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NAS KEY WEST
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ENVIRONMENTAL PROTECTION PLAN FOR REMEDIATION AT SOLID WASTE
MANAGEMENT UNITS 1, 2, 3, 5 AND 7, JET ENGINE TEST CELL, SITES 1, 3, 7 AND 8 AND
AREAS OF CONCERN SITES A AND B NAS KEY WEST FL

2/1/1995

BECHTEL ENVIRONMENTAL INC

ENVIRONMENTAL PROTECTION PLAN
NAS KEY WEST, KEY WEST, FLORIDA

DELIVERY ORDER NO. 0004

Prepared for

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Under Contract No. N62467-93-D-0936

Prepared by

BECHTEL ENVIRONMENTAL, INC.
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REVISION 0

FEBRUARY 1995

Bechtel Job No. 22567

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BEI	Bechtel Environmental, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
IR	Installation Restoration
JETC	Jet Engine Test Cell
NAS	Naval Air Station
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer of Charge of Construction
SARA	Superfund Amendments and Reauthorization Act
SWMU	Solid Waste Management Unit

1.0 DESCRIPTION OF THE ENVIRONMENTAL PLAN

1.1 GENERAL OVERVIEW AND PURPOSE

The purpose of this Environmental Protection Plan is to outline the methods and responsibilities for protection of natural resources and the environment during execution of the delivery order work. To accomplish this goal, Bechtel Environmental, Inc. (BEI) will comply with applicable Federal, State, and activity environmental laws and regulations, properly control and dispose of all waste generated, document and report on pollution prevention measures, and prepare, for Navy submittal, all reports required by outside agencies. BEI is required to protect natural resources during implementation of interim remedial actions as described in the Contract, Part 4.4, Protection of Natural Resources. The following paragraphs (Sections 2.0 through 8.0) are derived from the contract and include a general description of scope of work to be performed by BEI.

The objective of this project is to perform an interim remedial action, remove contamination sources, stabilize and/or otherwise control residual contamination at the sites to meet current guidelines for the protection of public health and safety.

It should be noted that the program is fundamentally an environmental restoration program. Essentially all substantive program activities are implementations of response actions for contaminated media. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Environmental Policy Act (NEPA) establish extensive environmental documentation requirements for and regulatory framework of remedial action programs. In addition, a Resource Conservation and Recovery Act (RCRA) permit is in place for the Boca Chica facility. RCRA regulations will provide environmental protection requirements for sites on Boca Chica. Many of the methods and responsibilities for protection of natural resources will be embodied in existing legislation and rules, and will be documented in the course of remedial action.

Because Key West is an environmentally sensitive area, the Navy and BEI anticipate that there will be substantive involvement of the various agencies and Natural Resource Trustees in issuing permits, approvals, and oversight of actual work activities. BEI will facilitate this process for the Navy by coordinating with these agencies, preparing applications, and performing related functions, while the Navy will initiate contacts with these agencies and execute permits and applications.

1.2 GENERAL SITE INFORMATION

Naval Air Station (NAS) Key West and its supporting facilities are located approximately 150 miles southwest of Miami on the westernmost of two major islands of the Florida Keys (Boca Chica and Key West) (see Figure 1-1). Operations on this site have included the generation, storage, and use of hazardous materials, including fuel and solvents.

Environmental cleanup at the facility is being conducted under both the Resource Conservation and Recovery Act (RCRA) and the Navy's Installation Restoration (IR) program. This

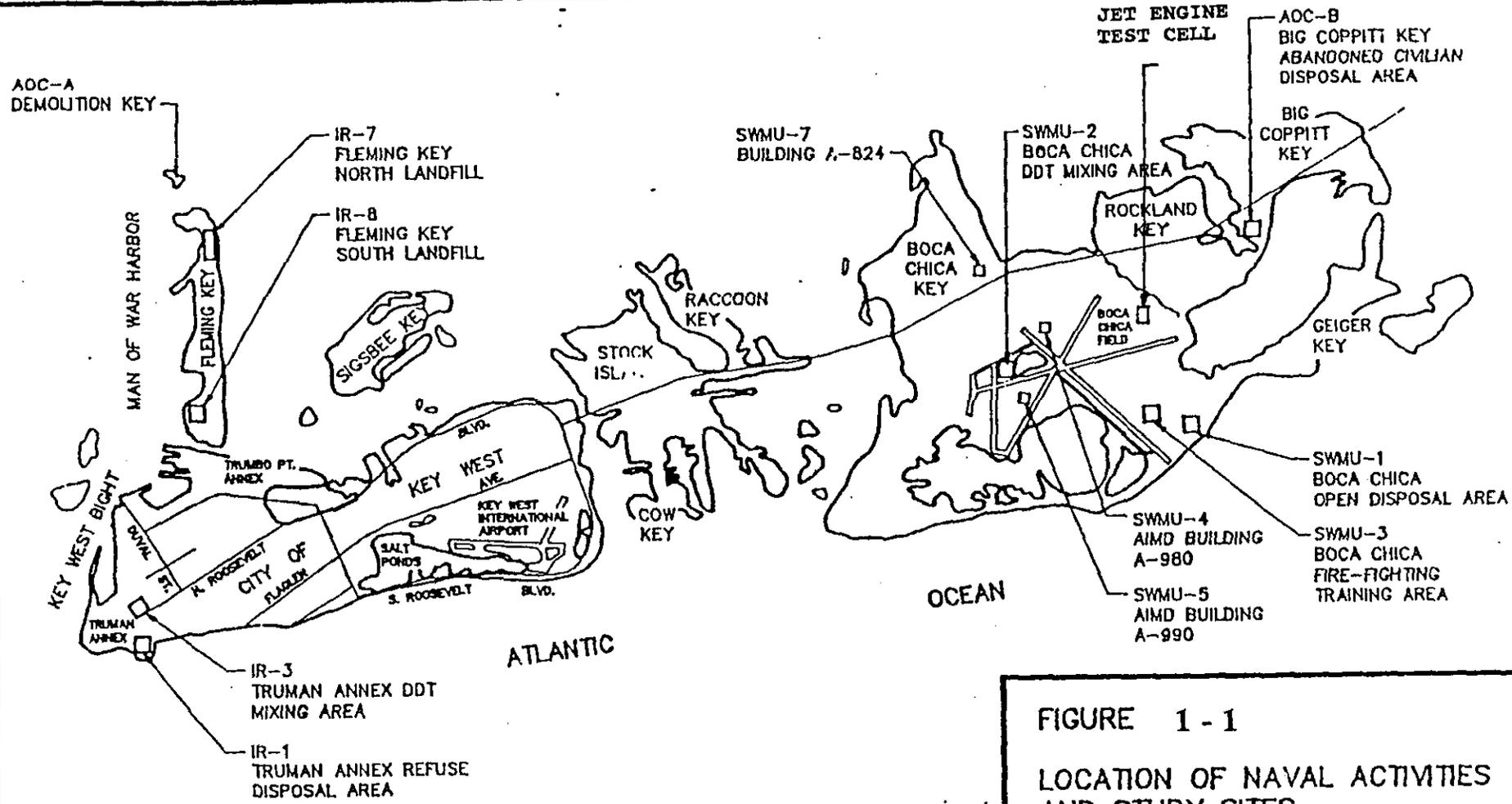


FIGURE 1 - 1
LOCATION OF NAVAL ACTIVITIES AND STUDY SITES
NAS - KEY WEST
KEY WEST, FLORIDA
Prepared for:
NAS - KEY WEST
KEY WEST, FLORIDA



environmental protection plan applies to the Solid Waste Management Units (SWMU), the IR cleanup areas and designated Areas of Concern (AOC) scheduled for remediation at the facility.

Interim remedial actions planned for NAS Key West include removal and/or treatment of contaminated soil, groundwater treatment, removal of debris, grading operations on a landfill, construction of a shoreline protection system, and treatment and disposal of petroleum-contaminated soil.

2.0 PROTECTION OF NATURAL RESOURCES

BEI will preserve natural resources within the project boundaries. Preservation of natural resources will be achieved through the use of project procedures designed to minimize environmental impacts and restore areas that must be disturbed during the course of remedial activities.

The Key West Naval Complex includes some areas that are completely developed, while other areas, such as portions of Boca Chica, Saddlebunch, and Demolition Key, are mostly cleared land. Around the periphery of these islands are mangrove communities and salt marshes in intertidal areas, grading into marine grass flats in sub-tidal areas (IT 1994).

Florida has 68 animal species considered endangered or threatened by either the United States Fish and Wildlife Service or the Florida Game and Freshwater Fish Commission. Sixteen of these species have ranges that potentially overlap NAS-Key West. Also, approximately 325 plants are listed by the Florida Department of Agriculture as either endangered or threatened. Of these, seven are now found in the Key West area (IT 1994).

Of particular importance is the protection of wetlands, mangroves, and endangered species, particularly the Lower Keys Marsh Rabbit, due to the widespread presence of wetlands and mangroves and confirmed habitat areas of the Marsh Rabbit (Figure 2-1). Table 2-1 presents the sites that have been identified as having a probable impact on natural resources from implementation of interim actions, based on known proximity of wetlands, mangroves, Marsh Rabbit habitat, and types of interim actions currently planned for the NAS Key West sites. This information is a result of discussions at NAS Key West (site visit August 1994) between BEI, the NAS Key West Public Works Department, the Resident Officer in Charge of Construction (ROICC), EPA Region IV, the Florida Department of Environmental Protection (FDEP), and the Southern Division Naval Facilities Engineering Command. As a result of a followup site visit (December 1994) BEI and NAS natural resource specialists have agreed on the delineation of wetlands and habitat areas affected by the interim remedial activities. A draft of the delineation report is shown as Attachment A.

2.1 LAND RESOURCES

Except in areas to be cleared, BEI will not remove or deface trees or shrubs without approval.

2.1.1 Tree Protection

BEI will protect existing trees that will remain after completion of work. Any trees that must be removed will be replaced, except exotic species, which will not be replaced. Mangrove

**Table 2-1
Probable Impacts on Natural Resources During Interim Actions**

Site	Wetlands ^a	Mangroves ^a	Endangered Species ^b	Required Permits
SWMU-1	YES	YES	YES ^b	WET
SWMU-2	YES	YES	NO	WET
SWMU-3 ^c	NO	NO	YES ^d	NO
SWMU-5	NO	NO	NO	NO
SWMU-7 ^c	NO	NO	NO	NO
JETC	NO	NO	NO	AQ/TBD
IR-1	NO	NO	NO	NO
IR-3	NO	NO	NO	NO
IR-7	NO	NO	NO	NO
IR-8	NO	NO	NO	WET
AOC-A	NO	NO	NO	NO
AOC-B	YES	YES	NO	WET

^aBasis: Visual observation and discussions with NAS Natural Resources Manager

^bBasis: Lower Keys Marsh Rabbit Recovery Plan and NAS Key West Habitat Location Map

^cBorders wetland area

^dPossible Least Tern nesting habitat

WET: Florida Department of Environmental Protection Joint Application for Works in the Waters of Florida (Wetland Permit)

AQ/TBD: Air Quality Permit or Restrictions/To Be Determined

protection will include compliance with Florida Administrative Code (FAC) 62-321, "Mangrove Protection," including Mangrove Alteration Permits (Attachment B). Sites that have been identified as having a probable impact on mangroves due to implementation of interim actions are presented in Table 2-1.

In many cases, the presence of mangroves is an indicator that wetlands are also present. Where alteration of mangroves are required, and where a wetland permit must be obtained to implement interim remedial action involving regulated dredge and fill activities, a separate mangrove alteration permit application is not required [FAC 62-321.040(5)].

2.1.2 Replacement

BEI will restore landscape features damaged by equipment operations. Work plans will identify trees and other landscape features that will be removed or changed. Work plans will also specify the method of landscape restoration.

2.1.3 Temporary Construction

BEI will remove traces of temporary construction facilities such as haul roads, work areas, structures, foundations, and stockpiles of excess or waste materials. BEI will utilize best management practices to control water runoff from stockpiled material.

2.2 STREAM CROSSINGS

Approval will be obtained from the Contracting Officer or designated representative before any equipment fords a stream. Temporary culverts or bridges will be utilized where necessary.

2.3 FISH AND WILDLIFE RESOURCES

Fish and wildlife will not be unnecessarily disturbed. Stream flows and other significant native habitats will be protected. BEI will assist the Naval Air Station to coordinate actions with the Florida Fish and Game Commission.

2.4 WETLAND AREAS

BEI will not disturb any wetland area or associated mangrove habitat without authorization. Approval may be required from the Florida Department of Environmental Protection, local agencies, or the Army Corps of Engineers. BEI will assist the Naval Air Station to obtain such approvals. BEI will comply with Florida regulations governing wetlands and mangroves, including FAC 62-340, "Delineation of the Landward Extent of Wetlands and Surface Waters" and 62-611, "Wetlands Application Regulations."

3.0 PROTECTION OF HISTORICAL AND ARCHAEOLOGICAL RESOURCES

3.1 OBJECTIVE

BEI will assist the Naval Air Station Cultural Resources Coordinator who will contact state agencies as required for known locations of historical or archaeological areas prior to the start of any work.

BEI will preserve and report to the Contracting Officer or designated representative any historical or archaeological items or human skeletal remains discovered in the course of work.

3.2 METHODS

BEI will provide guidance and training to field operations management on the importance and requirements related to historical resource protection.

4.0 PROTECTION OF SURFACE SOIL, VEGETATION, AND SURFACE WATERS

4.1 GROUND COVER

Burnoff of ground cover will not be permitted.

4.2 ERODIBLE SOILS

All earthwork will be brought to a final grade, as specified in delivery orders and detailed in approved specifications. Side slopes and back slopes will be protected immediately upon completion of rough grading. Protection against erosion will prevent migration of sediment into nearby creeks or streams.

4.3 TEMPORARY MEASURES

Silt fencing will be used to prevent erosion and control sedimentation.

4.3.1 Mechanical Retardation and Control of Runoff

BEI will mechanically retard and control rate of runoff from the site. This method may include building of diversion ditches, benches, and berms as required to retard and divert runoff to protected drainage courses.

4.3.2 Vegetation and Mulch

For interim actions including earthwork, BEI will provide temporary protection on side and back slopes as soon as rough grading is completed if sufficient soil is exposed to require erosion protection. Slopes will be protected by accelerated growth of permanent vegetation (seeding), mulching, or netting.

4.3.3 Protection of Endangered Species Habitat

The Naval Air Station has identified in the field habitat boundaries of endangered species present at NAS Key West. BEI will comply with U.S. Fish and Wildlife Service and Florida Fish and Game Commissions requirements with respect to such habitats.

One endangered species that has been identified to be present, particularly in the Boca Chica area, is the Lower Keys Marsh Rabbit. A map of known Marsh Rabbit habitat is shown in Figure 2-1. The U.S. Fish and Wildlife Service has published a recovery plan for the Marsh Rabbit titled, "Recovery Plan for the Lower Keys Marsh Rabbit," dated January 5, 1994 (see Attachment B). BEI will comply with this plan as necessary. Table 2-1 identifies the sites that have probable impact on the Marsh Rabbit.

Other examples of endangered species known to migrate in the Key West area are the Least Tern and the Roseate Tern. The Least Tern is on the Florida threatened species list and protected by the Migratory Species Act; the Roseate Tern is on both the federal and Florida list of threatened species. The Least Tern and the Roseate Tern may be present in the Florida Keys from April 1 to August 31. The terns nest and lay eggs in gravel areas such as unused portions of roadways and taxi-ways, and on rooftops. Construction activity and schedules may be impacted (especially at SWMU-3) should terns nest in areas scheduled for remediation.

5.0 PROTECTION OF THE ENVIRONMENT FROM POLLUTION DERIVED FROM INTERIM ACTIONS

5.1 CONTROL AND DISPOSAL OF SOLID AND SANITARY WASTES

Solid wastes will be collected, placed in containers, and regularly emptied at intervals to prevent the attraction of rodents or disease vectors. Debris, garbage, and sewage will be disposed of according to procedures and requirements as directed by the base construction office, and in compliance with applicable laws and regulations.

Procedures for collecting and properly disposing of solid wastes is addressed in the Program Hazardous Waste Management Plan.

5.2 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE

Procedures and requirements for the generation, management, transportation, and disposal of hazardous waste, as defined by RCRA, are described in the Program Hazardous Waste Management Plan.

5.3 AIR POLLUTION CONTROL

One of the planned interim actions on the Boca Chica Airfield is the construction and operation of a groundwater treatment system. An integral part of the groundwater treatment system is an air stripping tower for treatment of contaminated groundwater.

Air stripping towers are an air emissions source. Boca Chica Airfield is located in an attainment zone for all criteria air pollutants regulated under the Clean Air Act. It is not anticipated that

special emission controls will be required on the air stripping tower; however, an Air Stripper Review Worksheet will be prepared to determine the emissions of the treatment system. Preparation of this worksheet will be coordinated with the local air quality district (Southeast Air Quality District, Miami).

6.0 NOTIFICATION OF ENVIRONMENTAL OCCURRENCES

Environmental occurrences will be recorded and reported as specified by the Contracting Officer or designated representative, and in compliance with Section 4.8.4 (Oil and Hazardous Material Spills) of the contract. BEI will immediately report occurrences to the NAS Public Works Office, Environmental Coordinator, and the NAS Fire Department. For an emergency or an occurrence involving CERCLA/Superfund Amendments and Reauthorization Act (SARA) reportable event (e.g., spill), the event must be reported to the National Response Center as well as to the Contracting Office or his designee.

A Spill Prevention Control and Countermeasures Plan has been developed by BEI for the IR program, and can be found in Appendix C of the Site-specific Safety and Health Plan.

7.0 WASTE MINIMIZATION AND POLLUTION PREVENTION

An important element of providing environmental protective measures is to minimize the volume and toxicity of all wastes that are generated or of existing wastes that are being managed, to the extent practical. To achieve this goal, management must maintain project employees' awareness of waste management policies, plans, procedures, and activities.

7.1 VOLUME REDUCTION

Due to decreasing available disposal space, increasing disposal costs, and liability associated with hazardous material, a greater emphasis is being placed on waste reduction. Because new waste will be generated as a result of response actions and not by process operations, only a limited number of waste minimization techniques are appropriate. Techniques that will be used to minimize the volume of newly generated waste include material substitution, segregation, consolidation, loss prevention, supply control, reuse, and good housekeeping.

7.2 REDUCTION OF TOXICITY

The toxicity of waste managed as part of remedial activities must be reduced to meet RCRA requirements for hazardous waste disposal. Reduction of waste toxicity will be achieved when required by RCRA land disposal restrictions, as well as when appropriate to achieve CERCLA cleanup goals.

8.0 APPLICATIONS AND PERMITS

Prior to implementing the interim actions at NAS Key West, BEI will prepare applications and permits that are required by FDEP and the U.S. Army Corps of Engineers. The Navy will execute and submit these documents. Examples include "Joint Application for Works in the Waters of Florida" and "Application for Mangrove Alteration Permit."

Existing permits (e.g., NPDES permits) will be used or modified, as necessary. To date, the following permit applications have been identified as necessary: Wetlands Permits for SWMU-1, SWMU-2, IR-8, and AOC-B. Also, BEI will achieve economies of scale where practical by utilizing a project-wide approach to permitting to avoid unnecessary time delays and administrative costs. Table 2-1 depicts, on a site-by-site basis, permits necessary to implement interim remedial actions. Draft wetland permit applications have been provided to the Naval Air Station. Copies are attached as Attachments C, D, and E for information. A permit for IR-8 will be prepared when the shoreline protection system design is complete.

In addition to permits, NAS Key West is required by CERCLA to notify Natural Resource Trustees of remedial actions to mitigate past releases of hazardous substances. Examples of Natural Resource Trustees to be notified include: The National Oceanic and Atmospheric Administration (NOAA); the Florida Department of Environmental Protection, Natural Resource Trustee; U.S. Department of Fish and Wildlife; and the Florida Game and Freshwater Fish Commission. Each of these trustees will be provided an opportunity to review and comment on the planned interim remedial actions.

ATTACHMENT A

**WETLAND DELINEATION FOR VARIOUS SITES
SCHEDULED FOR REMEDIAL ACTION
AT NAS KEY WEST**

Bechtel

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JAN 17 1995

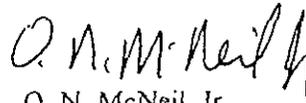
Commanding Officer
Southern Division
Naval Facilities Engineering Command
Attention: Mr. Dudley Patrick
2155 Eagle Drive
North Charleston, SC 29406

SUBJECT: Bechtel Job No. 22567
Department of the Navy Contract No. N62467-93-D-0936
DO 0004, PHASE 2, DRAFT WETLAND DELINEATION AT NAS KEY WEST
Subject Code: 7550

Dear Mr. Patrick:

I am enclosing a draft wetland delineation document for review and comment by SOUTHDIV and the Naval Air Station. Comments are requested by January 25, 1995, so that we can finalize the document for submittal by the Naval Air Station.

Sincerely,



O. N. McNeil, Jr.
Project Manager

Enclosure: as stated

cc:
Bill Carley



Bechtel Environmental, Inc.

WETLAND DELINEATION OF VARIOUS SITES
SCHEDULED FOR INTERIM REMEDIAL ACTION

AT

NAVAL AIR STATION

KEY WEST

Master.

Prepared for
Department of the Navy
Naval Facilities Engineering Command, South
Under Contract No. N64267-93-D-1

Prepared by
Bechtel Environmental, Inc.
Oak Ridge, Tennessee

January 1995

Bechtel Job No. 22567

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BLS	Below Land Surface
CEC	Cation Exchange Capacity
FAC	Florida Administrative Code
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
JETC	Jet Engine Test Cell
meg	milliequivalents
MSL	Mean Sea Level
NAS	Naval Air Station
OFW	Outstanding Florida Waters
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA Facility Investigation/Remedial Investigation
SWMU	Solid Waste Management Unit
TOC	Total Organic Carbon
USDA	United States Department of Agriculture

Wetland Delineation at Various Sites Scheduled for Remedial Action Naval Air Station - Key West

1.0 INTRODUCTION

As a basis for in-field determination of state and federal jurisdictional wetland-upland boundary, this delineation report is submitted with the joint application for Wetland Resource Alterations in the Waters of Florida. This report provides information to support the boundary decision and to locate its approximate position in the field. Methodology for the boundary delineation differs for state and federal jurisdiction. The State methodology (FAC Chapter 62-340) primarily differs from federal guidance (Environmental Laboratory, 1987) in the selection of one plant stratum used to determine dominance and in the use of fewer indicator status categories (obligate and facultative wet) to determine the presence of hydrophytic vegetation. Maps of the sites discussed in this report are found in Appendix A. Photographs of each of the wetland sites are presented in Appendix B, and wetland sample data sheets are presented in Appendix C.

There are 11 areas of interest, as shown on Figure 1, that are scheduled for interim remedial action (IRA) under the Navy's Base Installation Restoration Program (IRP) and the Resource Conservation and Recovery Act. IRA sites impacting jurisdictional wetlands include Boca Chica Open Disposal (SWMU-1), Boca Chica DDT Mixing Area (SWMU-2), Fleming Key South Landfill (IR-8), and Big Coppitt Key Abandoned Civilian-Disposal Area (AOC-B).

Interim remedial action at these sites include the removal of solid wastes, contaminated soils, and, at one site, the construction of a seawall to prevent shortline erosion into the cap of a landfill. All of these remedial actions will improve the environment by removing contaminated materials and solid wastes, installing measures to prevent future environmental damage, performing mitigative measures by the removal of some exotic vegetation, and enhancing the aesthetic value of the affected sites.

Best engineering and construction practices will be used during activities on or near jurisdictional wetlands. These may include surface water runoff control according to the Florida Land Development Manual (publication pending) and clear identification in the field of wetland areas. In addition to wetland protection, habitat of the federally endangered Lower Keys Marsh Rabbit will be preserved in its original state to the extent practicable. Restoration of affected wetlands will be achieved by replanting with equivalent vegetation. All exotic vegetation that must be removed to implement remedial action will be replaced with indigenous plant species.

Areas in which there are no federal or state wetland impacts from planned IRA include Fleming Key North Landfill (IR-7), Demolition Key (AOC-A), Jet Engine Test Cell (JETC), Truman Annex DDT Mixing Area (IR-3), Boca Chica Fire Fighting Training Area (SWMU-3), Building A-824 (SWMU-7), and Truman Annex Refuse Disposal Area (IR-1). For each of the sites, a description of the planned IRA and maps in Appendix C are included to document the separation of the site from wetlands.

2.0 IRA SITES EXPECTED TO IMPACT WETLANDS

2.1 BOCA CHICA OPEN DISPOSAL AREA (SWMU-1)

The site is located in the southeastern part of Boca Chica Key, between Perimeter Road and Geiger Creek as shown in Figure 2. It consists of a burn area, a central open disposal area, and an eastern debris zone. Preferred marsh habitat (coastal berm) of the federally endangered Lower Keys Marsh Rabbit is north of the abandoned antenna sites immediately adjacent to the site limits. Planned remediation consists of delineation and subsequent excavation of contaminated media in the bare ground of the open disposal area shown in Photo 1. Photo 2 shows the scattered interspersed mangroves associated with existing open water areas. Although wetland vegetation is absent, soils with hydric characteristics and hydrology exist in the central open disposal area and the area is regulated as a jurisdictional wetland. A wetland data sheet is included to document the presence of wetland indicators at SWMU-1.

2.1.1 Vegetation

The site is relatively flat with black mangroves (*Avicennia germinans*) and brazilian pepper (*Schinus terebinthifolius*) around the perimeter and interspersed within the area. Scarified bare ground with no vegetation is present throughout the site.

2.1.2 Soils

From drilling logs in the Draft Remedial Investigation (IT Corp., 1994), soils consist of compacted fill overlying oolitic limestone. Fill consisted of sand and gravel mixed with silt, reworked crushed oolitic limestone, and shell fragments and extended to 8 ft BLS. Grain size analysis shows the fill is poorly sorted medium to coarse grained sandy gravel with fines. The soil has a pH of 7.50 and a CEC of 35.7 meq/g. The TOC (1.04 mg/kg) indicates minimal organic matter and the permeability measurement (2.3E-06 cm/sec) shows a low permeability material. In contrast to the RFI/RI and according to the unpublished soil survey for Monroe County (SCS, draft), the area is underlain by soils of the series Islamorada, which is classified as a lithic Troposaprists. Lithologic logs verify the presence of wetland soils from monitoring wells drilled during preliminary remedial investigations (Geraghty and Miller, Inc., 1987) describing a general change in soil texture from sandy soils layered with organic material (KWM-05; KWM-08) near the road to peat and clay soils near Geiger Creek (KWM-06; KWM-07).

2.1.3 Hydrology

Groundwater elevations at the site are influenced by ocean tides and precipitation. Depths to groundwater vary from 0.4 to 0.7 ft below ground surface at SWMU-1 as collected from measurements of water levels during April-May 1993 (IT Corp., 1994). The topography of the site slopes gradually toward a mangrove area that lies between the site and Geiger Creek. The site is apparently often inundated during high tide and after rainfall. Depth of flooding is often indicated by height of pneumatophores from black mangroves (see Photo 2).

2.2 BOCA CHICA DDT MIXING AREA (SWMU-2)

The approximate location of SWMU-2 is shown in Figure 1 and site features shown in Figure 3. Proposed IRA includes establishing the boundary of DDT contamination in soils at the site, as well

as in the adjacent drainage ditch and excavating contaminated sediments. The 0.18-acre site is adjacent to the north side of a man-made drainage ditch that is connected to a large borrow pit along the southeast side of a taxiway (alpha) at the NAS Boca Chica Airfield. DDT mixing operations were conducted in a demolished building located approximately 30 ft from the drainage ditch as shown in Photo 3. A 5–10-ft strip adjacent to the drainage ditch is dominated by obligate hydrophytic vegetation likely receiving significant surface water runoff from paved runways and should be regulated as a jurisdictional wetland. A wetland data sheet is included for SWMU-2 to document the presence of all wetland field indicators.

2.2.1 Vegetation

The area near the demolished building is now partly covered with thick herbaceous cover, including black rush (Juncus roemerianus), sea ox-eye daisy (Borichia sp.), and keygrass (Monanthochloe littoralis) (see Photo 3). The drainage ditch has medium-size (<7 ft) black (Avicennia germinans) and red mangroves (Rhizophora mangle), buttonwood (Conocarpus erectus), and brazilian pepper (Schinus terebinthifolius) along its banks (Photo 4). The ditch connects water in an old borrow pit with the ocean, which is designated as Outstanding Florida Waters (OFW).

2.2.2 Soils

Soil descriptions in SWMU-2 are based on numerous soil borings and monitoring wells from the draft RFI/RI (IT Corp., 1994). The uppermost horizon is a light brown, silty, medium to fine-grained sand, poorly sorted fill mixture of sand and pebble size limestone varying in thickness from 3 to 4 ft. Natural oolitic limestone lies below the fill. The pH of the soil was 8.25 due to the abundance of carbonate soils and the CEC was 35.7 meq/g. The permeability of the soil is 2.3E-06 cm/sec, which is representative of a low permeability material. The TOC value at 1.04 mg/kg indicates little organic matter. The unpublished soil survey manual for Monroe County (SCS, draft) classifies soils surrounding the Boca Chica Airfield as Udorthents.

2.2.3 Hydrology

Groundwater levels at the site are highest in September [approximately 1.5 ft below land surface (BLS)] and lowest in May (approximately 5 ft BLS). No quantitative information exists on surface water additions to this site, which may be significant due to the presence of impermeable paved runways and taxiways.

2.3 FLEMING KEY SOUTH LANDFILL (IR-8)

Planned interim remedial actions include construction of a shoreline protection revetment to prevent further erosion of the landfill border (see Figure 4). The landfill covers approximately 45 acres on the southern end of Fleming Key and is heavily vegetated with Australian pine and some mangroves along the border (see Photos 5 and 6). Waste materials from the City of Key West and the Navy and dredging wastes were disposed at the site until 1982. Fleming Key is separated from the island of Key West by a channel. The Man of War Harbor on the west side of Fleming Key is one of the main shipping channels leading to the harbor at Key West. The tidal current flow through the channel is rapid. Erosion along the shoreline has exposed construction debris wastes in the landfill (see Photos 7 and 8). The area adjacent to the shoreline that must be affected to install the seawall is classified as a jurisdictional wetland as evidence by the presence of wetland field indicators. A wetland data sheet is submitted for IR-8.

2.3.1 Vegetation

Along the north side of the site is a slack water area covered with *Spartina*. This area may receive runoff from the central and northern areas of the landfill but is unaffected by the planned IRA. The area bordering the west and southern ends of the landfill are covered with Australian pines (*Casuarina* spp.) and some red (*R. mangle*) and black mangroves (*A. germinans*). This eroded border will be impacted during the construction of the shoreline revetment.

2.3.2 Soils

The soil is very porous and consists of poorly sorted limestone fill of very coarse sand and gravel (IT Corp., 1994). The CEC was 56.1 meq/g, and the TOC was 5700 mg/kg. The pH is very basic (8.5) and permeability was 1.04E-05 cm/sec. The soil survey manual (SCS, draft) maps the soil beneath the landfill as udorthents and that area to the north as Islamorada series, classified as a lithic Troposaprists. Preliminary investigations (Geraghty and Miller, Inc., 1987) show no additional information on the presence of hydric characteristics. It is assumed that the erosion of the shoreline has removed much of the hydrological and edaphic field indicators of jurisdictional wetlands.

2.3.3 Hydrology

The groundwater elevations and direction are tidally influenced by water levels in the Man of War Harbor. Groundwater elevations average 0.4 to 0.8 ft BLS during the period of April-May 1993 (IT Corp., 1994). Preliminary investigations measured groundwater levels in July and August of 1986 ranging from 0.4 to 0.9 ft MSL. Reports of seawater in trenches at the time of waste disposal also indicates a high groundwater table in the interior of the landfill site (Geraghty and Miller, Inc., 1987).

2.4 BIG COPPITT KEY ABANDONED CIVILIAN DISPOSAL AREA (AOC-B)

The site is a horseshoe-shaped fill area, approximately 100 ft wide by 250 ft long (see Figure 5). A light soil cover of approximately 6 to 12 in. overlies crushed car bodies and debris 1 to 2 ft thick (see Photo 9). The elevated fill area lies within an encroaching mangrove swamp (Photo 10) and adjacent to a canal, which is connected with the ocean. A wetland data sheet is included for AOC-B. The area dominated by mangroves indicates the border of this disposal area is a jurisdictional wetland.

2.4.1 Vegetation

An established and encroaching red and black mangrove community surrounds the disposal fill area. Immediately south of the entrance road to the site lies a small transitional buttonwood community, which is favored habitat for the endangered Lower Keys Marsh Rabbit. Access from the main road is partially blocked by a fringing row of mangroves; however, it is anticipated that equipment to be used for remedial action can access the site with little or no damage to the mangroves near the access road.

2.4.2 Soils

The unpublished soil survey manual maps the soils of this site as rock outcrop - Cudjoe complex, tidal and Islamorada. Islamorada soil series is classified as a mucky organic soil horizon over weathered bedrock, Lithic Tropasaprists. Soil borings consisted of soft greenish black to dark brown organic peat-like material, lime mud, and small rock and shell fragments. TOC for the soil was 6,100 mg/kg.

2.4.3 Hydrology

The site is partially inundated from surface water except for the central elevated peninsula of dry land. Ground elevations at the site vary from sea level up to approximately 2 ft above sea level. A canal is located along the northeast side of the study site. Groundwater levels averaged at approximately 0.5 to 1 ft BLS.

3.0 IRA SITES REMOTE FROM JURISDICTIONAL WETLANDS

3.1 BOCA CHICA FIRE FIGHTING TRAINING AREA (SWMU-3)

The site is located on Boca Chica Key in the southeast portion of NAS Key West immediately west of the southern blimp pad. The area consists of two unlined circular pits of which only the eastern pit is currently scheduled for remediation (see Figure 6). The pits are approximately 55 ft in diameter and 2-3 ft in depth. The pits were surrounded by recently graded gravel berms approximately 5 ft wide at the base. Piles of plane wreckage exist throughout the area of the site and are still being used as training tools from NAS operations. Planned remediation consists of delineation of the extent and excavation of contaminated materials. Mangrove wetlands are present near the site (>100 ft) but are not likely to be affected by remediation if proper precautions are undertaken. No wetland data sheet is submitted for SWMU-3 (see Photos 11 and 12).

3.1.1 Vegetation

Mangroves grow along the shoreline at the closest point 130 ft from the center of the east fire-fighting pad. Sparse vegetation grows between the mangroves and the site.

3.1.2 Soils

During drilling of boreholes (IT Corp., 1994), reworked crushed oolitic limestone with slight fractions of silt were encountered at the surface and extended to 10 ft BLS. Grain size analysis of soil samples indicates a well graded, highly compacted gravel, medium to coarse grained sand with 17.8 percent fines. The pH of the sample was 8 indicating a carbonate soils and rocks. The CEC is 44.2 meq/g, and the TOC is 0.73 mg/kg. The permeability of $9.55E-06$ cm/sec is representative of a fine sand. The unpublished soil survey manual for Monroe County maps the soils as udorthents - urban land complex (SCS, draft). Earlier preliminary investigations (Geraghty and Miller, Inc., 1987) of monitoring wells (KWM18, KWM19) and soil borings (10-B-1 through 10-B-8) verify more recent soil descriptions.

3.1.3 Hydrology

Groundwater flow at the site is tidally influenced. During April and May of 1993, average groundwater elevations in the east fire-fighting pit were 0.76-0.48 ft BLS. An unnamed lagoon leading to the ocean is part of an old borrow pit.

3.2 BUILDING A-824 (SWMU-7)

This fenced site is located west of US 1 on Boca Chica Key near a small arms firing range. The building was formerly used to store hazardous waste and currently houses a solvent recycling operation (Figure 7). Remediation is planned within the fence at the north end of the building (Photo 13) and consists of excavation of contaminated soils immediately behind the building with subsequent backfilling and revegetation. Habitat for the endangered Lower Keys Marsh Rabbit exists across the road to the east and across the drainage ditch to the west but will not be adversely affected by activities. Remediation of northern end of fenced area is not expected to affect significantly a pond and fringing wetlands adjacent to the fence (see Photo 14). No wetland data sheet is submitted for SWMU-7.

3.2.1 Vegetation

The area within the fence at the building is grassed and apparently frequently mown. Hydrophytic vegetation associated with a mosquito ditch to the west of the fence and a small pond immediately north of the fence exists.

3.2.2 Soils

The unpublished soil survey manual maps the soil as Cudjoe series and classified as a tropic fluvaquents. Soils around the perimeter of the building consisted of dense limestone fill beneath oolitic limestone cap rock. Southwest of the building, organic rich sediments were encountered in soil borings near the mosquito ditch (IT Corp., 1994).

3.2.3 Hydrology

The water table was present at 1 to 3 ft BLS in the vicinity of the building. To the southwest near the mosquito ditch, the water table was at or very near the surface. Groundwater flow is significantly influenced by the elevation of water in the ditch. A marsh west of the mosquito ditch grades to the ocean. Approximately 30 ft north of the building is a small pond surrounded by hydrophytic vegetation. The mosquito ditch drains overflow from the pond into the marsh.

3.3 TRUMAN ANNEX REFUSE DISPOSAL AREA (IR-1)

The site is located along the southern windward shore of Truman Annex on Key West. The 7 acre fenced site includes an antenna field and the area immediately north (see Figure 8). Shoreline protection consists of large concrete rubble and debris. The main sewer outfall line for Key West runs through the property, and the surrounding soils have undergone prior remediation. The disposal site is 10-15 ft above MSL and relatively flat with good grass cover. Material encountered during soil borings consisted of fill sands, reworked limestone, and gravel interspersed with debris, trash, and natural oolitic limestone. The fill was compacted and extended to

13 to 15 ft BLS. The depth to groundwater at the site is approximately 6 ft BLS at the end of the dry season (May). A sandy beach 100 ft to the northwest hatched 30 Atlantic loggerhead turtles (*C. c. caretta*) in September of 1991; however, access by turtles to the site is prevented by fencing. Planned remediation consists of delineation of the extent and excavation of contaminated materials. No wetlands are apparent on or near the site and no wetland data sheet is submitted for IR-1.

3.4 TRUMAN ANNEX DDT MIXING AREA (IR-3)

The site is located inland near a residential area, Fort Street (see Figure 9). The site is completely enclosed by a chain link fence and covered with tall grass and weeds. Contamination at the site was a result of storage and transfer accidental spillage; no disposal activities were performed onsite. During geological investigations, groundwater is present at approximately 5 ft BLS during the seasonal low. Soil borings indicated poorly sorted limestone fill mixed with gravel at the surface and sandy well-sorted limestone fill at depth. Planned remediation consists of delineation of the extent of contaminated soils and excavation. No wetlands are present at or near the site, and no data sheet is submitted for IR-3.

3.5 FLEMING KEY NORTH LANDFILL (IR-7)

The landfill covers approximately 16 acres of flat open area west of the USDA Animal Import Center at the northern end of Fleming Key (see Figure 10 and Photo 15). The elevated landfill is bounded on the west side by a dirt road, which follows the shoreline (see Photo 16). The scope of work for this site consists of filling and grading low areas on the landfill cap to prevent ponding of water. Wetland indicators are present in surrounding ditches at the toe of the slope of the landfill; however, these areas will not be affected by the filling and grading of low areas on the landfill cap. A wetland data sheet is submitted for IR-7.

3.5.1 Vegetation

The southwest edge of the site between the road and landfill area is a low area that ponds surface water runoff and is covered with trees and shrubs including Australian pine (*Casuarina* spp.), Brazilian pepper (*S. terebinthifolia*), bay cedar (*Suriana maritima*) and joewood (*Jacquinia keyensis*). Most of the landfill site is covered with mown grass.

3.5.2 Soils

A single soil sample showed a CEC of 39.4 meq/g and a TOC of 6,600 mg/kg. The pH of the sample was 8.4 due to the carbonate nature of the fill material. Permeability is $1.11E-05$ cm/sec representative of a fine to silty sand (IT Corp., 1994). The soil is mapped and classified as a udorthents by the unpublished county soil survey manual (SCS, draft). Lithologic logs from preliminary investigations (Geraghty and Miller, Inc., 1987) describe soils from monitoring wells (KWM-12) as fine- to medium-grained sand mixed with limestone and organic material.

3.5.3 Hydrology

The groundwater flow and elevation are significantly influenced by the tides from the Gulf of Mexico located to the east and the Man of War Harbor located to the west of the site. A small surface water inundated area between the dirt road and the landfill edge exists. Groundwater elevations averaged 0.4 ft BLS within the elevated portion of the landfill.

3.6 DEMOLITION KEY OPEN DISPOSAL AREA (AOC-A)

The site is the northern half of a man-made dredge spoil island historically used for explosives disposal. Burning and/or detonation in pits were the methods used for disposal of out-of-date ordnances (Figure 11). Demolition Key is approximately 6 ft above MSL at its highest point. Some of shoreline is elevated to the extent to be beyond tidal influence at the surface (Photo 17). Remediation activities include delineation of the extent of contamination and excavation. The presence of dominant exotic vegetation effectively obscures any indigenous vegetation indicative of wetlands. No wetland indicators were apparent at the sample site for AOC-A. A wetland data sheet is included for AOC-A to document the absence of field indicators.

3.6.1 Vegetation.

The interior of the northern half of Demolition Key near the blast pits (see Photo 18) is dominated by brazilian pepper (Schinus terebinthifolius) and Australian pines (Casuarina spp.); however, the shoreline supports a dense mangrove community approximately 2 to 3 ft in height to the north and south of the site limits (Photo 19). However, no mangroves are growing along the shoreline adjacent to the blast pit areas (see Photo 20) to be remediated and remedial activities will not impact the mangrove community. Reports exist of the presence of bay cedar (S. maritima) (IT Corp., 1994).

3.6.2 Soils

Borings consisted of loose, light to dark grayish brown sand to oolitic loam and fine to coarse gravels of limestone with roots and shells (IT Corp., 1994). Possible presence of unexploded ordnance precludes invasive observation.

3.6.3 Hydrology

No monitoring wells exist onsite but the porosity of soils indicate rapid percolation of rainwater and interaction with seawater. Groundwater elevations in soil borings varied from 0 to 2 ft BLS in April-May of 1993 (IT Corp., 1994).

3.7 JET ENGINE TEST CELL (JETC)

This site is located in the northeast section of Boca Chica Field and used to test recently repaired jet engines. The site is bordered on the south by an asphalt road, on the north by a saltwater inlet, and on the east and west by open, flat-lying grassy areas (see Figure 12 and Photo 21). Ground elevations vary from 0 to 5 ft above MSL. Planned remediation includes installation of a groundwater extraction system and either a reinjection gallery or piping of the effluent to the NAS wastewater treatment facility. Groundwater removal is not expected to affect the supply of surface water to the fringing wetlands along the inlet. Wetland jurisdiction is confined to the area dominated by mangroves and immediately adjacent to the open water (see Photo 22). Construction of the groundwater remediation system, including installation of extraction wells, will not affect wetlands. A wetland data sheet is submitted for JETC.

3.7.1 Vegetation

The immediate area is surrounded by mown grass but a fringing mangrove swamp exists along the shoreline of the saltwater inlet approximately 50 ft to the north. No mangroves grow directly behind the blast deflectors.

3.7.2 Soils

The area is mapped as Udorthents, which consist of extremely gravelly sand overlying marl. No soil borings exist to confirm the mapped series.

3.7.3 Hydrology

No information exists on inundation or saturation for this site.

SUMMARY

Wetland boundaries at the Naval Air Station, Key West, were delineated primarily by the presence of *mangroves* since this community formed an obvious demarcation of the hydrophytic community. Soils information was primarily from earlier intrusive investigations and not verified due to the presence of unknown contamination. Jurisdictional wetlands, which will be affected by interim remedial activities, have been identified on four sites: (1) Boca Chica Open Disposal Area (SWMU-1), (2) Boca Chica DDT Mixing Area (SWMU-2), (3) Fleming Key South Landfill (IR-8), and (4) Big Coppitt Key Abandoned Civilian Disposal Area (AOC-B).

Other sites that have wetlands proximate to the site but should not be affected by remedial activities include (1) Boca Chica Fire Fighting Training Area (SWMU-3), (2) Building A-824 (SWMU-7), (3) Demolition Key (AOC-A), and (4) Jet Engine Test Cell (JETC).

APPENDIX A

SITE MAPS

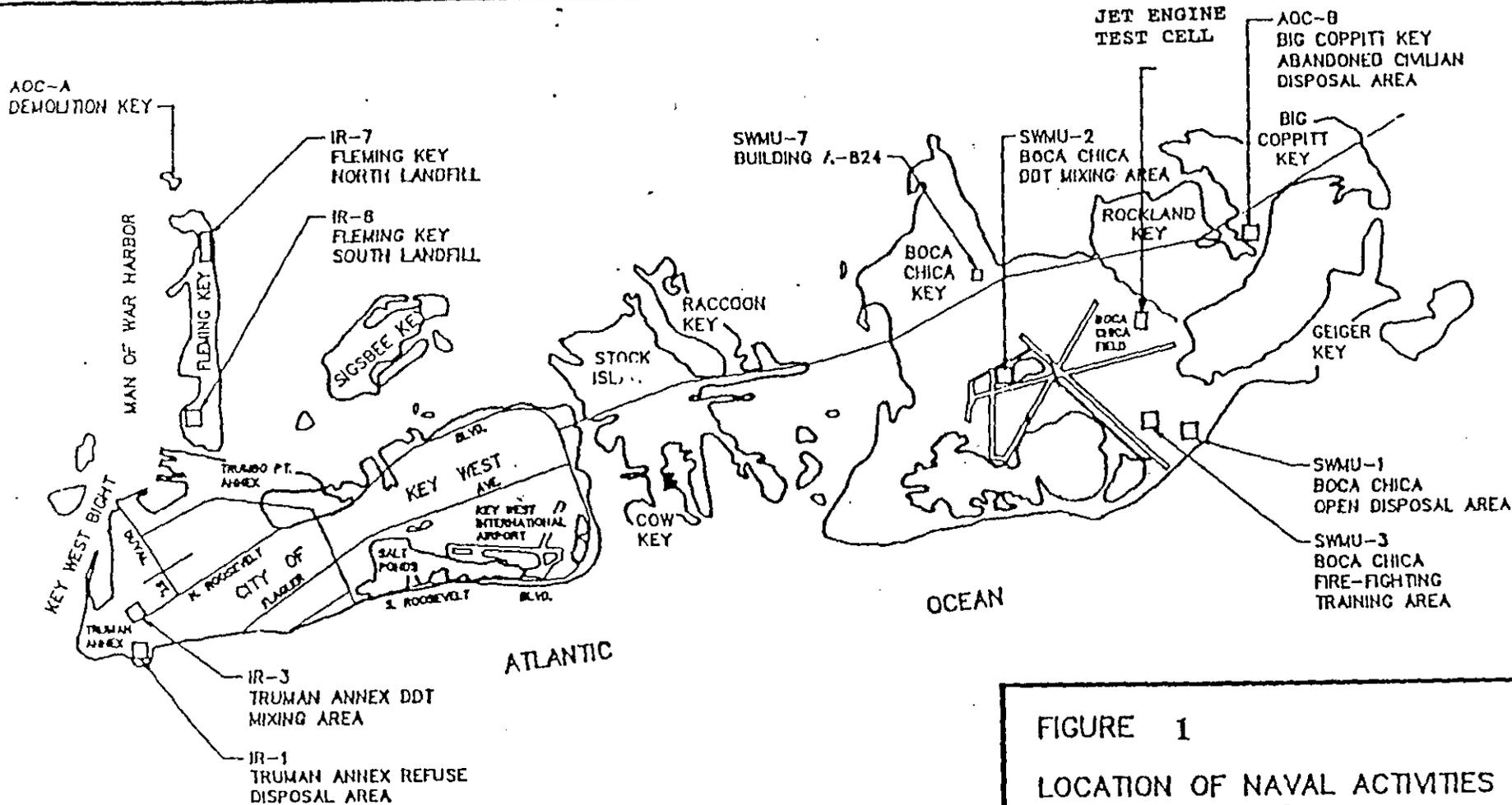


FIGURE 1

LOCATION OF NAVAL ACTIVITIES
AND STUDY SITES
NAS - KEY WEST
KEY WEST, FLORIDA

Prepared for:
NAS - KEY WEST
KEY WEST, FLORIDA

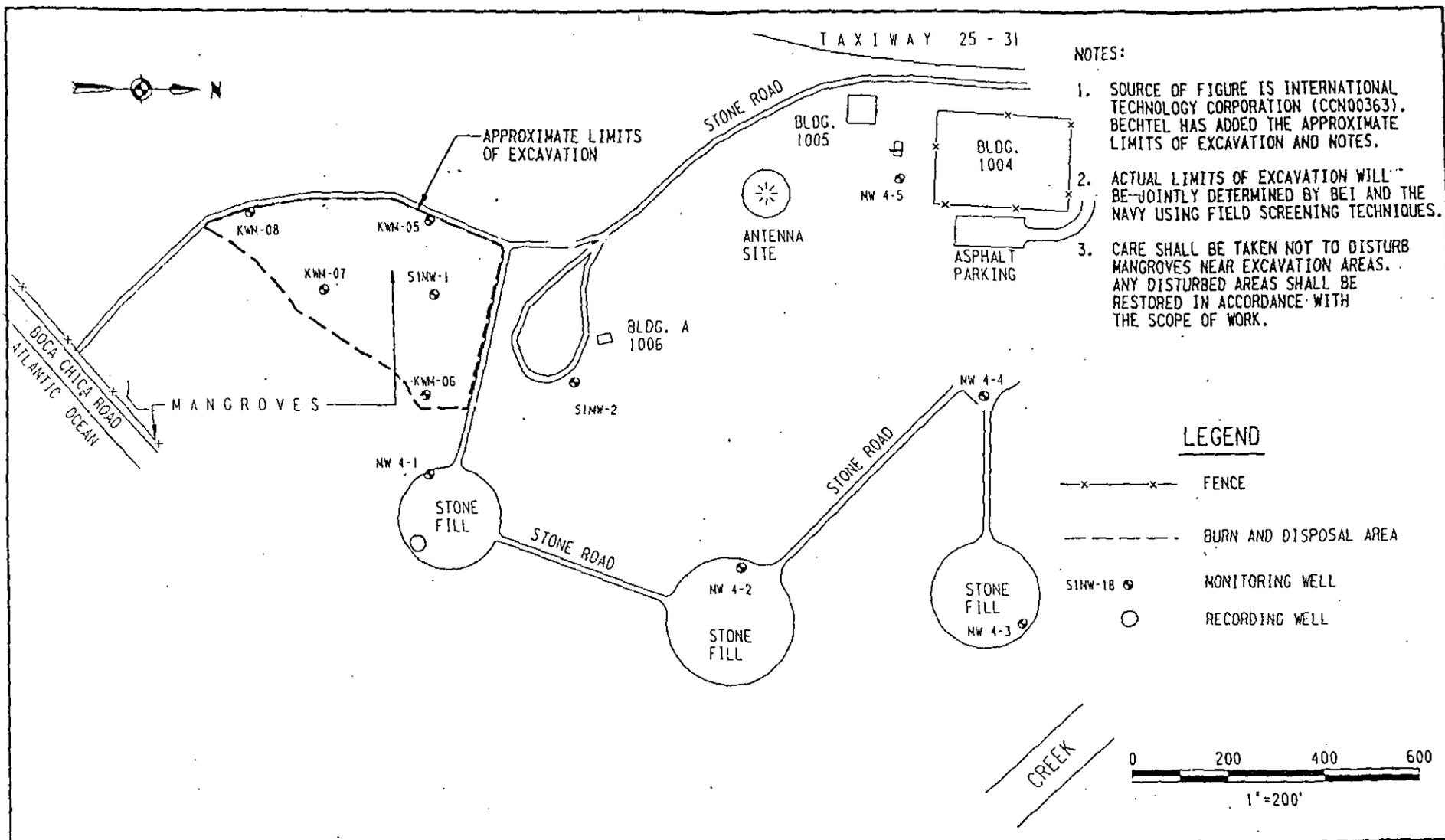


NOT TO SCALE

Source of Figure is IT Corp. Bechtel has added Jet Engine Test Cell

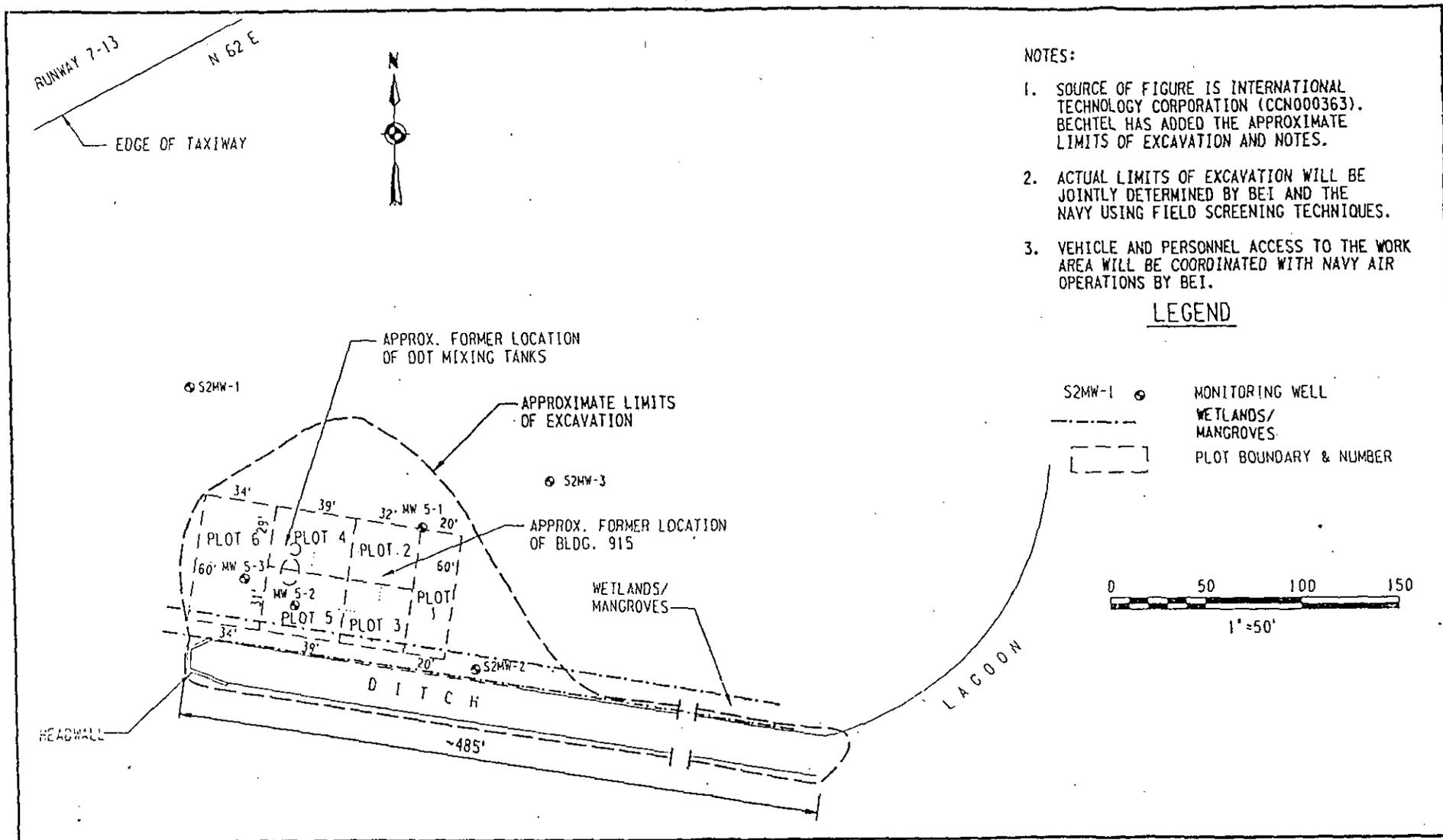


A-3



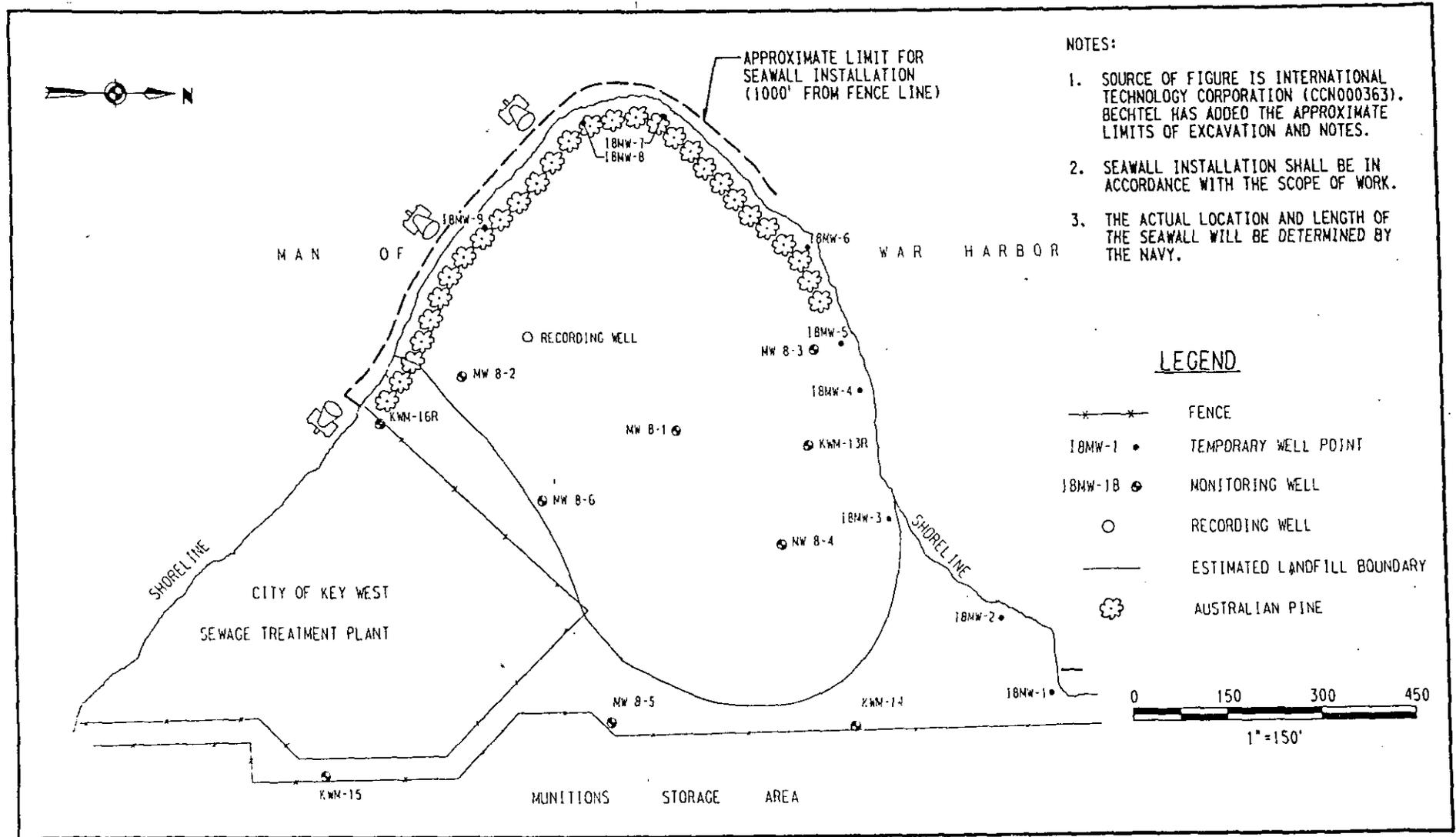
21267 221 FIG2-1.GCM

FIGURE 2
SWMU NO. 1 - BOCA CHICA
OPEN DISPOSAL AREA



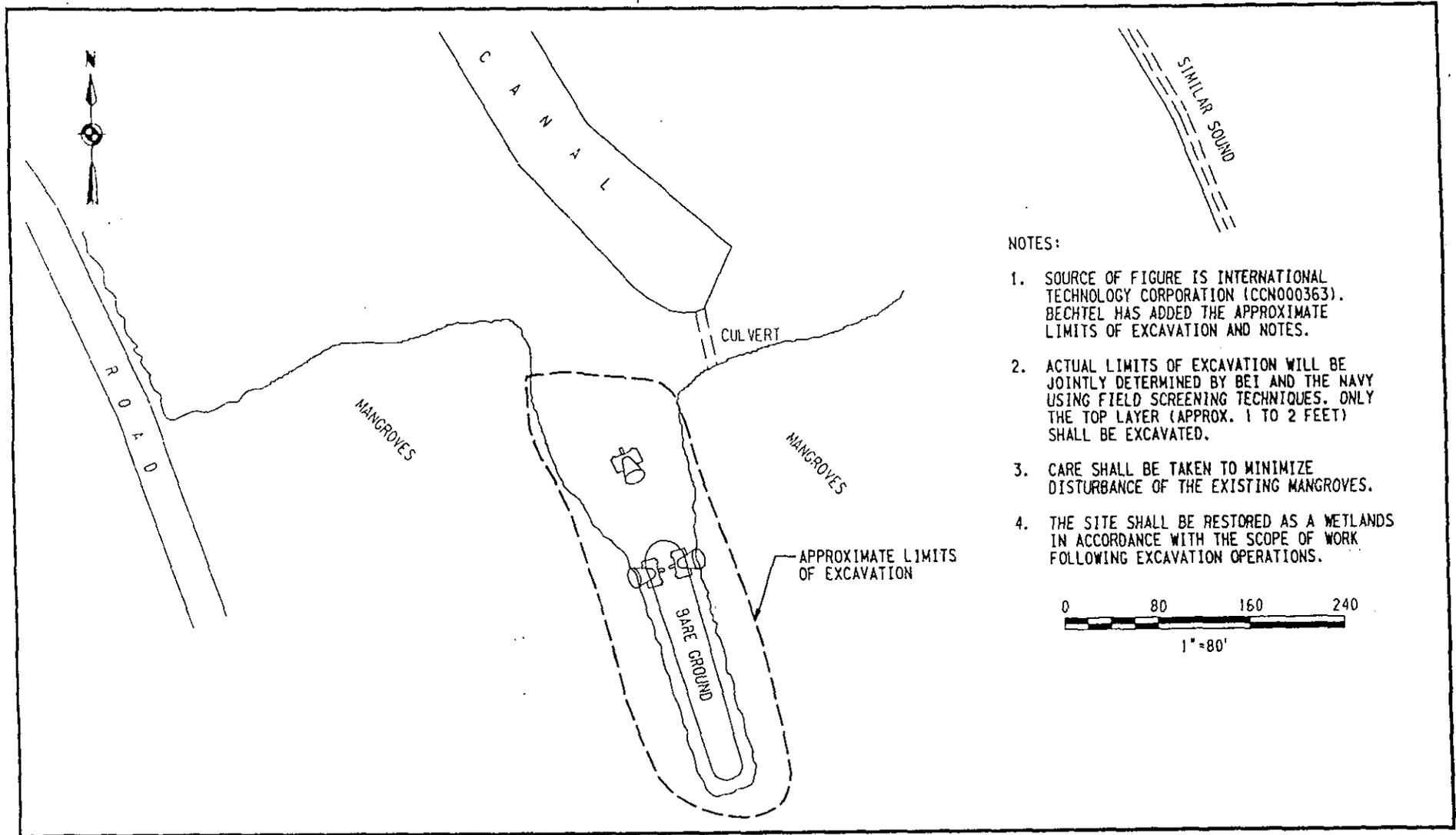
22541 321 48702896.DGN

FIGURE 3
 SWMU NO.2 - BOCA CHICA
 DDT MIXING AREA



11667 121 WEST.P&D>

FIGURE 4
SHORELINE STABILIZATION BELOW MHW
AT FLEMING KEY SOUTH LANDFILL (IR NO.8)



NOTES:

1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES. ONLY THE TOP LAYER (APPROX. 1 TO 2 FEET) SHALL BE EXCAVATED.
3. CARE SHALL BE TAKEN TO MINIMIZE DISTURBANCE OF THE EXISTING MANGROVES.
4. THE SITE SHALL BE RESTORED AS A WETLANDS IN ACCORDANCE WITH THE SCOPE OF WORK FOLLOWING EXCAVATION OPERATIONS.

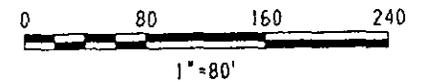
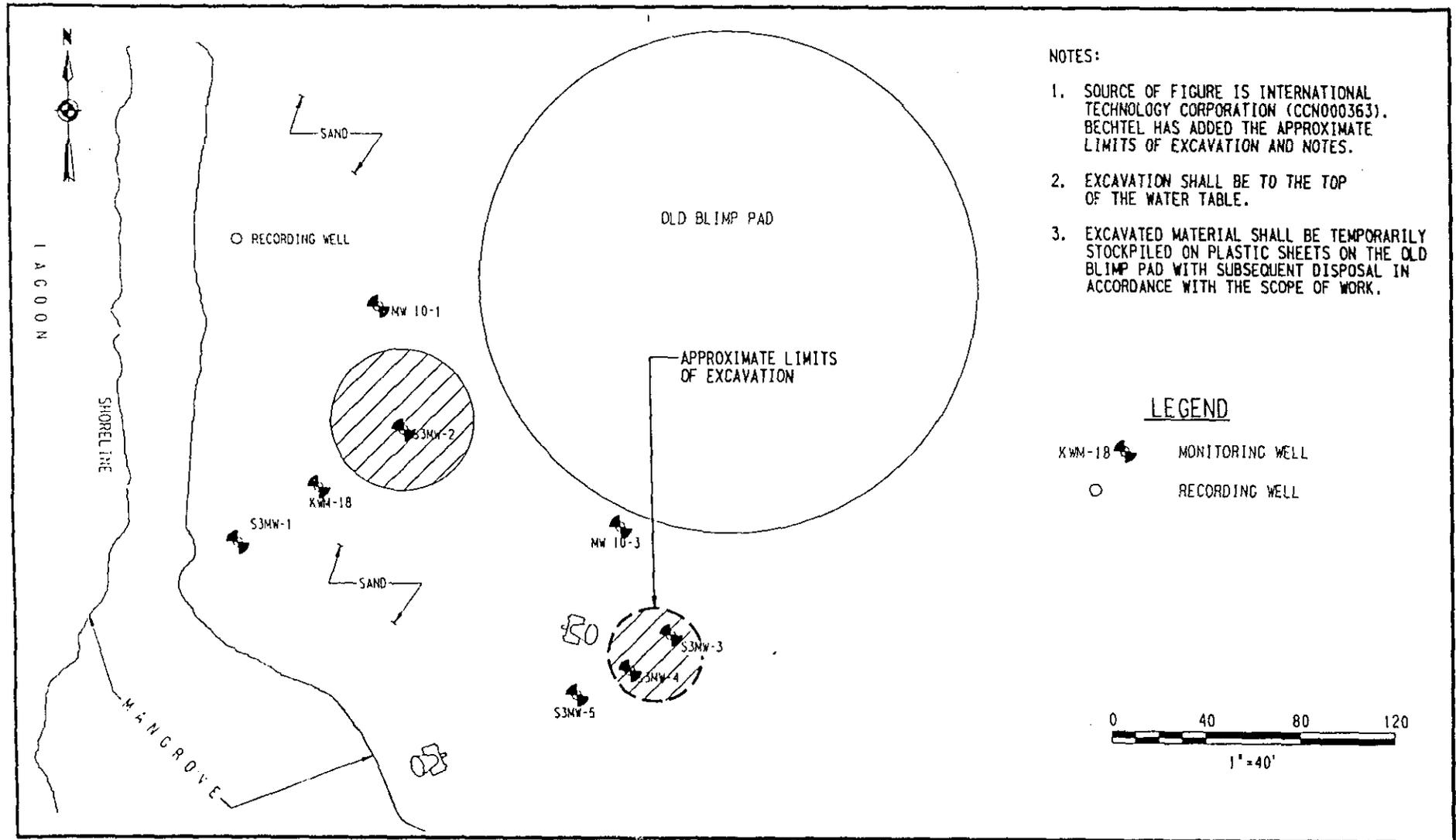


FIGURE 5
MANGROVE WETLANDS IN BIG COPPITT KEY
ABANDONED CIVILIAN - DISPOSAL AREA (AOC SITE-B)



NOTES:

1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
2. EXCAVATION SHALL BE TO THE TOP OF THE WATER TABLE.
3. EXCAVATED MATERIAL SHALL BE TEMPORARILY STOCKPILED ON PLASTIC SHEETS ON THE OLD BLIMP PAD WITH SUBSEQUENT DISPOSAL IN ACCORDANCE WITH THE SCOPE OF WORK.

LEGEND

- XWM-18  MONITORING WELL
-  RECORDING WELL

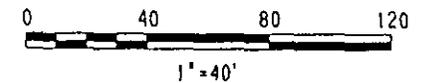


FIGURE 6
LOCATION OF MANGROVE SWAMP
AT BOCA CHICA FIRE FIGHTING
TRAINING AREA (SWMU NO. 3)

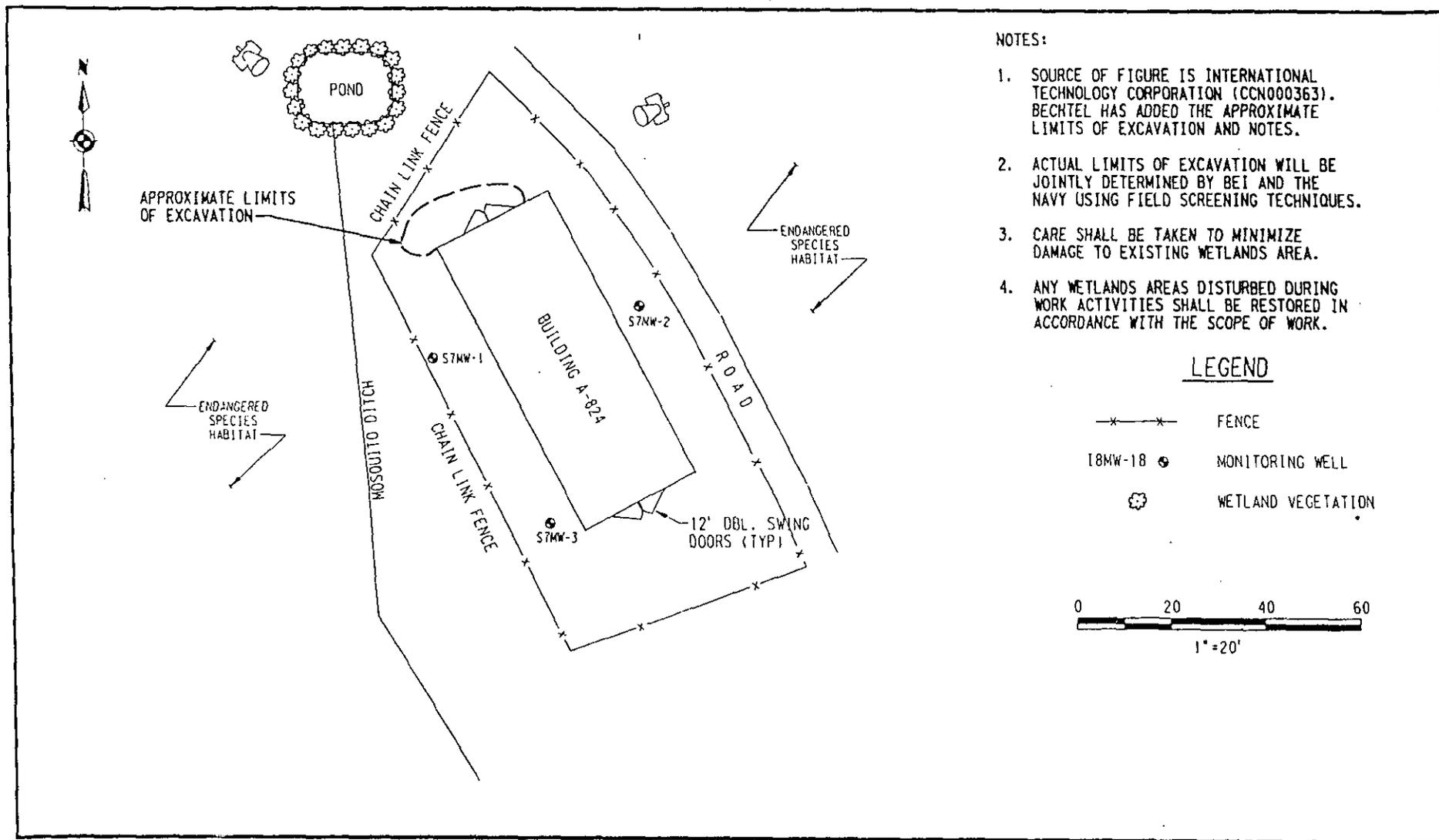


FIGURE 7
LOCATION OF WETLAND AND HABITAT
NEAR BOCA CHICA BUILDING A-824
(SWMU NO.7)

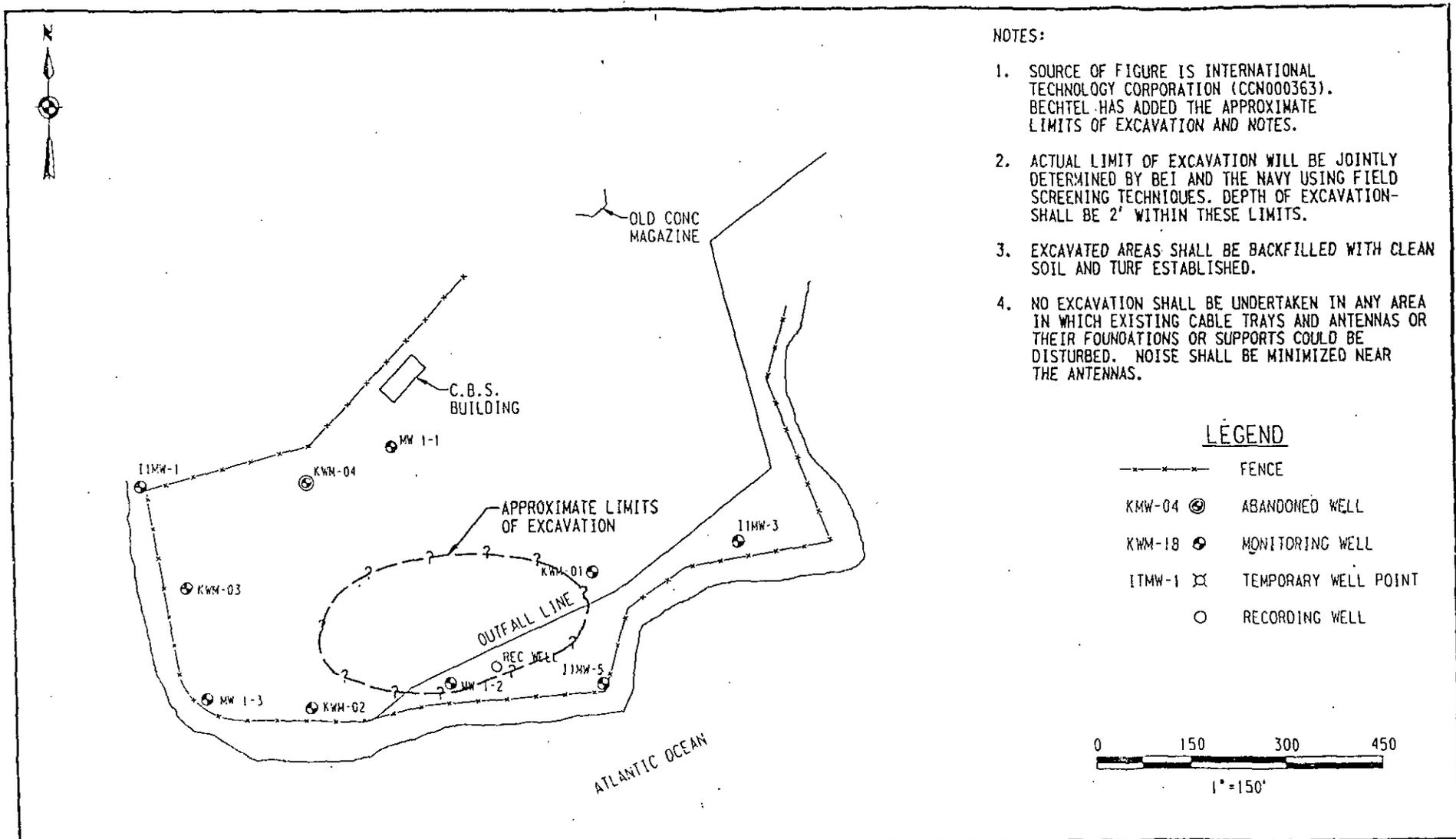


FIGURE 8
IR NO.1 - TRUMAN ANNEX (KEYWEST)
REFUSE DISPOSAL AREA

NOTES:

1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES.
3. CARE SHALL BE TAKEN TO MINIMIZE DAMAGE TO EXISTING WETLANDS AREA.
4. ANY WETLANDS AREAS DISTURBED DURING WORK ACTIVITIES SHALL BE RESTORED IN ACCORDANCE WITH THE SCOPE OF WORK.

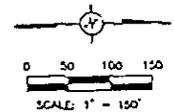
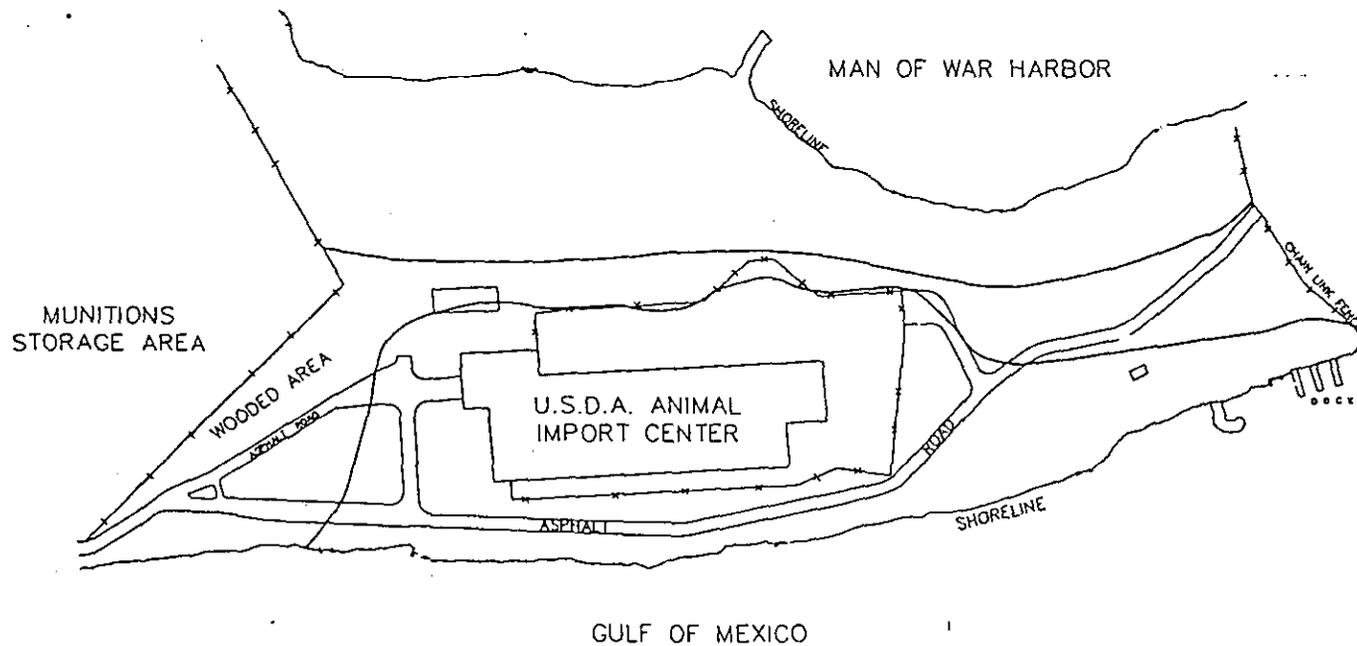


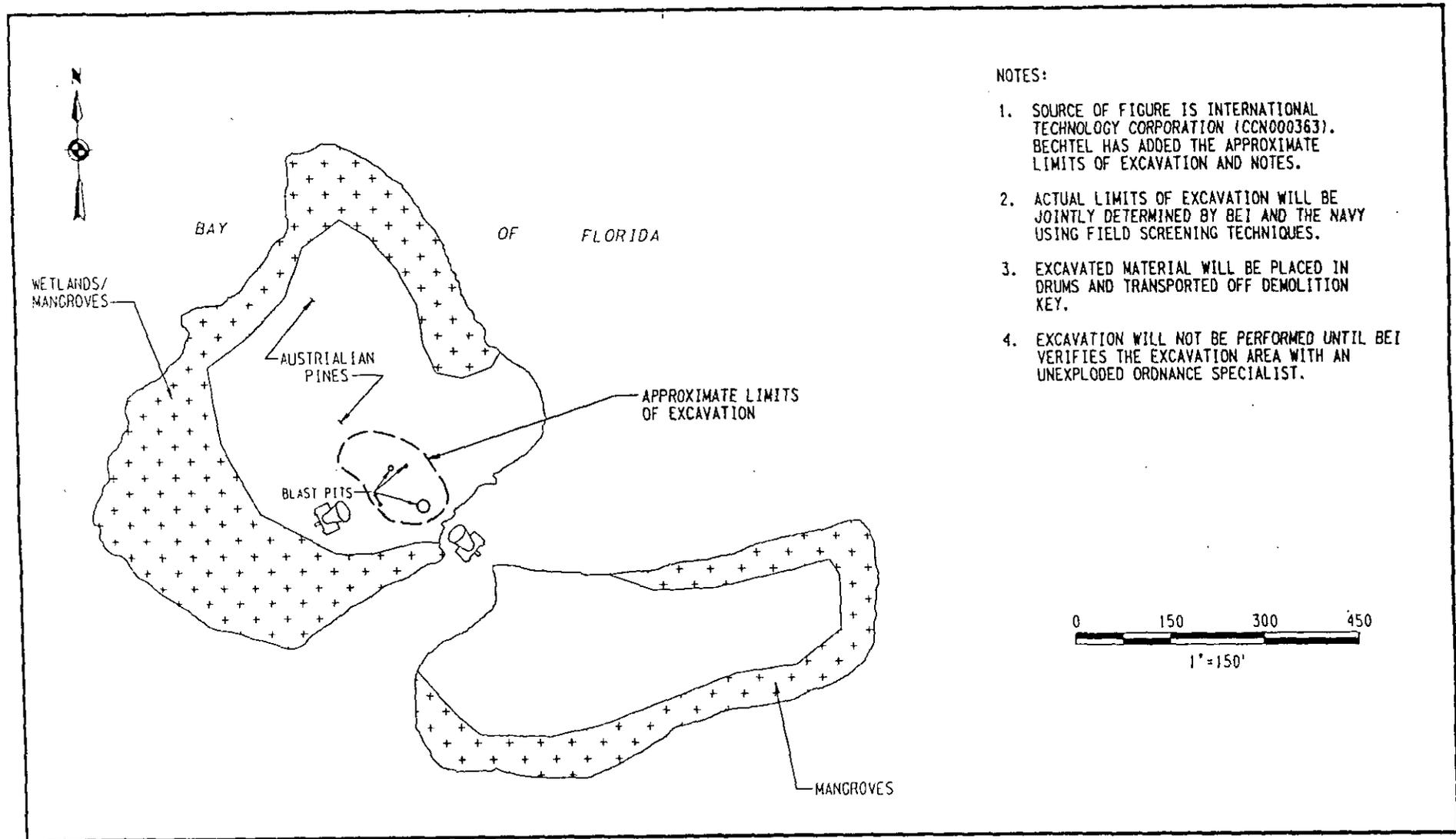
FIGURE 10

IR NO. 7 - FLEMING KEY
NORTH LANDFILL

Prepared for:

NAS - KEYWEST
KEY WEST, FLORIDA

IT INTERNATIONAL
TECHNOLOGY
CORPORATION



NOTES:

1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES.
3. EXCAVATED MATERIAL WILL BE PLACED IN DRUMS AND TRANSPORTED OFF DEMOLITION KEY.
4. EXCAVATION WILL NOT BE PERFORMED UNTIL BEI VERIFIES THE EXCAVATION AREA WITH AN UNEXPLODED ORDNANCE SPECIALIST.

FIGURE 11
MANGROVE WETLANDS NEAR
DEMOLITION KEY OPEN DISPOSAL
AREA (AOC SITE - A)

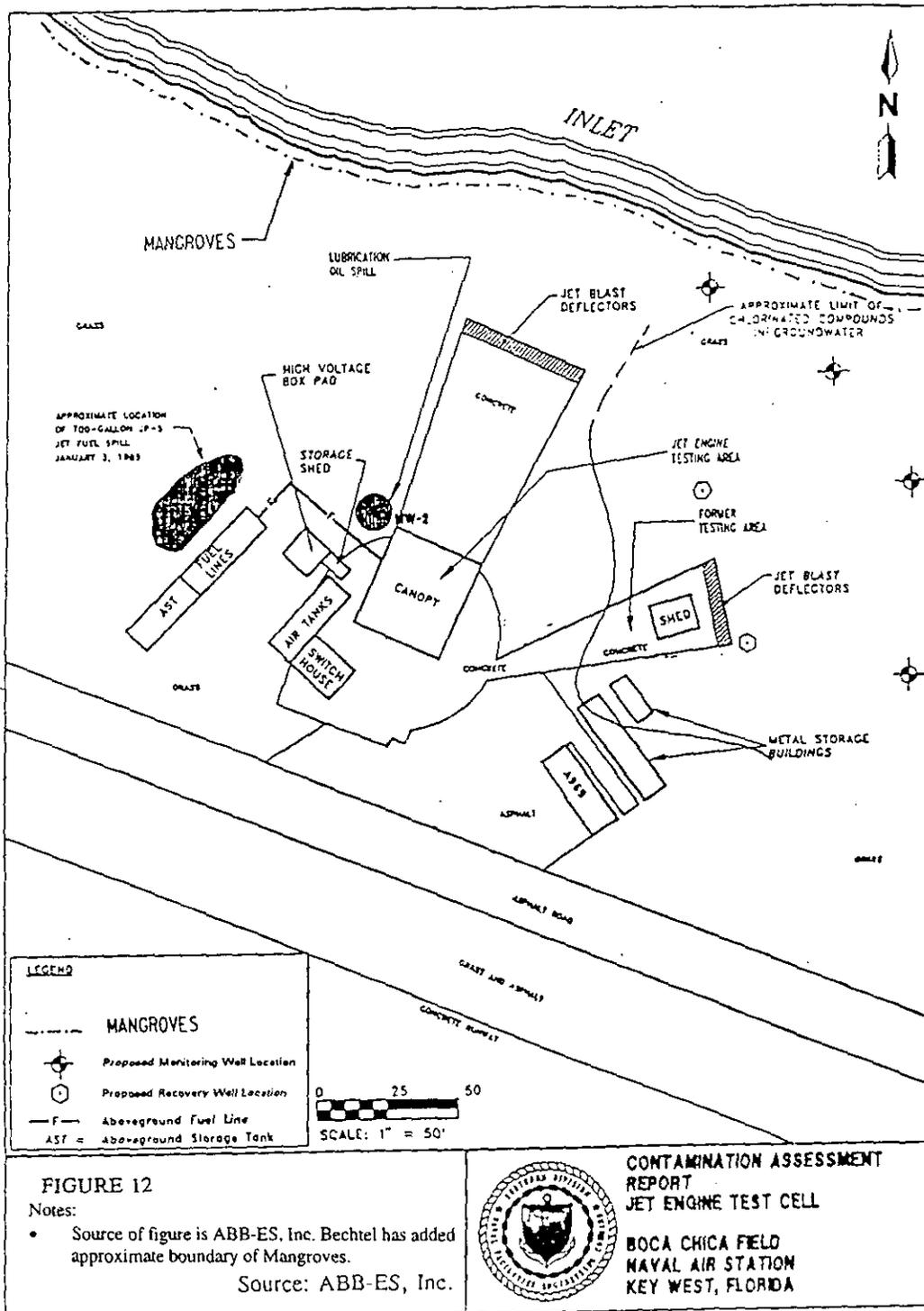




Photo 1. Boca Chica Open Disposal Area (SWMU-1). Mostly bare ground with interspersed mangroves. Utility poles in distance along Boca Chica Road.



Photo 2. Boca Chica Open Disposal Area (SWMU-1). At southeastern end of bare ground showing association of vegetation (black mangroves) with existing open water. Approximate location of wetland sample site.



Photo 3. Boca Chica DDT Mixing Area (SWMU-2). Three cover types present include bare ground, herbaceous, and mangrove. Approximate location of wetland sample site.



Photo 4. Boca Chica DDT Mixing Area (SWMU-2). Drainage ditch to be dredged for contaminated sediments.



Photo 5. Fleming Key South Landfill (IR-8). Shoreline of landfill showing predominance of Australian Pines but scattered mangrove.



Photo 6. Fleming Key South Landfill (IR-8). Eroding shoreline and red mangroves. Approximate location of wetland sample site.



Photo 7. Fleming Key South Landfill (IR-8). Construction rubble dislodged by eroding shoreline.



Photo 8. Fleming Key South Landfill (IR-8). Profile of shoreline.



Photo 9. Big Coppitt Key Abandoned Civilian Disposal Area (AOC-B). Photo shows elevated area with encroaching mangroves.



Photo 10. Big Coppitt Key Abandoned Civilian Disposal Area (AOC-B). Mangroves encroaching into rusted car body parts. Approximate location of wetland sample site.



Photo 11. Boca Chica Fire Fighting Training Area (SWMU-3). Photo shows distinct boundary between mangroves and bare ground.



Photo 12. Boca Chica Fire Fighting Training Area (SWMU-3). Berm behind people is easternmost fire pit to be excavated. Mangroves are > 100 ft to left (SW).



Photo 13. Building A-824 (SWMU-7). Remediation area within fence at northern end of building. Vegetation surrounding pond immediately north of fence.



Photo 14. Building A-824 SWMU-7). Photo taken at water's edge on northern end of building.



Photo 15 Fleming Key North Landfill (IR-7). Flat grassy area west of USDA Animal Import Center.



Photo 16. Fleming Key North Landfill (IR-7). Vegetation of toe of slope. Roadway in foreground along property line and adjacent to shoreline. Approximate location of wetland sample site.



Photo 17. Demolition Key (AOC-A). Photo taken at water's edge (note drift lines) showing elevation change to position of blast pit at right of people.



Photo 18 Demolition Key (AOC-A). General vegetation at largest of 4 blast pits. Approximate locatin of wetland sample site.



Photo 19. Demolition Key (AOC-A). Shoreline devoid of mangroves adjacent to blast pits.



Photo 20. Demolition Key (AOC-A). Mangroves to south of blast pits.



Photo 21. Jet Engine Test Cell (JETC). Fringing mangroves adjacent to inlet behind remediation site.



Photo 22. Jet Engine Test Cell (JETC). Approximate location of wetland sample site.

APPENDIX C
COE WETLAND DATA SHEETS

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Boya Chico Open Disposal Area (SWM4-1)</u> Applicant/Owner: <u>Naval Air Station Key West, Fla</u> Investigator: <u>D. Stair, A. Schuetz</u>	Date: <u>12/13/94</u> County: <u>Monroe</u> State: <u>Florida</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? Yes <input type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>SWM4-1</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Black Mangroves</u>		<u>OBL</u>	9. _____		
2. _____			10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: vegetation is widely scattered

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input checked="" type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input checked="" type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>Height of phreaticophore, indicate extensive flooding</u>	

DATA FORM
 • ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Boca Chica DDT Mixing Area (SWAU-2)</u> Applicant/Owner: <u>Naval Air Station, Egmont</u> Investigator: <u>D. Stair</u>	Date: <u>12/13/94</u> County: <u>Monroe</u> State: <u>Florida</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>SWAU-2</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Red mangroves</u>		<u>OBL</u>	9. _____		
2. <u>Sea Oxege Daisy</u>		<u>OBL</u>	10. _____		
3. <u>Black rush</u>		<u>OBL</u>	11. _____		
4. <u>Keygrass</u>		<u>OBL</u>	12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: _____

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: <u>18</u> (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>GW Not within 12 inches BLS however surface water may have significant input</u>	

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Fleming Key North Lake (A11 (IR-7))</u> Applicant/Owner: <u>Naval Air Station, Key West</u> Investigator: <u>D. Stair</u>	Date: <u>12/14/99</u> County: <u>Mohroe</u> State: <u>Florida</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>IR-7</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Brazilian pepper</u>		<u>FAC</u>	9. _____		
2. <u>Sea oxeye daisy</u>		<u>OBL</u>	10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): _____

Remarks: at slope

HYDROLOGY

<p><input type="checkbox"/> Recorded Data (Describe in Remarks):</p> <p style="margin-left: 20px;"><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p style="margin-left: 20px;"><input type="checkbox"/> Aerial Photographs</p> <p style="margin-left: 20px;"><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>at surface</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
Remarks: <u>at slope</u>	

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Fleming Key South Landfill (1R-8)</u> Applicant/Owner: <u>Naval Air Station, Key West</u> Investigator: <u>D. Stark</u>	Date: <u>12/14/94</u> County: <u>Monroe</u> State: <u>Fla</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>1R-8</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Australian pines</u>		<u>NI</u>	9. _____		
2. <u>Red mangroves</u>		<u>OBL</u>	10. _____		
3. <u>Black mangroves</u>		<u>OBL</u>	11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 75%

Remarks: _____

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other <input checked="" type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>___ Inundated ___ Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <input checked="" type="checkbox"/> Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)</p>
Remarks: <u>proximity to open water</u>	

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Demolition Key (AOC-A)</u> Applicant/Owner: <u>Naval Air Station, Key West</u> Investigator: <u>D. Stair</u>	Date: <u>12/15/94</u> County: <u>Monroe</u> State: <u>Fla</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>AOC-A</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Australian pine</u>		<u>NI</u>	9.		
2. <u>Brazilian Pepper</u>		<u>FAC</u>	10.		
3. _____			11.		
4. _____			12.		
5. _____			13.		
6. _____			14.		
7. _____			15.		
8. _____			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 50%

Remarks: _____

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>0.24</u> (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>No indicators apparent</u>	

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Blg Coppitt Abandoned Civilian Disposal Area</u> Applicant/Owner: <u>Naval Air Station, Key West</u> Investigator: <u>D. Flair, A. Schytz</u>	Date: <u>12/15/94</u> County: <u>Monroe</u> State: <u>Fla</u>
Do Normal Circumstances exist on the site? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>AOC-B</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Black Mangroves</u>		<u>OBL</u>	9. _____		
2. <u>Red Mangroves</u>		<u>OBL</u>	10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: _____

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>at surface</u> (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <p>Secondary Indicators (2 or more required):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<p>Remarks: _____</p>	

SOILS

Map Unit Name (Series and Phase): Islamorada Drainage Class: _____
 Taxonomy (Subgroup): lithic tropogypsis Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydro Soil Indicators:

<input checked="" type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input checked="" type="checkbox"/> Listed on National Hydric Soils List
<input type="checkbox"/> Gleyed or Low-Chrome Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: presence of rusted car bodies obscures indicators

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>Yes</u> No (Circle)	<input checked="" type="checkbox"/> (Circle)
Wetland Hydrology Present? <u>Yes</u> No	Is this Sampling Point Within a Wetland? <u>Yes</u> No
Hydric Soils Present? <u>Yes</u> No	

Remarks: see Figure 25

Approved by HQUSACE 3/92

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Jet Engine Test Cell</u> Applicant/Owner: <u>Naval Air Station Key West</u> Investigator: <u>D. Stair A. Schultz</u>	Date: <u>12/15/94</u> County: <u>Monroe</u> State: <u>Fla</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>JETC</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Red mangroves</u>		<u>OBL</u>	9. _____		
2. _____			10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: _____

HYDROLOGY

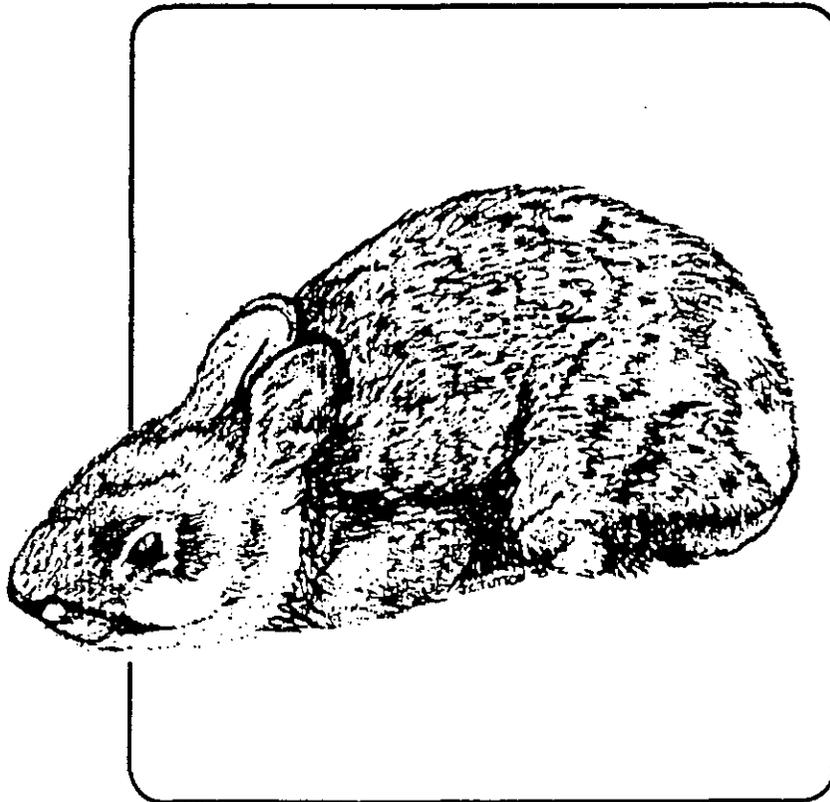
<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>at surface</u> (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: _____	

ATTACHMENT B

RECOVERY PLAN FOR THE LOWER KEYS MARSH RABBIT

RECOVERY PLAN

Lower Keys Marsh Rabbit (*Sylvilagus palustris hefneri*)



U.S. Fish and Wildlife Service

RECOVERY PLAN
FOR THE
LOWER KEYS MARSH RABBIT
(*Sylvilagus palustris hefneri*)

Prepared under contract by Elizabeth Forys

for
U.S. Department of the Interior
Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

RECEIVED
SEP 14 1994
BECHTEL 22567

Approved:



James W. Pulliam, Jr.
Regional Director, U.S. Fish and Wildlife Service

Date: January 5, 1994

DISCLAIMER

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect listed species. Plans are published by the U.S. Fish and Wildlife Service, sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. Objectives will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

Literature Citations should read as follows:

U.S. Fish and Wildlife Service. 1993. Recovery Plan for the Lower Keys Marsh Rabbit. Atlanta, Georgia. 15 pp.

Additional copies may be purchased from:

Fish and Wildlife Reference Service
5430 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814

Telephone: 301/492-6403 or 1/800-582-3421

Fees for recovery plans vary, depending upon the number of pages.

ACKNOWLEDGEMENTS

This Recovery Plan was prepared under contract by Elizabeth Forsys of the University of Florida. The majority of the data presented in this plan was obtained through a study funded by the Department of the Navy, Naval Air Station, Key West. The cover illustration was prepared by Jane Tutton, U.S. Fish and Wildlife Service, Vero Beach, Florida. The distribution map was prepared by Frederick Schaeffer, U.S. Fish and Wildlife Service, Vero Beach, Florida.

EXECUTIVE SUMMARY OF THE RECOVERY PLAN
FOR THE
LOWER KEYS MARSH RABBIT

Current Status: This subspecies is listed as endangered. The estimated total number of adult marsh rabbits during 1991 and early 1992 has fluctuated between 150 and 400 rabbits on three keys and the small islands off these keys. Half of the existing rabbit habitat is privately owned and unmanaged; the other half is federally owned.

Habitat Requirements and Limiting Factors: The Lower Keys marsh rabbit inhabits the buttonwood transition zone in the Lower Keys of Florida. Habitat destruction is the primary threat to the rabbit's survival; however, habitat degradation and human influenced mortality is also important.

Recovery Objective: Ongoing protection of existing populations and implementation of a reintroduction study are needed. Downlisting the species will be considered if the reintroduction study succeeds and maintains a minimum population size.

Recovery Criteria: Protect and manage all remaining areas of marsh rabbit habitat. If the reintroduction study succeeds, then reclassification to threatened could occur if a minimum total number of 400 rabbits (four keys with a minimum subpopulation of 100 rabbits/key) persists for at least 5 years.

Actions Needed:

1. Acquire marsh rabbit habitat and corridors. (Costs unknown)
2. Protect and manage habitat.
3. Protect marsh rabbits from human related mortality.
4. Conduct reintroduction study and reintroductions.
5. Monitor all marsh rabbit populations.
6. Inform and educate the public regarding the Lower Keys marsh rabbit.

Costs (000's):

Year	Need 2	Need 3	Need 4	Need 5	Total
1993	101.0	14.0	15.0	3.0	133.0
1994	12.5	4.0	10.0	3.0	29.5
1995	12.5	4.0	0.0	3.0	19.5
1996	12.5	4.0	0.0	3.0	19.5
1997	12.5	4.0	0.0	3.0	19.5
1998	2.5	4.0	10.0	3.0	19.5
1999	2.5	4.0	0.0	3.0	9.5
2000	2.5	4.0	0.0	3.0	9.5
2001	2.5	4.0	0.0	3.0	9.5
<u>2002</u>	<u>2.5</u>	<u>4.0</u>	<u>0.0</u>	<u>3.0</u>	<u>9.5</u>
Total	163.5	50.0	35.0	30.0	278.5

Date of Recovery: Reclassification to threatened may occur in 2002 if the reintroduction study succeeds.

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I. INTRODUCTION

The Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*) was described as a distinct subspecies by Lazell (1984). Lower Keys marsh rabbits were found to have a shorter molariform tooth row, a higher and more convex frontonasal profile, a broader cranium, and a longer dentary symphysis than mainland and Upper Keys rabbits. The subspecies was listed as endangered by the Florida Game and Fresh Water Fish Commission in 1989 (F.A.C. 39-27) and by the U.S. Fish and Wildlife Service (Service) in 1990 (U.S. Fish and Wildlife Service 1990). Critical habitat was not designated.

Historically, the range of the Lower Keys marsh rabbit extended from Big Pine Key to the southwesternmost of the Florida Keys, Key West (dePourtales, 1877). During the 1970's and 1980's a decline in Lower Keys marsh rabbits occurred (Lazell pers. comm.). Currently, the subspecies is limited to small population on a few keys and the total population estimates range between 150 and 400 rabbits. (Forys and Humphrey, unpublished report). Hereafter, all uncited data in this recovery plan are obtained from this report, a 2 and 1/2 year study of the Lower Keys marsh rabbit's biology and ecology. Approximately 35 percent of the occupied habitat is owned by the U.S. Navy, 15 percent is part of the Service's National Key Deer Refuge, and the remaining 50 percent is privately owned.

Description

S. p. hefneri is a medium sized cottontail rabbit with short, dark brown fur and a grayish-white belly. Its feet are relatively small, and its tail is dark brown and inconspicuous. External measurements collected from 13 non-pregnant adult female rabbits and 19 adult male rabbits found that marsh rabbits are not sexually dimorphic. The average measurements and standard deviations, in parentheses, of 29 adult marsh rabbits were as follows: weight 1,224.14 grams (g) (80.87), total length 339.31 millimeters (mm) (24.92), ear from notch, 52.66 mm (3.43), and right hind foot 73.62 mm (3.74).

Distribution

The marsh rabbit's historic range (Figure 1) extended from Big Pine Key to Key West (Layne 1974, Hall 1981) encompassing a linear distance of about 30 miles (48 kilometers (km)). It is probable that marsh rabbits were present on all keys that had suitable habitat in this chain.

Currently the marsh rabbit has been found to occupy 36 patches of habitat on a few major keys (Boca Chica Key, Saddlebunch / Sugarloaf Key, and Big Pine Key)(Figure 1) and the small islands near these keys. The majority of these habitat areas is smaller than 3 hectares (ha) and the total amount of habitat occupied is approximately 135 ha. Marsh rabbits were not found at another 23 patches of transition zone habitat. There is a large gap in the distribution of marsh rabbits from Cudjoe Key to the Torch Keys.

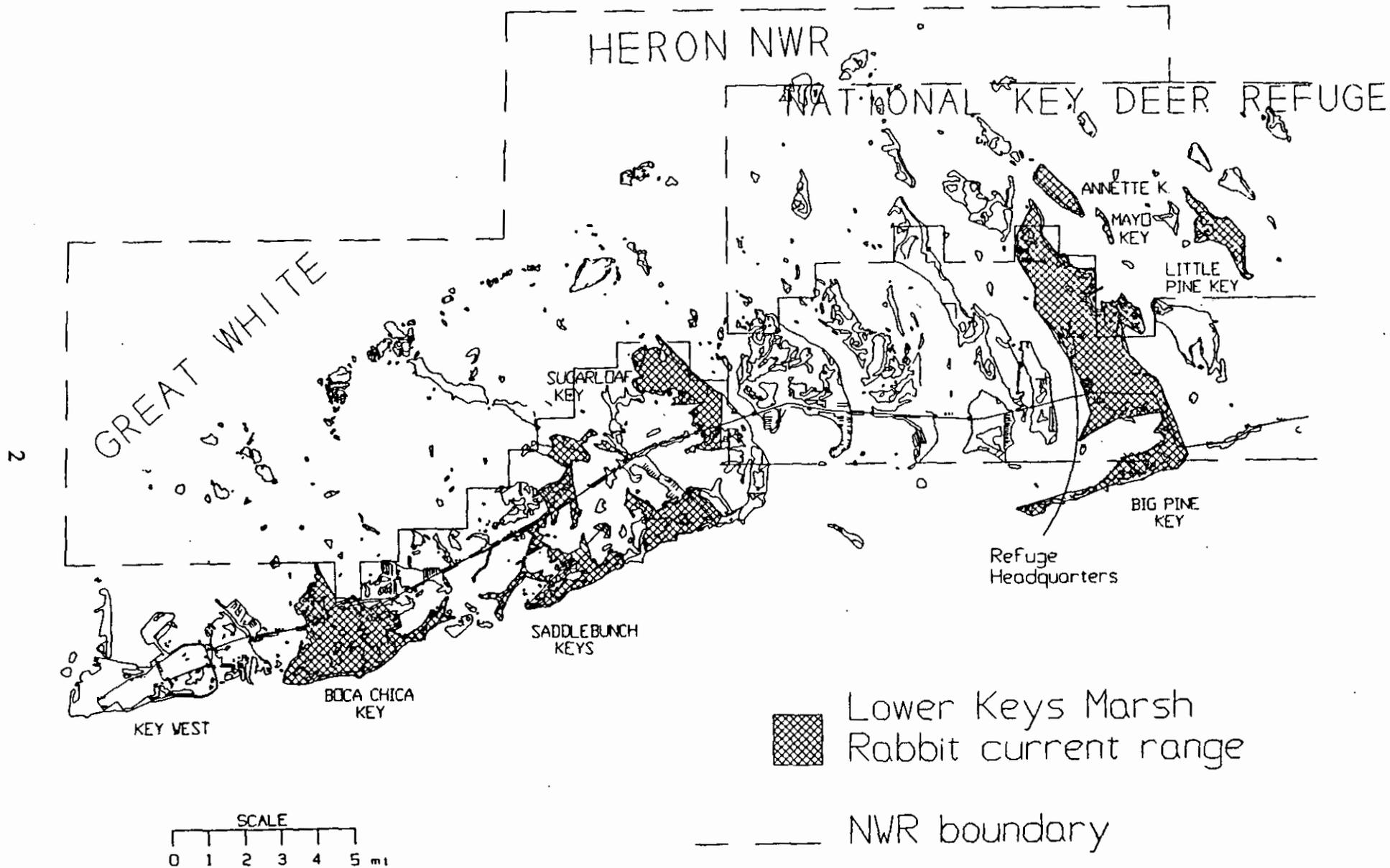


Figure 1. The Lower Keys of Florida displaying the current range of the Lower Keys marsh rabbit.

Habitat

The main habitat for the Lower Keys marsh rabbit is the transition zone, an area dominated by grasses and sedges, with buttonwood (*Conocarpus erectus*) the dominant tree species (Forys and Humphrey 1992). Fresh water marshes dominated by sawgrass (*Cladium jamaicensis*) and beach berms with thick clump grasses are also used, although these types of habitat are relatively rare. Occasionally, marsh rabbits also use low marsh and mangrove-dominated areas for feeding and as a corridor between patches of transition zone habitat.

A study of 11 adult female marsh rabbits that nested a total of 31 times found that all nests were made in clump grass, with 22 in cordgrass (*Spartina spartinae*) and the other nine in saltmarsh fimbriostylis (*Fimbristylis castanea*). A study of marsh rabbit microhabitat use also found that clump grasses were the most utilized habitat followed by areas of sea daisy (*Borrchia frutescens*) a succulent herb. Areas dominated by trees and areas of low marsh vegetation were less utilized.

Results of a dietary study based on fecal pellet samples from 40 marsh rabbits (20 from each sex, during both wet and dry seasons) found that marsh rabbits ate 19 plant species representing 14 families. Two grasses, seashore dropseed (*Sporobolus virginicus*) and *S. spartinae*, comprised over 50 percent of all diets. Two mangrove species, white mangrove (*Languncularia racemosa*) and red mangrove (*Rhizophora mangle*), and a small succulent shrub sea daisy, made up another 25 percent. The remainder of the species were grasses, sedges, shrubs and trees.

Three species, keygrass (*Monanthocloe littoralis*), buttonwood (*C. erecta*) and blackbead (*Pithecellobium guadalupense*), were abundant at the transition zone sites, but were absent from the marsh rabbit's diet. *M. littoralis* is a short wiry grass, and buttonwood and blackbead are tree species. Excluding these species, marsh rabbits generally fed on the most abundant species available. Neither season nor sex were found to effect the dietary habits of the rabbits.

Based on the Lower Keys marsh rabbit's distribution, it appears to need little fresh water to survive. Marsh rabbits were found on several isolated islets that consisted of mangroves and a small upper marsh area. In a study measuring urine osmotic pressures and renal medullary thickness of several species of mammals from the Lower Florida Keys (Dunson and Lazell 1982), the marsh rabbit was found to have one of the highest urinary concentrating capacities. Although further study is warranted, it is possible marsh rabbits can survive solely on dew and brackish water. It is unlikely that marsh rabbits can utilize seawater; even the most salt tolerant mammal in the study (*Rattus rattus*) cannot maintain its body mass on seawater.

Life History/Ecology

Natality

Natality data was collected from 11 radio-collared female marsh rabbits that were studied from 2 to 22 months and nested a total of 31 times. All females were observed to nest and produce a litter at least once, and the most fecund marsh rabbit produced six litters in 14 months. In general, the nests consisted of a main chamber with several smaller chambers and exit/entry routes. Only two of the females used the same nesting area more than once, and none of the female rabbits used the nest of another rabbit during this study.

There are no apparent seasonal patterns in the reproduction of the marsh rabbit. Combining data from the 2 years of the study, the number of rabbits with litters each month ranged from 0 to 56 percent, but did not appear to be following any type of trend. Lower Keys marsh rabbits produced an average of 3.7 litters per year and the average number of litters produced during the wet and dry seasons did not differ significantly.

Although the study's methods differed from those described above, Holler and Conaway's (1979) study on the reproduction of marsh rabbits (*S. p. paludicola*) of South Florida measured a higher fecundity rate (5.7 litters per year) than reported for the Lower Keys marsh rabbit. Litter size seemed relatively similar, ranging from 1 to 3 young per litter.

Mortality

Mortality rates for each sex and age class of marsh rabbits appears to be high. A study that calculated young juvenile (0 to 3 months) survival by comparing the number of young in nests to the number of young caught on trapping grids also calculated older rabbit's death rates by radio-collaring animals found that fewer than 21 percent of all rabbits born survive to adulthood (10 months). Adult mortality was also high, 48 percent for first year adults and 90 percent for second year adults. By following 27 radio-telemetry signals to rabbit carcasses it was determined that vehicles caused the most sub-adult and adult mortalities followed closely by feral cats (*Felis catus*), and raccoons (*Procyon lotor*). Eastern diamondback rattlesnake (*Crotalus adamanteus*) predation accounted for three deaths and one rabbit was shot.

Home Range and Dispersal

A radio-telemetry study of Lower Keys marsh rabbit movements found that all juveniles (N=7) remained in their natal range. Nearly all (10 out of 11) of the subadult (8 to 10 months) males made long distance (510 to 2050 m) movements (dispersal) away from their natal range and either established permanent home ranges or were killed. Females made shorter movements during this period of time and then established permanent home ranges. During this subadult phase both males and females were more likely to cross roads

and bodies of water. Adult home ranges were predominantly non-overlapping for animals of the same sex. Home range did not vary significantly between sexes and 23 adult marsh rabbits had an average home range and standard error of 1.21(0.18)ha.

Marsh rabbits were mostly active from late evening to the early morning. Nearly all marsh rabbit movements were made when protected by dense cover. Dispersing marsh rabbits appeared to use corridors that provided cover, regardless of vegetation.

Reasons for Decline

The primary reason for the decline of the Lower Keys marsh rabbit appears to be habitat loss, mainly due to development. In the 2 years between the study for the rabbit's listing (Howe 1988) and the actual listing, four of the 15 original sites were destroyed. In addition, the effects of habitat fragmentation and degradation are increasing the risk of predation and road mortalities. Marsh rabbit habitat is increasingly surrounded by large housing developments that are capable of supporting large domestic and feral cat populations as well as high densities of raccoons. In studies elsewhere, rabbits have been found to be one of the most prevalent prey items in feral cat diets (Jones and Coman 1981, Liberg 1985). Historically, intensive hunting by locals (Howe 1988) also may have had an impact.

In some areas, potential marsh rabbit habitat exists, but is currently being degraded by mowing, off road vehicle use, and trash dumping. In other areas, small patches of marsh rabbit habitat exist, but are isolated from other marsh rabbit populations. Without recurrent colonization and population interchange, these areas cannot support stable marsh rabbit populations.

Juvenile mortality has not been studied directly; however, incidents of predation by feral cats, raccoons, eastern diamondback rattlesnakes, and a bald eagle have been recorded. Of these predators, feral cats and raccoons may have the greatest impact on marsh rabbit populations. Both species are supplementally fed predators in the keys, in some cases by cat feeding stations set up in marsh areas. Although few incidents of cat predation have been reported in the keys, juvenile rabbits were the largest component of feral cat's diets in several studies elsewhere (Jones and Coman 1981, Liberg 1985).

Mortality due to vehicles was the highest cause of adult mortality in a study of 24 adult marsh rabbits. Other sources of mortalities included eastern diamondback rattlesnakes, raccoons, and poaching.

Habitat degradation has occurred at most of the marsh rabbit sites and includes destruction of habitat by exotic invasive plants, repeated mowing of habitat, dumping of trash, and off-road vehicle use.

Conservation Measures

Some conservation measures are currently being investigated by the U.S. Navy and may be initiated before the approval of this recovery plan. A nearly 3-year study of the Lower Keys marsh rabbit on Navy lands was funded in 1990, and the majority of the data in this recovery plan are a result of this study. Other actions that may be initiated in the near future include posting of "no mowing" signs in important rabbit habitat, fencing of some rabbit habitat to prevent illegal vehicle traffic, removal of some exotic plants, and the elimination of the feral cat population on the Navy base. In addition, the Navy has imposed nighttime speed regulations in important rabbit areas.

Strategy for Recovery

To protect existing rabbit populations from further decline, this plan requires habitat protection, management, restoration, and prevention of further habitat degradation. To decrease mortality, this plan suggests eradicating feral cats, eliminating supplemental raccoon feeding, and decreasing the number of roadkills.

If marsh rabbit reintroductions prove feasible, this plan recommends moving marsh rabbits to unoccupied keys and monitoring these reintroductions for at least 5 years.

II. RECOVERY

A. Recovery Objective

The objective of this recovery plan is to remove the threat of imminent extinction for the Lower Keys marsh rabbit. The Lower Keys marsh rabbit may be considered for downlisting from endangered to threatened if at least 400 rabbits total (100 rabbits/key minimum on four separate keys) are maintained over a period of 5 years. Because rabbit populations fluctuate widely, the average population size would probably be well over 400.

It does not seem likely that this subspecies will ever be removed from the endangered species list because of the amount of habitat destruction in the past. However, once downlisting to threatened occurs, the species' status will be reevaluated and recovery goals addressed. The estimate of 400 rabbits for downlisting was made with the aid of VORTEX, a simulation model of stochastic population change (Lacy 1990). In model scenarios, each key was considered to be a separate population, and population interchange was considered to be extremely rare. The model was run for 100 years and the impact of a mild to severe catastrophe was examined. If model parameters and predictions are accurate, the population of 400 rabbits would be able to withstand the impact a hurricane (or other short-term reduction in mortality) causing up to 45 percent mortality.

The minimum population size of 100 rabbits for each key would require population densities of 1.44 rabbits/ha for Big Pine Key, 2.08 rabbits/ha for Boca Chica Key, and

2.27 rabbits/ha for Saddlebunch/Sugarloaf Key. These required densities are within the natural range of marsh rabbit densities and could be reduced with habitat restoration on the keys.

B. Narrative Outline

1. Acquire habitat.

Habitat loss is the main reason for the marsh rabbit's decline. Habitat protection and management is paramount to the marsh rabbit's survival.

1.1. Purchase land or easements for land currently supporting rabbit populations.

Over half of the marsh rabbit habitat is privately owned, including the largest unfragmented site. A list of privately owned lands in greatest need of protection is given in Appendix A.

1.2. Protect important corridor areas.

Several of the marsh rabbit populations are currently vitally linked by corridors of low marsh and mangroves. Most of these areas are currently protected because of their wetland classification. These areas should be identified and the necessary permitting offices notified to avoid any negative impact on the rabbit.

2. Protect and manage habitat.

Most marsh rabbit sites are less than 3 ha in size and are near high concentrations of people. These areas must be actively protected and managed to prevent a negative impact on the rabbit populations. Cost estimates for this section may increase in the event that more habitat is purchased which requires management.

2.1. Prevent habitat degradation.

Habitat degradation can decrease the number of rabbits an area can support, contributing to the overall chance of extinction.

2.1.1. Remove invasive exotic vegetation.

Both Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthefolius*) thrive in transition zone habitat. Australian pine needles kill undergrowth, destroying the rabbit's food, shelter, and nesting sites. Brazilian pepper competes with native trees and grasses and is a food source for raccoons. These exotics are most abundant on the Navy base and on privately owned land. A priority list of exotic removals has been given to the Navy (Forys and Humphrey 1992). Individual exotic plants should be removed from the habitat as they appear.

2.1.2. Prevent habitat areas from being mowed.

Grass mowing temporarily destroys shelter, nesting sites, and food, and may kill young in the nest. Mowing could be considered "taking" of an animal and, therefore, may violate the Endangered Species Act. Most areas that are mowed once are then repeatedly mowed. Areas likely to be mowed should be posted with signs. This problem is greatest on Navy and privately owned land.

2.1.3. Fence or barricade areas where off-road vehicle (ORV) use and/or dumping is a threat.

Areas along roads are often used by ORV and as dumps. Dumping and off-road vehicle use destroys habitat. Other methods have been attempted to deter ORV use, but fences 1 foot off the ground appear to be the best method to prevent illegal vehicle use and yet allow rabbit and other species' movements. In areas that are also used by Key deer (*Odocoileus virginianus clavium*), alternative methods should be explored.

2.2. Restore and revegetate disturbed transition zone habitat.

Several rabbit habitat sites throughout the Lower Keys have been scarified by ORV's, are covered with refuse, or have been disturbed by previous land use. Restored, these areas could support more marsh rabbits and decrease the chance of the rabbit's extinction.

2.3. Utilize Federal regulatory mechanisms for protection.

The Lower Keys marsh rabbit is listed as an endangered species under the Endangered Species Act and as such is provided legal protection.

2.3.1. Conduct Section 7 consultations on Federal activities.

Section 7 of the Endangered Species Act requires Federal agencies to consult with the Service to assure appropriate consideration of impacts to listed species or their habitat in all Federal actions. The Lower Keys marsh rabbit must be considered (along with other federally listed species) whenever a proposed action, authorized, funded or carried out by a Federal agency might adversely affect the species or its habitat. The Service determined at the time of listing that designating critical habitat for the Lower Keys marsh rabbit was not prudent. The Service should continue evaluating the benefits of designating critical habitat to determine if it affords the species additional protection.

2.3.2. Ensure enforcement of Section 9 of the Endangered Species Act.

Section 9 of the Endangered Species Act prohibits the take of any listed species. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Law enforcement authorities should immediately be notified when an action occurs that might constitute take.

3. Protect Lower Keys marsh rabbits.

Human-induced or human-related mortality must be minimized if the subspecies is to survive.

3.1. Eliminate feral cat populations near rabbit habitat.

Cats can be a major threat to juvenile and adult marsh rabbit survival. Feral and house cats are abundant in the Lower Keys. Feral cats should be eliminated from the Navy base. Trapping should be conducted once a year in all major rabbit habitat sites to keep feral cat numbers low. Cat owners should be warned of this activity.

- 3.2. Control raccoon population by eliminating supplemental food sources.
Raccoons are capable of killing both adult and juvenile rabbits. Raccoon populations appear to be unnaturally high in some areas of the Lower Keys. All outdoor cat feeding stations and open dumpsters on the Navy base should be eliminated, and people entering the Navy base should be instructed not to feed the raccoons.
- 3.3. Decrease the number of roadkills using chatter strips at known rabbit crossing areas.
Nearly one quarter of the adult males studied were killed crossing the road. Much of the rabbit habitat left is bisected by roads, making it necessary for animals to cross. The speed limit in many of the rabbit habitat areas is low (25 to 30 miles per hour (mph)), but is rarely adhered to or enforced. Chatter strips (where feasible) may provide a permanent and economical alternative to speed limit enforcement, both on the Navy base and on the Monroe County roads.
- 3.4. Reduce nighttime speed limits.
Marsh rabbits are most active from dusk until dawn. A reduction in the nighttime speed limit to 15 mph may decrease the number of road kills both on the Navy base and on county roads.
- 3.5. Control poaching.
The Lower Keys marsh rabbit population will never be large enough to support hunting. Poaching must be controlled.
4. Determine feasibility of and implement reintroductions.
Reintroduction may be the only strategy to reclassify the marsh rabbit to threatened.
 - 4.1. Identify protected lands that once supported marsh rabbits and that currently can support marsh rabbits, design and conduct reintroduction study.
Using habitat analysis, identify sites that could currently support rabbits based on data from occupied sites. If possible, determine why these areas are not currently occupied and take steps (habitat improvement, predator removal) to improve these areas for rabbits. Using data on genetic and population variability, select which individuals and sites should be used for the trial study.
 - 4.2. Reintroduce marsh rabbits using rabbits from several distinct populations.
If necessary, explore using captive breeding to establish a pool for the reintroductions. The cost of reintroduction will be higher if captive breeding is necessary.
5. Monitor original and reintroduced populations through established pellet counting methods.
This will be necessary to determine recovery of the subspecies. The grid pellet counting method used in Forsy and Humphrey (1992) has been found to be effective and time efficient.
6. Inform and educate the public regarding the Lower Keys marsh rabbit.
 - 6.1. Prepare general information brochures.
Prepare educational brochures on the marsh rabbit and its habitat, these brochures could be distributed at the visitor information centers and through

the local Chambers of Commerce within the range of the marsh rabbit.

6.2. Educate residents.

The local Chambers of Commerce and newspapers may accomplish the same task through new resident information packets and periodic informational articles. The Navy should educate civilian employees as well as military personnel and their families regarding marsh rabbit presence, identification, life history and protection.

C. Literature Cited

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III. IMPLEMENTATION SCHEDULE

Priorities in Column 4 of the following Implementation Schedule are assigned as follows:

- Priority 1: An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.
- Priority 2: An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.
- Priority 3: All other actions necessary to provide for full recovery of the species.

Abbreviations in the Implementation Schedule:

Cont. = continuous TE = USFWS, Endangered Species
FA = Federal Agency LE = USFWS, Law Enforcement
MCo = Monroe County USN = United States Navy
Univ. = University
Realty = USFWS, Division of Realty
FGFC = Florida Game and Fresh Water Fish Commission
PAO = USFWS, Public Affairs Office

The Implementation Schedule that follows outlines actions and estimated costs for the recovery program. It is a guide for meeting the objectives discussed in Part II of this Plan. This schedule indicates task priorities, task numbers, task descriptions, duration of tasks, responsible agencies, and estimated costs. These actions, when accomplished, should bring about a recovery of the Lower Keys marsh rabbit and protect its habitat. It should be noted that not all the estimated monetary needs for all parties involved in recovery are identified and, therefore, Part III reflects only the estimated financial requirements for the recovery of this species.

While the U.S. Fish and Wildlife Service has no power to require other Federal and State agencies to carry out specific actions for endangered species recovery, we believe the designated agencies have the necessary authority to carry out the identified tasks. The implementation schedule serves to alert those agencies to the need for these actions and to justify seeking funds to carry out the actions.

Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs			Comments
				Fish and Wildlife Region Division	Other		FY1	FY2	FY3	
Purchase Land.	1.1.	1	Ukn.	4	Realty					
Protect Corridors.	1.2.	1	Ukn.	4	TE					
Remove Exotics.	2.1.1.	1	Cont.	4		USN	20	2	2	
Prevent Mowing.	2.1.2.	1	1 yr.	4		USN, MCo	1	0	0	USN conducting this task
Prevent ORV Use.	2.1.3.	1	Cont.	4		USN	30	0.5	0.5	
Restore Habitat.	2.2.	2	5 yrs.			USN	50	10	10	
Conduct Section 7.	2.3.1.	2	Cont.	4	TE	FA				
Enforce Section 9.	2.3.2.	1	Cont.	4	LE	FGFC				
Eliminate Feral Cats.	3.1.	2	Cont.	4		USN, MCo	4	4	10	
Educate About Raccoons.	3.2.	2	Cont.	4	TE	USN, MCo				USN conducting this task
Chatter strips	3.3.	2	1 yr.	4		MCo, USN	18	0	0	
Speed Limit	3.4.	2	1 yr.	4		MCo, USN	4	0	0	
Control Poaching.	3.5.	2	Cont.	4		FGFC				
Reintroduction Study	4.1.	3	2 yrs.	4	TE	Univ.	15	10	0	
Reintroduction	4.2.	3	1 yr.	4	TE	Univ.	10	0	0	
Population Monitoring	5	2	10 yrs.	4	TE	Univ.	3	3	3	
Education brochures	6.1.	2	Cont.	4	PAO/TE			5		
Educate residents.	6.2	2	Cont.	4	TE	USN, MCo				USN conducting this task for base personnel

APPENDIX : Land Protection Sites for the Lower Keys marsh rabbit. (Area was estimated from 1"=200' maps.)

KEY	DESCRIPTION	SECTION	LOT	HECTARES	ACRES
Sugarloaf	North of Old State Road 4A, west of Sugarloaf Blvd.	14	5,6,7,8,9,10,11,12,13,14,15,16,17,18,21,22,23,24,25,26	25.0	63.5
Sugarloaf	See above	12	4		
Big Pine	Near Drs. Arm	14	7	4.3	8.7
Big Pine	North of US 1, east of Beach Road	25	SE corner	7.5	19.0
Sugarloaf	North of Orchid Park development	11	1-23 and surrounding land	12.8	32.6
Sugarloaf	North of US 1, south of Sugarloaf Shores airport	4	1	2.4	6.0
Sugarloaf	Land surrounding Sugarloaf Shores airport	33	SE corner	10.8	27.4

Suggested List of Reviewers:

Dr. Steve Humphrey
Curator of Mammals
Florida Museum of Natural History
Museum Road, University of Florida
Gainesville, Florida 32611-2035

Natural Resource Coordinator*
Environmental, Public Works
Naval Air Station
Boca Chica, Florida 33040

Mr. Don A. Wood
Endangered Species Coordinator
Florida Game and Fresh Water Fish Commission
620 South Meridian Street
Tallahassee, Florida 32303

Dr. James D. Lazell*
The Conservation Agency
6 Swinburne Street
Conanicut Island, Rhode Island 02835

Mr. Randy Tate
Land Steward
The Nature Conservancy
201 Front Street, Bldg. 21
P.O. Box 4958
Key West, Florida 33041

Ms. Pat McNeese
Environmental Resources Department
5100 College Road
Key West, Florida 33040

* Indicates reviewers who provided written comments.

ATTACHMENT C

**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JOINT APPLICATION FOR WORKS IN THE WATERS OF FLORIDA
FOR SOLID WASTE MANAGEMENT UNIT NO. 1**



Joint Application for Works in the Waters of Florida

DRAFT

Department of the Army (Corps)/Florida Department of Environmental Regulation (DER)/
Department of Natural Resources (DNR)/Delegated Water Management District (Delegated WMD)

Type or Print Legibly **5WMD-1**

Corps Application Number (official use only)	DER Application Number (official use only)
--	--

1. Applicant's Name and Address

Name Commanding Officer
Last Name, First Name (if Individual); Corporate Name; Name of Govt. Agency

Street Naval Air Station (Code 1883)

City Key West State FL Zip 33040

Telephone (305) 293-2866 (Day) _____ (Night)

2. Name, Address, Zip Code, Telephone Number and Title of Applicant's Authorized Agent

Name N/A
Last Name, First Name

Corporate Name; Name of Govt. Agency _____

Street _____

City _____ State _____ Zip _____

Telephone (_____) _____ (Day) _____ (Night)

Name of Waterway at Work Site: Unnamed Tributary to Geiger Creek

4. Street, Road or Other Location of Work Boca Chica Airfield, Perimeter Road

Incorporated City or Town _____

Section _____ Township _____ Range _____

Section _____ Township _____ Range _____

Section _____ Township _____ Range _____

County(ies) Monroe

Coordinates in Center of Project:

Latitude W 81 ° 40 ' 20 " Longitude N 24 ° 24 ' 5 " Federal Projects Only: _____ x _____ y

Lot _____ Block _____ Subd _____ Plat Bk _____ Pg _____

Directions to Locate Site: Enter NAS Key West, drive to Flight Ops Office; Air Ops Officer needed for escort to middle of airfield.

5. Names, Addresses, and Zip Codes of Adjacent Property Owners Whose Property Also Adjoins the Water (Excluding Applicant). Show Numbers or Names of These Owners on Plan Views. If More Than Six (6) Owners Adjoin the Project, You May Be Required to Publish a Public Notice for the DER.

1. <u>N/A Navy property surrounds tributary</u>	2. _____	3. _____
4. _____	5. _____	6. _____

DRAFT

Proposed Use (Check one or more as applicable) Private Single Family Multi Family
 Public Commercial New Work Alteration of Existing Works Maintenance Other (Explain) Federal Government

Desired Permit Duration (see Fee Schedule)
 5 Yr 10 Yr Other (Specify) _____

General Permit or Exemption Requested Individual Permit
 DER General Permit FAC Rule 17-312. _____ DER Exemption FAC Rule 17-312. _____ Section 403. _____ F.S.

Total Extent of Work in Jurisdictional Open Waters or Wetlands: (Use additional sheets and provide complete breakdown of each category if more space is needed. See attached sheet for itemization by site.)

a. Within Corps Jurisdiction:
 Fill: _____ Sq. Ft. _____ Acres _____ Cu. Yds.
 Excavation: 129,600 Sq. Ft. 2.98 Acres 4,800 Cu. Yds.

b. Within DER Jurisdiction:
 Fill: _____ Sq. Ft. _____ Acres _____ Cu. Yds.
 Excavation: _____ Sq. Ft. _____ Acres 4,800 Cu. Yds.
 Excavation Waterward of MHW _____ cu. yds. (Information needed for DNR)
 Assume 1' excavation of contaminated soil _____ Cu. Yds.

c. DER Jurisdictional Area Severed (Area Landward of Fill Structures which will be Severed):
 _____ Sq. Ft. _____ Acres

d. DER Jurisdictional Area Created (New Excavation from Uplands, Exclusive of Mitigation):
 _____ Sq. Ft. _____ Acres

e. Docks, Piers, and Over Water Structures:
 Total Number of Slips N/A Total Number of Mooring Piling _____
 Length _____ Width _____ Height above MHW _____
 Length _____ Width _____ Height above MHW _____
 Number of Finger Piers _____ Length _____ Width _____ Height _____
 Number of Finger Piers _____ Length _____ Width _____ Height _____
 Total area of structure over waters & wetlands _____ sq. ft.
 Use of structure _____

Will the docking facility provide:	No	Yes	Number
Liveboard Slips	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fueling Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sewage Pump-out Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other Supplies or Services Required for Boating (Excluding refreshments, bait and tackle)	<input type="checkbox"/>	<input type="checkbox"/>	_____

f. Seawall length N/A ft. Seawall material _____
 Riprap revetment length _____ ft. Slope _____ H: _____ V Toe width _____ ft.
 Riprap at toe of seawall length _____ ft. Slope _____ H: _____ V Toe width _____ ft.
 Size of riprap _____
 Type of riprap or seawall material _____

g. Other (See Item 10). _____

DRAFT

Effective Date October 10, 1990
DER Application No. _____
(Filled in by DER)

10. Description of Work (be specific; use additional sheets as necessary).

*See Attached Scope of Work

11. Turbidity, Erosion, and Sedimentation Controls Proposed: Turbidity control methods consisting of best construction use of turbidity curtains and/or temporary check dams will be deployed in open water areas in compliance with the state water quality standards. Temporary structural measures to control erosion and sedimentation during excavation may include the use of silt fences in conjunction with straw bale dikes in areas subject to surface water inundation and diversion ditches or check dams in areas subject to periodic high tidal influences. In scarified areas, prompt temporary revegetation or plastic covers may be used to minimize the source of potential erosion.

12. Date Activity is Proposed to Commence June 12, 1995 ; to be Completed July 21, 1995
Total Time Required to Construct 30-working days

13. Previous Applications for this Project have been:

DER No.

Corps No.

- A. Denied (date) N/A _____
- B. Issued (date) _____
- C. Other (please explain) _____

Differentiate between existing work and proposed work on the drawings.

14. Certification. Application is hereby made for a permit or permits to authorize the activities described herein.

A. I Certify That: (Please check appropriate space)

1. I am the record owner , lessee , or the record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document.
2. I am not the record owner, lessee, or record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document, but I will have, before undertaking the proposed work, the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

Attach legal description of property or copy of deed to the property on which project is to occur (must be provided)

B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance of evidence that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of inspecting the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work, if a permit is granted.

D. This is a Joint Application and is not a Joint Permit. I hereby acknowledge the obligation and responsibility for obtaining all of the required state, federal or local permits before commencement of construction. I also understand that before commencement of the proposed project, I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Regulation, the Delegated Water Management District (where applicable), and the Department of Natural Resources, as necessary.

DRAFT

Form Fee	Joint Act for Waters in the Waters of Florida
Effective Date	October 10, 1990
DER Application No.	(Filled in by DER)

E. I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities or am acting as the duly authorized agent of the applicant. I understand that knowingly making any false statement or representation in this application is a violation of Section 403.161, F.S. and Chapter 837, F.S.

Typed/Printed Name of Applicant or Agent	Signature of Applicant or Agent	Date
(Corporate Title if applicable)		

AN AGENT MAY SIGN ABOVE IF APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf as my agent in the processing of this permit application and to furnish on request, supplemental information in support of the application.

Typed/Printed Name of Applicant	Signature of Applicant	Date
(Corporate Title if applicable)		

Notarization:

Sworn and subscribed before me at _____ County, _____
 this _____ day of _____, 19 _____.

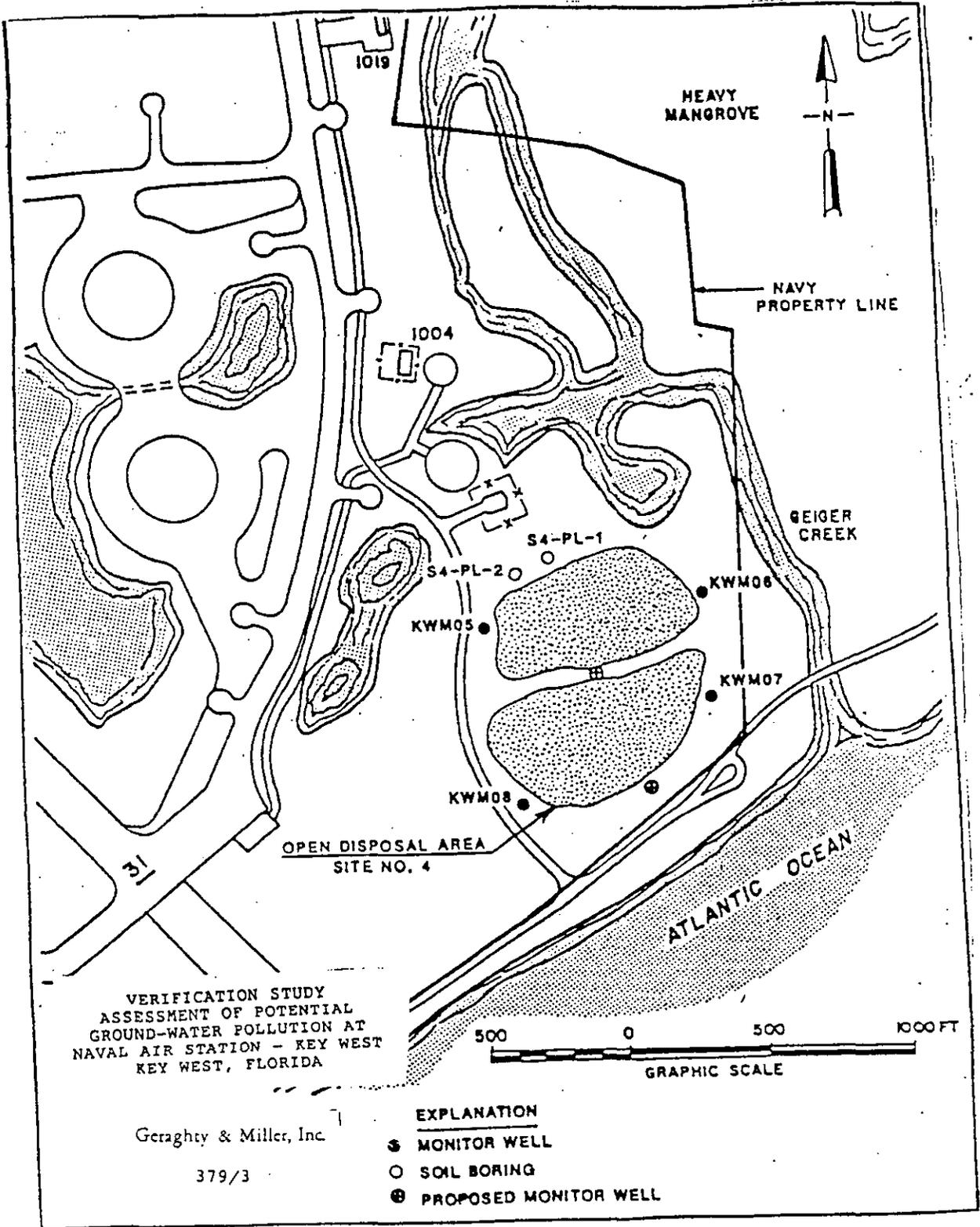
 Notary Public

My commission expires:

15. For your information: Section 370.034, Florida Statutes, requires that all dredge and fill equipment owned, used, leased, rented or operated in the state shall be registered with the Department of Natural Resources. Before selecting your contractor or equipment you may wish to determine if this requirement has been met. For further information, contact the Chief of the Bureau of Saltwater Licenses and Permits, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399. Telephone No. (904) 487-3122. This is not a requirement for a permit from the Department of Environmental Regulation.

18 U.S.C. Section 1001 provides that, Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

16. Please submit this completed form, with attached drawings and the complete DER processing fee (see Fee Schedule in F.A.C. Rule 17-4.050(4)(c), copy attached) to the appropriate DER or Delegated WMO office with jurisdiction over the project site.



Applicant: NAVAL AIR STATION
 Water Body: GEIGER CREEK
 County: MONROE
 Datum: _____

Purpose: INTERIM REMEDIATION AT SUMM-1

Original Work Maintenance

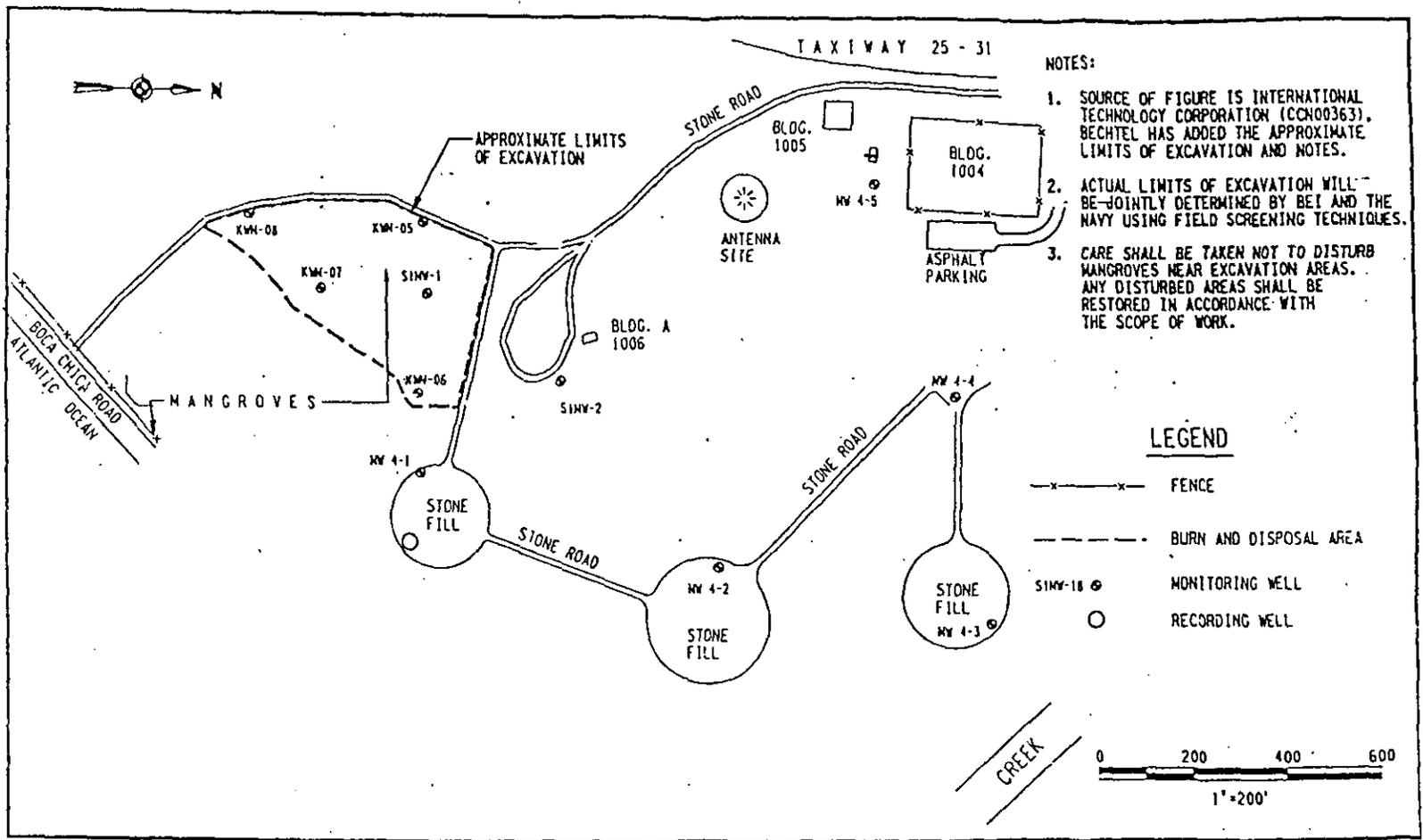
Sheet No.: 1 of 2

Date: 1/16/95

APPLICABLE:
 WATER BODY:
 COUNTY:
 DATE:

NAVAL AIR STATION
 FEIGER CREEK
 MONROE

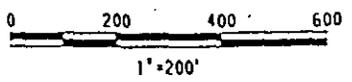
PURPOSE: INTERIM REMEDIATION AT SUMMIT-1
 ORIGINAL WORK MAINTENANCE
 SHEET NO.: 2 OF 2
 DATE: 1/16/95



- NOTES:
1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN00363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
 2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES.
 3. CARE SHALL BE TAKEN NOT TO DISTURB MANGROVES NEAR EXCAVATION AREAS. ANY DISTURBED AREAS SHALL BE RESTORED IN ACCORDANCE WITH THE SCOPE OF WORK.

LEGEND

- x-x- FENCE
- - - - - BURN AND DISPOSAL AREA
- SIMV-18 ○ MONITORING WELL
- RECORDING WELL



22547 321 FIG-1.DWG

SCOPE OF WORK
SWMU-1 - BOCA CHICA OPEN DISPOSAL AREA

Interim Remedial Action

The objective of the environmental remedial action at this area is contaminant source removal to prevent further migration of waste into other media. To accomplish this objective, the scope of work will consist of the following elements:

- abandon up to six monitoring wells;
- excavate lead contaminated soil and sediment;
- transport waste to a RCRA-permitted treatment/disposal facility;
- backfill with clean soil and return to existing grade; and
- replace any mangroves and other vegetation disturbed during the excavation with equivalent plants

This project is clearly in the public interest. In the absence of any action at this site, hazardous wastes and hazardous constituents may migrate from the soil into other media: sediments, surface waters, and groundwater. Performing this environmental restoration activity will protect human health and the environment.

The construction contractor performing this job must follow an Environmental Protection Plan approved by the Navy for this site. Best Management Practices will be used to prevent stormwater runoff from becoming a pathway for migration of contamination. Some equipment on site will come in contact with hazardous waste. Decontamination water, if any, will be collected, sampled, and if contaminated, properly disposed of.

Excavation of Contaminated Soil

Approximate excavation limits have been determined, and are shown on the site map provided in this permit application. Primary excavation limits will be established prior to excavation by field sampling on a 10 x 10 ft grid and analyzing for lead (the primary contaminant of concern) on site using analytical screening methods. Analytical results will be compared to desired cleanup goals to define the exact extent of excavation.

Excavation will begin in the lower areas and progress towards higher elevations, since a portion of the contaminated area lies in wetlands. The wetland areas have been delineated in the field; a copy of the wetland delineation report has been attached for your convenience. As material is removed from the water table, it will be initially stockpiled on the site and the water allowed to drain back into the excavation. It will be then loaded with a front-end loader directly into roll-off containers or dump trucks for

transportation to the treatment/disposal facility.

When analytical results are returned from an off-site laboratory and confirm that cleanup goals have been achieved, the excavation will be backfilled in 1 ft lifts and restored to original grade. Restoration of plants using mangroves and other indigenous plants will be performed.

ATTACHMENT D

**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JOINT APPLICATION FOR WORKS IN THE WATERS OF FLORIDA
FOR SOLID WASTE MANAGEMENT UNIT NO. 2**



Joint Application for Works in the Waters of Florida

DRAFT

Department of the Army (Corps)/Florida Department of Environmental Regulation (DER)/
Department of Natural Resources (DNR)/Delegated Water Management District (Delegated WMD)

Type or Print Legibly SWMU-2

Corps Application Number (official use only)

DER Application Number (official use only)

1. Applicant's Name and Address

Name Commanding Officer
Last Name, First Name (if individual); Corporate Name; Name of Gov. Agency
Street Naval Air Station (Code 1883)
City Key West State FL Zip 33040
Telephone (304) 293-2866 (Day) () (Night)

2. Name, Address, Zip Code, Telephone Number and Title of Applicant's Authorized Agent

Name N/A
Last Name, First Name
Corporate Name; Name of Gov. Agency _____
Street _____
City _____ State _____ Zip _____
Telephone () (Day) () (Night)

Name of Waterway at Work Site: Unnamed Lagoon in center of Boca Chica Airfield, tributary to Boca Chica Channel

4. Street, Road or Other Location of Work Boca Chica Airfield
Incorporated City or Town _____
Section _____ Township _____ Range _____
Section _____ Township _____ Range _____
Section _____ Township _____ Range _____
County(ies) Monroe

Coordinates in Center of Project: Federal Projects Only: _____ x _____ y
Latitude W 81 ° 41 ' 45 " Longitude N 24 ° 34 ' 35 "
Lot _____ Block _____ Subd _____ Plat Bk _____ Pg _____

Directions to Locate Site: South of Taviway Alpha on the airfield itself; access to site is restricted by Air Ops Officer

5. Names, Addresses, and Zip Codes of Adjacent Property Owners Whose Property Also Adjoins the Water (Excluding Applicant). Show Numbers or Names of These Owners on Plan Views. If More Than Six (6) Owners Adjoin the Project, You May Be Required to Publish a Public Notice for the DER.

- | | | |
|--|----------|----------|
| 1. <u>N/A Navy property surrounds lagoon</u> | 2. _____ | 3. _____ |
| 4. _____ | 5. _____ | 6. _____ |

DRAFT

Proposed Use (Check one or more as applicable) Private Single Family Multi Family
 Public Commercial New Work Alteration of Existing Works Maintenance Other (Explain) Federal Government

Desired Permit Duration (see Fee Schedule)
 5 Yr 10 Yr Other (Specify) _____

General Permit or Exemption Requested Individual Permit
 DER General Permit FAC Rule 17-312. _____ DER Exemption FAC Rule 17-312. _____ Section 403. _____ F.S.

Total Extent of Work in Jurisdictional Open Waters or Wetlands: (Use additional sheets and provide complete breakdown of each category if more space is needed. See attached sheet for itemization by site.)

a. Within Corps Jurisdiction:

Fill: _____ Sq. Ft. _____ Acres _____ Cu. Yds.
 Excavation: 9,000 Sq. Ft. 1.03 Acres 1,167 Cu. Yds.
600 x .15' x 15' (10 ft bank + 5 ft ditch) x (300 + 300) 600 x 15' x 15'

b. Within DER Jurisdiction:

Fill: _____ Sq. Ft. _____ Acres _____ Cu. Yds.
 Excavation: 9,000 Sq. Ft. _____ Acres 1,167 Cu. Yds.
 Excavation Waterward of MHW _____ cu. yds. (Information needed for DNR)

DER Jurisdictional Area Severed (Area Landward of Fill Structures which will be Severed):
 _____ Sq. Ft. _____ Acres

d. DER Jurisdictional Area Created (New Excavation from Uplands, Exclusive of Mitigation):
 _____ Sq. Ft. _____ Acres

e. Docks, Piers, and Over Water Structures: N/A

Total Number of Slips _____ Total Number of Mooring Pilings _____
 Length _____ Width _____ Height above MHW _____
 Length _____ Width _____ Height above MHW _____
 Number of Finger Piers _____ Length _____ Width _____ Height _____
 Number of Finger Piers _____ Length _____ Width _____ Height _____
 Total area of structure over waters & wetlands _____ sq. ft.
 Use of structure _____ sq. ft.

Will the docking facility provide:

	No	Yes	Number
Liveboard Slips	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fueling Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sewage Pump-out Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other Supplies or Services Required for Boating (Excluding refreshments, bait and tackle)	<input type="checkbox"/>	<input type="checkbox"/>	_____

f. Seawall length N/A ft. Seawall material _____
 Riprap reverment length _____ ft. Slope _____ H: _____ V Toe width _____ ft.
 Riprap at toe of seawall length _____ ft. Slope _____ H: _____ V Toe width _____ ft.
 Size of riprap _____
 Type of riprap or seawall material _____

g. Other (See Item 10).

DRAFT

Effective Date October 18, 1995
DER Application No. _____
(Fees in DEAR)

10. Description of Work (be specific; use additional sheets as necessary).

*See Attached Scope of Work

11. Turbidity, Erosion, and Sedimentation Controls Proposed: Turbidity control methods consisting of best construction use of turbidity curtains and/or temporary check dams will be deployed in open water areas in compliance with the state water quality standards. Temporary structural measures to control erosion and sedimentation during excavation may include the use of silt fences in conjunction with straw bale dikes in areas subject to surface water inundation and diversion ditch or check dams in areas subject to periodic high tidal influences. In scarified areas, prompt temporary revegetation or plastic covers may be used to minimize the source of potential erosion.

12. Date Activity is Proposed to Commence June 26, 1995 ; to be Completed August 18, 1995
Total Time Required to Construct 30 working days

13. Previous Applications for this Project have been:

DER No.

Corps No.

A. Denied (date) _____

B. Issued (date) _____

C. Other (please explain) _____

Differentiate between existing work and proposed work on the drawings.

14. Certification. Application is hereby made for a permit or permits to authorize the activities described herein.

A. I Certify That: (Please check appropriate space)

1. I am the record owner , lessee , or the record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document.

2. I am not the record owner, lessee, or record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document, but I will have, before undertaking the proposed work, the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

Attach legal description of property or copy of deed to the property on which project is to occur (must be provided)

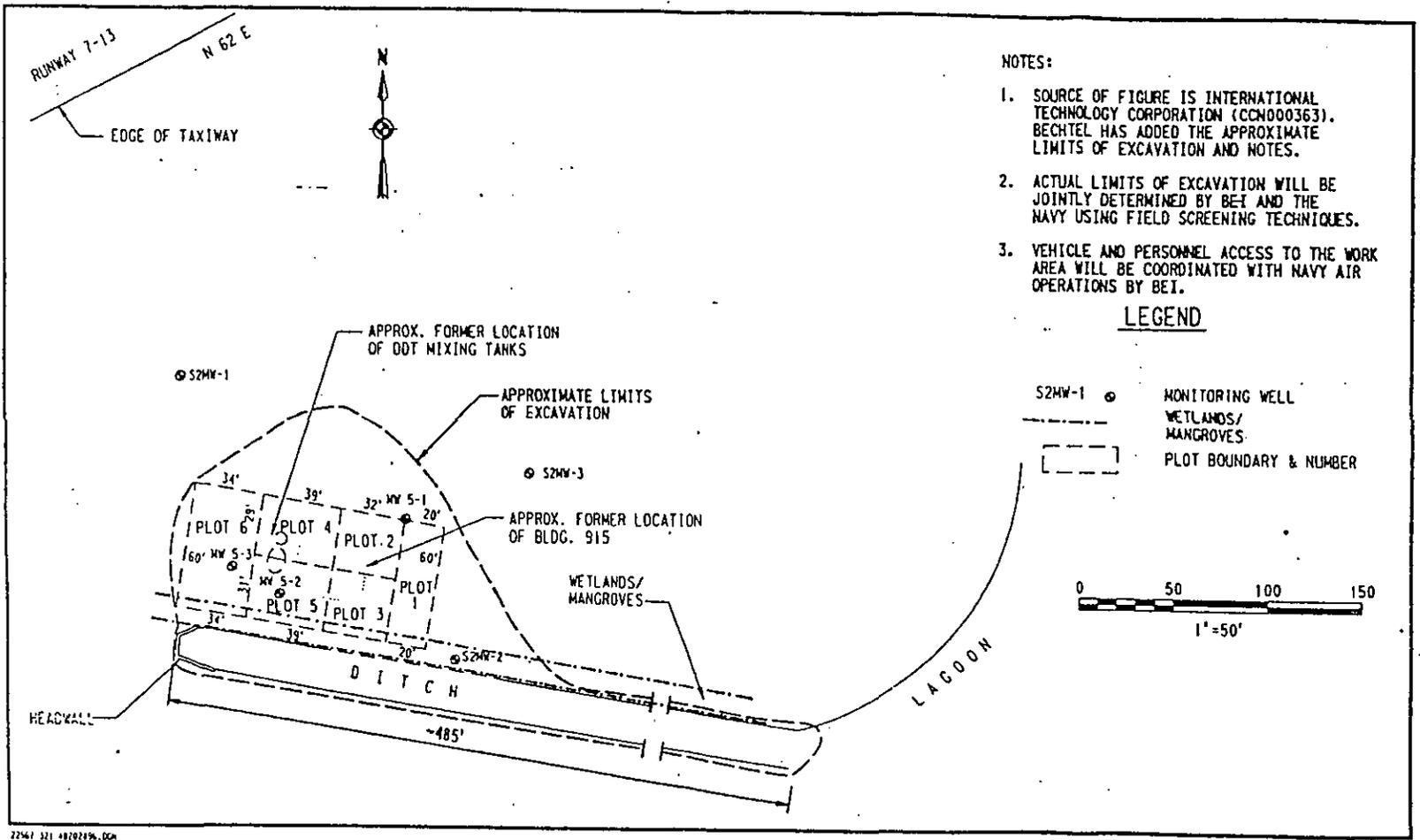
B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance of evidence that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of inspecting the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work, if a permit is granted.

D. This is a Joint Application and is not a Joint Permit. I hereby acknowledge the obligation and responsibility for obtaining all of the required state, federal or local permits before commencement of construction. I also understand that before commencement of the proposed project, I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Regulation, the Delegated Water Management District (where applicable), and the Department of Natural Resources, as necessary.

ADDRESS: NAVAL AIR STATION
 Water Body: UNNAMED LAGOON & AIRFIELD
 County: MORROBE
 Datum:

Purpose: INTERIM REMEDIATION OF SWMM-2
 Original Work Maintenance
 Sheet No.: 1 of 1
 Date: 1/16/95



- NOTES:
1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
 2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES.
 3. VEHICLE AND PERSONNEL ACCESS TO THE WORK AREA WILL BE COORDINATED WITH NAVY AIR OPERATIONS BY BEI.

LEGEND

SCOPE OF WORK
SWMU-2 - BOCA CHICA DDT MIXING AREA

Interim Remedial Action

The objective of the environmental remedial action at this area is contaminant source removal to prevent further migration of waste into other media. To accomplish this objective, the scope of work will consist of the following elements:

- abandon up to four monitoring wells,
- excavate pesticide contaminated soils,
- excavate pesticide contaminated sediments from an adjacent man-made ditch,
- transport waste to a RCRA-permitted treatment/disposal facility,
- backfill with clean soil and grade; and
- replace any mangroves disturbed during excavation.

This project is clearly in the public interest. In the absence of any action at this site, hazardous wastes and hazardous constituents may migrate from the soil into other media: sediments, surface waters, and groundwater. Performing this environmental restoration activity will protect human health and the environment.

This SWMU was a DDT mixing area, and sampling data indicates that DDT is present in soil. DDT is a listed RCRA waste when this commercial chemical product has been spilled and contaminated soil or debris.

The construction contractor performing this job must follow an Environmental Protection Plan approved by the Navy for this site. Best Management Practices will be used to prevent stormwater runoff from becoming a pathway for migration of contamination. Some equipment on site will come in contact with hazardous waste. Decontamination water, if any, will be collected, sampled, and if contaminated, properly disposed of.

Excavation of Contaminated Soil

Approximate excavation limits have been determined, and are shown on the site map provided in this permit application. Primary excavation limits will be established prior to excavation by field sampling on a 10 x 10 ft grid and analyzing for lead (the primary contaminant of concern) on site using analytical screening methods. Analytical results will be compared to desired cleanup goals to define the exact extent of excavation.

Excavation will begin in the lower areas and progress towards higher elevations, since a portion of the contaminated area lies in wetlands. The wetland areas have been delineated in the field; a copy of the wetland delineation report has been attached for your convenience. As material is removed from the water table, it will be initially stockpiled on the site and the water allowed to drain

back into the excavation. It will be then loaded with a front-end loader directly into roll-off containers or dump trucks for transportation to the treatment/disposal facility.

When analytical results are returned from an off-site laboratory and confirm that cleanup goals have been achieved, the excavation will be backfilled in 1 ft lifts and restored to original grade. Restoration of plants using mangroves and other indigenous plants will be performed.

ATTACHMENT E

**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JOINT APPLICATION FOR WORKS IN THE WATERS OF FLORIDA
FOR AOC-B, BIG COPPITT KEY ABANDONED CIVILIAN DISPOSAL AREA**



Joint Application for Works in the Waters of Florida

DRAFT

Department of the Army (Corps)/Florida Department of Environmental Regulation (DER)/
Department of Natural Resources (DNR)/Delegated Water Management District (Delegated WMD)

Type or Print Legibly **AOC - B**

Corps Application Number (official use only)	DER Application Number (official use only)
--	--

1. Applicant's Name and Address

Name Commanding Officer
Last Name, First Name (if individual); Corporate Name; Name of Gov. Agency

Street Naval Air Station (Code 1883)

City Key West State FL Zip 33040

Telephone (305) 293-2866 (Day) () (Night)

2. Name, Address, Zip Code, Telephone Number and Title of Applicant's Authorized Agent

Name N/A
Last Name, First Name

Corporate Name; Name of Gov. Agency _____

Street _____

City _____ State _____ Zip _____

Telephone () (Day) () (Night)

3. Name of Waterway at Work Site: Unnamed canal to Similar Sound

4. Street, Road or Other Location of Work State Rt. 941 - Boca Chica Road

Incorporated City or Town _____

Section _____ Township _____ Range _____

Section _____ Township _____ Range _____

Section _____ Township _____ Range _____

County(ies) Monroe

Coordinates in Center of Project: Federal Projects Only: _____ x _____ y

Latitude W 81 ° 38 ' 50 " Longitude N 24 ° 34 ' 35 "

Lot _____ Block _____ Subd _____ Plat Bk _____ Pg _____

Directions to Locate Site: Turn down Boca Chica Road from US 1; .5 mile on left.

5. Names, Addresses, and Zip Codes of Adjacent Property Owners Whose Property Also Adjoins the Water (Excluding Applicant). Show Numbers or Names of These Owners on Plan Views. If More Than Six (6) Owners Adjoin the Project, You May Be Required to Publish a Public Notice for the DER.

1. <u>N/A Navy property surrounds canal</u>	2. _____	3. _____
4. _____	5. _____	6. _____

DRAFT

Proposed Use (Check one or more as applicable) Private Single Family Multi Family
 Public Commercial New Work Alteration of Existing Works Maintenance Other (Explain) Federal Government

Desired Permit Duration (see Fee Schedule)

5 Yr 10 Yr Other (Specify) _____

General Permit or Exemption Requested Individual Permit

DER General Permit FAC Rule 17-312. _____ DER Exemption FAC Rule 17-312. _____ Section 403. _____ F.S.

3. Total Extent of Work in Jurisdictional Open Waters or Wetlands: (Use additional sheets and provide complete breakdown of each category if more space is needed. See attached sheet for itemization by site.)

a. Within Corps Jurisdiction:

Fill:	_____ Sq. Ft.	_____ Acres	_____ Cu. Yds.
Excavation:	<u>4,000</u> Sq. Ft.	_____ Acres	<u>296</u> Cu. Yds.
			(4,000 x 2) 27

b. Within DER Jurisdiction:

Fill:	_____ Sq. Ft.	_____ Acres	_____ Cu. Yds.
Excavation:	<u>4,000</u> Sq. Ft.	_____ Acres	<u>296</u> Cu. Yds.
Excavation Waterward of MHW	_____ cu. yds. (Information needed for DNR)		

c. DER Jurisdictional Area Severed (Area Landward of Fill Structures which will be Severed):

0 Sq. Ft. _____ Acres

d. DER Jurisdictional Area Created (New Excavation from Uplands, Exclusive of Mitigation):

0 Sq. Ft. _____ Acres

e. Docks, Piers, and Over Water Structures: N/A

Total Number of Slips _____	Total Number of Mooring Pilings _____
Length _____ Width _____ Height above MHW _____	
Length _____ Width _____ Height above MHW _____	
Number of Finger Piers _____ Length _____ Width _____ Height _____	
Number of Finger Piers _____ Length _____ Width _____ Height _____	
Total area of structure over waters & wetlands _____	sq. ft.
Use of structure _____	

Will the docking facility provide:

	No	Yes	Number
Liveboard Slips	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fueling Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sewage Pump-out Facilities	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other Supplies or Services Required for Boating (Excluding refreshments, bait and tackle)	<input type="checkbox"/>	<input type="checkbox"/>	_____

f. Seawall length N/A ft. Seawall material _____

Riprap reinforcement length _____ ft. Slope _____ H: _____ V Toe width _____ ft.

Riprap at toe of seawall length _____ ft. Slope _____ H: _____ V Toe width _____ ft.

Size of riprap _____

Type of riprap or seawall material _____

g. Other (See Item 10).

DRAFT

Exhibit Date October 10, 1990
DER Application No. _____ (Filled in by DER)

10. Description of Work (be specific; use additional sheets as necessary).

*See Attached Scope of Work

11. Turbidity, Erosion, and Sedimentation Controls Proposed: Turbidity control methods consisting of best construction use of turbidity curtains and/or temporary check dams will be deployed in open water areas in compliance with the state water quality standards. Temporary structural measures to control erosion and sedimentation during excavation may include the use of silt fences in conjunction with straw bale dikes in areas subject to surface water inundation and diversion ditch or check dams in areas subject to periodic high tidal influence. In scarified areas, prompt temporary revegetation or plastic covers may be used to minimize the source of potential erosion.

12. Date Activity is Proposed to Commence May 1, 1995 ; to be Completed June 12, 1995
Total Time Required to Construct 35 working days

13. Previous Applications for this Project have been:

DER No.

Corps No.

- A. Denied (date) _____
- B. Issued (date) _____
- C. Other (please explain) _____

Differentiate between existing work and proposed work on the drawings.

14. Certification. Application is hereby made for a permit or permits to authorize the activities described herein.

A. I Certify That: (Please check appropriate space)

- 1. I am the record owner , lessee , or the record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document.
- 2. I am not the record owner, lessee, or record easement holder of the property on which the proposed project is to be undertaken, as described in the attached legal document, but I will have, before undertaking the proposed work, the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

Attach legal description of property or copy of deed to the property on which project is to occur (must be provided)

B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance or evidence that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of inspecting the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work, if a permit is granted.

D. This is a Joint Application and is not a Joint Permit. I hereby acknowledge the obligation and responsibility for obtaining all of the required state, federal or local permits before commencement of construction. I also understand that before commencement of this proposed project, I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Regulation, the Delegated Water Management District (where applicable), and the Department of Natural Resources, as necessary.

DER Form _____
 Form Fee Joint Act by Works in the Waters of Florida
 Expiry Date October 10, 1990
 DER Application No. _____
 (Filed in DE DER)

DRAFT

E. I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities or am acting as the duly authorized agent of the applicant. I understand that knowingly making any false statement or representation in this application is a violation of Section 403.161, F.S. and Chapter 837, F.S.

Typed/Printed Name of Applicant or Agent	Signature of Applicant or Agent	Date
(Corporate Title if applicable)		

AN AGENT MAY SIGN ABOVE IF APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf as my agent in the processing of this permit application and to furnish on request, supplemental information in support of the application.

Typed/Printed Name of Applicant	Signature of Applicant	Date
(Corporate Title if applicable)		

Notarization:

Sworn and subscribed before me at _____ County, _____
 this _____ day of _____, 19 _____.

 Notary Public

My commission expires:

15. For your information: Section 370.034, Florida Statutes, requires that all dredge and fill equipment owned, used, leased, rented or operated in the state shall be registered with the Department of Natural Resources. Before selecting your contractor or equipment you may wish to determine if this requirement has been met. For further information, contact the Chief of the Bureau of Saltwater Licenses and Permits, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399. Telephone No. (904) 487-3122. This is not a requirement for a permit from the Department of Environmental Regulation.

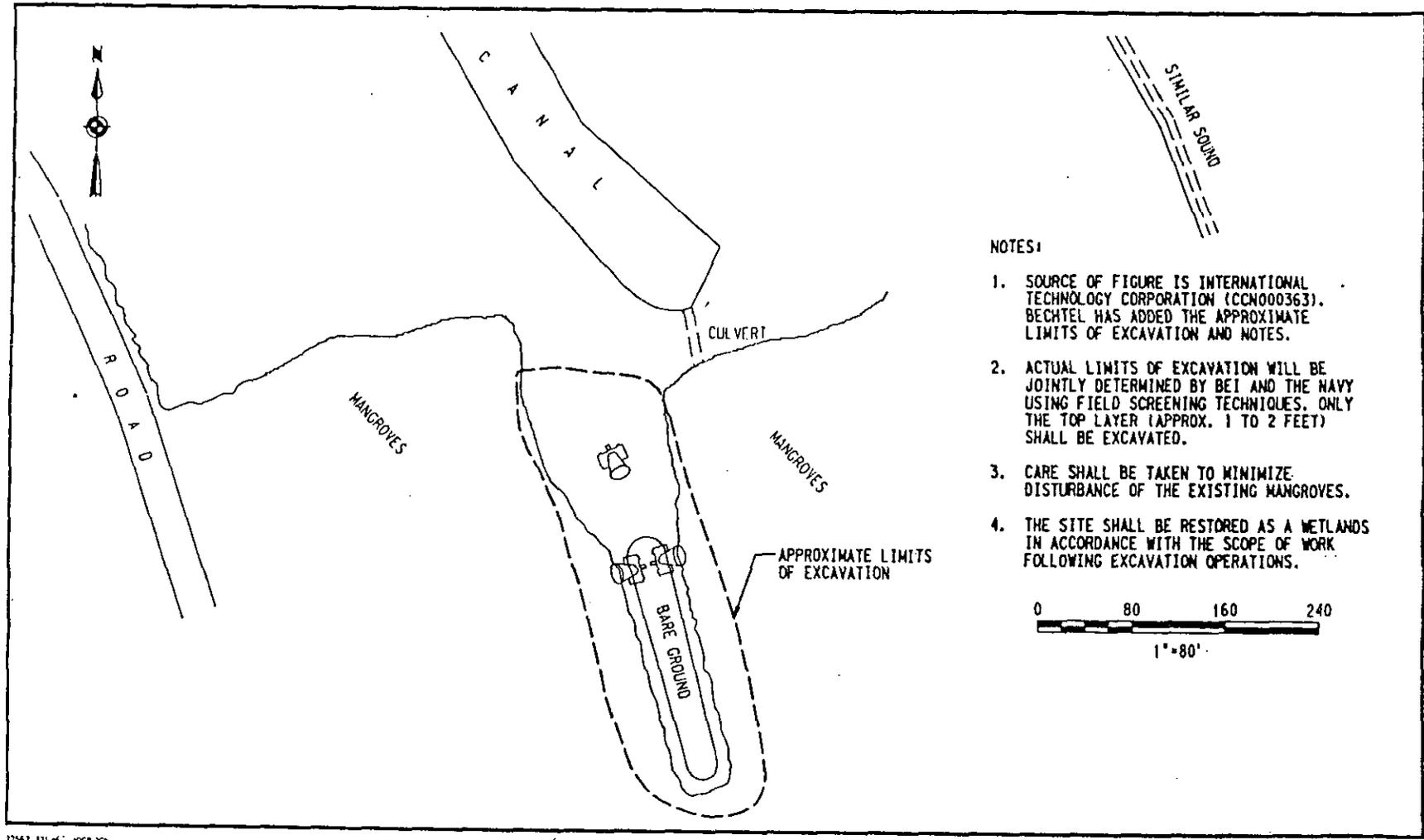
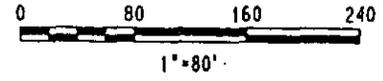
18 U.S.C. Section 1001 provides that, Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

16. Please submit this completed form, with attached drawings and the complete DER processing fee (see Fee Schedule in F.A.C. Rule 17-4.050(4)(c), copy attached) to the appropriate DER or Delegated WMD office with jurisdiction over the project site.



NOTES:

1. SOURCE OF FIGURE IS INTERNATIONAL TECHNOLOGY CORPORATION (CCN000363). BECHTEL HAS ADDED THE APPROXIMATE LIMITS OF EXCAVATION AND NOTES.
2. ACTUAL LIMITS OF EXCAVATION WILL BE JOINTLY DETERMINED BY BEI AND THE NAVY USING FIELD SCREENING TECHNIQUES. ONLY THE TOP LAYER (APPROX. 1 TO 2 FEET) SHALL BE EXCAVATED.
3. CARE SHALL BE TAKEN TO MINIMIZE DISTURBANCE OF THE EXISTING MANGROVES.
4. THE SITE SHALL BE RESTORED AS A WETLANDS IN ACCORDANCE WITH THE SCOPE OF WORK FOLLOWING EXCAVATION OPERATIONS.



22587 371 46 1 0008 308

Applicant: NAVAL AIR STATION
 Water Body: CANAL OF SIMILAR SOUND
 County: MORRIS
 Datum: _____

Purpose: INTERIM REMEDIATION AT AOC-B
 Original Work Maintenance
 Sheet No.: _____ of _____
 Date: 1/16/95

SCOPE OF WORK
AOC SITE B - BIG COPPITT KEY ABANDONED CIVILIAN DISPOSAL AREA

Interim Remedial Action

The objective of the remedial action at the Big Coppitt Key Abandoned Civilian Disposal Area is contaminant source removal to prevent further migration of waste into other media. To accomplish this objective, the scope of work will consist of the following elements:

- excavate and remove car bodies and debris,
- transport solid waste to a municipal landfill for disposal;
- transport hazardous waste (if any) to a RCRA-permitted treatment/disposal facility
- backfill and grade with clean soil; and
- replace any mangroves disturbed during excavation.

This project is clearly in the public interest. In the absence of any action at this site, solid wastes and potentially hazardous wastes may migrate from the soil into other media: sediments, surface waters, and groundwater. Performing this environmental restoration activity will protect human health and the environment.

The land around AOC-B was purchased by the Navy to prevent development of the area under the Boca Chica flight pattern. Sampling data suggests that no hazardous waste is present in soils at the site. However, one sediment sample taken from this area would likely exceed the toxicity characteristic level for lead (5 mg/L). Contaminated sediment excavated from this area will be managed, transported, and disposed of as hazardous waste (RCRA Waste Code D008).

The construction contractor performing this job must follow an Environmental Protection Plan approved by the Navy for this site. Best Management Practices will be used to prevent stormwater runoff from becoming a pathway for migration of contamination. Some equipment on site will come in contact with hazardous waste. Decontamination water, if any, will be collected, sampled, and if contaminated, properly disposed of.

Excavation of Car Bodies and Debris

Based on visual inspection of the area, an excavator will remove and stockpile the material covering the crushed car bodies. The exposed debris will be visually inspected for batteries and other lead-containing materials. Any batteries found will be segregated for shipment to a specifically licensed disposal site.

Excavation will extend into the water table. Any material excavated from below the water table will be placed above grade on the leading edge of the excavation and allowed to drain back into the excavation. The limits of excavation will be based on visual

inspection of the open excavation.

Because excavation will extend into the mangrove populated wetlands, care will be taken to minimize damage to the mangroves. Mangroves that must be removed will be saved, if possible, inventoried in the field, and replaced in kind. The excavation will be backfilled in 1 ft lifts to restore the site to original grade.