were recognized in Section 4.6.1 of the EA.

Wetlands Impacts

Summary of Comment: Fairfax County raised questions regarding minimization of wetland impacts similar to those raised by VDEQ in Item #1 above.

Response: Appendix I-2 of the Final EA provides the evaluation of alternatives with respect to consideration of the avoidance or minimization of wetland impacts.

Rare Species Impact

Summary of Comment: Fairfax County asks whether it might be possible to transplant affected specimens of rare species.

Response: The Authority will coordinate with the agencies to explore the possibility of relocating individual specimens of a state-listed rare species (hairy beardtongue) to suitable offsite habitat.

Energy Conservation

Summary of Comment: Fairfax County requested that the new buildings be planned and designed to comply with state and federal guidelines and industry standards for energy conservation and efficiency.

Response: As noted in Section 4.18 of the EA, a planning goal for Tier 2 is that it be 20 percent more efficient than the airport's newest concourse, Concourse B. Design specifications for Tier 2 and other facilities have not yet been developed; however, high efficiency building components, HVAC systems, lighting systems, and other equipment will be incorporated as designs evolve.

Regulatory and Coordination Needs

Summary of Comment: DEQ notes that permitting and/or agency coordination is required regarding the following areas:

- Wetlands and Water Quality
- Subaqueous Lands Management
- Erosion and Sediment Control
- Air Quality
- Solid and Hazardous Waste
- Water Supply
- Coastal Lands Management
- Federal Consistency Certification

Summary of Response: The Authority acknowledges its responsibilities for regulatory compliance and coordination as described by DEQ. These requirements are referenced in Tables 1-7 and 1-8 of the EA, and are discussed as described for specific comments above.

J.3.2 Response to Comments Submitted by Ferman "Dick" Shingleton

Summary of Comment #1: Mr. Shingleton asked whether the stormwater could be reused.

Response: While the Authority has programs in place to recycle resources, the recycling of stormwater is not practical for airport sites. The ponds are designed to be dry ponds holding stormwater only long enough to achieve water quality requirements before discharge. Long-term storage is not permitted by FAA since it attracts wildlife which is not compatible with airport operations.

Summary of Comment #2: Mr. Shingleton requested an estimate of the amount of water that will be required for construction of the Tier 2 and Related Projects.

Response: The largest water demand will be associated with dust control measures. These are highly dependent on weather conditions at the time of construction and cannot be reliably estimated at this time.

Summary of Comment #3: Mr. Shingleton asked if the stockpiled soil can be reused.

Response: The Authority is stockpiling excavated material precisely in order to be able to reuse it on construction projects requiring fill. The soil stockpile will be used only for the duration of the construction program.

Summary of Comment #4: Mr. Shingleton asks the source and quantity of electrical power for these projects.

Response: The South Utility projects include a substation and the source of power will be the Dominion Virginia Power Company.

Summary of Comment #5: Are we looking for rockets or passenger jets beyond 2010?

Response: Rockets are not expected.

Summary of Comment #6: Mr. Shingleton asks whether roads will be adequate to handle the increased traffic.

Response: Relative to the No-Build alternative, the proposed action will not increase airfield capacity, and therefore is not expected to affect traffic on the roads surrounding the airport. Minor improvements to on-airport roads will be undertaken to keep pace with level of traffic. These road improvements are independent of the proposed action because they would be needed with or without the Tier 2 and Related Projects evaluated in this environmental assessment.