Pensacola Naval Air Station

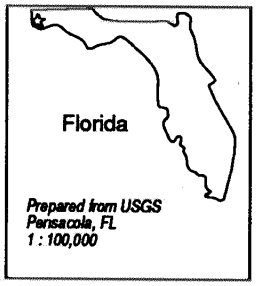
Pensacola, Florida
Region 4
FL9170024567

Site Exposure Potential

The Naval Air Station (NAS) Pensacola is located on a narrow peninsula in Pensacola Bay approximately 3 km southwest of Pensacola, Florida (Figure 1). The NAS occupies 2,260 hectares, bounded by Bayou Grande on the north and Pensacola Bay to the east and south.

Beginning in the 1930s, industrial wastes from operations at the site were discharged directly into Pensacola Bay and Bayou Grande. This continued until 1973 when an industrial waste treatment plant began operation. Wastes included paint, solvents, mercury, radium paint, and concentrated plating wastes containing cadmium, chromium, cyanide, lead, and nickel. The plating wastes were discharged via a drainage ditch to Bayou Grande. Other areas of concern include landfills; materials disposal and storage areas; pesticide storage, handling, and disposal areas; solvent, fuel, and industrial waste pipeline leak and spill areas; radium spill areas; and fire and crash training areas (Ecology and Environment 1989).

The site includes wetlands, large paved areas, sandy tracts vegetated with native grasses, a golf course, buildings, and housing sites. A concrete levee runs along the southeastern portion of the base and extends into the subtidal zone of Pensacola Bay.



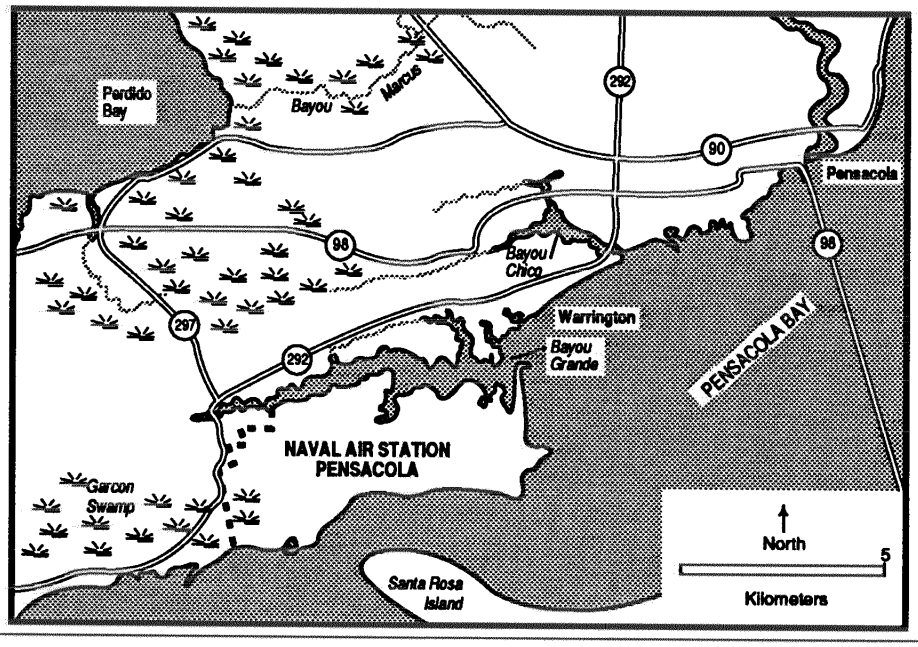


Figure 1.
Naval Air Station Pensacola,
Pensacola, Florida.

Naval Air Station Pensacola

Site Exposure Potential, *cont.*

Geology at the site is characterized by fine- to medium-grained quartz sand soil. The water table is generally shallow, but varies between 1.5 m and 4.5 m over much of the site. Groundwater flow is influenced by tides and storms, but there were insufficient data to determine its direction in most areas. In the northern part of the NAS, groundwater moves primarily to the north and northwest toward Bayou Grande. Other studies have suggested that there is a slight gradient to the south (Ecology and Environment 1989).

Surface water runoff and groundwater are potential pathways for transport of contaminants to Pensacola Bay, Bayou Grande, and the coastal wetlands.

Site-Related Contamination

The limited contaminant data for the site are summarized in Table 1 with applicable screening levels (Ecology and Environment 1989). Groundwater samples had low concentrations of a number of substances. Leachate from an inactive landfill adjacent to Bayou Grande contained cadmium, chromium, lead, mercury, nickel, and zinc at levels exceeding their respective AWQC (EPA 1986). Leachate has also been detected in groundwater and surface water adjacent to this landfill.

Table 1. Maximum concentrations of major contaminants in groundwater, leachate, soil, and sediment at the site.

	Water			Soil	Sediment	
	Ground-water µg/l	Leach-ate µg/l	AWQC[1] µg/l	Soil mg/kg	Sediment mg/kg	ER-L[2] mg/kg
INORGANIC SUBSTANCES						
cadmium	10	2,300	9.3	ND	140	5
chromium	5	1,900	50	ND	8,900	80
cyanide	ND	4,560	1	NT	NT	NA
lead	69	51,000	5.6	ND	650	35
mercury	27	200	0.025	ND	2	0.15
nickel	9	4,000	8.3	ND	27	30
zinc	365	25,100	86	ND	103	120
PESTICIDES						
p,p'-DDE	ND	ND	NA	1.2	NT	0.002
p,p'-DDD	ND	ND	NA	0.03	NT	0.002
p,p'-DDT	ND	ND	0.001	1.2	NT	0.001
dieldrin	ND	ND	0.0019	0.44	NT	0.00002
chlordane	ND	ND	NA	21.0	NT	0.0005

1 Ambient water quality criteria for the protection of aquatic organisms. Marine chronic criteria presented (EPA 1986).
2: Effective range-low; the concentration representing the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and Morgan (1990).
NT Not analyzed
NA Screening level not available.
ND Not detected at method detection limit; detection limit not given

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Site-Related Contamination, *cont.*

Elevated levels of pesticides were found in soil at the pesticide mixing facility. Elevated levels of radium radiation were also found in soil (1.2 mR/hr compared to a normal background level of 0.02 mR/hr) in addition to methylene chloride and cyanide. Sediment sampled below the storm drain outfalls contained levels of metals that are associated with toxic effects in studies compiled by Long and Morgan (1990).

NOAA Trust Habitats and Species

The habitats of primary interest to NOAA, Pensacola Bay and Bayou Grande, include an estimated 253 hectares of estuarine wetlands, including intertidal and shallow areas and eelgrass beds (USFWS 1987). These environments are part of the Pensacola estuary and serve as estuarine nurseries and adult habitat for numerous marine species. Pensacola Bay is is partially sheltered by barrier islands to the south. Bayou Grande is a shallow protected inlet of Pensacola Bay. Little is known about the aquatic habitats in this embayment, but its physical characteristics are similar to the sheltered, lower-salinity nursery areas in the upper reaches of the Pensacola estuary. Significant amounts of eelgrass habitat have been lost within Bayou Grande since the 1970s (Brown personal communication 1990).

Shallow estuarine environments play an important role in the recruitment of numerous fish species to the Gulf of Mexico. Several species, such as ladyfish, sheepshead, members of the drum family (drums and seatrout), and mullet are dependent upon estuaries during their early life history (Beccasio et al. 1982). Fisheries data collected by Cooley (1978) found high abundances of adult fish in Pensacola Bay, including 180 species (Table 2; Beccasio et al. 1982; RPI 1984; Ecology and Environment 1989). Some of the most abundant were spot, pinfish, Atlantic croaker, gulf menhaden, bay anchovy, longspine porgy, silver perch, southern hake, inshore lizardfish, gafftopsail catfish, sand seatrout, and spotted hake (Ecology and Environment 1989).

Southern and spotted hake, ladyfish, red drum, sheepshead, and Atlantic croaker are among the economically important species common in the bay. Recreational and commercial fisheries are present throughout the Pensacola estuary; primary species caught include Spanish mackerel, seatrout, drum, Atlantic croaker, snapper, amberjack, and porgy (Ecology and Environment 1989).

NOAA Trust Habitats and Species, *cont.*

Commercial fisheries for Eastern oyster, blue crab, and mullet also occur in the Pensacola estuary (Beccasio et al. 1982). Brown shrimp are fished commercially, and though juvenile white shrimp occur in the bay, recruitment to adult populations is too low to support a commercial fishery (Brown personal communication 1990). Recreational and commercial shellfishing is prohibited in Bayou Grande by local ordinance for resource management purposes. Shellfish harvests occur in portions of the bay, but may

Table 2. Important fish and invertebrate species, and habitat use in Pensacola Bay and Bayou Grande.

Species		Habitat		
Common Name	Scientific Name	Spawning	Nursery	Adult Forage
ANADROMOUS/CATADROMOUS FISH				
Gulf sturgeon	Acipenser oxyrhynchus desotoi			M
American eel	Anguilla rostrata		◆	
striped bass	Morone saxatilis		◆	◆
ESTUARINE/MARINE				
Fish				
Bay anchovy	Anchoa mitchelli	◆	◆	◆
sheepshead	Archosargus probatocephalus		◆	◆
gafftopsail catfish	Bagre marinus	◆	◆	◆
silver perch	Bairdiella chrysoura			◆
Atlantic menhaden	Brevoortia tyrannus		◆	◆
sand seatrout	Cynoscion arenarius	◆	◆	◆
spotted seatrout	Cynoscion nebulosus	◆	◆	◆
ladyfish	Elops saurus		◆	◆
pinfish	Lagodon rhomboides		◆	◆
spot	Leiostomus xanthurus		◆	◆
red snapper	Lutjanus campechanus		◆	◆
Atlantic croaker	Micropongonias undulatus		◆	◆
striped mullet	Mugil cephalus		◆	◆
Gulf flounder	Paralichthys albigutta		◆	◆
southern flounder	Paralichthys lethostigma		◆	◆
bluefish	Pomatomus saltatrix		◆	◆
vermilion snapper	Rhomboplites aurorubens			◆
red drum	Sciaenops ocellatus		◆	◆
Spanish mackerel	Scomberomorus maculatus			◆
amberjacks	Seriola sp.			◆
longspine porgy	Stenotomus caprinus			◆
inshore lizardfish	Synodus foetens			◆
southern hake	Urophycis floridana			◆
spotted hake	Urophycis regia			◆
Invertebrates				
scallops	Aequipecten irradians	◆	◆	◆
blue crab	Callinectes sapidus		◆	◆
hard clam	Mercenaria mercenaria	◆	◆	◆
white shrimp	Penaeus setiferus		◆	◆
brown shrimp	Penaeus aztecus		◆	◆
Marine mammals				
West Indian manatee	Trichechus manatus latirostris			M
Atlantic bottlenose dolphin	Tursiops truncatus			◆

M: These species are present as migrants only

NOAA Habitats and Species, *cont.*

be periodically restricted due to high coliform counts. Most of these restrictions are associated with high precipitation levels that increase runoff into the bay (Thompson personal communication 1989).

Threatened or endangered species near the site include the Gulf sturgeon, currently being considered for threatened species status by the U.S. Fish and Wildlife Service (USFWS 1987). The State Fisheries Commission is considering a moratorium on fishing of striped mullet. Manatees, an endangered marine mammal, have been sighted adjacent to the site within the last year (Troxel personal communication 1990). Atlantic bottlenose dolphin have also been sighted regularly near the site (Ecology and Environment 1989).

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