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NAS PENSACOLA
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PRELIMINARY ASSESSMENT REPORT OUTLYING LANDING FIELD BRONSON NAS
PENSACOLA FL
02/01/1992
NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY



PRELIMINARY ASSESSMENT
REPORT

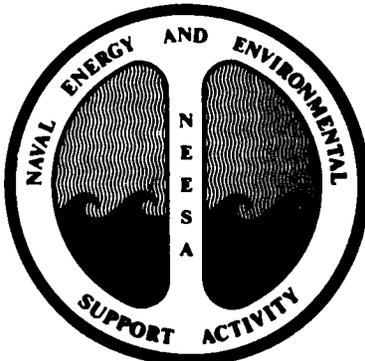
OUTLYING LANDING FIELD (OLF) BRONSON
ESCAMBIA COUNTY, FLORIDA

UIC:N00204

EPA:FL6170024610

NEESA 13-228PA

February 1992



**NAVAL ENERGY AND ENVIRONMENTAL
SUPPORT ACTIVITY**

Port Hueneme, California 93043-5014

PA-Score 1.0 Scoresheets
Outlying Landing Field Bronson - 01/30/92

Page: 1

OMB Approval Number: 2050-0095
 Approved for Use Through: 1/92

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT FORM	IDENTIFICATION	
	State: FL	CERCLIS Number: FL6170024610
	CERCLIS Discovery Date: 11/91	

1. General Site Information					
Name: Outlying Landing Field Bronson			Street Address: Code 18510, Building 1754.		
City: Pensacola	State: FL	Zip Code: 32508-5000	County: Escambia	Co. Code:	Cong. Dist:
Latitude: 30° 23' 0.0"	Longitude: 87° 25' 0.0"	Approx. Area of Site: 959 acres	Status of Site: Inactive		

2. Owner/Operator Information					
Owner: NAS Pensacola			Operator: Same		
Street Address: Code 18510, Building 1754			Street Address: Same		
City: Pensacola			City: Same		
State: FL	Zip Code: 32508-5000	Telephone: 904-436-4515	State:	Zip Code:	Telephone:
Type of Ownership: Federal Agency DOD			How Initially Identified: RCRA/CERCLA Notification		

PA-Score 1.0 Scoresheets
 Outlying Landing Field Bronson - 01/30/92

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POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT FORM	IDENTIFICATION	
	State: FL	CERCLIS Number: FL6170024610
	CERCLIS Discovery Date: 11/91	
3. Site Evaluator Information		
Name of Evaluator: Scott L. Horwitz	Agency/Organization: NEESA/NAVY	Date Prepared: 1/92
Street Address: Code 112E3	City: Port Hueneme	State: CA
Name of EPA or State Agency Contact: Region IV	Telephone: 404-250-3136	
Street Address: 345 Courtland Street NE	City: Atlanta	State: GA
4. Site Disposition (for EPA use only)		
Emergency Response/Removal Assessment Recommendation: No Date: 1/92	CERCLIS Recommendation: Lower Priority SI Date: 1/92	Signature: Name: Scott Horwitz Position: Environmental Engineer

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT FORM	IDENTIFICATION	
	State: FL	CERCLIS Number: FL6170024610
	CERCLIS Discovery Date: 11/91	

5. General Site Characteristics

Predominant Land Uses Within 1 Mile of Site: Residential Forest/Fields DOD	Site Setting: Rural	Years of Operation: Beginning Year: 1942 Ending Year: 1950
Type of Site Operations: DOD Other: Recreation Facility	Waste Generated: Onsite	
	Waste Deposition Authorized By: Present Owner	
	Waste Accessible to the Public No	
	Distance to Nearest Dwelling, School, or Workplace: 0 Feet	

6. Waste Characteristics Information

<table> <thead> <tr> <th>Source Type</th> <th>Quantity</th> <th>Tier</th> </tr> </thead> <tbody> <tr> <td>Contaminated soil</td> <td>1.00e+03 lbs</td> <td>W</td> </tr> <tr> <td>Contaminated soil</td> <td>3.85e+03 sq ft</td> <td>A</td> </tr> <tr> <td>Pile</td> <td>6.00e+04 cu ft</td> <td>V</td> </tr> </tbody> </table>	Source Type	Quantity	Tier	Contaminated soil	1.00e+03 lbs	W	Contaminated soil	3.85e+03 sq ft	A	Pile	6.00e+04 cu ft	V	General Types of Waste: Metals Solvents Oily Waste Other: Petroleum Products.
Source Type	Quantity	Tier											
Contaminated soil	1.00e+03 lbs	W											
Contaminated soil	3.85e+03 sq ft	A											
Pile	6.00e+04 cu ft	V											
Tier Legend C = Constituent W = Wastestream V = Volume A = Area	Physical State of Waste as Deposited Solid Liquid												

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT FORM		IDENTIFICATION	
		State: FL	CERCLIS Number: FL6170024610
		CERCLIS Discovery Date: 11/91	
7. Ground Water Pathway			
Is Ground Water Used for Drinking Water Within 4 Miles: No	Is There a Suspected Release to Ground Water: Yes	List Secondary Target Population Served by Ground Water Withdrawn From:	
Type of Ground Water Wells Within 4 Miles: None	Have Primary Target Drinking Water Wells Been Identified: No	0 - 1/4 Mile	0
Depth to Shallowest Aquifer: 3 Feet	Nearest Designated Wellhead Protection Area: None within 4 Miles	>1/4 - 1/2 Mile	0
Karst Terrain/Aquifer Present: No		>1/2 - 1 Mile	0
		>1 - 2 Miles	0
		>2 - 3 Miles	0
		>3 - 4 Miles	0
		Total	0

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT FORM	IDENTIFICATION	
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8. Surface Water Pathway

Part 1 of 4

Type of Surface Water Draining Site and 15 Miles Downstream: Stream Bay Ocean	Shortest Overland Distance From Any Source to Surface Water: 1000 Feet 0.2 Miles
Is there a Suspected Release to Surface Water: Yes	Site is Located in: Annual - 10 yr floodplain

8. Surface Water Pathway

Part 2 of 4

Drinking Water Intakes Along the Surface Water Migration Path: No

Have Primary Target Drinking Water Intakes Been Identified: No

Secondary Target Drinking Water Intakes:
 None

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8. Surface Water Pathway Part 3 of 4		
Fisheries Located Along the Surface Water Migration Path: No Have Primary Target Fisheries Been Identified: No Secondary Target Fisheries: None		
8. Surface Water Pathway Part 4 of 4		
Wetlands Located Along the Surface Water Migration Path? (y/n) Yes Have Primary Target Wetlands Been Identified? (y/n) Yes Secondary Target Wetlands: None		
Other Sensitive Environments Along the Surface Water Migration Path: Yes Have Primary Target Sensitive Environments Been Identified: Yes Secondary Target Sensitive Environments: None		

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9. Soil Exposure Pathway

Are People Occupying Residences or Attending School or Daycare on or Within 200 Feet of Areas of Known or Suspected Contamination: No

Number of Workers Onsite: None

Have Terrestrial Sensitive Environments Been Identified on or Within 200 Feet of Areas of Known or Suspected Contamination: No

10. Air Pathway

Total Population on or Within:	
Onsite	0
0 - 1/4 Mile	0
>1/4 - 1/2 Mile	0
>1/2 - 1 Mile	0
>1 - 2 Miles	0
>2 - 3 Miles	0
>3 - 4 Miles	0
Total	0

Is There a Suspected Release to Air: No

Wetlands Located
 Within 4 Miles of the Site: No

Other Sensitive Environments Located
 Within 4 Miles of the Site: No

Sensitive Environments Within 1/2 Mile of the Site:
 None

PRELIMINARY ASSESSMENT
REPORT

Activity Name: Outlying Landing Field (OLF) Bronson
Address: Escambia County, Florida

UIC: NO0204

EPA Region: 4

EPA Identification: FL6170024610

Latitude: 30° 23'N Longitude: 87° 25'W

Preliminary Assessment Team Members

Joseph Vogel, P.E.
Scott Horwitz, Environmental Engineer
Mark Kram, Hydrogeologist

Prepared by:

Naval Energy and Environmental Support Activity
Port Hueneme, CA 93043

NEESA 13-228PA
January 1991

Priority for Site Inspection: Low

1.0 INTRODUCTION.

ABSTRACT:

Outlying Landing Field (OLF) Bronson was used as an Outlying Field Landing for NAS Pensacola from 1942-1950. During that time the base used large amounts of aviation gasoline, oil products, and solvents. Presently, all the runways are inactive. Helicopters from Combat Support Squadron 16 use the area for training. The only current employees at Bronson are Morale Recreation and Welfare (MWR) personnel. Duties of MWR personnel at OLF Bronson include operating the campground, minor maintenance of the facility, and teaching sailing and windsurfing.

The base does not treat or dispose of hazardous wastes. All hazardous material and waste are managed through the Public Works Department in NAS Pensacola.

During the PA Investigation, three areas of environmental concern were discovered: two large aircraft fuel systems which were used to refuel various aircraft during 1940-1952, a hill which was used to align aircraft gun sights, and a fire fighter training area.

OLF Bronson used two large aircraft fuel distribution systems when the airfield was active. The first system consisted of four 25,000 gallon and one 15,000 gallon underground storage tanks (UST). The tanks were used to supply fuel for 5,500 feet gasoline fuel line. The fuel line was used in connection with 56 gasoline service pits. The service pits were used to refuel various aircraft. The five UST and the refueling pits are scheduled for removal. However, the fuel lines connected to the fuel pits will remain (E.C. Jordan).

The second fuel system consisted of six 25,000 gallon underground fuel tanks which supplied aviation fuel through 5,000 feet of underground steel lines. The fuel lines were used in connection with 20 gasoline service pits. The refueling pits were located near the seaplane ramps. The six UST and the refuel pits are scheduled to be removed. However, the fuel lines connected to the fuel pits will remain (E.C. Jordan). It is unknown if the tanks or the fuel lines were emptied when the station was dismantled.

Aircraft mechanics used the southeast section of the airfield to calibrate 30 and 50 caliber aircraft machine guns. Bullets from aircraft guns were aimed at a large clay hill to test and align aircraft gun sites. This clay hill, which will be referred to as 'Machine Gun Butt Hill', is approximately 100 feet in length, 20 feet high, and 30 feet wide.

The station fire department conducted practice burns at a fire fighting training area on the south side of the runways. The exact details of the fire fighting drills are unknown. It is suspected that the fire fighter drills were conducted while the airfield was in operation.

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2.0 AUTHORITY AND SCOPE.

Section 211 of the Superfund Amendments and Reauthorization Act of 1986 (SARA 211) provides continued authority for the Department of Defense Environmental Restoration Program (DERP) and the Defense Environmental Restoration Account (DERA). The Navy Installation Restoration (IR) program is authorized by Chief of Naval Operations instruction (OPNAVINST) 5090.1 of Aug 1990. Naval Facilities Engineering Command (NAVFACENCOM) manages the Navy program. NAVFACENCOM tasked the Naval Energy and Environmental Support Activity (NEESA) to conduct a preliminary assessment (PA) for each Navy and Marine Corps facility listed on the Federal Facilities Hazardous Waste Compliance Docket as required by SARA 120.

PAs are conducted in accordance with the Preliminary Assessment Guidance for Fiscal Year 1988, OSWER DIRECTIVE 9345.0-01, U.S. Environmental Protection Agency, January 1988, and recommendations are consistent with the National Contingency Plan.

The PA begins with investigation and review of available records at NEESA and the cognizant NAVFACENCOM Engineering Field Division. After the record search, the PA team visits the activity to complete documentation of past and present operations and disposal practices. With the assistance of the activity point of contact, the team tours the activity and interviews long term employees. If a potential threat to human health or the environment is present, further action is recommended.

3.0 ACTIVITY DESCRIPTION

3.1 Activity Location. OLF Bronson is located in northwest Florida, on the east side of Perdido bay, approximately 5 miles west of Pensacola, Florida and about one mile from the Alabama border (Figure 1). OLF Bronson consists of four abandoned airstrips and the remains of old support buildings for the air field. OLF Bronson covers nearly 950 acres, the majority of which is covered by grass, forest, and four airstrips (Figure 2). OLF Bronson is now known as Blue Angel Recreation Park and is used for recreational purposes and helicopter training exercises (U.S. Navy Master Plan).

3.2 Activity Mission and History. With the outbreak of World War II, the Chief of Naval Air Training, headquartered at Naval Air Station (NAS) Pensacola, Florida, determined that new air space was needed to train Naval pilots. They required an area that was close enough to NAS Pensacola for logistics support, but far enough away from the already congested skies over Pensacola. The 950 acre airfield was originally called Tarkiln Field when it was built in 1942. The name was changed to OLF Bronson in 1944. During World War II and the Korean conflict, OLF Bronson operated as a training base for Naval aviators. OLF Bronson was also used to maintain sea planes and train sea plane pilots (U.S. Navy Master Plan).

OLF Bronson was closed as an active airfield in late 1950, but the runways were still used for touch and go landings and for helicopter training. All buildings at OLF Bronson have been dismantled and parts of the base have been sold to private parties.

Presently, all the runways are inactive. However, helicopters from Combat Support Squadron 16 use the area for training. Morale Recreation and Welfare (MWR) personnel are the only current employees at Bronson. Duties of MWR personnel at OLF Bronson include operating the campground, minor maintenance of the facility, and teaching sailing and windsurfing (U.S. Navy Master Plan).

3.3 Surrounding Area. OLF Bronson is located in western Escambia County in an area which is sparsely populated. Two small communities, Paradise Beach and Perdido Heights, are located about a mile to the north of the old airfield. A few houses are located around the perimeter of the old airfield, but most of the surrounding area is either wetlands, forest, or the waters of Perdido Bay.

The areas north, south, and east of OLF Bronson are characterized by scattered residential structures, mobile homes, farm buildings, stores, and churches. Pensacola, with a population of 58,165 (1990 Census), is the nearest city (located approximately 5 miles to the east of the base). The population within a five mile radius of

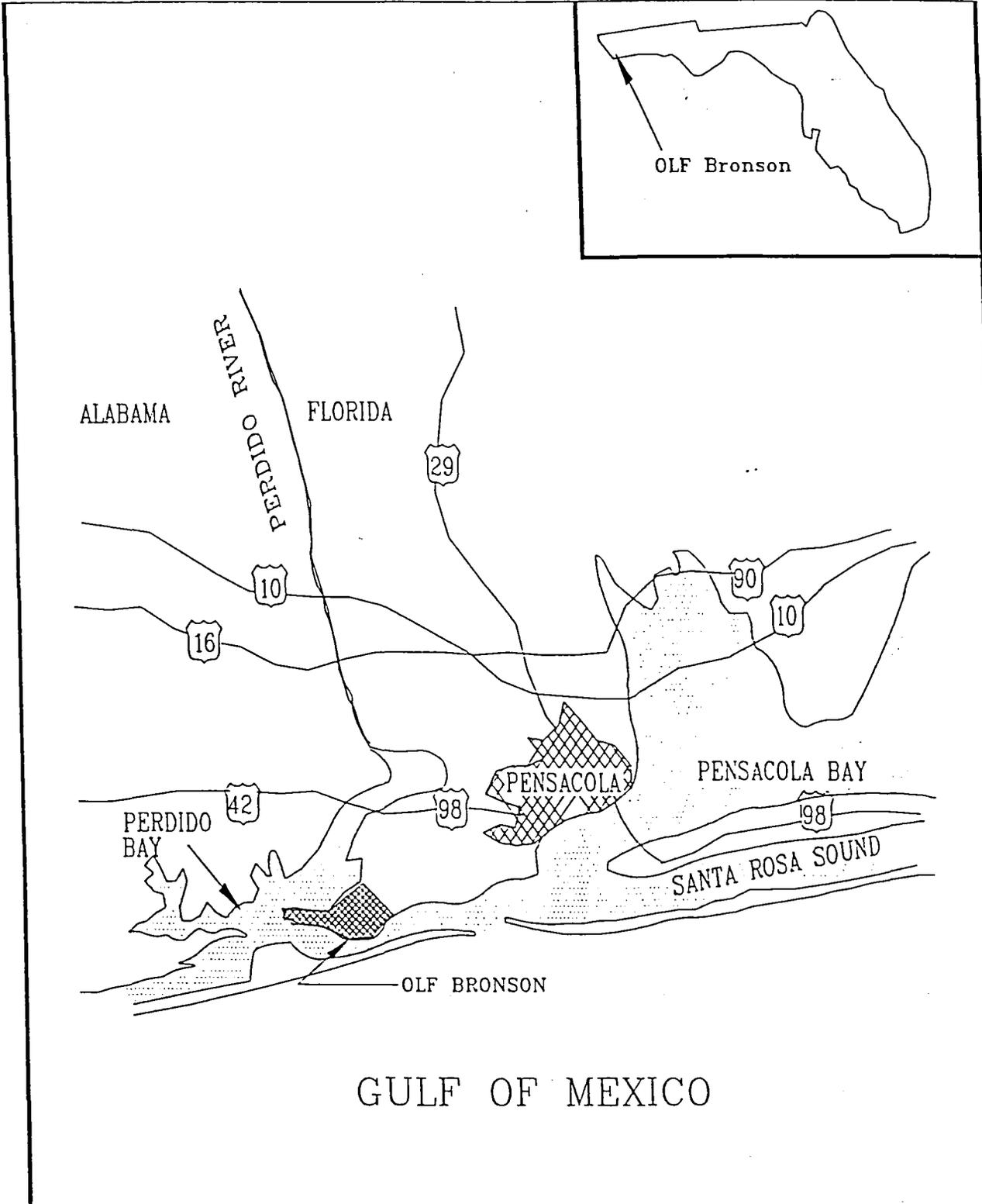
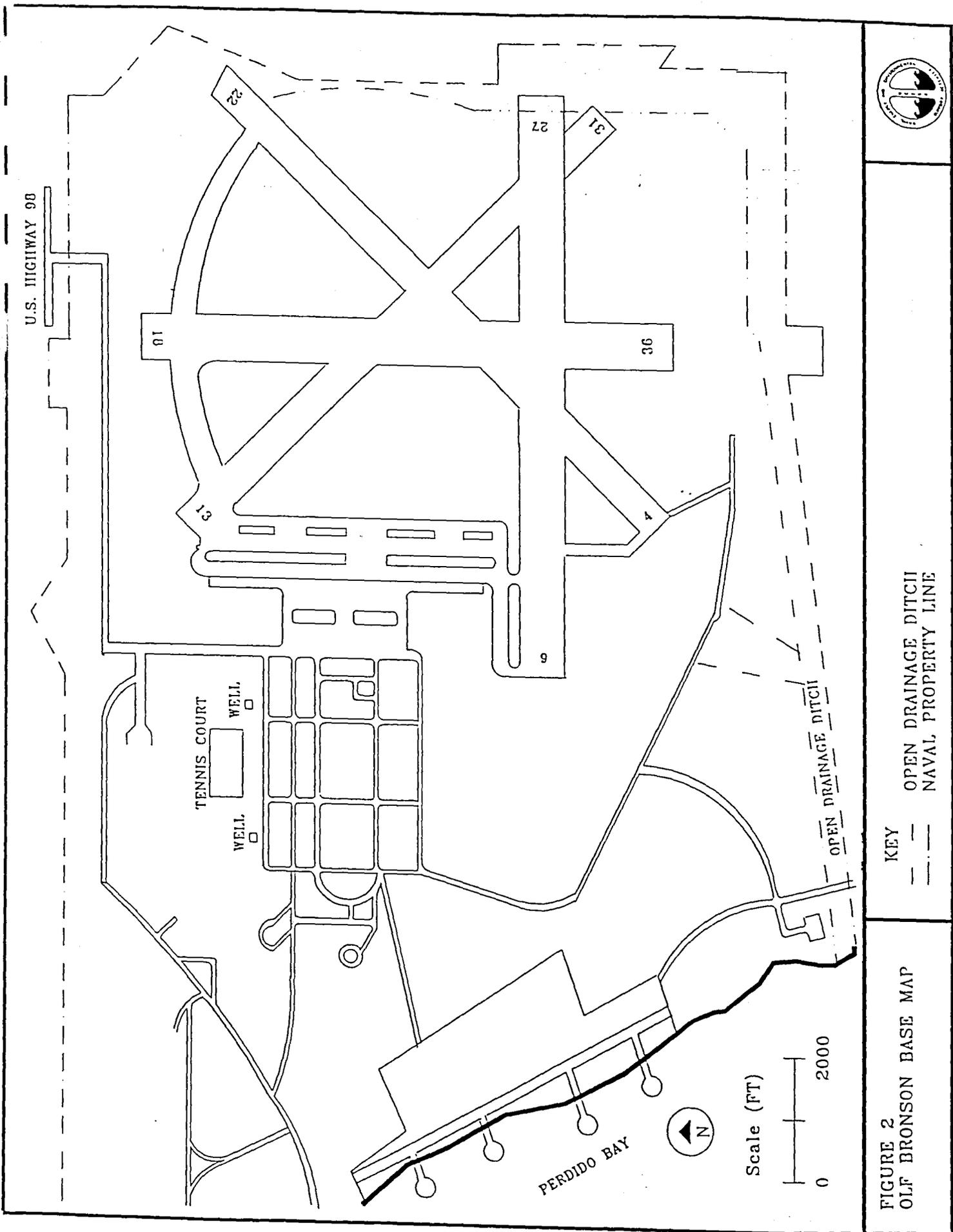


FIGURE 1
OLF Bronson
VICINITY MAP

- Key:
-  Highway
 -  Water Way





OLF Bronson is 32,378, with an average density of 412 persons per square mile. Appendix A gives a breakdown of local populations by census tract numbers (Pensacola Regional Planning Council).

3.4 Climate. OLF Bronson is located in a region of humid, subtropical climate with an average annual temperature of 68 degrees Fahrenheit. Average annual precipitation totals 61 inches. The wettest month is July, which averages 7.2 inches of precipitation and the driest month is November, which averages 3.4 inches of rain. Heavy thunderstorms and flash floods are often a problem in the area when hurricanes and tropical storms enter the Gulf of Mexico (U.S. Navy Master Plan, May 1989).

3.4 Vegetation and Wildlife.

OLF Bronson is covered by paved runways surrounded by grassy fields, wooded areas, and Perdido Bay. The surrounding area is predominantly wooded and supports a wide variety of plant species typical of humid subtropical climates. Slash and longleaf pines are the most abundant species in the area. Along with the pines, trees such as oaks, willows, magnolias, hickories, and gums grow naturally in the area (U.S. Navy Master Plan).

Several plant species listed as threatened or endangered by state or federal agencies have been observed at NAS Pensacola and OLF Bronson. These include Florida Department of Agriculture (FDA) listed endangered species, such as the white-top pitcherplant, large leaved jointweed, and water sundew (U.S. Navy Master Plan, May 1989).

Table 1 lists the numerous threatened and endangered species that may reside at or near OLF Bronson. This list was compiled during the generation of the Naval Technical Training Center, Corry Station Master Plan, Naval Complex Pensacola in May 1989.

TABLE 1

Endangered and Threatened Species

Plants

Scientific Name	Common Name
<i>Drosera intermedia</i>	Water sundew
<i>Epigaea repens</i>	Trailing arbutus
<i>Hexastylis arifolia</i>	Heartleaf
<i>Kalmia latifolia</i>	Mountain laurel
<i>Lilium iridollaej</i>	Panhandle lilly
<i>Polygonella macrophylla</i>	Large-leaved jointleave
<i>Rhodoendron austrinum</i>	Orange azalea
<i>Sarracenia leucophylla</i>	White-top pitcher plant
<i>Sarracenia rubra</i>	Red-flowered pithcer plant
<i>Stewartia malacodendron</i>	Silky camellia

Endangered Fish

<i>Fundulus jenkinsi</i>	Saltmarsh topnimow
--------------------------	--------------------

Amphibians and Reptiles

<i>Alligator mississippiensis</i>	American alligator
<i>Drymarchon corias couperi</i>	Eastern indigo snake
<i>Gopherus polyphemus</i>	Gopher tortoise
<i>Rana areolata aseopus</i>	Florida gopher frog
<i>Macroclemys temminki</i>	Alligator snapping turtle

Mammals

<i>Ursus americanus floridanus</i>	Florida black bear
------------------------------------	--------------------

Birds

<i>Dendroica dominica stoddardi</i>	Stoddard's yellow-thorated warbler
<i>Egretta thula</i>	Snowy egret
<i>Falco peregrinus tundrius</i>	Artic peregrine falcon
<i>Falco sparverius paulus</i>	Southeastern kestrel
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Pandion haliaetus carolinensis</i>	Eastern browm pelican
<i>Pelecanus occidentalis</i>	Brown Pelicans
<i>Picoides borealis</i>	Red-cockaded Woodpeckers

After U.S. Navy Master Plan
NTTC Corry Station, May 1989

3.6 Topography.

OLF Bronson resides in the Coastal Lowland topographic division of the Coastal Plain physiographic division of the United States. The Coastal Lowlands consist of relatively undissected nearly level plains lying less than 100 feet above sea level (Marsh, 1966).

Elevation of OLF Bronson ranges from 20 to 30 feet above mean sea level along a northwestern terrace on the property to sea level along the western portion of the property (Figure 3). With a few exceptions along the northwest corner of the property, topography is level to gently sloping (less than 8% slope).

3.7 Hydrology.

For most of the property, runoff is towards the southwest through a network of culverts that leads to Perdido Bay. Swampy areas exist in the south central portion of the property as well as in the extreme northwest and northeast corners.

The drainage basin of concern consists of a well-developed network of waterways which drains Escambia and Santa Rosa Counties (Figure 4). The Perdido River forms the Florida-Alabama line along the west margin of the Panhandle and flows southward into Perdido Bay. The Perdido River Basin consists of 925 square miles of area: (236 in Escambia and Santa Rosa counties) (Musgrove et. al., 1965). Average flow from the basin is 1,120 million gallons per day (284 mgd from Escambia and Santa Rosa counties). Escambia River, the largest stream in the area, flows southward from Alabama on the north, dividing Escambia County from Santa Rosa County, and empties into Escambia Bay approximately 8 miles from OLF Bronson. The Escambia River Basin consists of 4,233 square miles of area: 410 in Escambia and Santa Rosa counties (Musgrove et. al., 1965). Average flow from the basin is 4540 mgd (556 mgd from Escambia and Santa Rosa counties). Towards the north, streams on the east side of the Escambia River are relatively short with a random dendritic pattern. The streams on the west side (where OLF Bronson is located) are many times longer and have fairly straight, parallel channels that trend southeastward, reminiscent of trellis drainage. Hundreds of small ponds dot Escambia and Santa Rosa counties. These ponds are apparently accumulations of rainwater held up by underlying clay or iron-cemented sandstone ("hardpan").

Approximate average annual runoff, in inches, from areas within Escambia and Santa Rosa counties is presented in Figure 5. OLF Bronson Field is affected by a 100-year flood plain which straddles the western perimeter of the property. This flood prone area is illustrated in Figure 6. The flood plain encroaches upon some of the developed (paved) areas of the facility.

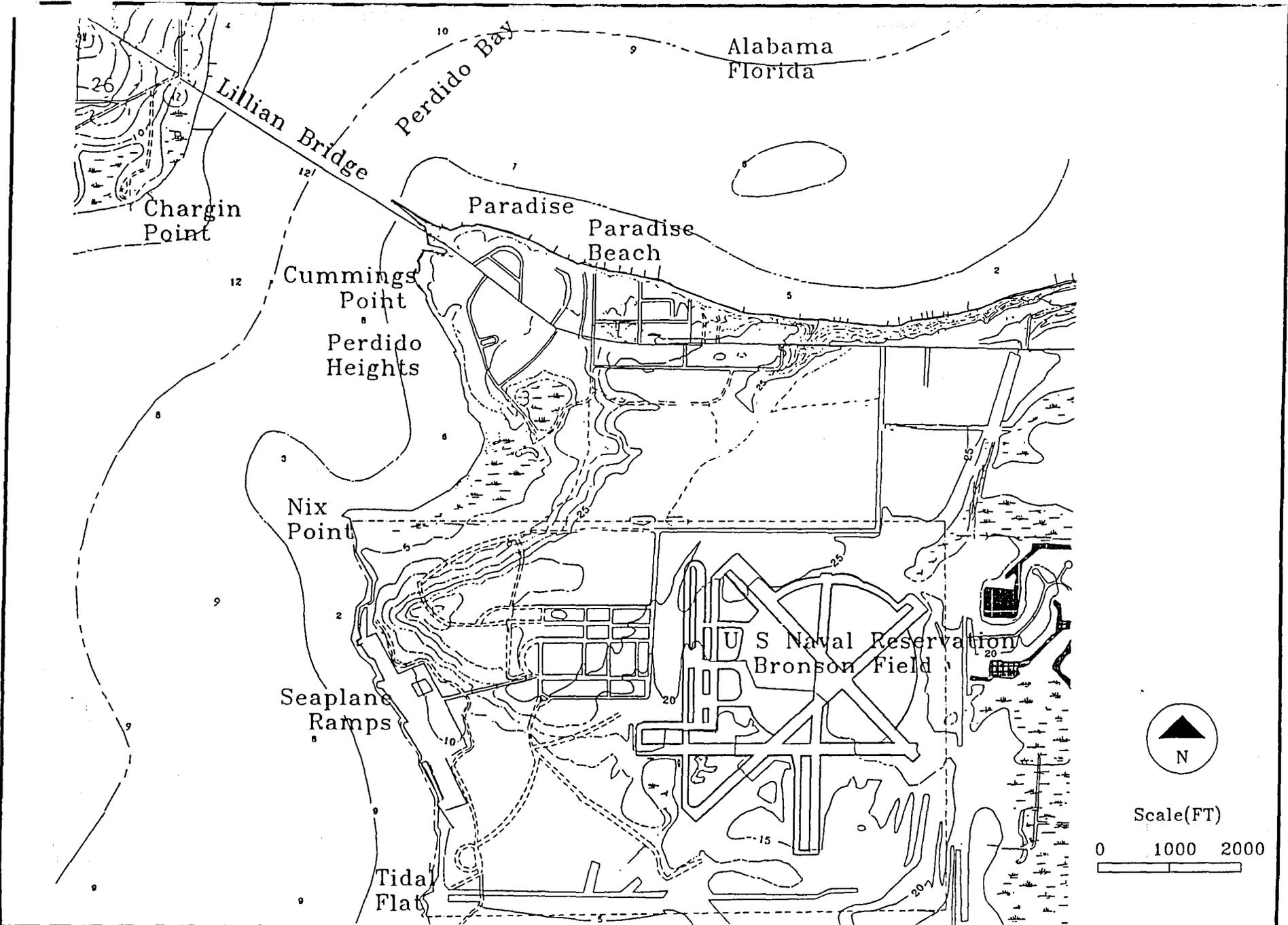


Figure 3
OLF Bronson
Topographic Map

Key:
Base Border - - - - -



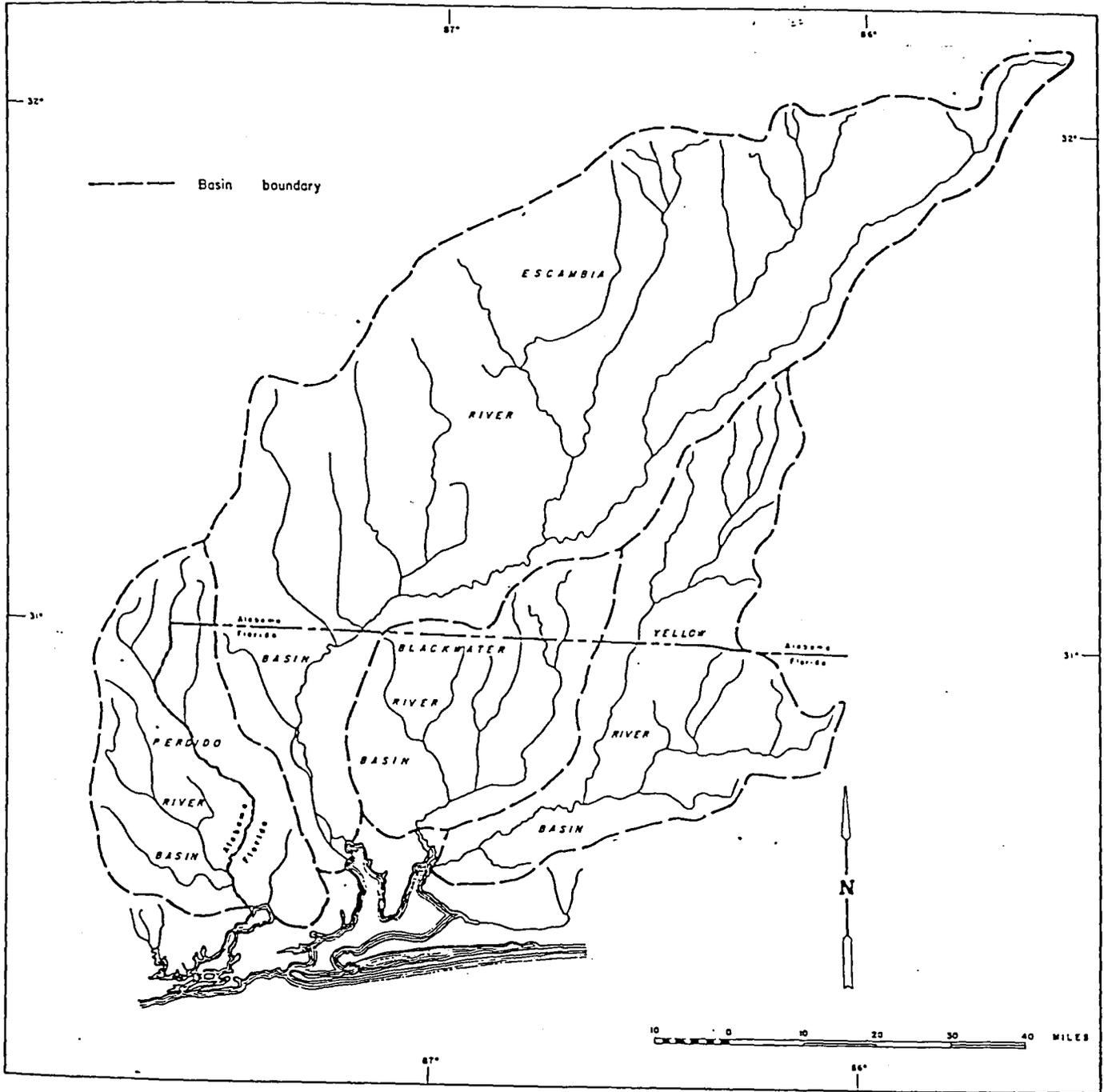


Figure 4
OLF BRONSON

Key: Basin Map of Perdido, Escambia, Blackwater, & Yellow Rivers (Modified After Musgrove ET. AL., 1965).



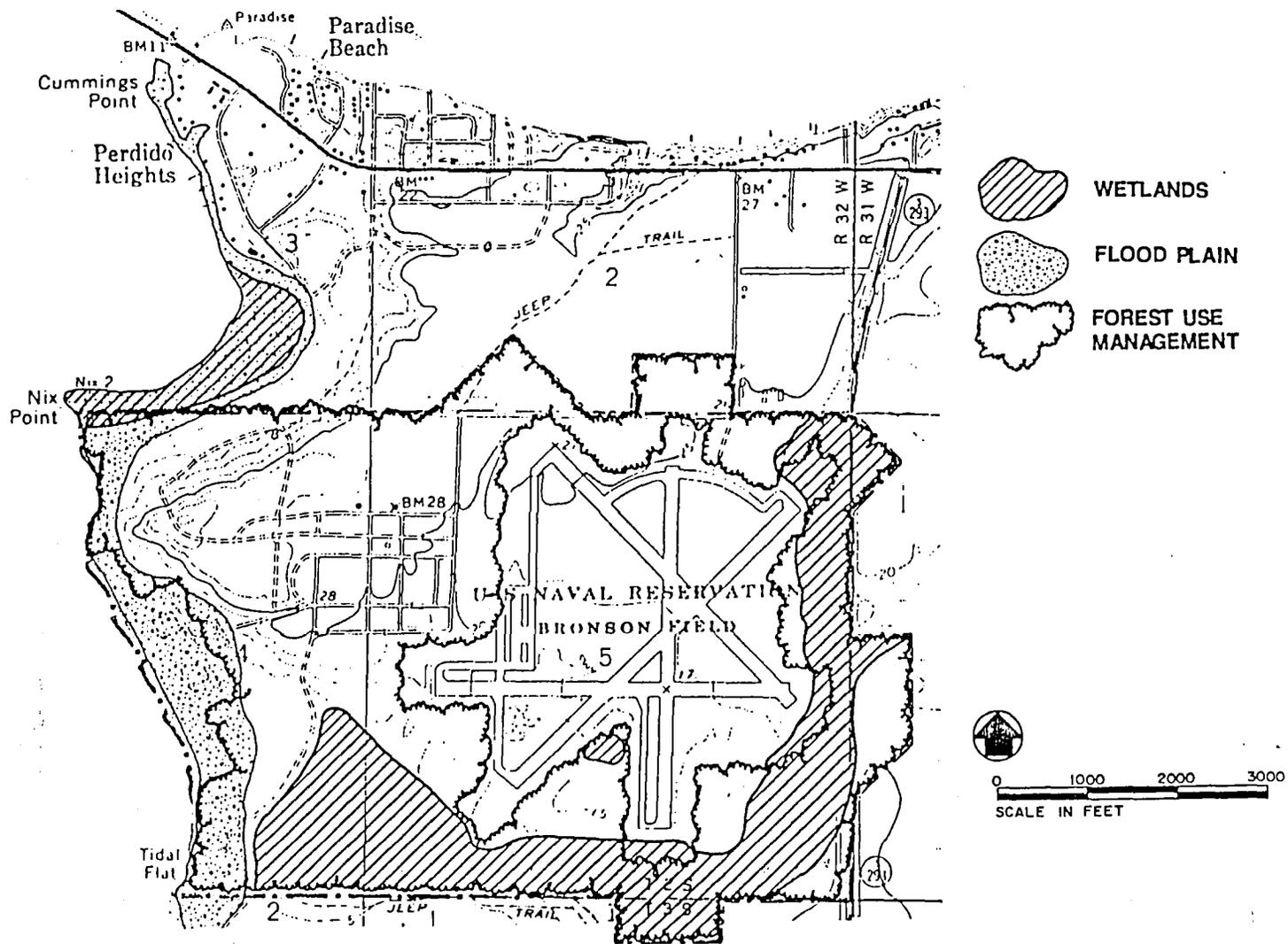


Figure 6
OLF Bronson
Flood Plain Area



The surface waters of Escambia and Santa Rosa counties are of excellent quality, except in the coastal reaches where tides bring salt water up the streams. The Escambia River, emanating from Alabama, possess waters of higher mineral content (approximately 100 ppm). However, this mineralization is diluted somewhat by the lower minerals-content waters of the Florida tributaries (Musgrove et. al., 1965).

Only a small part of the surface water of the Escambia and Santa Rosa County areas are presently being used. Recreation, shipping, cooling and waste disposal are the major uses at present (Musgrove et. al., 1965). These uses are nonconsumptive in that no water is permanently removed from the water body. Water used for cooling is removed from a stream and returned with only a slight rise in temperature. There are no known major surface water consumptive uses within the area and the full potential of the surface waters is far from being realized (Musgrove et. al., 1965).

Most uses of surface water are within the southern half of the area. Principal among these are recreation and shipping. Eleven Mile Creek has been used for disposal of industrial wastes (Musgrove et. al., 1965). No known drinking water uses of surface waters have been identified.

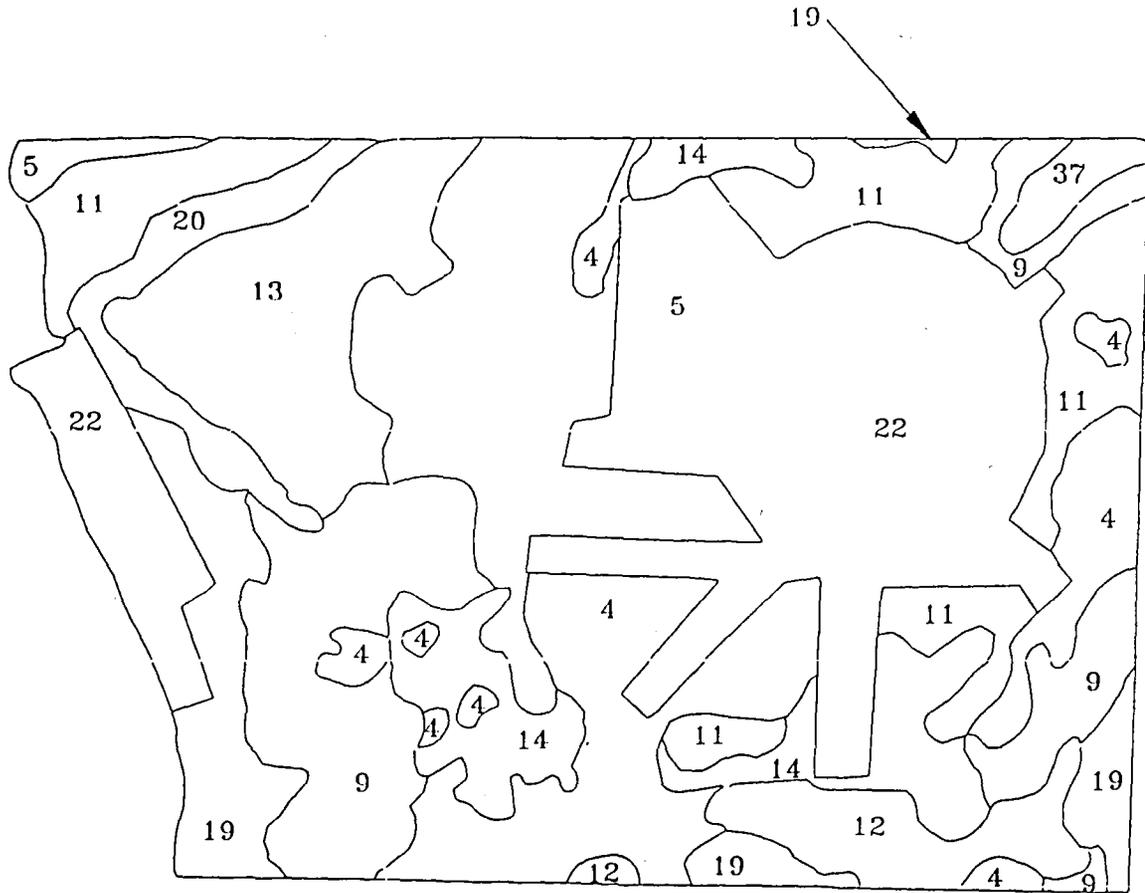
3.8 Soils.

The majority of the following soil information was obtained from the 1991 U.S. Department of Agriculture draft soil survey of Escambia County, Florida. The 1991 USDA soil survey, which is an update to the 1960 survey, has not been publicly released. New jargon will be implemented at the time of release. Therefore, new labels as well as old symbols and labels will be utilized in this report.

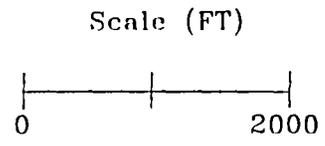
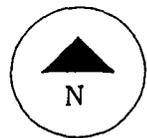
Figure 7 displays the soil configuration map as of 1991. Surface sediments in the Bronson Field area are classified with the Croatan, Foxworth, Hurricane, Lakeland, Leon, Pickney, Pottsburg, and Urban Land associations.

Croatan muck, depressional (12; formerly Portsmouth - Pg and Ph) has a 0 to 2 percent slope. The black surface soil ranges from 10 to 14 inches in thickness. Drainage is classified as very poor and water stands on much of the soil during wet seasons. The subsoil, ranging from a light gray to light grayish-brown, is a firm, fine, sandy clay loam. The profile description is as follows:

- 0 to 14 inches - black loam; friable; fine crumb structure; contains large amounts of organic matter; permeability of 5 to 10 inches per hour; pH of 4.5 to 5.5.
- 14 to 20 inches - very dark grayish-brown fine sandy clay loam; firm; weak, medium, subangular blocky structure; permeability of 5 to 10 inches per hour; pH of 4.5 to 5.5.



- 4 Pickney Sand
- 5 Croatan & Pickney Soils, Depressional
- 9 Leon Sand
- 11 Hurrricane Sand
- 12 Croatab Muck Depressional
- 13 Lakeland Sand, Level
- 14 Pottsburg Sand
- 19 Foxworth Sand
- 20 Lakeland Sand Gentle Slope
- 22 Urban Land
- 37 Pickney Mucky Sand Depressional



3.12

Figure 7
 OLF Bronson
 Soil Map
 (Modified Ater U.S.D.A 1991)



20 to 28 inches - dark grayish-brown, fine, sandy clay loam with brownish-yellow and gray mottles; firm; moderate, medium, subangular blocky structure; permeability of 5 to 10 inches per hour; pH of 4.5 to 5.5.

Croatan and Pickney soils, depressional (5; formerly Fresh Water Swamp - Fc, Mixed Alluvial - Ma, and Pamlico muck - Pa), has a 0 to 2 percent slope. The surface soil is a black muck of various thicknesses (a few inches to many feet) that rests on a black mucky sand containing varying amounts of organic matter. Drainage is classified as very poor. The profile description is as follows:

0 to 30 inches - black, well-decomposed, sticky muck that shrinks and cracks as it dries; permeability variable; pH of 4.0 to 5.0.

30 to 42 inches - black, mucky sand; permeability variable; pH of 4.0 to 5.0.

Foxworth sand (19; formerly Lakeland sand, level phase - Lj) has a 0 to 3 percent slope. The surface soil ranges from dark grayish-brown to yellowish-brown in color and from 2 to 4 inches in thickness. Drainage is classified as somewhat excessive. The second layer, a brownish-yellow or yellowish-brown sand, merges with the yellow or brownish-yellow subsoil. The profile description is as follows:

0 to 3 inches - dark grayish-brown sand; loose and single grained; structureless; contains small amount of organic matter; permeability of 10+ inches per hour; pH of 5.0 to 6.0.

3 to 10 inches - yellowish-brown; loose and single grained structureless; permeability of 5.0 to 6.0; pH of 5.0 to 6.0.

10 to 42 inches - brownish-yellow sand; loose and single grained; structureless; permeability of 5.0 to 6.0.

Hurricane sand (11; formerly Klej sand - Ke) has a 0 to 3 percent slope. The surface soil varies from dark gray to very dark grayish-brown in color and from 3 to 6 inches in thickness. Drainage is classified as somewhat poor. The subsoil layers range from brownish-yellow to yellow-brown sands and contain various amounts of yellowish-red, strong brown, and yellow mottling. The profile description is as follows:

0 to 4 inches - very dark gray, loamy sand; very friable; loose and single grained; structureless; permeability of 5 to 10 inches per hour; pH of 4.5 to 5.5.

4 to 12 inches - dark grayish-brown sand; loose and single grained; structureless; permeability of 5 to 10 inches per hour; pH of 4.5 to 5.5.

12 to 28 inches - pale-yellow sand; faintly mottled with a few medium areas of olive yellow, brownish-yellow, and white; loose and single grained; structureless; permeability of 10+ inches per hour; pH of 4.5 to 5.0.

28 to 42 inches - brownish-yellow sand with common, medium, distinct mottles of yellowish red, strong brown, and yellow lenses of white; loose and single grained; structureless; permeability of 10+ inches per hour; pH of 4.5 to 5.0.

Lakeland sand, level to very gently sloping phase (13; formerly Lakeland sand - Lj and Lk), has a 0 to 5 percent slope. This soil has a grayish-brown surface soil that merges with the brownish-yellow loamy, fine sand of the subsoil. Drainage is classified as somewhat excessive. The surface soil ranges from dark grayish-brown to yellowish-brown in color and from 2 to 4 inches in thickness. This soil is underlain by materials of finer texture below 42 inches and, in most places, within 72 inches. The profile description is as follows:

- 0 to 3 inches - dark grayish-brown sand; loose and single grained; structureless; contains small amounts of organic matter; permeability of 10+ inches per hour; pH of 5.0 to 6.0.
- 3 to 10 inches - yellowish-brown sand; loose and single grained; structureless; permeability of 10+ inches per hour; pH of 5.0 to 6.0.
- 10 to 42 inches - brownish-yellow sand; very friable; loose and single grained; structureless; permeability of 5 to 10 inches per hour; pH of 5.0 to 5.5.

Lakeland sand, gently sloping phase (20; formerly Lakeland sand - Ll), has a 5 to 8 percent slope. This soil is similar to the level phase of Lakeland sand, but its slopes are stronger.

Leon sand (9; formerly Leon sand - Lv and Lw) has a 0 to 2 percent slope. The surface soil ranges from gray to light brownish-gray in color and from 2 to 5 inches in thickness. Drainage is classified as somewhat poor. The organic matter stained pan ranges from a dark-brown to dark grayish-brown massive sand. Variations in the depth to the organic matter stained pan are common; however, in most instances it occurs below 24 inches. The profile description is as follows:

- 0 to 3 inches - gray sand; loose and single grained; permeability 10+ inches per hour; pH of 4.5 to 5.5.
- 3 to 26 inches - white sand; loose and single grained; permeability of 10+ inches per hour; pH of 4.0 to 5.5.
- 26 to 30 inches - dark-brown sand; strongly cemented; massive; structureless; organic stained pan; permeability of 0 to 5 inches per hour; pH of 4.0 to 5.5.
- 30 to 42 inches - light yellowish-brown sand; loose and single grained; permeability of 10+ inches; pH of 4.0 to 5.5.

Pickney mucky sand, depressional (37; formerly Rutlege sand - Rs), has a 0 to 2 percent slope. These soils formed under poor drainage from thick beds of acidic sandy materials. The surface soil contains copious amounts of organic material. The surface soil is black and varies from 10 to 14 inches in thickness. Drainage is classified as poor. The subsurface horizons range from gray to dark gray. These soils are common in areas of shallow water table and it is generally normal for water to stand on the surface for long periods during rainy seasons. The profile description is as follows:

- 0 to 12 inches - black sand; very friable; weak fine crumb structure; permeability of 5 to 10 inches of water per hour; pH of 4.5 to 5.5.

12 to 32 inches - dark-gray sand; very friable; weak fine crumb structure; permeability of 10+ inches of water per hour; pH of 4.5 to 5.5.

32 to 42 inches - light brownish-gray sand; loose and single grained; permeability of 10+ inches of water per hour; pH of 4.4 to 5.5.

Pickney sand (4; formerly Rutlege sand - Rs), has a 0 to 2 percent slope. See description for Pickney mucky sand.

Pottsburg sand (14; formerly Rutlege sand - Rs and Klej sand, level phase - Ke) has a 0 to 2 percent slope. See descriptions for Pickney mucky sand and Hurricane sand for characteristics.

Urban land (22) has a 0 to 3 percent slope and consists of regions that have been paved. Drainage is poor and runoff potential excessive. Permeability is generally less than 5 inches per hour.

Mixed alluvial land (see Croatan and Pickney soils, depressional, unit 5), poorly drained (Ma), has 0 to 2 percent slope. This unit represents a mixture of dissimilar materials that border the streams on the property. This land is a result of soil material accumulation rather than soil development. The materials vary so greatly in color, texture, and consistency that any attempt to map the soils separately would be impracticable. This land is subject to frequent overflow. In many places, it lies only a few inches above the water level of adjacent streams. The characteristics of this miscellaneous land type change from time to time as new material is deposited or removed with each overflow. Texture of this land varies greatly, depending on the source of the material and the condition of the stream when the material was deposited. Locally, texture varies from silt loam to sand. The color ranges from gray to black corresponding to the amount of organic matter present. Internal drainage is variable and surface runoff very slow.

3.9 Hydrogeology.

OLF Bronson resides along the western edge of the Florida Panhandle within the Coastal Plain Province. The Coastal Plain, a major physiographic division of the United States, extends eastward from Texas and northward as far as New York. It consists of Cretaceous to Recent age beds of sand, silt, limestone, and clay that dip gently seaward. Most of these sediments were deposited during higher stands of the sea as the Mississippi River system transported eroded debris landward. The Gulf Coast region of the United States is the landward side of the most active geosyncline in North America. The formations which make up the landward side of the geosyncline are all wedge-shaped, thickening rapidly from the outcrop gulfward to the south.

More precisely, OLF Bronson resides within the Coastal Lowlands topographic subdivision of the Coastal Plain which consists of

relatively undissected, nearly level plains lying less than 100 feet above sea level (Marsh, 1966). It is situated along the north flank of the Mississippi Embayment, which accounts for the characteristic southwestward dip of Cretaceous and younger strata (Figure 8, Figure 9, Figure 10 and Figure 11).

Figure 12 describes the geologic sequence by a representative log of an oil test well near Pensacola. For the region of study, a thick sequence of sand, gravel, and clay extends from the surface to as much as 1000 feet deep. Nearly all wells in this area tap permeable sediments within this sequence - collectively referred to as the Sand and Gravel Aquifer (Musgrove et. al., 1965). In the northern half of Escambia County, the Sand and Gravel Aquifer lies on the upper limestone of the Floridan Aquifer. In the southern part (where OLF Bronson resides), the two aquifers are separated by a thick clay unit of Miocene age, which serves to confine the water that is present in the upper limestone of the Floridan Aquifer (Fig. 13). An extensive clay bed, the Bucatunna Clay Member of the Byram Formation, underlies the upper limestone of the Floridan Aquifer and forms an aquiclude throughout the area. The lower limestone of the Floridan Aquifer underlies the Bucatunna and rests upon relatively impermeable clay and shale. Within the area, no fresh-water aquifers occur below the lower limestone of the Floridan Aquifer.

Since more than 99 percent of ground water utilized for drinking and industrial purposes in the region is obtained from the Sand and Gravel Aquifer, and it is separated from the Floridan Aquifer by a relatively impermeable clay, most of the remaining discussion will focus on the characteristics of this important reservoir. For a detailed discussion of Floridan Aquifer characteristics, see Musgrove et. al., 1965.

Parts of the Sand and Gravel Aquifer have a rather high average porosity and permeability and are thus excellent reservoirs for ground water. The aquifer primarily consists of relatively insoluble quartz grains, which accounts for the low mineral content and softness of this water. The ground water conditions are complicated by great lithologic variability due to facies changes during deposition. Ground water is under artesian pressure where lenses and layers of clay, sandy clay, or hardpan overlie a saturated permeable bed. Ground water is under non-artesian conditions where such clays or hardpan are absent or where the permeability is not completely saturated. It is not uncommon for a well to tap both artesian and non-artesian sources. Ground water in the Sand and Gravel Aquifer is derived almost entirely from rain falling in the area. Recharge is greatest where land is relatively flat. The aquifer is discharged by pumping, evapotranspiration, and seepage into streams, swamps, bays and the Gulf of Mexico (Trapp, 1972).

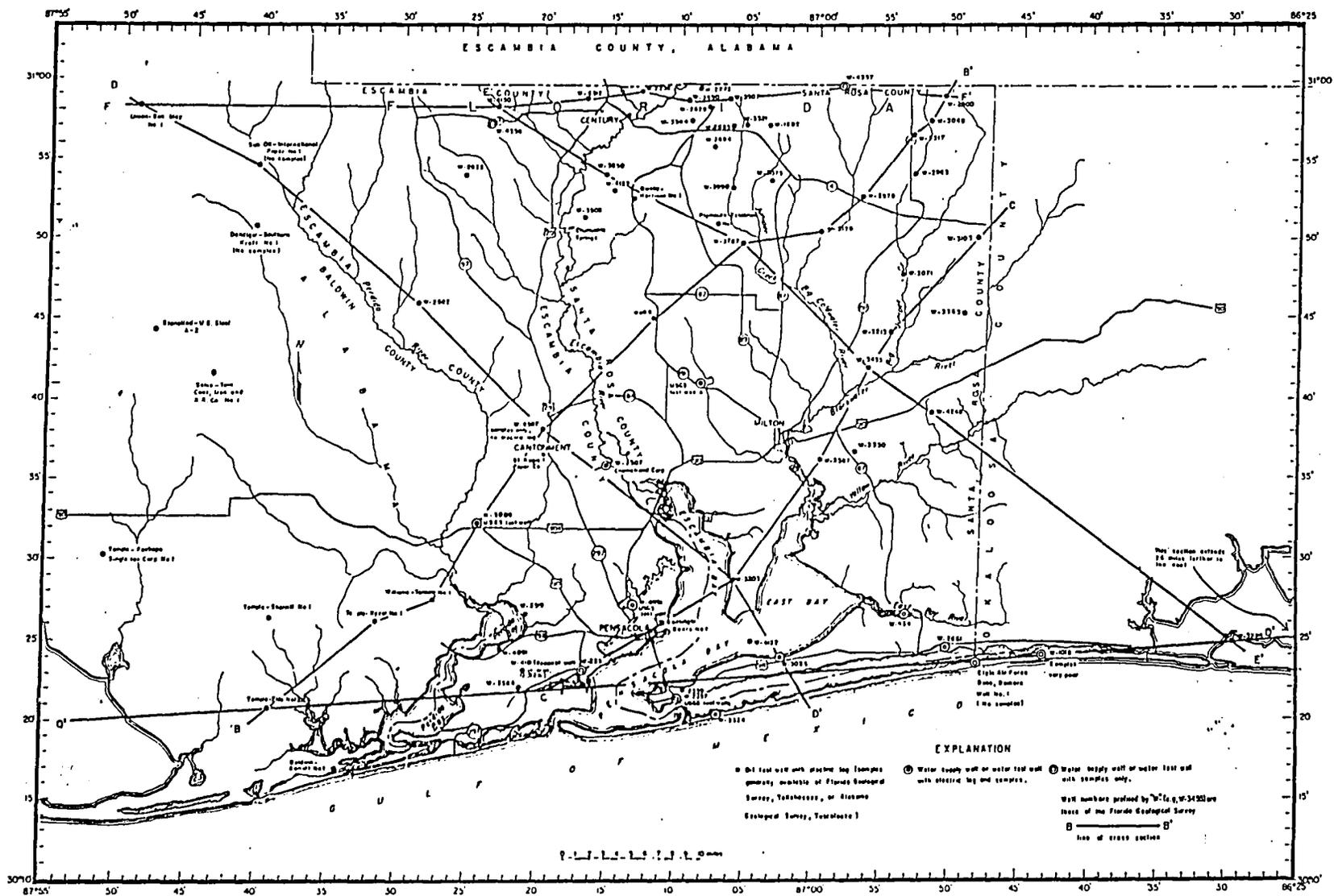


Figure 8
OLF Bronson

Key: Map of Westernmost Florida & Southwestern Alabama Showing Locations of Cross Sections & Wells Used in This Report (Modified After Marsh, 1966).



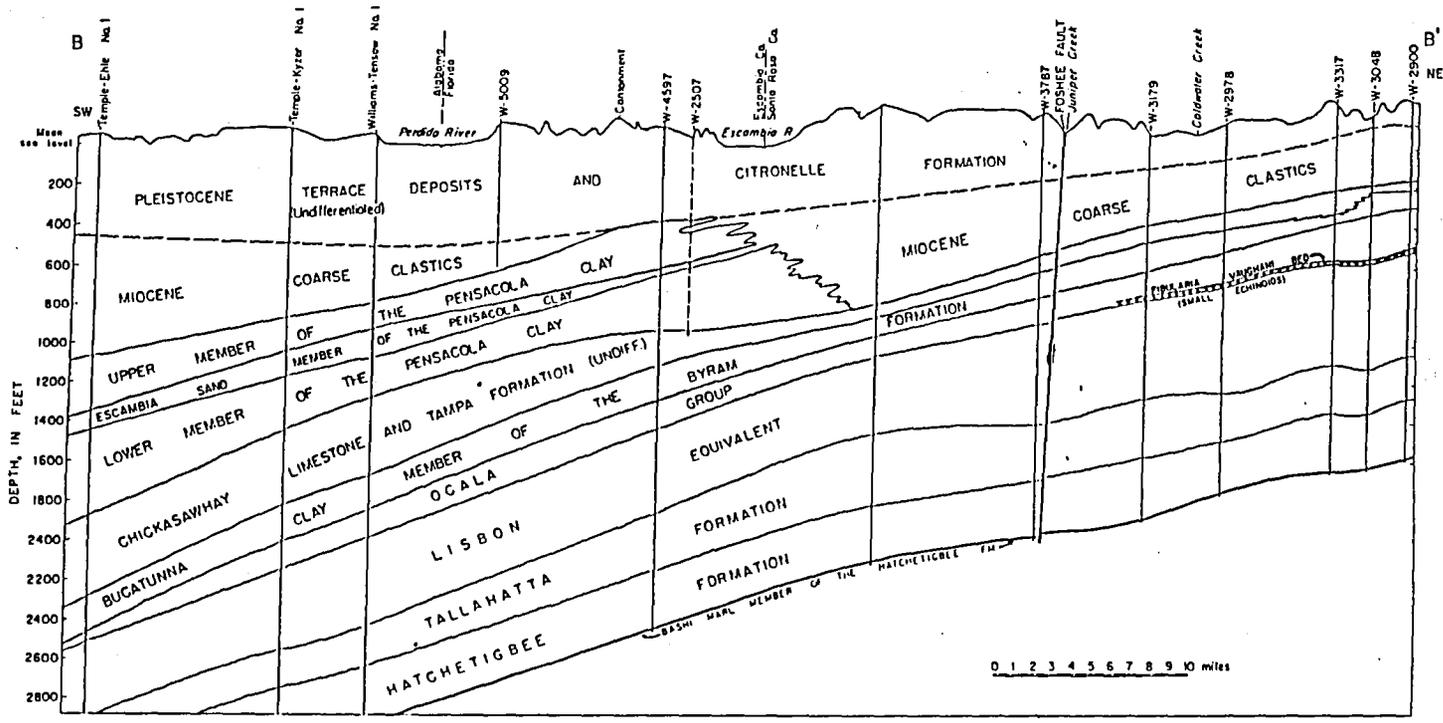


Figure 9
OLF Bronson

Key: Geologic Cross Section B-B' Across Escambia & Santa Rosa Counties (Modified After Marsh, 1966).
Section Parallels the Regional Dip.



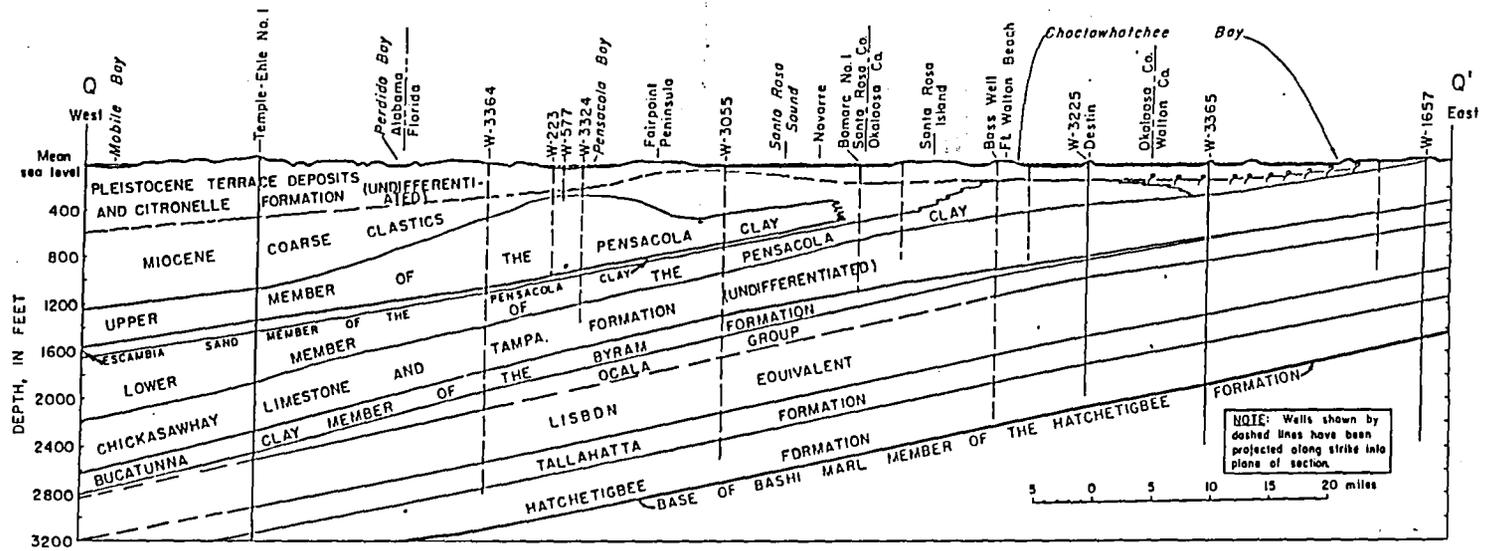


Figure 10
OLF Bronson

Key: Geologic Section Q-Q' From Mobile Bay to the Choctawhatchee River (115 Miles) Showing Formations along the Gulf Coast of Western Florida (Modified After Marsh, 1966).



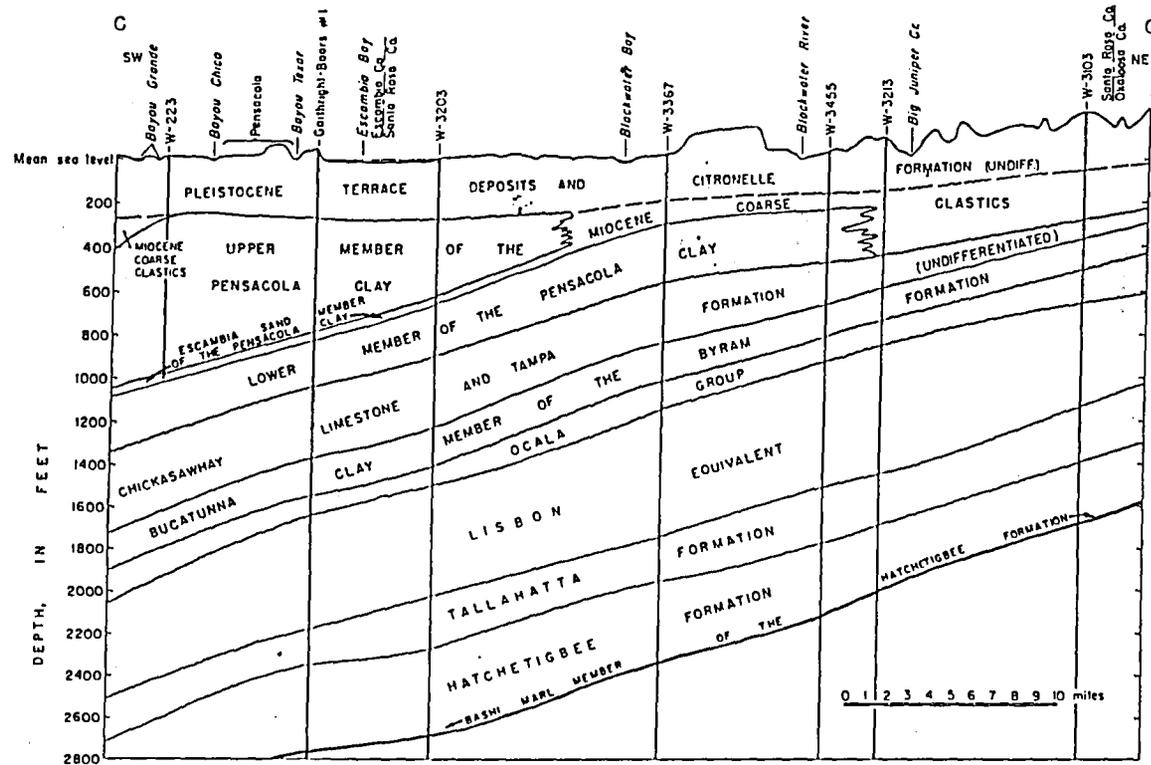


Figure 11
OLF Bronson

Key: Geologic Section C-C' Across Escambia & Santa Rosa Counties (Modified After Marsh, 1966). Section is Parallel to Regional Dip.



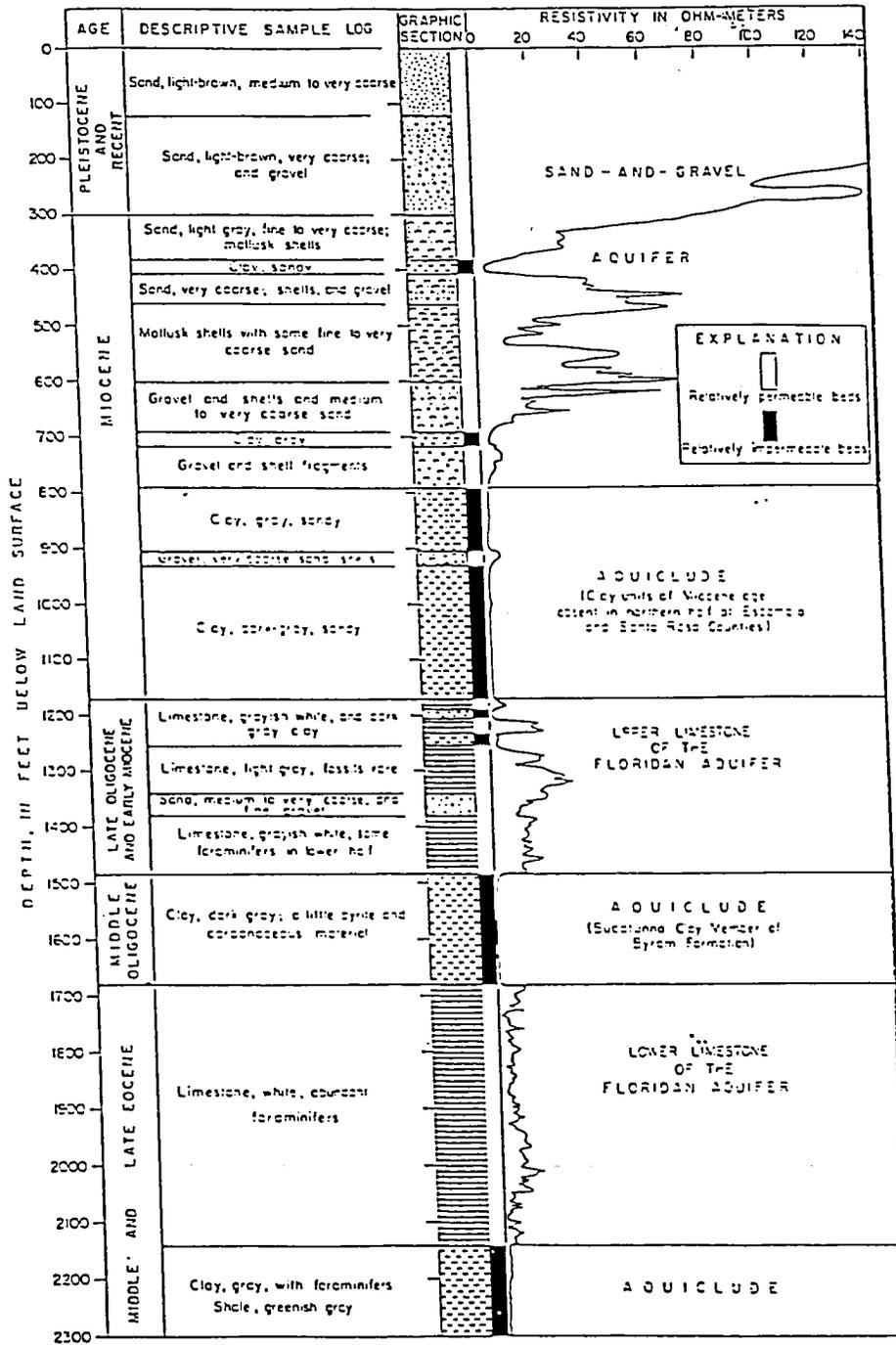


Figure 12
OLF Bronson

Key: Representative Geologic Sequence Based on Log of Oil Test Well Located Near Pensacola (After Marsh, 1966).



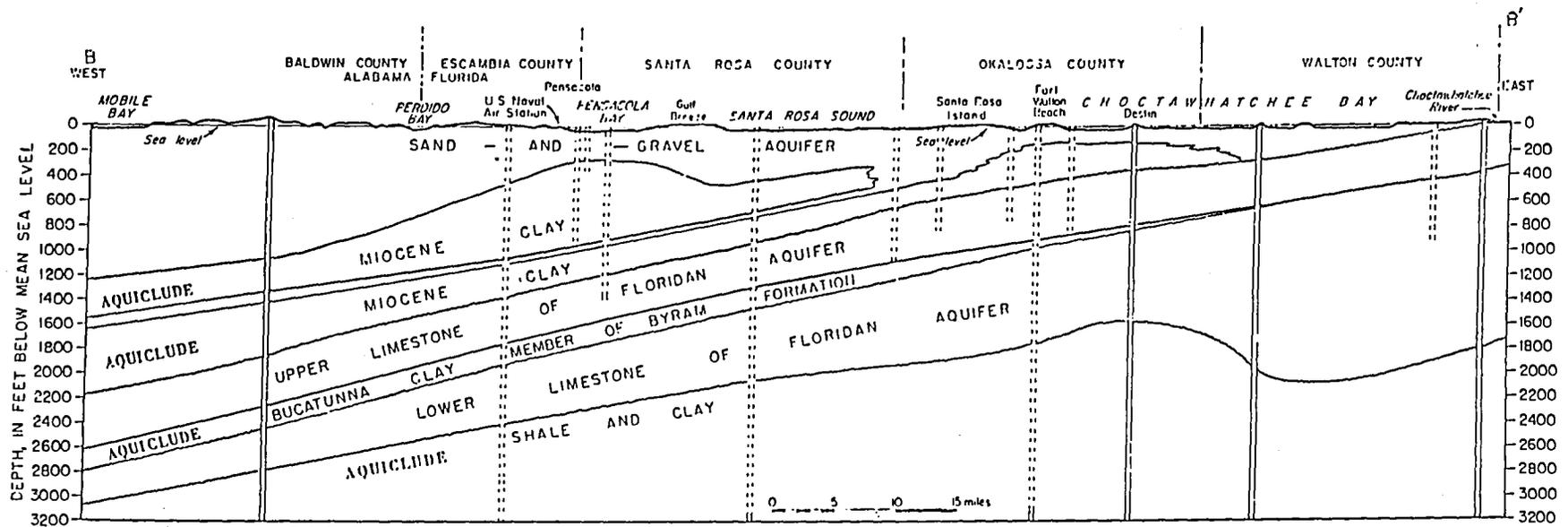


Figure 13
OLF Bronson

Key: Geologic Section Across Escambia & Santa Rosa Counties Showing Aquifers & Aquicludes Along Section B-B' in Figure 8 (Modified After musgrove ET. AL., 1965).



The gradient along the potentiometric surface in the shallow beds of the Sand and Gravel Aquifer generally indicates movement of ground water toward nearby streams. The seepage of this ground water supplies more than half of the entire flow of the smaller streams in Escambia and neighboring Santa Rosa counties. Average velocity of ground water was previously computed to be approximately 100 feet per year in the Pensacola area (Musgrove et. al., 1965). The water table tends to be highest under the broad, relatively level lands that are at a higher elevation than the surrounding lands.

The artesian pressure head of water in the lower permeable beds of the Sand and Gravel Aquifer does not conform to the topography of the land as much as the water table. The artesian pressure head of water from the lower beds indicates a general movement of water to the south (Musgrove et. al., 1965). The head of water in the northern part of Escambia and Santa Rosa counties is usually more than 100 feet above sea level and at some places exceeds 150 feet. In the central part of the counties, the artesian pressure head is about 30 to 80 feet above sea level except near the large rivers. Upward leakage of ground water probably occurs, which lowers the pressure head of the ground water. The artesian pressure head of water under the lands adjacent to the bays (i.e., OLF Bronson) is usually less than 20 feet above sea level and is often less than 10 feet above sea level.

Pumping tests on nearby wells screened within the Sand and Gravel Aquifer indicate specific capacity values that range from 30 to 80 gallons per minute per foot of drawdown (Musgrove et. al.). Aquifer tests performed on wells penetrating the Sand and Gravel Aquifer owned by the City of Pensacola, the U.S. Navy (at NTTC Corry Station), and Newport Industries indicate transmissivities ranging from 58,800 to 94,000 gallons per day per foot. Jacob and Cooper (1940) calculated the "apparent coefficient of storage" to be 0.32 in the upper sands of the Pensacola area. Velocities and the coefficients of transmissivity and storage may vary considerably from place to place. Therefore, drawdown at one place cannot be predicted on the basis of data collected elsewhere.

With few exceptions, the sum of the mineral constituents in the ground water of the Sand and Gravel Aquifer is very low, ranging from 12 to 36 ppm (Barraclough and Marsh, 1962). Water in this aquifer is exceptionally soft, generally containing 4 to 30 ppm of calcium and magnesium carbonates. The fluoride content of this water is usually less than 0.2 ppm. Iron content of water from this aquifer ranges from 0.06 to 4.9 ppm, although it is generally less than 0.25 ppm. Copious amounts of carbon dioxide render much of the water acidic. In some areas water contains hydrogen sulfide in solution. Carbon dioxide measurements in waters beneath NAS Pensacola have been as high as 100 mg/l (Trapp, 1972). However, elsewhere in the area, carbon dioxide concentrations are generally less than 30 mg/l. In Bronson Field ground water reserves, chloride is the major anion and

is generally accompanied by a predominant sodium cation (Musgrove et. al., 1965).

As of 1965, military operations used about 7 million gallons of ground water per day (mgd) in Escambia and Santa Rosa counties. NAS Pensacola had been using 5 mgd from 8 wells (200 to 250 feet deep) at Corry Field. Corry Field has 4 other wells on a standby basis. Bronson Field, Ellyson Field, Saufley Field, and Eglin Field 7 used a total of 1 mgd.

4.0 FINDINGS.

4.1 General Findings. A NEESA team visited OLF Bronson from 9 to 19 July 1991 to collect information for the Preliminary Assessment (PA). All data presented here are current as of those dates.

OLF Bronson, or Blue Angel Recreational Area, is now only used for recreational purposes and to train helicopter pilots. The facility at this time does not store, treat, or generate hazardous materials or hazardous wastes.

4.2 Previous Hazardous Waste Generation, Storage, and Disposal.

Between 1942 and 1957 numerous types of solvents, oils, and fuels were used at OLF Bronson to support air operations. By volume, more high octane aviation gas was used at the facility than any other hazardous material. Toluene, Carbon Tetrachloride, and Trichloroethane were also used by maintenance crew in the hangers and around the facility. The usage rate of solvents, oils, and fuels is unknown. Naval training aircraft required oil changes every 40 hours of flying time. All aircraft maintenance, except for major aircraft overhauls, was conducted at OLF Bronson. Waste oils from aircraft maintenance were put into underground waste oil tanks next to hangers 1103 and 1104. The waste oil was placed in UST 1103 and 1151. Figure 14 shows the approximate location of the UST. It is likely that some waste solvents were also put in these tanks.

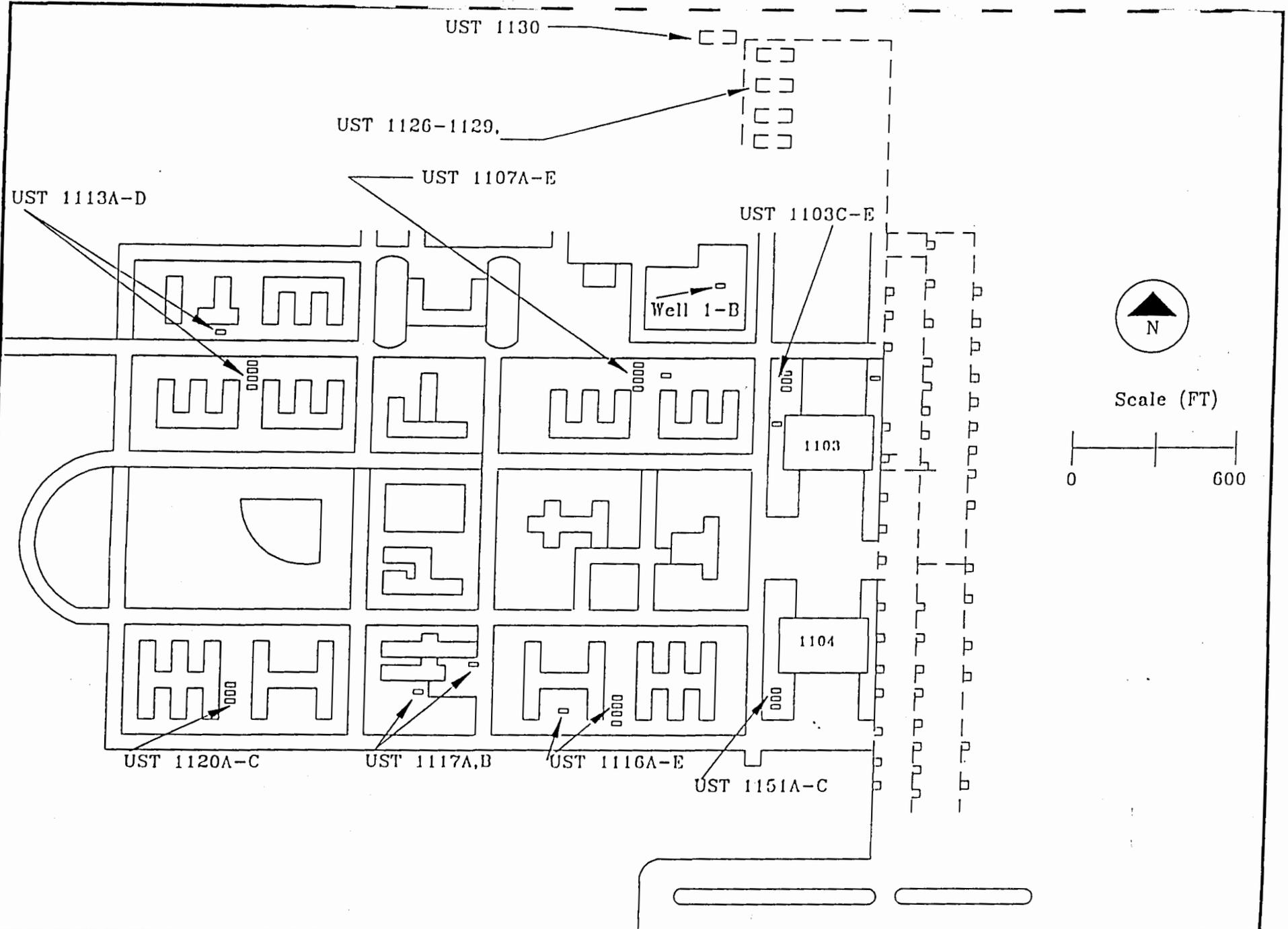
When the waste oil tanks were full, the waste liquids were pumped out and transported off base or burned by the base fire department during fire fighter training drills.

There were other areas around the airfield where hazardous waste and hazardous materials were stored. However, the majority of hazardous waste and hazardous materials were located around the hangar areas.

Besides the usage of fuels, oils, and solvents, both pesticides and herbicides were used at various locations around the base. The amounts and types of pesticides and herbicides used is unknown.

4.2.1 Fire Fighting Training Area. The station fire department conducted practice burns at a fire fighting training area on the south side of the runways. The exact details of the fire fighting drills are unknown. It is suspected that the fire fighting drills were conducted while the airfield was in operation. Figure 15 shows the approximate location of the area.

4.2.2 Machine Gun Butt Hill Area. Aircraft mechanics used the southeast section of the airfield to calibrate 30 and 50 caliber aircraft machine guns. Bullets from aircraft guns were aimed at a large clay hill to test and align aircraft gun sites. This clay hill which will be referred to as "Machine Gun Butt Hill", is approximately 100 feet in length, 20 feet high, and 30 feet wide.



42

Figure 14
 OLF Bronson
 Gasoline Distribution System

Key
 Fuel Line - - - - -
 Fuel Pit □



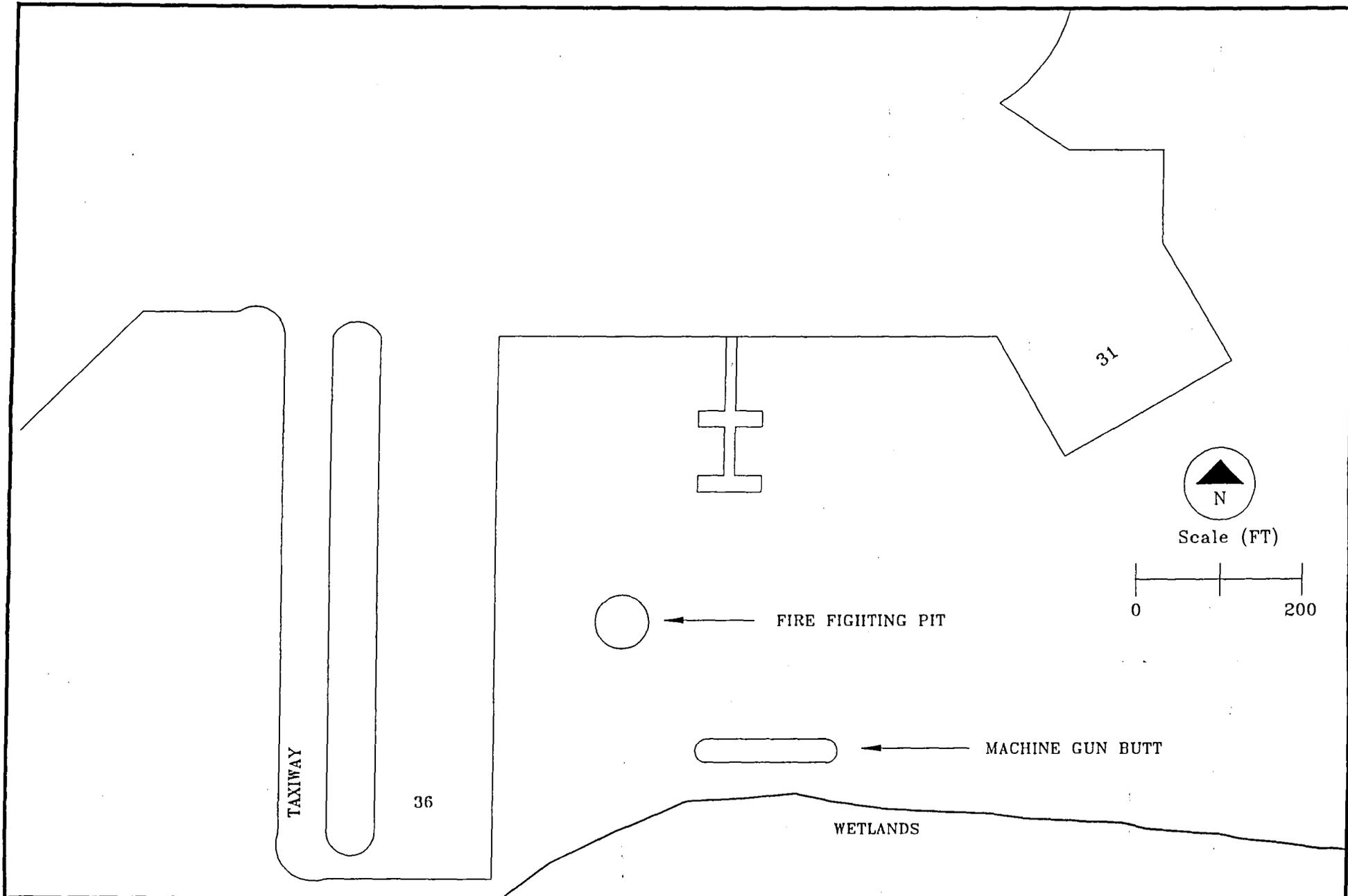


Figure 15
OLF Bronson
Fire Fighting Training &
Machine Gun Butt Area



The amount of rounds fired into the hill are unknown. Figure 15 shows the approximate location of the area.

4.3 Underground Storage Tanks. In 1990, Southern Division Naval Facilities Engineering Command (SOUTHDIV) contracted the engineering services of E.C. Jordon Consultants to develop a petroleum underground storage tank program for OLF Bronson. This contract is designed to remove all but 35 underground storage tanks (UST) and the piping associated with the tanks. The contract also includes the collecting of soil samples for the UST, which will not be removed. Table 2 list the tanks that are to be removed and whether soil sampling will be conducted. Table 3 lists the tanks which will not be removed.

OLF Bronson used two large aircraft fuel distributions systems. The first system consisted of five underground storage tanks located near hangers 1103 and 1104. Tanks 1126-1129 were 25,000 gallon capacity, while Tank 1130 was 15,000 gallon capacity. The tanks were constructed of steel and contained aviation fuel. The tanks were used to supply fuel for a 5,500 foot gasoline fuel line. The fuel line was used to transport fuel to 56 gasoline service pits. The service pits were used to refuel various aircraft. The five UST and the refueling pits are scheduled for removal. However, the fuel lines connected to the fuel pits will remain.

In addition to the five UST mentioned above, two 300 gallon tanks (Tank Numbers 1126A and 1228A) were used in the system to hold lube and used oil products. These tanks are planned to be removed by the contract mentioned above.

Figure 14 shows the approximate location of the system. It is unknown whether the tanks and fuel lines were emptied when the station was dismantled.

The second fuel system consisted of six 25,000 gallon underground fuel tanks (tank numbers 1131-1136), which supplied aviation fuel through 5,000 feet of underground steel lines. The fuel lines were used in connection with 20 gasoline service pits. The refueling pits were located near the seaplane ramps. The six UST and the refuel pits are scheduled to be removed. However, the fuel lines connected to the fuel pits will remain. It is unknown whether the tanks or the fuel lines were emptied when the station was dismantled. The approximate location of the system is shown on Figure 16.

In addition to the six tanks, four additional 300 gallon. tanks were used in the system to hold lube and waste oil. Tank numbers 1131A, 1132A, 1134A and 1136A are planned to be removed. The remaining UST are listed in Table 3. The approximate location of the tanks are shown on Figures 14 and 16.

TABLE 2
OLF Bronson, Tanks to be Removed

Tank Number	Size Gallons	Construction Material	Contents	Soil Collections (Y/N)
1103-C	1000	Concrete	Kerosene*	N
1103-D	1000	Concrete	Lube Oil*	N
1103-E	2000	Concrete	Used Oil	N
1126-A	300	Steel	Condensate	N
1128-A	300	Steel	Condensate	N
1126	25000	Steel	Aviation Gas	N
1127	25000	Steel	Aviation Gas	N
1128	25000	Steel	Aviation Gas	N
1129	25000	Steel	Aviation Gas	N
1130	15000	Steel	Aviation Gas	N
1131-A	300	Steel	Condensate	N
1131	25000	Steel	Aviation Gas	N
1132	25000	Steel	Aviation Gas	N
1132-A	300	Steel	Condensate	N
1133	25000	Steel	Aviation Gas	N
1134-A	300	Steel	Condensate	N
1134	25000	Steel	Aviation Gas	N
1136-A	300	Steel	Condensate	N
1135	25000	Steel	Aviation Gas	N
1136	25000	Steel	Aviation Gas	N
1146-A	300	Steel	Condensate	Y
1151-A	1000	Concrete	Kerosene*	N
1151-B	1000	Concrete	Lube oil*	N
1151-C	2000	Concrete	Used Oil	N
1156	2000	Steel	Gasoline	N
B1 to B24	300	Steel	Lube Oil	N
Well 1-B	2000	Steel	Gasoline	N

* Tanks are full

Source: E.C. Jordan, 1990

Table 3
OLF Bronson, UST Remaining

Tank Number	Capacity Gallons	Contents
1113-A	1500	Fuel Oil
1113-B	1500	Fuel Oil
1113-C	1500	Fuel Oil
1113-D	300	Gasoline
1113-E	UNKNOWN	UNKNOWN
1120-A	1500	Fuel Oil
1120-B	1500	Fuel Oil
1120-C	1500	Fuel Oil
1109-A	2500	Fuel Oil
1109-B	3000	Gasoline
1117-A	4000	Fuel Oil
1117-B	300	Gasoline
1116-A	1500	Fuel Oil
1116-B	1500	Fuel Oil
1116-C	1500	Fuel Oil
1116-D	3000	Fuel Oil
1116-E	3000	Fuel Oil
1101-A	1050	Fuel Oil
1107-A	3000	Fuel Oil
1107-B	1500	Fuel Oil
1107-C	1500	Fuel Oil
1107-D	1500	Fuel Oil
1107-E	1500	Fuel Oil
1103-A	660	Fuel Oil
1103-B	660	Fuel Oil
1104-A	Unknown	Unknown
1104-B	Unknown	Unknown
1140-A	1000	Fuel Oil
1140-B	1000	Fuel Oil
1146-A	1000	Fuel Oil
1143-A	Unknown	Unknown
1144	Unknown	Unknown
1159	Unknown	Unknown
1121	Unknown	Unknown

Wyatt C. Nedrick, Inc.
Architects & Engineers
June 1944

PERDIDO BAY

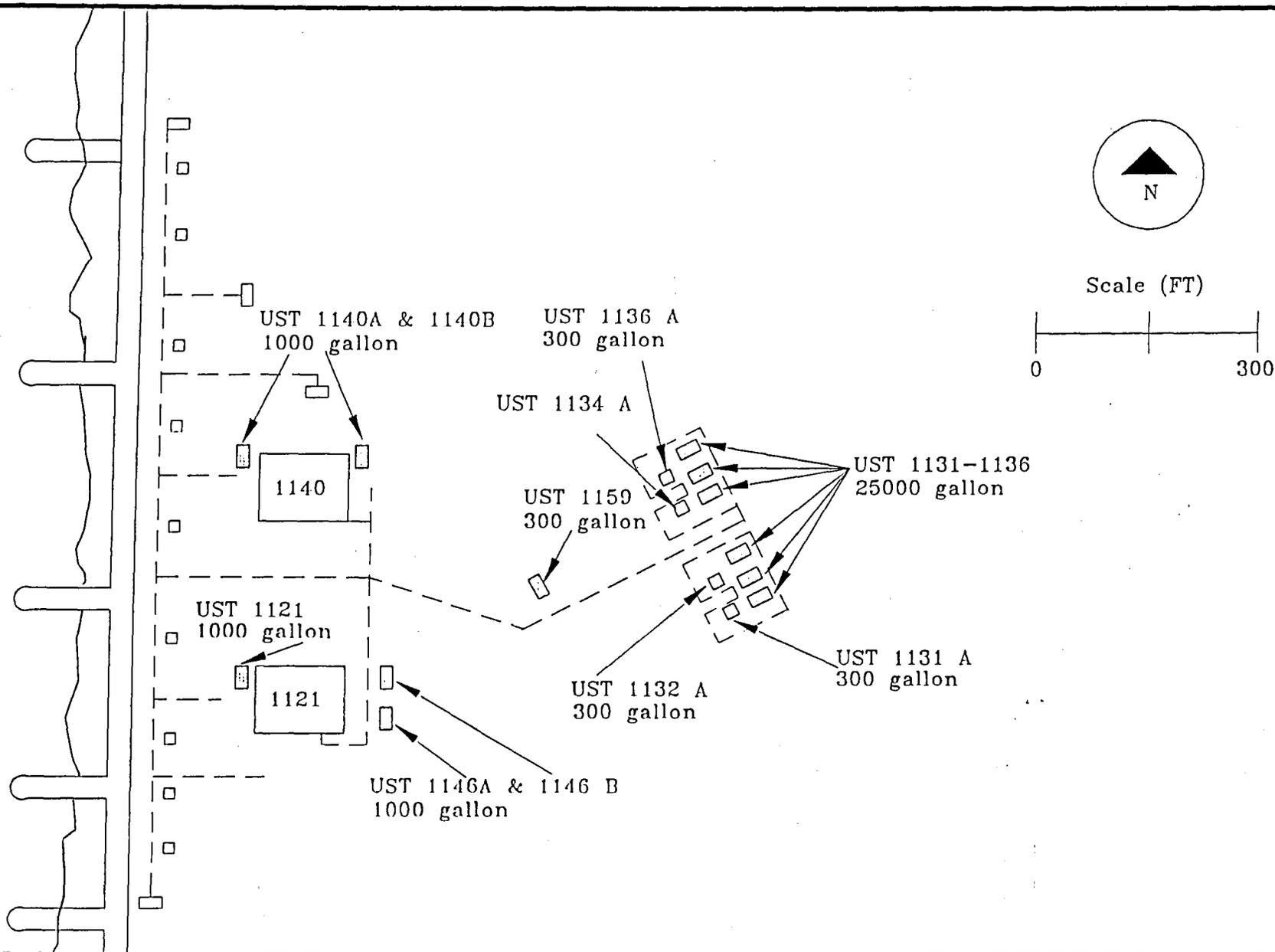


Figure 16
 OLF Bronson
 Seaplane Refueling System

Key:
 Fuel Line - - - -
 Fuel Pit □
 Underground Storage Tank ▤



5.0 AREA SPECIFIC INFORMATION

5.1 Area 1, Maintenance Areas Around the Hangars. OLF Bronson had four hangars - hangars 1140 and 1121, located near the sea plane ramps and hangars 1103 and 1104 located adjacent to Runways 9 and 18. Figures 14 and 16 show the approximate location of the areas. Numerous solvents, fuels, oils, and aircraft cleaners were used at and around the four hangars. Maintenance shops and waste oil tanks were located at all four hangars. Station personnel who worked at OLF Bronson in 1940 and 1950 reported that aircraft parts were degreased with solvents inside and outside the hangars. The Hangars and aircraft parking areas are adjacent to grassy areas. Liquid materials spilled or placed on the concrete near the hangars may have been washed into the grass during periods of precipitation or when the cement was washed down.

Ground water in the area is approximately 10 feet below the surface. If solvents or waste liquid materials reached the grassy areas, they could percolate into the soil and possibly reach ground water.

5.1.2 Potential Contamination Migration Pathways.

Surface Water Receptors. OLF Bronson had four hangars, Hangars 1140 and 1121, located near the sea plane ramps, and Hangars 1103 and 1104, located near Runways 9 and 18. Hangars 1140 and 1121 were located within 100 yards of Perdido Bay. Potential contaminants, which may have leached into the soil around Hangars 1140 and 1121, would likely migrate into Perdido Bay via local ground water flow. Surface water runoff is not thought to be a threat to Perdido Bay.

Hangars 1103 and 1104 are approximately a half a mile from Perdido Bay, which is the closest source of surface water. Runoff or leachate are not thought to pose a threat to Perdido Bay.

Air Receptors. Suspected hazardous wastes are below the surface. Potential hazardous wastes are not thought to pose a threat to local air quality.

Ground Water Receptors. There are no known potable water wells down gradient from the four hangars. Potential contaminants could contaminate local ground water. Ground water is believed to discharge into Perdido Bay.

5.1.3 Area Recommendations. A contract is already underway to remove most of the UST and the potential contamination associated with them. If feasible, it may be more cost and time effective to modify the UST removal contract to include soil samples for the Hangar areas and to determine whether any contamination exists. Soil samples should be collected for analysis for lead and semivolatiles. A soil gas survey should be conducted around the hangars.

5.2 Area 2, Fire Fighter Training Area. The Fire Fighter Training area is located approximately 600 feet north of the Machine Gun Butt Area (Figure 15). The fire fighter training area is about 70 feet in diameter and rests on barren soil. The soil in the area is charred and possesses little vegetation.

The exact details of the fire fighting drills that were conducted are unknown. The majority of flammable liquids burned in the pit was likely waste aviation gasoline. However, other flammable liquids such as kerosene, chlorinated solvents, diesel fuel, hydraulic fluid, and automobile gas may have been burned. Some hydraulic fluids formulated prior to 1972 contained PCBs, so there may have been some PCBs burned in the pit.

A typical fire consisted of filling the training area with water then pouring the flammable material on top of the water and igniting it. Most of the flammables would have burned off but some may have leached into the soil. Potential for migration from the site would be towards ground water, which is only approximately 5 feet in depth in the area.

5.2.2 Potential Contamination Migration Pathways.

Surface Water Receptors. Perdido Bay is located just west of the Fire Fighting Area. Surface water runoff from the Fire Fighting Training Area could drain into the wetlands located south of the area. Charred residue located at the Fire Fighter Training Area may pose a small threat to local surface waters.

Air Receptors. Since this operation was conducted over thirty years ago the volatility of the hazardous materials is no longer a threat to the surrounding air.

Ground Water Receptors. Ground water is believed to discharge into Perdido Bay. There are no known potable water wells down gradient from the Fire Fighter Training Area. Potential contaminants could contaminate local ground water. Although soils in the vicinity have relatively poor drainage characteristics, they are fairly permeable. Therefore, the potential for vertical migration to ground water and to surface discharge zones does exist.

5.2.3 Area Recommendations. Soil samples should be taken in this area to see if any residual contamination may exist. Soil should be sampled for ICP metals, semi-volatiles, and PCBs.

If feasible, it may be more cost and time effective to modify the UST removal contract to include soil samples for the Fire Fighting Training area to determine if any contamination may exist.

5.3 AREA 3, Machine Gun Butt. The machine gun butt is a clay hill about 100 foot in length, 30 foot wide and 20 foot high. Large amounts of spent bullets are scattered about the machine gun butt and lodged in it. Many of the bullets are lead, some are lead with steel jackets, and others have copper jackets. The machine gun butt and all nearby soil is clay or clay and sand intermixed. It is not known if metals are leaching from the area. Figure 15 shows the approximate location of the area.

5.3.1 POTENTIAL CONTAMINATION MIGRATION PATHWAYS.

Surface Water Receptors. Perdido Bay is located just west of the facility. Surface water run-off from the Machine Gun Butt could drain into Perdido Bay on the southwest side of the facility. Heavy metals, located at the Machine Gun Butt may pose a small threat to local surface waters.

Heavy metals tend to bind to clay particles in sediments and are generally not very mobile. Erosion of top soil from the Machine Gun Butt would be the most likely source of contamination reaching local surface waters.

Ground water Receptors. Ground water is believed to discharge into the wetlands surrounding the area. There are no known potable water wells down gradient from the Machine Gun Butt. Metals from the hill are not expected to leach. Thus, it is believed that a threat to the local ground water is minimal.

5.3.3 Area Recommendations. Soil samples should be collected along the perimeter of around the Machine gun butt and analyzed for ICP metals. The sampling plan in this area should be aimed at determining whether metals are migrating from the site.

The Naval Civil Engineering Laboratory (NCEL) at Port Hueneme, CA is developing a system to recycle and recover metals found at target ranges. Even if no contamination is found migrating from the machine gun butt, all spent bullets should still be recycled and soils should be washed to remove residual metals.

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- U.S.D.A. 1960. Soil survey of Escambia County, Florida: series 1955, No. 8, 87 p.
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Appendix 1
Population Densities for OLF Bronson

Track	Population	Area	Density
24	3658	15	244
26.01	4532	30	151
27	6333	12	528
33.03	9657	10	966
36.03	8198	20	410
TOTAL:	32378 persons in a five mile radius of OLF Bronson.		

Calculations for the Population Densities:

Area= πR^2 where, R=5 miles

Area= $\pi (5 \text{ mile})^2$

Area=78.54 miles

Therefore, the population density for OLF Bronson is:

Density=Population/Area.

Density=32378 people/78.54 miles

Density=412.

PA-Score

PA SCORESHEETS

Site Name: Old Hangar Area
CERCLIS ID No.: FL6170024610
Street Address: Code 18510, Building 1754.
City/State/Zip: Penscola, FL 32508-5000

Investigator: Scott L. Horwitz
Agency/Organization: NEESA/NAVY
Street Address: Code 112E3
City/State: Port Hueneme, CA

Date: 1/92

WASTE CHARACTERISTICS

Waste Characteristics (WC) Calculations:

1 Hangar Area	Contaminated soil	Ref: 3	WQ value	maximum
Wastestream	1.00E+03 lbs		2.00E-01	2.00E-01

1. Hangar Area:

When the base was used as an outlying landing field, it utilized four hangars. Numerous solvents, fuels, oils, and aircraft cleaners were used at and around the four hangars. Station personnel who worked at the base reported that liquid materials spilled or placed on a concrete pad may have been washed into the grass during periods of precipitation or when the pad was washed down. Thus, the approximate value of waste in the areas of concern is 1000 lbs. This value is based on conversation with base personnel.
Ref: Interview with Base Personnel.

Waste Characteristics Score: WC = 18

Ground Water Pathway Criteria List
 Suspected Release

Are sources poorly contained? (y/n/u)	Y
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	U
Is precipitation heavy? (y/n/u)	Y
Is the infiltration rate high? (y/n/u)	Y
Is the site located in an area of karst terrain? (y/n)	N
Is the subsurface highly permeable or conductive? (y/n/u)	Y
Is drinking water drawn from a shallow aquifer? (y/n/u)	N
Are suspected contaminants highly mobile in ground water? (y/n/u)	N
Does analytical or circumstantial evidence suggest ground water contamination? (y/n/u)	Y

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

When the base was used as an outlying landing field, it utilized four hangars. Numerous solvents, fuels, oils, and aircraft cleaners were used at and around the four hangars. Maintenance shops and waste oil tanks were located at all four hangars. Station personnel who worked at the base reported that aircraft parts were degreased with solvents inside and outside the hangars. Liquid materials spilled or placed on the concrete near the hangars may have been washed into the grass during periods of precipitation or when the cement was washed. If solvents or waste liquid materials reached the grassy areas, they could percolate into the soil and possibility each the local ground water.

Ref: Interview with Base Personnel.

Ground Water Pathway Criteria List
Primary Targets

Is any drinking water well nearby? (y/n/u)	N
Has any nearby drinking water well been closed? (y/n/u)	N
Has any nearby drinking water well user reported foul-testing or foul-smelling water? (y/n/u)	N
Does any nearby well have a large drawdown/high production rate? (y/n/u)	N
Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance? (y/n/u)	N
Does analytical or circumstantial evidence suggest contamination at a drinking water well? (y/n/u)	N
Does any drinking water well warrant sampling? (y/n/u)	N

Other criteria? (y/n) N

PRIMARY TARGET(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Targets:

GROUND WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	█
Is the site located in karst terrain? (y/n)	No	
Depth to aquifer (feet):	3	1
Distance to the nearest drinking water well (feet):	36960	2

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550	█	█
2. NO SUSPECTED RELEASE	█	0	
LR =	550	0	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0	█	█
4. SECONDARY TARGET POPULATION Are any wells part of a blended system? (y/n) N	0	0	
5. NEAREST WELL	0	0	
6. WELLHEAD PROTECTION AREA None within 4 Miles	0	0	
7. RESOURCES	5	0	
T =	5	0	

WASTE CHARACTERISTICS

WC =

18	0
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GROUND WATER PATHWAY SCORE:

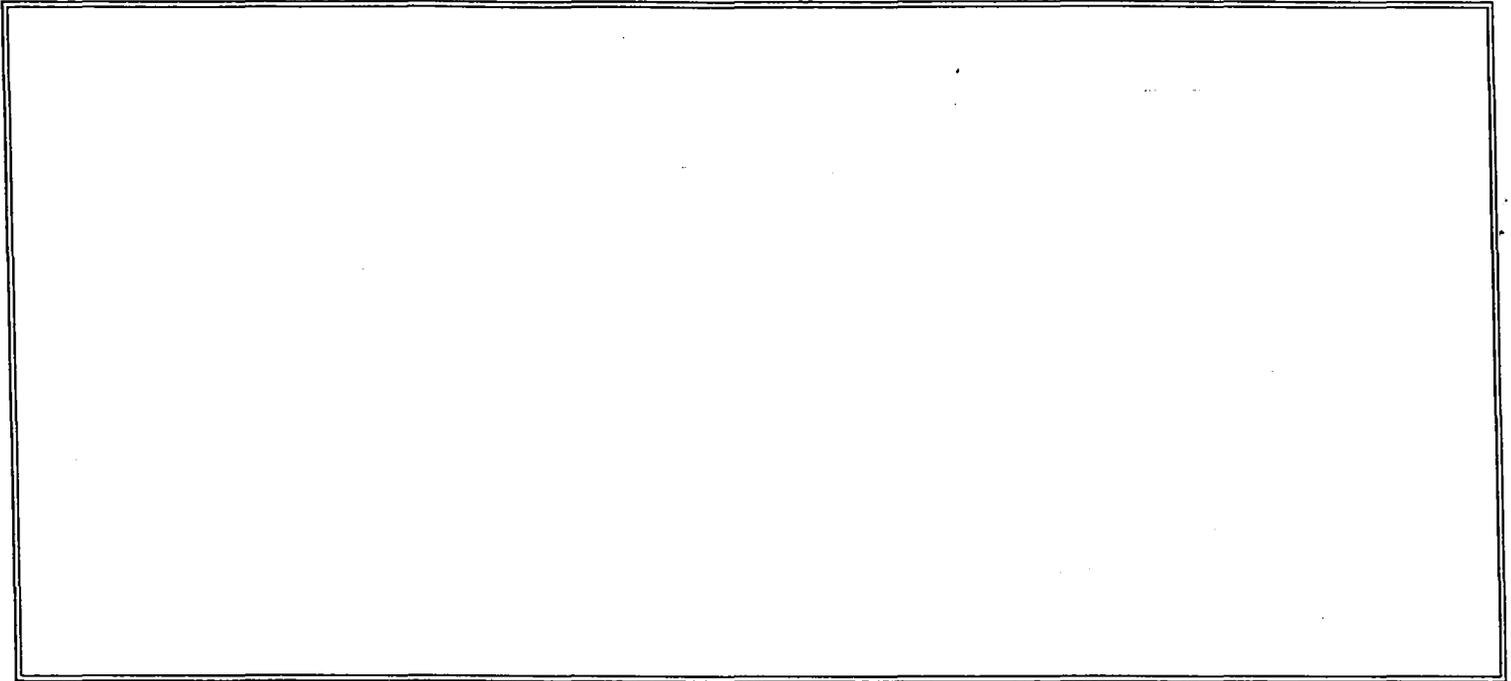
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Ground Water Target Populations

Primary Target Population Drinking Water Well ID	Dist. (miles)	Population Served	Reference	Value
None				
Total				

Secondary Target Population Distance Categories	Population Served	Reference	Value
0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total			0

Apportionment Documentation for a Blended System



Surface Water Pathway Criteria List
 Suspected Release

Is surface water nearby? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	Y
Is the drainage area large? (y/n/u)	U
Is rainfall heavy? (y/n/u)	Y
Is the infiltration rate low? (y/n/u)	Y
Are sources poorly contained or prone to runoff or flooding? (y/n/u)	Y
Is a runoff route well defined(e.g.ditch/channel to surf.water)? (y/n/u)	U
Is vegetation stressed along the probable runoff path? (y/n/u)	N
Are sediments or water unnaturally discolored? (y/n/u)	N
Is wildlife unnaturally absent? (y/n/u)	N
Has deposition of waste into surface water been observed? (y/n/u)	N
Is ground water discharge to surface water likely? (y/n/u)	Y
Does analytical/circumstantial evidence suggest S.W. contam? (y/n/u)	Y
Other criteria? (y/n)	N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

OLF Bronson had four hangars, Hangars 1140 and 1121, located near the sea plane ramps, and Hangars 1103 and 1104, located near Runways 9 and 18. Hangars 1140 and 1121 were located within 100 yards of Perdido Bay. Potential contaminants, which may have leached into the soil around Hangars 1140 and 1121, may have migrated into Perdido Bay via local groundwater flow.

Hangars 1103 and 1104 are approximately a half a mile from Perdido Bay, which is the closest source of surface water. Runoff or leachate are not thought to pose a threat to Perdido Bay.

Surface Water Pathway Criteria List
 Primary Targets

Is any target nearby? (y/n/u)	If yes:	Y
N Drinking water intake		
N Fishery		
Y Sensitive environment		

Has any intake, fishery, or recreational area been closed? (y/n/u) N

Does analytical or circumstantial evidence suggest surface water
 contamination at or downstream of a target? (y/n/u) Y

Does any target warrant sampling? (y/n/u)	If yes:	Y
N Drinking water intake		
N Fishery		
Y Sensitive environment		

Other criteria? (y/n) N

PRIMARY INTAKE(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Intakes:

continued -----

continued -----

Other criteria? (y/n) N

PRIMARY FISHERY(IES) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Fisheries:

Other criteria? (y/n) N

PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED? (y/n) Y

Summarize the rationale for Primary Sensitive Environments:

OLF Bronson is covered by paved runways surrounded by grassy fields, wooded areas, Perdido Bay, and wetlands. The surrounding area is predominatly wooded and supports a wide variety of plant species.

Several plant species listed as threatened or endangered by state or federal agencies have been observed at OLF Bronson. These include Florida Department of Agriculture (FDA) listed endangered species, such as the white-top pitcherplant, large leaved jointweed, and water sundew.

Ref: U.S. Navy Master Plan.

SURFACE WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	
Distance to surface water (feet):	1000	2
Flood frequency (years):	1-10	4
What is the downstream distance (miles) to:		
a. the nearest drinking water intake?	0.0	
b. the nearest fishery?	0.0	
c. the nearest sensitive environment?	0.5	4

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

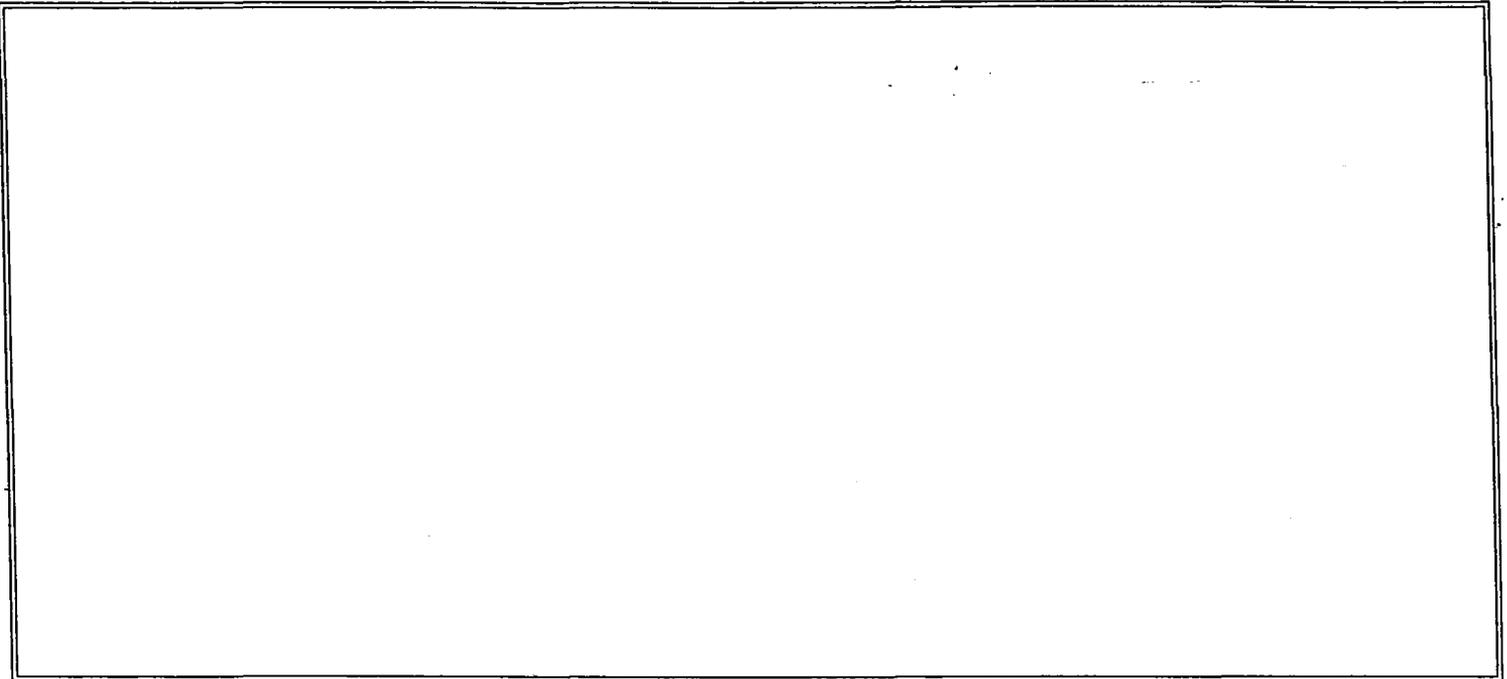
Drinking Water Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
3. Determine the water body type, flow (if applicable), and number of people served by each drinking water intake.			
4. PRIMARY TARGET POPULATION 0 person(s)	0		
5. SECONDARY TARGET POPULATION Are any intakes part of a blended system? (y/n): N	0	0	
6. NEAREST INTAKE	0	0	
7. RESOURCES	5	0	
T =	5	0	

Drinking Water Threat Target Populations

Intake Name	Primary (y/n)	Water Body Type/Flow	Population Served	Ref.	Value
None					
Total Primary Target Population Value					0
Total Secondary Target Population Value					0

Apportionment Documentation for a Blended System



Human Food Chain Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
8. Determine the water body type and flow for each fishery within the target limit.			
9. PRIMARY FISHERIES	0		
10. SECONDARY FISHERIES	0	0	
T =	0	0	

Human Food Chain Threat Targets

Fishery Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
None				
Total Primary Fisheries Value				0
Total Secondary Fisheries Value				0

Environmental Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
11. Determine the water body type and flow (if applicable) for each sensitive environment.			
12. PRIMARY SENSITIVE ENVIRONMENTS	300		
13. SECONDARY SENSITIVE ENVIRONS.	0	0	
T =	300	0	

Environmental Threat Targets

Sensitive Environment Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Wetland	Y	primary sens. envir.	4	300
2 White-top Pitcherplant	Y	primary sens. envir.	4	300
3 Large Leaved Jointweed	Y	primary sens. envir.	4	300
4 Water Sundew	Y	primary sens. envir.	4	300
None				
Total Primary Sensitive Environments Value				300
Total Secondary Sensitive Environments Value				0

Surface Water Pathway Threat Scores

Threat	Likelihood of Release(LR) Score	Targets(T) Score	Pathway Waste Characteristics (WC) Score	Threat Score LR x T x WC / 82,500
Drinking Water	550	5	32	1
Human Food Chain	550	0	32	0
Environmental	550	300	32	60

SURFACE WATER PATHWAY SCORE:

61

Soil Exposure Pathway Criteria List
Resident Population

- | | |
|--|---|
| Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? (y/n/u) | N |
| Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? (y/n/u) | N |
| Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? (y/n/u) | N |
| Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? (y/n/u) | N |
| Does any neighboring property warrant sampling? (y/n/u) | N |

Other criteria? (y/n) N

RESIDENT POPULATION IDENTIFIED? (y/n) N

Summarize the rationale for Resident Population:

SOIL EXPOSURE PATHWAY SCORESHEETS

Pathway Characteristics

		Ref.
Do any people live on or within 200 ft of areas of suspected contamination? (y/n)	No	
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination? (y/n)	No	
Is the facility active? (y/n):	No	

LIKELIHOOD OF EXPOSURE	Suspected Contamination	References
1. SUSPECTED CONTAMINATION LE =	550	

Targets

2. RESIDENT POPULATION 0 resident(s) 0 school/daycare student(s)	0	
3. RESIDENT INDIVIDUAL	0	
4. WORKERS None	0	
5. TERRES. SENSITIVE ENVIRONMENTS	0	
6. RESOURCES	0	
T =	0	

WASTE CHARACTERISTICS

WC =

RESIDENT POPULATION THREAT SCORE:

NEARBY POPULATION THREAT SCORE:

Population Within 1 Mile: None

SOIL EXPOSURE PATHWAY SCORE:

Soil Exposure Pathway Terrestrial Sensitive Environments

Terrestrial Sensitive Environment Name	Reference	Value
None		
Total Terrestrial Sensitive Environments Value		

Air Pathway Criteria List
Suspected Release

Are odors currently reported? (y/n/u) N

Has release of a hazardous substance to the air
been directly observed? (y/n/u) N

Are there reports of adverse health effects (e.g., headaches,
nausea, dizziness) potentially resulting from migration
of hazardous substances through the air? (y/n/u) N

Does analytical/circumstantial evidence suggest release to air? (y/n/u) N

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) N

Summarize the rationale for Suspected Release:

AIR PATHWAY SCORESHEETS

Pathway Characteristics

Do you suspect a release? (y/n)			No	Ref.
Distance to the nearest individual (feet):			0	
LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References	
1. SUSPECTED RELEASE	0			
2. NO SUSPECTED RELEASE		500		
LR =	0	500		

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION	0	0	
5. NEAREST INDIVIDUAL	0	0	
6. PRIMARY SENSITIVE ENVIRONS.	0		
7. SECONDARY SENSITIVE ENVIRONS.	0	0	
8. RESOURCES	0	5	
T =	0	5	

WASTE CHARACTERISTICS

WC =

0	18
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AIR PATHWAY SCORE:

1

Air Pathway Secondary Target Populations

Distance Categories	Population	References	Value
Onsite	0		0
Greater than 0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total Secondary Population Value			0

SITE SCORE CALCULATION	SCORE
GROUND WATER PATHWAY SCORE:	1
SURFACE WATER PATHWAY SCORE:	61
SOIL EXPOSURE PATHWAY SCORE:	0
AIR PATHWAY SCORE:	1
SITE SCORE:	31

SUMMARY

1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water? No

If yes, identify the well(s).

If yes, how many people are served by the threatened well(s)? 0

2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?
- A. Drinking water intake No
 - B. Fishery No
 - C. Sensitive environment (wetland, critical habitat, others) Yes

If yes, identity the target(s).

Wetlands border the base to the south and the east. Three plant species listed as threatened by the Florida Department of Agriculture have been found at OLF Bronson. These include the White-Top Pitcherplant, the Large Leaved Jointweed and the Water Sundew

3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? No

If yes, identify the properties and estimate the associated population(s)

4. Are there public health concerns at this site that are not addressed by PA scoring considerations? No

If yes, explain:

REFERENCE LIST

1. Marsh, O.T. 1966. Geology of Escambia and Santa Rosa Counties, Western Florida Panhandle: Florida Geol. Survey, Bull. 46, 140p.
2. Reference deleted, but space may be reused
3. United States Geological Survey. Topographic Maps, West Pensacola.
4. Interview with Base Personnel.
5. United States Navy 1989. Naval Technical Training Center, Corry Station Master Plan, Naval Complex, Pensacola, Florida.

PA-Score

PA SCORE SHEETS

Site Name: Fire Fighter Training Area
CERCLIS ID No.: FL6170024610
Street Address: Code 18510, Building 1754.
City/State/Zip: Penscola, FL 32508-5000

Investigator: Scott L. Horwitz
Agency/Organization: NEESA/NAVY
Street Address: Code 112E3
City/State: Port Hueneme, CA

Date: 1/92

WASTE CHARACTERISTICS

Waste Characteristics (WC) Calculations:

1 Fire Fighter Area	Contaminated soil	WQ value	maximum
Area	3.85E+03 sq ft	1.13E-01	1.13E-01

2. Fire Fighter Training Area:

The station fire department conducted practice burns in a fire fighting training area. The fire fighter training area is about seventy feet in diameter. Thus, the approximate area is:

$$\text{Area} = ((70 \text{ ft})^2) (3.142) / 4$$

$$\text{Area} = 3350 \text{ ft}^2.$$

Waste Characteristics Score: WC = 18

Ground Water Pathway Criteria List
 Suspected Release

Are sources poorly contained? (y/n/u)	Y
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	U
Is precipitation heavy? (y/n/u)	Y
Is the infiltration rate high? (y/n/u)	Y
Is the site located in an area of karst terrain? (y/n)	N
Is the subsurface highly permeable or conductive? (y/n/u)	Y
Is drinking water drawn from a shallow aquifer? (y/n/u)	N
Are suspected contaminants highly mobile in ground water? (y/n/u)	N
Does analytical or circumstantial evidence suggest ground water contamination? (y/n/u)	Y

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

Groundwater is believed to discharge into Perdido Bay. There are no known potable water wells down gradient from the Fire Fighter Training Area. Potential contaminants could contaminate local groundwater. Although soils in the vicinity have relatively poor drainage characteristics, they are fairly permeable. Therefore, the potential for vertical migration to groundwater and to surface discharge zones does exist.

Ref:

Ground Water Pathway Criteria List
Primary Targets

Is any drinking water well nearby? (y/n/u)	N
Has any nearby drinking water well been closed? (y/n/u)	N
Has any nearby drinking water well user reported foul-testing or foul-smelling water? (y/n/u)	N
Does any nearby well have a large drawdown/high production rate? (y/n/u)	N
Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance? (y/n/u)	N
Does analytical or circumstantial evidence suggest contamination at a drinking water well? (y/n/u)	N
Does any drinking water well warrant sampling? (y/n/u)	N
Other criteria? (y/n)	N

PRIMARY TARGET(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Targets:

GROUND WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics			Ref.
Do you suspect a release? (y/n)	Yes		
Is the site located in karst terrain? (y/n)	No		
Depth to aquifer (feet):	3		1
Distance to the nearest drinking water well (feet):	36960		2
LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION Are any wells part of a blended system? (y/n) N	0	0	
5. NEAREST WELL	0	0	
6. WELLHEAD PROTECTION AREA None within 4 Miles	0	0	
7. RESOURCES	5	0	
T =	5	0	

WASTE CHARACTERISTICS

WC =	18	0
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GROUND WATER PATHWAY SCORE:

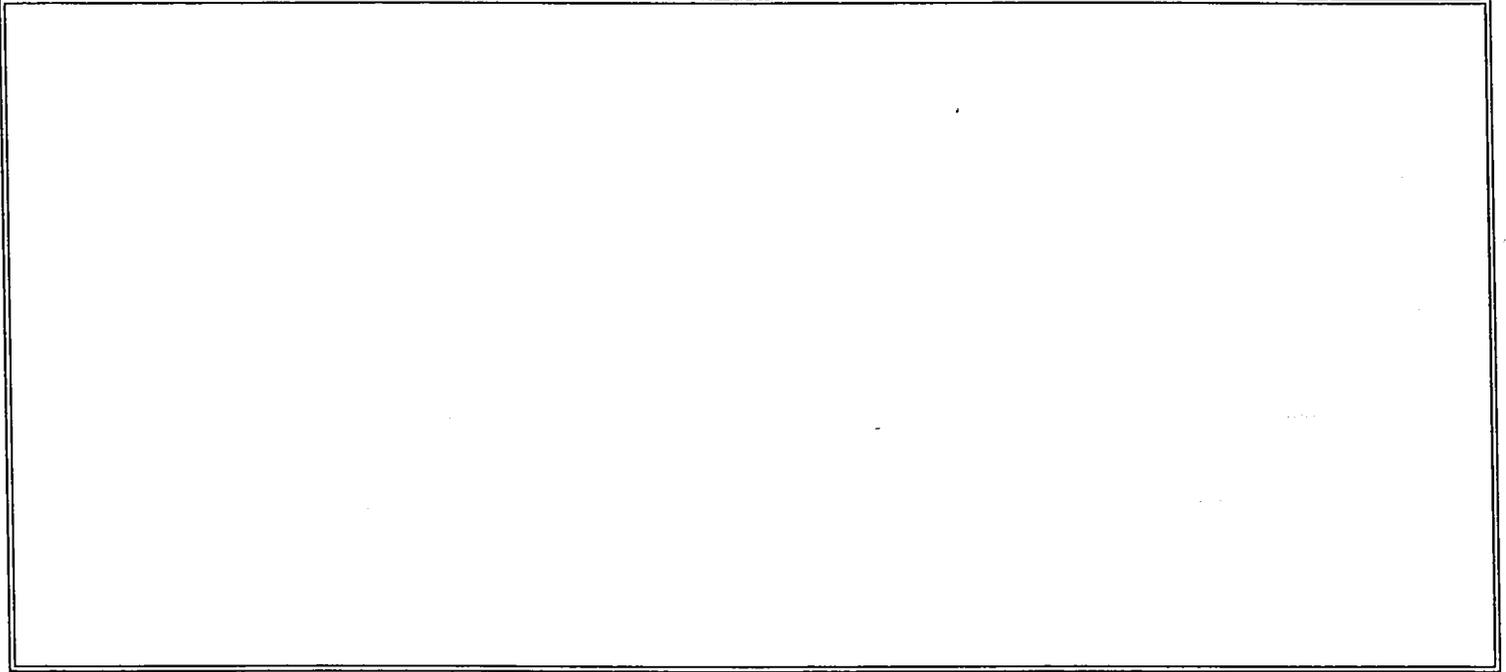
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Ground Water Target Populations

Primary Target Population Drinking Water Well ID	Dist. (miles)	Population Served	Reference	Value
None				
Total				

Secondary Target Population Distance Categories	Population Served	Reference	Value
0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total			0

Apportionment Documentation for a Blended System



Surface Water Pathway Criteria List
 Suspected Release

Is surface water nearby? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	Y
Is the drainage area large? (y/n/u)	U
Is rainfall heavy? (y/n/u)	Y
Is the infiltration rate low? (y/n/u)	Y
Are sources poorly contained or prone to runoff or flooding? (y/n/u)	Y
Is a runoff route well defined(e.g.ditch/channel to surf.water)? (y/n/u)	U
Is vegetation stressed along the probable runoff path? (y/n/u)	N
Are sediments or water unnaturally discolored? (y/n/u)	N
Is wildlife unnaturally absent? (y/n/u)	N
Has deposition of waste into surface water been observed? (y/n/u)	N
Is ground water discharge to surface water likely? (y/n/u)	Y
Does analytical/circumstantial evidence suggest S.W. contam? (y/n/u)	Y

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

Perdido Bay is located just west of the Fire Fighter Training Area. Surface water runoff from the area could drain into the wetlands located south of the area. Charred residue located at the Area may pose a small threat to local surface waters.

continued -----

Other criteria? (y/n) N

PRIMARY FISHERY(IES) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Fisheries:

Other criteria? (y/n) N

PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED? (y/n) Y

Summarize the rationale for Primary Sensitive Environments:

OLF Bronson is covered by paved runways surrounded by grassy fields, wooded areas, Perdido Bay, and wetlands. The surrounding area is predominatly wooded and supports a wide variety of plant species.

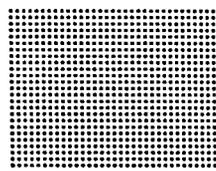
Several plant species listed as threatened or endangered by state or federal agencies have been observed at OLF Bronson. These include Florida Department of Agriculture (FDA) listed endangered species, such as the white-top pitcherplant, large leaved jointweed, and water sundew.

Ref: U.S. Navy Master Plan.

SURFACE WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	
Distance to surface water (feet):	1000	2
Flood frequency (years):	1-10	4
What is the downstream distance (miles) to:		
a. the nearest drinking water intake?	0.0	
b. the nearest fishery?	0.0	
c. the nearest sensitive environment?	0.5	4

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

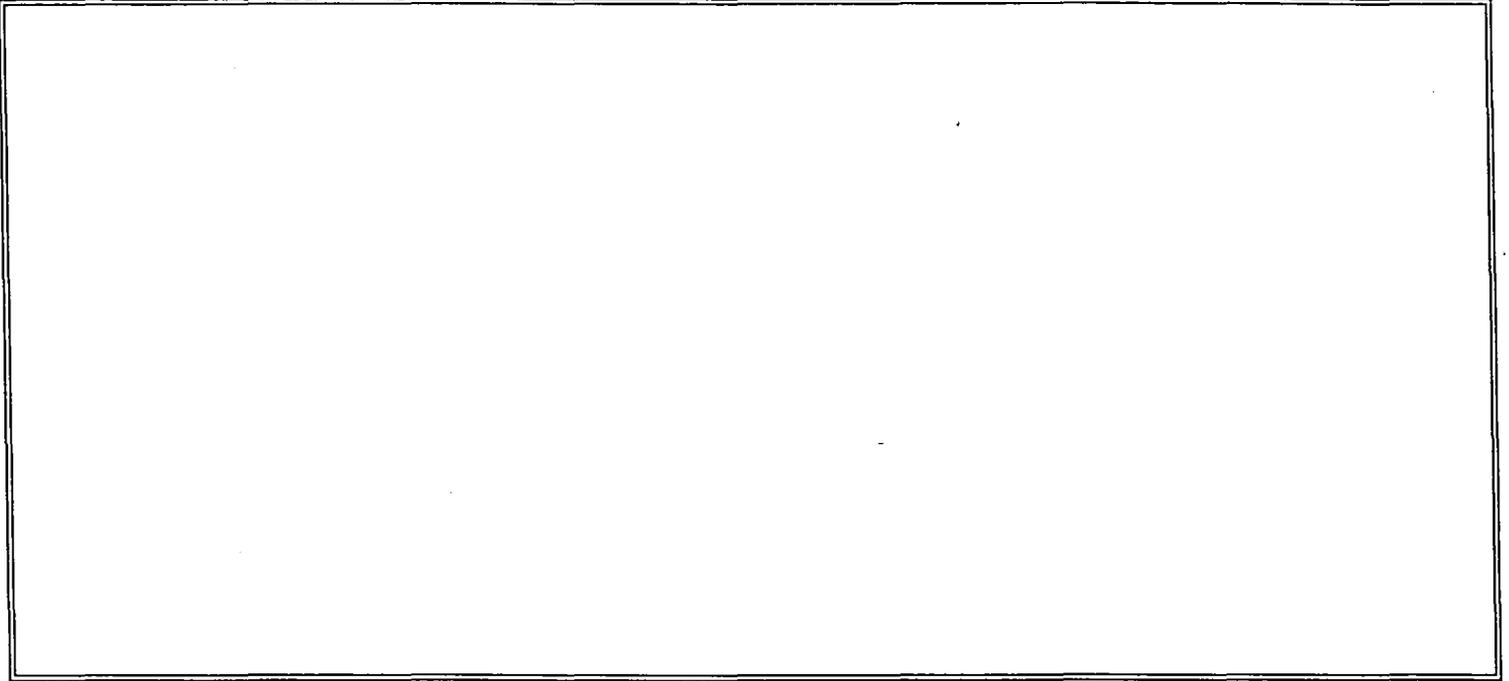
Drinking Water Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
3. Determine the water body type, flow (if applicable), and number of people served by each drinking water intake.			
4. PRIMARY TARGET POPULATION 0 person(s)	0		
5. SECONDARY TARGET POPULATION Are any intakes part of a blended system? (y/n): N	0	0	
6. NEAREST INTAKE	0	0	
7. RESOURCES	5	0	
T =	5	0	

Drinking Water Threat Target Populations

Intake Name	Primary (y/n)	Water Body Type/Flow	Population Served	Ref.	Value
None					
Total Primary Target Population Value					0
Total Secondary Target Population Value					0

Apportionment Documentation for a Blended System



Human Food Chain Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
8. Determine the water body type and flow for each fishery within the target limit.			
9. PRIMARY FISHERIES	0		
10. SECONDARY FISHERIES	0	0	
T =	0	0	

Human Food Chain Threat Targets

Fishery Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
None				
Total Primary Fisheries Value				0
Total Secondary Fisheries Value				0

Environmental Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
11. Determine the water body type and flow (if applicable) for each sensitive environment.			
12. PRIMARY SENSITIVE ENVIRONMENTS	300		
13. SECONDARY SENSITIVE ENVIRONS.	0	0	
T =	300	0	

Environmental Threat Targets

Sensitive Environment Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Wetland	Y	primary sens. envir.	4	300
2 White-top Pitcherplant	Y	primary sens. envir.	4	300
3 Large Leaved Jointweed	Y	primary sens. envir.	4	300
4 Water Sundew	Y	primary sens. envir.	4	300
None				
Total Primary Sensitive Environments Value				300
Total Secondary Sensitive Environments Value				0

Surface Water Pathway Threat Scores

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score	Threat Score LR x T x WC / 82,500
Drinking Water	550	5	32	1
Human Food Chain	550	0	32	0
Environmental	550	300	32	60

SURFACE WATER PATHWAY SCORE:

61

Soil Exposure Pathway Criteria List
Resident Population

Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? (y/n/u) N

Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? (y/n/u) N

Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? (y/n/u) N

Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? (y/n/u) N

Does any neighboring property warrant sampling? (y/n/u) N

Other criteria? (y/n) N

RESIDENT POPULATION IDENTIFIED? (y/n) N

Summarize the rationale for Resident Population:

Soil Exposure Pathway Terrestrial Sensitive Environments

Terrestrial Sensitive Environment Name	Reference	Value
None		
Total Terrestrial Sensitive Environments Value		

Air Pathway Criteria List
Suspected Release

Are odors currently reported? (y/n/u) N

Has release of a hazardous substance to the air
been directly observed? (y/n/u) N

Are there reports of adverse health effects (e.g., headaches,
nausea, dizziness) potentially resulting from migration
of hazardous substances through the air? (y/n/u) N

Does analytical/circumstantial evidence suggest release to air? (y/n/u) N

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) N

Summarize the rationale for Suspected Release:

AIR PATHWAY SCORESHEETS

Pathway Characteristics

Do you suspect a release? (y/n)			No	Ref.
Distance to the nearest individual (feet):			0	
LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References	
1. SUSPECTED RELEASE	0			
2. NO SUSPECTED RELEASE		500		
LR =	0	500		

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION	0	0	
5. NEAREST INDIVIDUAL	0	0	
6. PRIMARY SENSITIVE ENVIRONS.	0		
7. SECONDARY SENSITIVE ENVIRONS.	0	0	
8. RESOURCES	0	5	
T =	0	5	

WASTE CHARACTERISTICS

WC =

0	18
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AIR PATHWAY SCORE:

1

Air Pathway Secondary Target Populations

Distance Categories	Population	References	Value
Onsite	0		0
Greater than 0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total Secondary Population Value			0

Air Pathway Primary Sensitive Environments

Sensitive Environment Name	Reference	Value
None		
Total Primary Sensitive Environments Value		

Air Pathway Secondary Sensitive Environments

Sensitive Environment Name	Distance	Reference	Value
None			
Total Secondary Sensitive Environments Value			

SITE SCORE CALCULATION	SCORE
GROUND WATER PATHWAY SCORE:	1
SURFACE WATER PATHWAY SCORE:	61
SOIL EXPOSURE PATHWAY SCORE:	0
AIR PATHWAY SCORE:	1
SITE SCORE:	31

SUMMARY

1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water? No

If yes, identify the well(s).

If yes, how many people are served by the threatened well(s)? 0

2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?
- A. Drinking water intake No
 - B. Fishery No
 - C. Sensitive environment (wetland, critical habitat, others) Yes

If yes, identify the target(s).

Wetlands border the base to the south and the east. Three plant species listed as threatened by the Florida Department of Agriculture have been found at OLF Bronson. These include the White-Top Pitcherplant, the Large Leaved Jointweed and the Water Sundew

3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? No

If yes, identify the properties and estimate the associated population(s)

4. Are there public health concerns at this site that are not addressed by PA scoring considerations? No

If yes, explain:

REFERENCE LIST

1. Marsh, O.T. 1966. Geology of Escambia and Santa Rosa Counties, Western Florida Panhandle: Florida Geol. Survey, Bull. 46, 140p.
2. Reference deleted, but space may be reused
3. ~~United States Geological Survey. Topographic Maps, West Pensacola.~~
4. Interview with Base Personnel.
5. United States Navy 1989. Naval Technical Training Center, Corry Station Master Plan, Naval Complex, Pensacola, Florida.

PA-Score

PA SCORESHEETS

Site Name: Machine Gun Butt Hill
CERCLIS ID No.: FL6170024610
Street Address: Code 18510, Building 1754.
City/State/Zip: Penscola, FL 32508-5000

Investigator: Scott L. Horwitz
Agency/Organization: NEESA/NAVY
Street Address: Code 112E3
City/State: Port Hueneme, CA

Date: 1/92

WASTE CHARACTERISTICS

Waste Characteristics (WC) Calculations:

1 Machine Gun Hill	Pile	WQ value	maximum
Volume	6.00E+04 cu ft	8.89E+02	8.89E+02

~~3. Machine Gun Butt Hill:~~

The machine gun butt hill is a clay hill about 100 ft in length, 30 ft wide and 20 ft high. Large amounts of spent bullets are scattered about the area. The approximate volume is:

$$\text{Volume} = (100 \text{ ft}) * (30 \text{ ft}) * (20 \text{ ft})$$

$$\text{Volume} = 60000 \text{ cft.}$$

Waste Characteristics Score: WC = 32

Ground Water Pathway Criteria List
 Suspected Release

Are sources poorly contained? (y/n/u)	Y
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	U
Is precipitation heavy? (y/n/u)	Y
Is the infiltration rate high? (y/n/u)	Y
Is the site located in an area of karst terrain? (y/n)	N
Is the subsurface highly permeable or conductive? (y/n/u)	Y
Is drinking water drawn from a shallow aquifer? (y/n/u)	N
Are suspected contaminants highly mobile in ground water? (y/n/u)	N
Does analytical or circumstantial evidence suggest ground water contamination? (y/n/u)	U

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

Perdido Bay is located just west of the facility. Surface water run-off from the Machine Gun Butt is believed to drain into Perdido Bay on the southwest side of the facility. Heavy meatalms located at the Machine Gun Butt may pose a small threat to local surface waters.

Heavy metals tend to bind to clay particles in sediments and are generally not very mobile. Erosion of top soil from the Machine Gun Butt would be the most likely source of contamination reaching local surface waters.

Ref:

Ground Water Pathway Criteria List
Primary Targets

Is any drinking water well nearby? (y/n/u)	N
Has any nearby drinking water well been closed? (y/n/u)	N
Has any nearby drinking water well user reported foul-testing or foul-smelling water? (y/n/u)	N
Does any nearby well have a large drawdown/high production rate? (y/n/u)	N
Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance? (y/n/u)	N
Does analytical or circumstantial evidence suggest contamination at a drinking water well? (y/n/u)	N
Does any drinking water well warrant sampling? (y/n/u)	N
Other criteria? (y/n)	N

PRIMARY TARGET(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Targets:

GROUND WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	
Is the site located in karst terrain? (y/n)	No	
Depth to aquifer (feet):	3	1
Distance to the nearest drinking water well (feet):	36960	2

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION Are any wells part of a blended system? (y/n) N	0	0	
5. NEAREST WELL	0	0	
6. WELLHEAD PROTECTION AREA None within 4 Miles	0	0	
7. RESOURCES	5	0	
T =	5	0	

WASTE CHARACTERISTICS

WC =	32	0
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GROUND WATER PATHWAY SCORE:

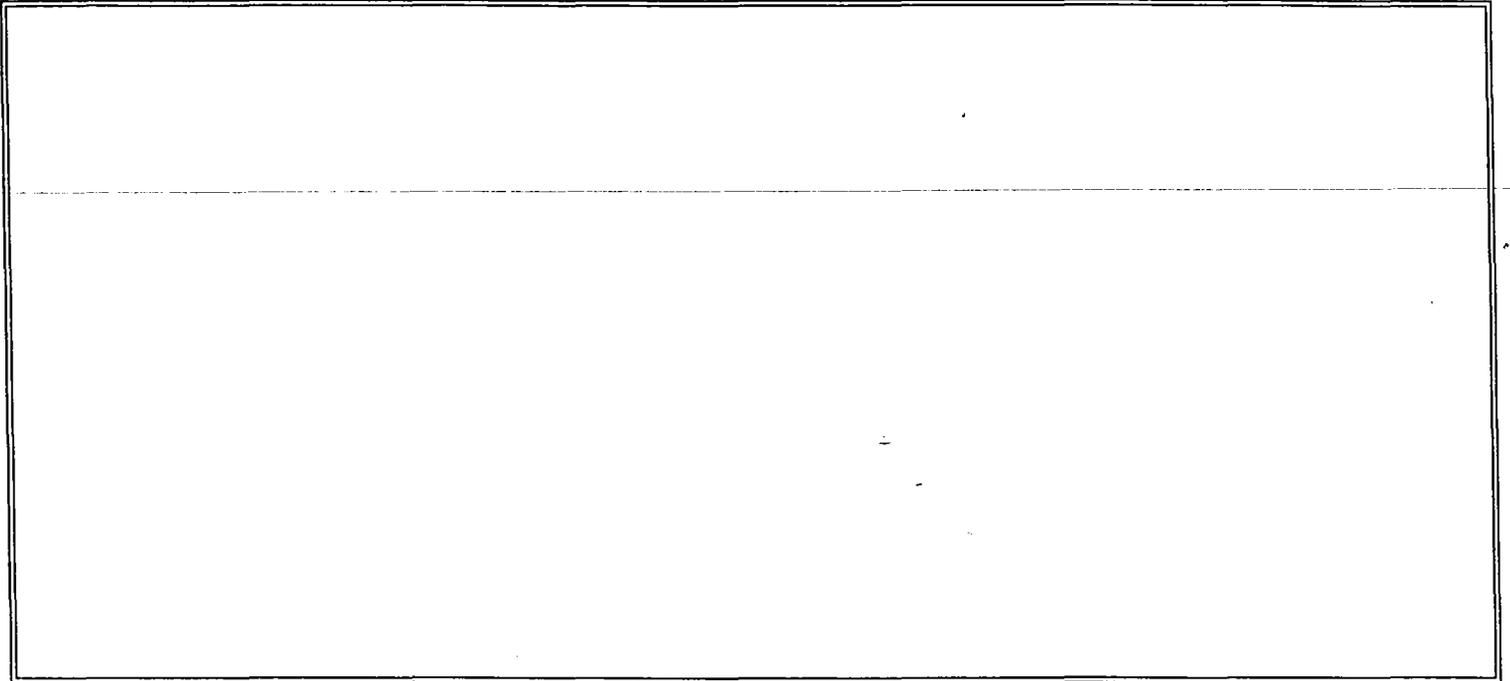
1

Ground Water Target Populations

Primary Target Population Drinking Water Well ID	Dist. (miles)	Population Served	Reference	Value
None				
Total				

Secondary Target Population Distance Categories	Population Served	Reference	Value
0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total			0

Apportionment Documentation for a Blended System



Surface Water Pathway Criteria List
 Suspected Release

Is surface water nearby? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	Y
Is the drainage area large? (y/n/u)	U
Is rainfall heavy? (y/n/u)	Y
Is the infiltration rate low? (y/n/u)	Y
Are sources poorly contained or prone to runoff or flooding? (y/n/u)	Y
Is a runoff route well defined(e.g.ditch/channel to surf.water)? (y/n/u)	U
Is vegetation stressed along the probable runoff path? (y/n/u)	N
Are sediments or water unnaturally discolored? (y/n/u)	N
Is wildlife unnaturally absent? (y/n/u)	N
Has deposition of waste into surface water been observed? (y/n/u)	N
Is ground water discharge to surface water likely? (y/n/u)	Y
Does analytical/circumstantial evidence suggest S.W. contam? (y/n/u)	Y

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

Perdido Bay is located just west of the facility. Surface water run-off from the three sites will, more than likely drain into the bay.
 Ground water in the area is extremely shallow, and may discharge into Perdido Bay. Thus, ground water could possibly be contaminating the bay.

Surface Water Pathway Criteria List
Primary Targets

Is any target nearby? (y/n/u)	If yes:	Y
N Drinking water intake		
N Fishery		
Y Sensitive environment		
Has any intake, fishery, or recreational area been closed? (y/n/u) N		
Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target? (y/n/u) Y		
Does any target warrant sampling? (y/n/u)	If yes:	Y
N Drinking water intake		
N Fishery		
Y Sensitive environment		

Other criteria? (y/n) N

PRIMARY INTAKE(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Intakes:

continued -----

continued -----

Other criteria? (y/n) N

PRIMARY FISHERY(IES) IDENTIFIED? (y/n) N

~~Summarize the rationale for Primary Fisheries:~~

Other criteria? (y/n) N

PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED? (y/n) Y

Summarize the rationale for Primary Sensitive Environments:

OLF Bronson is covered by paved runways surrounded by grassy fields, wooded areas, Perdido Bay, and wetlands. The surrounding area is predominately wooded and supports a wide variety of plant species.

Several plant species listed as threatened or endangered by state or federal agencies have been observed at OLF Bronson. These include Florida Department of Agriculture (FDA) listed endangered species, such as the white-top pitcherplant, large leaved jointweed, and water sundew.

Ref: U.S. Navy Master Plan.

SURFACE WATER PATHWAY SCORESHEETS

Pathway Characteristics

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	
Distance to surface water (feet):	1000	2
Flood frequency (years):	1-10	4
What is the downstream distance (miles) to:		
a. the nearest drinking water intake?	0.0	
b. the nearest fishery?	0.0	
c. the nearest sensitive environment?	0.5	4

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

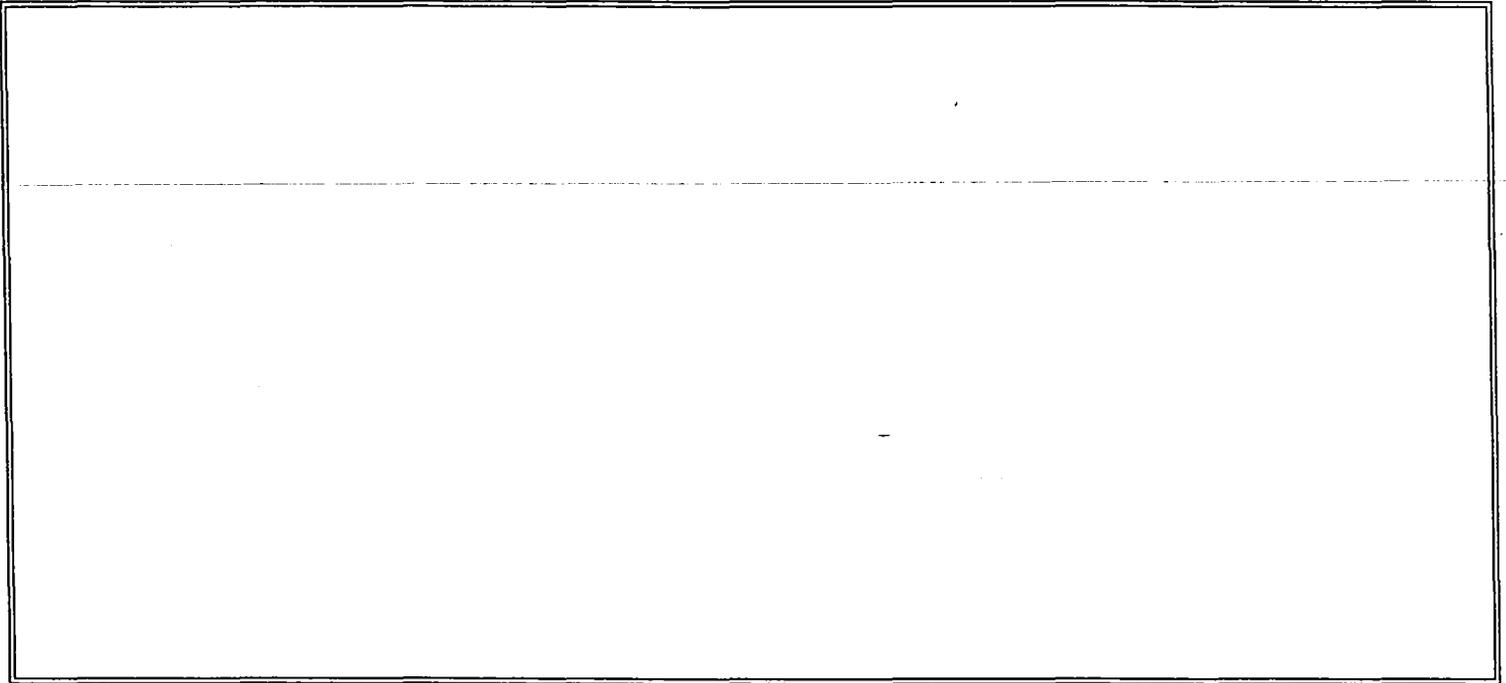
Drinking Water Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
3. Determine the water body type, flow (if applicable), and number of people served by each drinking water intake.			
4. PRIMARY TARGET POPULATION 0 person(s)	0		
5. SECONDARY TARGET POPULATION Are any intakes part of a blended system? (y/n): N	0	0	
6. NEAREST INTAKE	0	0	
7. RESOURCES	5	0	
T =	5	0	

Drinking Water Threat Target Populations

Intake Name	Primary (y/n)	Water Body Type/Flow	Population Served	Ref.	Value
None					
Total Primary Target Population Value					0
Total Secondary Target Population Value					0

Apportionment Documentation for a Blended System



Human Food Chain Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
8. Determine the water body type and flow for each fishery within the target limit.			
9. PRIMARY FISHERIES	0		
10. SECONDARY FISHERIES	0	0	
T =	0	0	

Human Food Chain Threat Targets

Fishery Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
None				
Total Primary Fisheries Value				0
Total Secondary Fisheries Value				0

Environmental Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
11. Determine the water body type and flow (if applicable) for each sensitive environment.			
12. PRIMARY SENSITIVE ENVIRONMENTS	300		
13. SECONDARY SENSITIVE ENVIRONS.	0	0	
T =	300	0	

Environmental Threat Targets

Sensitive Environment Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Wetland	Y	primary sens. envir.	4	300
2 White-top Pitcherplant	Y	primary sens. envir.	4	300
3 Large Leaved Jointweed	Y	primary sens. envir.	4	300
4 Water Sundew	Y	primary sens. envir.	4	300
None				
Total Primary Sensitive Environments Value				300
Total Secondary Sensitive Environments Value				0

Surface Water Pathway Threat Scores

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score	Threat Score $LR \times T \times WC / 82,500$
Drinking Water	550	5	32	1
Human Food Chain	550	0	32	0
Environmental	550	300	32	60

SURFACE WATER PATHWAY SCORE:

61

Soil Exposure Pathway Criteria List
Resident Population

Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? (y/n/u) N

Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? (y/n/u) N

Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? (y/n/u) N

Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? (y/n/u) N

Does any neighboring property warrant sampling? (y/n/u) N

Other criteria? (y/n) N

RESIDENT POPULATION IDENTIFIED? (y/n) N

Summarize the rationale for Resident Population:

SOIL EXPOSURE PATHWAY SCORESHEETS

Pathway Characteristics

		Ref.
Do any people live on or within 200 ft of areas of suspected contamination? (y/n)	No	
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination? (y/n)	No	
Is the facility active? (y/n):	No	

LIKELIHOOD OF EXPOSURE	Suspected Contamination	References
1. SUSPECTED CONTAMINATION LE =	550	

Targets

2. RESIDENT POPULATION 0 resident(s) 0 school/daycare student(s)	0	
3. RESIDENT INDIVIDUAL	0	
4. WORKERS None	0	
5. TERRES. SENSITIVE ENVIRONMENTS	0	
6. RESOURCES	0	
T =	0	

WASTE CHARACTERISTICS

WC =

RESIDENT POPULATION THREAT SCORE:

NEARBY POPULATION THREAT SCORE:

Population Within 1 Mile: None

SOIL EXPOSURE PATHWAY SCORE:

Soil Exposure Pathway Terrestrial Sensitive Environments

Terrestrial Sensitive Environment Name	Reference	Value
None		
Total Terrestrial Sensitive Environments Value		

Air Pathway Criteria List
Suspected Release

Are odors currently reported? (y/n/u) N

Has release of a hazardous substance to the air
been directly observed? (y/n/u) N

Are there reports of adverse health effects (e.g., headaches,
nausea, dizziness) potentially resulting from migration
of hazardous substances through the air? (y/n/u) N

Does analytical/circumstantial evidence suggest release to air? (y/n/u) N

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) N

Summarize the rationale for Suspected Release:

AIR PATHWAY SCORESHEETS

Pathway Characteristics

Do you suspect a release? (y/n)			No	Ref.
Distance to the nearest individual (feet):			0	
LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References	
1. SUSPECTED RELEASE	0			
2. NO SUSPECTED RELEASE		500		
LR =	0	500		

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION	0	0	
5. NEAREST INDIVIDUAL	0	0	
6. PRIMARY SENSITIVE ENVIRONS.	0		
7. SECONDARY SENSITIVE ENVIRONS.	0	0	
8. RESOURCES	0	5	
T =	0	5	

WASTE CHARACTERISTICS

WC =

0	32
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AIR PATHWAY SCORE:

1

Air Pathway Secondary Target Populations

Distance Categories	Population	References	Value
Onsite	0		0
Greater than 0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	0		0
Greater than 2 to 3 miles	0		0
Greater than 3 to 4 miles	0		0
Total Secondary Population Value			0

Air Pathway Primary Sensitive Environments

Sensitive Environment Name	Reference	Value
None		
Total Primary Sensitive Environments Value		

Air Pathway Secondary Sensitive Environments

Sensitive Environment Name	Distance	Reference	Value
None			
Total Secondary Sensitive Environments Value			

SITE SCORE CALCULATION	SCORE
GROUND WATER PATHWAY SCORE:	1
SURFACE WATER PATHWAY SCORE:	61
SOIL EXPOSURE PATHWAY SCORE:	0
AIR PATHWAY SCORE:	1
SITE SCORE:	31

SUMMARY

1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water? No

If yes, identify the well(s).

If yes, how many people are served by the threatened well(s)? 0

2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?
- A. Drinking water intake No
 - B. Fishery No
 - C. Sensitive environment (wetland, critical habitat, others) Yes

If yes, identity the target(s).

Wetlands border the base to the south and the east. Three plant species listed as threatened by the Florida Department of Agriculture have been found at OLF Bronson. These include the White-Top Pitcherplant, the Large Leaved Jointweed and the Water Sundew

3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? No

If yes, identify the properties and estimate the associated population(s)

4. Are there public health concerns at this site that are not addressed by PA scoring considerations? No

If yes, explain:

REFERENCE LIST

1. Marsh, O.T. 1966. Geology of Escambia and Santa Rosa Counties, Western Florida Panhandle: Florida Geol. Survey, Bull. 46, 140p.
2. Reference deleted, but space may be reused
3. United States Geological Survey. Topographic Maps, West Pensacola.
4. Interview with Base Personnel.
5. United States Navy 1989. Naval Technical Training Center, Corry Station Master Plan, Naval Complex, Pensacola, Florida.