ENVIRONMENTAL ASSESSMENT
CENTAUR CRYOGENIC TANKING FACILITY AND
CENTAUR PROCESSING BUILDING
CAPE CANAVERAL AIR FORCE STATION, FLORIDA

PREPARED FOR

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION
ENVIRONMENTAL PLANNING DIVISION
DIRECTORATE OF ACQUISITION
CIVIL ENGINEERING
LOS ANGELES AIR FORCE BASE, CALIFORNIA

OCTOBER 1991

PREPARED BY

ENGINEERING-SCIENCE, INC.
Tampa, Florida

F33615-89-D-4003/0005

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION (AFSC)
LOS ANGELES AIR FORCE BASE, PO BOX 92960
LOS ANGELES, CA 90009-2960

OCT 21 1991

TO: Governmental Agencies, Public Officials, Public Groups and Interested Individuals

Attached for public and governmental agency notification is the Finding of No Significant Impact (FONSI) and the Environmental Assessment (EA) for the Centaur Cryogenic Tanking Facility and Centaur Processing Building located at Cape Canaveral AFS, Florida. This is in compliance with the National Environmental Policy Act of 1969 and the regulations of the President's Council on Environmental Quality.

The FONSI and EA address the environmental impacts associated with the construction and operation of the Centaur Cryogenic Tanking Facility and Centaur Processing Building located at Cape Canaveral AFS, Florida. The thirty (30) day notification period is not required based on the standards set in Air Force Regulation 19-2, Environmental Impact Analysis Process, paragraph 11f (1-4).

Copies of the FONSI and EA may be obtained by writing to:

Department of the Air Force
Headquarters Space Systems Division, SSD/DEV,
Attn: Mr. Dan Pilson
P.O. Box 92960
Los Angeles AFB, CA 90009-2960

or by calling Mr. Dan Pilson at (213) 363-1409.

Sincerely,

WILLIAM G. NORTON, COL, USAF
Director of Acquisition Civil Engineering

DEPARTMENT OF THE AIR FORCE

OCT 2 1 1991

TO: Governmental Agencies, Public, Officials, Public Groups and Interested Individuals

Attached for public and governmental agency notification is the Finding of No Significant Impact (FONSI) and the Environmental Assessment (EA) for the Cryogenic Tanking Facility and Cryogenic Processing Building located at Cape Canaveral AFS, Florida. This is in compliance with the National Environmental Policy Act of 1969 and the regulations of the President's Council on Environmental Quality.

The FONSI and EA address the environmental impacts associated with the construction and operation of the Cryogenic Tanking Facility and Cryogenic Processing Building located at Cape Canaveral AFS, Florida. The thirty (30) day notification period is not required based on the exemption in Air Force Regulation 19-2 Environmental Impact Analysis Process, paragraph III 1-4c.

Copies of the FONSI and EA may be obtained by writing to:

Department of the Air Force
Headquarters Space Systems Division, SKI/INV
Attn: Mr. Dan Ellison
P.O. Box 92960
Los Angeles AFB, CA 90009-2960

or by calling Mr. Dan Ellison at (213) 643-1409.

Sincerely,

WILLIAM G. NORTON, COL, USAF
Director of Acquisition Civil Engineering

ENVIRONMENTAL ASSESSMENT
CENTAUR CRYOGENIC TANKING FACILITY AND
CENTAUR PROCESSING BUILDING
CAPE CANAVERAL AIR FORCE STATION, FLORIDA

PREPARED FOR

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION
ENVIRONMENTAL PLANNING DIVISION
DIRECTORATE OF ACQUISITION
CIVIL ENGINEERING
LOS ANGELES AIR FORCE BASE, CALIFORNIA

OCTOBER 1991

PREPARED BY

ENGINEERING-SCIENCE, INC.
Tampa, Florida

F33615-89-D-4003/0005

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

CENTAUR CRYOGENIC TANKING FACILITY AND

CENTAUR PROCESSING BUILDING

CAPE CANAVERAL AFS, FLORIDA

1. INTRODUCTION

The U.S. Air Force (USAF) proposes to construct two new off-line processing facilities at Cape Canaveral Air Force Station (CCAFS), Florida to support the Titan IV program. One purpose of the Titan IV program is placement of national security satellites in orbit. The program is required to maintain Department of Defense mission requirements to place national security satellites in orbit.

2. PROPOSED ACTION

The new facilities, known as the Centaur Cryogenic Tanking Facility (CCTF) and Centaur Processing Building (CPB), will be used to perform all testing and processing of the Centaur upper stage prior to mating with the Titan IV core vehicle. Presently all pre-launch processing of the Centaur upper stage must be done in the Vertical Integration Building, cell 3. This serial processing can accommodate only four launches per year. However, as early as 1994, Titan IV program launches will be required to exceed that rate. Therefore, an off-line processing facility will be needed to support the program. The CCTF and CPB will provide off-line processing and multiple vehicle storage and minimize the checkout time on the launch pad, increasing the launch rate to at least five Titan IV/Centaurs per year. The facilities also will provide for future processing of Atlas/Centaur vehicles.

The CCTF will consist of a Cryogenic Tanking Cell (CTC); a CTC Support Building; an Operations Support Building; and other support facilities such as sewage treatment facilities, generator buildings and substations, security facilities, and storage. The CPB will include two assemble/checkout cells and two storage cells; and a future Atlas Booster processing facility.

CCAFS is located along the eastern coast of Florida near the city of Cocoa Beach in Brevard County. The station occupies approximately 15,800 acres (25 square miles) of a barrier island that is bounded on the east by the Atlantic Ocean and on the west by the Banana River. The proposed location for the CCTF and CPB is on a site adjacent to Cape

Road, near the Titan Integrate, Transfer, and Launch area. The proposed site currently is vacant and previously was used for stockpiling of fill that was used in construction of various facilities and launch complexes.

Alternatives considered for the proposed action were modification of Complex 36A into a suitable processing facility and construction of the facilities in the industrial area near Hangar J. Complex 36A was eliminated from further consideration due to cost considerations; it has since been activated for Atlas launches. Locating the facilities in the industrial area was dismissed due to safety constraints. The current proposed site was moved south from the corner of Cape Road and Telemetry Road and has been set back 245 feet from Cape Road to reduce impact to Florida scrub jay habitat and potential archaeological sites.

3. SUMMARY OF ENVIRONMENTAL IMPACTS

This environmental assessment consisted of reviewing the potential impacts of CCTF and CPB construction and operation on the natural and manmade environment. A summary of findings for each subject area is given below.

Air Quality

Construction of the CCTF and CPB will not violate ambient air quality standards for fugitive dust. Other air pollutants generated during construction would be limited and temporary and also should result in no significant impact.

During operation, emissions from the standby generators are not expected to result in any significant impact. During tanking operations, emissions of hydrazine from the scrubber may exceed the State "no threat level" for hydrazine in the vicinity of the east shore of the Banana River west of the CCTF/CPB site. However, based on the relative short duration and infrequent occurrence of the tanking operation during the year, the predicted ground-level concentrations will pose no threat to the health of the offsite population; however, hydrazine levels will be discussed with the Florida Department of Environmental Regulation during the permit application process for the scrubber. Predicted hydrazine emissions do not exceed worker protection standards for onsite employees.

Water Quality

Construction and operation of the CCTF and CPB will not result in significant impacts on surface water or ground water quality or hydrology. Storm water runoff would be collected in a series of swales and cross-road drains. There will be no surface water discharge from the site. Effluent from a properly designed and operated onsite wastewater treatment and disposal plant will not cause water quality degradation or mounding of the water table. Proper design and maintenance of the swales and the wastewater plant will preclude adverse impacts to local hydrology and water quality.

Geology and Soils

The CCTF and CPB will not alter site geology and, aside from covering parts of the site with impervious materials, will not alter site soils. Impacts to geology or soils are not expected.

Biota

Development of the proposed site will affect approximately 35 acres of vacant but previously disturbed terrain. Some plant communities and animal habitats will be eliminated.

Two Federally threatened and two State species of special concern are among the species observed or potentially found on the site. The two threatened species are the eastern indigo snake and the Florida scrub jay. The two species of special concern are the gopher tortoise and the Florida mouse. The facilities have been set back approximately 245 feet to the west of Cape Road in order to preserve prime Florida scrub jay habitat. Two crossings of this set-back area will be required for the access road and utilities. Compliance with the guidelines of the CCAFS Scrub Jay Management Plan for construction of the CCTF and CPB will minimize adverse impacts to scrub jays in the vicinity.

The Air Force initiated consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act of 1973. USFWS concurred with the Air Force's determination that the CCTF and CPB would have "no effect" on threatened or endangered species.

Socioeconomics and Population

Of the 200 operations personnel anticipated for the CCTF/CPB, up to 40 will be relocated from outside Brevard County. This will not cause a significant impact on local population, housing, schools, infrastructure, or transportation.

The economic impact of construction and of the relocated personnel will have a slight positive impact on the economy.

Waste

In the event of a spill in the diesel generator building, an oil-water separator connected to the floor drain would provide containment. A spill in the Paint, Oil, and Lubricants Building would be contained by a non-draining collection sump connected to the floor drain. The CTC, where hydrazine (N_2H_4) tanking will be performed, will have a hazardous waste floor drain system connected to a sump for collection of N_2H_4 spills, rinsate waste, and line flush waste. From the sump, waste will be pumped to an above-ground emergency spill storage tank. Scrubber liquor from the N_2H_4 scrubber is an additional hazardous waste. The Joint Propellants Contractor will be responsible for collection and disposal of these wastes in accordance with local, State and Federal regulations.

With the use of proper containment and waste handling/disposal practices that will meet all local, State, and Federal requirements, no adverse impact is expected.

Safety and Noise

The CCTF and CPB will be designed to accommodate cryogenic and hypergolic storage and transfer areas in accordance with the Explosives Quantity Distances Siting and Safety Criteria of Air Force Regulations. Safety features include revetments between the CTC and CTC Support Building and between the CTC and liquid hydrogen storage; spill disposal means for N_2H_4; removal of volatilized N_2H_4 by a scrubber; evacuation of non-essential personnel and use of protective gear during N_2H_4 tanking; spill retention areas; and fire protection systems. With the use of these and other safety measures that will meet all local, State, and Federal requirements, no adverse safety impact is expected.

The primary noise concern is construction noise, which will be mitigated through the use of hearing protection for construction workers and noise abatement devices on construction equipment. Thus, no significant noise impact will result from the CCTF and CPB.

Cultural Resources

A U.S. Army Corps of Engineers survey concluded that the CCTF and CPB will not impact any historic or archaeological resources at CCFAS. The State Historic Preservation Officer concurred with the Corps of Engineers' conclusions.

4. FINDINGS

Based on the above discussion and the supporting Environmental Assessment, a finding of no significant impact is made. Copies of the Environmental Assessment on the proposed action, dated October 1991, can be obtained from:

Department of the Air Force
Headquarters, Space Systems Division, SSD/DEV
P.O. Box 92960
Los Angeles AFB, CA 90009-2960
ATTN: Mr. Daniel Pilson

APPROVED: HQ SSD Environmental Protection Committee OCT 18 1991

EUGENE L. TATTINI
Colonel, USAF
Vice Commander

TABLE OF CONTENTS

	PAGE
FINDING OF NO SIGNIFICANT IMPACT (FONSI)	
LIST OF FIGURES	iv
LIST OF TABLES	v
1. PROPOSED ACTION AND ALTERNATIVES	1-1
1.1 THE PROPOSED ACTION	1-1
1.1.1 Purpose of and Need for the Action	1-1
1.1.2 Project Location	1-2
1.1.3 Project Description	1-2
1.1.3.1 New Construction	1-2
1.1.3.2 Existing Facilities Utilization	1-6
1.2 ALTERNATIVES TO THE PROPOSED ACTION	1-6
1.2.1 No Action	1-6
1.2.2 Alternatives Eliminated from Detailed Consideration	1-6
1.3 SCOPE OF THIS ENVIRONMENTAL REVIEW	1-7
2. ENVIRONMENTAL DESCRIPTION AND IMPACTS	2-1
2.1 NATURAL ENVIRONMENT	2-1
2.1.1 Meteorology	2-1
2.1.2 Air Quality	2-3
2.1.3 Hydrology	2-9
2.1.3.1 Ground Water	2-9
2.1.3.2 Surface Water	2-10
2.1.4 Water Quality	2-11
2.1.4.1 Ground Water	2-11
2.1.4.2 Surface Water	2-11
2.1.5 Geology and Soils	2-11
2.1.5.1 Stratigraphy	2-11
2.1.5.2 Soils	2-13
2.1.5.3 Geologic Hazards	2-13
2.1.6 Biota	2-14
2.1.6.1 Terrestrial Biota	2-14
2.1.6.2 Field Reconnaissance	2-17
2.1.6.3 Threatened, Endangered, and Special Status Species	2-22
2.2 MAN-MADE ENVIRONMENT	2-26
2.2.1 Population	2-26
2.2.1.1 Demography	2-26
2.2.1.2 Housing	2-27
2.2.2 Socioeconomics	2-27
2.2.2.1 Schools	2-27

2.2.2.2 Water 2-28
2.2.2.3 Wastewater Treatment and Disposal 2-28
2.2.2.4 Solid Waste Management 2-29
2.2.2.5 Power 2-29
2.2.2.6 Public Safety 2-29
2.2.2.7 Health Care 2-30
2.2.2.8 Transportation 2-30
2.2.2.9 Economy 2-30
2.2.3 Hazardous Waste 2-31
2.2.4 Safety 2-33
2.2.5 Noise 2-34
2.2.6 Cultural Resources 2-34
2.2.6.1 Archaeological Resources 2-34
2.2.6.2 Historic Resources 2-35

2.3 CUMULATIVE IMPACTS 2-35
2.3.1 Air Quality 2-35
2.3.2 Hydrology and Water Quality 2-36
2.3.3 Geology and Soils 2-36
2.3.4 Biota 2-36
2.3.5 Population 2-37
2.3.6 Socioeconomics 2-37
2.3.7 Hazardous Waste 2-38
2.3.8 Safety 2-38
2.3.9 Noise 2-38
2.3.10 Cultural Resources 2-38

3. REGULATORY REVIEW AND PERMIT REQUIREMENTS 3-1

3.1 AIR QUALITY 3-1

3.2 WATER QUALITY 3-2
3.2.1 Storm Water Discharge 3-2
3.2.2 Sewage Treatment 3-2
3.2.3 Potable Water 3-3
3.2.4 Industrial Wastewater 3-3
3.2.5 Wetlands 3-3

3.3 HAZARDOUS WASTE 3-3

3.4 STORAGE TANKS 3-4

3.5 COASTAL ZONE MANAGEMENT 3-4

3.6 THREATENED AND ENDANGERED SPECIES 3-4

3.7 CULTURAL RESOURCES 3-5

4. MITIGATION MEASURES 4-1

4.1 AIR QUALITY 4-1

4.2 HYDROLOGY AND WATER QUALITY 4-1

4.3 GEOLOGY AND SOILS 4-1

4.4 BIOTA 4-1

4.5 POPULATION 4-2

4.6 SOCIOECONOMICS 4-3

4.7 HAZARDOUS WASTE 4-3

4.8 SAFETY 4-3

4.9 NOISE 4-3

4.10 CULTURAL RESOURCES 4-3

5. PERSONS AND AGENCIES CONTACTED 5-1

5.1 U.S. AIR FORCE 5-1
5.1.1 Headquarters, Space Systems Division 5-1
5.1.2 Armstrong Laboratory 5-1
5.1.3 Patrick Air Force Base/CCAFS 5-1

5.2 FEDERAL AGENCIES 5-2

5.3 STATE AGENCIES 5-2

5.4 LOCAL AGENCIES 5-2

5.5 OTHERS 5-3

6. REFERENCES 6-1

7. LIST OF PREPARERS 7-1

8. ACRONYMS AND ABBREVIATIONS 8-1

APPENDIX A ENDANGERED SPECIES ACT: SECTION 7 CONSULTATION

APPENDIX B LIGHT MANAGEMENT PLAN GUIDELINES 30 OCTOBER 1990 REVISION

APPENDIX C NATIONAL HISTORIC PRESERVATION ACT: SECTION 106 CONSULTATION AND STATE HISTORIC PRESERVATION OFFICER CONCURRENCE

LIST OF FIGURES

FIGURE		PAGE
1.1	General Location Map, Cape Canaveral Air Force Station	1-3
1.2	Proposed Site for the CCTF and CPB	1-4
1.3	Proposed CCTF/CPB Site Plan	1-5
2.1	Wind Rose for Cape Canaveral for 1968-1978	2-2
2.2	Generalized Geologic Profile, Cape Canaveral Air Force Station	2-12
2.3	Vegetation at Cape Canaveral Air Force Station	2-15
2.4	Vegetation at Proposed CCTF/CPB site	2-18

LIST OF TABLES

TABLE		PAGE
2.1	Predicted Offsite PM-10 and TSP Emissions for the CCTF and CPB	2-6
2.2	Predicted Offsite Hydrazine Emissions for the CCTF and CPB	2-8
2.3	Selected Plant Species Found at the Proposed CCTF/CPB Site	2-19
2.4	Threatened and Endangered Species Associated with CCAFS	2-23

SECTION 1

PROPOSED ACTION AND ALTERNATIVES

1.1 THE PROPOSED ACTION

The U.S. Air Force (USAF) Space Systems Division (SSD) proposes to construct a Centaur Cryogenic Tanking Facility (CCTF) and Centaur Processing Building (CPB) at Cape Canaveral Air Force Station (CCAFS), Florida to support the Titan IV program. The purpose of the CCTF and CPB is to minimize the checkout time on the launch pad, increasing the launch rate capability to at least five Titan IV/Centaurs per year.

The CCTF and CPB are new facilities that will be located on one site near the Titan Integrate, Transfer, and Launch (ITL) area. The facilities will be used to perform all testing and processing of the Centaur upper stage prior to mating with the Titan IV core vehicle at the launch pad. This testing will include handling of cryogenic and hazardous propellants and pyrotechnic devices. Testing is conducted to demonstrate the capability of the propellant loading and control system to maintain levels of liquid oxygen (LO_2), liquid hydrogen (LH_2), gaseous helium (GHe), and hydrazine (N_2H_4). In addition, chilldown capability of the liquid helium (LHe) system is tested along with the integrity of various bulkheads, vent valves, and duct assemblies. The computer controlled vent and pressurization system is tested under various conditions. The facilities also will provide provisions for future processing of Atlas/Centaur vehicles.

The CCTF consists of the Cryogenic Tanking Cell, Operations Support Building, and required security and utility systems. This is estimated to cost about $24.0 million and construction start is scheduled for about March 1992. The CPB will be added to the CCTF site and is estimated to cost about $34.0 million, for a total cost of $58.0 million. Construction start for the CPB is scheduled for about January 1993. This Environmental Assessment includes both the CCTF and CPB activities.

1.1.1 Purpose of and Need for the Action

The CCTF and CPB are required to support the Titan IV program. Presently all pre-launch processing of the Centaur upper stage must be done in the Vertical Integration Building (VIB), cell 3. This serial processing can only accommodate four launches per year. However, as early as 1994, Titan IV program launches will be required to exceed that rate. Therefore, an off-line processing facility will be needed to support the program. The purpose of the CCTF and CPB is to provide off-line processing and multiple vehicle storage and to minimize the checkout time on the launch pad, thereby increasing the launch rate capability to at least five Titan IV/Centaur launches per year. The CCTF and CPB are

needed to support the accelerated Titan IV launch rate and also will provide for future off-line processing of Atlas/Centaur vehicles.

The potential impacts of the increased launch rate were assessed in a previous Environmental Assessment (USAF, 1990a).

1.1.2 Project Location

CCAFS is located along the eastern coast of Florida near the city of Cocoa Beach in Brevard County (Figure 1.1). The station is approximately 15 miles north of Patrick Air Force Base (AFB) and adjacent to the National Aeronautics and Space Administration's (NASA's) Kennedy Space Center (KSC). CCAFS occupies approximately 15,800 acres (25 square miles) of a barrier island that is bounded on the east by the Atlantic Ocean and on the west by the Banana River.

The CCTF and CPB are new facilities that will be located on a site adjacent to Cape Road, near the Titan ITL area (Figure 1.2). The proposed site was used in the 1960s for stockpiling of fill that was used in construction of various facilities and launch complexes on ICBM Road. The site is currently vacant.

1.1.3 Project Description

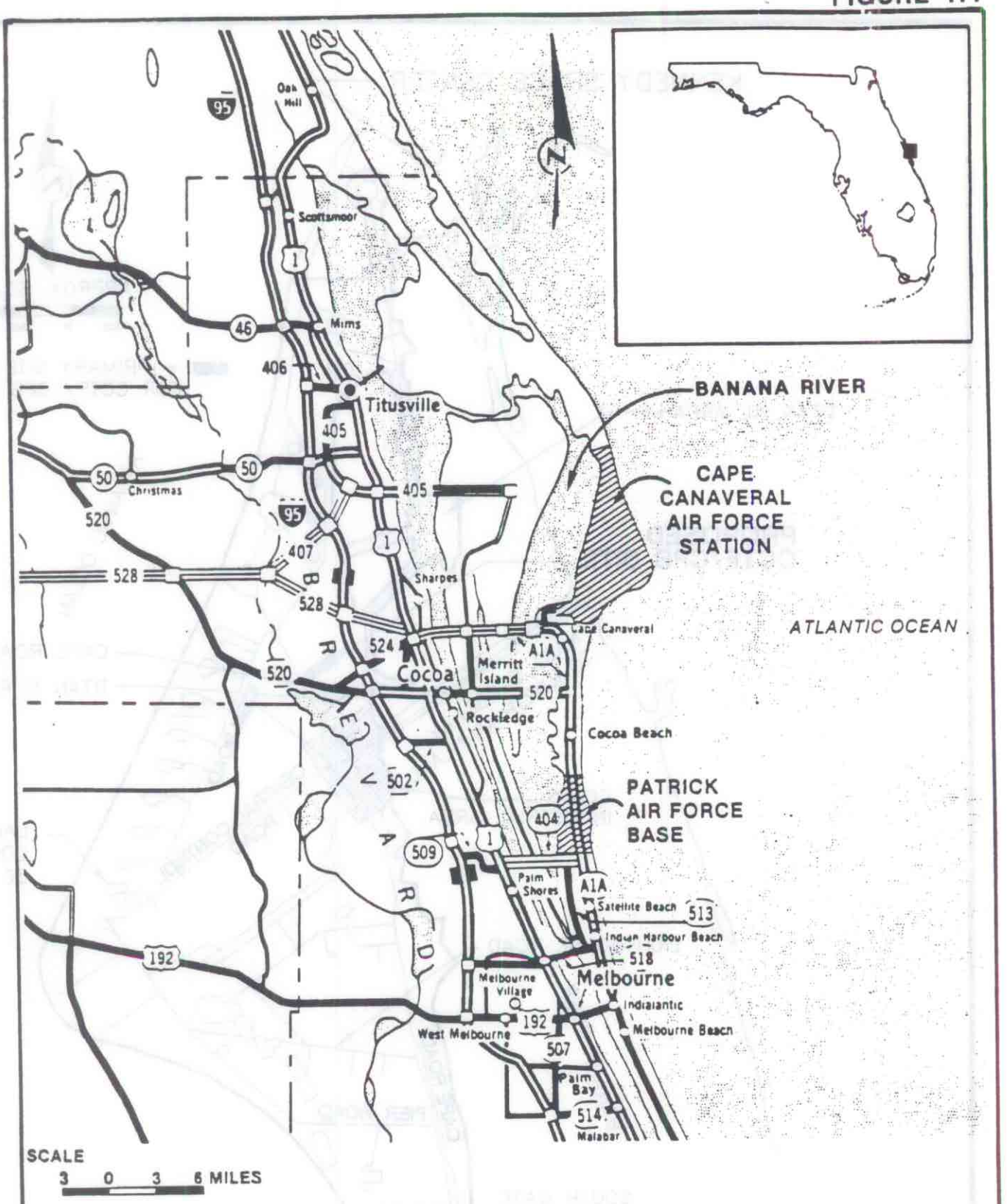
1.1.3.1 New Construction

The proposed action includes approximately 28 acres of developed area consisting of roads, parking lots, drainage facilities, cryogenic storage areas, utilities, various structures, and surface and below grade (primarily utility) improvements. The total project site, including those areas without facilities, is approximately 35 acres. The proposed site plan is shown on Figure 1.3.

CCTF facilities will consist of the following:

- Cryogenic Tanking Cell (CTC). The tanking and detanking of the Titan IV Centaur vehicle is performed in the vertical position in this cell.
- CTC Support Building. Tool storage, technical operations, test and maintenance support, mechanical equipment , communications, and avionics/electrical equipment will be housed in this building.
- Operations Support Building (OSB). The function of the OSB is to support the operations performed in the Centaur Processing Building and CTC.
- Other support facilities, including two diesel generator buildings; electrical substations; paint, oil, and lubricant (POL) storage; sewage treatment facilities; guard house; security fencing; emergency spill storage tank; and gas and cryogenic storage.

FIGURE 1.1

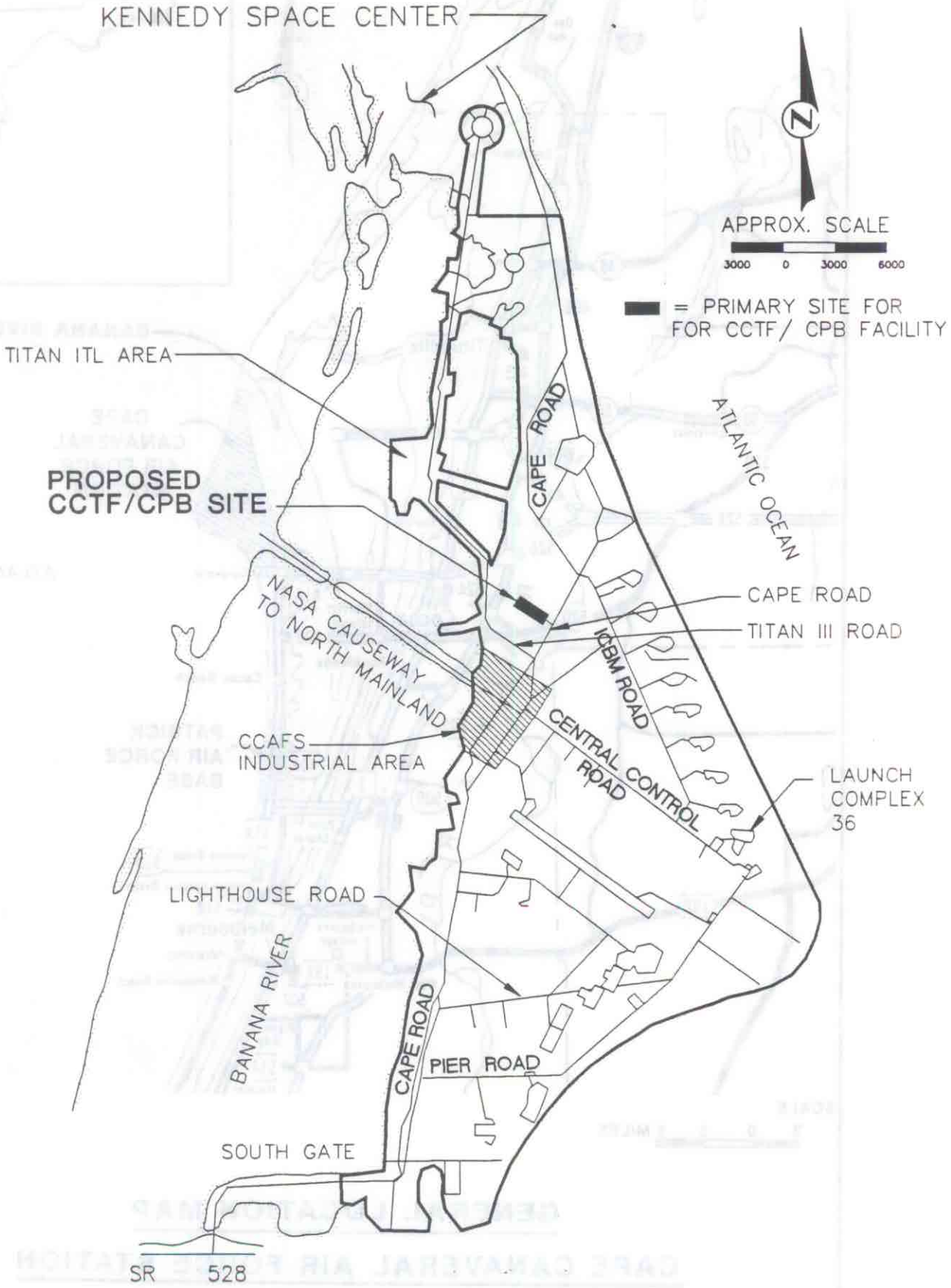


GENERAL LOCATION MAP

CAPE CANAVERAL AIR FORCE STATION

(SOURCE: USAF, 1986)

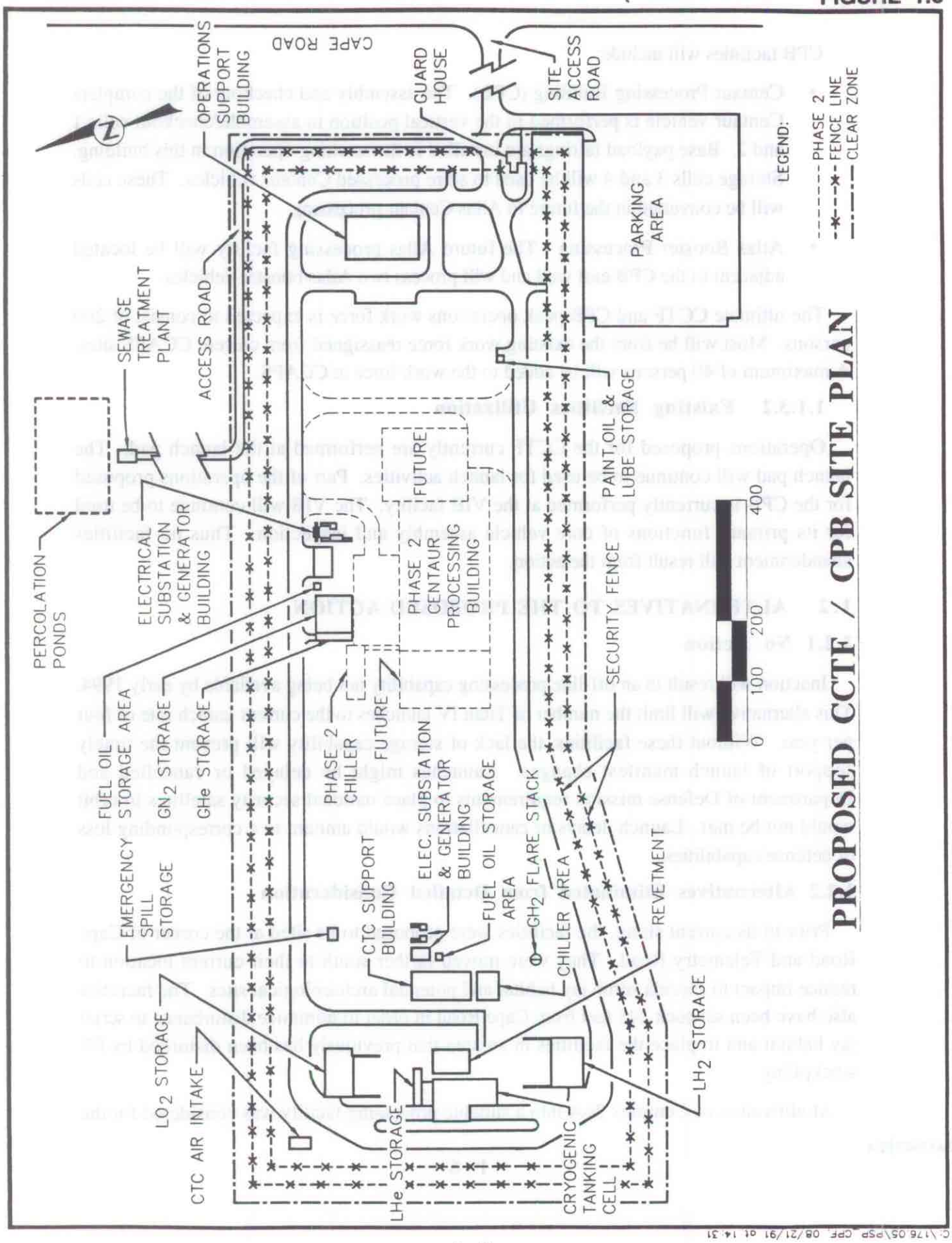
FIGURE 1.2



PROPOSED SITE FOR THE CCTF AND CPB

PSCCTF, 08/27/91 at 10:52

FIGURE 1.3


PROPOSED CCTF / CPB SITE PLAN
CAPE ROAD
OPERATIONS SUPPORT BUILDING
GUARD HOUSE
SITE ACCESS ROAD
LEGEND:
PHASE 2
FENCE LINE
CLEAR ZONE
PARKING AREA
SEWAGE TREATMENT PLANT
ACCESS ROAD
PERCOLATION PONDS
ELECTRICAL SUBSTATION & GENERATOR BUILDING
PHASE 2 CENTAUR PROCESSING BUILDING
FUTURE
PAINT, OIL & LUBE STORAGE
SECURITY FENCE
0 100 200 400
FUEL OIL STORAGE AREA
GN2 STORAGE
GHe STORAGE
PHASE 2 CHILLER
FUTURE
ELEC. SUBSTATION & GENERATOR BUILDING
FUEL OIL STORAGE AREA
GH2 FLARE STACK
CHILLER AREA
REVETMENT
EMERGENCY SPILL STORAGE
CTC SUPPORT BUILDING
LO2 STORAGE
CTC AIR INTAKE
LHe STORAGE
CRYOGENIC TANKING CELL
LH2 STORAGE

CPB facilities will include:

- Centaur Processing Building (CPB). The assembly and checkout of the complete Centaur vehicle is performed in the vertical position in assemble/checkout cells 1 and 2. Base payload fairings are installed in the stacking operation in this building. Storage cells 3 and 4 will be used to store processed Centaur vehicles. These cells will be converted in the future to Atlas Centaur processing.
- Atlas Booster Processing. The future Atlas processing facility will be located adjacent to the CPB east wall and will process two Atlas booster vehicles.

The ultimate CCTF and CPB peak operations work force is expected to consist of 200 persons. Most will be from the existing work force reassigned from current CCAFS sites. A maximum of 40 persons will be added to the work force at CCAFS.

1.1.3.2 Existing Facilities Utilization

Operations proposed for the CCTF currently are performed at the launch pad. The launch pad will continue to be used for launch activities. Part of the operations proposed for the CPB is currently performed at the VIB facility. The VIB will continue to be used for its primary functions of core vehicle assembly and inspection. Thus no facilities abandonment will result from the action.

1.2 ALTERNATIVES TO THE PROPOSED ACTION

1.2.1 No Action

Inaction will result in an off-line processing capability not being available by early 1994. This alternative will limit the number of Titan IV launches to the current launch rate of four per year. Without these facilities, the lack of storage capability will prevent the timely support of launch manifest changes. Launches might be delayed or cancelled and Department of Defense mission requirements to place national security satellites in orbit would not be met. Launch delays or cancellations would amount to a corresponding loss of defense capabilities.

1.2.2 Alternatives Eliminated from Detailed Consideration

Prior to its current siting, the facilities were proposed to be sited at the corner of Cape Road and Telemetry Road. They were moved farther south to their current location to reduce impact to Florida scrub jay habitat and potential archaeological sites. The facilities also have been set back 245 feet from Cape Road in order to minimize disturbance to scrub jay habitat and to place the facilities in an area that previously has been disturbed by fill stockpiling.

Modification of Complex 36A into a suitable processing facility was considered for the

CCTF and CPB. Modification of this complex for a processing facility, however, would cost more and thus be less cost effective than a new processing facility, especially when considering recurring maintenance. This complex has since been activated for Atlas launches.

A second alternative considered was to construct the facilities in the industrial area near Hangar J. However, because the facilities must accommodate cryogenic and hypergolic storage and transfer areas, the project is subject to Explosives Quantity/Distance (Q/D) Siting and Safety Criteria per Air Force Regulation (AFR) 127-100, Chapters 5 and 11. The storage and transfer areas must be separated from inhabited areas, roads, and from each other in accordance with AFR 127-100. Mandatory Q/Ds pertaining to these facilities include a 1370-foot inhabited buildings Q/D, a 750-foot roads Q/D, and a 620-foot intraline Q/D. Therefore, due to safety constraints, locating these facilities in the industrial area would preclude tests involving hazardous fuels and pyrotechnic devices; this would fall short of project requirements.

1.3 SCOPE OF THIS ENVIRONMENTAL REVIEW

This environmental assessment (EA) was prepared to satisfy the environmental review requirements set forth in the National Environmental Policy Act of 1969 (NEPA, Public Law 91-190). It was prepared in accordance with the President's Council on Environmental Quality regulations implementing NEPA (40 CFR, Parts 1500-1508) and AFR 19-2 (August 10, 1982). The objective of the EA is to form a basis for determining the significance of a proposed action's environmental impacts.

This EA focuses on the potential impacts to air and water quality, geology, biota, including threatened and endangered species, socioeconomics, cultural resources, waste, safety, and noise that will result from construction and operation of the CCTF and CPB at a site on Cape Road near the ITL area.

SECTION 2

ENVIRONMENTAL DESCRIPTION AND IMPACTS

2.1 NATURAL ENVIRONMENT

2.1.1 Meteorology

Affected Environment. The climate at CCAFS is characterized by long, relatively humid summers and mild winters. Due to its location adjacent to the Atlantic Ocean and the Indian and Banana Rivers, annual variations in temperature are moderate. The annual average temperature at CCAFS is 71 degrees Fahrenheit (F). Monthly average temperatures range from 81 degrees F in July to 64.4 degrees F in January. The highest average daily maximum temperature is 88 degrees F in July, and the lowest average daily minimum temperature is 51 degrees F in February. Freezing temperatures are rare on the Cape, though occasional freezes occur farther inland in Brevard County. Temperature inversions are infrequent, occurring approximately 2 percent of the time (USAF, 1988).

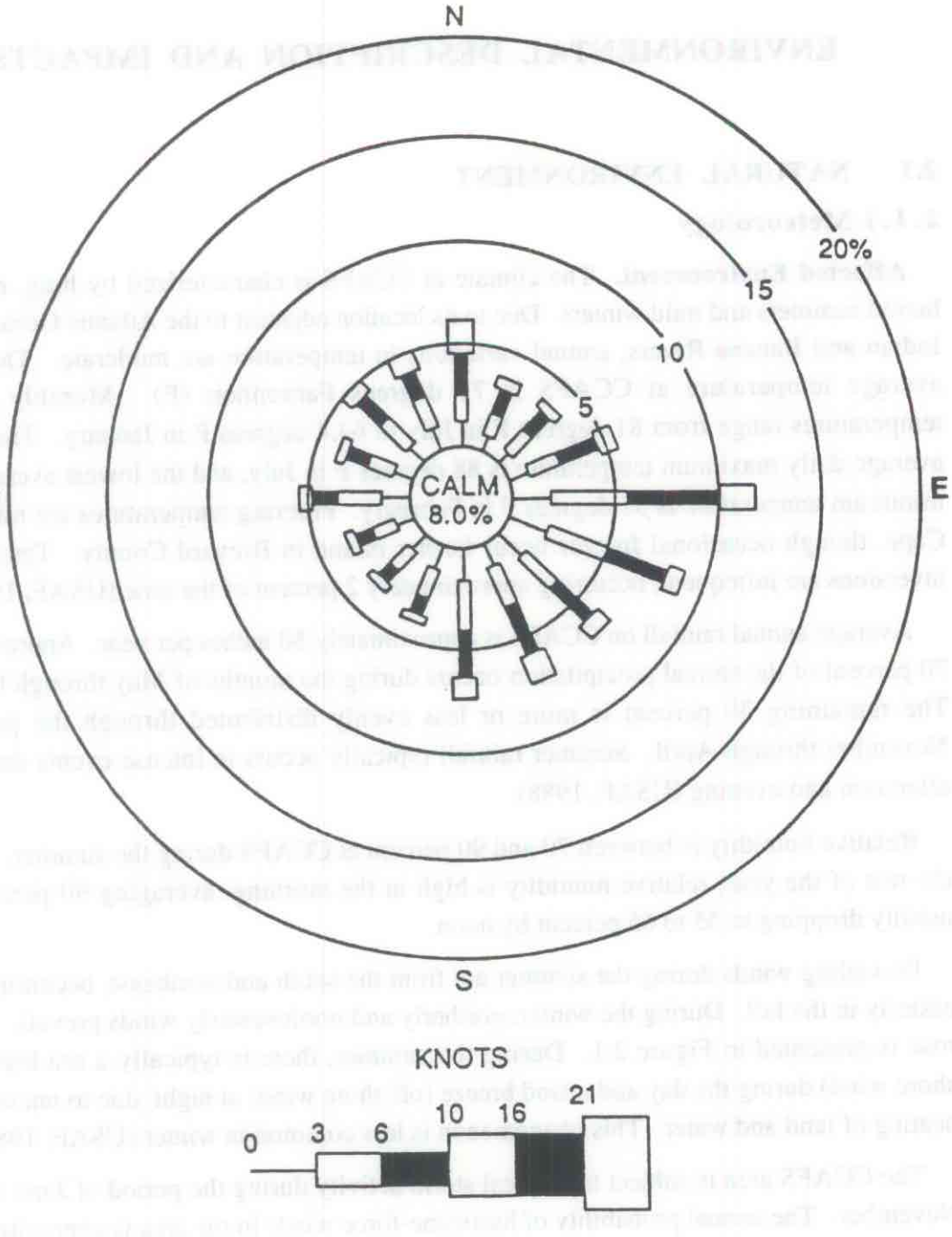
Average annual rainfall on CCAFS is approximately 50 inches per year. Approximately 70 percent of the annual precipitation occurs during the months of May through October. The remaining 30 percent is more or less evenly distributed through the period of November through April. Summer rainfall typically occurs in intense events during the afternoon and evening (USAF, 1988).

Relative humidity is between 70 and 90 percent at CCAFS during the summer. During the rest of the year, relative humidity is high in the morning, averaging 90 percent, but usually dropping to 55 to 65 percent by noon.

Prevailing winds during the summer are from the south and southeast, becoming more easterly in the fall. During the winter, northerly and northwesterly winds prevail. A wind rose is presented in Figure 2.1. During the summer, there is typically a sea breeze (on shore wind) during the day and a land breeze (off shore wind) at night, due to uneven solar heating of land and water. This phenomenon is less common in winter (USAF, 1988).

The CCAFS area is subject to tropical storm activity during the period of June through November. The annual probability of hurricane-force winds in the area is approximately 1 in 20 (Jordan, 1984).

Environmental Consequences. No impacts to local meteorology will be caused by this project.



WIND ROSE FOR CAPE CANAVERAL FOR 1968 - 1978

(SOURCE: USAF, 1990)

2.1.2 Air Quality

Affected Environment. The air quality at CCAFS is good since there are few air pollution sources in the local area. Brevard County is within an air quality control region classified by the U.S. Environmental Protection Agency (USEPA) as an attainment area for all criteria pollutants. These are pollutants for which a national ambient air quality standard (NAAQS) has been established and include sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), ozone (O_3), particulate matter equal to or less than 10 micrometers in diameter (PM-10), and lead (Pb). The State requires the NAAQS be met at ambient air, defined as air that is accessible to the general public. If the general public has access to a site by any means of transportation, then ambient air will be defined at that location.

Ambient air quality monitoring conducted by the Florida Department of Environmental Regulation (FDER) in Brevard County is somewhat limited with respect to the criteria pollutants. Ambient air quality monitoring data for 1990 indicate that six air monitoring sites were in operation at that time. Four sites, two at Titusville and two on Merritt Island, measured total suspended particulates (TSP); two sites, one in northern Brevard County (Cocoa Beach) and one in southern Brevard County (Palm Bay), measured O_3. During 1990, neither TSP nor O_3 standards were exceeded (FDER, 1990).

On 31 July 1987, a new NAAQS for PM-10 became law and replaced the NAAQS for TSP. The new PM-10 standard established the following ambient particulate concentrations: 150 micrograms per cubic meter ($\mu g/m^3$) 24-hour average not to be exceeded more than once per year; and 50 $\mu g/m^3$ annual arithmetic mean. FDER has adopted the PM-10 standard even though all sampling sites have not been changed over to the PM-10 ambient monitors. All particulate monitoring sites will eventually be converted to PM-10 sampling capability. There is no State standard for TSP; however, ambient monitors set up in the vicinity of CCAFS are TSP monitors. The State is in the process of converting TSP monitors to PM-10 monitors on a case-by-case basis. Those stations showing TSP concentrations greater than the PM-10 standards will be converted to PM-10 monitors first. TSP values are provided in this document for comparison purposes since the State still monitors for TSP. Monitoring results for the Titusville and Merritt Island sites did not exceed TSP standards for 1990.

The only other criteria pollutant for which long-term monitoring was conducted in Brevard County is O_3. As stated previously, the NAAQS was not exceeded at either the Cocoa Beach or Palm Bay monitoring sites during 1990.

Environmental Consequences. Potential sources of pollutant emissions from the CCTF and CPB will include construction activities (site preparation, facilities construction) conducted during the building of the complex; and stationary source operation such as the diesel generators, hydrogen flare, and N_2H_4 scrubber after the facilities come on line.

Emissions during construction activities are associated with land clearing, ground excavation, earthmoving, equipment traffic over temporary roads at the site, and construction of the facilities.

In an effort to help estimate emissions of air pollutants, USEPA has developed emission factors that relate the quantity of a pollutant released to the atmosphere with the activity associated with the release of that pollutant. The average TSP emission factor applied to typical construction sites such as the CCTF and CPB is 1.2 tons per acre per month of activity (USEPA, 1985) A more recent USEPA report (USEPA, 1988) allows calculations of PM-10 emissions from some open dust sources based on the PM-10/TSP emission factor ratio. The PM-10/TSP ratios for the three predominant construction source activities (topsoil removal, earthmoving, and truck hauling) range from 0.22 to 0.27. To present the worst-case scenario, the PM-10/TSP ratio of 0.27 was used to estimate PM-10 emissions from the CCTF and CPB. Is is assumed for this calculation that 3 acres will be the maximum area under active construction at any one time.

The estimate of PM-10 emissions from the construction site employs the following calculation:

TSP emissions = (1.2 tons/acre-month) (3 acres)

= 3.6 tons/month

Total PM-10 emissions = (3.6 tons/acre-month) (0.27)

= 1.0 ton/month

This estimate assumes that no dust control measures are used. It is estimated that an effective dust suppression program (watering twice daily) would reduce emissions by 50 percent (USEPA, 1985) to 1.8 tons per month for TSP and 0.5 tons/month for PM-10, assuming 3 acres of the site under active construction at any one time. For modeling purposes, emissions rates were based on 20 work days per month at 8 hours per day.

The USEPA Industrial Source Complex Short Term dispersion model (ISCST) was used to estimate the maximum contribution to the ambient PM-10 and TSP concentrations from planned construction activities. ISCST is a steady-state Gaussian plume model that can be used to access pollutant concentrations from an industrial source complex to include stack, area, and volume source types. Using externally supplied sequential hourly meteorological data, ISCST is designed to calculate concentration values for time periods of 1, 2, 3, 4, 6, 8, and 24 hours. The model was run using one year (1969) of sequential hourly meteorological data from CCAFS to predict ambient pollutant concentrations at five specific receptors or fence line locations. The regulatory default option (recommended by

USEPA for regulatory applications) was used for modeling runs. The "rural terrain" option also was used, which reduces any induced turbulence introduced by buildings or other structures found in an urban setting that aid in the mixing of the ambient air mass and therefore, the dispersion of the emissions form the site. Finally, the maximum 24-hour particulate concentrations were calculated to correspond to NAAQS particulate standards.

By employing the ISCST model as described above, ambient PM-10 and TSP concentrations were predicted for five locations, including the CCAFS north property line (9600 meters), the CCAFS south property line (11,000 meters), the near shore of the Banana River just west of the proposed site (1000 meters), directly across the Banana River at the KSC (4800 meters), and the shore of the Atlantic Ocean east of the site (2000 meters). The increases in the 24-hour PM-10 and TSP concentrations attributed to construction activities employing no dust control and construction activities using an effective dust control program are presented in Table 2.1.

The predicted PM-10 ambient concentrations would be less than the 24-hour (150 $\mu g/m^3$) NAAQS for both the uncontrolled and controlled scenarios for all five locations examined in the model. The predicted increase in PM-10 ambient concentration at the nearest offsite receptor (near shore of Banana River) based on no dust control is 46 percent of the 24-hour NAAQS; with dust control, the increase in ambient concentration is 23 percent of the NAAQS. Since existing PM-10 ambient concentrations are well below the NAAQS, the increase in ambient particulate concentrations from proposed construction activities should pose no threat to the continued attainment of air quality standards.

Pollutants from equipment and vehicle engine exhausts are NO_X, SO_2, CO, PM-10, and volatile organic compounds (VOCs). Combustion engine exhausts will be temporary and, like the fugitive dust emissions, will not be expected to result in significant impacts. Construction of site buildings may include field painting of ferrous and nonferrous metal; however, this will be on a limited basis and should pose no significant impact.

Stationary source emissions, as noted above, will come from the two standby diesel generators, and the hydrogen flare and N_2H_4 scrubber. Electrical power to the CCTF and CPB will be supplied from a commercial source; however, standby power will be provided for the guard house, security system, emergency lighting, fire alarm system, and tank/detank operations. During cryogenic tanking operations (eight times per year), the CTC critical substation will operate on generator-supplied power. Each of the generators is expected to operate fewer than 50 hours per year. Emissions from the diesel engines will include NO_X, SO_2, CO, PM-10, and VOCs. Pollutant emissions will be infrequent because of the generators' stand-by status and are not expected to result in any significant impact.

Table 2.1
Predicted Offsite PM-10 and TSP Emissions for the CCTF and CPB

Receptor Location	PM-10* 24-hr ($\mu g/m^3$)	PM-10** 24-hr ($\mu g/m^3$)	TSP* 24-hr ($\mu g/m^3$)	TSP** 24-hr ($\mu g/m^3$)	PM-10 24-hr Standard ($\mu g/m^3$)
North Base Boundary	4	2	16	8	150
South Base Boundary	2	1	8	4	
West Base Boundary	68	34	240	120	
East Base Boundary	18	9	60	30	
KSC	6	3	24	12	

* No dust control
** Dust control

The CCTF and CPB will be capable of processing and testing the Titan IV Centaur vehicles. Part of this activity includes tanking/detanking the Centaur with LH_2 and N_2H_4. These operations will take place in the CTC at a frequency of about eight times per year. Associated with these processes are the control devices needed to eliminate excess hydrogen gas and treat N_2H_4 vapors generated during the tanking activities. A propane-ignited flare will be used to destroy the excess hydrogen. The flare will be located about 60 feet southeast of the CTC Support Building. Pollutant emissions from the flare would include small amounts of NO_x, CO, and VOCs (unburned propane fuel). Since hydrogen gas will be flared only eight times per year, no significant impacts are anticipated from this source.

Only about 350 pounds of N_2H_4 will be loaded/unloaded during tanking operations. N_2H_4 exhaust emissions generated during these operations will be controlled by use of a scrubber with a removal efficiency of 99 percent. The scrubber will be located near the CTC in the vicinity of the hazardous waste storage tank. It is estimated that flowrate from the CTC to the scrubber will be approximately 25 cubic feet per minute and the N_2H_4 concentration in the gas stream will be 5 percent by volume.

N_2H_4 is considered an air toxic by FDER. The State regulates an air toxic through the development of "no threat levels" (NTLs); a ground level ambient concentration as defined by the State in its "Florida Air Toxics Working List No Threat Levels" (FDER, 1991) to which a person may be exposed and not experience any detrimental effects. The NTL ambient concentrations were developed as part of a strategy to control toxic emissions to a no threat level and are, as such, health-based standards. The 8-hour, 24-hour, and annual NTLs for N_2H_4 are 0.13 $\mu g/m^3$, 0.0312 $\mu g/m^3$, and 0.0034 $\mu g/m^3$ respectively.

The ISCST model was used to predict 8-hour N_2H_4 ambient concentrations at the same five locations used for particulate concentration analysis to assess impact on the general population. This was done because N_2H_4 is an air toxic and must be modeled for ambient concentrations at the nearest offsite receptor; i.e., the nearest place to which the general public has access. The 8-hour concentrations then were compared to the FDER's 8-hour NTL for N_2H_4. Since the tanking operations will be of short duration (approximately 4 hours) and only performed approximately eight times per year, comparison was made against the 8-hour NTL as opposed to the 24-hour and annual NTLs. Results of the modeling analysis are presented in Table 2.2.

Predicted N_2H_4 ambient concentrations are at or below the NTL for four of the five locations analyzed. The one exception is the Banana River location just west of the proposed CCTF/CPB site. The predicted level at this near-shore site is approximately 3 1/2 times higher than the NTL. Based on the relative short duration and infrequent occurrence

Table 2.2
Predicted Offsite Hydrazine Emissions for the CCTF and CPB

Receptor Location	Hydrazine 8-hour Concentration ($\mu g/m^3$)	Hydrazine No Threat Level ($\mu g/m^3$)
North Base Boundary	0.01	0.13
South Base Boundary	0.01	
West Base Boundary	0.44	
East Base Boundary	0.13	
KSC	0.04	

of the tanking operation during the year, the predicted ambient concentrations should pose no threat to the health of the offsite population; however, potential mitigation for the possible exceedance of the NTL at the near shore of the Banana River during tanking will be discussed with FDER during preparation of the air permit application.

The USEPA screening analysis dispersion model (SCREEN) was used to predict 1-hour ground-level N_2H_4 ambient concentrations at the CCTF/CPB site in order to assess onsite worker exposure. SCREEN is a Gaussian plume model that incorporates source-related factors and internal meteorological factors to estimate one-hour pollutant concentrations. The model was run using the "full meteorology" option that identifies the worst case meteorological conditions that result in the maximum ground level concentrations. The "discreet distance" option was used to predict concentrations at specific receptors (fence line locations). The "rural terrain" option was used, which reduces any induced turbulence introduced by buildings or other structures found in an urban setting that aids in the mixing of the ambient air mass and, therefore, the dispersion of the emissions from the site.

By employing the SCREEN model, N_2H_4 concentrations were predicted out to a distance of 250 meters from the scrubber in 10-meter increments. The maximum concentration was found to be 0.0625 mg/m^3 at a distance of 70 meters.

Based on a worst case assumption that a worker would be at the 70-meter location and be exposed to 0.0625 mg/m^3 for four hours (length of tanking operation), the 8-hour time weighted exposure would be 0.031 mg/m^3. This exposure is less than the Occupational Safety and Health Administration (OSHA) permissible exposure limit of 0.1 mg/m^3 for N_2H_4. In addition, it is very likely that this exposure is over-estimated owing to the variability in meteorological conditions and worker movement. Therefore, the predicted onsite ambient concentrations should pose no threat to the health of the onsite worker population.

2.1.3 Hydrology

2.1.3.1 Ground Water

Affected Environment. Ground water is present at CCAFS in two aquifers, the unnamed surficial aquifer and the Floridan Aquifer. The surficial or water table aquifer is an unconfined (non-artesian) aquifer usually located a few feet below the ground surface. The stratigraphic units that make up the surficial aquifer are composed of undifferentiated sands of Recent and Pleistocene age and a marl formation of Pliocene age. These units typically extend to a depth of 70 feet below land surface (bls) at CCAFS. Ground water in the surficial aquifer at CCAFS generally flows to the west except along the east coast of the peninsula (USGS, 1962).

The deeper Floridan is an artesian aquifer confined by a regional zone of low permeability. An artesian aquifer has a hydraulic head above ground surface. Wells that penetrate an artesian aquifer will flow freely at the ground surface.

The Floridan Aquifer is composed of several limestone formations. The uppermost limestone formation generally occurs at a depth of approximately 180 feet bls at CCAFS. The limestone formations extend to a depth of several thousand feet; however, the major water-bearing units are located in the upper thousand feet.

Because ground water at CCAFS is highly mineralized, water for domestic and commercial uses at CCAFS is obtained from the city of Cocoa, which has a well field in Orange County.

Environmental Consequences. Maximum potable water demand from the CCTF and CPB will be 4225 gallons per minute. This is a fire flow requirement for emergency use only. The expected domestic potable water usage is at least an order of magnitude below fire flow. Because these requirements are within available capacity, and because there will not be a significant increase in population associated with the facilities, there should not be a significant impact on ground water withdrawal due to the facilities.

2.1.3.2 Surface Water

Affected Environment. CCAFS is located on the Canaveral Peninsula, which is a barrier island between the Atlantic Ocean and the Banana River (Figure 1.1). The majority of ground surface at CCAFS is composed of relict dune ridges. The dunes typically facilitate rapid infiltration of runoff.

The closest water bodies to the CCTF/CPB site are the Banana River, located approximately 3000 feet west of the site, and the Atlantic Ocean, located approximately 1.5 miles east.

The CCTF/CPB site is within the 500-year (6 feet above mean sea level) floodplain. However, less than 5 percent of the site is within the 500-year floodplain. In addition, the site has no outfall below the 500-year floodplain. The drainage basin containing the entire CCTF/CPB site is not connected hydraulically at the elevation of, or below, the 500-year floodplain elevation.

Environmental Consequences. A series of shallow swales and cross-road drains for storm water runoff will be constructed for the CCTF and CPB. The swales are designed to collect and convey runoff away from the proposed facilities. The intent of the design is to spread out the drainage over the site and to permit the runoff to percolate uniformly into the soil. Therefore, there will be no impact to surface water bodies due to the CCTF and CPB.

2.1.4 Water Quality

2.1.4.1 Ground Water

Affected Environment. Ground water from the surficial aquifer at CCAFS is not a major domestic or commercial source of water. Generally, surficial aquifer ground water located adjacent to the Banana River or the Atlantic Ocean contains high levels of sodium, chlorides, and minerals, whereas surficial ground water located at the interior of the peninsula displays relatively good quality.

The Floridan Aquifer is the primary source for potable water in central Florida. However, the water within the Floridan at CCAFS is highly mineralized as a result of saline intrusion from surrounding salt water bodies. Water for domestic and commercial uses at CCAFS is obtained from the city of Cocoa. The source of this water is a well field in Orange County.

Environmental Consequences. No impact on local ground water quality is expected due to facilities operations as there will be adequate containment of all hazardous materials and adequate design and operation of domestic wastewater land application (percolation ponds) and storm water treatment facilities.

2.1.4.2 Surface Water

Affected Environment. As previously stated, the closest surface water body to the proposed CCTF/CPB site is the Banana River. The Banana River is an Outstanding Florida Water (OFW) located within a state aquatic preserve (FDER 17-3.041(9)(h), March, 1990). OFW are waters designated by the Environmental Regulatory Commission as worthy of special protection because of their natural attributes (FDER 17-3.021(22), March 1990). The waters of the Banana River also are classified as Class III by the State of Florida. Class III waters are for recreation and the propagation and maintenance of fish and wildlife.

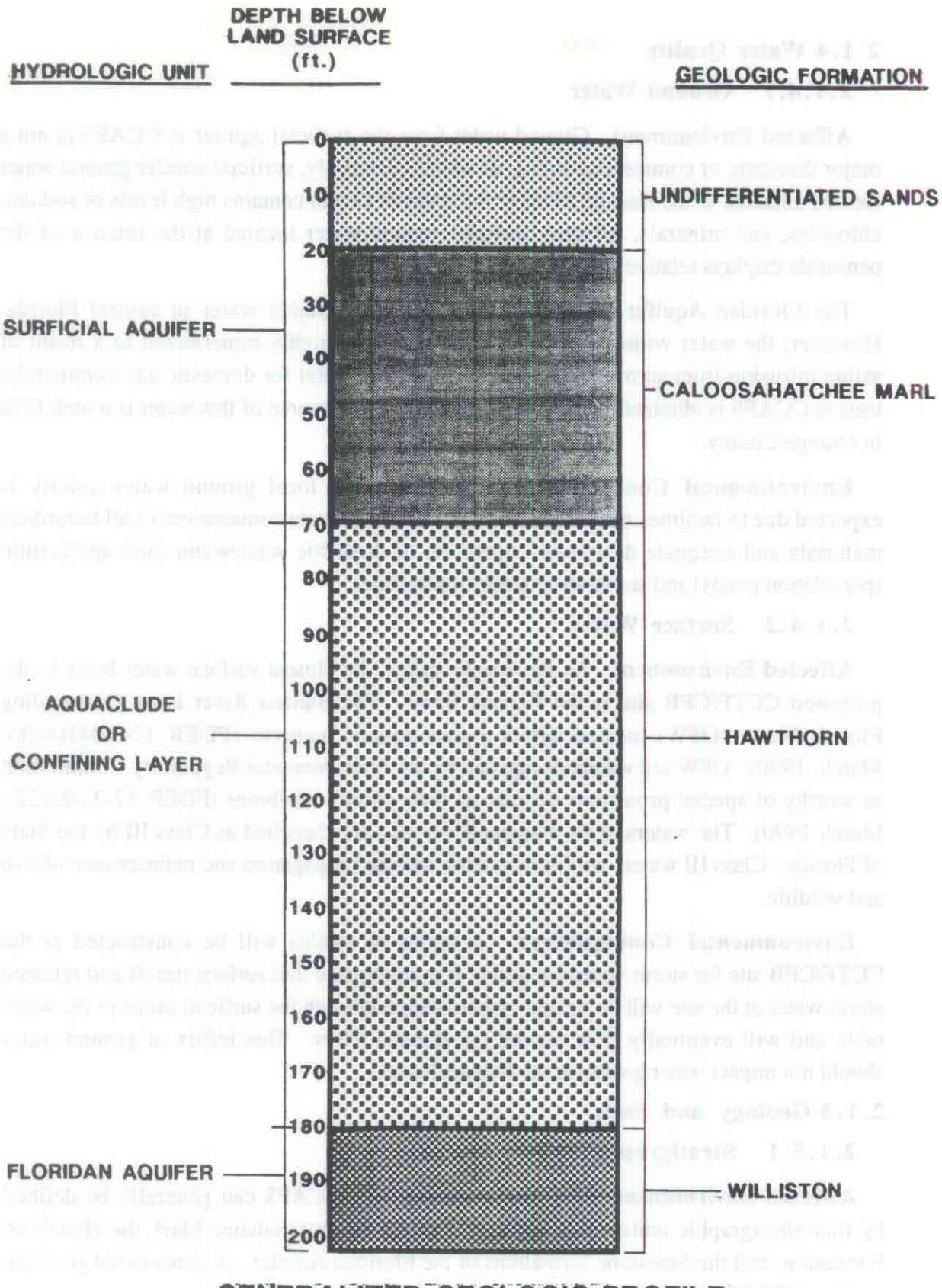
Environmental Consequences. A series of swales will be constructed at the CCTF/CPB site for storm water retention. It is anticipated that surface runoff and retained storm water at the site will be treated by percolation through the surficial sands to the water table and will eventually flow toward the Banana River. This influx of ground water should not impact water quality in the Banana River.

2.1.5 Geology and Soils

2.1.5.1 Stratigraphy

Affected Environment. The geology underlying CCAFS can generally be defined by four stratigraphic units: the surficial sands, the Caloosahatchee Marl, the Hawthorn Formation, and the limestone formations of the Floridan Aquifer. A generalized geologic profile of CCAFS is presented in Figure 2.2.

FIGURE 2.2



GENERALIZED GEOLOGIC PROFILE
CAPE CANAVERAL AIR FORCE STATION

Surficial Sands: Immediately underlying the surface are Pleistocene to Recent age sandy marine deposits. These undifferentiated sandy units typically extend to depths of approximately 10 to 30 feet bls.

Caloosahatchee Marl: The surficial sands are underlain by the fine grained semi-confining zones of the Caloosahatchee Marl Formation of Pliocene to Upper Miocene age. The Caloosahatchee consists of green to gray sandy shell marl with varying silt, clay, and shell content. The Caloosahatchee generally extends to a depth of about 70 feet bls.

Hawthorn Formation: Underlying the Caloosahatchee Marl is the Hawthorn Formation of Miocene age. The Hawthorn Formation is the regional confining unit for the Floridan Aquifer and consists of green to gray clays, silty clays, and sands with phosphatic zones and beds of sandy limestone. The Hawthorn is generally 80 to 120 feet thick, typically extending to a depth of around 180 feet bls.

Limestone Formations: Beneath the Hawthorn Formation are the Eocene age limestone formations of the Floridan Aquifer. The upper limestone units from youngest to oldest are the Williston, Inglis, Avon Park, and Ocala Formations. The Floridan Aquifer and other limestone formations extend several thousand feet bls at CCAFS.

Environmental Consequences. The CCTF and CPB will not alter site geology and no impacts will result.

2.1.5.2 Soils

Affected Environment. The proposed CCTF/CPB site is located in an area dominated by Canaveral-Urban land complex soils (SCS, 1974). These fine- to coarse-grained sands of varying shell content are typical of beach and dune deposits and are highly permeable. Most of the site previously was covered with dredge spoil as it was used as a fill stockpile location during base construction in the 1960s. Some of this fill, characteristic of Canaveral-Urban land soils, remains on the site.

The northeast and northwest corners of the site have Welaka sand. This is a nearly level, well-drained sandy soil that generally supports coastal scrub vegetation.

Environmental Consequences. Aside from covering parts of the site with impervious materials, the CCTF and CPB will not alter site soils.

2.1.5.3 Geologic Hazards

Affected Environment. The principal geologic hazard in central Florida is sinkholes. Sinkholes develop when overlying soils collapse into existing limestone cavities. The CCAFS is not located in an active sinkhole area. Review of topographic maps did not reveal the presence of any sinkholes. The Canaveral Peninsula is not prone to sinkholes due to several factors. The limestone formations are at depths of over 100 feet bls and do not tend to be cavernous. The Hawthorn and Caloosahatchee Marl Formations

combined are over 100 feet thick and separate the limestone from the surficial sands.

Another geologic hazard is earthquakes. CCAFS is situated in a region of low seismic activity.

Environmental Consequences. Although the possibility of sinkhole development or the occurrence of an earthquake cannot be ruled out completely, risks to the proposed CCTF and CPB associated with these geologic hazards appear to be minimal.

2.1.6 Biota

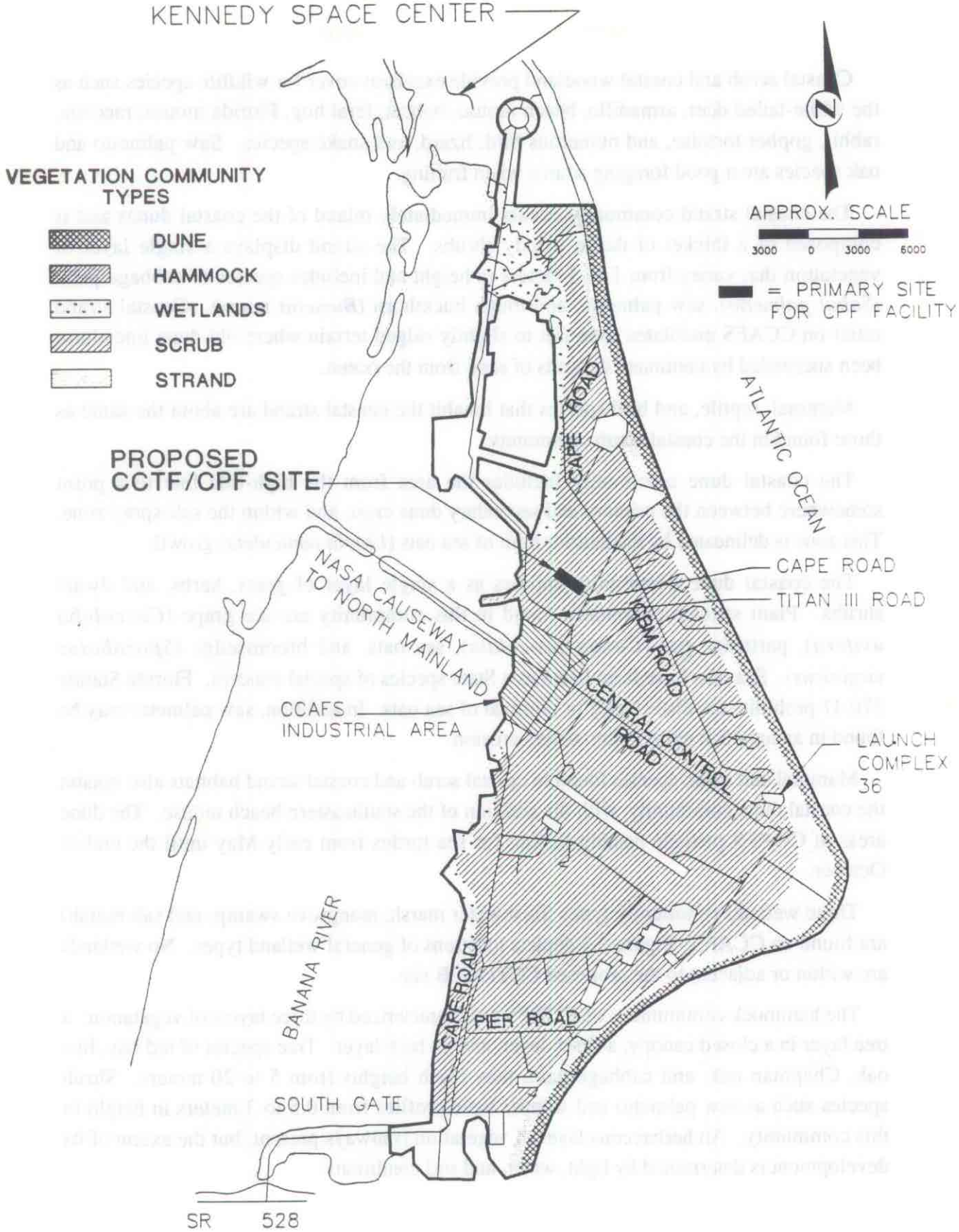
2.1.6.1 Terrestrial Biota

Affected Environment. Gross vegetational types found at CCAFS have been mapped and described (George, 1987; Provancha et al., 1986). Figure 2.3 identifies the localities of vegetational community types.

Near-natural conditions have been retained at CCAFS due to the restricted nature of activities allowed on the station. The majority of the 15,800-acre complex consists of vegetation indigenous to the Florida coastal scrub (9,400 acres), coastal strand (2,300 acres), and coastal dune (800 acres) plant communities. Wetlands at CCAFS represent a minor percentage of the total land area and include 20 acres of freshwater wetlands, 450 acres of mangrove swamp, and 140 acres of salt marsh (George, 1987). Known hammocks at CCAFS are small in size and total less than 200 acres. The remaining acreage is primarily covered with launch and support facilities.

The coastal scrub community is characterized by dense growths of scrub vegetation, such as myrtle oak (*Quercus myrtifolia*), live oak (*Q. virginiana*), saw palmetto (*Serenoa repens*), Chapman oak (*Q. chapmanii*), and stoppers (*Eugenia* spp.) that have developed nearly impenetrable thickets, forming clumps of vegetation that are separated by bare sand. In profile, this community varies in height from less than 1 up to 6 meters. Coastal scrub appears in a single layer, with limited herbaceous groundcover. This community appears in a temporary stage that may develop into xeric flatwoods, sand pine scrub, or a xeric coastal hammock (George, 1987; Layne, 1978).

Coastal scrub also develops (succeeds) into coastal woodland. Coastal woodland is found throughout CCAFS. Coastal woodland is included in the coastal scrub areas shown in Figure 2.3, and woodland acreage is included in the acreage estimate for coastal scrub above because of the similarity of appearance. Coastal woodland is characterized by two layers of vegetation: an upper, closed canopy and a lower, shrub layer. Live oak, Chapman oak, red bay (*Persea borbonia*), and hercules club (*Zanthoxylum clava-herculis*) form the canopy and may reach heights from 5 to 15 meters. Saw palmetto and immature oaks form the shrub layer. An herb layer is nearly absent.



VEGETATION AT CAPE CANAVERAL AIR FORCE STATION

Coastal scrub and coastal woodland provide excellent cover for wildlife species such as the white-tailed deer, armadillo, beach mouse, bobcat, feral hog, Florida mouse, raccoon, rabbit, gopher tortoise, and numerous bird, lizard, and snake species. Saw palmetto and oak species are a good foraging source when fruiting.

The coastal strand community occurs immediately inland of the coastal dunes and is composed of a thicket of dense woody shrubs. The strand displays a single layer of vegetation that varies from 1 to 4 meters in height and includes species of cabbage palm (*Sabal palmetto*), saw palmetto, and tough buckthorn (*Bumelia tenax*). Coastal strand relief on CCAFS undulates from flat to slightly ridged terrain where old dune lines have been succeeded by continued deposits of sand from the ocean.

Mammal, reptile, and bird species that inhabit the coastal strand are about the same as those found in the coastal scrub community.

The coastal dune community includes the area from the high-tide line to a point somewhere between the primary and secondary dune crest, and within the salt-spray zone. This zone is delineated by the interior limit of sea oats (*Uniola paniculata*) growth.

The coastal dune community appears as a single layer of grass, herbs, and dwarf shrubs. Plant species commonly found in this community are sea grape (*Coccoloba uvifera*), partridge pea (*Cassia fasiculata*), sea oats, and broomsedge (*Sporobolus virginicus*). Sea oats have been listed as a State species of special concern. Florida Statute 370.41 prohibits the disturbance or removal of sea oats. In addition, saw palmetto may be found in an area that experiences severe erosion.

Mammal and avian species found in coastal scrub and coastal strand habitats also inhabit the coastal dune community, with the addition of the southeastern beach mouse. The dune areas at CCAFS provide nesting habitat for sea turtles from early May until the end of October.

Three wetland community types (freshwater marsh, mangrove swamp, and salt marsh) are found on CCAFS. Figure 2.3 depicts locations of general wetland types. No wetlands are within or adjacent to the proposed CCTF/CPB site.

The hammock communities on CCAFS are characterized by three layers of vegetation: a tree layer in a closed canopy, a shrub layer, and an herb layer. Tree species of red bay, live oak, Chapman oak, and cabbage palm may reach heights from 5 to 20 meters. Shrub species such as saw palmetto and stopper have profiles from 0.5 to 3 meters in height in this community. An herbaceous layer of vegetation is always present, but the extent of its development is determined by light, water, and soil conditions.

Hammock communities on CCAFS are located in areas with historically stable soils. These sites are normally on the interior sides of barrier strands and on higher portions of the undulating Cape Canaveral terrain (George, 1987). Scrub communities throughout CCAFS appear to be in transition toward hammock types and xeric scrub oak woodlands.

Hammocks at CCAFS are inhabited by wildlife species that are associated with the adjacent coastal scrub.

2.1.6.2 Field reconnaissance

Preliminary review of existing vegetation mapping (George, 1987) in the vicinity of the proposed CCTF/CPB site identified it as a coastal scrub community. Field reconnaissance of the proposed CCTF/CPB site and surrounding land was conducted to verify these preliminary findings and to identify additional vegetational cover types and unique site features, and to determine the presence of threatened, endangered, and special concern species. A listing of plants observed during field reconnaissance is presented in Table 2.3. A vegetational communities map for the site and environs is presented in Figure 2.4.

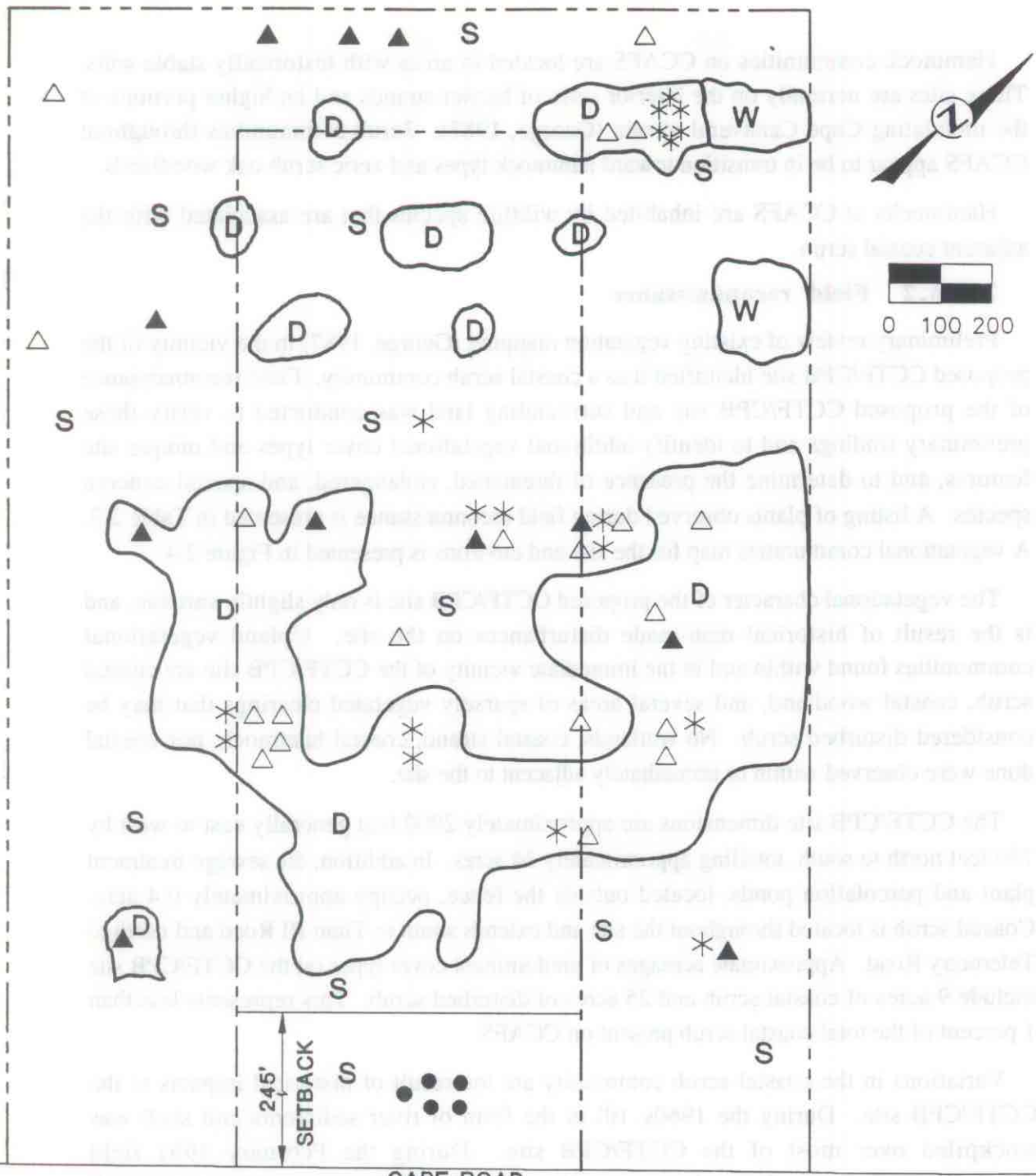
The vegetational character of the proposed CCTF/CPB site is only slightly variable, and is the result of historical man-made disturbances on the site. Upland vegetational communities found within and in the immediate vicinity of the CCTF/CPB site are coastal scrub, coastal woodland, and several areas of sparsely vegetated clearings that may be considered disturbed scrub. No wetlands, coastal strand, coastal hammock, nor coastal dune were observed within or immediately adjacent to the site.

The CCTF/CPB site dimensions are approximately 2000 feet generally east to west by 750 feet north to south, totalling approximately 34 acres. In addition, the sewage treatment plant and percolation ponds, located outside the fence, occupy approximately 0.4 acre. Coastal scrub is located throughout the site and extends south to Titan III Road and north to Telemetry Road. Approximate acreages of predominant cover types on the CCTF/CPB site include 9 acres of coastal scrub and 25 acres of disturbed scrub. This represents less than 1 percent of the total coastal scrub present on CCAFS.

Variations in the coastal scrub community are the result of historical impacts to the CCTF/CPB site. During the 1960s, fill in the form of river sediments and shell was stockpiled over most of the CCTF/CPB site. During the February 1991 field reconnaissance, a correlation between soil type and vegetation cover was observed. Disturbed scrub appears to be located in areas that have a greater amount of remnant dredge spoil and are at typically higher elevations due to mounded soils. Coastal scrub and coastal woodland on and around the CCTF/CPB site are primarily underlain by sandy soils with a thinner cover of remnant spoil or no spoil.

Along the disturbed scrub and coastal scrub interface, mounds of spoil and sand were observed as well as a number of animal burrows. During the vegetation survey, thirteen

FIGURE 2.4



VEGETATIVE COMMUNITY TYPE

S	COASTAL SCRUB	▲	GOPHER TORTOISE BURROW ACTIVE
W	COASTAL WOODLAND	△	GOPHER TORTOISE BURROW INACTIVE
D	DISTURBED SCRUB	✳	SMALL MAMMAL BURROW
— — —	APPROX. PROPERTY LINE	●	BIRD NEST
— - - —	BOUNDARY OF AREA SURVEYED		

VEGETATION AT PROPOSED CCTF / CPB SITE

VPCPF.DWG

Table 2.3
Selected Plant Species Found at the Proposed CCTF/CPB Site

Scientific Name	Common Name	Coastal Scrub	Coastal Woodland	Disturbed Scrub
Trees/shrubs				
Baccharis halimifolia	Groundsel	X		X
Bumelia tenax	Tough buckthorn	X		X
Callicarpa americana	American beautyberry	X	X	
Cassia fasciculata	Partridge pea	X		X
Juniperus silicicola	Southern red cedar		X	
Licania michauxii	Gopher apple		X	X
Myrica cerifera	Wax myrtle	X	X	X
Quercus chapmanii	Chapman oak	X	X	
Quercus virginiana	Live oak	X	X	
Rhus copallina	Winged sumac	X		
Ricinus communis	Castorbean	X		
Sabal palmetto	Cabbage palm	X	X	
Salix virginiana	Carolina willow	X		
Schinus terebinthifolius	Brazilian pepper	X		
Serenoa repens	Saw palmetto	X	X	X
Verbesina virginica	Crownbeard	X		
Zanthoxylum clava-herculis	Hercules club	X	X	
Vines				
Mikania spp.	Climbing hempweed	X		
Passiflora incarnata	Passion flower	X		
Smilax spp.	Cat briar	X	X	
Toxicodendron radicans	Poison ivy	X	X	X
Vitis rotundifolia	Wild grape	X	X	

TA176TBL23

Table 2.3 Selected Plant Species Found at the Proposed CCTF/CPB Site (continued)

Scientific Name	Common Name	Coastal Scrub	Coastal Woodland	Disturbed Scrub
Herbs				
Ambrosia artemisifolia	Ragweed	X		X
Andropogon virginicus	Broomsedge	X		X
Catharanthus roseus	Madagascar periwinkle	X		
Lantana camara	Lantana	X		X
Opuntia spp.	Prickly pear cactus	X		X
Polygonella polygama	Jointweed	X		
Portulaca oleracea	Common purslane	X		
Pteridium aquilinum	Bracken fern	X	X	
Salvia coccinea	Tropical sage	X		
Spartina patens	Cordgrass	X	X	X
Epiphytes				
Tillandsia recurvata	Ball moss	X	X	
Tillandsia usneoides	Spanish moss		X	

TA176TBL23

gopher tortoise (*Gopherus polyphemus*) burrows, three active and ten inactive, were observed within the CCTF/CPB site boundaries, most in the disturbed scrub. Ten small animal burrows also were located. Burrow locations are shown in Figure 2.4.

There are two distinct variations of the coastal scrub community type on the CCTF/CPB site. Within the northeastern half of the property, scrub areas are typically composed of wax myrtle (*Myrica cerifera*), live oak, Chapman oak, and groundsel (*Baccharis halimifolia*) interspersed with dense sands of saw palmetto and little to no ground cover. This coastal scrub area is typical of undisturbed scrub areas found throughout CCAFS.

A disturbed scrub community is located to the west of the undisturbed coastal scrub. This community is vegetated with broomsedge, sand cordgrass, prickly pear cactus, and patches of scrub species listed above. Numerous sections of this area are unvegetated. Wildlife species observed in the disturbed scrub include several sparrows (*Aimophila* spp.), robins (*Turdus migratorius*), three Florida scrub jays (*Aphelocoma coerulescens coerulescens*), and two brown garter snakes (*Thamnophis* sp.).

West of the disturbed scrub area is another coastal scrub community. This community appears to be more hydric in nature than typical coastal scrub communities found on CCAFS. This area is dominated by dense growths of wax myrtle, groundsel bush, and crownbeard (*Verbesina virginica*). A distinctive herb layer of purslane (*Portulaca oleracea*) provides an average of 60 percent groundcover throughout this area. Immature scrub species form most of the remaining ground cover. This community displays a distinctly more mesic environment with a thin surface detritus layer overlying sandy soils. It appears to be at a slightly lower elevation than areas farther east on the site. The eastern boundary of this community corresponds to the western limits of the old spoil area. An earthen ridge is present at this location and historically may have created a longer hydroperiod within this area; thereby explaining the more hydric environment. Wildlife species identified in this area were limited to several sparrows, robins, and rufous-sided towhees (*Pipilo erythrophthelmus*). Gopher tortoise burrows in this community were associated with the more sparsely vegetated areas.

Within the central portion of the mesic coastal scrub community, there are two drainage relief areas. These areas support willow (*Salix virginiana*) in addition to the coastal scrub species.

Because of the density of vegetation in the mesic coastal scrub, this area is not considered preferred habitat for any threatened, endangered, or special concern species.

There are two coastal woodland communities of live oak, Chapman oak, bracken fern (*Pteridium aquilinum*), and gopher apple (*Licania michauxii*) just north of the northwestern border of the site. Woodland communities provide a moderately dense canopy layer

averaging approximately 60 percent cover. Understory vegetation is sparse with greater than 90 percent of the ground covered by leaf litter.

Environmental Consequences. Development of the proposed site to accommodate construction of the CCTF and CPB will impact the biota within the approximately 35-acre area of the site. Habitat for numerous plants, small mammals, birds, amphibians, and reptiles is likely to be eliminated due to vegetation clearing and facility emplacement. Increased personnel activity also might disturb wildlife in the vicinity of the site, especially during the construction period.

Animals may move to locations outside of the impacted area of the site. However, if carrying capacity in adjacent locations is full, there would be no resources to support additional individuals. Thus, impact to the animal and plant inhabitants is expected due to habitat loss.

2.1.6.3 Threatened, Endangered, and Special Status Species

Affected Species. Twenty-seven listed animal species are associated with CCAFS, and are presented in Table 2.4. U.S. Fish and Wildlife Service (USFWS) and Florida Game and Fresh Water Fish Commission (FGFWFC) status and sightings are also included in this table. Of these species, four are potentially associated with the project site. No federally designated threatened or endangered flora are known to exist at CCAFS and no species specific critical habitat for flora or fauna has been established.

The four protected species that are known to exist or have a significant potential for occurrence at the project site are: eastern indigo snake (*Drymarchon corais couperi*), Florida scrub jay, gopher tortoise, and Florida mouse (*Peromyscus floridanus*).

The eastern indigo snake is listed as threatened by both USFWS and FGFWFC, and, while not observed at the CCTF/CPB site, has been identified throughout the Cape through road kills and field collections. Eastern indigo snakes principally occupy the xeric relict dune ridges of coastal scrub vegetation and moist hardwood hammocks, frequently making use of gopher tortoise burrows for winter shelter and nesting habitat.

The Florida scrub jay is listed as a threatened species by both USFWS and FGFWFC. The Florida scrub jay population on CCAFS is the second largest scrub jay population known to exist in Florida (George, 1987). The scrub jay extensively uses the scrub vegetation at the Cape for nesting and gathering acorns. The Florida scrub jay has been observed at the CCTF/CPB site, primarily in the scrub along Cape Road. As many as seven individuals were observed at one time near the eastern site boundary during the field reconnaissance. After informal consultation with USFWS, the facilities have been located with a setback of 245 feet from Cape Road so that there is minimal disturbance to this scrub jay habitat.

Table 2.4
Threatened and Endangered Species Associated with CCAFS

Scientific Name	Common Name	Status[1] USFWS[2]	FGFWFC[3]	Status at CCAFS[4]
Amphibians and Reptiles				
Alligator mississippiensis	American alligator	T(S/A)	SSC	o
Caretta caretta caretta	Atlantic loggerhead turtle	T	T	o
Chelonia mydas mydas	Atlantic green turtle	E	E	o
Dermochelys coriacea	Leatherback turtle	E	E	o
* *Drymarchon corais couperi*	Eastern indigo snake	T	T	o
* *Gopherus polyphemus*	Gopher tortoise	UR2	SSC	o
Lepidochelys kempi	Atlantic ridley turtle	E	E	o
Nerodia fasciata taeniata	Atlantic salt marsh snake	T	T	n/o
Rana areolata	Gopher frog	UR2	SSC	n/o
Birds				
Ajaia ajaja	Roseate spoonbill	---	SSC	o
* *Aphelocoma coerulescens coerulescens*	Florida scrub jay	T	T	o
Dendroica kirtlandii	Kirtland's warbler	E	E	n/o
Falco peregrinus tundrius	Arctic peregrine falcon	T	E	o
Falco sparverius paulus	Southeastern American kestrel	UR2	T	o
Grus canadensis pratensis	Florida sandhill crane	---	T	o
Haematopus palliatus	American oyster catcher	---	SSC	o
Haliaeetus leucocephalus	Bald eagle	E	T	o
Mycteria americana	Wood stork	E	E	o
Pandion haliaetus	Osprey	---	SSC	o
Pelecanus occidentalis	Brown pelican	---	SSC	o
Polyborus plancus audubonii	Audubon's crested caracara	T	T	n/o
Sterna antillarum	Least tern	---	T	o

TA176TBL24

Table 2.4 Threatened and Endangered Species Associated with CCAFS (continued)

Scientific Name	Common Name	Status[1] USFWS[2]	FGFWFC[3]	Status at CCAFS[4]
Mammals				
* *Peromyscus floridanus*	Florida mouse	UR2	SSC	o
Peromyscus polionotus niveiventris	Southeastern beach mouse	T	T	o
Trichechus manuatus latirostris	West Indian manatee	E	E	o

[1] E = Endangered; T = Threatened; T(S/A) = Threatened due to Similarity of Appearance
SSC = Species of Special Concern; UR2 = Under review, but substantial evidence of biological vulnerability and or threat is lacking

[2] U.S. Fish and Wildlife Service

[3] Florida Game and Freshwater Fish Commission

[4] o = observed
n/o = not observed

Species marked with a "*" are found or potentially found at the CCTF/CPB site.

References:

FGFWFC, 1990.

USAF, 1990a.

USFWS, 1989.

TA176/TBL24

The gopher tortoise is listed as under review by the USFWS and as a species of special concern by the FGFWFC. Gopher tortoises are restricted to well-drained sandy soils of xeric communities such as the coastal strand, coastal scrub, and hammock that are found on CCAFS. This species has been confirmed to exist within the study site. Three active and ten inactive tortoise burrows were observed during the field reconnaissance of the CCTF/CPB site.

The Florida mouse is listed as under review for federal endangered or threatened status by the USFWS and as a species of special concern by the FGFWFC. The Florida mouse is distributed in a patchwork pattern of more or less isolated populations. Its habitat is typically xeric, with open tree stands, clumps of scrubby oaks and other shrubs with scattered patches of bare ground, and well-drained sandy soils. A nocturnal animal, the Florida mouse frequently uses gopher tortoise burrows during the day. While the Florida mouse was not observed at the proposed CCTF/CPB site during the vegetation surveys and has not been trapped previously at the site, small mammal trappings conducted in similar cover type approximately four miles farther north on CCAFS, in the vicinity of Launch Complex 40, have confirmed the presence of the species in oak scrub on CCAFS. Ten unidentified small animal burrows were observed on the CCTF/CPB site during the vegetation survey. Therefore, it is possible that the species is found at the site.

One bald eagle (*Haliaeetus leucocephalus*) was observed perched on overhead transmission wires along Cape Road adjacent to the site at the time of the field reconnaissance. No eagle nests were found on the site and it is assumed that the bird was a transitory visitor.

No other direct or indirect indications of other USFWS- or FGFWFC-listed species were observed during this preliminary field investigation.

While not found on the site, there are endangered sea turtles that nest along the Atlantic Ocean beaches on CCAFS. The turtle hatchlings can be impacted by lights on shore. Bright lights can cause the hatchlings to move inshore, rather than out to sea.

Environmental Consequences. Biologists from the USFWS inspected the proposed CCTF/CPB site on 13 September 1990 in order to observe potential habitat for threatened and endangered species. In fulfilling the requirements of Section 7 of the Endangered Species Act of 1973, as amended, the USAF initiated consultation with the USFWS on 7 February 1991 for information and comments on the potential for adverse impacts to protected species on CCAFS at and in the vicinity of the proposed CCTF/CPB site.

As a result of informal consultation with USFWS, the facilities have been set back approximately 245 feet to the west of Cape Road in order to preserve prime scrub jay habitat. However, disturbance will be necessary for the required access road and utility crossings. Initially, up to six utility crossings were planned. This has been reduced to two crossings, with one being adjacent to the access road. Compliance with the development guidelines of the CCAFS Scrub Jay Management Plan (USAF, 1990b) for construction of the CCTF and CPB will minimize adverse impacts to scrub jays in the vicinity.

USFWS, in a 14 February 1991 letter response to the Air Force (Appendix A), concurred with the Air Force's determination that the CCTF and CPB would have "no effect" on threatened or endangered species. Adherence to the "Light Management Plan Guidelines, CCAFS, Florida" (11 March 1989, revised 30 October 1990; included in Appendix B) will ensure that the facilities have no significant impact on sea turtle hatchlings.

2.2 MAN-MADE ENVIRONMENT

2.2.1 Population

2.2.1.1 Demography

Affected Environment. Prior to 1950 the population of Brevard County was predominantly rural. Activation of CCAFS in the 1950s brought military personnel into the county. From 1950 to 1960, the total population of Brevard County grew from 23,500 to 111,500. The number of retirees moving into the county increased during the 1970s. In 1985, Brevard County's population was estimated at 388,000. The 1990 population of Brevard County was 417,594 (University of Florida, 1990), with principal urban centers in the cities of Melbourne (61,277), Titusville (42,963), Palm Bay (56,671), and Cocoa (18,274). By the year 2000, the county's population is projected to reach 533,616, an increase of nearly 27 percent over current levels (University of Florida, 1990). The projected growth is expected to be highest on the mainland in southern Brevard County and lowest on the mainland in central Brevard County (Brevard County Research and Cartography Division, 1988).

Most military personnel at CCAFS and Patrick AFB live in Brevard County, approximately 57 percent of them on Patrick AFB. About 95 percent of Air Force civilian contractor personnel live in Brevard County; the remainder live in Orange County, Indian River County, and other counties. No permanent residents are located on CCAFS. Most people working on the base are employed by companies associated with launch vehicle testing and space-launch operations (USAF, 1988). These employees live in surrounding communities.

Environmental Consequences. Construction personnel needed for the proposed project will be drawn from the current labor force of Brevard County. Therefore, there will be no impact on the size or composition of the local population associated with construction of the facilities.

For the CCTF, personnel currently working at the launch pad will be reassigned to the CCTF. Therefore, there will be no net increase in personnel.

For the CPB, personnel performing work at the VIB and other CCAFS facilities will transfer to the CPB. However, the CPB includes four cells for both Titan IV Centaur and Atlas/Centaur. With simultaneous versus sequential processing, new work force requirements are anticipated.

The net result for both CCTF and CPB is that of 200 peak personnel anticipated, most will be existing CCAFS labor reassigned to the facilities, with a maximum of 40 persons reassigned from contractor operations outside Brevard County. This is less than one tenth of one percent of the projected future population growth increment of Brevard County. Therefore, the operation of the facilities will cause no significant population impacts.

2.2.1.2 Housing

Affected Environment. In 1990, there were 183,168 housing units in Brevard County. Vacancy rates over Brevard County averaged 12.5 percent, with a vacancy rate of 28.3 percent in the Cape Canaveral area (B. Baggs, Brevard County Geographic Research Division, personal communication). The average household in Brevard County in 1989 included 2.50 persons (University of Florida, 1990).

Environmental Consequences. No impact on housing will be felt during the construction period since construction workers will be drawn from the local labor pool and are expected to commute from their present residences.

No significant impact on housing will be caused by CCTF and CPB operations as personnel growth is relatively small compared to projected area growth. The current housing vacancy rate will be sufficient to absorb the growth.

2.2.2 Socioeconomics

2.2.2.1 Schools

Affected Environment. Public schools in Brevard County are part of a county-wide, single-district school system with 69 schools and over 50,000 students. The school system has been growing since 1982, and capacity has been exceeded in some parts of central Brevard County. Average growth in the district is expected to exceed 6 percent by 1993. Seven elementary schools are being planned over the next five years — five in the Palm Bay area and two between Cocoa and Titusville.

Environmental Consequences. There will be no significant impact on enrollment in any area of the school system because the proposed project will result in a relatively minor population increase, which will be within school planning parameters.

2.2.2.2 Water

Affected Environment. The city of Cocoa provides potable water, drawn from the Floridan Aquifer, to the central portion of Brevard County. The maximum daily capacity is 40 million gallons per day (mgd), and average daily consumption is 26 mgd (Cocoa Beach Area Economic Development Council, 1988). CCAFS receives its water supply from the city of Cocoa and uses 3 mgd. To support launches, the water supply distribution system at CCAFS was constructed to provide peak capacities of up to 30,000 gallons per minute for 10 minutes.

Environmental Consequences. Water supply requirements for the CCTF and CPB project can be met from elevated tanks south of the site in the industrial area, through a 12-inch diameter line 100 feet southwest of the site along Cape Road. Backflow preventer stations will be provided on the two feeder lines to the CCTF and CPB to protect the CCAFS water system from possible contamination from the CCTF/CPB. Maximum potable water demand will be 4225 gallons per minute. This is a fire flow requirement for emergency use only. The expected domestic potable water usage is at least an order of magnitude below fire flow. No significant impacts on water use are anticipated as the existing water supply has ample available capacity to accommodate the requirements of the CCTF and CPB.

The water supply systems of the local communities have ample available supply to provide for the relatively minor population increase associated with the CCTF and CPB.

2.2.2.3 Wastewater treatment and disposal

Affected Environment. Each of the cities of Cocoa, Cape Canaveral, Cocoa Beach, and Rockledge is served by its own municipal sewer system. Unincorporated areas of central Brevard County are served by several plants. CCAFS provides for its own sewage disposal with a sewage treatment plant in the Industrial Area, Trident chemical treatment plant, package plants, and numerous septic tanks.

Environmental Consequences. A 6000 gallons per day (gpd) packaged extended aeration sewage treatment plant is being provided to serve the CCTF and CPB. Treated effluent will flow by gravity to one of two 40-foot by 40-foot percolation ponds. These ponds are to be used alternately on a seven-day cycle. A ground water mounding analysis has been performed, as required by Chapter 17-610 Florida Administrative Code (FAC). According to the mounding analysis the ground water peak elevation at 7-day loading is approximately 6.60 feet above mean sea level, which is below the bottom of the percolation

pond. The analysis determined that the ponds will dispose 6000 gpd of treated wastewater with no negative effects.

2.2.2.4 Solid waste management

Affected Environment. Nonhazardous solid waste at CCAFS is managed according to the nature and quantity of the waste. The CCAFS sanitary landfill located near the airstrip accepts only construction debris. Debris from large construction projects is usually disposed of off base by the contractor.

Environmental Consequences. Construction of the CCTF and CPB will generate conventional wastes, including waste wood, paper, concrete, metal, etc. These will be disposed of by the construction contractor at the Brevard County Solid Waste Disposal Facility

Nonhazardous waste generated during operation of the CCTF and CPB will include solid waste typical of office operations and sludge (domestic wastewater residuals) from the onsite sewage treatment plant. Solid waste will be disposed of at the Brevard County Solid Waste Disposal Facility. Sludge from the sewage treatment plant will be analyzed to determine if it is hazardous. If it is not, it will be spread over the base solid waste landfill.

Hazardous waste management is discussed in Section 2.2.3.

2.2.2.5 Power

Affected Environment. Florida Power & Light (FPL) supplies electricity to Brevard County. CCAFS is serviced by FPL through a 240/138-kV switching station.

Environmental Consequences. Electricity for the CCTF and CPB will be obtained from existing power lines running along Cape Road. Two diesel generator systems will be used for standby power and during cryogenic tanking operations. Additional power will be required for the CCTF and CPB compared to present usage at the VIB and launch complex; however, levels will be within existing generating capacity.

2.2.2.6 Public safety

Affected Environment. The police departments in the five municipalities of the central Brevard area have one officer per 631 people, and fire protection has one full-time officer per 936 people (Cocoa Beach Area Economic Development Council, 1988). Police and fire services at CCAFS are provided by the launch base support contractor and include mutual agreements with other jurisdictions, particularly the city of Cape Canaveral and KSC.

Environmental Consequences. No impacts on public safety services are expected, as the project will not significantly change the population of the area.

2.2.2.7 Health Care

Affected Environment. CCAFS is equipped with a dispensary operated under a joint contract (NASA/USAF) with EG&G, Inc., to handle accident cases, physical examinations, and emergencies involving the work force. Additional medical services are available at the Air Force Space Command Hospital, Patrick AFB, and at three hospitals in the Cocoa Beach area. The three offsite hospitals have a total of 625 beds.

Environmental Consequences. No significant changes in the area population are expected. Hence, no significant impact on health care is expected.

2.2.2.8 Transportation

Affected Environment. Transportation in the region is served by highway, rail, airport, and harbor facilities. Federal, state, and local roads provide highway service to Brevard County. Principal routes are Interstate 95, U.S. 1, and State Routes AlA, 407, 520, and 528. Bridges and causeways link the urban areas on the beaches to Merritt Island and the mainland. The Florida East Coast Railway affords rail service to the county, with a main line through the cities of Titusville, Cocoa, and Melbourne. Spur rail lines serve other parts of the county, including CCAFS. Several commercial and general aviation airports are located in the vicinity of CCAFS, the closest being Melbourne Regional Airport, approximately 30 miles south of the base. Port Canaveral, located at the southern boundary of CCAFS, is the area seaport facility. Industrial and commercial facilities are located at the port, and cruise ship use is increasing.

The base road system, which is linked to the regional highway system by the NASA Causeway and the CCAFS south gate, serves launch complexes, support facilities, and industrial areas. A branch rail line, maintained on the base by the USAF, links the base to the main line at Titusville. An airstrip near the center of the base is used by government aircraft and for the delivery of launch vehicles. Water transportation is provided to the base via Port Canaveral.

Environmental Consequences. The number of vehicle trips per day during construction will average approximately 100 to 150 (50 to 75 each way). Movement of slow-moving vehicles or oversize loads will not be allowed during rush hours. Operations will produce an increase in traffic of approximately 80 trips per day (40 each way). During operation, the trip increases will be split between two shifts, lessening opportunities for delays. Only slight delays or traffic congestion are expected from security checks or other operations associated with construction or operation of these facilities

2.2.2.9 Economy

Affected Environment. The total civilian labor force in Brevard County in February 1990 was 178,359, and the unemployment rate was 5.4 percent (C. Johnson, Florida

Department of Labor and Security, personal communication). In addition to resident employees, many people commute from surrounding areas to work in the county. Services, manufacturing, retail trade, and government-related enterprises are the principal means of employment. Major employers include KSC, Port Canaveral, CCAFS, and aerospace firms.

Employment in the construction industry in Brevard County has remained steady in recent years, even though non-agricultural employment rose at a rate of 6.4 percent per year. The construction work force was 9,100 in February 1990 (C. Johnson, Florida Department of Labor and Security, personal communication).

The total personal income of Brevard County residents in 1988 was $5.9 billion. The annual per capita income of county residents in 1988 was $15,432 (University of Florida, 1990).

Environmental Consequences. The CCTF and CPB construction labor force will average 50 to 75 workers over the 18 month construction period, with a maximum of 200 workers over a 2 to 3 month period. All construction employees will be drawn from the local labor force.

Information for the first quarter of 1988 from the Florida Department of Labor and Security indicates that the basic income multiplier for Brevard County is 1.56; that is, each dollar of "new" money brought in from outside the county circulates in the local economy until it has increased total income by approximately $1.56. Application of this multiplier to the estimated construction cost of $58 million ($24 million for the CCTF and $34 million for the CPB) indicates that the total (direct and secondary) economic impact of construction will be an increase of approximately $90.5 million in total personal income of Brevard County. This increase amounts to approximately 1.5 percent of the county's 1988 income, which will have a slight positive impact on the economy.

The CPB will relocate 40 contractor personnel from outside Brevard County for operations. Assuming that the average annual salary of these employees is $40,000, the total yearly income increase from the new jobs will be $1.6 million. Application of the 1.56 multiplier to this income increase produces a total economic benefit of approximately $2.5 million. This amounts to approximately 0.04 percent of the county's 1988 income, a negligible positive impact on the economy.

2.2.3 Hazardous Waste

Affected Environment. Hazardous waste management is the responsibility of each generator/contractor at CCAFS. The Air Force and NASA have tasked certain contractors to manage their permitted hazardous waste storage areas and arrange for proper offsite disposal. Wastes not recycled, reused, or recovered for combustion are placed in interim

storage for up to 90 days at a designated accumulation area. They are then transported to a permitted storage site or off site for disposal.

A spill control plan, as required by the USEPA under its Regulations on Oil Pollution Prevention (40 CFR 112), is part of the CCAFS Oil and Hazardous Substance Pollution Contingency Plan (OPlan 19-1).

Environmental Consequences. Hazardous wastes routinely generated during construction and operation of the CCTF and CPB will include minimal quantities of waste paint, solvent, and oil. These will be held on site for less than 90 days. Hazardous waste generated during construction is the responsibility of the construction contractor. Wastes generated from operations conducted by commercial users are the responsibility of that organization as described in Section 3.3 of this EA.

Spill prevention and control for the CCTF and CPB will comply with the CCAFS Oil and Hazardous Substance Pollution Contingency Plan (OPlan 19-1).

There is the potential for spills from the above-ground diesel fuel tanks, from the diesel generator day tanks, from the POL storage building, or from the N_2H_4 tanking operation. Each above-ground diesel fuel tank will have an impervious secondary containment system equal to more than 110 percent of the volume of the tank. This will be provided by a concrete structure consisting of a slab with a twelve-inch high curb on all sides.

Each diesel generator building will have a floor drain connected through an oil/water separator to the sanitary sewer system. The POL building will have a floor drain connected to a non-draining collection sump, equal in volume to a 55-gallon drum. The oil/water separators and the POL collection sump will be capable of mobile equipment pump out.

In the event of a spill from any of the above facilities, waste will be held on site for less than 90 days and removed by the USAF/NASA disposal contractor.

The CTC, where N_2H_4 tanking will be performed, will have parallel sanitary sewer and hazardous waste floor drains. All inlets to one or the other system can be capped as operations require. During operations when N_2H_4 is not being handled, the hazardous waste floor drains will be plugged and any spills, which would be non-hazardous, would be routed to the sanitary sewer. During N_2H_4 operations, the plugs will be removed from the hazardous waste floor drains and the sanitary sewer will be plugged. Any spilled N_2H_4 would flow to the hazardous waste floor drains and not to the sanitary sewer. Washdown and wastewater from the hazardous waste floor drains will be routed to a sump in the CTC. From the sump, it will be pumped to a 5000-gallon above-ground emergency spill storage tank located northeast of the CTC. Rinsate waste and line flush waste also will be routed to the storage tank. The tank will have an earth berm for 110 percent spill retention. The system for containing the waste N_2H_4, including the tank, associated

piping, and the sump, must conform with the requirements of 40 CFR 265 Subpart J (hazardous waste tank systems) except § 265.197(c) and § 265.200

Other hazardous waste potentially generated from N_2H_4 fueling operations includes scrubber liquor. The spent liquor will be removed periodically by contractor personnel and disposed of as a hazardous waste.

If any N_2H_4 spill were to occur at this facility, the Joint Propellants Contractor would respond for clean-up. The N_2H_4 wastes generated from the clean-up operation would be handled as hazardous waste and would be managed and disposed of in accordance with all State and Federal regulations. All N_2H_4 wastes determined to be hazardous wastes currently are sent off site to a permitted treatment, storage, or disposal facility. No neutralization of N_2H_4 hazardous waste is permitted to take place at CCAFS.

2.2.4 Safety

The CCTF and CPB will be designed to accommodate cryogenic and hypergolic storage and transfer areas. These areas will be separated from inhabited areas, roads, and from each other in accordance with the Explosives Quantity Distances Siting and Safety Criteria (AFR 127-100). Revetments will be constructed between the CTC and the CTC Support Building and between the CTC and LH_2 storage in order to stop low angle fragments if a catastrophic event occurs. The revetments between the CTC and the CTC Support Building will consist of four 14-foot by 14-foot (interior dimensions) concrete cells located side by side and occupying an area of 16 feet by 61 feet. The reinforced concrete walls will be 12 inches thick and will have a piling foundation. The revetment wall for the LH_2 storage area will be a 12-inch thick reinforced concrete retaining wall. Each of the two diesel generator fuel storage tanks will have a five-foot high concrete block wall on three sides (north, south, and west) for blast protection.

N_2H_4 will not be stored on site, but will be brought to the site from the CCAFS Fuel Storage Area by specialized tank truck and loaded directly onto the vehicle. Because of the toxicity of N_2H_4 and the possibility of accidental spills, all pertinent safety precautions (evacuation of nonessential personnel, use of protective gear) will be in force.

There will be a spill retention area equal to the volume of the LH_2 Dewar (33,000 gallons) at the base of the LH_2 storage area. A water, fixed spray fire protection system will cover the LH_2 tank, tank supports, retaining wall, and trailer parking area. There also will be fire alarms. Volatilized LH_2 will be removed by a flare.

There will be a spill retention area equal to the volume of the 11,000 gallon LO_2 Dewar.

The CPB, CTC, OSB, and CTC Support Building will be equipped with a centrally supervised fire protection system including fire extinguishers, overhead sprinkler systems, fire hose connections, and fire alarms.

With the use of these and other safety measures required by Eastern Space and Missile Center — Safety, no adverse safety impact is expected.

2.2.5 Noise

The primary noise concern associated with the CCTF and CPB is construction noise. This will be generated by vehicles and equipment involved in site clearing and grading, foundation preparation, facility construction, and finishing work. Occupational exposure to noise from these activities will be mitigated through use of appropriate hearing protection for construction workers. Noise generation by construction equipment will be controlled through use of appropriate noise abatement devices, such as mufflers, use of appropriate construction tools, noise curtains, etc., thereby reducing exposure of other persons on CCAFS to noise.

During operation, the CCTF and CPB will generate noise levels typical of an urban industrial area. This noise will be confined to the vicinity of the CCTF and CPB and is consistent with the industrial use of CCAFS. Therefore, no significant impact on ambient noise levels is anticipated.

2.2.6 Cultural Resources

2.2.6.1 Archaeological Resources

Affected Environment. The Environmental Resources Planning Section of the U.S. Army Corps of Engineers, Mobile District (ERP/COE) conducted a Phase I archaeological survey of the CCTF/CPB site in August 1990.

Field checks conducted as part of the survey revealed only a minute remnant of relict dunes remaining in the heart of the tract. Tests revealed a profile of deep gray medium sand. No evidence of any prehistoric or early historic cultural activity was observed. A relict dune of approximately 75 meters in length exists on the western margin of the site. A large oak is growing near the southern one third of the remnant. Tests on this relict dune revealed a white sand profile with some brown inclusions. The top two inches were humically stained. The survey party observed no artifacts or other signs of an archaeological site in the test units or elsewhere on the site.

Environmental Consequences. The ERP/COE survey concluded that the CCTF and CPB will not impact any historic or archaeological resources at CCAFS. The ERP/COE submitted the Phase I survey (ERP/COE, 1990) to the State Historic Preservation Officer (SHPO) with a cover letter dated 26 September 1990. The SHPO concurred with the conclusions of the survey in a 4 October 1990 signed notation added to the cover letter (Appendix C). This action constitutes the Section 106 consultation under the National Historic Preservation Act.

2.2.6.2 Historic Resources

A survey of historic resources at CCAFS was conducted by Barton and Levy (1984). No structures eligible for the National Register of Historic Places (NRHP) were identified at the proposed CCTF/CPB site.

2.3 CUMULATIVE IMPACTS

Cumulative impact assessment evaluates the impact expected from the CCTF and CPB along with other major actions planned or under construction at CCAFS. Other proposed or in-progress construction projects at CCAFS are the Solid Motor Assembly and Readiness Facility (SMARF), the Payload Fairing Cleaning Facility (PFCF), and the Delta Centralized Facility (DCF). The SMARF and the PFCF are part of the Titan IV/Solid Rocket Motor Upgrade Program (USAF, 1990a). They are located on man-made land in the ITL area approximately two miles (for the PFCF) and three miles (for the SMARF) west of the CCTF/CPB site. The SMARF is approximately 75 percent complete and the PFCF construction is complete but the facility is not operational yet. The DCF proposed site is on Lighthouse Road, approximately four miles southeast of the CCTF/CPB site (USAF, 1991). Construction has not begun on the DCF.

There are also several renovations of launch complexes planned. These will not entail significant land clearing, earth moving, or change in land use.

2.3.1 Air Quality

Potential air quality impacts resulting from construction on the approximately 28 developed acres at the CCTF/CPB site include emissions of fugitive dust from one-time construction activities, exhaust emissions (NO_x, SO_2, CO, PM-10, and VOCs) from vehicle and equipment engines, and VOCs from small painting activities. However, these emissions will be well below thresholds used by regulators to determine if air quality impact evaluation is required.

Emissions associated with operation of the CCTF and CPB will be generated by the standby diesel generators, the hydrogen flare, and the N_2H_4 scrubber. Exhaust emissions from the standby generators will be insignificant. Combustion products from the flare will also be insignificant. Emissions of N_2H_4 vapors will be minimized by the scrubber at the CTC.

Emissions from construction and operation of the CCTF and CPB will slightly degrade local air quality near the facilities, but impacts will be temporary and are not expected to be significant off site. This is also the case with construction of the SMARF, the PFCF, and the DCF. Because the emissions will be localized and controlled in each project, there should be no cumulative impact.

Launch operations at launch complexes on CCAFS are another source of emissions. Launches for the various programs are not conducted at the same time; thus, their air emissions are sporadic and not cumulative. The emissions produced by launch activities are not the same as those anticipated due to construction and operation of the CCTF and CPB.

Therefore, the long-term cumulative air quality impact of the CCTF and CPB construction and operation is not expected to be significant. The area presently meets air quality criteria with ambient concentrations well below the NAAQS.

2.3.2 Hydrology and Water Quality

Surface runoff from the CCTF/CPB site will infiltrate directly to the ground water. Storm water runoff will discharge into a series of swales with treatment by percolation. Effluent from an onsite wastewater treatment plant will discharge to two percolation ponds. Through a mounding analysis, it has been determined that the ponds will dispose 6000 gpd of treated wastewater with no negative effects.

The largest source of discharge water on CCAFS is from base vehicle launches. Launches release deluge water to grade, followed by surface runoff and infiltration to ground water. The maximum total quantity to be discharged should occur in 1993, when 22 launches are planned, with total deluge discharge of approximately 6.1 million gallons (USAF, 1989). All of the discharge is permitted and not expected to cause significant impacts to hydrology or water quality.

The volume of water discharged from the CCTF and CPB and other support facilities is small compared to the volume produced during launches. Proper design and maintenance of the storm water and the wastewater facilities at the CCTF and CPB will preclude adverse impacts to local hydrology and water quality. Therefore, the cumulative impacts on surface water and ground water quality from construction and operation of the proposed CCTF and CPB should not be significant.

2.3.3 Geology and Soils

Because no impacts to geology or soils are expected at the CCTF/CPB site, no cumulative impacts are expected.

2.3.4 Biota

Development of the proposed site to accommodate construction of the CCTF and CPB facilities is expected to affect approximately 35 acres of previously disturbed vegetated terrain. Within the limits of the construction area (i.e., fenced site), habitat for small mammals, birds, amphibians, and reptiles will be eliminated, and wildlife will be forced to seek forage and shelter in adjacent locations. Some or all of these adjacent areas may be at their carrying capacity and thus not capable of supporting additional individuals. Increased

personnel activity also might disturb wildlife in the vicinity of the site, especially during the construction period. However, because the CCTF/CPB site has previously been disturbed and has a partial cover of dredge spoil, it is not prime habitat. Thus, its impacts, both local and cumulative, have been minimized by its location at this site.

Other construction projects occurring at CCAFS also may eliminate habitat; the impacts due to the CCTF and CPB will be cumulative to these others. The proposed DCF construction is expected to remove 18 acres of coastal scrub habitat (USAF, 1991). The SMARF and PFCF construction will not result in significant impacts to terrestrial biota because they are located in previously disturbed, man-made areas. Construction of the SMARF will impact approximately 0.4 acres of wetlands, which is being mitigated through construction of a 0.8 acre wetland. The CCTF and CPB will not have any effect on wetlands.

The species found on the proposed site include two that are classified as threatened and two species of special concern. The USFWS reviewed the site and concurred with the Air Force's determination that the CCTF and CPB will cause "no effect" on threatened or endangered species (Appendix A). Compliance with the development guidelines of the CCAFS Scrub Jay Management Plan (USAF, 1990b) will minimize adverse impacts to the threatened Florida scrub jay. This applies to local as well as cumulative effects.

2.3.5 Population

The construction and operational phases of the proposed project will not result in a significant increase in population, or a need for new housing. Therefore, there will be no cumulative impacts in population or housing.

2.3.6 Socioeconomics

The construction will not change the industrial nature of land use on CCAFS. The activities will not require any new community facilities such as schools, or any new utility services such as water and power. Since the project will not significantly affect existing population, any additional use of the water service or waste disposal services is within available capacity. No significant impacts on public safety services (police and fire departments) are expected. Health care services will not be affected.

Transportation services and traffic on offbase and base roads will not be significantly impacted. Because operations will not require any change in the nature of the labor force and the employment associated with construction is small in relation to Brevard County's overall economic context, adverse impacts to the socioeconomic structure of the community are not expected, and economic benefits will be small.

Therefore, because the project specific impacts from the CCTF and CPB are negligible, there should not be a significant cumulative impact due to the action.

2.3.7 Hazardous Waste

Hazardous waste generated at CCAFS is managed according to the CCAFS Hazardous Waste Management Plan (OPlan 19-14). Hazardous waste generated during construction and operation of the CCTF and CPB will fulfill the mandates of the Plan, including waste minimization.

Routine CCTF and CPB operations are not expected to generate more than a minimal volume of waste paint, solvent, and oil. The SMARF and PFCF will generate similar wastes. Renovation of the launch complexes also will generate similar wastes along with sandblasting and paint chipping wastes. The DCF will be an office operation and will not generate hazardous waste. Capacity of the recycling, reuse, recovery, and disposal facilities used by the USAF/NASA disposal contractor is sufficient to handle these wastes.

Therefore, while the CCTF and CPB will add to the total volume of hazardous waste generated on CCAFS, there should be no adverse impact associated with this incremental addition.

2.3.8 Safety

The use of safety measures with respect to cryogenic, hazardous, and pyrotechnic materials will minimize the potential for offsite safety impacts. Therefore, there will be no cumulative impact on safety at CCAFS.

2.3.9 Noise

Construction and operation activities for the CCTF and CPB might overlap other activities at CCAFS, but because noise generation from the CCTF and CPB will be localized and no other activities are anticipated within one mile of the proposed CCTF/CPB site, no cumulative impact on ambient noise levels is expected as a result of this action.

2.3.10 Cultural Resources

An ERP/COE Phase I survey has concluded, and the SHPO concurred, that the CCTF and CPB will not impact any historic or archaeological resources at CCAFS. Therefore, there will be no cumulative impact on cultural resources.

SECTION 3

REGULATORY REVIEW AND PERMIT REQUIREMENTS

3.1 AIR QUALITY

The Florida pollution control program is managed by the FDER under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act. To ensure the protection of the public health, safety, and welfare, FDER requires permits for the construction of any installation considered to be a source of air pollutants. The policy inherent in the permits program is to protect the air quality existing at the time air quality standards were adopted or to upgrade or improve the quality of the air within the state.

Pollutants will be emitted from the CCTF and CPB facilities during both construction and operations. Emissions during construction will consist of fugitive dust, exhaust emissions from construction equipment and vehicles, and VOCs from field painting operations. The FDER considers these emissions incidental to construction and therefore does not feel that they will contribute to a pollution problem within the state. In this case, the CCTF and CPB are exempted from permitting requirements under rule 17-4.040 FAC.

The following stationary sources are subject to review and permitting by the FDER: (1) diesel generators, (2) hydrogen flare, and (3) N_2H_4 scrubber.

Because each of the two generators will operate fewer than 50 hours per year, they can be exempted from permit requirements under rule 17-2.210(3)(t) FAC. This rule exempts emergency electrical generators, heating units, and general purpose diesel engines operating no more than 400 hours per year. The hydrogen flare will require an air construction permit since it is not specifically exempted under rule 17-2.210 FAC (Permits Required). Design and operation of the flare will have to conform to the requirements specified in 40 CFR 60, section 18. It also is anticipated that the N_2H_4 scrubber will require an air construction permit since emissions will contain an air toxic.

Although the FDER may require permits for these sources, the emissions from these facilities will not be great enough to trigger review under "Prevention of Significant Deterioration" regulations for attainment areas. The anticipated low emissions from the CCTF and CPB facilities are not expected to impact NAAQS or Florida ambient air quality standards, which are equivalent to the NAAQS.

3.2 WATER QUALITY

3.2.1 Storm Water Discharge

The CCTF/CPB storm water design will utilize swales for onsite retention and treatment by percolation. The site is within a drainage basin with no outfall.

Florida's storm water discharge permitting program is designed to prevent adverse effects on surface water quality from runoff. In order to ensure adequate protection to surface water quality, a storm water discharge permit issued by the Saint Johns River Water Management District (SJRWMD) will be required for the CCTF and CPB complex. Chapter 40C-42 FAC regulates projects with less than 12 acres of impervious surfaces, which will apply to the CCTF and CPB facilities. A Chapter 40C-42 FAC storm water management permit will be required to demonstrate that the project has no outfall, will recover the volume generated by the 25-year, 24-hour rainfall event within 14 days, and the first inch of volume storage is recovered within 72 hours following the storm event.

The USEPA has adopted storm water management regulations under 40 CFR 122. These regulations require the issuance of a general National Pollution Discharge Elimination System (NPDES) permit for construction activities exceeding five acres. However, the NPDES regulations indicate that drainage basins with no point source discharge to surface waters of the United States are exempt from permit requirements.

The CCTF/CPB site is within a drainage basin with no outfall and the storm water design will retain the 100-year flood event. Surface waters of the United States will not receive any discharge from the site. Therefore, the project is exempt from NPDES permit requirements.

3.2.2 Sewage Treatment

The CCTF/CPB site will require a domestic waste construction permit from the FDER (Rule 17-600 FAC). The employees at the site will generate approximately 30 gallons of wastewater per person per 8-hour period (per Air Force Manual 88-11, Vol. 3 - Domestic Wastewater Treatment). The complex will operate two 8-hour shifts. The 200 people per day maximum will be split unevenly between the shifts. Assuming a total design population of 200 people at the complex, the treatment system will need to process a peak flow of 6,000 gpd of sanitary waste. Designs call for a package wastewater treatment plant with two 40-foot by 40-foot percolation ponds to be located outside the fenced area of the facilities. After the treatment plant has been constructed, it must be certified as complete by a Florida-registered Professional Engineer and a request to place in service be granted by FDER prior to operation. An operating permit must also be applied for and obtained after a short operating period under the auspices of the construction permit.

3.2.3 Potable Water

CCAFS has a bulk water use agreement with the city of Cocoa for potable water supplies. As long as the additional usage is within the agreement conditions, the City has no objections to the project .

FDER will require a general permit for the potable water system. Processing of the permit is to the city of Cocoa, then to the State. Once the system has been constructed, a letter of certification of completion must be submitted by a Florida-registered Professional Engineer. An operating permit is not required.

3.2.4 Industrial Wastewater

No industrial wastewater generation is planned on the site; therefore, a permit will not be required.

3.2.5 Wetlands

The CCTF/CPB site is not within wetlands as defined by the U.S. Army Corps of Engineers. Ms. Michelle Reiber of SJRWMD evaluated the site on 20 February 1991 for wetland jurisdiction for SJRWMD permitting. According to Ms. Reiber, no wetlands were observed on the site. With use of proper sediment control measures, the activities proposed for the site will not affect offsite wetlands. Therefore, the project will not require a separate FDER dredge and fill permit. The FDER dredge and fill program is delegated (on a trial basis) to SJRWMD. The Corps of Engineers Section 404 dredge and fill permit is not required based on SJRWMD jurisdictional assessment and independent field reconnaissance.

3.3 HAZARDOUS WASTE

The CTC will contain several emergency washdown and hazardous materials floor drain systems. During N_2H_4 operations, only the hazardous waste floor drains will be open; the openings to the sanitary sewer will be capped. The hazardous waste floor drains discharge to a sump where the waste mixture is pumped to an onsite stainless steel above-ground storage tank. Each diesel generator building has a floor drain that connects through an oil/water separator to the sanitary sewer system. The POL storage building has a floor drain that discharges to a non-draining sump for spill containment and mobile equipment pump out. Each above-ground diesel fuel tank will have an impervious secondary containment system for spill containment. In the event of a spill in any of these facilities, the waste will be removed from the site prior to the 90-day storage limit and will be appropriately treated and disposed of. Operations activities typically will generate minimal quantities of waste paint, solvent, and oil. If these wastes are classified as hazardous, they will be held for less than 90 days and removed in accordance with all State and Federal regulations.

The scrubber wastes will be handled and disposed of in a similar manner.

The FDER administers the federal hazardous waste generator program. Rule 17-730 FAC incorporates by reference 40 CFR 262, 40 CFR 264, and 40 CFR 265, which regulate hazardous waste generation. A USEPA facility number is required for hazardous waste generators. For the CCTF and CPB, the existing CCAFS facility number can be used upon notification and modification. This will be the case only for waste considered to be the responsibility of the Air Force (i.e., tanking operations for Air Force-related flights or projects). Commercial users of the facility who generate hazardous wastes will be responsible for obtaining their own USEPA facility number and managing and disposing of their own wastes in accordance with all State and Federal regulations.

3.4 STORAGE TANKS

The CCTF/CPB site will include two above-ground diesel fuel storage tanks (AGSTs), with associated above-ground piping. Because each tank system will be less than 550 gallons, it is specifically exempt from the regulations of Rule 17-762 FAC. No registration or notification requirements are prescribed for these tanks.

3.5 COASTAL ZONE MANAGEMENT

The Coastal Zone Management Act (CZMA) authorizes a state-federal partnership to ensure the protection of coastal resources. While Florida has specifically excluded federal facilities from the state's coastal zone as required by sections 305(b)(1) and 304(1) of the CZMA, the act requires that federal activities directly affecting the coastal zone and federal development projects that are located in or directly affecting the coastal area must be consistent "to the maximum extent practicable" with the Florida Coastal Management Program (CMP). Therefore the Florida CZMA requires consistency review of federal development projects and activities ". . . which significantly affect the coastal waters and the adjacent shorelands of the state" (380.23(3)(a), F.S.).

For the CCTF and CPB, the USAF has determined that the project is consistent "to the maximum extent practicable" with the goals and objectives of the Florida CMP. Of the Florida Statutory Authorities included in the CMP, impacts from construction and operation of the CCTF and CPB and mitigation of such impacts in the areas of historic preservation (Chapter 267), living land and freshwater resources (Chapter 372), and environmental control (Chapter 403) are addressed in this Environmental Assessment.

3.6 THREATENED AND ENDANGERED SPECIES

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), is intended to prevent the further decline of endangered and threatened plant and animal species and to help in the restoration of populations of these species and their habitats. The act, which is

jointly administered by the Departments of Commerce and the Interior, requires that each federal agency consult with the USFWS to determine whether endangered or threatened species are known to exist or have critical habitats on or in the vicinity of the site of a proposed action.

A Section 7 consultation was requested on 7 February 1991 by the USAF for the CCTF and CPB. Several onsite meetings between the USAF and the USFWS were conducted to examine and evaluate the potential environmental impacts to protected species. Site modifications recommended by the USFWS were incorporated into the siting and design of the facilities. In response, the USFWS provided a 14 February 1991 letter concurring with the USAF determination of no effect on endangered or threatened species (Appendix A).

3.7 CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA), as amended, establishes a positive national policy for the preservation of the cultural environment, and sets forth a mandate for protection in Section 106. The purpose of Section 106 is to protect properties listed in or eligible for listing in the NRHP through review and comment by the Advisory Council on Historic Preservation (ACHP) of federal undertakings that affect such properties. Properties listed in the NRHP are declared eligible for listing by the Secretary of the Interior. Through Section 106 of the NHPA, a public interest process is established in which the federal agency proposing an undertaking participates along with the SHPO, the ACHP, interested organizations, and individuals. The process is designed to ensure that impacts to properties are identified, and that alternatives are considered in the planning process to avoid or mitigate an adverse effect on property eligible for the NRHP.

A Section 106 consultation was initiated for the site by ERP/COE. The SHPO has concurred with an ERP/COE conclusion that the CCTF and CPB will not impact any historic or archaeological resources at CCAFS. This fulfills the requirements of Section 106. No additional permitting or regulatory requirements are necessary.

SECTION 4
MITIGATION MEASURES

4.1 AIR QUALITY

Significant air quality impacts to offsite receptors are not expected from the proposed construction of the CCTF and CPB. However, reduction of possible air quality impact both off site and in the area around the construction site itself from fugitive dust can be achieved through implementation of an effective dust suppression program. Watering is one of the most common control methods, since water and the necessary equipment usually are available at the site. An effective watering program (twice per day) could reduce fugitive dust emissions by as much as 50 percent.

Emissions from routine N_2H_4 tanking operations will be minimized through scrubbing of the hazardous vapors. The potential for emissions from accidental spills will be minimized through the use of catch basins where accidental spills will be quickly contained and pumped to the hazardous waste holding tank for subsequent disposal.

4.2 HYDROLOGY AND WATER QUALITY

The potential impacts to hydrology and water quality appear to be minor. Impacts from CCTF/CPB-generated wastewater will be mitigated by treatment at a permitted wastewater treatment plant and percolation ponds. Storm water runoff will be diverted to a series of swales and mitigated through onsite detention and treatment by percolation. No other mitigation is required.

4.3 GEOLOGY AND SOILS

Because the facilities will have no impact on local geology or soil characteristics, no mitigation will be necessary.

4.4 BIOTA

The project will impact biota on the proposed construction site. A Section 7 consultation and site review with the USFWS have resulted in project design and siting modifications to reduce environmental impacts on threatened species.

An Air Force Policy Letter on Endangered Species (27 March 1988) states that "the Air Force must protect Federally listed endangered and threatened plant and animal species and their critical habitat, including species proposed for listing and proposed critical habitat." The CCAFS Scrub Jay Management Plan (USAF, 1990b) ensures that all activities on the station comply with the Endangered Species Act with respect to the threatened Florida

scrub jay. The Plan is used in conjunction with the Controlled Burning Plan for CCAFS (USAF, 1990c). Because the majority of scrub on CCAFS exceeds the optimal height range for scrub jay habitat, the Plan calls for prescribed burning and mechanical clearing along with frequent mowing of open grassy areas bordering scrub, in order to improve scrub jay habitat. The Plan also presents specific development guidelines that will minimize adverse impacts, including site planning, landscaping, and use of vegetation islands in parking lots.

The general area in which the CCTF/CPB site is located is listed in the scrub jay management plan as having a high priority for a prescribed burn, with implementation in the first year of the controlled burning plan. While no specific date for the burn has been scheduled for the area, implementation prior to construction of the CCTF/CPB would be advisable and would improve scrub jay habitat in the area that will not be occupied by the CCTF/CPB site. The site planning guidelines of the scrub jay management plan have been complied with in that the site was relocated to a previously disturbed area and it was set back from Cape Road to maintain a buffer strip in Florida scrub jay habitat. Additionally, native vegetation islands will be established within the parking lot, as per the scrub jay management plan. If there are scrub jays nesting in the buffer strip during construction of the facilities, disturbance could result in an incidental take of the species. Actions will be required to avoid such disturbance, including finding the location of all active scrub jay nests in the buffer strip and scheduling construction activities to avoid active nests or to occur outside the nesting season.

Monitoring of exterior illumination is critical at CCAFS due to the seasonal nestings of sea turtles on the beach. Facility lighting at the CCTF/CPB site will follow prescribed guidelines as stated in the "Light Management Plan Guideline CCAFS, Florida" (11 March 1989, revised 30 October 1990; Appendix B), including a lighting survey to identify those lights that could cause disorientation problems to turtle hatchlings. Lights identified will be evaluated to determine an appropriate corrective action. All exterior lighting will be narrow band color type, low pressure sodium fixtures that are well shielded. Implementation of this plan is expected to discourage endangered sea turtle hatchlings on the beach from moving inland rather than seaward, consequently decreasing their mortality resulting from disorientation.

The USFWS concurred with the Air Force's determination of "no effect" on endangered or threatened species from the CCTF and CPB. No further mitigation is required.

4.5 POPULATION

No significant impacts to population or housing are expected from the proposed project; therefore, mitigation will not be necessary.

4.6 SOCIOECONOMICS

Because adverse impacts on the economy, provision of public services, land use, and transportation are not expected to occur, no mitigation will be necessary.

4.7 HAZARDOUS WASTE

Hazardous waste generated by CCTF and CPB construction and operation will be stored for less than 90 days on the site. The waste will be removed by a licensed transporter to an approved offsite recipient site. No further mitigation is required.

4.8 SAFETY

Because no adverse safety impacts are expected to result from this action, no mitigation will be required.

4.9 NOISE

Noise impacts on workers involved with construction of the CCTF and CPB will be controlled through use of appropriate hearing protection. The use of mufflers and other noise abatement devices on construction equipment will control noise generation to acceptable levels for persons outside of the construction area.

During operation, workers in noisy environments will wear appropriate hearing protection. Noise will be dampened in other parts of the facilities by noise attenuating partitions.

4.10 CULTURAL RESOURCES

The archaeological and historical resources survey conducted in August 1990 identified no resources at the CCTF/CPB site. Concurrence of the opinion was signed by the SHPO on 4 October 1991. Therefore, no impacts will occur and no mitigation is required.

4.6 SOCIOECONOMICS

Because adverse impacts on the economy, provision of public services, housing and transportation are not expected to occur, no mitigation will be necessary.

4.7 HAZARDOUS WASTE

Hazardous waste generated by CCTF and the construction of approach will be stored for less than 90 days in the site. The waste will be removed by a licensed transporter in an approved Grade Pipeline and No Further Mitigation Required.

4.8 SAFETY

Because no adverse safety impacts are expected to result from this action, no mitigation will be required.

4.9 NOISE

No use impacts on workers involved with construction of the CCTF and CPF will be considered because of the use of appropriate hearing protection. The use of mufflers and other noise attenuation devices on construction equipment will control public exposure to acceptable levels of pedestrian noise at the construction site.

During operation, workers will not enter the noise when appropriate hearing protection. Noise will be dissipated in other parts of the facilities by noise-accumulating partitions.

4.10 CULTURAL RESOURCES

The archaeological and historical resources survey conducted in August 1990 identified no resources at the CCTF/CPF site. Consumers of the opinion was signed by the SHPO and October 1991. Therefore no impacts will occur and no mitigation is required.

SECTION 5

PERSONS AND AGENCIES CONTACTED

5.1 U.S. AIR FORCE

5.1.1 Headquarters, Space Systems Division

DEV

Dan Pilson

DEE

Sam Sampras

5.1.2 Armstrong Laboratory

OEB

Maj John Garland

1st Lt Darrin Curtis

Lt Col George New

5.1.3 Patrick Air Force Base/CCAFS

1040th CES/DEEV

Olin Miller

Robert Ellis

Clay Gordin

6555/RM

Denise Levels

ESMC/SG

Capt Paul Devane

Tsgt Julie Miller

5.2 FEDERAL AGENCIES

U.S. Army Corps of Engineers, Mobile District

Ralph Etheridge

U.S. Environmental Protection Agency

Roosevelt Childeress

5.3 STATE AGENCIES

Florida Dept. of Environmental Regulation

Barry Andrew

T. Heron

Laxsanee Levin

Osama Mahmoud

Jessica Phillips

Stephanie Sorantino

Allen Zahm

5.4 LOCAL AGENCIES

Saint Johns River Water Management District

Michelle Reiber

Brevard County Geographic Research Division

Brian Baggs

Brevard County Office of Natural Resources Management

Doug Divers

Tom Stewart

City of Cocoa Utilities Engineering

Ed Wegerif

5.5 OTHERS

General Dynamics, Inc.

Richard Ford

Robert DeCort

Johnson Controls World Services, Inc.

Tom Gawlik

Don George

Mark Mercadante

Reynolds, Smith and Hills, Inc.

Wayne Finger

Richard Young

SECTION 6
REFERENCES

Barton, D.F. and R.S. Levy. 1984. An Architectural and Engineering Survey and Evaluation of Facilities at Cape Canaveral Air Force Station, Brevard County, Florida. Technical report submitted to National Park Service, Atlanta, GA.

Brevard County Research and Cartography Division. 1988. 1988 Data Abstract, Merritt Island, FL.

Cocoa Beach Area Economic Development Council. 1988. Cocoa Beach Area Economic Profile. Cocoa Beach Area Chamber of Commerce, Merritt Island, FL.

Florida Game and Freshwater Fish Commission (FGFWFC). 1990. Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida. 1 January 1990.

Florida Administrative Code (FAC). Chapter 17-2. Air Pollution.

Florida Administrative Code (FAC). Chapter 17-4. Permits.

Florida Administrative Code (FAC). Chapter 17-600. Domestic Wastewater Facilities.

Florida Administrative Code (FAC). Chapter 17-610. Reuse of Reclaimed Water and Land Application.

Florida Administrative Code (FAC). Chapter 17-730. Hazardous Waste.

Florida Administrative Code (FAC). Chapter 17-762. Aboveground Storage Tank Systems.

Florida Administrative Code (FAC). Chapter 40C-42. Storm Water Discharge Facility Rule.

Florida Department of Environmental Regulation (FDER). 1990. Comparison of Air Quality Data with the National Ambient Air Quality Standards. ALLSUM Statistical Report.

Florida Department of Environmental Regulation (FDER). 1991. Florida Air Toxics Working List No Threat Levels. A Joint FDER/Local Program Initiative. Draft Version 1.0. January 1991.

Florida Statutes. Chapter 161. 1985. The Coastal Zone Protection Act of 1985.

George, D. H. 1987. Fish and Wildlife Management Plan for Cape Canaveral Air Force Station, Florida. Pan Am World Services, Inc. Cape Canaveral Air Force Station, Florida.

Jordan, C.L. 1984. Florida's weather and climate: Implications for water. pp. 18-35 in Water Resources Atlas of Florida. E.A. Fernald and D. J. Patton, eds. Florida State University Press, Tallahassee.

Layne, J.N. (ed.). 1978. Mammals. Volume 1 in P.C.H. Pritchard (series ed.) Rare and Endangered Biota of Florida. University Presses of Florida, Gainesville.

Provancha, M.J., P.A. Schmalzer, and C. R. Hinkle. 1986. Vegetation Types. John F. Kennedy Space Center. Bionetics, Kennedy Space Center, Florida.

Soil Conservation Service (SCS). 1974. Soil Survey of Brevard County, Florida.

University of Florida. 1990. Florida Statistical Abstract. University Presses of Florida, Gainesville, FL.

U.S. Air Force (USAF). 1986. Environmental Assessment for the Complementary Expendable Launch Vehicle (CELV) at Cape Canaveral Air Force Station, FL.

U.S. Air Force (USAF). 1988. Environmental Assessment: Medium Launch Vehicle Program, Cape Canaveral Air Force Station, Florida. May, 1988.

U.S. Air Force (USAF). 1989. Environmental Assessment: Medium Launch Vehicle II (MLV II) Program, Cape Canaveral Air Force Station, Florida. February, 1989.

U.S. Air Force (USAF). 1990a. Environmental Assessment, Titan IV/Solid Rocket Motor Upgrade Program, Cape Canaveral Air Force Station, Florida and Vandenberg Air Force Base, California. February, 1990.

U.S. Air Force (USAF). 1990b. Florida Scrub Jay (*Aphelocoma c. coerulescens*) Management Plan for Cape Canaveral Air Force Station, Florida. December 1990.

U.S. Air Force (USAF). 1990c. Controlled Burning Plan for Cape Canaveral Air Force Station, Florida.

U.S. Air Force (USAF). 1991. Environmental Assessment, Delta Centralized Facility, Cape Canaveral Air Force Station, Florida. April, 1991.

U.S. Army Corps of Engineers, Mobile District (ERP/COE). 1990. Historic Properties Investigations of Centaur Processing Facility, Interim Spin Test Facility, Missile Assembly Building Parking; Cape Canaveral Air Force Station, Brevard County, Florida. September 1990.

U.S. Environmental Protection Agency (USEPA). 1985. Compilation of Air Pollutant Factors, Volume 1, Stationary Point and Area Sources, 4th ed. AP-42. Research Triangle Park, NC.

U.S. Environmental Agency (USEPA). 1988. Gap Filling PM-10 Emission Factors for Selected Open Area Dust Sources. EPA-450/4-88-003. Research Triangle Park, NC.

U.S. Fish and Wildlife Service (USFWS). 1989. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 and 17.12. January, 1989.

U.S. Geological Survey (USGS). 1962. Water Resources of Brevard County, Florida. Florida Geological Survey Report of Investigations, No. 28.

SECTION 7

LIST OF PREPARERS

7.1 ENGINEERING-SCIENCE, INC.

Janice A. Artemel	M.A., Anthro/Archaeol	Archaeology
James R. Butner	M.S., Env. Eng.	Project Manager
Rosemarie Chrisologo	M.S., Env. Eng.	Socioeconomics
Peter A. Cole	B.A., Biology	Biology
Brian Farris	M.P.A., Public Admin.	Socioeconomics
James Garrison, P.E.	Ph.D. pending, Env. Eng.	Air Quality
Kim G. Marler	B.S., Biology	Botany/Ecology
Mark W. Robertson	B.S., Geology	Ground water/Geology
Julia A. Schulten	Ph.D., Botany	Deputy Project Manager
Allen Webb	M.S., Biology	Permitting/Ecology
R.C. Wooten	Ph.D., Biology	Technical Director

SECTION 8

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AFR	Air Force Regulation
bls	below land surface
CCAFS	Cape Canaveral Air Force Station
CCTF	Centaur Cryogenic Tanking Facility
CMP	Coastal Management Program
CO	carbon monoxide
CPB	Centaur Processing Building
CTC	Cryogenic Tanking Cell
CZMA	Coastal Zone Management Act
DCF	Delta Centralized Facility
EA	Environmental Assessment
ERP/COE	Environmental Resources Planning, U.S. Army Corps of Engineers
F	Fahrenheit
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
FGFWFC	Florida Game and Freshwater Fish Commission
FPL	Florida Power and Light Co.
GHe	gaseous helium
gpd	gallons per day
ISCST	Industrial Source Complex Short Term dispersion model
ITL	Integrate, Transfer, and Launch
KSC	Kennedy Space Center
LHe	liquid helium

LH_2	liquid hydrogen
LO_2	liquid oxygen
mgd	million gallons per day
$\mu g/m^3$	micrograms per cubic meter
N_2H_4	hydrazine
NAAQS	National Ambient Air Quality Standard
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTL	no threat level
O_3	ozone
OFW	Outstanding Florida Waters
OSB	Operations Support Building
PFCF	Payload Fairing Cleaning Facility
PM-10	particulate matter smaller than 10 micrometers in diameter
POL	paint, oil, and lubricants
Q/D	Quantity/Distance
OSHA	Occupational Safety and Health Administration
SHPO	State Historic Preservation Officer
SJRWMD	Saint Johns River Water Management District
SMARF	Solid Motor Assembly and Readiness Facility
SO_2	sulfur dioxide
SSD	Space Systems Division
TSP	total suspended particulates
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency

USFWS	U.S. Fish and Wildlife Service
VIB	Vertical Integration Building
VOCs	volatile organic compounds

APPENDIX A

ENDANGERED SPECIES ACT:

SECTION 7 CONSULTATION

DEPARTMENT OF THE AIR FORCE
1040TH CIVIL ENGINEERING SQUADRON (AFSPACECOM)
PATRICK AIR FORCE BASE, FLORIDA 32925-6045

REPLY TO ATTN OF: DE

SUBJECT: Request for Section 7 Consultation of Endangered Species for Centaur Processing Facility (Your Ltr, 21 Sep 90)

TO: United States Department of the Interior
Fish and Wildlife Services
3100 University Blvd, South
Suite 120
Jacksonville, Florida 32216

1. A recent visit by your biologist to several project sites at Cape Canaveral Air Force Station resulted in comments from your office which were received 23 Sep 90. However, the project list did not include comments on the Centaur Processing Facility which was visited on the same consultation tour. It is vitally important that we get your comments on this facility. Project site plan is attached for your information.

2. Your promptness in responding to this request is greatly appreciated. Any questions regarding this request may be directed to Mr Clay Gordin at 407/494-7288.

Olin C. Miller

OLIN C. MILLER, GM-13, DAF
Acting Chief, Engineering and
Environmental Planning Branch

2 Atch
1. Site Plan
2. AF Form 813

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3100 UNIVERSITY BLVD. SOUTH
SUITE 120
JACKSONVILLE, FLORIDA 32216

February 14, 1991

Mr. Olin C. Miller
Acting Chief, Engineering and
Environmental Planning Branch
Department of the Air Force
Patrick Air Force Base, florida 32925-6045

FWS Log No: 4-1-91-036

Dear Mr. Miller:

This responds to your letter of February 7, 1991, pursuant to Section 7 of the Endangered Species Act of 1973, as amended. The proposed project, Centaur Processing Facility, is required to support the Titan IV program on Cape Canaveral Air Force Station, Brevard County.

The project calls for the construction of a 3000 to 4000-square foot building. The Air Force evaluated the impact this project would have on the Federally threatened Florida scrub jay, and determined no effect. The original building site would have removed Florida scrub jay habitat; however, the location was changed to accommodate this species. The new site is an old spoil area, vegetated with a mixture of sand cordgrass, wax myrtle and salt bush. Biologists from this office inspected this site on September 13, 1990. Based on our review, we concur with the Air Force's determination of no effect.

Although this does not represent a Biological Opinion as described under Section 7 of the Act, it does fulfill the requirements of the Act, and no further action is required. If modifications are made in the project, please notify our office as reinitiation of consultation may be necessary.

Sincerely yours,

Michael M. Bentzien

Michael M. Bentzien
Acting Field Supervisor

APPENDIX B

LIGHT MANAGEMENT PLAN GUIDELINES

30 OCTOBER 1990 REVISION

DEPARTMENT OF THE AIR FORCE
1040TH CIVIL ENGINEERING SQUADRON (AFSPACECOM)
PATRICK AIR FORCE BASE, FLORIDA 32925-6045

30 OCT 1990

REPLY TO ATTN OF: CC

SUBJ: Revised Policy for All Exterior Lighting at Cape Canaveral AFS and Patrick AFB (Our 16 Mar 90 Ltr, same subject)

SSD/DE 6555 ASTG/RM LBS 6380
CCAFS/CC NASA/NAMO

1. As a result of continuing research the United States Fish and Wildlife Service (USFW) has altered their decision concerning use of exterior lights and their affect on federally protected sea turtles. Their data shows that all lights affect the sea turtles and their hatchlings in some negative way. The least offender is the low pressure sodium (LPS) light.

2. Therefore, in accordance with AFR 88-15 (see Atch 1) and USFW direction (see Atch 2), the following will be a permanent design and construction policy regarding exterior lighting to keep ESMC in compliance with the Endangered Species Act. This policy applies to all exterior lighting systems or fixtures everywhere within the USAF property boundaries of Cape Canaveral AFS, Patrick AFB and coastal mainland sites.

a. Exterior lighting that is not mission, safety or security essential must be eliminated during sea turtle nesting season, 1 May through 31 October.

b. Mission essential operations that must have artificial lighting will be satisfied with a well shielded LPS light. Well shielded is defined to mean that each light must be surrounded by a guard that will prevent the light from shining toward the beach, while directing its light only onto the work area.

c. Where color rendition is required, a well shielded high pressure sodium light may be used.

d. For the protection of endangered species and for energy/cost savings, all lights must be turned off when not in use. Photocells are no longer permitted for use in parking lots, storage yards, or for area lighting unless the lights are a mission, safety or security requirement. If a photocell is required, it must be linked to a timer and an LPS light must be used. All exterior lights will be controlled by individual or cluster light-specific switches or an Energy Management Control System.

3. This policy letter supersedes 6550 ABG/DE letter, 16 Mar 90, same subject. If questions arise, please contact Clay Gordin or Olin Miller, 1030 CES/DEEV, 494-7288.

SETH HEYWOOD, JR., Lt Col, USAF
Range/Base Civil Engineer

2 Atch
1. AFR 88-15, para 16-34
2. USFW Ltr, 19 Dec 89

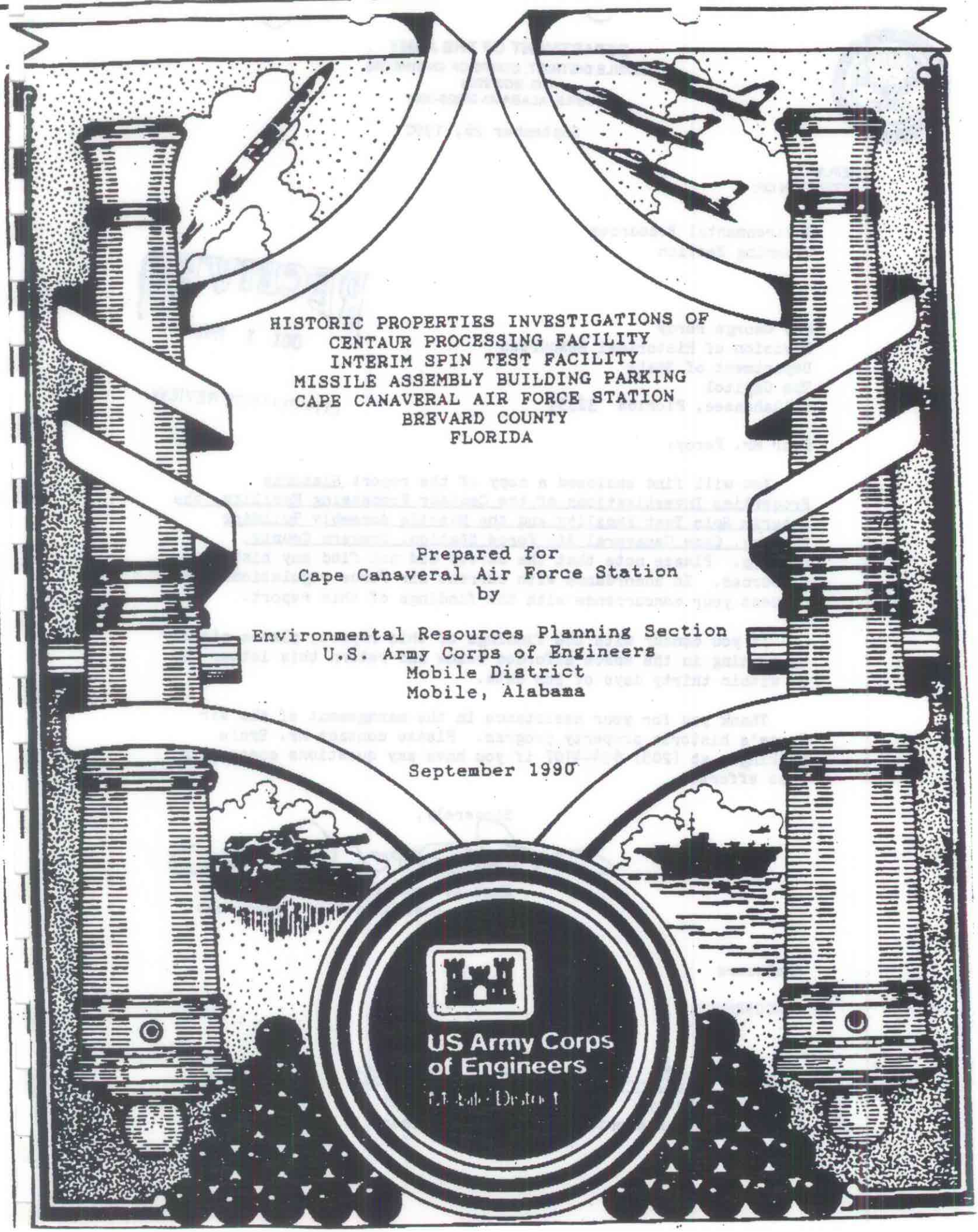
cc: DEM/DEE/DER

APPENDIX C

NATIONAL HISTORIC PRESERVATION ACT:

SECTION 106 CONSULTATION AND

STATE HISTORIC PRESERVATION OFFICER CONCURRENCE



HISTORIC PROPERTIES INVESTIGATIONS OF CENTAUR PROCESSING FACILITY INTERIM SPIN TEST FACILITY MISSILE ASSEMBLY BUILDING PARKING CAPE CANAVERAL AIR FORCE STATION BREVARD COUNTY FLORIDA

Prepared for
Cape Canaveral Air Force Station
by

Environmental Resources Planning Section
U.S. Army Corps of Engineers
Mobile District
Mobile, Alabama

September 1990

US Army Corps of Engineers
Mobile District

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

September 26, 1990

REPLY TO
ATTENTION OF:

Environmental Resources
Planning Section

RECEIVED
OCT 1 1990
COMPLIANCE REVIEW

Mr. George Percy
Division of Historical Resources
Department of State
The Capitol
Tallahassee, Florida 32399

Dear Mr. Percy:

You will find enclosed a copy of the report Historic Properties Investigations of the Centaur Processing Facility, the Interim Spin Test Facility and the Missile Assembly Building Parking, Cape Canaveral Air Force Station, Brevard County, Florida. Please note that the survey did not find any historic resources. In accordance with current Air Force regulations, we request your concurrence with the findings of this report.

If you concur with the findings of this report, please signify by signing in the space afforded below and return this letter to us within thirty days of its date.

Thank you for your assistance in the management of the Air Force's historic property program. Please contact Mr. Ernie Seckinger at (205) 694-4107 if you have any questions concerning this effort.

Sincerely,

Hugh A. McClellan
Chief, Environment and Resources
Branch

Enclosure

CONCURRENCE:

Louis D. Tesar 10/4/90
for Mr. George Percy (Date)
Florida State Historic Preservation Officer

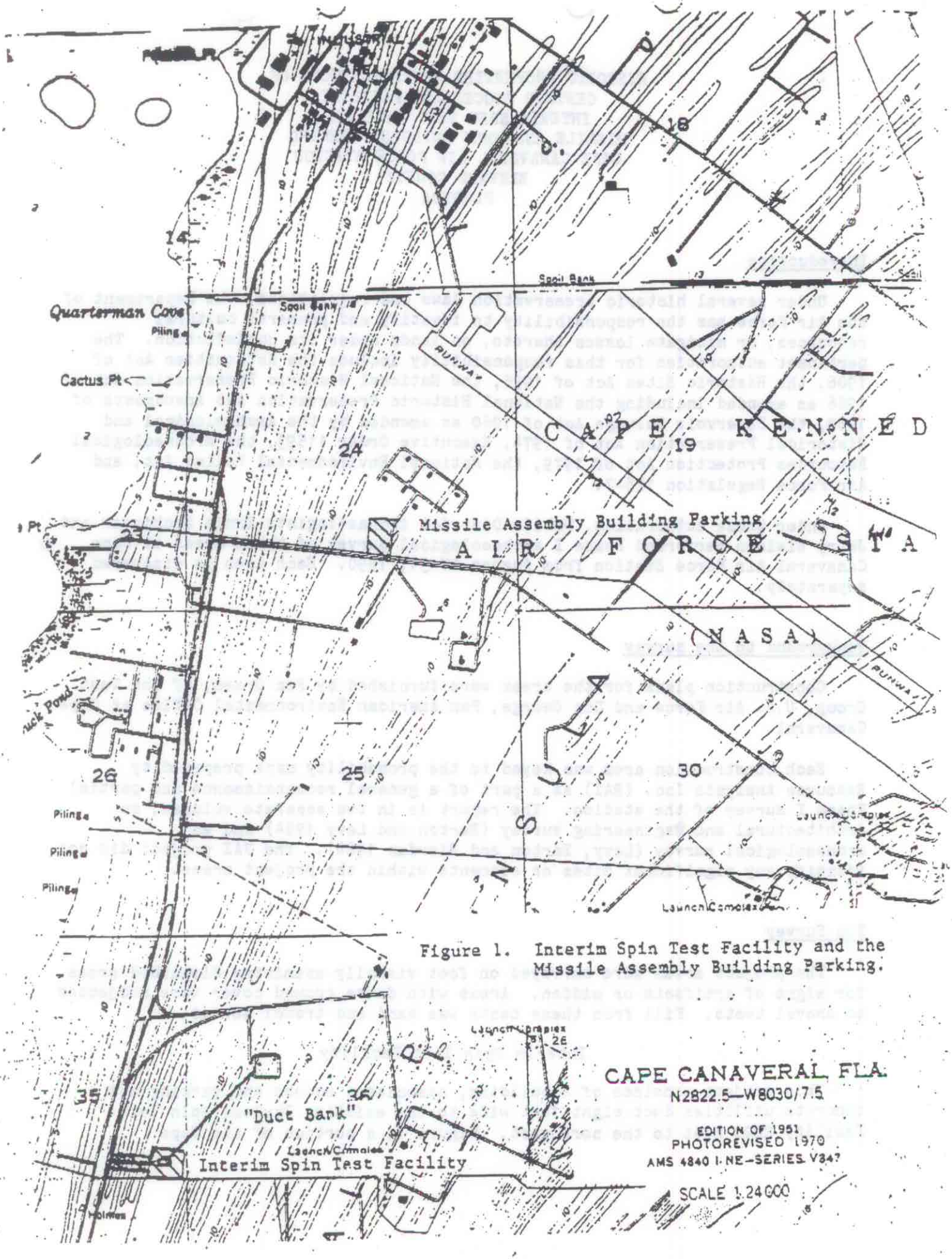


Figure 1. Interim Spin Test Facility and the Missile Assembly Building Parking.

HISTORIC PROPERTIES INVESTIGATIONS OF
CENTAUR PROCESSING FACILITY
INTERIM SPIN TEST FACILITY
MISSILE ASSEMBLY BUILDING PARKING
CAPE CANAVERAL AIR FORCE STATION
BREVARD COUNTY
FLORIDA

Introduction

Under several historic preservation laws and regulations, the Department of the Air Force has the responsibility to identify and preserve cultural resources, or mitigate losses thereto, on lands under its jurisdiction. The pertinent authorities for this responsibility include the Antiquities Act of 1906, the Historic Sites Act of 1935, the National Historic Preservation Act of 1966 as amended including the National Historic Preservation Act Amendments of 1980, the Reservoir Salvage Act of 1960 as amended by the Archeological and Historical Preservation Act of 1974, Executive Order 11593, the Archaeological Resources Protection Act of 1979, the National Environmental Policy Act, and Air Force Regulation 126-7.

Under these authorities, Mobile District Archaeologists Ernie Seckinger and Jerry Nielsen performed Phase I archaeological survey of three areas at Cape Canaveral Air Force Station from August 27-31, 1990. Each area is discussed separately.

Background to the survey

Construction plans for the areas were furnished by Ron Green, of the Test Group, U.S. Air Force and Don George, Pan American Environmental Office at Cape Canaveral.

Each construction area was keyed to the probability maps prepared by Resource Analysts Inc. (RAI) as a part of a general reconnaissance and partial Phase I survey of the station. The report is in two separate volumes, an architectural and engineering survey (Barton and Levy 1984) and an archaeological survey (Levy, Barton and Riordan 1984). The RAI project did not identify any significant sites or elements within the project areas.

The Survey

The project areas were surveyed on foot visually examining disturbed areas for signs of artifacts or midden. Areas with dense ground cover were subjected to shovel tests. Fill from these tests was hand and trowel sorted.

Interim Spin Test Facility

This project consists of a building, associated access and parking and a concrete utilities duct eight feet wide to the existing Payload Spin Test Facility 2000 feet to the northeast. Figure 1, a portion of the Cape

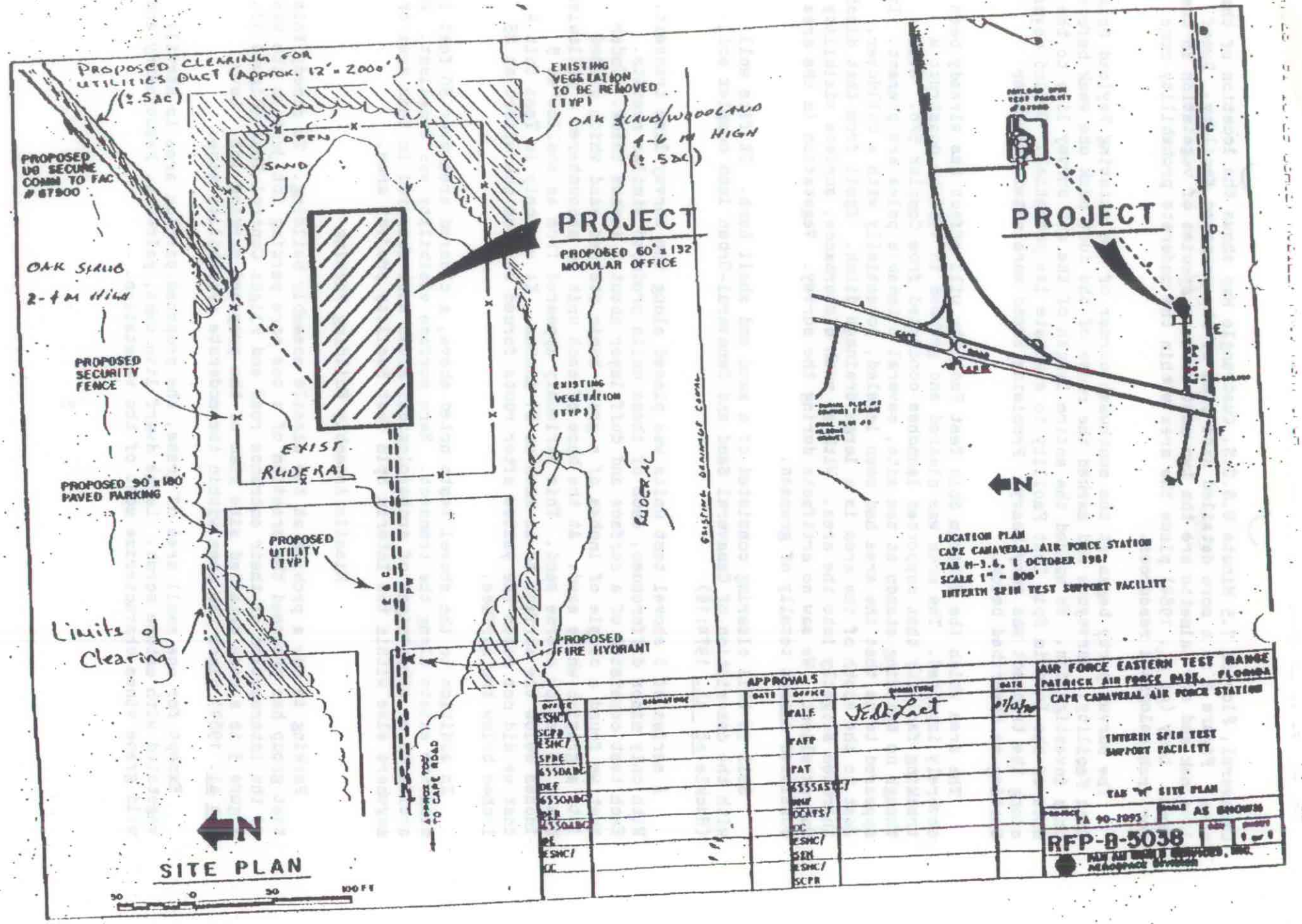


Figure 3. Interim Spin Test Facility Site Plan.

Canaveral, Florida 7.5 Minute U.S.G.S. Quadrangle Map shows the location of the area. Figure 2 is a more detailed site plan of the proposed facility. Dwarf live oak and saw palmetto are the two most obvious species of vegetation in the area. Levy (et al. 1984) place the area within the moderate probability zone for archaeological resources.

The survey party began at the southwest corner of the existing Payload Spin Test Facility. Surveyors had marked the route of the duct bank one week before this investigation. We walked the entire length of the cut survey line to the site of the Interim Spin Test Facility to evaluate its potential. Ground cover along the transect was very heavy. Promising areas were noted for later testing as described below.

The area which the Interim Spin Test Facility will affect has already been severely impacted. The area was cleared and grubbed in 1958 to construct a tracking facility that supported launches conducted from Complex 5/6. Even though no building stands at the site, several climbable poles are present. It appeared to us that the area had been leveled, potentially with a bulldozer. Just to the south of the area is a large drainage ditch. Spoil from that ditch intrudes slightly into the area. With so much disturbance, surface visibility was excellent. We saw no artifacts during the survey. Vegetation in the area consisted almost totally of grasses.

Soil in this clearing consisted of a sand and shell hash. It fits well with the description of Canaveral Sand and Canaveral-Urban land complex soil (Huckle et al. 1974:16)

A series of 6 shovel test units was placed along the survey line transect. With only minor differences, each of these units produced similar results. Each test consisted of a surface and duff layer about 2 inches thick. Under that we found a couple of inches of a gray, humic stained sand which graded into a grayish white sand. At the base of each unit we encountered a yellowish brown to yellow coarse sand. This variously appeared from as shallow as 5 inches below the surface to as much as 21 inches. It was only in Test Unit 4 that we did not reach the yellow after roots forced us from the effort at 25 inches below the surface.

In addition to the shovel tests noted above, a cleared area over 50 feet in diameter exists along the transect. Here surface visibility was excellent. No artifacts or other signs of archaeological sites were observed in this area or anywhere else within the Interim Spin Test Facility project area.

Missile Assembly Building Parking

Parking is now a problem at the missile assembly building. To remedy this, that group has proposed the creation of a one acre parking lot just to the west of the intersection of their entrance road and Flight Control Road (Figure 1). Figure 3 is a more detailed site plan of the proposed parking lot. Levy (et al. 1984) place the area within the moderate probability zone.

Except for one small area of grass, the proposed parking area is heavily vegetated with mature scrub. Large dwarf live oaks, palmetto, beautyberry and wild grape vines characterize most of the vegetation.

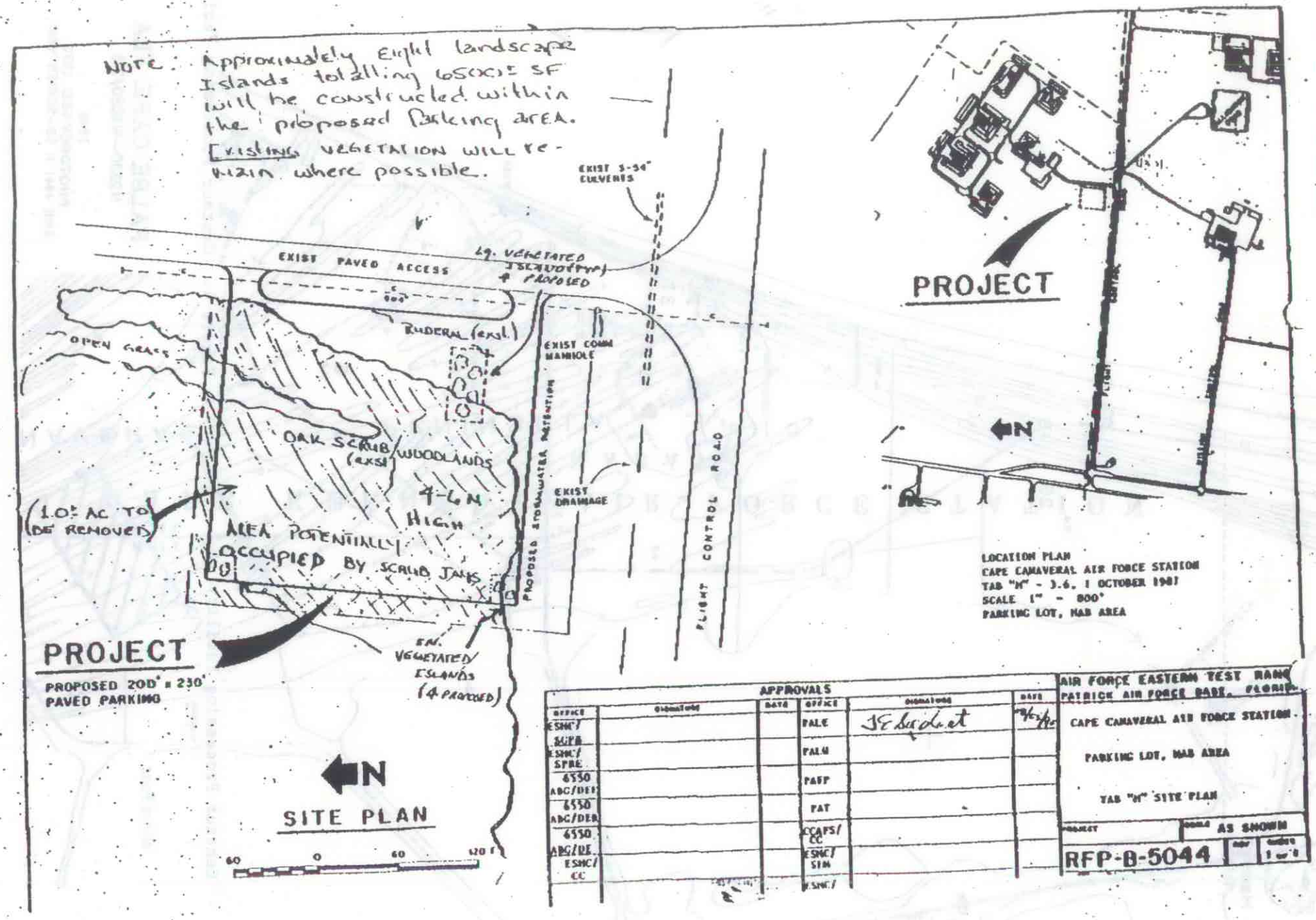
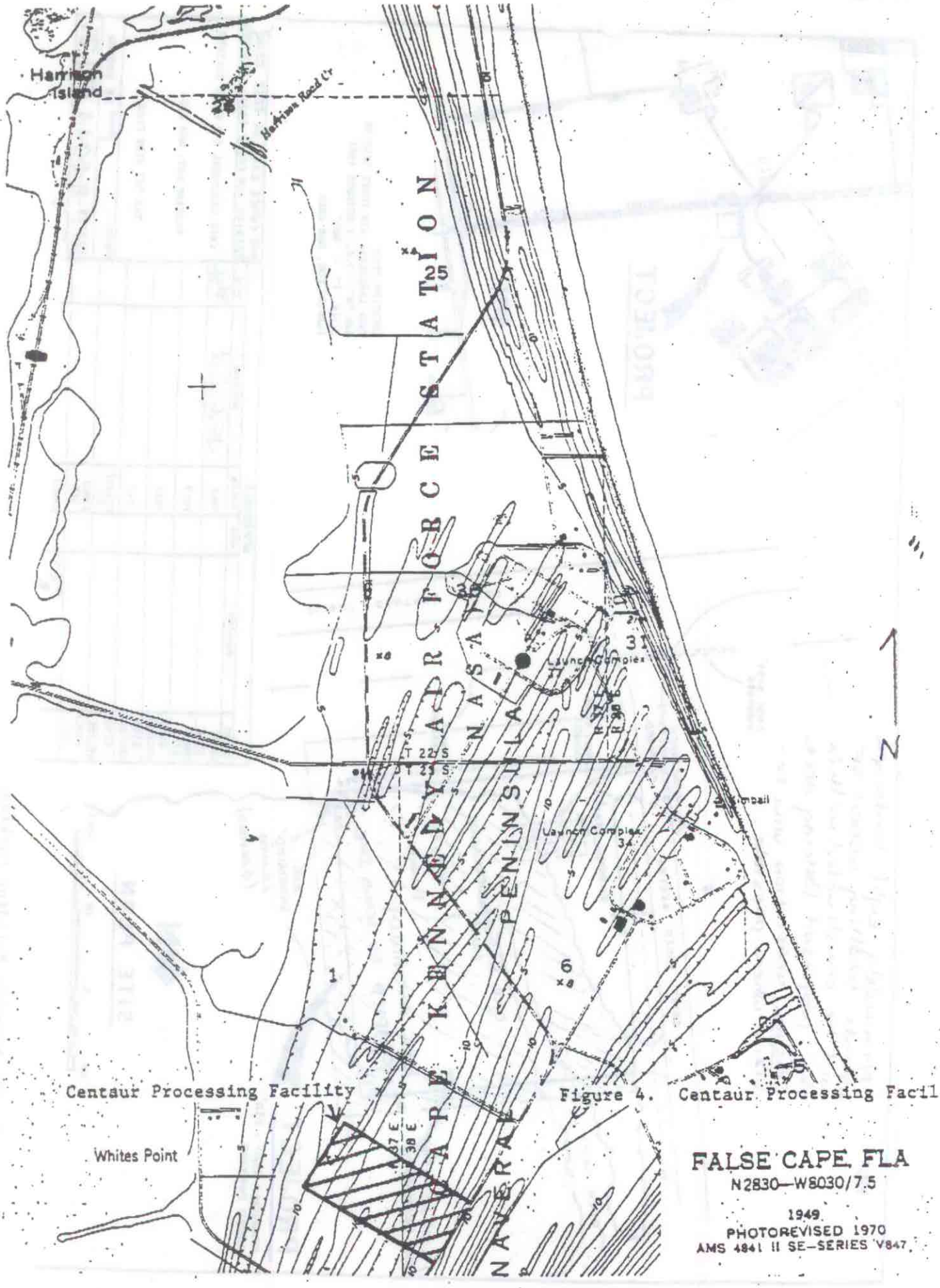


Figure 3. Missile Assembly Building Parking.



Centaur Processing Facility

Figure 4. Centaur Processing Facility

The survey party covered each of the 3 relict dune ridges running through the area. Even though the relict dunes were evident on the ground, relief was low. The Cape Canaveral USGS Quadrangle Map of 1976 shows the area is less than 10 feet in elevation.

Three formal shovel tests revealed a dark gray sand grading to a light gray sand. Below that lay a yellow coarse sand. This sand lay from between 12 and 25 inches below the surface. We saw no artifacts or midden in these tests.

In the northern portion of the area a low sand bag wall was observed. Whether this is evidence of previous military training use is not known. A real property data search showed no record of development in this area other than roads to support construction of the Missile Assembly Building. No other artifacts were located in this project area.

Centaur Processing Facility

The Centaur Processing Facility, as proposed, consists of a secure fenced site containing several structures. Figure 4, a portion of the False Cape, Florida U.S.G.S. 7.5 Minute Quandrangle Map shows the location of the proposed facility. Figure 5 is a more detailed site plan. For the survey's purposes, we assumed that ground disturbance within this 2000 by 900 foot area would be total. We also evaluated a small area on the north side of the proposed facility for a construction storage and office area.

The footprint of the facility covers about 41.3 acres off Cape Road (Figure 5). Planners moved the original siting of the facility to avoid prime scrub jay habitat. Aerial photographs taken in 1985 show the area is mostly made up of a "D" shaped area of old spoil.

The RAI archaeological potential map shows the area as disturbed. They show a building number, CC111, within the tract but do not identify it or recommend it as eligible for the National Register of Historic Places.

Our main concern was an area near the rear of the tract where we thought a relict dune might still exist. Field checks were, however, accomplished over the whole area.

Walking through the tract was difficult due to the thick undergrowth in this young, immature scrub. Most species of vegetation consisted of thick wax myrtle, lantana and herbaceous weeds.

Only a minute remnant of relic dunes were found in the heart of the tract. Tests on the 5 meters in diameter area revealed a profile of deep gray medium sand. Roots at 20" prevented further digging. No evidence of any prehistoric or early historic cultural activity was observed.

The suspected relict dune on the western margin of the proposed facility exists. It can be located by the presence of the tallest live oak (or any other tree for that matter) within the project's limits. About 75 meters of this dune remain. The large oak grows near the southern one third of the

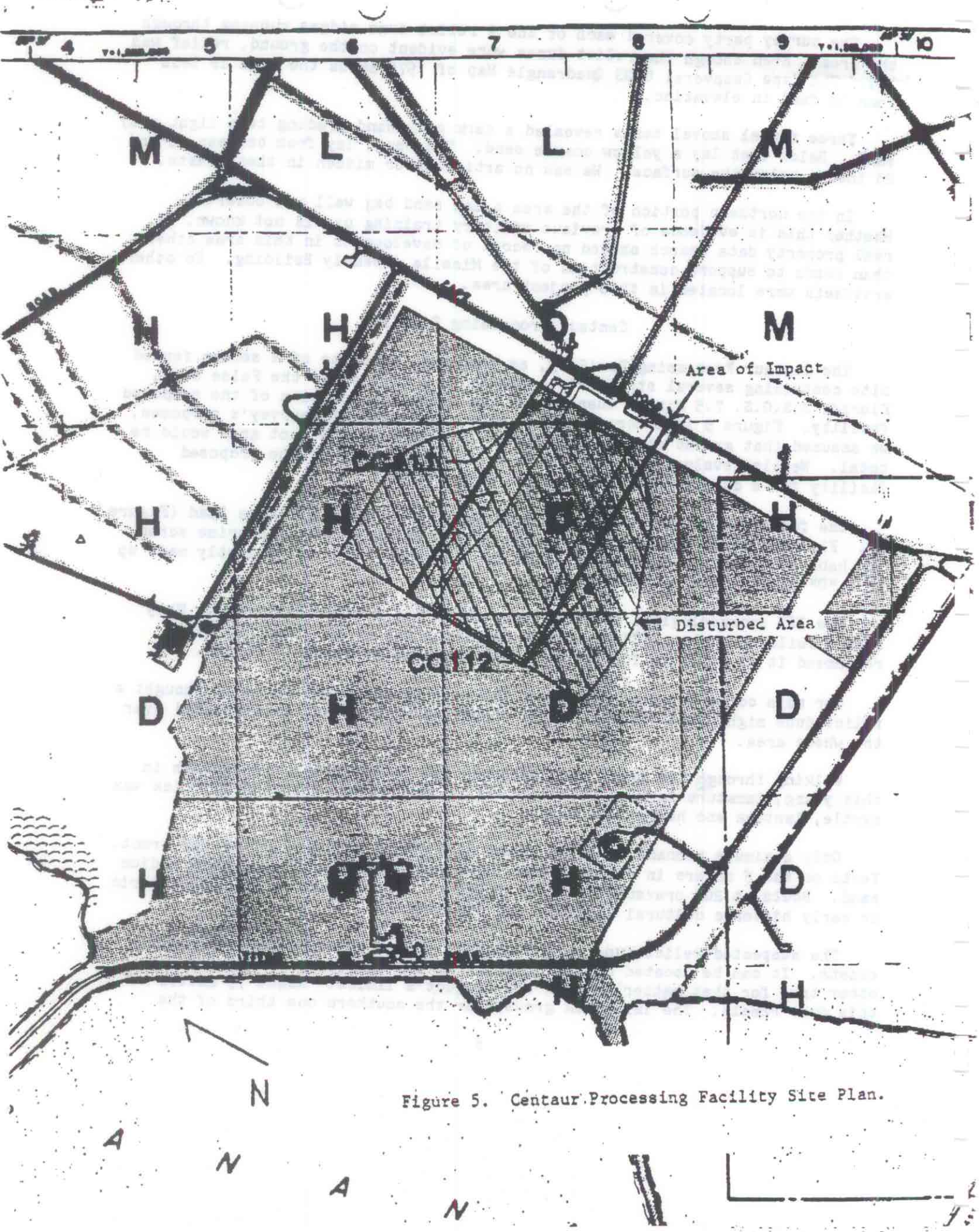


Figure 5. Centaur Processing Facility Site Plan.

remnant. Tests on this relict revealed a white sand profile with some brown inclusions. The top two inches were humically stained. Even under trees the ground was relatively free of vegetation. Ground visibility was excellent. The survey party observed no artifacts or other signs of an archaeological site in the test units or on the surface.

Summary

During the week of August 27-31, 1990, Mobile District Archaeologists surveyed three tracts for the presence of cultural resources. None of the three, the Interim Spin Test Facility, the Missile Assembly Building Parking Lot or the Centaur Processing Facility and the associated construction area resulted in the discovery of any historic resources.

Therefore, construction of the three proposed facilities at the locations supplied to and surveyed by the Mobile District will not impact any historic or archaeological resources on the Cape Canaveral Air Force Station.

References Cited

Barton, David F. and Richard S. Levy
1984 An Architectural and Engineering Survey and Evaluation of Facilities at Cape Canaveral Air Force Station, Brevard County, Florida. Report submitted to the Southeast Regional Office, National Park Service, Atlanta, by Resource Analysts, Inc. Bloomington, Indiana.

Huckle, Horace F., Hershel D. Dollar, and Robert F. Pendleton
1974 Soul Survey of Brevard County, Florida. USDA, Soil Conservation Service in cooperation with the University of Florida Agricultural Experiment Stations.

Levy, Richard S., David F. Barton, and Timothy B. Riordan
1984 An Archeological Survey of Cape Canaveral Air Force Station, Brevard County, Florida. Report submitted to the Southeast Regional Office, National Park Service, Atlanta, by Resource Analysts, Inc. Bloomington, Indiana.