

ENVIRONMENTAL ASSESSMENT

THE COURSES AT ANDREWS AIR FORCE BASE, MARYLAND

Prepared For:
89TH Airlift Wing
Andrews Air Force Base, MD
Environmental Flight
Environmental Planning Section



U.S. AIR FORCE

APRIL 2002

Prepared By:
HQ Air Force
Center for Environmental Excellence

LIST OF ACRONYMS

ACOE	Army Corps of Engineers
AFB	Air Force Base
AFI	Air Force Instruction
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP's	Best Management Practices
BRA	Baseline Risk Assessment
CAA	Clean Air Act
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CEV	Civil Engineering, Environmental Flight
dB	Decibels
DoD	Department of Defense
EA	Environmental Assessment
EO's	Executive Orders
FONSI	Finding of No Significant Impact
Gpd	gallons per day
Gpm	gallons per minute
HQ AMC	Headquarters Air Mobility Command
MDE	Maryland Department of Environment
MDNR	Maryland Department of Natural Resources
Mgd	million gallons per day
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPL	National Priorities List
NPS	National Park Service
PCB	Polychlorinated Biphenyl
PG	Prince Georges (County)
PGCHD	Prince Georges County Health Department
RI	Remedial Investigation
SIP	State Implementation Plan
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WSSC	Washington Suburban Sanitary Commission

FINAL

ENVIRONMENTAL ASSESSMENT

**INCREASING WATER SUPPLY
FOR
GOLF COURSE IRRIGATION
AT
THE COURSES AT ANDREWS AIR FORCE BASE
PRINCE GEORGES COUNTY, MARYLAND**

Air Force
Center for Environmental Excellence
Brooks Air Force Base, Texas

COVER SHEET

Lead Agency - Department of the Air Force

Report Designation - Draft Environmental Assessment (EA)

Proposed Action - Increasing Water Supply for Golf Course Irrigation, The Courses at Andrews Air Force Base, Prince Georges County, Maryland

Comment and Response - Written comments and inquiries regarding this document should be directed to Mr. William H. Bushman, RLA, 3207 North Road, Building 532, Brooks Air Force Base, Texas 78235-5363 (210-536-3719).

Summary - Andrews Air Force Base maintains one of the finer golf recreation facilities in the Washington DC community and serves active duty military, retirees, military dependents, civilian personnel, and the general public. The three golf courses are adjacent to the Base Lake recreational area and use water from Base Lake to maintain quality-playing turf. An adequate water supply is critical to both golf course operations and to the Base Lake recreational area.

Andrews AF Base proposes to increase the water supply to Base Lake while conserving local water resources. The existing source originates from groundwater seepage into Base Lake and from an irrigation well completed in an underlying aquifer (Magothy Formation). Three additional sources of water have been identified:

- Groundwater from the (deeper) Patapsco Formation
- Surface water runoff in nearby Piscataway Creek
- Stormwater runoff from the course itself

This combination of supplies conserves local water resources by relying on rainfall as a primary source and capturing available storm water runoff from the course and Piscataway Creek. It relies on groundwater only as needed, while maintaining natural stream baseflow in Piscataway Creek.

The Proposed Action includes these three sources. An irrigation well would be completed in the Patapsco Formation and the groundwater would be routed to Base Lake. The well would be located on the golf course approximately 400 feet northwest of Base Lake and 400 feet south of South Perimeter Road, between East Course hole 9 and South Course hole 4. The Piscataway Creek withdrawal would be from the existing in-stream pool above the weir located approximately 1,400 feet northeast of Base Lake. Whenever excess stream flow is available from the stream (as gauged by the weir), water would be pumped to Base Lake. Golf course stormwater runoff would be captured in an existing catchment between East Course Holes 9 and 10 and routed via underground pipe / improved grassed swale to Base Lake. Through a series of pumping controls, Base Lake would be maintained at a “natural” water level.

Various Alternatives are considered, including the No-Action Alternative. This EA describes the Proposed Action and Alternatives and assesses the potential environmental impacts resulting from each. Resources and issues studied in detail include soil and geology, water resources, hazardous materials, biological resources, land use, aircraft safety, and utilities. The Proposed Action would have the least environmental impact and would ultimately provide environmental benefits. Based on the findings of this report, no significant or unreasonable environmental impacts are anticipated to result from of the Proposed Action.

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1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared in accordance with the Council on Environmental Quality (CEQ) regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508, Section 1502.13) and Air Force Instruction (AFI 32-7061 and 32 CFR Part 989 (6-July-1999), as amended at 66FR 16868, 28-March-2001). This section of the EA describes the Purpose and Need for increasing irrigation supplies to the golf courses at Andrews Air Force Base (AFB). In addition, a discussion of the feasibility study leading up to this EA, the decision to be made, applicable laws and regulations, related base activities, and the scope of this study are included.

1.1 Location

Andrews AFB (Base) is entirely within Prince Georges (PG) County, Maryland, approximately five miles south-southeast of Washington, D.C. (Figure 1). The Base itself encompasses approximately 4,300 acres of land, partially bounded by Allentown Road on north, MD Route 4 on the northeast, and MD Route 5 on the southwest. This area is part of the Coastal Plain Physiographic Province, approximately 12 miles southeast of the Fall Line between the Coastal Plain and Piedmont Physiographic Provinces. The golf courses are in the southern portion of the Base, approximately 0.3 mile (mi) southwest of the airfield runways (Figure 2). The three 18-hole golf courses are irrigated with water provided through central pumping system along the western edge of Base Lake.

1.2 Purpose and Need

The Courses at Andrews AFB are an asset to the Base and the surrounding Washington, D.C., community. The courses provide access to a resource that contributes to the overall welfare and recreation program at the Base. In addition, the Base Lake recreational area provides not only aesthetic appeal, but also recreational opportunities such as boating and picnicking.

The Courses at Andrews AFB underwent expansion in the 1990s. Part of this expansion included development of an additional supply pond. This pond was originally included in design; however geotechnical and environmental limitations prevented construction of the pond as designed. As a result, the golf courses were left without an adequate irrigation source.



Photograph 1-1 The Courses at Andrews Air Force Base

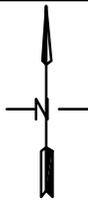
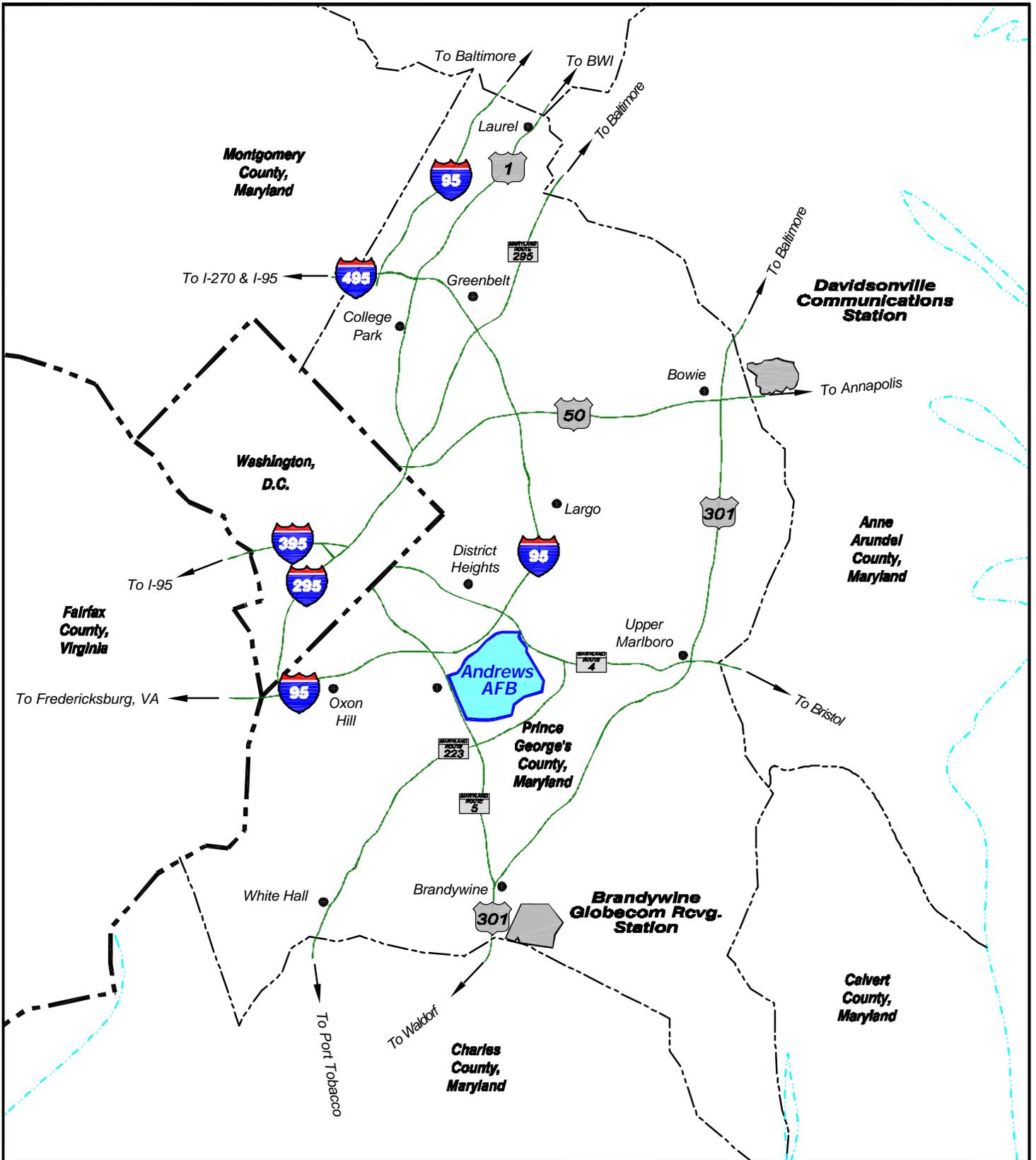
Sufficient irrigation water must now be secured to ensure the long-term viability of the golf and lake facilities, as well as to protect the overall recreational value for the Andrews AFB community and the real property investment already made. Based on the levels of irrigation pumping required by the pumping station and the number of sprinkler heads on the courses, a peak pumping capacity of approximately one million gallons per day (mgd) is needed.

Based on the acreages of tees, greens, fairways, and practice area, and using irrigation application rates specific to this region (Hammond and McKinney, 1990), the estimated average daily demand during an irrigation year is 190,000 gallons per day (gpd), with peak monthly averages of up to 748,000 gpd. Based on evaluations performed during the Water Supply Feasibility Study (WSFS) (USAF, 2001a), the current estimated annual deficit is 103,000 gpd and the month of maximum use deficit is 649,000 gpd.

1.3 Feasibility Study

A detailed hydrogeologic water supply feasibility study was completed in order to identify the water supply alternatives (USAF, 2001a). This study closely examines the past and projected future irrigation needs and lake requirements from a hydrogeologic perspective to accurately define the volume of water required to maintain a viable irrigation system and recreation value at Base Lake.

On-site water sources examined include the lake itself (which is groundwater-fed), shallow groundwater from nearby borrow pits, storm water runoff, Piscataway Creek, public water supply connection, and wastewater reuse.



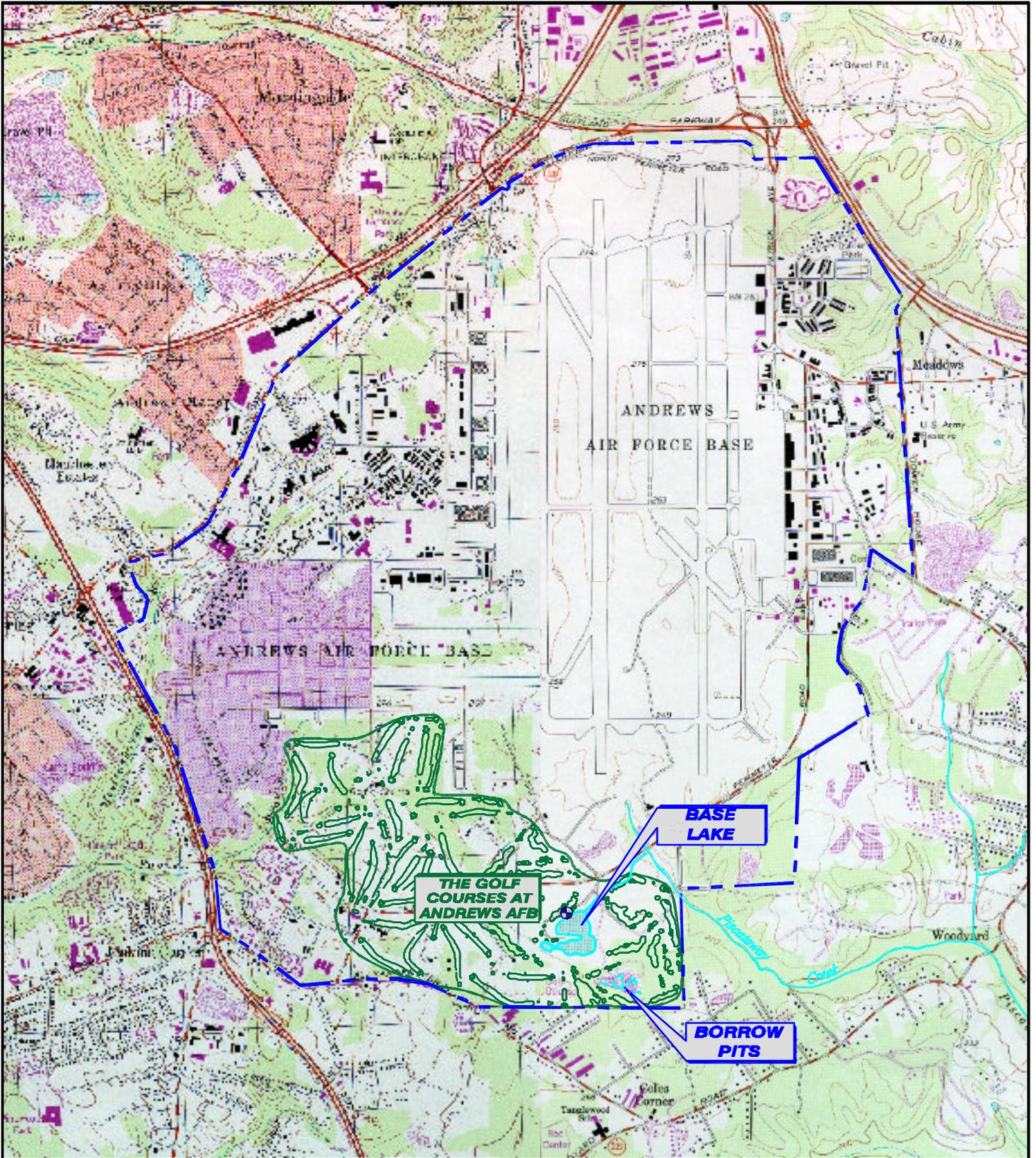
ANDREWS AIR FORCE BASE

Prince George's County, Maryland

LOCATION MAP

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date <i>01/28/02</i>	date <i>01/29/02</i>	date <i>01/30/02</i>	1
job no. 01-1408-04-1400-000		file no. 1400-001-D	

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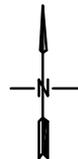


NOTE: BASE MAP IS FROM THE ANACOSTIA, MD., AND THE UPPER MARLBORO, MD. USGS TOPOGRAPHIC QUADRANGLES. (PHOTOREVISED 1979 AND 1993).

 LOCATION OF EXISTING SUPPLY WELL



QUADRANGLE LOCATION



ANDREWS AIR FORCE BASE

Prince George's County, Maryland

GOLF COURSE LOCATION MAP

drawn MDS	checked ESA	approved MDH	figure no.
date 01/28/02	date 01/29/02	date 01/30/02	2
job no. 01-1408-04-1400-000	file no. 1400-slm2-A		

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This study identifies multiple complementary Alternatives which, taken together, would optimize available water resources to adequately irrigate the golf course, allow a necessary degree of operational flexibility and back-up supply, and maintain recreational and aquatic habitat value at



Photograph 1-2 View of Base Lake Looking East

Base Lake. The evaluations show that the new well originally intended to draw from the Magothy Formation would not adequately serve the needs of the facilities. The three alternative sources recommended for implementation are as follows: 1) use of a deeper well in the Patapsco Formation, 2) withdrawal of storm flows from adjacent Piscataway Creek, and 3) capture and re-routing of storm flows on the course into Base Lake.

1.4 Decision to Be Made

The Alternatives to be decided upon include the following:

- **Proposed Action** – Continue using the existing well and Base Lake and adopt the recommended findings of the WSFS and add three source Alternatives: a Patapsco Aquifer well, Piscataway Creek, and golf course storm water flows.
- Implement one or a combination of the source alternatives:
 1. Use groundwater from the Patuxent Formation
 2. Use groundwater from the Magothy Formation (Glenn and Sadler, 1996c)
 3. Increase the yield of the existing well
 4. Laterally expand Base Lake
 5. Deepen Base Lake

6. Use former borrow pits as a seasonal groundwater supply
7. Use the WSSC public water supply
8. Treat and re-use wastewater generated on the Base.

➤ No Action – Do not add irrigation sources to the existing well and Base Lake sources.

The Commander of the 89th Airlift Wing is the decision maker. The decision will be based on the findings of this EA and in consideration of the pros and cons of the Proposed Action, public comments, and agency recommendations.

1.5 Applicable Laws and Regulations

A listing of applicable laws and regulations that govern this EA and subsequent actions is included in Appendix A. This also includes pertinent Executive Orders (EO) and Air Force Directives for Environmental Management that have been implemented to ensure coordination of federal plans, functions, programs, and resources for environmental issues. All of the alternatives, including the No-Action Alternative, require compliance with regulations set forth by the Maryland Department of Environment (MDE) (surface and groundwater withdrawal, sediment and erosion control, and/or stormwater management), Maryland National Capital Park and Planning Commission (MNCPPC) (well installation), P G County Health Department (well construction), the Maryland Department of Natural Resources (forest conservation), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (hazardous waste).

1.6 Related Base Activities

Recent and ongoing projects requiring NEPA documentation include management of flight operations, development of recreational facilities at the Base Lake, environmental investigations, and construction of the third 18-hole golf course, all of which include appropriate NEPA documentation.

The Air Mobility Command Environmental Programs Division (HQ AMC/CEV) is preparing an EA for Management of Obstructions to Flight Operations at Andrews AFB at the same time as this EA (USAF, 2001b). The anticipated date of completion of this EA is June 2002. The Proposed Action includes the selective removal and trimming of trees for flight safety considerations. Also, runway reconfiguration is being considered.

The existing recreational facilities at Base Lake were constructed between 1999 and 2001. The facilities include a children's play area, pavilions, an asphalt-paved parking lot and partially paved access road, and split-rail decorative fencing. Further development of the Recreational Area is to include picnicking, outdoor playgrounds, and other recreational amenities (USAF, 2001c).

Base Lake is within 1,200 feet southwest of former landfill areas designated as Landfill 06 (LF06) and Landfill 07 (LF07). Andrews AFB prepared a Decision Document in 1996 for No Action required at the landfill sites to protect human health or the environment. A Remedial Investigation (RI) and Baseline Risk Assessment (BRA) showed that organic constituents in soil, surface water, and groundwater near LF06 and LF07 are comparable to background concentra-

tions and pose no significant threat to public health or the environment (USAF, 1996a). Due to the listing of Andrews AFB on NPL in 1999, remedial investigations are continuing in 2002.

The water within Base Lake continuously interacts with the shallow groundwater flow system. During the golf course irrigation season the water level in Base Lake is lowered due to irrigation demand, which induces groundwater flow from the shallow aquifer into Base Lake. The shallow aquifer in the Base Lake area is part of ongoing environmental investigations that were considered during the WSFS.

Construction of the third 18-hole golf course and associated facilities were addressed in a 1995 EA and Preparation of a Findings of No Significant Impact (FONSI). The study encompassed Base Lake Recreational Area and addressed potential impacts to soils, air quality, water resources, biological resources, socioeconomic factors, land use, transportation, aircraft operations, noise, aesthetics, cultural resources, recreational resources, and cumulative impacts (USAF, 1995a).

1.7 Scope of this Study

This EA describes the Proposed Action and Alternatives for providing adequate water supply to irrigate the Courses at Andrews AFB and maintain the recreational and aquatic habitat values at Base Lake. In accordance with Air Force policy and CEQ regulations, the study focuses on the potential environmental impacts from the different alternatives including the No-Action Alternative. Chapter 3 identifies the Affected Environment and issues of potential importance to decision-makers. Potential impacts to the environment are identified and discussed for each alternative in Chapter 4. A FONSI (Appendix B) is based on the assessment of these consequences. Andrews AFB will provide a 30-day review and comment period for this EA to garner any concerns expressed by local, state, and federal regulatory agencies and the public at large.

The issues surrounding increase of the irrigation supply are summarized in the following table. The level of potential direct, cumulative and secondary impact for each of these issues is indicated.

TABLE -1 SUMMARY OF ISSUES ADDRESSED

	<u>Nature of Potential Impact</u>		
	Direct	Cumulative / Secondary	Not anticipated
Soils and Geology	X	X	
Water Resources	X	X	
Hazardous Materials	X	X	
Biological Resources	X	X	
Land Use		X	
Aircraft Safety		X	
Utilities		X	
Wetlands			X
Endangered Species			X
Cultural Resources			X
Airspace			X
Noise			X
Transportation			X
Environmental Justice			X
Air Quality			X
Socioeconomic			X

As shown, those issues requiring detailed study include soils and geology, water resources, hazardous materials, biological resources, land use, aircraft safety, and utilities. Those issues not requiring detailed study and the rationale are as follows:

- Wetlands – There are no wetlands subject to the Clean Water Act (CWA) or EO on Protection of Wetlands in the project construction areas (IT Corporation, 1997). Withdrawal of water from Piscataway Creek would not affect waters of the US since it would utilize existing in-stream structures. It would operate during and immediately after storm events and could have a positive effect on the downstream environment. The unmitigated peak flows generated on the airfield could actually be lessened. Since stream baseflows would be maintained, no downstream impacts to wetlands are anticipated.
- Endangered Species - No threatened or endangered species are within the study area subject to the endangered species act (Davis, 1994).
- Cultural Resources – According to available records, there are no known resources subject to the Archaeological Resources Protection Act or National Historic Preservation Act in the area of the Proposed Action (Parsons, 1996) or alternatives.
- Airspace - The Proposed Action and Alternatives would not affect the current runway configuration or change the compatible use zone since there will be no increase in the surface area of Base Lake or the existing storm water depression between East Course holes 9 and 10.

- Noise - The Proposed Action would rely on electric pumping systems and gravity drainage with minimal noise effects. Well drilling would have a temporary and localized impact on noise levels around the drill rig.
- Transportation - The effects of the Proposed Action and alternatives are outside of the high-traffic areas on Andrews AFB, and the only traffic effects would be those associated with the temporary construction activities and are considered minor.
- Environmental Justice - The Proposed Action and Alternatives are entirely within Andrews AFB. As such, no low-income or minority populations will experience disproportionate impacts.
- Air Quality - The Proposed Action will use electric pumping systems that will not affect local air quality, except during construction activities, which would use diesel- and gasoline-driven equipment.
- Socioeconomic - The Proposed Action and Alternatives should not measurably change the income and employment status at the Base or in the region, since these are essentially maintenance to the existing facility.

2.0 PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and Alternatives, including the No-Action Alternative, are discussed in detail in this section.

2.1 Proposed Action

Andrews AFB proposes to increase the water supply to Base Lake. The goal of the Proposed Action is to develop a supplemental water supply capable of yielding approximately 103,000 gpd on an annual average basis and 649,000 gpd during the month of maximum use (USAF, 2001a). The existing supplies originate from groundwater seepage into Base Lake and from an irrigation well completed in the Magothy Formation and would continue to be used.



The Proposed Action consists of securing three additional sources of water in an integrated and optimized approach to augment the existing sources in order to meet the irrigation and lake water requirements.

1. Groundwater from the Patapsco Formation
2. Surface water runoff in nearby Piscataway Creek
3. Stormwater runoff from the course itself

Photograph 2-1 View of Existing Well and the Discharge into Base Lake

This multi-source approach to development of a supplemental supply promotes conservation of water resources through capture and use of excess stormwater runoff and mitigates potential groundwater impacts from lake and well withdrawals.

2.1.1 Patapsco Well

The proposed well would be located on the golf course approximately 400 feet northwest of Base Lake and 400 feet south of South Perimeter Road, between East Course hole 9 and South Course hole 4 (Figure 3). The construction of a well would consist of drilling a borehole approximately

600 feet deep into the Patapsco Formation, installing steel casing and stainless steel well screen at appropriate depths based on the geophysical and geologic logging results, well development to improve efficiency, and installing a pumping system to discharge groundwater into the catchment between East Course holes 9 and 10 and eventually into Base Lake.



Photograph 2-2 Storm Water Catchment between East Course Holes 9 and 10

Up to about 500,000 gpd could be anticipated from such a well. No other Patapsco groundwater users are within 5,000 feet of Andrews AFB. This Proposed Action would require an MDE Water Appropriation and Use Permit, MDE approved erosion / sediment control and stormwater management plan, MDE Well Construction Permit, P G County Well Construction Permit. Construction activities would be conducted in accordance with local, state, and federal regulations.

2.1.2 Piscataway Creek Withdrawal

This potential supply can capture runway runoff to Piscataway Creek. It was identified not as a stand-alone source, since it cannot provide the irrigation needs and maintain the proper flow-by, but to augment the groundwater sources, reduce their potential impacts, and help mitigate storm flows. The proposed withdrawal would be from the existing in-stream pool above the weir located in Piscataway Creek approximately 1,400 feet northeast of Base Lake.



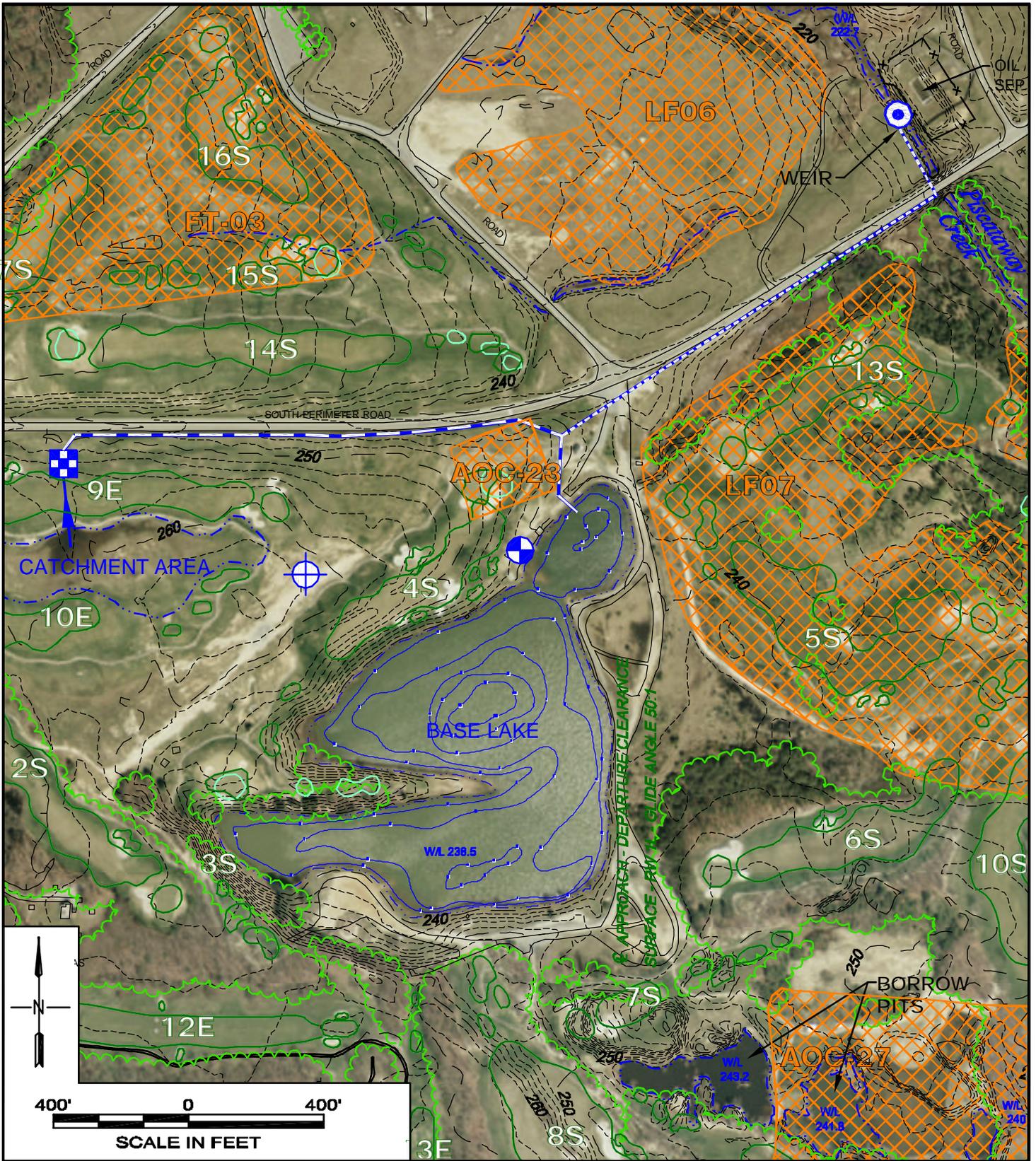
Photograph 2-3 Piscataway Creek Weir

A pump and automatic control system would be designed and constructed to allow for the withdrawal of water as available in excess of the flow-by. A four-inch diameter underground pipeline would be installed through open-space area adjacent to Piscataway Creek and South Perimeter Road. The pumped water would be discharged to Base Lake (Figure 3).

This Proposed Action would require a MDE Water Appropriation and Use Permit. Construction activities would be performed in accordance with local, state, and federal regulations. In addition, applicable erosion and sediment control measures would be used during the pipe installation.

2.1.3 Capturing and Rerouting Stormwater Runoff

This source cannot be relied on for a continuous supply, but is identified to make use of excess runoff and reduce potential groundwater impacts from the other sources. Golf course stormwater runoff would continue to be captured in an existing catchment between East Course holes 9 and 10 and routed via underground pipe / improved grassed swale to Base Lake. This area receives significant runoff, which currently overloads the existing swales and pipes discharging to Piscataway Creek. As a result, the Base occasionally experiences flooding across South Perimeter Road and the access road to Base Lake, and there has been significant downstream erosion.



NOTE: AERIAL PHOTO BACKGROUND WAS PROVIDED BY VARGIS, LLC AND REFERENCED AS "R1 2000 IMAGERY".

LEGEND

-  PISCATAWAY CREEK INTAKE
-  EXISTING SUPPLY WELL
-  PROPOSED WELL
-  WATER INLET
-  EXISTING UNDERGROUND PIPE
-  UNDERGROUND PIPE LOCATED BENEATH 10' GRASSED SWALE
-  4" UNDERGROUND PIPE



ANDREWS AIR FORCE BASE

Prince George's County, Maryland

**ANDREWS AIR FORCE BASE
PROPOSED ACTION FEATURES**

drawn <i>MZS</i>	checked <i>ESL</i>	approved <i>MDP</i>	figure no.
date 04/02/02	date 04/02/02	date 04/02/02	3
job no. 01-1408-04-1400-000		file no. 1400-001-D	

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Photograph 2-4 Stormwater Runoff Flooding the Base Lake Recreation Area Entrance Road

2.2 Alternatives

Nine Alternatives, including the No-Action Alternative (as required by NEPA and CEQ), were considered. The following Alternatives were considered during the preparation of the Description of Proposed Action and Alternatives (DOPAA).

2.2.1 No-Action Alternative

The No-Action Alternative is to do nothing to augment the existing water supply and continue to use the existing supplies as they are currently permitted.

2.2.2 Use of Groundwater from the Patuxent Formation

This alternative involves the drilling and construction of a well approximately 900 to 1,300 feet deep into the Patuxent Formation (Hansen, 1968). Wells completed in the Patuxent Aquifer are typically high yielding wells, however this aquifer could produce significantly high iron concentrations and cost almost twice as much as a well completed in the Patapsco Aquifer (Proposed Action). Up to about 700,000 gpd could be anticipated from such a well. No other Patuxent groundwater users are within 5,000 feet of Andrews AFB.

This alternative would require MDE Water Appropriation and Use and Well Construction permits, MDE sediment / erosion control and stormwater management approval, PG County Well Permit, and modification to PG County Water and Sewer Master Plan.

2.2.3 Use of Groundwater from the Magothy Formation

This alternative consists of drilling and constructing a well in the Magothy Formation, similar to the existing well located on the northwest side of Base Lake. A well completed in the Magothy Aquifer would be approximately 350 feet deep and would cost about 20% less than a well completed in the deeper Patapsco Formation. The well would have to be located at least 2,000 feet from the existing well to minimize well interference effects. This scenario also requires the installation of three-phase power and a pipeline from the well to Base Lake, increasing the total cost of the alternative. Approximately 200,000 to 300,000 gpd could be anticipated from such a well. There appear to be some relatively low demand wells drawing from the Magothy Aquifer in the Andrews AFB area, which could be affected. This alternative would not be capable of exclusively meeting the supplemental water supply requirements.

This alternative would require a MDE Water Appropriation and Use Permit and Well Construction Permit, MDE sediment / erosion control and stormwater management approval, PG County Well Permit, and modification to PG County Water and Sewer Master Plan.

2.2.4 Increasing the Yield of the Existing Well

According to available information, the existing well located on the northwest side of Base Lake was drilled in or around 1978, is screened in the Magothy Aquifer, and had an initial yield of approximately 190 gallons per minute (gpm). Currently the well is being pumped at a rate of approximately 130 gpm. No information is readily available regarding the age of the existing submersible pump or if the well has been rehabilitated since construction. Over time the efficiency and yield of this screened well may have decreased due to chemical incrustation, biofouling, collapse of well screen, formation plugging adjacent to the well, pump impeller and/or shaft deterioration due to pumping sand, or lower water table. Although the well is permitted for up to 350,000-gpd withdrawal (Appendix C), it can currently only produce 200,000 gpd.

In many cases the efficiency of a well can be restored using various methods depending on the condition diagnosed. Likewise, a pump replacement can allow higher rates of pumping if the decrease in yield is only mechanical. Use of this alternative could provide approximately 80,000 gpd of additional supply. This alternative would not be capable of exclusively meeting the supplemental water supply demand.

No alterations to the existing permits are required to implement this alternative.

2.2.5 Lateral Expansion of Base Lake

According to a hydrographic investigation performed in the WSFS (USAF, 2001a), the existing Base Lake covers approximately 17 acres and has a maximum depth of 12 feet. Due to the multi-purpose recreational uses of the lake and for aesthetic reasons, withdrawals for course irrigation are managed in order to maintain the water level within a few feet of full capacity. At times the irrigation demand requires additional drawdown of the water level in the lake. The usable storage volume of the lake is approximately 12 million gallons (50 percent of empty lake capacity). Lateral expansion of the lake could create additional surface area and an equivalent

increase in the usable storage volume. Assuming a 60-day supply is required, approximately 300,000 cubic yards of material would need to be removed, affecting about 50 acres of land.

Dredging and excavation in selected areas of the lake would accomplish this alternative. The water level in Base Lake would need to be lowered significantly during expansion to facilitate removal of material. A spoils site, likely the former borrow pits to the south, would receive the removed materials.

This alternative would require a MDE Water Appropriation and Use Permit, MDE Waterways Construction permit and approval, MDE Sediment and Erosion Control plan and approval, MDE Stormwater Management plan and approval, MDE Water Quality Certification, a joint MDE/Army Corps of Engineers (ACOE) wetlands permit, an assessment of airspace and BASH issues, and addressing CERCLA issues. Significant regulatory opposition to this alternative would be anticipated due to environmental considerations, pending the results of on-going investigations.



Photograph 2-5 View Of Base Lake Looking Northwest

2.2.6 Deepening of Base Lake

Based on the WSFS hydrographic study (USAF, 2001a), the maximum depth of the lake is 12 feet and the capacity of the lake is estimated to be 24 million gallons. The deepening of the Base Lake would increase the storage capacity of the lake without affecting the existing land use surrounding the lake. To use this storage, however, the water level in the lake would be routinely lowered more than is allowable in current operations. This alternative would likely require the complete draining of Base Lake to allow for the dredging and removal of material. This alternative would require a MDE water appropriation and use permit, MDE waterways construction permit, MDE sediment / erosion control and stormwater management approval, MDE water quality certification, and joint MDE/ACE wetlands permit.

This alternative would require a MDE Water Appropriation and Use Permit, MDE Waterways Construction permit and approval, MDE Sediment and Erosion Control plan and approval, MDE Stormwater Management plan and approval, MDE Water Quality Certification, a joint MDE/Army Corps of Engineers (ACOE) wetlands permit, an assessment of airspace and BASH issues, and addressing CERCLA issues. Significant regulatory opposition to this alternative would be anticipated due to environmental considerations, pending the results of on-going investigations.

2.2.7 Use of Borrow Pits as a Seasonal Groundwater Supply

Two former sand and gravel borrow pits exist approximately 1,000 feet southeast of Base Lake. The pits currently have standing water up to six feet deep and are groundwater fed. There is little surface water inflow or drainage into these ponds. However, the permeable nature of the sand and gravel aquifer, which they intercept, may allow groundwater influx in significant quantities during high-water table seasons. The seasonal shallow water table fluctuations on site would, however, limit the reliable supply from this source.



Photograph 2-6 Located Approximately 1,000 Feet Southeast Of Base Lake

This Alternative would involve connecting the two pits with a buried pipe (approximately 100 feet long by 6 inches in diameter). This system would render the bottom of the borrow pits essentially dry during the growing season. A low head pumping system would be installed in a dewatering sump in the deepest portion of the borrow pit and water would be discharged to Base Lake via a two inch diameter buried pipe that would be plowed-in to avoid trenching impacts.

A modified MDE surface water appropriation and use permit would be required for this alternative, along with addressing possible CERCLA issues.

2.3 Alternatives Considered But Eliminated From Further Study

2.3.1 Waste Water Reuse

The facilities at Andrews AFB generate considerable wastewater flows. Wastewater reuse has been used successfully in many areas of the country for non-potable water supplies. Wastewater at Andrews AFB is currently routed to pumping stations throughout the base, which transmit waste flows into the Washington Suburban Sanitary Commission (WSSC) collection system, eventually reaching a WSSC wastewater treatment plant.

Reuse of a portion of these waste flows at Andrews AFB would involve construction of a wastewater treatment plant on site. This would include primary, secondary, and tertiary treatment systems. Such a plant would likely be located and permitted on Piscataway Creek, with the discharge routed to Base Lake.

The wastewater reuse alternatives would entail a relatively large construction project and significant disturbance due to trenching and piping required for implementation. Wastewater reuse, once ultimately constructed, would reduce the volume of wastewater effluent routed to the WSSC treatment facility. It would, however, have no effect on any Base wastewater utilities, other than requiring additional subsurface force and gravity mains and possibly a pumping station.

Wastewater reuse would affect the level of the shallow water table beneath the irrigated areas at Andrews AFB, potentially in a positive way. If not managed properly, however, it could have detrimental effects on the quality of the groundwater. In addition, equipment failures could cause habitat destruction in Base Lake or result in the release of toxicological and/or trace metal contaminants into Base Lake.

Air Force policies, permitting issues and potential impacts and costs render this alternative unreasonable and force it to be dropped from further study (AFI 32-7061 Sections 2.51 and 2.52).

2.3.2 Connection to Existing Water System

This alternative would use potable water for irrigation. The connection to the potable water supply would be constructed and metered by WSSC with a discharge pipe directly to Base Lake.

The WSSC connection Alternative would entail a relatively large construction project and significant disturbance due to trenching and piping required for implementation. The WSSC connection would have an effect on Base utilities only in the sense that an additional water main extension would have to be installed on Base and sized adequately to provide irrigation water. This could substantially increase the Base water costs seasonally and unpredictably.

Connection to the potable WSSC supply could mitigate effects at Base Lake by transferring them to the Potomac River and / or Patuxent River sources. WSSC connection would have a positive effect on the quality of the Base Lake by maintaining a higher water level.

Air Force policies, permitting issues, and potential impacts and capital and operational costs render this alternative unreasonable and force it to be dropped from further study (AFI 32-7061 Sections 2.51 and 2.52).

3.0 AFFECTED ENVIRONMENT

This section discusses the environmental conditions of the Base Lake area and the resources that would be affected by implementation of the Proposed Action or Alternatives. The environmental conditions potentially affected include soils and geology, water, hazardous materials, biological resources, land use, aircraft safety, and utilities.

3.1 Soils and Geology

Andrews AFB is located within the Coastal Plain Physiographic Province. The geologic formations of the Coastal Plain are inclined to the southeast at approximately one degree and thicken seaward. A generalized stratigraphic section illustrating the geology in the Andrews AFB area is shown in Figure 4. As shown, in the Andrews AFB area the total thickness of these sedimentary layers is approximately 1,300 feet (Hansen, 1972). The elevation of the ground surface near Base Lake is approximately 250 feet MSL. The surface materials are Upland Deposits, comprised mainly of sand and gravel with minor amounts of silt and clay (Cleaves, et al., 1968). These are underlain by various formations, of which the Magothy, Patapsco, and Patuxent formations are considered the predominant aquifers. These aquifers are confined or bounded by clay layers that form barriers to groundwater flow between the aquifers.

The soils in the study area are primarily sand and gravel that have been disturbed by excavation for runway and golf course construction and other historical activities at Andrews AFB. The predominant soil type in the study area is the Beltsville Silt Loam. These soils are typically moderately deep, poorly drained, gently sloping and are subject to moderate to severe erosion (Gibson, 1978).

3.2 Water Resources

The southern portion of Andrews AFB lies in the Piscataway Creek watershed, which drains to the Potomac River. Groundwater occurs in several aquifers located beneath the study area. The shallow unconfined aquifer is not used for potable supplies in the region, although it is an important resource since it provides baseflow to surface water features in the area. The deeper aquifers of the Coastal Plain provide potable water supplies and are an important resource.

3.2.1 Surface Water

The headwaters of Piscataway Creek originate in the central portion of Andrews AFB and flow nearly 12 miles to the Potomac River south of Washington D.C. Piscataway Creek itself is approximately 1,200 feet to the northeast of Base Lake. A weir located in the creek just north of South Perimeter Road and has a drainage area of 1,610 acres, the largest catchment on Andrews AFB and the headwaters of Piscataway Creek. Based on recent sampling results (GMI, March 2001) the quality of the water meets applicable NPDES criteria.



Photograph 3-1 Piscataway Creek Looking Northwest Towards the Weir

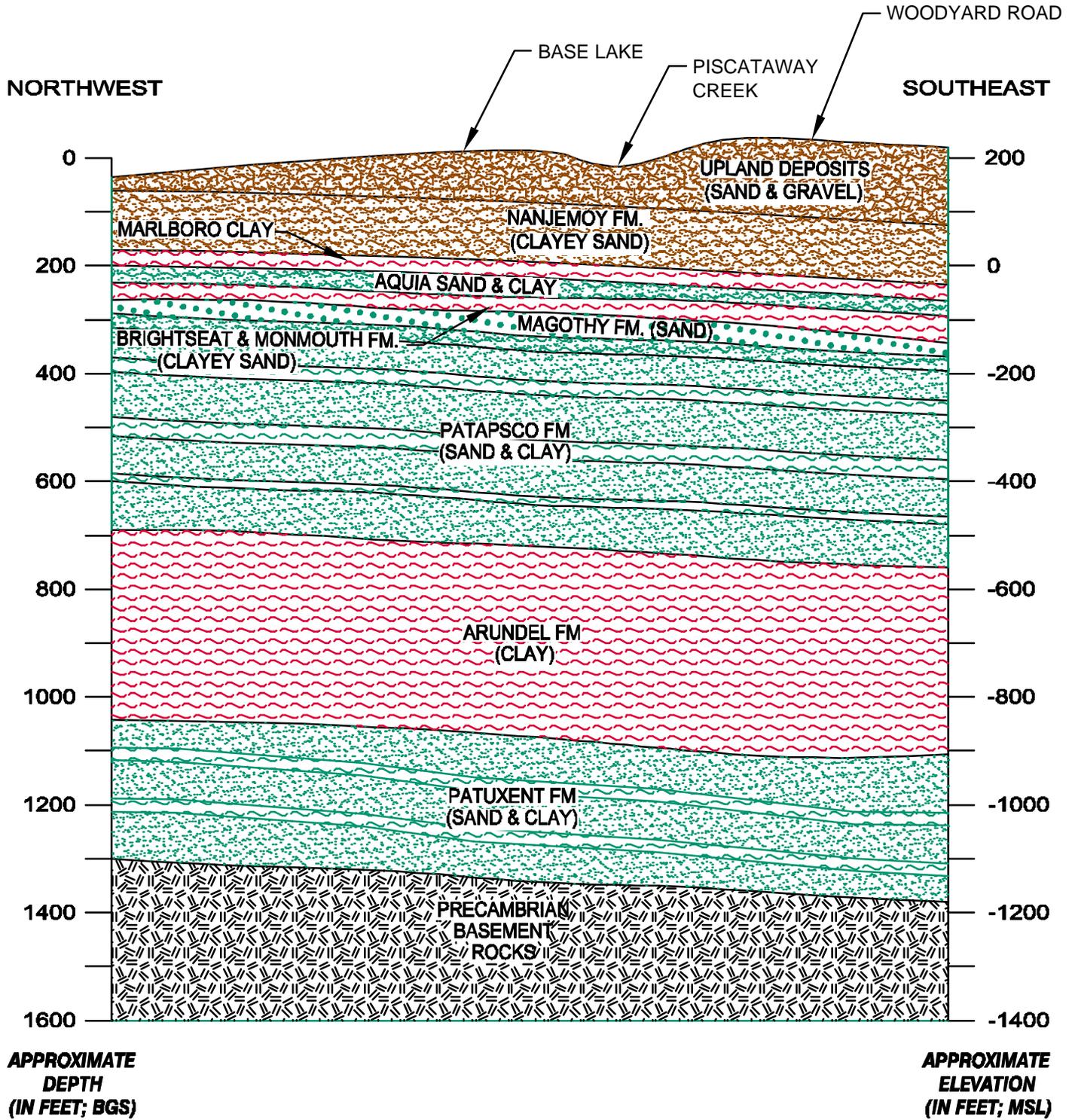
Several unnamed tributaries and Base Lake also contribute surface water to Piscataway Creek. Base Lake has a surface area of approximately 17 acres and has a capacity of approximately 24 million gallons. The maximum depth of the lake is 12 feet although the average depth is approximately 4 feet. Due to the various recreational uses of the lake and for aesthetic reasons, withdrawals for course irrigation are managed in order to maintain the water level within a few feet of full capacity. A discharge weir located in the northern portion of the lake controls the maximum water level.

Two sand and gravel borrow pits are located to the southeast of Base Lake. The pits are each approximately one-half acre in size and range in depth from a few inches to six feet. Direct precipitation, stormwater runoff, and groundwater infiltration are the only sources of water to the pits. The borrow pits typically contain less than about one foot of water in the late summer as the water table naturally recedes. There are no constructed surface water discharge points from either pit, although groundwater flows into an unnamed tributary to Piscataway Creek.

3.2.2 Shallow Aquifer

The surficial deposits form a relatively shallow, unconfined aquifer zone underlying the Base Lake area. This shallow aquifer is recharged primarily by local precipitation that infiltrates through the on-site soils. Base Lake is excavated into the top of this aquifer. As a result, withdrawal of water from the lake lowers the water level and induces groundwater flow from the shallow aquifer. The amount of groundwater infiltration is proportional to the amount of lake drawdown and can be greatly affected by natural seasonal fluctuations of the water table. This aquifer has been and is currently under investigation for water quality effects from past land uses in the area.

GENERALIZED ANDREWS AFB STRATIGRAPHY



NOTE: BASED ON INFORMATION CONTAINED IN; GEOPHYSICAL LOG CROSS-SECTION NETWORK OF THE CRETACEOUS SEDIMENTS OF SOUTHERN MARYLAND, MARYLAND GEOLOGICAL SURVEY R.I. NO. 7, 1968

COLOR KEY

- CONFINING LAYER
- MINOR AQUIFER
- MAJOR AQUIFER



ANDREWS AIR FORCE BASE
Prince George's County, Maryland

ANDREWS AIR FORCE BASE CROSS SECTION

drawn <i>MDS</i>	checked <i>ESA</i>	approved <i>MDH</i>	figure no.
date <i>01/28/02</i>	date <i>01/29/02</i>	date <i>01/30/02</i>	4
job no. 01-1408-04-1400-000		file no. 1400-001-D	

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3.2.3 Deep Aquifers

The Magothy, Patapsco and Patuxent Formations each have the capability of providing significant quantities of water to a properly constructed well. The Patapsco and Patuxent Formations are multi-layer aquifers consisting of interbedded clay, silt, sand, and gravel. The hydraulically conductive sand and gravel aquifers are bounded on the top and bottom by clay and silt layers that limit groundwater flow. Therefore, the source of groundwater recharge to these aquifers occurs in the areas where they outcrop.

The estimated depths to the tops of the major aquifers beneath the Base Lake area are as follows (Hansen, 1968 and existing well geophysical log):

- Magothy - approximately 300 feet
- Patapsco - approximately 400 feet
- Patuxent - approximately 900 feet

3.3 Hazardous Materials

3.3.1 Landfills

Former landfills LF06 and LF07 are discussed in the Decision Document for No Action (USAF, 1996a). The former landfills are located north and northeast of Base Lake and are covered with locally excavated materials. LF06 consists of about 30 acres and is currently a grassed field while LF07 covers approximately 60 acres and contains South Course holes 5, 6, 10, 12, and 13. LF06 and LF07 were reported to be used primarily for disposal of inert construction and land clearing debris at various times between the 1950's and 1980's, as well as during golf course construction. Other miscellaneous wastes such as furniture, appliances, tires, shop wastes, and other refuse were reported to be disposed of at the sites (USAF, 1996a). Although the landfill materials may have leached low-level volatile organic compounds and pesticides into the groundwater, the concentrations were generally below maximum contaminant levels. These and other sites are under further investigation in an ongoing RI/FS for subsurface contamination.

3.3.2 Golf Course Turf Management

The EA for construction of the third golf course at Andrews AFB discusses the potential to contaminate surface and groundwater resources by application of herbicides, pesticides, and fertilizers to turf (USAF, 1995a). The EA specified that nutrient loadings to surface waters would be reduced through the use of a nutrient management plan and water quality control best management practices (BMP's). The BMPs consist of controls such as water detention basins to intercept surface runoff before entering wetlands and stream systems.



Photograph 3-2 View of South Course Hole 4 Beyond Base Lake

Well-maintained turf is effective in adsorbing pollutants and preventing erosion. Grass swales and buffers are also effective in reducing the nutrient loading to surface water resources. These BMP features are found throughout the course areas surrounding Base Lake.

3.4 Biological Resources

According to a 1993 study, only four species of fish occur in Base Lake, which has historically been managed under a fish-stocking plan (USAF, 1995a). The study indicates that the introduction of foreign fish and aquatic plant species into Base Lake have limited the diversity and habitats within the lake. Pursuant to these results, a follow-up study was performed in 2001 (USAF 2001d). These results indicate an increase in species and number of fish. The significant fluctuation of the lake water level due to golf course irrigation is a factor in the overall health of the lake. Andrews AFB policy prohibits fishing at Base Lake. In addition, fishing at the near-by borrow pits is not allowed due to safety issues.

The 1993 study also identified fifteen fish species in Piscataway Creek, which suggests the presence of a diverse, somewhat healthy, self-sustaining fish community.

No other biological resources to be affected by the Proposed Action or Alternatives are expected.

3.5 Land Use

The primary land use in the area is the Golf Courses and the Base Lake recreation area. Existing facilities surrounding the lake area include the golf courses, picnic areas and playground. Addi-

tional recreational facilities are currently being reviewed. The lake itself is the only water storage facility and is the withdrawal point for the golf course irrigation system.

3.6 Aircraft Safety

While not an environmental resource, bird/wildlife aircraft strike hazards (BASH) are a significant concern to aircraft safety, especially during low-altitude approach and departures. Bird/wildlife aircraft strikes have the potential to damage aircraft, injure personnel onboard, and/or cause an aircraft accident. Base Lake is identified in the Andrews AFB BASH Plan as a primary source of potential bird strikes (USAF, 1996b). Waterfowl frequenting the Base Lake area, especially during the migration seasons (fall and spring), increase the BASH. BASH is a safety issue that has been addressed and analyzed in greater depth in the Andrews AFB BASH Plan.

3.7 Utilities

Utilities include the water and wastewater disposal systems and the electrical supply. The WSSC provides Andrews AFB with potable water primarily originating from the Potomac and Patuxent Rivers. WSSC receives wastewater from the Base, which is pumped from various stations on base and eventually carried to a WSSC treatment facility. Electricity is provided to the Base through the grid by Potomac Electric Power Company.

4.0 ENVIRONMENTAL CONSEQUENCES

The potential environmental consequences of implementing the Proposed Action and Alternatives are assessed in this section. As described in Subsection 1.7, each of the primary resources/issues is addressed for all Alternatives, including the No-Action Alternative. In this, both direct and cumulative/secondary effects are discussed. These consider both short-term (i.e. construction) and long-term effects of implementation of the Alternatives. Both positive and negative effects are addressed, although no significant impacts were identified. A summary of the various issues and Alternatives is presented in Subsection 4.7.

4.1 Soils and Geology

The primary effects on the soils at Andrews AFB are from the construction activities associated with each of the Alternatives. These disturbances are relatively minor in nature. The well drilling operation itself only disturbs an approximate 20-foot by 20-foot area in the immediate vicinity of the well. Sediment and erosion control measures and a temporary mud pit would be implemented adjacent to the drilling site. Drilling fluids, consisting of inorganic earth materials from the subsurface and biologically degradable and/or natural mud drilling fluids, would be captured in the sedimentation control areas and the adjacent catchment. These materials would be tested for contaminants prior to discharge. They are typically considered inert and once the drilling operation is complete they will support growth of natural vegetation.

Pumping from Piscataway Creek would require a buried pipeline to be routed from the weir area to Base Lake, crossing South Perimeter Road beneath the bridge and the Base Lake access road (Figure 3). The area of disturbance would be less than 5000 square feet, assuming six-inch-wide trenching using a standard ditch witch and a four-inch-diameter pipe. Trenching will be back-filled, graded, and seeded upon completion.

The capture and rerouting of storm flows from the golf course into Base Lake would entail installation of subsurface piping and improved grass swale along Perimeter Road and crossing east of South Course hole 4 and into Base Lake. The construction and disturbance would be approximately 10 feet wide and approximately 1,800 feet long, a total of 18,000 square feet. Once completed, the area would be graded, seeded, and restored to natural grass cover. Implementation of this alternative would have the positive effect of eliminating the flooding which occurs over the Base Lake entrance road and the erosion that has occurred on the north side of the road where the storm flow outfalls toward Piscataway Creek.

Impacts to soils from the other well drilling alternatives would be comparable to that of the Patapsco well. Increasing the yield of the existing well, pumping from the existing borrow pits, and the No-Action Alternative would have little to no effect on soils at Andrews AFB.

Lateral expansion and deepening of Base Lake both would entail significant impacts to soil resources at Andrews AFB. These impacts would be directly from the dredging operations themselves, as well as the disposal of the dredged sediments. A disposal area would have to be selected and adequate sedimentation and erosion control provided for a significant volume of material.

There are no significant impacts to the geology beneath Andrews AFB from the Proposed Actions and Alternatives. The drilling operations themselves disturb very little sediment due to the relatively narrow diameter of the borehole and the completion requirement imposed by the Maryland State Board of Well Drillers and Prince Georges County Health Department (PGCHD). Impacts to the aquifers formed by the subsurface geologic materials are addressed in Water Resources-Groundwater.

4.2 Water Resources

The potential effects to groundwater and surface water resources are addressed from an operational standpoint.

Implementation of the Proposed Action would have potentially positive and negative effects on groundwater and surface water resources.

Use of a Patapsco aquifer well will affect the groundwater table in that particular geologic horizon. However, an inventory of other wells and groundwater users in this area indicates few other users within five miles of Andrews AFB. In addition, there are no major users (greater than 100,000 gpd) within this search radius (Figure 5) (MDE, 2001).

The effects of use of a Patapsco well are not anticipated to extend laterally beyond a few thousand feet and are limited vertically by the confining layers above and below the Patapsco aquifer (Figure 4). Interference with the existing well in the Magothy Formation is not anticipated due to the clay layers between these two aquifers and the mandatory construction requirement for a cement-grout seal that will be provided in constructing the irrigation well.

The use of runoff captured in the headwaters of Piscataway Creek at the weir location would have no net effect on low stream flows (Figure 3). This is due to the limitations that would be imposed on the withdrawal which are designed to maintain an environmental release below this point of withdrawal. The release would be in accordance with natural stream flows during any given season and would therefore not adversely affect the aquatic habitat downstream. The Proposed Action could actually enhance downstream habitat by reducing peak flows resulting from the airfield impervious surfaces. It would also reduce groundwater impacts from other sources.

Capturing and routing of the storm water flows from the golf course to Base Lake would have the beneficial effect of reducing peak and erosive storm flows and would reduce reliance on groundwater and Piscataway Creek.

Use of an additional well in the Magothy would have a detrimental effect on the existing well and could negatively affect other shallow groundwater users in the area (Figure 5), just as increasing the yield of the existing well could. In addition, the PGCHD has questioned the integrity of confining layers above the Magothy, which could, theoretically, affect the shallow aquifer on the base (USAF, 2001d). Additional geologic data is being developed in the remedial investigation.

Increasing the shallow groundwater withdrawal by lateral expansion of Base Lake, deepening of Base Lake, or borrow pit pumping would have a measurable, negative effect on the shallow aquifer.

fer system. This is because the shallow aquifer is unconfined and fed directly by rainfall falling in the immediate area and is subject to significant seasonal fluctuation; increasing withdrawals could exacerbate these effects.

4.3 Hazardous Materials

The potential impacts of the Proposed Action and Alternatives and the impacts to them from hazardous materials contamination at Andrews AFB were considered. The two former landfills (LFO6 and LFO7) are just above the shallow water table. In addition, there are other environmental sites on the Base above or in this shallow water table aquifer. Although the Base is moving toward closure of these sites, the landfill areas are being reevaluated as potential contaminant sources.

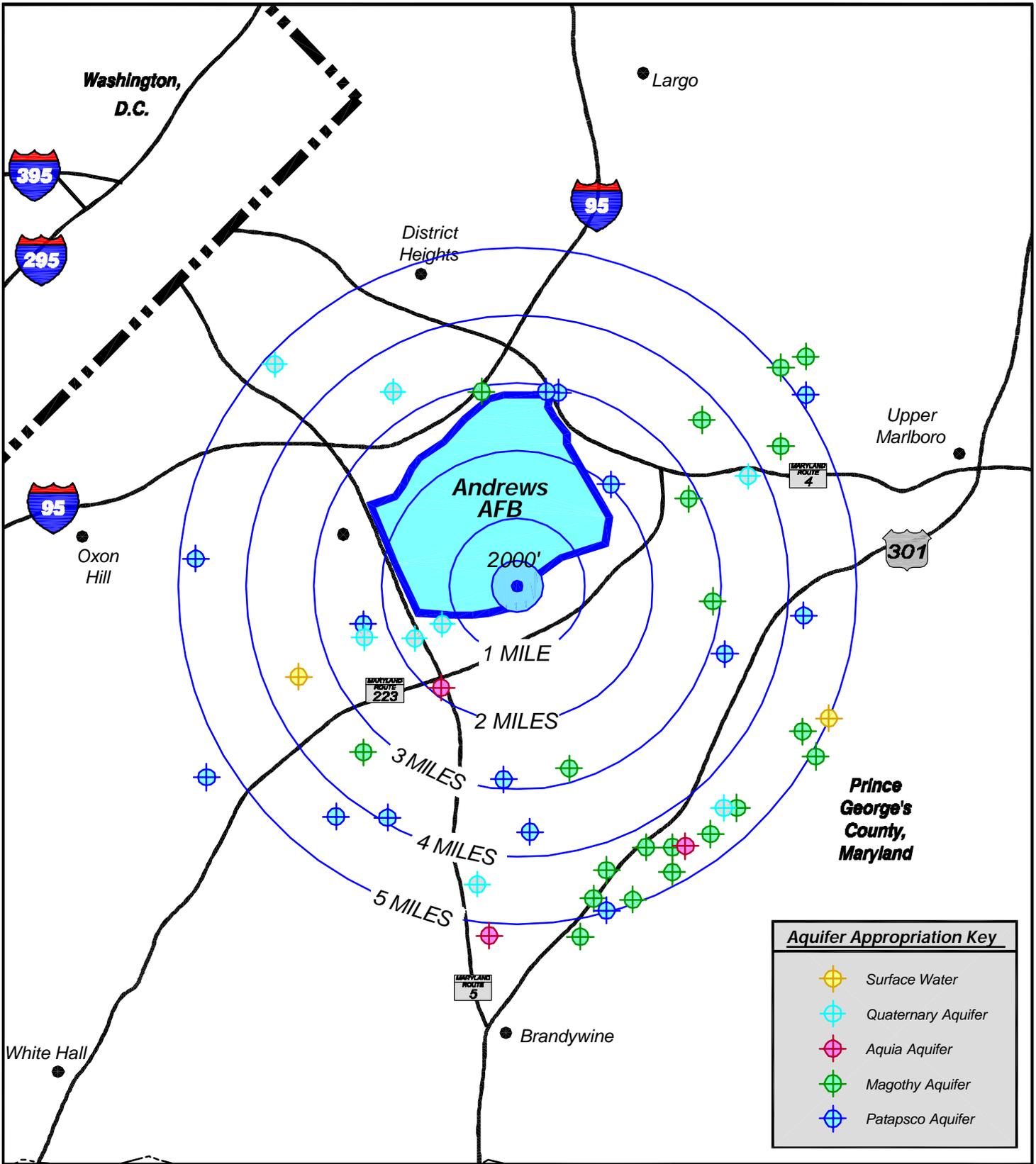
The Proposed Action would allow stabilization of Base Lake water levels. Since Base Lake is fed by the shallow groundwater aquifer, it can potentially draw groundwater contaminants from beneath adjacent former landfill areas when it is drawn down. By maintaining the Base Lake at a higher, natural elevation, drawing water from the shallow aquifer and potential contaminant mobilization can be minimized. In addition, maintaining higher lake levels can reduce detrimental summer heating effects. Therefore, the overall quality of Base Lake water could be expected to improve with implementation of the Proposed Action.

Due to the multiple, natural clayey layers (into which the well would be sealed) above the Magothy and Patuxent aquifers, the well Alternatives should not directly affect the shallow groundwater aquifer. The well would be constructed in accordance with current well construction regulations and would have double casing at its upper terminus and the casing would be grout-sealed. The proposed Action would be coordinated with on-going subsurface environmental investigations. Information generated by both efforts would be used to evaluate and manage the local aquifer uses. Lateral expansion of Base Lake, deepening of Base Lake, and borrow pit pumping all could, to one degree or another, adversely affect the shallow water table aquifer and the migration of potential landfill contaminants.

4.4 Biological Resources

There are no significant potential impacts to the aquatic biota in Base Lake and Piscataway Creek from the Proposed Action and Alternatives. The Proposed Action would enhance the aquatic habitat in Base Lake by maintaining a higher, more natural water level throughout the irrigation season. Currently, the lake is drawn down significantly due to lack of supply and can only provide relatively shallow habitat in many areas. Heating of the water can be significant in the summertime due to large surface-area-to water mass ratio. With the Proposed Action, shallow water areas along the shorelines would be made relatively stable, not migrating in and out significantly as the water levels fluctuate in the lake. This enhancement could provide better quality habitat for aquatic life in the Base Lake.

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Aquifer Appropriation Key	
	Surface Water
	Quaternary Aquifer
	Aquia Aquifer
	Magothy Aquifer
	Patapsco Aquifer

LEGEND

- DISTANCE FROM BASE LAKE
- LOCATION OF GROUNDWATER APPROPRIATION



NOTE: NO POTABLE WELLS LOCATED WITHIN 2000' OF BASE LAKE.

ANDREWS AIR FORCE BASE
Prince George's County, Maryland

**ANDREWS AIR FORCE BASE
INVENTORY OF OTHER USERS**

drawn <i>MDS</i>	checked <i>ESA</i>	approved <i>MDH</i>	figure no.
date <i>01/28/02</i>	date <i>01/29/02</i>	date <i>01/30/02</i>	5
job no. 01-1408-04-1400-000		file no. 1400-001-D	

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There should be no impacts (positive or negative) on water fowl with the Proposed Action since there would be no net change in water surface area. Lateral expansion of Base Lake is the only Alternative which would increase water surface area and associated water fowl habitat.

4.5 Land Use

The land use effects of the Proposed Action and Alternatives are essentially secondary in nature. Since all the actions and proposed Alternatives are on entirely within Andrews AFB, and many are within the golf course property itself, there are no off-site land use effects anticipated.

Implementation of the Proposed Action will have no off-site effects and minimal effects on the golf course itself. The withdrawal from the Piscataway Creek would entail construction of an underground pipeline across an open space area and along South Perimeter Road. This construction work would essentially be brought to original grade and restored.

The benefits for the Proposed Action would be in the recreational value of the golf course and Base Lake itself. Currently, the golf course receives about half of the water needed by the existing turf. Due to the well-drained nature of these soils, and the relatively high heat that occur in the summer months, daily attention is required to maintain the playing surface. Long periods without adequate irrigation can result in loss of turf, associated loss of the economic value of the facility, and resulting cost in reseeded and restoration.

Land use effects associated with the other Alternatives are similar to those of the Proposed Action.

4.6 Aircraft Safety

Consideration of aircraft safety is brought by potential secondary BASH from increasing waterfowl population.

The Proposed Action would not significantly increase the waterfowl habitat on the base. It could have positive effects on the aquatic life in the Base Lake food chain. It would not expand the existing catchment between East Course holes 9 and 10, but would extend the length of temporary pooling during the growing season. Since there would not be a net increase in permanent habitat, there should not be an increase in waterfowl populations.

Most of the Alternatives examined would not have any significant impacts to aircraft safety from BASH. Only with lateral expansion of Base Lake would waterfowl habitat within the flight line area be increased, which could have some effect and would require further study.

4.7 Utilities

Water, sewage, and wastewater utilities are examined due to both potential primary and secondary effects. Although these effects are relatively minor, they do have a bearing on the Proposed Action and Alternatives.

The Proposed Action would have no effect on regional or Base water or sewer utilities. Electrical usage will increase slightly as would be expected, although the use of gravity drainage and minimal groundwater pumping will be promoted in the source management to save operational costs. The largest pumps required for any of the actions would be less than half that used by the existing irrigation pumping stations.

5.0 SUMMARY

This EA has described the Proposed Action and Alternatives in the level of detail consistent with AFI 32-7061 and 32 CFR Part 989 (6-July-1999), as amended at 66FR 16868, 28-March-2001. It provides a description of the affected environment and includes detailed description of those issues most pertinent to the Proposed Action and Alternatives. All aspects of the Proposed Action have been examined in light of the issues and the environmental consequences of each are described. In addition, Alternatives to the Proposed Action have been examined with respect to the same issues and those environmental consequences described in detail.

The potential positive and negative effects on each of the issues studied are summarized in Table 2. In order to facilitate evaluation and decision-making, a rating scale is used to indicate the relative degree of positive or negative potential effects.

Table-2 Summary of Alternatives and Issues

	Soils and Geology	Water Resources	Hazardous Materials	Biological Resources	Land Use	Aircraft Safety	Utilities	total rating
Patapsco well	C	O		O	O			
	-1	-1	0	2	1	0	0	1
Piscataway Creek	C	O		O	O			
	-1	-1	0	1	1	0	0	0
Golf Course runoff	C	O		O	O	O		
	-1	1	0	1	2	-1	0	2
No Action		O	O	O	O			
	0	-2	-1	-2	-1	0	0	-6
Patuxent well	C	O		O	O			
	-1	-1	0	2	1	0	0	1
Magothy well	C	O	O	O	O			
	-1	-2	-1	1	1	0	0	-2
Increase yield of existing well		O	O					
	0	-2	-1	0	0	0	0	-3
Lateral Expansion of Base Lake	C	O	O	C&O	O	O		
	-2	-1	-1	-2	1	-1	0	-6
Deepening of Base Lake	C	O	O	C&O	C			
	-2	-2	-1	-2	-1	0	0	-8
Borrow Pits		O	O					
	0	-1	-1	0	0	0	0	-2

Notes:
Proposed Action shown in bold type
 Relative degree of positive and/or negative effects rated on scale of -2 to +2
 C = Construction Impact only, O = Operational Impact only, C&O = Construction and Operational Impact

Depending on subsurface conditions, the Patuxent aquifer well and Patapsco aquifer well Alternatives might stand alone in meeting project requirements. However, a combination of Alternatives can optimize the supply, mitigate environmental consequences, and improve stormwater management on the Base. The Proposed Action (the use of a Patapsco well with Piscataway Creek pumping and rerouting of storm water flow) also conserves water resources by relying on rainfall as a primary source and capturing available stormwater runoff.

Economic and cost criteria are not evaluated as a routine part of the NEPA process. However, the wastewater reuse, WSSC connection, lateral expansion and / or deepening of Base Lake, and the Patuxent well alternatives are not viable economically and it would be difficult to justify funding for such projects.

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- U.S. Air Force, 1995b, Andrews Air Force Base General Plan. Prepared by Harland Bartholomew & Associates, Chesterfield, Missouri.
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- U.S. Air Force, 1996c, Irrigation Options for the Golf Course Addition at Andrews Air Force Base, Maryland, prepared by Glenn and Sadler, Norfolk, Virginia.
- U.S. Air Force, 2001a, Water Supply Feasibility Study for the Courses at Andrews Air Force Base, Maryland, prepared by Science Applications International Corporation for Headquarters Air Force Center for Environmental Excellence, Brooks AFB, TX.
- U.S. Air Force, 2001b, Draft Environmental Assessment for Management of Obstructions to Flight Operations at Andrews Air Force Base.
- U.S. Air Force, 2001c, Final environmental assessment for development of the Base Lake Recreational Area at Andrews Air Force Base, Maryland, Prepared by Geo-Marine, Inc. for Headquarters Air Force Center for Environmental Excellence, Brooks AFB, TX.
- U.S. Air Force, 2001d, Personal Communication with Carol Devier-Heeney, 89 CGS/CEVP.
- U.S. Air Force, 2001e, Draft Integrated Natural Resources Management Plan for Andrews Air Force Base, Maryland, prepared by Geo-Marine, Inc. for Headquarters Air Force Center for Environmental Excellence, Brooks AFB, TX.

7.0 LIST OF PREPARERS

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Brian Dolan, 89 CES/CEVR, B.S. Geology, 1993, University of Maryland. Years of experience: 9.

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Keith Harris, Environmental Protection Specialist, 89 CES/CEVP, REM. Years of experience: 18.

APPENDIX A

APPLICABLE LAWS AND REGULATIONS

- AFI 32-7064, Natural Resources Management
- AFI 32-7065, Cultural Resources Management
- Air Force Instruction (AFI) 32-7061, Environmental Impact Analysis Process (EIAP)
- Archaeological Resources Protection Act of 1979 [16 USC 470]
- Clean Air Act of 1970, as Amended (CAA) [42 USC 7401-7671]
- Clean Water Act of 1972, as Amended 1977 (CWA) [33 USC 1251-1376]
- Comprehensive Environmental Response Compensation and Liability Act (CERCLA)
- Conservation Programs on Military Reservations of 1960 (Sikes Act) [16 USC 670a-670o]
- Council on Environmental Quality (CEQ) regulations, CFR parts 1500 through 1505
- Endangered Species Act (ESA) of 1973 [16 USC 1531-1544] [PL 93-205], as amended 1988
- Environmental Conservation Program [DoD DIR 4715.3]
- Erosion Protection Act [33 USC 426]
- Executive Order 11988 and 11990, Floodplain Management and Protection of Wetlands, respectively
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Exotic Organisms [EO 11987]
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), amended 1972 [7 USC 136-136y]
- Federal Noxious Weed Act of 1974, as amended [7 USC 2801]
- Historical and Archeological Data Preservation Act of 1974 [16 USC 470-470a-1]
- Migratory Bird Treaty Act of 1918 [16 USC 703-712]
- National Environmental Policy Act (NEPA) regulations, CFR parts 1500 through 1505
- Noise Control Act of 1972 [42 USC 4901]
- Noxious Plant Control Act of 1968 [43 USC 1241 et seq.]
- Pollution Prevention Act of 1990 [42 USC 13101-13109]
- Prince George's County, Maryland, Department of the Environment, Sediment Control
- Prince George's County, Maryland, Department of the Environment, Stormwater Management
- Prince George's County, Maryland, Department of Planning
- Prince George's County, Maryland, Health Department, Bureau of Environmental Services
- Protection of Wetlands [EO 11990]
- Recreational Fisheries [EO 12962]
- Resource Conservation and Recovery Act of 1976 (RCRA) [42 USC 6901-6992]
- State of Maryland, Water Management Administration, Water Appropriations Permit
- State of Maryland, Board of Well Drillers, Licenses
- Washington Suburban Sanitary Commission, Sanitary Sewer Discharge Permit
- Water Resources Planning Act [42 USC 1962]

FINAL
FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT FOR INCREASING WATER SUPPLY
FOR GOLF COURSE IRRIGATION
THE COURSES AT ANDREWS, ANDREWS AIR FORCE BASE, MARYLAND

INTRODUCTION

This Finding of No Significant Impact (FONSI) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) § 1500-1508), and the Air Force Environmental Impact Analysis Process (32CFR § 989). The decision in this FONSI is based upon the Environmental Assessment (EA) for Increasing Water Supply for Golf Course Irrigation, The Courses at Andrews, Andrews Air Force Base (AFB), Maryland and agency comments. The EA analyzed potential environmental consequences from the Proposed Action and Alternatives.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Andrews Air Force Base proposes to increase the water supply to Base Lake while conserving local water resources. The existing source originates from groundwater seepage into Base Lake and from an irrigation well completed in an underlying aquifer (Magothy Formation). Three additional sources of water have been identified:

- Groundwater from the (deeper) Patapsco Formation
- Surface water runoff in nearby Piscataway Creek
- Stormwater runoff from the course itself

This combination conserves local water resources by relying on rainfall as a primary source and capturing available storm water runoff from the course and Piscataway Creek. It relies on groundwater only as needed, while maintaining natural stream baseflow in Piscataway Creek.

The Proposed Action includes this combination of sources. An irrigation well would be completed in the Patapsco Formation and the groundwater would be routed to Base Lake. The well would be located on the golf course approximately 400 feet northwest of Base Lake and 400 feet south of South Perimeter Road, between East Course hole 9 and South Course hole 4. The Piscataway Creek withdrawal would be from the existing in-stream pool above the weir located approximately 1,400 feet northeast of Base Lake. Whenever excess stream flow is available from the stream (as gauged by a weir), water would be pumped to Base Lake. Golf course stormwater runoff would be captured in an existing catchment between East Course Holes 9 and 10 and routed via underground pipe / improved grassed swale to Base Lake. Through a series of pumping controls, Base Lake would be maintained at a more “natural” water level.

Nine Alternatives are considered, including the No-Action Alternative. These include:

- Use of groundwater from the (deepest) Patuxent Formation
- Use of additional groundwater well in the (shallower) Magothy Formation
- Increasing the yield of the existing well in the (shallower) Magothy Formation
- Lateral expansion of Base Lake
- Deepening of Base Lake
- Use of existing borrow pits as a seasonal groundwater supply

Wastewater re-use and connection to the existing potable water system were considered but eliminated from further study. Air Force policies, permitting issues, and potential impacts and operational costs rendered these alternatives too unreasonable to proceed with further analysis.

ENVIRONMENTAL EFFECTS

Issues with potential direct and cumulative and secondary impacts were considered in detail to provide the Air Force with sufficient information to enable an appropriate decision. These are soils and geology, water resources, hazardous materials, biological resources, land use, aircraft safety, and utilities. Issues eliminated from detailed study because they were either not present in the study area or were not associated with potential impacts were wetlands, threatened and endangered species, cultural resources, airspace, noise, transportation, environmental justice, air quality, and socio-economic factors.

The proposed action will have minor and temporary effects on previously disturbed soils and will ultimately have a positive effect in reducing erosion. Water resources are conserved in the proposed action, potential groundwater impacts are mitigated by use of surface runoff, and other users will not be unreasonably impacted (ensured by MDE permitting process). The potential impacts to hazardous materials are negligible and there are positive benefits to maintaining Base Lake at a higher water level. Positive benefits to biological resources will result from the Proposed Action. Potential impacts to land use, aircraft safety, and utilities will be negligible.

DECISION

Based on the review of the EA, I have decided to proceed with increasing the water supply for golf course irrigation at the Courses at Andrews. Implementation of the Proposed Action will provide the supply needed to maintain the existing golf course for the benefit of military families, other DoD personnel assigned to Andrews AFB, and the public, and to avoid continual replacement of turf. For each environmental resource or issue, anticipated direct and indirect impacts were assessed, considering both short- and long-term effects. The Proposed Action includes best management practices and standard operating procedures to avoid or eliminate significant impacts and conserve natural resources.

CONCLUSION

In accordance with the CEQ regulations implementing NEPA and the Air Force Environmental Impact Analysis Process, I conclude that the proposed action will have no significant impact on the quality of the human or natural environment and that preparation of an environmental impact statement is not warranted and will not be prepared.

APPROVED:



Dane R. Martin, Colonel, USAF

Vice Commander, 89th Airlift Wing Chair, Environmental Protection Committee

21 May 02

Date

PUBLIC NOTICE

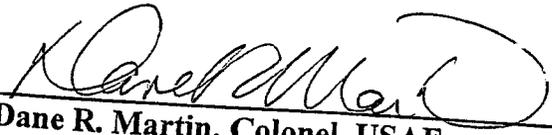
FINDING OF NO SIGNIFICANT IMPACT

Increasing Water Supply for Golf Course Irrigation, The Courses at Andrews Air Force Base, Prince Georges County, Maryland

Pursuant to the Council on Environmental Quality regulations implementing procedural provisions of the National Environmental Policy Act, the Department of the Air Force gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement is not required for Increasing Water Supply for Golf Course Irrigation, The Courses at Andrews Air Force Base, Prince Georges County, Maryland.

The EA addressing this action is on file at Andrews Air Force Base and interested parties may obtain a copy from: Mr. William H. Bushman, HQ AFCEE/ECA, 3207 North Road, Bldg 532, Brooks AFB, TX 78235-5363, (210) 536-3719.

APPROVED:


Dane R. Martin, Colonel, USAF



Date

Vice Commander, 89th Airlift Wing Chair, Environmental Protection Committee

APPENDIX C

WATER APPROPRIATION PERMITS

05/31/2001 12:57 410-631-3163

MDE WMA

PAGE 02

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
WATER APPROPRIATION AND USE PERMIT

PERMIT NUMBER: PG79G002(02)

EFFECTIVE DATE: AUGUST 1, 1997
EXPIRATION DATE: AUGUST 1, 2009
FIRST APPROPRIATION: JANUARY 1, 1980



U.S. AIR FORCE

HEREINAFTER REFERRED TO AS THE "PERMITTEE", IS AUTHORIZED BY THE WATER MANAGEMENT ADMINISTRATION, HEREINAFTER REFERRED TO AS THE "ADMINISTRATION" PURSUANT TO THE PROVISIONS OF TITLE 5 OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND (1996 REPLACEMENT VOLUME) AS AMENDED, TO APPROPRIATE AND USE WATERS OF THE STATE SUBJECT TO THE FOLLOWING CONDITIONS:

1. ALLOCATION - THE WATER WITHDRAWAL GRANTED BY THIS PERMIT IS LIMITED TO:
A DAILY AVERAGE OF 105,000 GALLONS ON A YEARLY BASIS AND
A DAILY AVERAGE OF 350,000 GALLONS FOR THE MONTH OF MAXIMUM USE.
2. USE - THE WATER IS TO BE USED FOR GOLF COURSE IRRIGATION.
3. SOURCE - THE WATER SHALL BE TAKEN FROM ONE WELL IN THE MAGOTHY FORMATION.
4. LOCATION - THE POINT(S) OF WITHDRAWAL SHALL BE LOCATED ANDREWS AIR FORCE BASE GOLF COURSE, BETWEEN SOUTH PERIMETER ROAD AND ALEXANDER FERRY ROAD, PRINCE GEORGES COUNTY, MARYLAND.

CONTINUED ON PAGE 2

FROM: 410 631 3163

P02

PERMIT NUMBER: PG79G002(02)
PAGE NUMBER TWO

5. RIGHT OF ENTRY - THE PERMITTEE SHALL ALLOW AUTHORIZED REPRESENTATIVES OF THE ADMINISTRATION ACCESS TO THE PERMITTEE'S FACILITY TO CONDUCT INSPECTIONS AND EVALUATIONS NECESSARY TO ASSURE COMPLIANCE WITH THE CONDITIONS OF THIS PERMIT. THE PERMITTEE SHALL PROVIDE SUCH ASSISTANCE AS MAY BE NECESSARY TO EFFECTIVELY AND SAFELY CONDUCT SUCH INSPECTIONS AND EVALUATIONS.
6. PERMIT REVIEW - THE PERMITTEE WILL BE QUERIED EVERY THREE YEARS (TRIENNIAL REVIEW) REGARDING WATER USE UNDER THE TERMS AND CONDITIONS OF THIS PERMIT. FAILURE TO RETURN THE TRIENNIAL REVIEW QUERY WILL RESULT IN SUSPENSION OR REVOCATION OF THIS PERMIT.
7. PERMIT RENEWAL - THIS PERMIT WILL EXPIRE ON THE DATE INDICATED ON THE FIRST PAGE OF THIS PERMIT. IN ORDER TO RENEW THE PERMIT THE PERMITTEE SHALL FILE A RENEWAL APPLICATION WITH THE ADMINISTRATION NO LATER THAN 45 DAYS PRIOR TO THE EXPIRATION.
8. PERMIT SUSPENSION OR REVOCATION - THIS PERMIT MAY BE SUSPENDED OR REVOKED BY THE ADMINISTRATION UPON VIOLATION OF THE CONDITIONS OF THIS PERMIT, OR UPON VIOLATION OF ANY REGULATION PROMULGATED PURSUANT TO TITLE 5 OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND (1996 REPLACEMENT VOLUME) AS AMENDED.
9. CHANGE OF OPERATIONS - ANY ANTICIPATED CHANGE IN APPROPRIATION WHICH MAY RESULT IN A NEW OR DIFFERENT USE, QUANTITY, SOURCE, OR PLACE OF USE OF WATER SHALL BE REPORTED TO THE ADMINISTRATION BY THE PERMITTEE BY SUBMISSION OF A NEW APPLICATION.
10. ADDITIONAL PERMIT CONDITIONS - THE ADMINISTRATION MAY AT ANYTIME (INCLUDING TRIENNIAL PERMIT REVIEW OR WHEN A CHANGE APPLICATION IS SUBMITTED) REVISE ANY CONDITION OF THIS PERMIT OR ADD ADDITIONAL CONDITIONS CONCERNING THE CHARACTER, AMOUNT, MEANS AND MANNER OF THE APPROPRIATION OR USE, WHICH MAY BE NECESSARY TO PROPERLY PROTECT, CONTROL AND MANAGE THE WATER RESOURCES OF THE STATE. CONDITION REVISIONS AND ADDITIONS WILL BE ACCOMPLISHED BY ISSUANCE OF A REVISED PERMIT.

CONTINUED ON PAGE 3

PERMIT NUMBER: PG79G002(02)
PAGE NUMBER THREE

11. NON-TRANSFERRABLE - THIS PERMIT IS NON-TRANSFERRABLE. A NEW OWNER MAY ACQUIRE AUTHORIZATION TO CONTINUE THIS APPROPRIATION BY FILING A NEW APPLICATION WITH THE ADMINISTRATION. AUTHORIZATION WILL BE ACCOMPLISHED BY ISSUANCE OF A NEW PERMIT.
12. FLOW MEASUREMENT - THE PERMITTEE SHALL MEASURE ALL WATER USED UNDER THIS PERMIT BY A METHOD WHICH SHALL BE APPROVED BY THE ADMINISTRATION.
13. WITHDRAWAL REPORTS - THE PERMITTEE SHALL SUBMIT TO THE ADMINISTRATION, SEMI-ANNUALLY (JULY-DECEMBER, NO LATER THAN JANUARY 31 AND JANUARY-JUNE, NO LATER THAN JULY 31), PUMPING RECORDS. THESE RECORDS SHALL SHOW THE TOTAL QUANTITY OF WATER PUMPED EACH MONTH UNDER THIS PERMIT.
14. WATER LEVEL MEASUREMENTS - FOR ALL THE APPLICANT'S WELLS FOUR (4) INCHES IN DIAMETER OR LARGER, PUMPING EQUIPMENT SHALL BE INSTALLED SO THAT WATER LEVELS CAN BE MEASURED DURING PUMPING AND NONPUMPING PERIODS WITHOUT DISMANTLING ANY EQUIPMENT. ANY OPENING FOR TAPE MEASUREMENTS OF WATER LEVELS SHALL HAVE A MINIMUM INSIDE DIAMETER OF 0.5 INCHES AND BE SEALED BY A REMOVABLE CAP OR PLUG. THE PERMITTEE SHALL PROVIDE A TAP FOR TAKING RAW WATER SAMPLES BEFORE WATER ENTERS A TREATMENT FACILITY, PRESSURE TANK, OR STORAGE TANK.
15. PERMIT SUPERSESSION - THIS PERMIT HAS BEEN REVIEWED AND REVISED AND SUPERSEDES THE APPROPRIATION AND USE GRANTED BY THE FOLLOWING PRIOR PERMIT ISSUED TO:
U.S.AIR FORCE, ANDREWS AIR BASE ON FEBRUARY 1, 1991
(PG79G002(01))
16. SUPPLEMENTAL PERMIT - THIS PERMIT & THE FOLLOWING LISTED PERMITS ARE SUPPLEMENTAL TO EACH OTHER. TOTAL WITHDRAWALS UNDER THIS PERMIT & THE FOLLOWING LISTED PERMIT(S) SHALL NOT EXCEED THEIR COMBINED TOTAL PERMITTED WITHDRAWAL.
PG96G005

BY AUTHORITY OF THE DIRECTOR
WATER MANAGEMENT ADMINISTRATION

M/G Paj 8/22/97
Matthew G. Pajerowski, Chief
WATER RIGHTS DIVISION

CS

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

WATER APPROPRIATION AND USE PERMIT

PERMIT NUMBER: PG96G005(01)

EFFECTIVE DATE: AUGUST 1, 1997
EXPIRATION DATE: AUGUST 1, 2009
FIRST APPROPRIATION: AUGUST 1, 1997



U.S. AIR FORCE

HEREINAFTER REFERRED TO AS THE "PERMITTEE", IS AUTHORIZED BY THE WATER MANAGEMENT ADMINISTRATION, HEREINAFTER REFERRED TO AS THE "ADMINISTRATION" PURSUANT TO THE PROVISIONS OF TITLE 5 OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND (1996 REPLACEMENT VOLUME) AS AMENDED, TO APPROPRIATE AND USE WATERS OF THE STATE SUBJECT TO THE FOLLOWING CONDITIONS:

1. ALLOCATION - THE WATER WITHDRAWAL GRANTED BY THIS PERMIT IS LIMITED TO:
A DAILY AVERAGE OF 79,000 GALLONS ON A YEARLY BASIS AND
A DAILY AVERAGE OF 166,000 GALLONS FOR THE MONTH OF MAXIMUM USE.
2. USE - THE WATER IS TO BE USED FOR GOLF COURSE IRRIGATION.
3. SOURCE - THE WATER SHALL BE TAKEN FROM ONE POND IN THE AQUIA FORMATION.
4. LOCATION - THE POINT(S) OF WITHDRAWAL SHALL BE LOCATED AT ANDREWS AIR FORCE BASE GOLF COURSE, BETWEEN SOUTH PERIMETER ROAD AND ALEXANDER FERRY ROAD, PRINCE GEORGES COUNTY, MARYLAND.

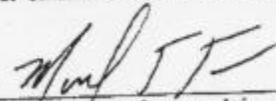
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5. RIGHT OF ENTRY - THE PERMITTEE SHALL ALLOW AUTHORIZED REPRESENTATIVES OF THE ADMINISTRATION ACCESS TO THE PERMITTEE'S FACILITY TO CONDUCT INSPECTIONS AND EVALUATIONS NECESSARY TO ASSURE COMPLIANCE WITH THE CONDITIONS OF THIS PERMIT. THE PERMITTEE SHALL PROVIDE SUCH ASSISTANCE AS MAY BE NECESSARY TO EFFECTIVELY AND SAFELY CONDUCT SUCH INSPECTIONS AND EVALUATIONS.
6. PERMIT REVIEW - THE PERMITTEE WILL BE QUERIED EVERY THREE YEARS (TRIENNIAL REVIEW) REGARDING WATER USE UNDER THE TERMS AND CONDITIONS OF THIS PERMIT. FAILURE TO RETURN THE TRIENNIAL REVIEW QUERY WILL RESULT IN SUSPENSION OR REVOCATION OF THIS PERMIT.
7. PERMIT RENEWAL - THIS PERMIT WILL EXPIRE ON THE DATE INDICATED ON THE FIRST PAGE OF THIS PERMIT. IN ORDER TO RENEW THE PERMIT THE PERMITTEE SHALL FILE A RENEWAL APPLICATION WITH THE ADMINISTRATION NO LATER THAN 45 DAYS PRIOR TO THE EXPIRATION.
8. PERMIT SUSPENSION OR REVOCATION - THIS PERMIT MAY BE SUSPENDED OR REVOKED BY THE ADMINISTRATION UPON VIOLATION OF THE CONDITIONS OF THIS PERMIT, OR UPON VIOLATION OF ANY REGULATION PROMULGATED PURSUANT TO TITLE 5 OF THE ENVIRONMENT ARTICLE, ANNOTATED CODE OF MARYLAND (1996 REPLACEMENT VOLUME) AS AMENDED.
9. CHANGE OF OPERATIONS - ANY ANTICIPATED CHANGE IN APPROPRIATION WHICH MAY RESULT IN A NEW OR DIFFERENT USE, QUANTITY, SOURCE, OR PLACE OF USE OF WATER SHALL BE REPORTED TO THE ADMINISTRATION BY THE PERMITTEE BY SUBMISSION OF A NEW APPLICATION.
10. ADDITIONAL PERMIT CONDITIONS - THE ADMINISTRATION MAY AT ANYTIME (INCLUDING TRIENNIAL PERMIT REVIEW OR WHEN A CHANGE APPLICATION IS SUBMITTED) REVISE ANY CONDITION OF THIS PERMIT OR ADD ADDITIONAL CONDITIONS CONCERNING THE CHARACTER, AMOUNT, MEANS AND MANNER OF THE APPROPRIATION OR USE, WHICH MAY BE NECESSARY TO PROPERLY PROTECT, CONTROL AND MANAGE THE WATER RESOURCES OF THE STATE. CONDITION REVISIONS AND ADDITIONS WILL BE ACCOMPLISHED BY ISSUANCE OF A REVISED PERMIT.

11. NON-TRANSFERRABLE - THIS PERMIT IS NON-TRANSFERRABLE. A NEW OWNER MAY ACQUIRE AUTHORIZATION TO CONTINUE THIS APPROPRIATION BY FILING A NEW APPLICATION WITH THE ADMINISTRATION. AUTHORIZATION WILL BE ACCOMPLISHED BY ISSUANCE OF A NEW PERMIT.
12. FLOW MEASUREMENT - THE PERMITTEE SHALL MEASURE ALL WATER USED UNDER THIS PERMIT BY A METHOD WHICH SHALL BE APPROVED BY THE ADMINISTRATION.
13. WITHDRAWAL REPORTS - THE PERMITTEE SHALL SUBMIT TO THE ADMINISTRATION, SEMI-ANNUALLY (JULY-DECEMBER, NO LATER THAN JANUARY 31 AND JANUARY-JUNE, NO LATER THAN JULY 31), PUMPING RECORDS. THESE RECORDS SHALL SHOW THE TOTAL QUANTITY OF WATER PUMPED EACH MONTH UNDER THIS PERMIT.
14. *****
* INITIATION OF WITHDRAWAL - THE PERMITTEE SHALL NOTIFY THE*
* ADMINISTRATION BY CERTIFIED MAIL WHEN WITHDRAWALS FOR THE*
* USES SPECIFIED IN THIS PERMIT HAVE BEEN INITIATED. THIS *
* PERMIT SHALL EXPIRE IF WATER WITHDRAWAL IS NOT COMMENCED *
* WITHIN TWO YEARS AFTER THE EFFECTIVE DATE OF THIS PERMIT *
* EXCEPT THAT UPON WRITTEN REQUEST TO THE ADMINISTRATION *
* PRIOR TO THE EXPIRATION OF THE TWO YEAR PERIOD, THE TIME *
* LIMIT MAY BE EXTENDED FOR GOOD CAUSE, AT THE DISCRETION *
* OF THE ADMINISTRATION. *

15. SUPPLEMENTAL PERMIT - THIS PERMIT & THE FOLLOWING LISTED PERMITS ARE SUPPLEMENTAL TO EACH OTHER. TOTAL WITHDRAWALS UNDER THIS PERMIT & THE FOLLOWING LISTED PERMIT(S) SHALL NOT EXCEED THEIR COMBINED TOTAL PERMITTED WITHDRAWAL.
PG79G002

BY AUTHORITY OF THE DIRECTOR
WATER MANAGEMENT ADMINISTRATION


Matthew G. Pajerowski, Chief
WATER RIGHTS DIVISION
8/10/97

MTF

APPENDIX D

COMMENTS AND RESPONSES

Comment Response Matrix		Draft Environmental Assessment
Increasing Water Supply for Golf Course Irrigation		Andrews Air Force Base, Maryland
Location / Number	Comment	Response
MD Department of Natural Resources (Greg Golden)		15-Mar-02
1	On page 8, there is a reference to endangered species. While not clarified, this seems to refer to Federally listed species. We recommend that you also address any potential State listed rare, threatened, or endangered species. Some State listed species have been documented in the past in certain areas of Andrews Air Force Base. There should be consideration of any nearby State listed species during the review of any applications for State permits. The base environmental staff and/or our Wildlife and Heritage Division can be contacted for further information on the State listed species which have been documented within the base.	Agreed. The nature of the proposed action is such that there should be no significant impacts to animal, plant, or insect species. The EA has been prepared in cooperation with Andrews Air Force Base environmental staff, whose direction and comments have been used throughout the document. The MDNR Wildlife and Heritage Division will be consulted for further information on the State listed species which have been documented within the Base upon State permit application for new actions.
2	We strongly support the intent stated in the document to only withdraw water from the stream during those flows which exceed seasonal baseflows. This is the best way to optimize protection of existing aquatic resources in the stream. With this method, artificial extreme low flows caused by water withdrawals are avoided. Also, we agree that through this method excessive storm flows and related streambank erosion are lessened to some degree by the removal of some amount of storm runoff from the stream. We believe that this best management strategy should be easily accomplished because of the large storage capacity of the lake and the alternate means of acquiring water that are included in the plan. During periods of no rainfall, water should still be available for irrigation without needing to withdraw from the stream under baseflow or low flow conditions. Capacity to withdraw water from the stream during storm flows should be designed to optimize those opportunities, so that withdrawals during baseflow can continue to be	We concur. The stream intake would be screened to minimize the entrainment of aquatic life. No changes necessary.
3	We also strongly support the stated intent to capture some amount of stormwater runoff from upland areas. This helps to minimize discharge of untreated and un-attenuated stormwater runoff from the base to natural streams, while gaining water supply for later irrigation. We recommend that any further opportunities to collect stormwater runoff from the site for delivery to the lake for storage be considered, especially from impervious surfaces on the base and other hard-packed grassed areas. This approach can aid in the stormwater retrofit of the base as a whole, which we would assume has many areas of older development which did not have stormwater management facilities installed when they were built.	We concur. No changes necessary.
4	It appears from the Environmental Assessment text that installation of pipeline structures is viewed as a minimal impact. We advocate the consideration of vegetation disturbance or removal that might occur with pipeline installation. This should include consideration of potential impacts to State listed rare, threatened, and endangered species; non-tidal wetlands; or other valuable vegetative habitats. In general, we advocate the minimization of impacts to naturally vegetated areas during the placement of any pipelines.	Agreed. The proposed action takes advantage of already-disturbed areas for any pipe routes. In general, the relatively small diameter of much of the piping allows use of continuous excavation / backfill installation methods. A sediment and erosion plan will be approved by MDE prior to implementation, which will include appropriate and rapid stabilization.

Comment Response Matrix		Draft Environmental Assessment
Increasing Water Supply for Golf Course Irrigation		Andrews Air Force Base, Maryland
Location / Number	Comment	Response
MD Department of Planning (Deborah Weller)		21-Feb-02
1	Has an actual detailed analysis been performed to determine the effect this well will have on current water users as well as future water demands?	The nearest well in the Patapsco aquifer is over two miles away and potential direct impacts to any shallower wells would be prevented by the intervening confining clay layers (AAFB and most of the surrounding area is served by public water from WSSC sources originating from surface water). Based on the aquifer characteristics, well interference is not expected and potential impacts would be quantified in the MDE permitting process with field testing.
2	Is this project consistent with the Counties' land use plans?	Yes. Future planning would also be addressed during Prince Georges County review for inclusion in the county Water and Sewer Plan.
3	Also the plan mentions that there are several water users in the area but glosses over the potential impacts of the well on their water supply. What will the impact be on these users? I would like to be sure that they would not be negatively impacted.	See response to comment 1.
4	What is the full extent of the area that would be influenced by the new well in terms of draw down?	This would be determined during testing of the well in accordance with MDE guidelines. The results would be reviewed by the MDE and they would determine reasonable and acceptable pumping rates.

Comment Response Matrix		Draft Environmental Assessment
Increasing Water Supply for Golf Course Irrigation		Andrews Air Force Base, Maryland
Location / Number	Comment	Response
Prince Georges Co. Div. of Environmental Health (Anne Williams)		18-Mar-02
Cover Sheet	1) This office applauds the efforts to reutilize water generated on the site by the collection of stormwater at the catchment between the East Courses Holes 9 and 10. Please be aware that significant amounts of pesticides and fertilizers are applied to keep golf course greens in picturesque condition. Along with the stormwater, residues of pesticides and fertilizers, and heavy metals will also be collected and deposited into the Base Lake. During May 2001, this office reviewed a draft environmental assessment for the development of the Base Lake recreational area. In that document, there were plans to utilize the Base Lake for recreational fishing. (See enclosed documents from this office dated May 21, 2001 and from the US EPA dated May 5, 2001.) Currently, this office has concerns regarding the utilization of the Base Lake for recreational fishing. These concerns will increase as the result of the addition of water from the catchment basin.	Comment noted. Appropriate water quality testing will be provided in implementation in actions proposed herein. As a note, adding groundwater to Base Lake should provide additional dilution of any potential contaminants and use of the Lake for irrigation will "recycle" potential chemicals and reduce potential impacts to the receiving stream. The use of Base Lake for recreational fishing is not within the scope of this EA, however current Base policy prohibits fishing at Base Lake.
Cover Sheet	2) The State of Maryland is currently experiencing drought conditions. While it is true that these conditions are more severe on the Eastern Shore and the central portion of Maryland, the effects are also being felt by the citizens of this County. Until drought conditions are lifted, it is requested that the irrigation well installed in the Magothy formation not be utilized. The Magothy is a very important aquifer for residential drinking water and is supposed to be reserved for residential use only. This office would prefer the utilization of groundwater from the Patapsco formation instead and that no additional wells are placed in the Magothy.	Agreed. Implementation of the proposed action can allow reduction of Magothy Formation use. As indicated in the EA, increased use of the Magothy has been ruled out as an option.
Sect. 1.2	3) Due to the volume of water to be utilized by this project, it needs to be reviewed by Prince George's County for inclusion into the County's Ten-Year Water and Sewer Master Plan.	Agreed. Once the test well is complete and the water appropriation permit is issued, an application to amend the PG County Water and Sewer Master Plan would be filed.
Figure 2	4) The area delineated also covers four CERCLA sites (i.e. Landfill 7 (LF07), Fire Training Area 2 (FT03), Area of Concern 23 - radioactive waste (AOC 23) and AOC-27 disposal pits. See the enclosed map.	CERCLA site locations added to Figure 3. Figure 2 is a golf course location map.
Sect. 1.5	5a) Due to the proximity of the golf course to several Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, CERCLA must be added to your list of applicable laws and regulations.	Change made.
Sect. 1.5	5b) See comment 3.	See response to comment 3.
Sect. 1.6	6) Although Andrews Air Force Base (AAFB) did prepare a decision document, which stated that both the landfills (LF-06 and LF-07) pose no significant threat to public health or the environment, this office did not concur with this document due to the lack of full characterization of LF-06 and LF-07. Furthermore, due to the placement of AAFB on the National Priorities List (NPL), both landfills must be reassessed for their effects on human health and the environment per CERCLA. The expansion of the golf course onto LF-07 may have to be removed to accommodate the investigation to characterize LF-06 and LF-07 and/or for the required remediation at LF-06 and LF-07.	Understood. The proposed action has no connection with the landfill investigations. It would be implemented in cooperation with Andrews AFB environmental staff and would enhance understanding of the hydrogeologic framework underlying the Base.
Sect. 2.1.1	7) Due to the concern on the amount of residual pesticides, herbicides and heavy metals concentrating in the catchment basin, it might be more appropriate for the groundwater to be pumped directly into Base Lake.	This has been considered and would be tested during the MDE permitting process and in a staged implementation, possibly using a temporary direct line to Base Lake.
Sect. 2.1.1	8) See comment 3.	See response to comment 3.
Figure 3	9) Figure 3 needs to be altered to include the locations of FT-03, AOC-23, and AOC-27.	Appropriate changes made to figure.
Sect 2.2.3	10) See comment 2.	See response to comment 2.
Sect. 2.2.4	11) See comment 2.	See response to comment 2.
Sect. 2.2.5	12) Due to the close proximity of CERCLA sites the design of the expansion would have to be cleared through the Superfund Partnering Team to ensure the protection of human health and the environment. It is quite feasible that the exploratory investigations will need to be conducted to ensure that the expansion does not take place in contaminated areas.	We concur. No changes necessary.

Comment Response Matrix		Draft Environmental Assessment
Increasing Water Supply for Golf Course Irrigation		Andrews Air Force Base, Maryland
<u>Location /</u> Number	<u>Comment</u>	<u>Response</u>
Sect. 2.2.5	13) The sediment removed from the expansion of the Base Lake would need to be analyzed for a full suite of contaminants to include: target analyte list - metals and cyanide, target compound list - volatile compounds, semi-volatile compounds, pesticides/aroclor (PCBs), and dioxins/furans prior to disposal to ensure that contaminated material is not being placed at the former borrow pits.	We concur. No changes necessary.
Sect. 2.2.6	14) See comments 12 and 13.	See response to comments 12 and 13.
Sect. 2.3	15) The shallow unconfined aquifer is still utilized in Prince George's County for residential drinking water use.	We concur. No changes necessary.
Figure 4	16) It would have been more accurate to base the stratigraphy of Andrews AFB on the information contained in the well logs from the various monitoring wells installed on the base. This figure is missing the Calvert Formation, which is known to exist on the base. It can be seen in the sides of the deeply incised stream cuts of the unnamed tributary of the Cabin Branch and is known to exist under LeRoy's Land Landfill (LF-05).	Agreed. However, the main intent of this cross section is to illustrate the location of the Magothy, Patapsco, and Patuxent aquifers. The Calvert Formation is well above the aquifers under consideration for use and does not really pertain to this EA. This is geologically interesting and pertinent to environmental investigations, and may be included in future versions of the cross section.
Sect. 3.3.1	17) See comment 6. Also refer to the US EPA letter dated May 9, 2001- comments 2, A, B, C and D, comment 8 and comment 10.	See responses to comments 2, 3, and 6.
Sect. 4.1	18) See comments 12 and 13.	We concur- alternative eliminated from consideration. No changes necessary.
Sect. 4.2	19) See comment 2.	See response to comment 2.
Sect. 4.2	20) The stated options, i.e. increasing the use of the shallow groundwater withdrawal by the lateral expansion of the Base Lake, deepening of the Base Lake, or borrow pit pumping, having a negative effect on the shallow aquifer system is invalid. While this County still has drinking water wells installed in the shallow aquifer, the majority are located in the southeastern portion of the County. The pertinent issues are the encroachment of the CERCLA sites (LF-07, AOC-23, and AOC-27) and the proper management of contaminated sediments removed from the Base Lake. See comments 12 and 13.	The reference is not to potential impacts to local wells but to the effects that increasing the withdrawals could have on groundwater flow patterns in the shallow aquifer beneath the CERCLA sites.
Sect. 4.4	21) See comments 1 and 7.	See response to comments 1 and 7.

Comment Response Matrix		Draft Environmental Assessment
Increasing Water Supply for Golf Course Irrigation		Andrews Air Force Base, Maryland
<u>Location /</u> Number	<u>Comment</u>	<u>Response</u>
Maryland Historical Trust (via MDP)		
Entire Document	"No effect" on historic properties and federal and/or State historic preservation requirements have been met.	Agreed. No response needed.
Maryland Department of Environment		
Entire Document	The document accurately identifies the location of the two former landfills and that these landfills are still undergoing investigation under CERCLA.	Agreed. No response needed.
Appendix A	Appendix A should be revised to include CERCLA, the authority under which the landfills are being investigated.	Change made.

File Copy



Maryland Department of Planning

Parris N. Glendening Governor
Kathleen Kennedy Townsend Lt. Governor

Roy W. Kienitz Secretary
Mary J. Abrams Deputy Secretary

April 5, 2002

Mr. Michael Haufler
Senior Technical Manager
Science Applications International Corporation
1129 Business Parkway South, Suite 10
Westminster, MD 21157

Post-It* Fax Note	7671	Date	4-11-02	# of pages	6
To	Mike Haufler	From	Bob Rosenbush		
Co./Dept.	SAIC	Co.	MOP		
Phone #		Phone #	410-767-4487		
Fax #	410-857-5535	Fax #	410-767-4480		

REVIEW AND RECOMMENDATION

State Application Identifier: MD20020212-0117
 Description: Draft Final E.A. and FONSI: Upgrade Irrigation System: Increase Water Supply for Golf Course Irrigation at The Courses at Andrews Air Force Base: conserve local water resources
 Applicant: Science Applications International Corporation
 Location: Prince George's County
 Approving Authority: U.S. Department of Defense
 Recommendation: Consistent With Qualifying Comments and Contingent Upon Certain Actions

Dear Mr. Haufler:

In accordance with Presidential Executive Order 12372 and Code of Maryland Regulation 14.24.04, the State Clearinghouse has coordinated the intergovernmental review of the referenced project. This letter with attachments, constitutes the State process review and recommendation based upon comments received to date. This recommendation is valid for a period of three years from the date of this letter.

Review comments were requested from the Maryland Departments of the Environment, Housing and Community Development including the Maryland Historical Trust, Natural Resources and Transportation; Prince George's County; and the Maryland Department of Planning.

The Maryland Departments of Housing and Community Development including the Maryland Historical Trust and Transportation found this project to be consistent with their plans, programs, and objectives.

The Maryland Department of the Environment, Natural Resources, and the Maryland Department of Planning found this project to be generally consistent with their plans, programs, and objectives, but included certain qualifying comments summarized below and discussed in the attached comments.

Prince George's County stated that their findings of consistency are contingent upon the Applicant taking the actions summarized below and discussed in the attached comments.

Mr. Michael Haufler

April 5, 2002

Page 2

Summary of Comments:

Prince George's County made these recommendations in their attached comments:

- the irrigation well installed in the Magothy formation should no longer be used until drought conditions are lifted;
- the Golf Course is located close to several Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. Reference to the CERCLA must be added to the list of applicable laws and regulations in the Final Environmental Assessment; and
- the Applicant is encouraged to demonstrate the proper management of sediments that are removed from the Base Lake.

The Department of the Environment mentioned that Appendix A should be amended to include the CERCLA. See the attached comments.

The Department of Natural Resources stated that the potential impacts of the proposed action on State listed rare, threatened or endangered species should be given consideration during the preparation of any applications for State permits. See the attached e-mail message.

The Maryland Historical Trust has determined that the project will have "no effect" on historic properties and that the federal and/or State historic preservation requirements have been met.

The Maryland Department of Planning addressed issues relating to: land use compatibility and the impact of the proposed action on current and future water users. See the attached memorandum.

Any statement of consideration given to the comments should be submitted to the approving authority, with a copy to the State Clearinghouse. Additionally, the State Application Identifier Number must be placed on any correspondence pertaining to this project. The State Clearinghouse must be kept informed if the recommendation cannot be accommodated by the approving authority. Please remember, you must comply with all applicable state and local laws and regulations. If you have any questions about the comments contained in this letter or how to proceed, please contact the State Clearinghouse at (410) 767-4490. Also please complete the attached form and return it to the State Clearinghouse as soon as the status of the project is known. *Any substitutions of this form must include the State Application Identifier Number.* This will ensure that our files are complete. We appreciate your attention to the intergovernmental review process and look forward to your continued cooperation. If you need to contact a staff person, please call 410-767-4490.

Sincerely,

Linda C. Janey, J.D.

Director, Clearinghouse & Plan Review Unit

LCJ:BR:mds

Enclosures

(* indicates with attachments)

cc: Kathryn Orosz - DHCD*

Beverly Warfield - PGEO*

Joane Mueller - MDE*

Ronald Spalding - MDOT*

Stephanie Seachrist - NCPC*

Ray Dintaman - DNR*

-----Original Message-----

From: GGOLDEN@dnr.state.md.us [mailto:GGOLDEN@dnr.state.md.us]
Sent: Friday, March 15, 2002 10:08 AM
To: Bill.bushman@brooks.af.mil
Cc: KMEADE@dnr.state.md.us
Subject: Maryland Department of Natural Resources Comments for Andrews
Air Force Base, Golf Course Irrigation EA

Mr. William Bushman:

Regarding : February 2002 Environmental Assessment, Increasing Water Supply
for Golf Course Irrigation, The Courses at Andrews Air Force Base, Prince
George's County, Maryland

I am commenting in response to the request for comments on the above
referenced Environmental Assessment sent to Ray Dintaman, Director,
Environmental Review Unit, Maryland Department of Natural Resources. It is
my understanding from the transmittal memo sent with the document that
emailed comments were acceptable and/or preferred. I attempted to comment
on the matrix comment form that was provided, but my computer was in a
read-only mode for that document, so I have written our comments in text
form below:

On page 8, there is a reference to endangered species. While not clarified,
this seems to refer to Federally listed species. We recommend that you also
address any potential State listed rare, threatened, or endangered species.
Some State listed species have been documented in the past in certain areas
of Andrews Air Force Base. There should be consideration of any nearby
State listed species during the review of any applications for State
permits. The base environmental staff and/or our Wildlife and Heritage
Division can be contacted for further information on the State listed
species which have been documented within the base.

We strongly support the intent stated in the document to only withdraw water
from the stream during those flows which exceed seasonal baseflows. This is
the best way to optimize protection of existing aquatic resources in the
stream. With this method, artificial extreme low flows caused by water
withdrawals are avoided. Also, we agree that through this method excessive
storm flows and related streambank erosion are lessened to some degree by
the removal of some amount of storm runoff from the stream. We believe that
this best management strategy should be easily accomplished because of the
large storage capacity of the lake and the alternate means of acquiring
water that are included in the plan. During periods of no rainfall, water
should still be available for irrigation without needing to withdraw from
the stream under baseflow or low flow conditions.

Capacity to withdraw water from the stream during storm flows should be designed to optimize those opportunities, so that withdrawals during baseflow can continue to be avoided. We recommend that the intake for water from the stream be screened to minimize the entrainment of aquatic life.

We also strongly support the stated intent to capture some amount of stormwater runoff from upland areas. This helps to minimize discharge of untreated and un-attenuated stormwater runoff from the base to natural streams, while gaining water supply for later irrigation. We recommend that any further opportunities to collect stormwater runoff from the site for delivery to the lake for storage be considered, especially from impervious surfaces on the base and other hard-packed grassed areas. This approach can aid in the stormwater retrofit of the base as a whole, which we would assume has many areas of older development which did not have stormwater management facilities installed when they were built.

It appears from the Environmental Assessment text that installation of pipeline structures is viewed as a minimal impact. We advocate the consideration of vegetation disturbance or removal that might occur with pipeline installation. This should include consideration of potential impacts to State listed rare, threatened, and endangered species; nontidal wetlands; or other valuable vegetative habitats. In general, we advocate the minimization of impacts to naturally vegetated areas during the placement of any pipelines.

Thank you for the opportunity to comment on this document. If you have any questions regarding the comments above, please contact me at your convenience.

Greg Golden
Environmental Review Unit
Maryland Department of Natural Resources
410-260-8334

#####

This message has been scanned for viruses.

Memorandum

To: Bob Rosenbush
From: Deborah Weller, Maryland Department of Planning
Date: 2/21/2002
Re: **Draft Final E.A and FONSI: Upgrade Irrigation System: Increase
Water Supply for Golf Course Irrigation at the Courses at Andrews Air
Force Base**

I have several questions pertaining to this proposed project. First, has an actual detailed analysis been performed to determine the effect this well will have on current water users as well as future water demands. Is this project consistent with the Counties' land use plans? Also the plan mentions that there are several water users in the area but glosses over the potential impacts of the well on their water supply. What will the impact be on these users? I would like to be sure that they would not be negatively impacted. What is the full extent of the area that would be influenced by the new well in terms of draw down?

K:emp'debbie

Division of
Environmental Health



Prince George's County Health Department

9201 Basil Court, Suite 318
Largo, Maryland 20774-5310
301/883-7600 (TDD) 301/883-5025

March 18, 2002

Mr. Michael D. Haufler, PG
Science Applications International Corporation
125 Airport Drive, Suite 36
Westminster, Maryland 21157-3038

Mr. William H. Bushman
RLA
3207 North Road, Building 532
Brooks Air Force Base, Texas 78235-5363

RE: Draft Environmental Assessment - The Courses at Andrews Air Force Base

Dear Messrs. Haufler and Bushman:

This office has reviewed the above referenced project and has the following comments:

General Comments Regarding the Cover Sheet

- 1) This office applauds the efforts to reutilize water generated on the site by the collection of stormwater at the catchment between the East Course Holes 9 and 10. Please be aware that significant amounts of pesticides and fertilizers are applied to keep golf course greens in picturesque condition. Along with the stormwater, residues of pesticides and fertilizers, and heavy metals will also be collected and deposited into the Base Lake. During May 2001, this office reviewed a draft environmental assessment for the development of the Base Lake recreational area. In that document, there were plans to utilize the Base Lake for recreational fishing. (See enclosed documents from this office dated May 21, 2001 and from the US EPA dated May 5, 2001.) Currently, this office has concerns regarding the utilization of the Base Lake for recreational fishing. These concerns will increase as the result of the addition of water from the catchment basin.
- 2) The State of Maryland is currently experiencing drought conditions. While it is true that these conditions are more severe on the Eastern Shore and the central portion of Maryland, the effects are also being felt by the citizens of this County. Until drought

Mr. Michael D. Haufler
Mr. William H. Bushman
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conditions are lifted, it is requested that the irrigation well installed in the Magothy formation not be utilized. The Magothy is a very important aquifer for residential drinking water and is supposed to be reserved for residential use only. This office would prefer the utilization of groundwater from the Patapsco formation instead and that no additional wells are placed in the Magothy.

1.0 Introduction

Page 1, Section 1.2 Purpose and Need, last paragraph

- 3) Due to the volume of water to be utilized by this project, it needs to be reviewed by Prince George's County for inclusion into the County's Ten-Year Water and Sewer Master Plan.

Page 4, Figure 2

- 4) The area delineated also covers four CERCLA sites (i.e. Landfill 7 (LF07), Fire Training Area 2 (FT03), Area of Concern 23 - radioactive waste (AOC 23) and AOC-27 disposal pits. See the enclosed map.

Page 6, Section 1.5 Applicable Laws and Regulations

- 5)
 - a) Due to the proximity of the golf course to several Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, CERCLA must be added to your list of applicable laws and regulations.
 - b) See comment 3.

Page 6, Section 1.6 Related Base Activities, fourth and sixth paragraph

- 6) Although Andrews Air Force Base (AAFB) did prepare a decision document, which stated that both the landfills (LF-06 and LF-07) pose no significant threat to public health or the environment, this office did not concur with this document due to the lack of full characterization of LF-06 and LF-07. Furthermore, due to the placement of AAFB on the National Priorities List (NPL), both landfills must be reassessed for their effects on human health and the environment per CERCLA. The expansion of the golf course onto LF-07 may have to be removed to accommodate the investigation to characterize LF-06 and LF-07 and/or for the required remediation at LF-06 and LF-07.

2.0 Proposed Action and Alternatives

Page 10 and 11, Section 2.1.1 Patapsco Well, first paragraph

- 7) Due to the concern on the amount of residual pesticides, herbicides and heavy metals concentrating in the catchment basin, it might be more appropriate for the groundwater to be pumped directly into the Base Lake.

Page 11, Section 2.1.1 Patapsco Well, last paragraph

- 8) See comment 3.

Page 13, Figure 3

- 9) Figure 3 needs to be altered to include the locations of FT-03, AOC-23, and AOC-27.

Page 15, Section 2.2.3 Use of Groundwater from the Magothy Formation

- 10) See comment 2.

Page 15, Section 2.2.4, Increasing the Yield of the Existing Well

- 11) See comment 2.

Page 15, Section 2.2.5 Lateral Expansion of the Base Lake, first paragraph

- 12) Due to the close proximity of CERCLA sites the design of the expansion would have to be cleared through the Superfund Partnering Team to ensure the protection of human health and the environment. It is quite feasible that exploratory investigations will need to be conducted to ensure that the expansion does not take place in contaminated areas.

Page 16, Section 2.2.5 Lateral Expansion of the Base Lake, second paragraph

- 13) The sediment removed from the expansion of the Base Lake would need to be analyzed for a full suite of contaminants to include: target analyte list - metals and cyanide, target compound list - volatile compounds, semivolatile compounds, pesticides/aroclor (PCBs), and dioxins/furans prior to disposal to ensure that contaminated material is not being placed at the former borrow pits.

Mr. Michael D. Haufler
Mr. William H. Bushman
Page 4
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Page 16, Section 2.2.6 Deepening of Base Lake

- 14) See comments 12 and 13.

3.0 Affected Environment

Page 20, Section 3.2 Water Resources

- 15) The shallow unconfined aquifer is still utilized in Prince George's County for residential drinking water use.

Page 22, Figure 4 - Andrews Air Force Base Cross Section

- 16) It would have been more accurate to base the stratigraphy of Andrews AFB on the information contained in the well logs from the various monitoring wells installed on base. This figure is missing the Calvert Formation, which is known to exist on base. It can be seen in the sides of the deeply incised stream cuts of the unnamed tributary of the Cabin Branch and is known to exist under LeRoy's Land Landfill (LF-05).

Page 23, Section 3.3.1 Landfills

- 17) See comment 6.

Also refer to the US EPA letter dated May 9, 2001- comments 2. A, B, C and D, comment 8 and comment 10.

4.0 Environmental Consequences

Page 26, Section 4.1 Soils and Geology, paragraph five

- 18) See comments 12 and 13.

Page 27, Section 4.2 Water Resources, paragraphs three, four and seven

- 19) See comment 2.

Mr. Michael D. Haufler
Mr. William H. Bushman
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March 18, 2002

Page 27, Section 4.2 Water Resources, paragraph eight

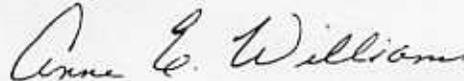
- 20) The stated options, i.e. increasing the use of the shallow groundwater withdrawal by the lateral expansion of the Base Lake, deepening of the Base Lake, or borrow pit pumping, having a negative effect on the shallow aquifer system is invalid. While this County still has drinking water wells installed in the shallow aquifer, the majority are located in the southeastern portion of the County. The pertinent issues are the encroachment of the CERCLA sites (LF-07, AOC-23, and AOC-27) and the proper management of contaminated sediments removed from the Base Lake. See comments 12 and 13.

Page 28, Section 4.4 Biological Resources, paragraph one

- 21) See comments 1 and 7.

If you have any questions regarding this matter, please contact me at (301) 883-7628, weekdays between 7:30 a.m. and 3:30 p.m.

Sincerely,



Anne E. Williams
Environmental Crimes Specialist

AEW:mbb

Enclosures

cc: S. Andrew Sochanski, RPM, Federal Facilities Branch (3HS13), U.S. EPA
Mark Callaghan, RPM, WAS/EERP, MDE
Brian Dollan, RPM, Installation Restoration Program, AAFB
Larry Coffman, PGC Department of Environmental Resources
Manfred Reichwein, PGC Health Department

PLEASE COMPLETE YOUR REVIEW & RECOMMENDATION BEFORE March 11, 2002

RETURN COMPLETED FORM TO: Linda C. Janey, J.D., Director, Clearinghouse & Plan Review Unit, Maryland Department of Planning
301 West Preston Street, Room 1104, Baltimore, Maryland 21201-2365

State Application Identifier:	MD20020212-0117	Clearinghouse Contact:	Bob Rosenbush
Location:	PGEO	Clearinghouse Phone:	410-767-4490
Applicant:	Science Applications International Corporation		
Description:	Draft Final E.A. and FONSI: Upgrade Irrigation System: Increase Water Supply for Golf Course Irrigation at The Courses at Andrews Air Force Base: conserve local water resources		

Based on a Review of the Information Provided, We Have (✓) Checked the Appropriate Determination Below

CONSISTENT RESPONSES - STATE AGENCIES ONLY

- C1 It is consistent with our plans, programs, and objectives.
- C2 It is consistent with the policies contained in Executive Order 01.01.1992.27 (Maryland Economic Growth, Resource Protection, and Planning Act of 1992), Executive Order 01.01.1998.04 (Smart Growth and Neighborhood Conservation Policy), and our plans, programs, and objectives.
- C3 (MHT ONLY) It has been determined that the project will have "no effect" on historic properties and that the federal and/or state historic preservation requirements have been met.
- C4 (DNR ONLY) It has been determined that this project is in the Coastal Zone and is not inconsistent with the Maryland Coastal Zone Management Program.
- C7 (MDP ONLY) It is consistent with the requirements of State Finance and Procurement Article 5-7B-02; 03,04 and 05 Smart Growth and Neighborhood Conservation (Priority Funding Areas).

CONSISTENT RESPONSES - COUNTY & LOCAL AGENCIES ONLY

- C5 It is consistent with our plans, programs, and objectives.
- C6 It is consistent with the Economic Growth, Resource Protection, and Planning Visions (Planning Act of 1992), State Finance and Procurement Article 5-7B- Smart Growth and Neighborhood Conservation (Priority Funding Areas), and our plans, programs, and objectives.

OTHER RESPONSES - ALL AGENCIES

- R1 **GENERALLY CONSISTENT WITH QUALIFYING COMMENTS:** It is generally consistent with our plans, programs and objectives, but the attached qualifying comment is submitted for consideration.
- R2 **CONTINGENT UPON CERTAIN ACTIONS:** It is generally consistent with our plans, programs and objectives contingent upon certain actions being taken as noted in the attached comment.
- R3 **NOT CONSISTENT:** It raises problems concerning compatibility with our plans, programs, objectives, or Planning Act visions/policies or it may duplicate existing program activities, as indicated in the attached comment. If a meeting with the applicant is requested, please check here.
- R4 **ADDITIONAL INFORMATION REQUESTED:** Additional information is required to complete the review. The information needed is identified below. If an extension of the review period is requested, please check here.
- R5 **FURTHER INTEREST:** Due to further interest/questions concerning this project, we request that the Clearinghouse set up a conference with the applicant.
- R6 **SUPPORTS** "Smart Growth" and Federal Executive Order 12072 (Federal Space Management), which directs federal agencies to locate facilities in urban areas.

Attach additional comments if necessary OR use the spaces below for brief comments.

Name: E. J. Cole
 Organization: MHT/DHCD
 Address: 100 Community Place
Crownsville, MD 21032

Signature: [Signature]
 Phone: (410) 514-7631
 Date Completed: 2/21/02

(✓) Check here if additional comments attached.

Maryland Department of The Environment
WASTE MANAGEMENT ADMINISTRATION
RESPONSE TO CLEARINGHOUSE PROJECTS AND
SECRETARY'S REFERRAL DOCUMENTS

Project Review SAI#: MD20020217-0117
County/Location: Prince George's County
Received in WAS: 3/28/2002
Due Date to OSPP: 3/5/2002

It is generally consistent with our plans, programs, and objectives but the following qualifying comment is submitted for consideration:

The document accurately identifies the location of the two former landfills (LF-06 and LF-07) and that these landfills are still undergoing investigation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Appendix A should be revised to include CERCLA, the authority under which the landfills are being investigated.

Contact the Environmental Restoration and Redevelopment Program at (410) 631-3437 for more information.

Signature: _____
Date: _____
Name: _____

Signature: _____
Date: _____
Name: _____



Science Applications International Corporation
An Employee-Owned Company

April 16, 2002

Mr. Ray Dintaman (Greg Golden reviewer)
Environmental Review Unit
Maryland Department of Natural Resources
Tawes State Office Building, B-3
Annapolis, MD 21401

**Re: Andrews Air Force Base
Increasing Water Supply for Golf Course Irrigation
State Application Identifier MD20020212-0117**

Mr. Golden:

Thank you for your review. Your comments are both constructive and supportive, and will help guide the implementation of any further actions by the Base. We respond to each of your comments below.

Comment 1 - On page 8, there is a reference to endangered species. While not clarified, this seems to refer to Federally listed species. We recommend that you also address any potential State listed rare, threatened, or endangered species. Some State listed species have been documented in the past in certain areas of Andrews Air Force Base. There should be consideration of any nearby State listed species during the review of any applications for State permits. The base environmental staff and/or our Wildlife and Heritage Division can be contacted for further information on the State listed species which have been documented within the base.

- **Comment 1 Response** - Agreed. The nature of the proposed action is such that there should be no significant impacts to animal, plant, or insect species. The EA has been prepared in cooperation with Andrews Air Force Base environmental staff, whose direction and comments have been used throughout the document. The MDNR Wildlife and Heritage Division will be consulted for further information on the State listed species which have been documented within the Base upon State permit application for any actions.

Comment 2 - We strongly support the intent stated in the document to only withdraw water from the stream during those flows which exceed seasonal baseflows. This is the best way to optimize protection of existing aquatic resources in the stream. With this method, artificial extreme low flows caused by water withdrawals are avoided. Also, we agree that through this method excessive storm flows and related streambank erosion are lessened to some degree by the removal of some amount of storm runoff from the stream. We believe that this best management strategy should be easily accomplished because of the large storage capacity of the lake and the alternate means of acquiring water that are included in the plan. During periods of no rainfall, water should still be available for irrigation without needing to withdraw from the stream under

baseflow or low flow conditions. Capacity to withdraw water from the stream during storm flows should be designed to optimize those opportunities, so that withdrawals during baseflow can continue to be avoided. We recommend that the intake for water from the stream be screened to minimize the entrainment of aquatic life.

- **Comment 2 Response** - We concur. The stream intake would be screened to minimize the entrainment of aquatic life (and to protect the pump).

Comment 3 - We also strongly support the stated intent to capture some amount of stormwater runoff from upland areas. This helps to minimize discharge of untreated and un-attenuated stormwater runoff from the base to natural streams, while gaining water supply for later irrigation. We recommend that any further opportunities to collect stormwater runoff from the site for delivery to the lake for storage be considered, especially from impervious surfaces on the base and other hard-packed grassed areas. This approach can aid in the stormwater retrofit of the base as a whole, which we would assume has many areas of older development which did not have stormwater management facilities installed when they were built.

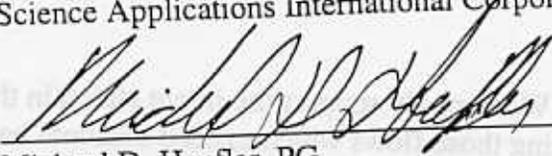
- **Comment 3 Response** - We concur.

Comment 4 - It appears from the Environmental Assessment text that installation of pipeline structures is viewed as a minimal impact. We advocate the consideration of vegetation disturbance or removal that might occur with pipeline installation. This should include consideration of potential impacts to State listed rare, threatened, and endangered species; non-tidal wetlands; or other valuable vegetative habitats. In general, we advocate the minimization of impacts to naturally vegetated areas during the placement of any pipelines.

- **Comment 4 Response** - Agreed. The proposed action takes advantage of already-disturbed areas for any pipe routes. In general, the relatively small diameter of much of the piping allows use of continuous excavation / backfill installation methods. A sediment and erosion plan will be approved by MDE prior to implementation, which will include appropriate and rapid stabilization.

Again, we appreciate your review and comments.

Respectfully submitted,
Science Applications International Corporation


Michael D. Haufler, PG
Senior Technical Manager

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Science Applications International Corporation
An Employee-Owned Company

April 16, 2002

Ms. Deborah Weller
Maryland Department of Planning
301 West Preston Street
Suite 1101
Baltimore, MD 21201-2305

Re: **Andrews Air Force Base
Increasing Water Supply for Golf Course Irrigation
State Application Identifier MD20020212-0117**

Ms. Weller:

Thank you for your review. Your comments are both constructive and supportive, and will help guide the implementation of any further actions by the Base. We respond to each of your comments below.

Comment 1 - Has an actual detailed analysis been performed to determine the effect this well will have on current water users as well as future water demands?

- **Comment 1 Response** - The nearest well in the Patapsco aquifer is over two miles away and potential direct impacts to any shallower wells would be prevented by the intervening confining clay layers (AAFB and most of the surrounding area is served by public water from WSSC sources originating from surface water). Based on the aquifer characteristics, well interference is not expected and potential impacts would be quantified in the MDE permitting process with field testing.

Comment 2 - Is this project consistent with the Counties' land use plans?

- **Comment 2 Response** - Yes. Future planning would also be addressed during Prince Georges County review for inclusion in the county Water and Sewer Plan.

Comment 3 - Also the plan mentions that there are several water users in the area but glosses over the potential impacts of the well on their water supply. What will the impact be on these users? I would like to be sure that they would not be negatively impacted.

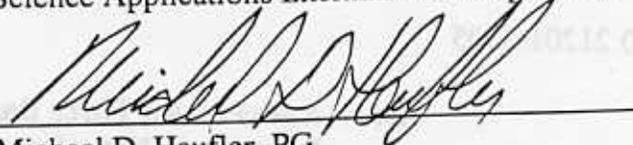
- **Comment 3 Response** - They will not be unreasonably impacted, and the MDE permitting process ensures this. See response to comment 1.

Comment 4 - What is the full extent of the area that would be influenced by the new well in terms of draw down?

- **Comment 4 Response** - This would be determined during testing of the well in accordance with MDE guidelines. The results would be reviewed by the MDE and they would determine reasonable and acceptable pumping rates.

Again, we appreciate your review and comments.

Respectfully submitted,
Science Applications International Corporation



Michael D. Haufler, PG
Senior Technical Manager

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Science Applications International Corporation
An Employee-Owned Company

April 16, 2002

Ms. Anne Williams
Environmental Crimes Specialist
Prince Georges County
Division of Environmental Health
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Largo, Maryland 20774-5310

Re: **Andrews Air Force Base
Increasing Water Supply for Golf Course Irrigation
State Application Identifier MD20020212-0117**

Ms. Williams:

Thank you for your review. Your comments are both constructive and supportive, and will help guide the implementation of any further actions by the Base. We respond to each of your comments below.

Comment 1 - This office applauds the efforts to reutilize water generated on the site by the collection of stormwater at the catchment between the East Courses Holes 9 and 10. Please be aware that significant amounts of pesticides and fertilizers are applied to keep golf course greens in picturesque condition. Along with the stormwater, residues of pesticides and fertilizers, and heavy metals will also be collected and deposited into the Base Lake. During May 2001, this office reviewed a draft environmental assessment for the development of the Base Lake recreational area. In that document, there were plans to utilize the Base Lake for recreational fishing. (See enclosed documents from this office dated May 21, 2001 and from the US EPA dated May 5, 2001.) Currently, this office has concerns regarding the utilization of the Base Lake for recreational fishing. These concerns will increase as the result of the addition of water from the catchment basin.

- **Comment 1 Response** - Comment noted (thank you). Appropriate water quality testing will be provided in implementation of any action proposed herein. As a note, adding groundwater to Base Lake should provide additional dilution of any potential contaminants and use of the Lake for irrigation will "recycle" potential chemicals and reduce potential impacts to the receiving stream. The use of Base Lake for recreational fishing is not within the scope of this EA; however, current Base policy prohibits fishing at Base Lake.

Comment 2 - The State of Maryland is currently experiencing drought conditions. While it is true that these conditions are more severe on the Eastern Shore and the central portion of Maryland, the effects are also being felt by the citizens of this County. Until drought conditions

are lifted, it is requested that the irrigation well installed in the Magothy formation not be utilized. The Magothy is a very important aquifer for residential drinking water and is supposed to be reserved for residential use only. This office would prefer the utilization of groundwater from the Patapsco formation instead and that no additional wells are placed in the Magothy.

- **Comment 2 Response** - Agreed. Implementation of the proposed action can allow reduction of Magothy Formation use. As indicated in the EA, increased use of the Magothy has been ruled out as an option.

Comment 3 - Due to the volume of water to be utilized by this project, it needs to be reviewed by Prince George's County for inclusion into the County's Ten-Year Water and Sewer Master Plan.

- **Comment 3 Response** - Agreed. Once the test well is complete and the water appropriation permit is issued, an application to amend the PG County Water and Sewer Master Plan would be filed.

Comment 4 - Figure 2. The area delineated also covers four CERCLA sites (i.e. Landfill 7 (LF07), Fire Training Area 2 (FT03), Area of Concern 23 - radioactive waste (AOC 23) and AOC-27 disposal pits. See the enclosed map.

- **Comment 4 Response** - CERCLA site locations added to Figure 3. Figure 2 is a golf course location map.

Comment 5a - Due to the proximity of the golf course to several Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, CERCLA must be added to your list of applicable laws and regulations.

- **Comment 5a Response** - Change made.

Comment 5b - See comment 3.

- **Comment 5b Response** - See response to comment 3.

Comment 6 - Although Andrews Air Force Base (AAFB) did prepare a decision document, which stated that both the landfills (LF-06 and LF-07) pose no significant threat to public health or the environment, this office did not concur with this document due to the lack of full characterization of LF-06 and LF-07. Furthermore, due to the placement of AAFB on the National Priorities List (NPL), both landfills must be reassessed for their effects on human health and the environment per CERCLA. The expansion of the golf course onto LF-07 may have to be removed to accommodate the investigation to characterize LF-06 and LF-07 and/or for the required remediation at LF-06 and LF-07.

- **Comment 6 Response** - Understood. The proposed action has no connection with the landfill investigations. It would be implemented in cooperation with Andrews AFB

environmental staff and would enhance understanding of the hydrogeologic framework underlying the Base.

Comment 7 - Due to the concern on the amount of residual pesticides, herbicides and heavy metals concentrating in the catchment basin, it might be more appropriate for the groundwater to be pumped directly into Base Lake.

- **Comment 7 Response** - This has been considered and would be tested during the MDE permitting process and in a staged implementation, possibly using a temporary direct line to Base Lake.

Comment 8 - See comment 3.

- **Comment 8 Response** - See response to comment 3.

Comment 9 - Figure 3 needs to be altered to include the locations of FT-03, AOC-23, and AOC-27.

- **Comment 9 Response** - Appropriate changes made to figure.

Comment 10 - See comment 2.

- **Comment 10 Response** - See response to comment 2.

Comment 11 - See comment 2.

- **Comment 11 Response** - See response to comment 2.

Comment 12 - Due to the close proximity of CERCLA sites the design of the expansion would have to be cleared through the Superfund Partnering Team to ensure the protection of human health and the environment. It is quite feasible that the exploratory investigations will need to be conducted to ensure that the expansion does not take place in contaminated areas.

- **Comment 12 Response** - We concur - alternative eliminated from consideration.

Comment 13 - The sediment removed from the expansion of the Base Lake would need to be analyzed for a full suite of contaminants to include: target analyte list - metals and cyanide, target compound list - volatile compounds, semi-volatile compounds, pesticides/aroclor (PCBs), and dioxins/furans prior to disposal to ensure that contaminated material is not being placed at the former borrow pits.

- **Comment 13 Response** - We concur - alternative eliminated from consideration.

Comment 14 - See comments 12 and 13.

- **Comment 14 Response** - See response to comments 12 and 13.

Comment 15 - The shallow unconfined aquifer is still utilized in Prince George's County for residential drinking water use.

- **Comment 15 Response** - We concur.

Comment 16 - Figure 4. It would have been more accurate to base the stratigraphy of Andrews AFB on the information contained in the well logs from the various monitoring wells installed on the base. This figure is missing the Calvert Formation, which is known to exist on the base. It can be seen in the sides of the deeply incised stream cuts of the unnamed tributary of the Cabin Branch and is known to exist under LeRoy's Land Landfill (LF-05).

- **Comment 16 Response** - Agreed. However, the main intent of this cross section is to illustrate the location of the Magothy, Patapsco, and Patuxent aquifers. The Calvert Formation is well above the aquifers under consideration for use and does not really pertain to this EA. This is geologically interesting and pertinent to environmental investigations, and may be included in future versions of the cross section.

Comment 17 - See comment 6. Also refer to the US EPA letter dated May 9, 2001-comments 2, A, B, C and D, comment 8 and comment 10.

- **Comment 17 Response** - See responses to comments 2, 3, and 6.

Comment 18 - See comments 12 and 13.

- **Comment 18 Response** - We concur – alternative eliminated from consideration.

Comment 19 - See comment 2.

- **Comment 19 Response** - See response to comment 2.

Comment 20 - The stated options, i.e. increasing the use of the shallow groundwater withdrawal by the lateral expansion of the Base Lake, deepening of the Base Lake, or borrow pit pumping, having a negative effect on the shallow aquifer system is invalid. While this County still has drinking water wells installed in the shallow aquifer, the majority are located in the southeastern portion of the County. The pertinent issues are the encroachment of the CERCLA sites (LF-07, AOC-23, and AOC-27) and the proper management of contaminated sediments removed from the Base Lake. See comments 12 and 13.

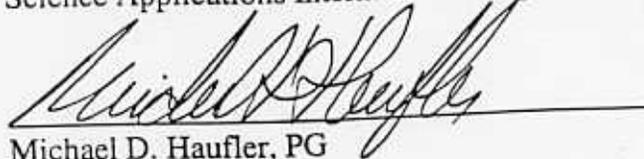
- **Comment 20 Response** - The reference is not to potential impacts to local wells but to the effects that increasing the withdrawals could have on groundwater flow patterns in the shallow aquifer beneath the CERCLA sites.

Comment 21 - See comments 1 and 7.

➤ **Comment 21 Response** - See response to comments 1 and 7.

Again, we appreciate your review and comments.

Respectfully submitted,
Science Applications International Corporation



Michael D. Haufler, PG
Senior Technical Manager

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