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**Preliminary Assessment Report for
Army Aviation Support Facility #3,
Installation 13307,
Hunter Army Airfield,
Savannah, Georgia**

Prepared for

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Prepared by

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Acronyms

AASF	Army Aviation Support Facility
ACM	asbestos-containing material
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEH	Directorate of Engineering and Housing (Hunter Army Airfield)
DNR	Department of Natural Resources (Georgia)
DoD	U.S. Department of Defense
DRMO	Defense Reutilization Marketing Organization
EPA	U.S. Environmental Protection Agency
ESO	environmentally significant operation
FISP	Facility Inventory and Stationing Plan
GAARNG	Georgia Army National Guard
gpm	gallons per minute
HAA	Hunter Army Airfield
IRP	Installation Restoration Program
MOA	Memorandum of Agreement
NPDES	National Pollution Discharge Elimination System
PA	preliminary assessment
PCB	polychlorinated biphenyl
POL	petroleum, oils, and lubricants
RCRA	Resource Conservation and Recovery Act
SAC	U.S. Air Force Strategic Air Command
USAEC	U.S. Army Environmental Center (formerly USATHAMA)
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency (now USAEC)
USGS	U.S. Geological Survey
UST	underground storage tank

**Preliminary Assessment Report for
Army Aviation Support Facility #3,
Installation 13307,
Hunter Army Airfield,
Savannah, Georgia**

Summary

This report presents the results of the preliminary assessment (PA) conducted by Argonne National Laboratory at the Georgia Army National Guard property located on Hunter Army Airfield (HAA) near Savannah, Georgia, known as Army Aviation Support Facility (AASF) #3. Preliminary assessments of federal facilities are being conducted to compile the information necessary for completing preremedial activities and to provide a basis for establishing corrective actions in response to releases of hazardous substances. The principal objective of the PA is to characterize the site accurately and determine the need for further action by examining site activities, types and quantities of hazardous substances utilized, the nature and amounts of wastes generated or stored at the facility, and potential pathways by which contamination could affect public health and the environment. This PA satisfies, for the AASF #3 property, requirements of the Department of Defense Installation Restoration Program (IRP). The scope of this assessment is limited to the facilities and past activities contained within the area now occupied by AASF #3. However, this assessment report is intended to be read in conjunction with a previous IRP assessment of HAA completed in 1992 (USATHAMA 1992) and to provide comprehensive information on AASF #3 for incorporation with information contained in that previous assessment for the entirety of HAA.

The AASF #3 is a 5.5-acre site located on HAA in the southeastern portion of Georgia, on the outskirts of the city of Savannah, in the county of Chatham. The facilities included in this PA are the aircraft maintenance and repair hangar, Hangar 850; the outdoor waste storage area; the former motor pool area; and the administration and office buildings. The environmentally significant operations associated with the property are the outdoor waste storage area adjacent to Hangar 850 and the former motor pool area adjacent to Building 811.

A review of both historical and current practices at the property indicates that the AASF #3 property poses a very minimal risk to human health or the environment and represents no imminent or substantial threat. Releases of hazardous contaminants are suspected to have occurred in the outdoor waste storage area adjacent to Hangar 850. This area is believed to have been the site of

unprotected waste storage since 1954, while under control of the U.S. Air Force from 1954 to 1967, the U.S. Army from 1967 to 1979 (excluding a period from 1971 to 1974 when HAA was not operational), and the Georgia Army National Guard from 1979 to the present. Both hearsay and circumstantial information suggest that hazardous wastes stored in this area over its period of operation included various degreasing solvents (primarily, 1,1,1-trichloroethane and trichloroethylene) and other chemicals that were used in the past for aircraft maintenance, including benzene, toluene, and xylene. In addition, waste lubricating oils, waste hydraulic fluids, and off-specification aviation fuels (JP-4) are also known to have been stored at this location. Overt contamination of the native surface soils within bermed storage areas was documented during the site visit and had also been noted in previous investigations by others (McMaster 1983).

This investigation has established a pathway by which contaminants released to the ground surface in the waste storage area can reach both surface waters and shallow groundwater aquifers in the vicinity of HAA. However, at this time, no reports of significant contamination of these resources that can be associated with this storage area are known to exist.

No additional investigations under the IRP program are warranted. However, planned upgrades to the outdoor waste storage area should include removal and proper disposal of the stained surface soils observed in that area. In addition, it is recommended that samples be taken of the remaining native soils to ensure the absence of unacceptable levels of residual contaminants. Analytes should include 1,1,1-trichloroethane, trichloroethylene, benzene, toluene, and xylenes.

1 Introduction

This document is a report of the preliminary assessment (PA) conducted by Argonne National Laboratory at the Georgia Army National Guard (GAARNG) property known as Army Aviation Support Facility (AASF) #3, located on Hunter Army Airfield (HAA) on the outskirts of Savannah, Georgia.

1.1 Authority for the Preliminary Assessment

The National Guard Bureau, Army Directorate, engaged Argonne to perform PAs of selected Army National Guard (ARNG) properties. These assessments are done in a manner consistent with both the U.S. Department of Defense (DoD) Installation Restoration Program (IRP) and the U.S. Environmental Protection Agency's (EPA's) Potential Hazardous Waste Site Preliminary Assessment Guidance. Preliminary assessments of ARNG properties are conducted under the authority and direction of the IRP; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or, more commonly, Superfund); and the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499).

1.2 Objectives

This PA report is based on existing information from the GAARNG records that were made available to Argonne investigators and from other sources. Although this PA effort did not extend to the generation of new data, it nonetheless identifies areas where existing data are incomplete, unreliable, or ambiguous and recommends ways to address such shortcomings.

The objectives of the PA are to satisfy Phase I of the IRP and to

- Identify and characterize the environmentally significant operations (ESOs),
- Identify property areas or ESOs that may require a site investigation,
- Identify ESOs or areas of environmental contamination that may require immediate removal,

- Identify properties for which no further action is needed, and
- Provide information sufficient to prescore the site with the EPA's PA Scoresheets (EPA 1991).

A unique objective of this assessment derives from the fact that AASF #3 is contained within HAA, which is an active Army installation and subpost to Fort Stewart, Georgia. Under current DoD policies, the host command, the 24th Infantry Division (Mechanized) is primarily responsible for completing a comprehensive assessment of HAA, including those areas currently or previously occupied by tenant organizations. This assessment, therefore, is developed as an addendum to the assessment and site characterization previously completed for HAA (USATHAMA 1992) and is intended to be compatible with that previous study in order to ensure full incorporation of the information contained herein into the overall characterization and evaluation of HAA.

1.3 Procedures

The PA began with a review of files located at the GAARNG Headquarters in Atlanta, Georgia, on January 25-27, 1993. A site visit was conducted on January 29, 1993, to obtain additional information through direct observation and interviews with personnel familiar with the property and its operations. Other relevant information was obtained from the U.S. Geological Survey (USGS), the Georgia Geologic Survey, the Technical Information Center of the U.S. Army Environmental Center (formerly the U.S. Army Toxic and Hazardous Materials Agency, USATHAMA), and the Fort Stewart and HAA environmental offices.

1.4 Report Format

This PA report presents a summary and evaluation of the data relevant to the PA for this property. Section 2 describes the property and its surrounding environment and land uses. Section 3 identifies and characterizes the ESOs at the site. Section 4 summarizes known and suspected releases to the environment, and Section 5 discusses potential human and environmental receptors for such releases. Section 6 summarizes the findings and conclusions, discusses the quality and reliability of the supporting information, identifies areas requiring further action, and (as appropriate) suggests how such actions can be accomplished. Section 7 lists pertinent

materials reviewed. Appendix A gives interview information. Appendix B provides a listing of federally listed and state-listed threatened and endangered species known to exist on, or in the immediate vicinity of, HAA.

2 Property Characterization

2.1 General Property Information

The AASF #3, located on a 5.5-acre parcel on HAA, is operated by the GAARNG. The HAA is a subpost to the Fort Stewart Military Reservation, which is an Army field training facility currently under the command of the 24th Infantry Division (Mechanized). The HAA is located in the southeastern portion of Georgia, on the outskirts of Savannah. A general location map for HAA is provided in Figure 1. The AASF #3 is located in the central portion of HAA, north of the flight line. A facility map for HAA that shows the general location of AASF #3 is provided in Figure 2.

The GAARNG occupies AASF #3 under lease agreement DACA21-3-86-0122, which was first issued in January 1979. The lease agreement was initiated by the GAARNG in 1978 to support the relocation of the 1160th Transportation Company and AASF #3 from Albany, Georgia. Prior to GAARNG occupancy, the buildings included in the lease were occupied by an active Army unit, the 24th Aviation Battalion. Three amendments to the lease agreement — all minor in scope — address topics such as extension of the period of the lease agreement, inclusion of additional buildings not covered in the original agreement, elimination of one of the buildings included in the original lease agreement, and an increase in the overall land area covered by the lease. (See Table 1 for additional details on the lease agreement.)

Currently, AASF #3 occupies a land area of 5.5 acres. Buildings occupied by AASF #3 include Buildings 801, 803, 807, and 809, and approximately 25% of aircraft Hangar 850. The easternmost portion of a small aircraft maintenance hangar, Building 811, was also originally included in the AASF #3 lease but was removed by a 1988 amendment. Building 811 continues to be used for aircraft maintenance and repair by an active Army unit.

In addition, the current AASF #3 lease also extends to Building 427, located elsewhere on HAA. Although this storage building is currently not used, it remains a part of the current AASF #3 lease. The building has primarily been used by the GAARNG to store equipment. The AASF #3 lease also includes Building 837, which is a small vehicle maintenance facility located to the south of the AASF #3 facility. In January 1992, the GAARNG engaged in negotiations with the U.S. Coast Guard leading to a Memorandum of Agreement (MOA) that would exchange

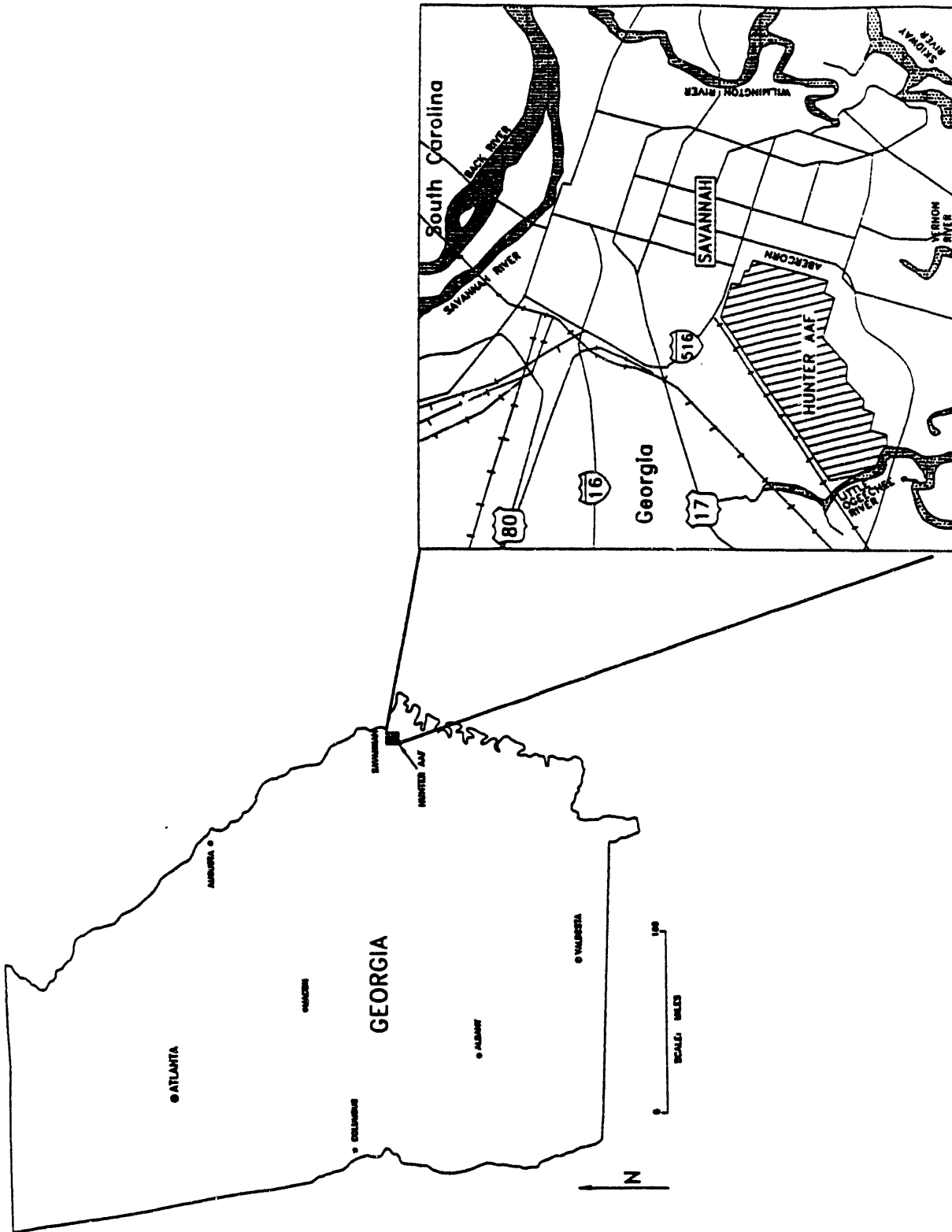


FIGURE 1 General Location of Hunter Army Airfield (Sources: McMaster 1983; adapted from USATHAMA 1992)

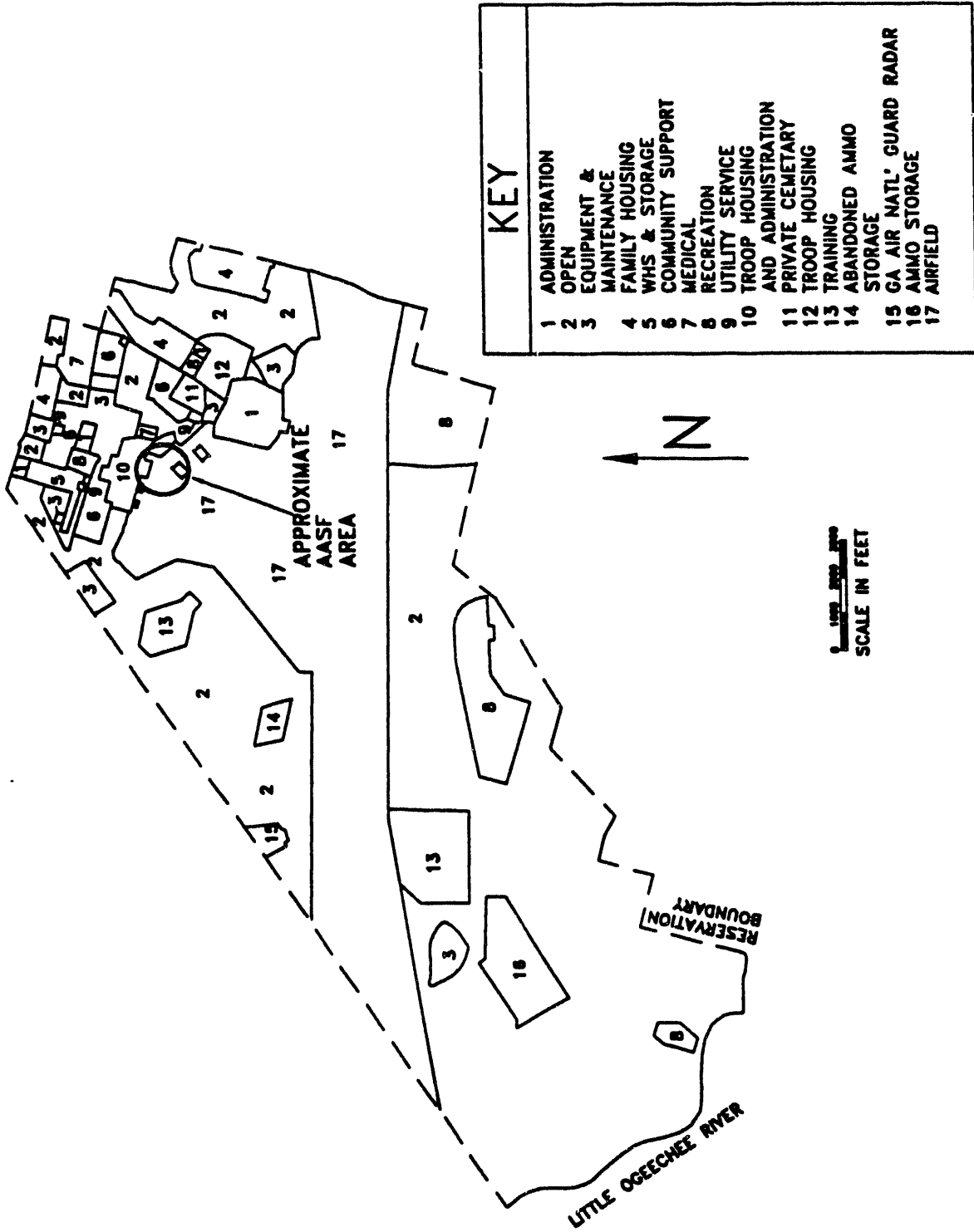


FIGURE 2 Hunter Army Airfield Facility Map: General Location of Leased Property at Army Aviation Support Facility #3 (Sources: Adapted from USATHAMA 1992; GAARNG Real Property Outgrant Files)

TABLE 1 Identifying Information for Army Aviation Support Facility #3

Installation address	Army Aviation Support Facility #3 Georgia Army National Guard Hunter Army Airfield Chatham County, Georgia 31403-3617
Geographic location	
Latitude	32° 04' 00" N
Longitude	81° 07' 00" W
Section	NA in this geographic region
Township and range	NA in this geographic region
FISP ^a installation number	13307
Commander	Major Frank Tolle
Types of facilities	Army Aviation Support Facility (AASF) #3, including 25% of the aircraft maintenance and repair hangar (Hangar 850), the outdoor waste storage area, and the motor pool area. Army Aviation Training Facility (AATF), including administrative offices, classrooms, and flight ready room (Buildings 801, 807, and 809). Ammunition storage (Building 803).
License information	
Initial License	DACA21-3-86-0122 (January 1, 1979).
Modification 1	Extends period of agreement from two to five years (date uncertain).
Modification 2	Allows the GAARNG to sublease to active Army units (May 5, 1987).
Modification 3	Amends listed facilities and boundaries of the lease agreement, eliminating GAARNG occupancy of Building 811 and establishing GAARNG occupancy of P-1229. Overall acreage covered by the lease remains unchanged (January 1988).
Principal contact	Captain Bruce Berger Environmental Protection Specialist Facility Management Office/Environmental Branch Department of Defense Georgia Army National Guard Headquarters P.O. Box 17965 Atlanta, Georgia 30316-0965 (404) 624-6585

^a Facility Inventory and Stationing Plan.

the use of Buildings 837 and 834, which is an aircraft nose dock facility, between the GAARNG and the Coast Guard. However, no records exist that would substantiate the execution of this MOA. In addition to the above facilities, the lease includes use by AASF #3 of approximately four acres of aircraft ramp parking contiguous to Hangar 850 and a 21,600-ft² vehicle/equipment parking area (a former motor pool adjacent to Building 811). Additional relevant property information is contained in Table 1. A site plan for the AASF #3 facility is included in Figure 3.

2.2 Description of Facilities

The major facilities at AASF #3 with the potential to release contaminants to the environment include Hangar 850, which is a large aircraft maintenance and repair facility; an outdoor waste storage area south of Hangar 850; and the former motor pool area adjacent to Building 811.

In addition, three permanent wood-frame structures at AASF #3 function as administrative office space and equipment storage areas: Buildings 801, 807, and 809. These facilities are discussed briefly in this PA, although facilities in these categories of use are considered to have a low potential for environmental impact. Building 803, an ammunition storage bunker located near the administration buildings, is also discussed briefly in this PA. Finally, Building 427, located in a noncontiguous area in the northern portion of the HAA cantonment area, was previously used for equipment storage but is now vacant. No environmental impacts are associated with Building 427. This building, which was part of the original construction at HAA (circa 1940) has recently been condemned and is scheduled by Fort Stewart's Facility Engineer Office to be razed in the near future. Personnel from AASF #3 have reported that all buildings associated with AASF #3 are owned by the GAARNG. However, all real estate records reviewed contradict these reports and indicate that all structures are Army-owned.

Under the terms of the lease agreement, HAA's Directorate of Engineering and Housing (DEH) provides potable water, sanitary sewer service, and electric power to the AASF #3 facilities. The DEH is also responsible for basic infrastructure maintenance, including asbestos surveys and remediations where necessary. Potable water is provided through a basewide distribution system supplied by two groundwater wells located elsewhere within the HAA cantonment area. Sanitary wastes are delivered by a cantonment-wide sewer system to the HAA sewage treatment plant. Previous studies of HAA (McMaster 1983) have determined that

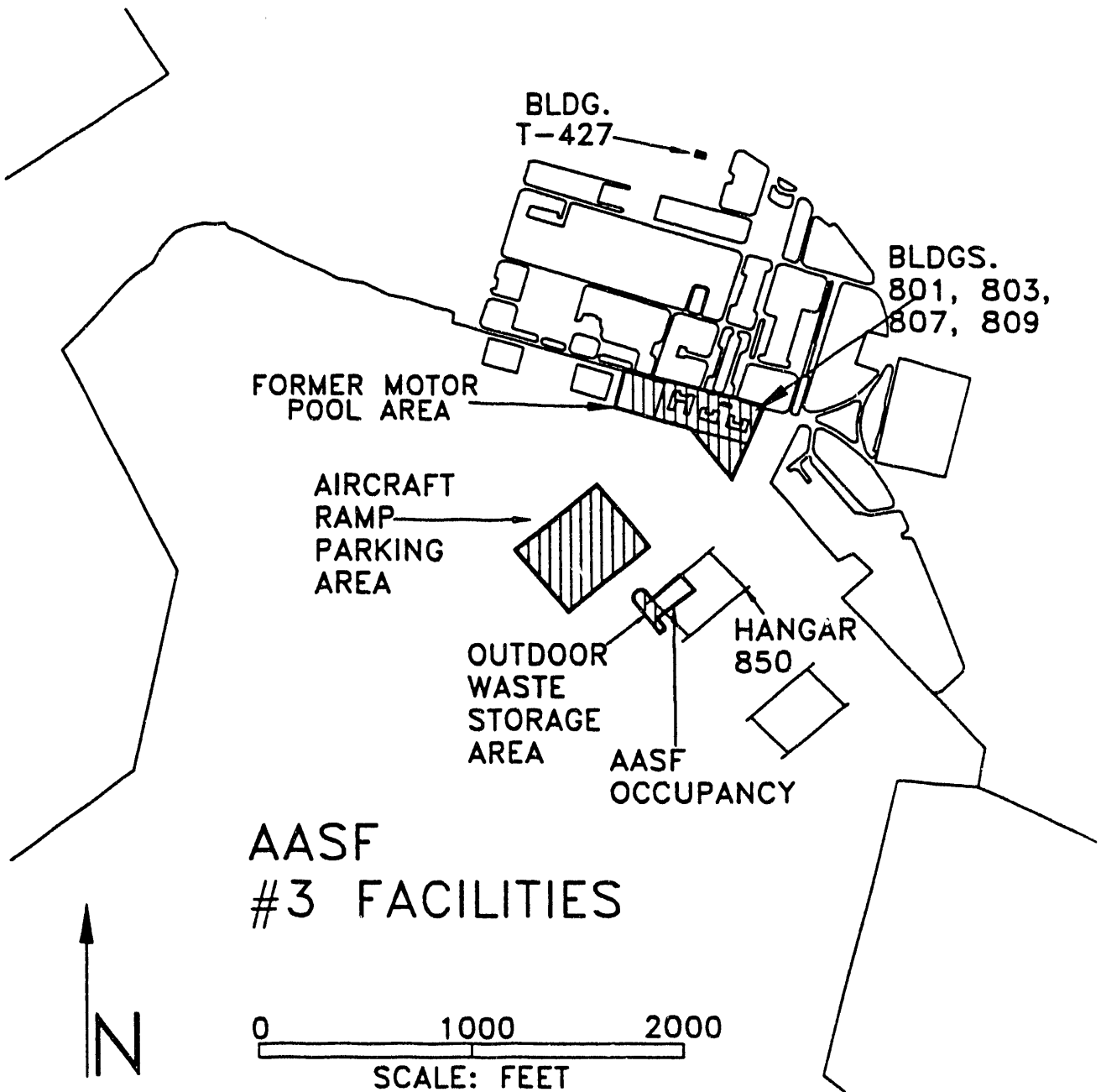


FIGURE 3 Site Plan for Army Aviation Support Facility #3 (Sources: GAARNG undated blueprint; GAARNG Real Property Outgrant Files)

polychlorinated biphenyl (PCB)-containing transformers had been in service at HAA, but most PCB-containing transformers have been removed from service. No PCB transformers are located within, or proximate to, the AASF #3 property, and PCB spills have not been recorded anywhere on HAA.

Nonhazardous solid wastes generated at AASF #3 are collected by DEH personnel, combined with other HAA solid wastes, and transported (by using DEH vehicles) to the City of Savannah Sanitary Landfill. Previously, solid wastes from AASF #3 were delivered by DEH to the on-post sanitary landfill on HAA, located south and west of AASF #3. The on-post landfill was operational until 1981. Environmental studies of the on-post landfill, which included shallow groundwater monitoring, indicated that no environmental contamination has resulted from its operation (USAEHA 1989).

Waste lubricating oils generated at AASF #3 are accumulated in 55-gal drums in the outdoor storage area south of Hangar 850 and are subsequently transported by DEH personnel to the energy recovery facility at Fort Stewart. Waste hydraulic fluids and off-specification JP-4 fuels are also accumulated in this waste storage area and are stored in 55-gal drums and in a 600-gal skid-mounted aboveground tank, respectively, for eventual transport by DEH to Fort Stewart. Since 1989, waste degreasing solvents (Stoddard Type II) generated at AASF #3 have been collected by a private contractor, Safety-Kleen Corporation, for recycling under a statewide contract negotiated by the GAARNG that covers all of its facilities.

Underground storage tanks (USTs) have never been located within the AASF #3 facility. Administrative buildings are heated by diesel fuel, which is stored in dedicated 250-gal aboveground tanks. In addition, a 600-gal aboveground tank, located in the waste storage area south of Hangar 850, is currently used to store off-specification aviation fuel (JP-4).

Currently, 14 vehicles and 11 rotary wing aircraft are assigned to AASF #3. All vehicle maintenance is performed at a state-owned facility located off base. Facility personnel reported that vehicle maintenance for AASF #3 has always been performed at off-base facilities since the inception of AASF #3 at HAA in 1979.

2.2.1 Hangar 850, Aircraft Maintenance and Repair Facility

Hangar 850 is a metal-sided, 26,000-ft² structure constructed in 1954. Virtually all aircraft maintenance and repair activities occur inside Hangar 850. (However, fuel samples are drawn from aircraft in the adjacent ramp parking area.) The AASF #3 occupies the southwestern quarter of Hangar 850. The portion of Hangar 850 occupied by AASF #3 includes approximately 25% of the main aircraft maintenance area, as well as several shops and equipment storage rooms in the extreme southern portion of the building. The remainder of Hangar 850 is occupied by active Army units that perform the same general types of aircraft maintenance and repair as AASF #3. Aircraft maintenance at AASF #3 mainly involves maintenance of aircraft fluids and servicing of engines as well as mechanical, hydraulic, and electronics systems. Support shops within Hangar 850 include sheet metal fabrication facilities (including welding and brazing facilities), a hydraulic system repair/rebuild shop, and equipment/parts storage areas. No engine rebuilding occurs at AASF #3. A minimal amount of touch-up spray painting is performed in the main hangar area.

External aircraft washing takes place at the washracks immediately north of Hangar 850. However, these washracks, which are used by all units with aircraft on HAA, are not part of AASF #3. The washracks discharge to the storm water drainage system. In their original configuration, the washracks discharged directly to the storm sewer. However, oil-water separators were reportedly installed sometime after 1983. The DEH personnel maintain the washracks and their oil-water separators. No hazardous chemicals are reportedly used in aircraft washing operations and no adverse environmental impacts have been associated with the washracks (McMaster 1983; USAEHA 1989).

The central portion of Hangar 850 is equipped with two interconnected floor drains that discharge directly to the HAA storm water system, a combination of engineered sewers, and open ditches. No oil-water separators are situated in these drains. However, the current spill response plan for AASF #3 calls for covering the drain inlet with a rubber mat to prevent spilled fluids from entering the drain before they can be retrieved. Personnel at AASF #3 report that similar spill response capabilities are not in place for the other units occupying Hangar 850. No incidents of significant spills to the floor drain in the portion of the hangar occupied by AASF #3 have been documented.

Cold solvent parts degreasing also takes place in the main hangar area. Spent solvents are removed from the degreasing tank by Safety-Kleen and are replaced with recycled Stoddard

Type II solvent. As allowed by the lease, other units sometimes perform maintenance on their aircraft within the portion of Hangar 850 occupied by AASF #3.

The GAARNG records do not detail the types of solvents used in degreasing activities for aircraft maintenance prior to the inception of the Safety-Kleen contract. However, an environmental assessment of HAA (McMaster 1983) indicates that solvents such as benzene, toluene, and xylene were commonly used in aircraft maintenance activities throughout HAA.

2.2.2 Outdoor Material/Waste Storage Area

Waste oils, waste hydraulic fluids, and off-specification JP-4 fuels are stored in an outdoor storage area south of Hangar 850. Waste fuels are stored in a skid-mounted 600-gal aboveground tank, which is staged on native soil without a liner but within a sandbag berm. Likewise, 55-gal drums are stored on native soil within sandbag berms. Waste fuels are evacuated periodically from the 600-gal tank by DEH personnel, who also periodically remove other drummed wastes. All wastes are ultimately transferred to Fort Stewart and are either placed in the Fort Stewart hazardous waste storage facility or incinerated at the Fort Stewart energy recovery plant. Although no significant spillage is reported to have occurred in this area, surface soil staining is apparent within the tank and drum bermed storage areas.

Personnel from AASF #3 indicate that, since GAARNG occupancy in 1979, the current waste storage area south of the hangar building has been used for storage of waste and no other outdoor areas within the AASF #3 have served as waste or material storage areas. Records do not clarify use of this area prior to GAARNG occupancy in 1979. Nevertheless, this waste storage area is the only location within the immediate vicinity of Hangar 850 that appears both convenient and suitable for waste storage activities. This observation, combined with the fact that a nearly identical waste storage area exists at the adjacent Hangar 860, which is under Army control, suggests that this storage area may have been in service since Army occupancy of HAA in 1967.

Current practice is to segregate waste oils from other waste fluids to preserve the current option of waste oil disposal through incineration in the Fort Stewart energy recovery facility. However, previous studies at HAA (McMaster 1983) have established that, prior to 1961, it was commonplace to mix waste oils with degreasing solvents (principally, 1,1,1-trichloroethane and trichloroethylene). Segregation of waste oils and solvents has taken place at Fort Stewart since 1961. Consequently, since the Army acquired HAA in 1967 and established it as a subpost to

Fort Stewart, it is reasonable to assume that waste management practices similar to those at Fort Stewart would have been initiated at HAA. Prior to 1989, degreasing solvents generated at AASF #3 were stored in this area before pick up by DEH personnel for delivery to Fort Stewart.

Finally, as noted above, a similar waste storage facility is located south of the adjacent Hangar 860, less than 100 yards east of the AASF #3 storage facility. The Hangar 860 waste storage area originally consisted of three 600-gal aboveground tanks — one each for waste oil, waste solvent, and waste fuel. The waste solvent tank was removed by DEH sometime before 1988. Earlier investigators indicated that the Hangar 850 storage area also originally consisted of three 600-gal aboveground tanks that were used in the same manner as the tanks in the Hangar 860 storage yard. The dates on which the waste hydraulic oil tank and the waste solvent tank were removed from the Hangar 850 storage area are not known. Despite the similarities of design and assumed usage, earlier investigators observed much more substantial spillage to the ground surface in the Hangar 860 storage area (USAEHA 1989).

2.2.3 Former Motor Pool Area

The paved parking area east of Building 811 has always been used by AASF #3 as a vehicle and equipment parking area. Previous studies (McMaster 1983; USAEHA 1989) indicated that this area was previously used as a motor pool. However, except for real estate records that refer to this area as a "motor pool," records do not indicate whether previous occupants (prior to 1979) conducted vehicle maintenance activities in this area and do not specify the nature and extent of wastes related to vehicle maintenance that may have been generated here. A careful inspection of the concrete paving revealed no areas of contamination or pavement cracks. Because the adjacent building (Building 811) was constructed as an aircraft hangar, it is expected that this concrete paving, which would have served as an apron leading to that hangar, is built to rigorous specifications of thickness and strength in order to withstand the weight of aircraft. Storm drains are not located anywhere on this slab. The natural grade allows incident water to run off the slab to the north onto native soils and into a nearby storm sewer inlet. However, careful inspection revealed no areas of significant contamination of surface soils in any areas adjacent to this slab.

Records of AASF #3 activity in this area do not indicate a potential for release of contaminants to the environment. However, paved areas immediately adjacent to the AASF #3 area to the south are currently being used by an active Army unit as a petroleum, oils, and lubricants (POL) storage area and waste satellite accumulation point, involving both 55-gal drum

and aboveground tank storage. This area is very heavily stained and is maintained in a poor condition. Although there is no indication that releases from this area are migrating by surface runoff onto the AASF #3 area, they may be migrating by other pathways to the same storm sewer system into which the AASF #3 motor pool area drains.

2.2.4 Buildings 801, 803, 807, and 809

Buildings 801, 807, and 809 are all wood-frame structures with areas of 4,660, 4,660, and 6,461 ft², respectively. All were part of the original HAA construction in 1940 and were originally used as barracks. These buildings were originally heated with coal and later converted to fuel oil, which was dispensed from dedicated 250-gal aboveground tanks. No significant releases of fuel from these heating tanks have been documented. However, during the site visit, some minor leakage of fuel oil was observed from the tank at Building 807.

Buildings 801, 807, and 809 are known to have been constructed with asbestos-containing material (ACM). During the site visit, an inspection of the boiler room at the north end of Building 807 revealed that asbestos-containing boiler and pipe insulation had severely deteriorated and some loose pieces of insulation were found scattered throughout the floor of the room. The room, which is normally locked, was found open — apparently because telephone repairs were ongoing. Officials at AASF #3 reported that they normally do not have access to utility rooms, and they believed the asbestos remediation of this building had already been completed by the HAA DEH. It is unknown whether previous DEH surveys indicated a need to remediate asbestos in the occupied parts of this building or in either of the other administrative buildings at AASF #3.

Building 801 houses the administrative offices, classrooms, and flight ready room for AASF #3. Buildings 807 and 809 house administrative offices for the 244th Aviation Regiment and the 48th Infantry Brigade (Mechanized, Aviation Section) of the GAARNG, respectively. Finally, Building 803 is a 528-ft² hollow tile structure originally constructed in 1940 as an ammunition storage bunker. It is presently used by AASF #3 for that purpose.

Notwithstanding the asbestos problem noted above, no evidence indicates that activities within or around Buildings 801, 803, 807, and 809 have resulted in either impacts to the public or significant releases of contaminants to the environment.

2.3 Property History

The HAA covers more than 5,400 acres in Chatham County, Georgia, adjacent to the city of Savannah. It was built in 1940 as the site of the first municipal airport for the city of Savannah, Georgia. The first military occupation of HAA was by the U.S. Air Force Strategic Air Command (SAC), although the date of Air Force acquisition is uncertain. In 1967, when the training mission at nearby Fort Stewart Military Reservation was expanded to include flight training in support of the Vietnam Conflict, ownership of HAA was transferred to the Army. The HAA became a subinstallation to Fort Stewart and the site of an Army flight school until 1971, when both Fort Stewart and HAA were closed and put into caretaker status. Some civilian occupation of HAA occurred from 1971 to 1974, but details about which buildings were occupied and the specific nature of the civilian activities over that period are not available. The Army reactivated both Fort Stewart and HAA in early 1974. In January 1979, AASF #3 was relocated to HAA from its original location in Albany, Georgia.

In March 1992, HAA experienced a release of approximately 65,000 gal of JP-4 aviation fuel from an aboveground storage tank south of AASF #3. The spill entered Lamar Canal at a point downgradient of AASF #3. The spill was reportedly cleaned up to the satisfaction of state regulatory officials (Houston 1993).

In June 1992, workers replacing a section of the storm water sewer system that serves the runway and ramp parking areas reportedly (Tolle 1993) encountered significant aviation fuel contamination in subsurface soils in the sewer pipe excavation. No additional details on this subsurface contamination could be located, however. This contamination has not been associated with AASF #3 activities. It is important to note that floor drains in Hangar 850, as well as in the adjacent Army-operated Hangar 860, connect to a different storm water drainage system than the one where contamination was observed. It is possible, however, that spills to the pavement in the aircraft parking area occupied by AASF #3 could reach the affected storm sewer system. No such releases from AASF #3 aircraft have been documented. Information regarding whether HAA officials plan additional investigations into the possible deterioration of other portions of the storm water sewer system is not available.

2.4 Permitting Status

Currently, no environmental permits cover the activities at AASF #3. Furthermore, no information gathered in this investigation indicates that any operating or discharge permits are required for AASF #3.

The HAA, however, operates under a number of permits issued by the Georgia Department of Natural Resources (DNR)-Environmental Protection Division (USATHAMA 1992). These permits include a Safe Drinking Water Act permit issued in 1992 (# 2025 J 1239) for operation of the HAA potable water system, an air emissions permit issued in 1978 (# 9711 025 6356 0) for operation of the central heating plant boiler, and a National Pollution Discharge Elimination System Permit (NPDES) (#GA0027588) covering discharges from the HAA industrial waste water treatment plant to Lamar Canal and the Savannah River. The GAARNG has no specific compliance responsibilities for any of these permits.

In July 1980, HAA applied for and received a Part A Interim Status Permit from the EPA Region 4 Office for storage of hazardous waste regulated by the Resource Conservation and Recovery Act (RCRA) program. However, in 1983, EPA requested that HAA withdraw its Part A permit because hazardous wastes generated at HAA (including hazardous wastes generated at AASF #3) were being moved to the RCRA-permitted storage facility operated by the Defense Reutilization Marketing Office (DRMO) at Fort Stewart within the allowable 90-day time period, therefore precluding the need for a RCRA storage permit for HAA.

2.5 Surrounding Environment and Land Use

2.5.1 Demographics and Land Use

The current on-post population at HAA consists of approximately 4,541 individuals (USATHAMA 1992). Of this number, approximately 1,805 are residents and 2,736 are nonresident military and civilian workers. According to the 1990 decennial census, the population of Savannah is 137,560; the population of Thunderbolt, located to the east of HAA, is 2,786; and the population of Vernonberg, located to the southeast of HAA, is 74 (USATHAMA 1992). Based on these numbers, the total off-post population within a four-mile radius of AASF #3 is approximately 140,420.

The HAA is approximately 8.4 square miles in size. The AASF #3 occupies approximately 5.5 acres of this area. The administration buildings of AASF #3 are located within the cantonment area, which is characterized by grass lawns, shrubs, and trees planted around buildings and along roads and walkways. The remainder of the AASF #3 facilities (Hangar 850 and the aircraft ramp parking area) are located within the aircraft runway and parking areas, which consist of large expanses of concrete pavement.

2.5.2 Climate

The climate of HAA is strongly influenced by Savannah's coastal location and subtropical latitude. The climate is classified as humid and subtropical, with mild winters, warm summers, and appreciable amounts of precipitation throughout the year. Average monthly temperatures range from 80°F during the summer to 51°F during the winter. Daily maximum temperatures during the summer months, June through August, peak around 90°F. Daily minimum temperatures during the winter months rarely fall below 39°F. More extreme temperatures are unusual because of the moderating effect of the ocean. Relative humidity is moderately high in summer, ranging from 60 to 90%, and slightly lower in winter, ranging from 55 to 85%.

The average annual precipitation is 51 in., approximately half of which falls between June and September. Summer storms, which usually occur as relatively short afternoon thunderstorms, may be severe with damaging winds and hail. The heaviest rainfall is usually associated with tropical cyclones, which are most common in August and September. Snowfall is rare.

The prevailing wind direction in Savannah is southwesterly during the summer months, northeasterly from September through December, and variable from January through April. The average annual wind speed is 8.4 miles per hour, with monthly averages ranging from 10 miles per hour in February and March to 7 miles per hour in August.

2.5.3 Physiography and Surface Water

Savannah is located in the lower Georgia Coastal Plain physiographic province, a segment of the Atlantic Coastal Plain of eastern North America. The general topography of this province is flat to gently rolling with relatively low elevations that decrease gradually to sea level at the Atlantic Ocean. The topography is marked by the presence of numerous marine terraces, many of which

consist of low elongated ridges that parallel the coastline. These low ridges generally are separated by wide swampy valleys.

Surface water is plentiful in the Savannah area. The city is bordered on the northeast by the Savannah River and on the east by the Wilmington River and its associated wetlands. The areas south and southeast of the city are characterized by a number of streams and associated wetland areas that drain into the Little Ogeechee River, the Forest River, the Vernon River, and the Skidway River. The ground elevation throughout the Savannah area ranges from near sea level to approximately 15 ft above mean sea level (MSL) (USGS 1978, 1979, 1980, and 1983). To facilitate flood control, a network of open drainage ditches has been constructed throughout the area to divert surface water runoff from developed areas into marshes and rivers.

The HAA is situated on relatively high ground. Elevations across most of the base range from 6.5 to 14 ft above MSL. Low-lying areas with elevations less than 1.5 ft above MSL occur along the western boundary and in the southwest corner of the base near the Little Ogeechee River. A portion of the land in the southwest corner may be classified as wetlands. Surface water runoff from most of the base is captured by either the storm water sewer system or a series of open drainage ditches that direct water toward the south and southwest of the base into either the Little Ogeechee River or the Vernon River. The AASF #3 is located near the highest elevation on the base. Surface water runoff in this area is captured by the cantonment area's storm water sewer system, which consists of a combination of subsurface sewer mains and open, unpaved drainage ditches. Storm water from the vicinity of the AASF #3 administrative buildings and the former motor pool area is collected by a main that runs east-northeast before emptying into an open drainage ditch that runs past the health clinic and the post chapel. This ditch runs to the northwest and enters a sewer main that drains westward into Lamar Canal. Most storm water from the vicinity of the AASF #3 hangar building is collected by a main that runs northeast into the aforementioned open drainage ditch. Storm water from the apron west of the hangar is collected by a main that runs westward into an unpaved ditch that leads into Lamar Canal.

Lamar Canal is an open drainage ditch that drains to the southwest along the western boundary of HAA. Water directed along Lamar Canal eventually drains into the Little Ogeechee River. The Little Ogeechee River is used primarily for recreational purposes, but it has very little private access. No known surface water intake structures occur on this river either 15 miles upstream or downstream of HAA (USATHAMA 1992).

Three bodies of surface water are present on HAA property: Hallstrom Lake, Borrow Pit, and Oglethorpe Lake. Each of these lakes is fed by precipitation, surface water runoff, and, possibly, infiltration of groundwater. Both Hallstrom Lake and Oglethorpe Lake are fish-stocked recreational waters (USATHAMA 1992). Hallstrom Lake and Borrow Pit are located in the southern portion of HAA and are not subject to surface water runoff from AASF #3. Oglethorpe Lake is located in the cantonment area approximately 1,200 ft to the west-northwest of AASF #3. Despite its proximity, Oglethorpe Lake is not likely to be subject to surface water runoff from AASF #3 because the storm sewer system directs the drainage from AASF #3 in the opposite direction.

The soils underlying most of the HAA cantonment area are classified as Chipley soils. These soils consist of moderately well drained, fine sands characterized by rapid permeability. Because approximately 80% of the AASF #3 land area is paved or within the footprint of a building, only a very small area of native soil is exposed. Some of the low-lying areas in the cantonment area are underlain by very poorly drained, loamy sands of the Ellabelle soil series — including the open drainage area just northeast of AASF #3, which receives some of the storm water runoff from the AASF #3 facilities. Soils of the Ellabelle series are characterized by seasonally high water tables and a propensity for flooding. A detailed soils map and descriptions of soil properties have been published by the U.S. Department of Agriculture (1974).

2.5.4 Groundwater and Hydrogeology

2.5.4.1 Geology

The Coastal Plain province is comprised of a wedge of interbedded clastic and carbonate sediments of Cretaceous age and younger. These sediments generally dip seaward and thicken from a featheredge at their inland margin to great thicknesses along the Atlantic coast. The inland margin of the oldest outcropping formations, referred to as the Fall Line, occurs along a northeast-southwest trend located approximately 100 miles northwest of Savannah. The basement rocks underlying this wedge of sedimentary formations consist of nearly impermeable igneous, metamorphic, and sedimentary rocks ranging in age from early Mesozoic (Triassic and Jurassic) to Paleozoic.

The Coastal Plain sediments were deposited in fluctuating fluvial and shallow marine environments associated with a long series of successive sea level advances and retreats. As a

result, the formations are complexly interbedded and lithologic variations may be great over short lateral distances. Unconformities occur between formations, representing breaks in deposition or periods of erosion resulting from recession or encroachment of the sea. In general, clastic formations are predominant in the older Coastal Plain formations and in the inland section of the sedimentary wedge. These formations grade laterally into predominantly carbonate rocks along the Georgia coast.

Table 2 is a generalized correlation chart describing the Paleocene through Holocene stratigraphic section along the Georgia coast. This chart identifies commonly accepted formation names, geologic age, and corresponding hydrologic units. It reflects the most recent interpretations of the regional geology as described by Johnston and Bush (1988), Clarke et al. (1990), and Miller (1992). In general, the pre-Miocene formations consist of carbonate rocks such as evaporites, dolomites, and limestones that were deposited in either shallow tidal flats or warm, shallow open marine waters. The Miocene-aged units represent three separate depositional sequences related to cycles of sea level advance and retreat. Each sequence consists of a basal carbonate layer, a middle clay layer, and an upper sand layer. The post-Miocene formations are largely undifferentiated and consist of interlayered sand, clay, and thin limestone beds.

According to Clarke et al. (1990), in Chatham County the Paleocene through Holocene section ranges in thickness from approximately 1,400 to 1,750 ft. Specific thicknesses of the individual geologic units are detailed in Table 3. By comparison, the unit thicknesses in a Savannah municipal water well (Savannah No. 13) are also listed in Table 3. Savannah No. 13, which was drilled in 1954, is located approximately 0.5 miles from the southeastern corner of HAA.

2.5.4.2 Regional Groundwater

Unless otherwise noted, the information presented in this section regarding regional groundwater conditions is derived from Clarke et al. (1990) and Johnston and Bush (1988). Groundwater resources in the Coastal Plain province are relatively plentiful. One of the most prolific aquifers in the United States, the Floridan aquifer system, is located in this region. Previously referred to as the "principal artesian aquifer," the Floridan aquifer system underlies all of Florida, southern Georgia, and parts of Alabama and South Carolina. The Floridan aquifer system is overlain by secondary groundwater aquifers (Table 2).

TABLE 2 Generalized Correlation Chart of the Paleocene-Holocene Stratigraphic Section along the Georgia Coastal Plain

FORMATION NAME	GEOLOGIC UNIT	HYDROLOGIC UNIT
Undifferentiated Deposits	Post-Miocene	Surficial Aquifer
Hawthorne Group	Miocene Unit A	Confining Unit
	Miocene Unit B	Upper Brunswick Aquifer
	Miocene Unit C	Confining Unit
	Miocene Unit C	Lower Brunswick Aquifer
Suwanee Limestone	Oligocene	Upper Floridan Aquifer
Ocala Limestone	Upper Eocene	
Avon Park Formation	Middle Eocene	Confining Unit
Oldsmar Formation	Lower Eocene	Lower Floridan Aquifer
Clayton Formation	Paleocene	
Cedar Keys Formation		

--- Unconformable contact

Sources: Johnston and Bush (1988); Clarke et al. (1990); Miller (1992).

TABLE 3 Thickness of Geologic Units in Savannah Area Wells

Geologic Unit	Chatham County Wells ^a (ft)	Savannah No. 13 ^b (ft)
Post-Miocene	50-75	84
Miocene	100-200	135
Oligocene	80-100	60
Upper Eocene	240-280	353
Middle Eocene	540-700	-
Lower Eocene	120-180	-
Paleocene	270	-

^a Source: Clarke et al. (1990).

^b Source: Herrick (1961).

In most areas, the Floridan aquifer system consists of two permeable zones, referred to as the Upper and Lower Floridan aquifers, separated by a confining unit of variable age and character. In general, the groundwater in the Lower Floridan aquifer is quite saline and does not meet established drinking water standards. As a result, this aquifer has not been extensively developed, except in several municipal and industrial wells in the Savannah area (O'Connell and Davis 1991). Chloride concentrations in the Upper Floridan aquifer tend to increase with depth and in some areas, particularly south of Savannah near Brunswick, saltwater encroachment into the Upper Floridan aquifer has been detected. However, during the past 20 years of water sampling, chloride concentrations in Savannah area wells have not increased.

Throughout most of the Coastal Plain, including the Savannah area, the Floridan aquifer system is under artesian conditions, meaning that the groundwater is confined under pressure by overlying units. When a well taps an artesian aquifer, the water level in the well will rise above the level of the aquifer. The surface defined by the heights to which water will rise in a number of wells is called the potentiometric surface. Since the early 1940s, a cone of depression has been observed in the potentiometric surface of the Floridan aquifer in the vicinity of Savannah as a result of large groundwater withdrawals (Peck 1991; Kellam 1986). Groundwater levels in the Upper

Floridan aquifer have decreased by more than 150 ft since pumping began in the late 1800s (Krause et al. 1984).

Within the Upper Floridan aquifer, permeability contrasts can be quite significant, with relatively to highly permeable zones being separated by less permeable zones. As a result of the variable permeability, the transmissivity of the aquifer varies greatly. In the Savannah region, transmissivity ranges from 10,000 to 50,000 ft²/day. Upper Floridan wells produce between 5,000 and 10,000 gallons per minute (gpm), and in Chatham County the estimated pumpage from the Floridan aquifer ranges from 50 to 100 million gal/day. Depth to the Upper Floridan aquifer in the Savannah area is estimated at 260-274 ft. According to Clarke et al. (1990), in Chatham County the Upper Floridan aquifer is 250-270 ft thick and the Lower Floridan aquifer is 190-390 ft thick. According to Johnston and Bush (1988), in Chatham County the Upper Floridan is 250 ft thick and the Lower Floridan is 200-390 ft thick.

The Floridan Aquifer System is overlain by younger sediments that serve as potential alternate sources of groundwater (Table 2). Two water-bearing zones, referred to as the Upper and Lower Brunswick aquifers, have been identified in Miocene-aged fine to coarse sands. In the Savannah area, few wells are drilled only into the Brunswick aquifers; most wells completed in these aquifers are also completed in the Upper Floridan aquifer. These aquifers are characterized by confining to semiconfining conditions. Depth to the Upper Brunswick aquifer ranges from 170 to 184 ft. In Chatham County, the Upper Brunswick aquifer is less than 60 ft thick and the Lower Brunswick aquifer ranges from 0 to 20 ft thick. The estimated transmissivity of the Brunswick aquifers ranges from 680 to 5,700 ft²/day, and typical well yields range from 3 to 180 gpm.

The post-Miocene sediments also comprise a potential secondary aquifer, referred to as the surficial aquifer (Table 2). In the vicinity of Savannah, the surficial aquifer is used primarily for domestic lawn irrigation; in more rural areas, it may serve as the principal source of drinking water. Across most of the Georgia Coastal Plain, the surficial aquifer is characterized by water table conditions; however, discontinuous lenses of clay may result in localized confined conditions. The configuration of the water table in the surficial aquifer generally represents a subdued replica of the land surface. However, along the shoreline and inland for approximately 30 miles, the influence of tidal fluctuations on the water table is observable. Within this zone, the water table in wells near tidal waters increases with high tide and decreases with low tide; tidal fluctuation is greatest closest to these tidal waters. In coastal areas, the water table is estimated to be within 5 ft of the ground surface; adjacent to marshes and estuaries, the water table is estimated

to be at sea level. The thickness of the surficial aquifer averages 185 ft. The estimated transmissivity of the surficial aquifer ranges from 14 to 6,700 ft²/day, and typical well yields range from 2 to 180 gpm.

Groundwater in the Floridan and Brunswick aquifers is recharged primarily by precipitation that falls in outcrop areas located inland to the northwest and north. Discharge from these aquifers is through withdrawal from wells and, where the head gradients are favorable, vertical leakage into overlying units. The surficial aquifer primarily is recharged by local infiltration of precipitation and surface waters. Discharge from the surficial aquifer is primarily through evapotranspiration, discharge to surface waters, and withdrawal from wells.

Regional groundwater flow in the water-bearing units of the Coastal Plain is to the southeast; however, local variations in flow direction result from the influence of groundwater pumping and surface water bodies. In the vicinity of Savannah, groundwater flow in the Upper Floridan aquifer is strongly influenced by the large number of pumping wells. In general, flow will be directed toward the center of the cone of depression in the aquifer's potentiometric surface (Kellam 1986; Peck 1991). Within the surficial aquifer, groundwater flow direction is influenced by the impact of tidal fluctuations but primarily will be directed toward the nearest pumping wells and downgradient bodies of surface water.

2.5.4.3 Local Groundwater

Numerous groundwater wells are drilled within a four-mile radius of AASF #3, most of which are drinking water supply wells. Figure 4 locates those wells for which some information is available; Table 4 tabulates this information. It is likely that other wells exist within this four-mile radius; however, information describing their locations is unavailable. It is presumed that most of these unidentified wells are private wells for which records and registration information are not maintained by the state.

Nine drinking water supply wells are located within the boundaries of HAA. The two wells located in the cantonment area, Hunter 01 and 02, are the primary water supply wells for the base. These wells pump water to a blended distribution system that serves most of the on-post population. Both are completed only in the Upper Floridan aquifer. The remaining seven wells are located at outlying facilities and serve limited populations. Two of these wells, Hunter 05 and

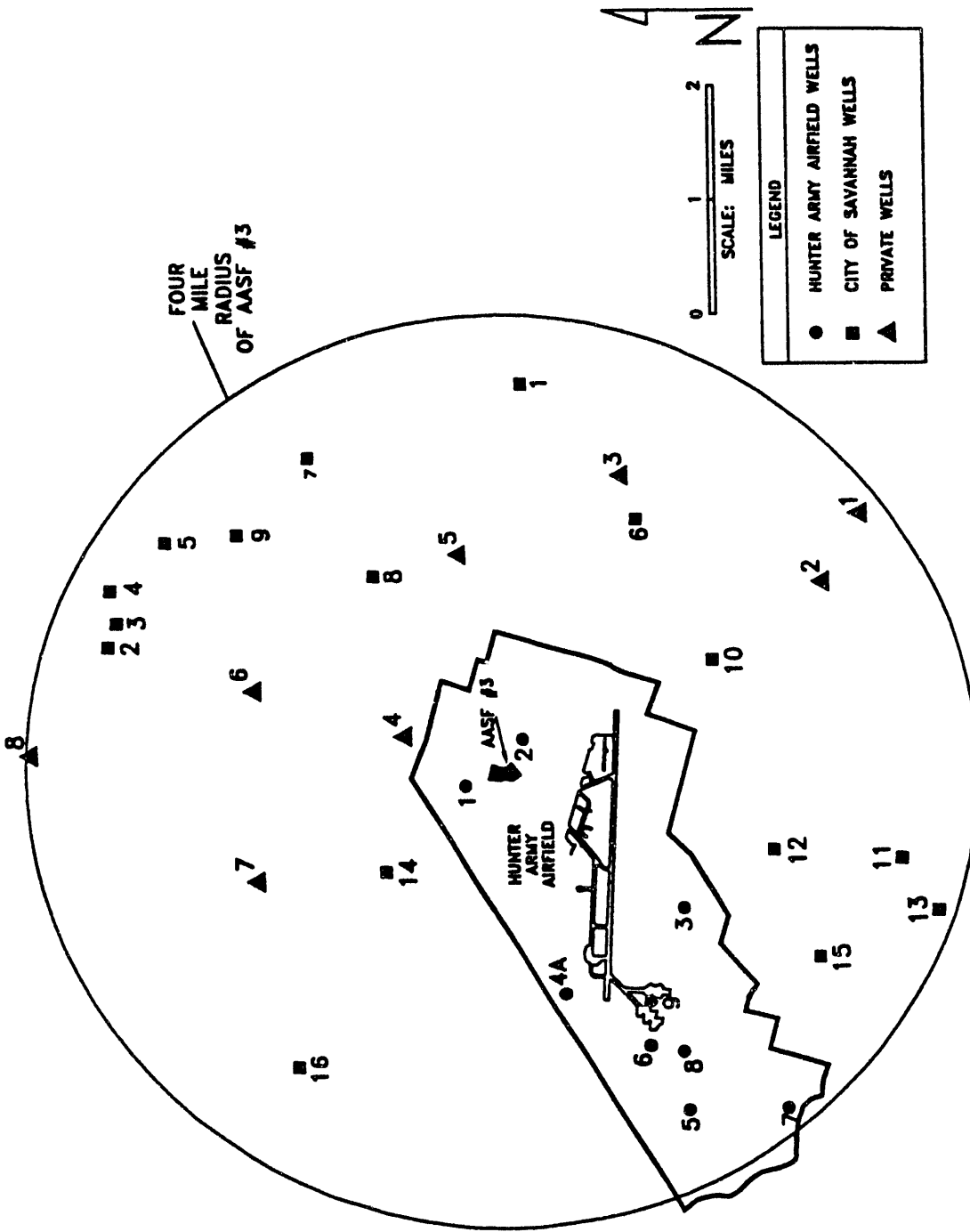


FIGURE 4 Locations of Water Wells within a Four-Mile Radius of Army Aviation Support Facility #3 (Sources: Clark et al. 1990; USATHAMA 1992)

TABLE 4 Information on Water Wells Located within a Four-Mile Radius of Hunter Army Airfield

Map Number	Well Name	Interval Open (ft)	Pump Rate (gpm)	Aquifer Code ^a
Hunter Army Airfield Wells^b				
1	HAAF 01, Building 711	250-550	1,300	UF
2	HAAF 02, Building 194	250-600	1,300	UF
3	HAAF 03, outdoor recreation	40-360	30	S,UB,UF
4	HAAF 04A, 117 Georgia Air Natural Guard	92-300	80	S,UB,UF
5	HAAF 05, stables ^c	--	--	--
6	HAAF 06, dog kennels ^c	--	--	--
7	HAAF 07, Lott's Island	330-450	70	UF
8	HAAF 08, ordnance	255-370	80	UF
9	HAAF 09, Saber Hall	--	1,000	--
City of Savannah Wells^d				
1	Savannah 01	300-1,006	1,300	UF,LF
2	Savannah 02	244-540	700	UB,UF
3	Savannah 03	220-700	1,875	UF
4	Savannah 04	256-700	2,750	UF
5	Savannah 05	265-900	2,850	UF
6	Savannah 06	240-750	1,020	UF
7	Savannah 07	200-525	2,880	UB,UF
8	Savannah 09	267-710	1,550	UF
9	Savannah 12	265-550	1,600	UF
10	Savannah 13	270-1,000	1,300	UF,LF
11	Savannah 14	338-800	700	UF,LF
12	Savannah 15	252-414	1,000	UF
13	Savannah 23	320-639	1,100	UF
14	Savannah 25	287-540	1,100	UF
15	Savannah 27	321-550	1,470	UF
16	Savannah 31	340-498	1,000	UF
Private Wells^e				
1	Forest City Gun Club	232-353	--	UF
2	W.H. Featherstone	190-323	--	UB,UF
3	Benedictine School	100-327	--	S,UB,UF
4	Derst Baking Co.	258-568	--	UF
5	Candler Hospital	290-600	--	UF
6	Sav. Elec. Power Co., OP2	276-561	--	UF
7	Howard Johnson's Motel	294-448	--	UF
8	Meddin Package Co. 2	246-533	--	UF

^a Aquifer Codes: S = surficial; UB = Upper Brunswick; UF = Upper Floridan; LF = Lower Floridan.

^b Sources: USATHAMA (1992); Blackshear (1993).

^c Abandoned wells.

^d Sources: Clarke et al. (1990); USATHAMA (1992).

^e Source: Clarke et al. (1990).

Hunter 06, are not in use (Blackshear 1993). Each of the five active outlying wells is drilled to the Upper Floridan, and two of these wells, Hunter 03 and 04A, also are completed in the more shallow surficial and Upper Brunswick aquifers.

The City of Savannah operates a total of 38 wells, which support eight separate water distribution systems (USATHAMA 1992). Of the approximately 65,000 connections in the city, 58,500 are residential water users. The population served by the city's water supply system is approximately 149,175 (USATHAMA 1992). Sixteen of the city's wells are located within the four-mile radius of AASF #3. Information describing the exact population served by these wells is not readily available. However, by using the most current population data, apportionment calculations for the 16 municipal water supply wells in Savannah located within a four-mile radius of AASF #3 are provided in Table 5. Most of the 16 wells are completed solely in the Upper

TABLE 5 Apportionment Calculations for the City of Savannah Public Water Supply System^a

Well #	Pump Capacity (gpm)	Total (%)	Apportioned Population
1	1,300	5.4	3,375
2	700	2.9	1,817
3	1,875	7.7	4,867
4	2,750	11.4	7,139
5	2,850	11.8	7,398
6	1,020	4.2	2,648
7	2,880	11.9	7,476
9	1,550	6.4	4,024
12	1,600	6.6	4,154
13	1,300	5.4	3,375
14	700	2.9	1,817
15	1,000	4.1	2,596
23	1,100	4.5	2,856
25	1,100	4.5	2,856
27	1,470	6.1	3,816
31	1,000	4.1	2,596
	24,195	100	62,810

^a Accounts for 16 municipal wells located within a four-mile radius of AASF #3.

Floridan aquifer. Three of the wells also are open in the deeper Lower Floridan and two wells also are open in the more shallow Upper Brunswick. None of the municipal wells appears to be completed in the surficial aquifer.

A number of private wells also are located within the four-mile radius of AASF #3; information describing eight of these wells is available. As noted above, it is likely that additional private wells are located in this area; however, information describing them is not available. The eight wells plotted on Figure 4 are completed in the Upper Floridan aquifer. Two of the wells also are completed in the Upper Brunswick, and one well is completed in the surficial aquifer.

2.5.5 Sensitive Environments

Approximately 885 acres of HAA are designated as wetlands (USATHAMA 1992). Most of this acreage is located in the western portion of the base approximately two to three miles from AASF #3. Surface water runoff originating at AASF #3 is captured by a storm water sewer system that drains into Lamar Canal and ultimately into the western portion of the base where the wetlands are located.

A number of federally listed and state-listed endangered and threatened species are known to reside in or be transient to the Savannah area. A listing of these species is provided in Appendix C. At least two of these species, the woodstork (*Myctera americana*) and the bald eagle (*Haliaeetus leucocephalus*), have been seen on HAA; however, they are not known to be residents. It is assumed that no endangered species reside within the boundaries of HAA, although no wildlife surveys have been conducted to confirm this (USATHAMA 1992). It is possible that endangered species inhabit undeveloped land to the west and southwest of the base.

3 Environmentally Significant Operations

The PA team from Argonne has identified only two ESOs at the AASF #3 facility: (1) the outdoor waste storage area adjacent to Hangar 850 and (2) the former motor pool area adjacent to Hangar 811. Figure 5 shows the general locations of the ESOs.

3.1 Outdoor Waste Storage Area

The outdoor waste storage area is located immediately south of Hangar 850. It is believed to have been established in 1954 and is likely to have been in continuous use until the present. The area consists of one 600-gal aboveground storage tank used to store off-specification JP-4 fuel, as well as barrel storage areas where waste hydraulic fluids and waste oils are stored. Both the aboveground tank and the barrel storage areas consist of a base composed of native loamy sandy soils. Each area is fitted with a sandbag berm. Neither bermed area has a liner. Staining of the soils within the berm was observed during this investigation, as well as in previous investigations. The soil staining is confined to the areas within the berms. The land area encompassed by the two bermed storage areas is approximately 500 ft².

Wastes currently stored by AASF #3 in the outdoor storage area include off-specification JP-4 fuel (in the aboveground tank) and waste hydraulic fluids and waste oils (within the bermed drum storage area). However, circumstantial information, as well as previous HAA studies, has suggested that these areas were likely used in the past to store waste solvents such as 1,1,1-trichloroethane, trichloroethylene, benzene, toluene, and xylenes. In 1989, the GAARNG ceased storage of waste solvents in these areas with the inception of a GAARNG-wide solvent recycling program.

3.2 Former Motor Pool Area

The former motor pool area is located adjacent to and to the east of Hangar 811. The area consists of a rectangular concrete pavement surrounded by native soils on the east and north sides; Hangar 811 on the west side; and an Army-operated material and waste storage area, along with the beginning of concrete-paved ramp parking areas, on the south side. Since GAARNG occupancy of the former motor pool area in 1979, no wastes have been generated or stored in this

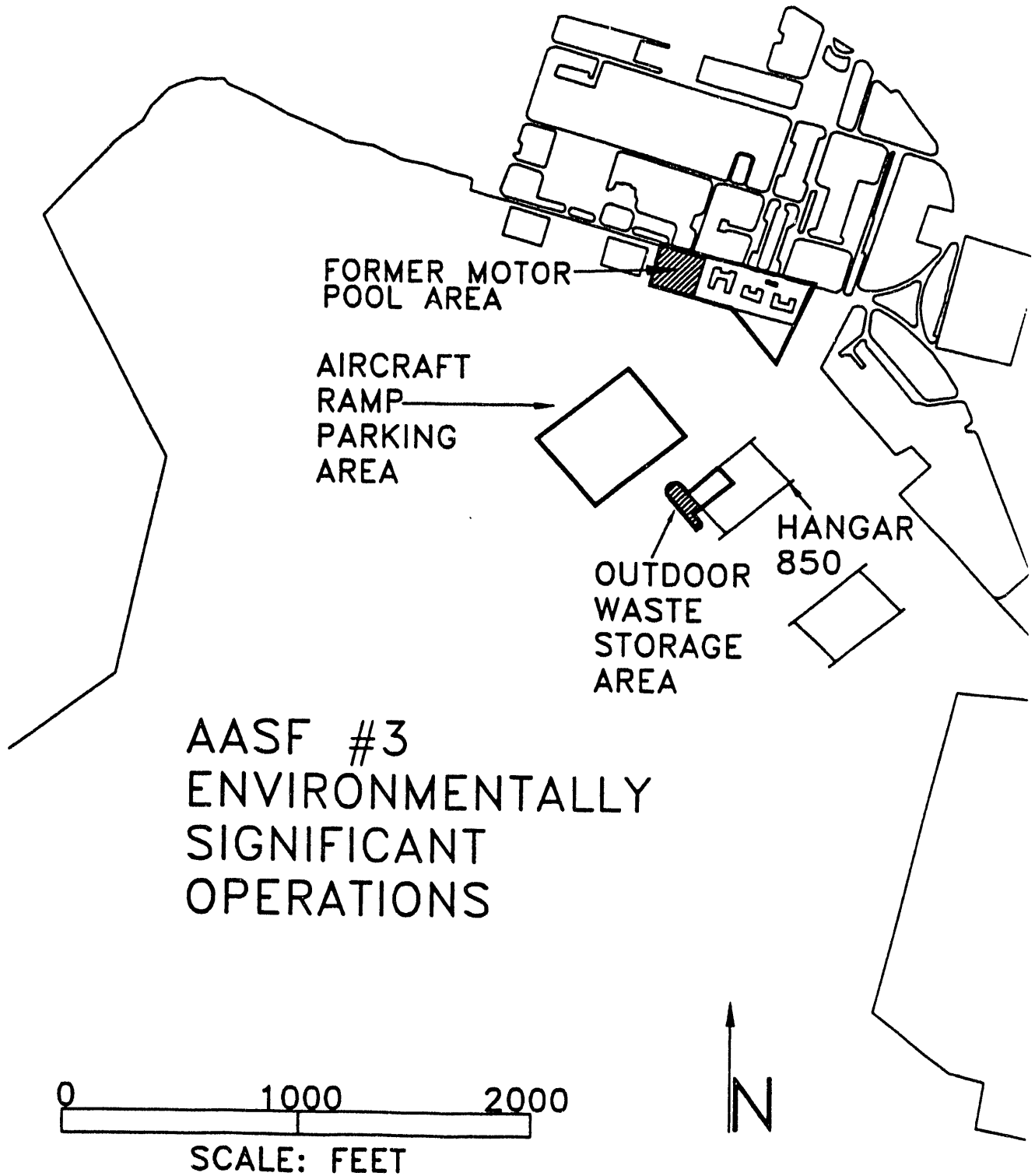


FIGURE 5 Locations of Environmentally Significant Operations at Army Aviation Support Facility #3 (Sources: GAARNG undated blueprint; USAEHA 1989)

area. However, circumstantial evidence suggests that vehicle and aircraft maintenance may have been practiced in this area by previous occupants. Although the material and waste storage area, located immediately south of the former motor pool area, is currently used by an active Army unit, it is likely that this area has been used to store materials and wastes related to these earlier maintenance activities. Except for heavy staining within the Army material and waste storage area (which has never been part of AASF #3), no overt evidence of contaminant release from the former motor pool area is apparent.

4 Known and Suspected Releases

4.1 Releases to Groundwater

No releases of contaminants to groundwater are known.

Releases of contaminants to surface waters or to the land surface could affect the surficial groundwater aquifer, which is in hydraulic connection with surface waters. Impacts to shallow groundwater are especially possible when heavy precipitation results in high water table elevations. Consequently, impacts to the shallow groundwater aquifer from surface soil contamination observed within the bermed waste storage areas south of Hangar 850 are suspected.

4.2 Releases to Surface Water

No releases to surface waters from AASF #3 have been documented.

Although surface soil contamination is apparent in the Hangar 850 outdoor waste storage area, this contamination is confined to areas within berms. Except during periods of wholesale flooding in the waste storage area, migration of surface soil contamination from within the berms to nearby surface waters (open storm water drainage ditches) is not likely to occur. No such incidents of wholesale flooding in the waste storage area have been documented. However, as noted above, impacts to the surficial aquifer are suspected. And, because this surficial aquifer is hydraulically connected to surface waters, the possibility of an indirect impact to surface water exists, albeit remote. As noted in Section 2.2.1, aircraft washracks, located immediately north of Hangar 850, also have the potential to impact surface waters. Although AASF #3 uses these washracks, maintenance of this equipment is the responsibility of HAA DEH.

No evidence of impacts to surface waters from contaminants migrating from the former motor pool area is present. The adjacent Army-operated material and waste storage area is, however, suspected of impacting nearby surface waters (the open storm water drainage ditch north of the former motor pool area).

4.3 Releases to Soil

Releases of contaminants to surface soils have been observed within the bermed areas of the outdoor storage area north of Hangar 850. However, no migration of contaminated soils within the berm to other land surface areas has been evidenced.

Releases from the Army-owned material and waste storage area adjacent to the former motor pool area have clearly occurred. However, the area surrounding this storage area is completely paved and direct impact to surface soils is not possible. Contaminants migrating from this storage area may impact soils in nearby drainage ditches that receive runoff from this area.

4.4 Releases to Air

No releases to the air from the AASF #3 waste storage area have been documented.

Volatile wastes known or suspected of being previously stored in the outdoor storage area have included JP-4 fuels and waste solvents such as 1,1,1-trichloroethane, trichloroethylene, benzene, toluene, and xylenes. Of these, only waste JP-4 fuels continue to be stored in the area. Storage of other volatile wastes ceased in 1989.

Wind blowing of contaminated surface soils within storage berms is not expected to occur, except during periods of extremely strong winds. Such periods occur infrequently.

Although a pathway for air release has been established on the basis of observed surface soil contamination, the present-day impacts to air are considered to be negligible.

4.5 Other Releases

No other significant releases of contaminants to the environment have been identified for the AASF #3 facility.

5 Human and Environmental Receptors

5.1 Groundwater

Groundwater is the primary source of potable water in the Georgia Coastal Plain. Within a four-mile radius of AASF #3, public drinking water supply systems are operated by both the city of Savannah and HAA. According to available information, all Savannah municipal wells pump water from the Upper Floridan aquifer. A few of these municipal wells also pump water from the more shallow Upper Brunswick and deeper Lower Floridan aquifers; all of these wells are completed at depths of 200 ft or more. Five of the seven active wells at HAA are completed solely in the Upper Floridan aquifer at depths of 250 ft or more. The remaining two wells apparently also pump water from the surficial and Upper Brunswick aquifers. Little information is available regarding private wells located within the same four-mile radius. For those wells that are documented, the primary production zones are the Upper Brunswick and Upper Floridan aquifers. However, at least one well, operated by the Benedictine School, appears to be completed in the surficial aquifer also. It is likely that other private wells that tap the surficial aquifer exist, although the number and location of these wells have not been determined. According to Clarke et al. (1990), most wells that tap the surficial aquifer are not used for potable water supplies.

The Upper Floridan and Upper Brunswick aquifers are largely confined aquifers that are recharged primarily by precipitation that falls in distant outcrop areas located to the north and northwest. As a result, no direct contaminant migration pathway is apparent between activities at AASF #3 and these groundwater supply aquifers. No contaminant releases to these deeper aquifers are suspected. Individuals whose potable water supply is derived only from these aquifers are not considered to be potential receptors of contaminated groundwater.

The surficial aquifer is an unconfined aquifer that is recharged primarily by local infiltration of precipitation and surface waters. Throughout HAA, depth to the water table in the surficial aquifer is very shallow. Potential contaminant migration pathways exist between surface activities and groundwater in the surficial aquifer either through (1) direct downward migration of contaminants released at the hazardous waste storage areas or (2) infiltration of contaminated surface water runoff moving along open drainage ditches. Contaminant releases to the surficial aquifer are suspected. Potential receptors of this contaminated groundwater include individuals whose potable water supply includes water pumped from this surficial aquifer. Given the scope of

operations at AASF #3, it is unlikely that the facility presents a significant single source of contamination.

On the basis of available information, only three wells located within a four-mile radius of AASF #3 are pumping water from the surficial aquifer. These wells include two wells operated by HAA (Hunter 03 and 04A, Figure 4) and one well operated by the Benedictine School (private well #3, Figure 4). The two HAA wells, located in outlying areas of the base, serve small populations only. Well 03, located at the outdoor recreation facility, serves a daily population of four workers plus a number of customers at the golf course. Well 04A, located at the 117th GAARNG facility, serves a regular population of four workers. One weekend a month, the population served by Well 04A increases to approximately 1,000 individuals who are present for training exercises (Blackshear 1993). Information describing the population served by the Benedictine School is unavailable at this time. Several factors, as yet not quantified, may determine whether any of these wells will produce contaminated groundwater. These factors include the extent to which contaminants have migrated beyond the uppermost surficial soil layer (0-6 ft) into the groundwater, the mobility of the contaminants in the groundwater, the direction of contaminant migration (if any) in the surficial aquifer, and the dilution effect of water produced from deeper artesian aquifers in multiple completion wells.

5.2 Surface Water

Surface water is abundant in the area surrounding HAA, primarily in the form of streams, rivers, marshes, and estuaries. Groundwater is the primary source for potable water in this region, and use of surface waters is mainly restricted to recreational and fishing usage. Almost all surface water runoff from the base is directed to the southwest and south into either the Little Ogeechee River or the Vernon River, and no known surface water intake structures are located on these rivers either 15 miles upstream or downstream of the base.

Potentially contaminated surface water originating from AASF #3 is captured by the cantonment area storm water sewer system and is directed into Lamar Canal. Lamar Canal runs southwest along the western boundary of HAA and transports surface water runoff into marsh areas associated with the Little Ogeechee River. Potential receptors of contaminated surface water include fauna living in or having direct contact with contaminated waters and humans having direct contact with or ingesting contaminated aquatic species. Because localized flooding along the

drainage ditches is possible after significant precipitation events, overflows from the ditches would also provide opportunities for on-site personnel to contact contaminated surface waters.

The marshes and wetlands associated with the Little Ogeechee River are the only sensitive environments that would be impacted by contaminant releases to surface waters originating at AASF #3.

5.3 Soil

Contaminated surface soils have been observed within the bermed areas of the outdoor waste storage area south of Hangar 850. These bermed areas are unlined and composed of sandbags. Although this design does not sufficiently prevent migration of contaminants to surficial aquifers by infiltration, it appears to have sufficiently prevented migration or distribution of contaminated soils. Contaminated soils within the bermed areas do not appear to have been transported outside the berms as a result of wind action. As a result, only those AASF #3 and DEH workers whose job responsibilities require their entrance into the bermed areas for the purpose of introducing or removing waste materials are expected to have potential for direct contact with contaminated soils. The number of individuals that may experience such contact is estimated to be less than 10.

5.4 Air

As noted in Section 3, impacts to air are considered negligible or nonexistent. Impacts to air are possible as a result of either wind blowing of contaminated soils or volatilization of contaminants from contaminated surface soils. Given the normally light and variable winds at HAA, wind blowing of contaminants is virtually nonexistent.

If releases to air as a result of volatilization were to occur, the expected impacts would be very minimal and localized in extent. Only those AASF #3 and HAA personnel whose job responsibilities place them in the immediate vicinity of the waste storage area are expected to be impacted. The affected population, therefore, is limited to workers at AASF #3 whose specific job responsibilities include delivering wastes to the outdoor waste storage area south of Hangar 850, or to HAA DEH personnel responsible for removing wastes from this area for transportation to Fort Stewart. The total number of individuals expected to be impacted by air releases is, therefore, estimated to be less than 10.

5.5 Other Receptors

No other receptors have been identified.

6 Preliminary Assessment Findings and Conclusions

6.1 Summary of Preliminary Assessment Findings

The GAARNG facility known as AASF #3 is located on HAA on the outskirts of Savannah, Georgia, in Chatham County. Only two ESOs have been identified for AASF #3: (1) the former motor pool area and (2) the outdoor waste storage area. Although environmental contamination has been identified at a number of locations at HAA, none of these conditions can be related to GAARNG activities at AASF #3. No incidents of significant accidental releases of contaminants as a result of spills or leaks have been documented for the areas presently occupied by the AASF #3 facility.

Identification of the former motor pool area as an ESO is based solely on circumstantial information about activities in this area prior to GAARNG occupancy. No releases of contaminants from the former motor pool area are known or suspected to have occurred since GAARNG occupancy of this area in 1979. Activities at the former motor pool area conducted by previous tenants are believed to have included vehicle and aircraft maintenance. Wastes expected to result from such activities are believed to have included waste JP-4 aviation fuels; waste lubricating oils; waste hydraulic fluids; and a variety of degreasing solvents such as 1,1,1-trichloroethane, trichloroethylene, benzene, toluene, and xylene. These wastes are believed to have been stored in an outdoor waste storage area immediately south of the motor pool area, which is not under GAARNG control. No significant releases of any contaminants from the former motor pool area have been documented and no overt evidence of environmental damage has been observed in this area during either this or previous investigations.

No significant contaminant release has been documented for the outdoor waste storage area located south of Hangar 850. However, surface soil contamination as a result of minor spills and leaks has been observed within the unlined bermed storage areas. This storage area is believed to have been in nearly continuous use since 1954. Wastes currently stored by AASF #3 primarily include off-specification JP-4 aviation fuels, waste hydraulic fluids, and waste lubrication oils. In addition to these wastes, the wastes stored in this area by both AASF #3 and previous tenants have also included waste solvents such as 1,1,1-trichloroethane, trichloroethylene, benzene, toluene, and xylene. Analytical documentation of impacts to any environmental media from this waste storage area does not exist. However, besides the overt surface soil contamination, impacts

to shallow groundwater are possible. Indirect impacts to surface waters are also possible, although the potential for such impacts is low.

6.2 Recommendations for Further Action

The primary objective of the PA is to identify and evaluate ESOs to determine whether they warrant (1) immediate action, (2) site investigation, or (3) no further PA/IRP action. Generally, the available information indicates that AASF #3 presents a very minimal threat to human health and the environment. No immediate remedial actions are necessary. Furthermore, no additional IRP characterizations or remedial actions are warranted.

The GAARNG has indicated its intention to upgrade the outdoor waste storage area in the near future. This upgrade will involve the installation of self-contained waste storage buildings. It is recommended that these upgrades proceed as planned. In addition, it is recommended that, in association with this upgrade, all visible soil contamination be removed for proper disposal and samples of native soils be taken from the resulting excavation in order to confirm the absence of unacceptable levels of residual contamination.

Although not within the scope of the IRP program, it is further recommended that the GAARNG ensure the expedient completion by HAA DEH of the asbestos remediation required for the Building 807 utility room, as well as the completion of asbestos surveys for all occupied areas of all administrative buildings within AASF #3.

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Appendix A:
Interview Information

Appendix A:

Interview Information

Individuals Interviewed

Environmental Protection Coordinator
Georgia Army National Guard
Atlanta, Georgia

Facility Management Officer
Georgia Army National Guard
Atlanta, Georgia

Environmental Protection Specialist
Georgia Army National Guard
Atlanta, Georgia

Officer in Charge
Army Aviation Support Facility #3
Hunter Army Airfield
Savannah, Georgia

Environmental Coordinator
Fort Stewart Military Reservation
Fort Stewart, Georgia

Environmental Protection Specialist
Fort Stewart Military Reservation
Fort Stewart, Georgia

Environmental Specialist
Hunter Army Airfield
Savannah, Georgia

GAARNG Staff Member
Army Aviation Support Facility #3
Hunter Army Airfield,
Savannah, Georgia

GAARNG Staff Member
Army Aviation Support Facility #3
Hunter Army Airfield
Savannah, Georgia

Engineer
Facility Engineering Office
Hunter Army Airfield
Savannah, Georgia

Real Property Officer
Hunter Army Airfield
Savannah, Georgia

Master Planner
Hunter Army Airfield
Savannah, Georgia

Engineer
Directorate of Engineering and Housing
Hunter Army Airfield
Savannah, Georgia

Engineer
Water and Sewer Department
Hunter Army Airfield
Savannah, Georgia

Argonne Investigators

Investigator	Ronald Kolpa
Telephone number	(708) 252-4852

Investigator	Karen Smith
Telephone number	(303) 986-1140 x267

Appendix B:

**Federally Listed and State-Listed Threatened and
Endangered Species in the Vicinity of
Savannah, Georgia**

Appendix B:

Federally Listed and State-Listed Threatened and Endangered Species in the Vicinity of Savannah, Georgia

Endangered Species

Animals

Amber Darter (<i>Percina antesella</i>)	Ivory-Billed Woodpecker (<i>Campephilus principalis</i>)
American Peregrine Falcon (<i>Falco peregrinus anatum</i>)	Kemp's Turtle
Atlantic Ridley Turtle (<i>Lepidochelys kempii</i>)	Kirtland's Warbler (<i>Dendroica kirtlandii</i>)
Bachman's Warbler (<i>Vermivora bachmanii</i>)	Leatherback Turtle (<i>Dermochelys coriacea</i>)
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Manatee (<i>Trichechus manatus</i>)
Conasauga Logperch (<i>Percina jenkinsi</i>)	Peregrine Falcon (<i>Falco peregrinus</i>)
Curland's Warbler	Red Wolf (<i>Canis rufus</i>)
Eastern Brown Pelican (<i>Pelecanus occidentalis</i>)	Red-Cockaded Woodpecker (<i>Picoides borealis</i>)
Eastern Cougar (<i>Felis concolor cougar</i>)	Right Whale (<i>Balaena glacialis</i>)
Finback Whale (<i>Balaenoptera physalus</i>)	Sei Whale (<i>Balaenoptera borealis</i>)
Florida Panther (<i>Felis concolor coryi</i>)	Sherman's Pocket Gopher (<i>Geomys fontanelus</i>)
Gray Bat (<i>Myotis grisescens</i>)	Short-Nosed Sturgeon (<i>Acipenser brevirostrum</i>)
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)	Southern Cave Fish (<i>Typhlichthys subterraneus</i>)
Humpback Whale (<i>Megaptera novaeangliae</i>)	Sperm Whale (<i>Physeter macrocephalus</i>)
Indiana Bat (<i>Myotis sodalis</i>)	Woodstork (<i>Mycteria americana</i>)

Plants

Arrow Wood (<i>Viburnum bracteatum</i>)	Mat-Forming Quillwort (<i>Isoetes tegetiformans</i>)
Black-Spored Quillwort (<i>Isoetes melanospora</i>)	Michaux Sumac (<i>Rhus michauxii</i>)
Buckthorn (<i>Bumelia thornei</i>)	Northern Pitcherplant (<i>Sarracenia purpurea</i>)
Canby Dropwort (<i>Oxypolis canbyi</i>)	Ocone-Bells (<i>Shortia galacifolia</i>)
Cooley Meadowrue (<i>Thalictrum cooleyi</i>)	Open-Ground Whitlow-Grass (<i>Draba aprica</i>)
Curtiss Loosestrife (<i>Lythrum curtissii</i>)	Persistent Trillium (<i>Trillium persistens</i>)
False Pimpernel (<i>Lindernia saxicola</i>)	Pondberry (<i>Lindera melissifolia</i>)
Florida Torreya (<i>Torreya taxifolia</i>)	Pool Sprite (<i>Amphianthus pusillus</i>)
Fringed Campion (<i>Silene polypetala</i>)	Relict Trillium (<i>Trillium reliquum</i>)
Georgia Plume (<i>Elliottia racemosa</i>)	Shoals Spiderlily (<i>Hymenocallis coronaria</i>)
Goldenseal (<i>Hydrastis canadensis</i>)	Small Whorled Pogonia (<i>Isotria medeoloides</i>)
Green Pitcherplant (<i>Sarracenia oreophila</i>)	Star-Flower (<i>Trientalis borealis</i>)
Hairy Rattleweed (<i>Baptisia arachnifera</i>)	Sweet Pitcherplant (<i>Sarracenia rubra</i>)
Harper Fimbristylis (<i>Fimbristylis perpusilla</i>)	Tennessee Yellow-Eye Grass (<i>Xyris tennesseensis</i>)
Harperella (<i>Ptilimnium nodosum</i>)	Three-Tooth Cinquefoil (<i>Potentilla tridentata</i>)
Hirst Panic Grass (<i>Panicum hirstii</i>)	Twinleaf (<i>Jeffersonia diphylla</i>)
Kral Water-Plantain (<i>Sagittaria secundifolia</i>)	Woods False Hellebore (<i>Veratrum woodii</i>)
Large-Flower Skullcap (<i>Scutellaria montana</i>)	

Threatened Species

Animals

American Alligator (<i>Alligator mississippiensis</i>)	Piping Plover (<i>Charadrius melodus</i>)
Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>)	Snail Darter (<i>Percina tanasi</i>)
Green Sea Turtle (<i>Chelonia mydas</i>)	Spotfin Chub (<i>Cyprinella monacha</i>)
Indigo Snake (<i>Drymarchon corais couperi</i>)	Yellowfin Madtom (<i>Noturus flavipinnis</i>)
Loggerhead Turtle (<i>Caretta caretta</i>)	

Plants

Ashe Savory (<i>Calamintha ashei</i>)	Parrot Pitcherplant (<i>Sarracenia psittacina</i>)
Bay Starvine (<i>Schisandra glabra</i>)	Piedmont Barren Strawberry (<i>Waldsteinia lobata</i>)
Biltmore Sedge (<i>Carex biltmoreana</i>)	Piedmont Water-Milfoil (<i>Myriophyllum laxum</i>)
Bluestem (<i>Schizachyrium niveum</i>)	Piedmont Ragwort (<i>Senecio millefolium</i>)
Croomia (<i>Croomia pauciflora</i>)	Plumleaf Azalea (<i>Rhododendron prunifolium</i>)
Dwarf Witch-Alder (<i>Fothergilla gardenii</i>)	Pondspice (<i>Litsea aestivalis</i>)
False Dragon-Head (<i>Physostegia veroniciformis</i>)	Purple Sedge (<i>Carex purpurifera</i>)
Florida Willow (<i>Salix floridana</i>)	Sedge (<i>Carex amplisquama</i>)
Georgia Rockcress (<i>Arabis georgiana</i>)	Sedge (<i>Carex misera</i>)
Glade-Cress (<i>Leavenworthia exiua</i>)	Smooth Purple Coneflower (<i>Echinacea laevigata</i>)
Granite Rock Stonecrop (<i>Sedum pusillum</i>)	Southern Meadowrue (<i>Thalictrum debile</i>)
Harper Dodder (<i>Cuscuta harperi</i>)	Swamp Pink (<i>Helonias bullata</i>)
Hartwrightia (<i>Hartwrightia floridana</i>)	Variable Indian Plaintain (<i>Cacalia diversifolia</i>)
Hooded Pitcherplant (<i>Sarracenia minor</i>)	Virginia Spirea (<i>Spirea virginiana</i>)
Indian Olive (<i>Nestronia umbellula</i>)	Wagner Spleenwort (<i>Asplenium heteroresiliens</i>)
Mohr Barbara-Buttons (<i>Marshallia mohri</i>)	Whitetop Pitcherplant (<i>Sarracenia leucophylla</i>)
Oglethorpe Oak (<i>Quercus oglethorpensis</i>)	Yellow Flytrap (<i>Sarracenia flava</i>)

Source: USATHAMA (1992).

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